



Digitized by the Internet Archive  
in 2007 with funding from  
Microsoft Corporation

<http://www.archive.org/details/pt1americanfore23natiuoft>



# AMERICAN FORESTRY

THE MAGAZINE OF

THE AMERICAN FORESTRY ASSOCIATION, WASHINGTON, D. C.

VOLUME XXIII, NOS. 1 TO 12, INCLUSIVE—JANUARY TO DECEMBER, 1917, INCLUSIVE

## AUTHOR'S INDEX

	Page		Page
Adams, Bristow, articles by	32; 94; 166; 290; 364; 428; 458; 494; 552; 583; 678	Marlatt, C. L., article by	75
Allen, Arthur A., articles by	15; 98; 154; 221; 272; 290; 364; 419; 484; 529; 625; 663; 736	Mattoon, Wilbur R., article by	158
Baker, Ida Agnes, article by	459	McFarland, J. Horace, article by	531
Ball, Woodruff, article by	212	McLoud, Norman C., articles by	389; 465; 521; 593; 598
Buttrick, P. L., article by	710	Mendenhall, Eugene M., article by	14
Caldwell, Guy, article by	80	Mitchell, Guy E., article by	758
Chamberlain, Leon T., poem by	458	Morison, W. G., article by	435
Chapman, Arthur, poem by	289	Moulton, Robert H., article by	549
Chapman, Herman H., articles by	225; 270; 293	Nelson, E. W., article by	139
Cornell, Herbert W., article by	93	Norton, Gayne T. K., articles by	292; 351; 555; 668
Cox, W. T., article by	107	Olzendam, Roderic M., article by	49
Coyne, Frank, articles by	361; 423	Pack, Charles Lathrop, articles by	81; 519; 559; 590; 676
Daniels, Mark, articles by	29; 657	Pettis, C. R., article by	70
Detwiler, S. B., articles by	3; 69; 88; 280	Powers, Mabel, article by	656
Douglass, A. E., article by	732	Putnam, Bessie L., article by	343
Douglass, C. W. H., articles by	346; 424	Reed, C. A., article by	619
Edwards, Russell T., article by	116	Riley, Smith, articles by	358; 680; 727
Fairchild, David, article by	213	Sanders, J. G., article by	147
Field, Alice Gertrude, poem by	269	Sarett, Lew R., poem by	726
Foote, John, article by	488	Shattuck, C. H., article by	536
Fraser, Donald A., poem by	709	Shufeldt, R. W., articles by	21; 83; 103; 161; 169; 217; 285; 340; 403; 431; 474; 543; 565; 611; 669; 743
Glaenger, Richard Butler, poems by	165; 240	Smith, J. Russell, article by	228
Gohier, Urbain, article by	30	Spaulding, Perley, article by	67
Granger, C. M., article by	299	Spencer, Alice, article by	592
Graves, Henry S., article by	133	Stahl, C. J., article by	234
Haddon, Rawson Woodman, articles by	181; 244; 307; 630; 693; 751	Sterling, E. A., article by	689
Haman, Miles, article by	331	Sudworth, George B., article by	683
Hawes, Austin F., article by	332	Thayer, Stephen Henry, poem by	93
Houston, D. E., article by	205	Theiss, Lewis E., articles by	160; 395
Hunzicker, Lena B., article by	667	Tomlinson, Bertha M., article by	14
Johnson, H. L., poem by	464	Whittle, Charles A., article by	492
Judd, C. S., article by	239	Williams, Mrs. Lydia Adams, article by	96
Killick, V. W., article by	731	Wilson, Ellwood, articles by	53; 115; 180; 248; 314
Kyle, Jennie Lynne, article by	349	Wilson, Stanley F., article by	427
Levison, J. J., articles by	34; 100; 173; 236	Woods, John B., article by	481
MacCaughy, Vaughan, article by	276	Wright, Allen H., article by	675
		Zimmerman, H. E., articles by	398; 591; 624

## GENERAL INDEX

	Page		Page
Address By President Charles Lathrop Pack	81	Blister Disease, Fighting the Pine	562; 688
Aeolian Erosion in Hawaii—C. S. Judd	239	Blister Disease Quarantines, Pine	302
Aerial Forest Patrol—W. T. Cox	107	Blister Disease, The Fight against the Pine	38
Airplane Construction, Wood in—Bristow Adams	583	Blister Disease Work Progresses, Pine	433
Airplanes, Spruce for	554	Blister Quarantine Hearing, Pine	241
Altoona's Watershed Forested	366	Blue Mesa Forest Fire, The—Henry L. Spencer	561
Aquatic Plants, Marsh Land and Other—R. W. Shufeldt	611	Book Reviews:	
Atlantic and Gulf States, Plants and Animals of the—R. W. Shufeldt	743	The Story of the Forest,—Gordon Dorrance	115
American Forestry Association, Call for the 38th Annual Meeting	757	Tree Wounds and Diseases,—A. D. Webster	115
American Forestry Association, 37th Annual Meeting and Forestry Conference	108	Southern Forestry Congress Proceedings	115
American Foresters in Military Service (Roster)	652; 754	The Well-Considered Garden—Mrs. Frances King	115
American Forestry Magazine Praised	438	The Book of Forestry—F. F. Moon	115
American Milkweeds, The—R. W. Shufeldt	21	Handbook for Rangers and Woodsmen—Jay L. B. Taylor	115
American Nurseries, The Independence of—David Fairchild	213	Commercial Woods of the Philippines	178
Annual Meeting of the American Forestry Association, Call for the	757	Lumberjack Bob—Lewis H. Theiss	178
Ants in Gardens	558	An Uncensored Diary,—Ernesta Drinker Bullitt	315
Annual Meeting of the American Forestry Association, Thirty-Seventh	108	Scott Burton, Forester—Edward G. Cheyney	315
Apache Land, The Lure of—Russell T. Edwards	116	The Bird Study Book—T. Gilbert Pearson	315
Appalachians, A Forest Ranger Course for the Southern	275	Forest Working Plans—A. B. Recknagel	315
Apple Tree of the Northwest, First—H. E. Zimmerman	591	Essentials of American Timber Law—J. P. Kinney	315
April, Planting Suggestions for—J. J. Levison	173	The Way to Study Birds—John Dryden Kuser	374
Autumn Leaves, Conservation in	674	The Organization of the Lumber Industry—Wilson Compton	374
Ballad of the Timber Cruiser, A—Lew R. Sarett	726	The Book of the Peony—Mrs. Edward Harding	374
Bates College, Forestry at	655	Forest Fancies—Lucy C. Kellerhouse	374
Bear's Breast Peak, Rugged—Guy E. Mitchell	758	The Forestry Annual	374
Beaver, The Lure of the—D. Lange	600	Empire Forester	374
Birds and the Camera—A. A. Allen	154	French Forests and Forestry—T. S. Woolsey, Jr.	504
Bird Department—A. A. Allen	15; 98; 154; 221; 272; 419; 484; 539; 625; 663; 736	100 Hints on Flowers and Birds—Mae Savell Croy	504
Birds, Efforts to Save the—R. W. Shufeldt	103	The Bird Study Book—T. Gilbert Pearson	504
Birds, Making Friends with—A. A. Allen	484	An Introduction to Forestry for Young People—Sir Andrew N. Agnew	504
Black Forest Gone? Has the—John B. Woods	481	The Development of Forest Law in America—J. P. Kinney	632
Black Locust Needed for Ships	742	A Nursery Blight of Cedars—Glenn G. Hahn, Carl Hartley and Roy G. Pierce	632
Blasting, Nurseryman Recommends	695	How to Make Farm Timbers Rot Proof	632
Blasting Tree Holes	183	The Sport Alluring	632
Blister Disease, An Effective Quarantine Law, \$300,000 for Pine	168	Wood and Other Organic Structural Materials—Charles H. Snow	695
		Botany of Crop Plants—Wilfrid W. Robbins	695

	Page		Page
Clearing and Grubbing—Halbert P. Gillette	695	Efficiency and Economy in Oregon (Editorial)	176
Successful Carving and Preserving—Ala Powell	696	Efforts to Save the Birds—R. W. Shufeldt	103
Chemistry of Food and Nutrition—Henry C. Sherman	696	Elm, Natural Graft on Cork—Guy Caldwell	80
Feeding the Family—Mary S. Rose	696	England's Need, Sawmill units	327
Human Foods and their Nutritive Value—Harry Snyder	696	Enlisting Soldiers of the Soil	334
Stories the Iriquois Tell their Children—Mabel Powers	760	Epigrams on Home Gardening and Food Thrift	593
Foods and Household Management—Helen Kinne	760	Epoch-Making Conference, An—Herman H. Chapman	293
The Forests of Maryland—F. W. Besley	761	Erosion, A Problem of—R. S. Maddox	724
Birds of America—The University Society	761	Erosion and Forest Defense, Chasms of—Charles A. Whittle	482
Borers on Forest Trees, Flatheaded	153	Erosion in Hawaii, Aeolian—C. S. Judd	239
Boy Scouts Battle Moths	165	Esthetics, Harmonizing Lumbering and—C. M. Granger	299
Bringing Back the Game—A. A. Allen	15	Extension of National Forests in Colorado, The—H. H. Chapman	399
Building an Atmosphere of Stability into the Home—Rawson W. Haddon	630	Feathers and Fins, Flowers—R. W. Shufeldt	669
Building, The New York State College of Forestry	363	Federal Forest Reserves, Recreation in the—Ida Agnes Baker	459
Built, How a Successful Suburban House is—Rawson W. Haddon	693	Fertile Soil, Turning a Desert into—Robert H. Moulton	549
Bungalows, Building—Rawson Woodman Haddon	244	Fight Against the Pine Blister Disease, The	38
Cactus, A Giant—Stanley F. Wilson	427	Fighting The Pine Blister Disease	562
Cactus Lakes—Frank Coyne	361	Fig Tree of Miami, Saving the Old Wild	43
Camera, Birds and The—A. A. Allen	154	Fighting Front, A Forester at the—P. L. Buttrick	710
Camping, "Private Property"—No—Smith Riley	358	Fighting the Pine Blister Disease	688
Can and Cannon: Drier and Dreadnaught—Norman C. McCloud	389	Fire Fork, A Forest	43
Canadian Department (Department of Magazine)—Ellwood Wilson	53; 115; 180; 248; 314; 377; 438; 505; 567; 633; 697; 759	Fire Loss, Lowest Forest	172
Cantonment, Lumber for an Army	398	Fire Season, Bad Forest	692
Cascade Pass, Washington—An Illustration	279	Fire, The Blue Mesa Forest—Henry L. Spencer	560
Caterpillar, The Tent Tree	171	Fireplaces, A Page of Remarkable	750
Cavity Filling, How Far to Go in—J. J. Levison	100	Fires Burn Much Timber, Forest	520
Chasms of Erosion and Forest Defense—Chas. A. Whittle	492	Fire Season, The Forest	735
Cherokee, Scrappin' Fire on th',—Poem—H. L. Johnson	464	First Forest Regiment Goes Across, The	517
Cherries, "Witch's Broom" on Japanese—C. W. H. Douglass	346	Flathead Borers on Forest Trees	153
Chicadee, The Nuthatches and the—A. A. Allen	633	Florida Magnolia Tree, The—Jennie Lynne Kyle	349
Children's Playgrounds in Parks and Forests—Smith Riley	680	Flowers, Daisies, Corn Cockle, Bugloss, and Other Summer—R. W. Shufeldt	285
China, Forestry Progressing in	407	Flowers, Early Spring and Summer—R. W. Shufeldt	161
Cicuta, The Poisonous	554	Flowers, Feathers and Fins—R. W. Shufeldt	669
"Claims" in the Grand Canyon, Mining—H. H. Chapman	225	Flowers, Forest—Bessie L. Putnam	343
Climatic Records in the Trunks of Trees—A. E. Douglass	732	Flowers, Midsummer—R. W. Shufeldt	403
Coal Shortage, Wood Cutting to Overcome—(Editorial)	749	Flower Specimens, Collecting Tree and—R. W. Shufeldt	169
Cocoons, The Valiant Hunters Specimens—R. W. Shufeldt	169	Flowers That Bloom in June—R. W. Shufeldt	340
Colorado Redeems Herself (Editorial)	434	Flowers that Boys and Girls Should Know, Wild—R. W. Shufeldt	474
Colorado, The Extension of National Forests in—H. H. Chapman	399	Flying Wedge of Bankers and Farmers—Address by Charles Lathrop Pack	590
Colonial Houses, Four—Rawson Woodman Haddon	181	Food Crisis, The—Charles Lathrop Pack	199
Combinations, The Peril of (Editorial)	47	Food Gardens, A Million and More	263
Comfort Fund, A Relief and	581	Food Garden as a Character Builder, The (Editorial)	367
Commercial Uses of Wood: Willow	8	Food Gardens, Planting One Million	197
Sugar Pine	283	Food Problem, War and the—Norman C. McCloud	521
Commission, The National Emergency Food Garden	197	Food Production—It's Past and It's Future. Urban and Suburban—Charles Lathrop Pack	676
Community Spirit Saved the Trees—Gayne T. K. Norton	292	Food-Producing Trees—J. Russell Smith	228
Conference and Annual Meeting of the American Forestry Association, International Forestry	46	Food, Some Achievements in—Norman C. McCloud	593
Conference, An Epoch-Making—Herman H. Chapman	293	Food, The New Freedom—of—Norman C. McCloud	465
Conservation in Autumn Leaves	675	Food Thrift, Widespread Activity in Home—Charles Lathrop Pack	519
Conservation of Game in the National Forests and National Parks, E. W. Nelson	139	Forest Resources and the War, Our—E. A. Sterling	689
Cornell, Forestry Prize Award at	726	Forest Fire Season, Bad	692
Country Houses, A Group of Low-cost—Rawson Woodman Haddon	307	Forest Fire Season, The	735
Cross, The Friar, His Dog and the Iron—Alice Spencer	592	Forest Fires, Women Help to Fight	674
Cruiser, A Ballad of the Timber—Lew R. Sarett	726	Forests, How Warfare Taxes the	716
Cruising in the Pacific Northwest, Timber—Herman H. Chapman	270	Forester at the Fighting Front, A—P. L. Buttrick	710
Curacao, Lignum Vitæ in—Miles Haman	331	Foresters and Woodsmen in War Work	719
Current Literature (Department of the Magazine)—54; 121; 185; 248; 317; 378; 440; 506; 570; 633; 699; 762	304	Foresters in Demand	542
Cut-Over Lands a National Problem (Editorial)	304	Forests and Lumber, War	328
Daisies, Corn Cockle, Bugloss, and other Summer Flowers—R. W. Shufeldt	285	Forest Destruction, French Forest—Urbain Gohier	30
Deadly Manzanillo, The—Frank Coyne	423	Forest Fire, The Blue Mesa—Henry L. Spencer	560
Defense, Foresters for National	268	Forest Fires Burn Much Timber	520
Desert into Fertile Soil, Turning a—Robert H. Moulton	549	Forests, Insuring Standing	499
Destruction, French Forest—Urbain Gohier	30	Forest Flowers—Bessie L. Putnam	342
Diplomatic Forest Ranger, The—W. G. Morison	435	Forests Given Permanence, National	170
"Doctor Mountain"—Mark Daniels	657	Forests, Recreational Uses of the National—Henry S. Graves	133
Does State Forestry Need "Reorganization"? (Editorial)	113	Forest Regiment Goes Across, The First	517
Dog in the Manger, A Feathered	168	Forest Regiment off for France	396
Dogwood, The—R. D. Shufeldt	217	Forest Resources, South American	295
Donations to Lumber and Forest Regiments Relief Committee (List)	735	Forest Service Reveals Lumber Industry Conditions, The	105
Drier and Dreadnaught. Can and Cannon:—Norman C. McCloud	389	Forest Week, New York's	548
Dynamite for Planting Pecans	695	Foresters in Military Service, Roster of	652; 754
Early Saxifrage, Bloodroot, and Jack-in-the-Pulpit—R. W. Shufeldt	83	Foresters in War Work	348
Early Spring and Summer Flowers—R. W. Shufeldt	161	Foresters in World's Largest Regiment	644
Eastern Forest Lands Bought	233	Foresters to the Front—Bristow Adams	453
Economic Necessity for Public Ownership, The (Editorial)	110	Foresters for National Defense	268
Edible Fruits of Forests Trees	686	Forestration Commission, Nebraska's—Woodruff Ball	212
Editorial (Department of the Magazine)—47; 110; 176; 242; 304; 367; 434; 500; 629; 691; 748	242	Forestry and the Paper Industry—D. F. Houston	205
Education in Forestry, Primary (Editorial)	242	Forestry and the War—Charles Lathrop Pack	559
		Forestry as a Profession for Young Men in the United States—(Editorial)	691
		Forestry at Bates College	655
		Forestry for Boys and Girls (Department of Magazine)—Bristow Adams	32; 94; 166; 290; 364; 428; 494; 552; 678.
		Forestry Guy, The—Poem—Arthur Chapman	289
		Forestry in Vermont—Roderic M. Olzendam	49
		Forestry, Landscaping and—Smith Riley	727
		Forestry Meeting at Pittsburgh	284
		Forestry Progressing in China	407
		Forestry Regiment in Action, A	325

	Page		Page
Forestry Regiments, Relief Fund for the	643	Low-cost Country Houses, A Group of—Rawson Woodman	307
Fork, A Forest Fire	43	Haddon	172
Forms of Leaves	412	Lowest Forest Fire Loss	261
Fountain, Oak Tree—H. E. Zimmerman	398	Lumber and Ships, War	398
France, Forester Graves in	397	Lumber for an Army Cantonment	542
France, Forest Regiment Off for	396	Lumber for the Expeditionary Force	397
Free Trees for Pennsylvania	726	Lumber for War-Time Uses	105
Freedom—of Food, The New—Norman C. McCloud	465	Lumbering and Esthetics, Harmonizing—C. M. Granger	299
French Forest Destruction—Urbain Gohier	30	Lumber, War, Forests and	328
French Forests, In the	114	Lure of Apache Land, The—Russell T. Edwards	116
Friar, His Dog and the Iron Cross, The—Alice Spencer	592	Lure of the Beaver, The—D. Lange	600
Front, A Forester at the Fighting—P. L. Buttrick	710	Magnolia Tree, The Florida—Jennie Lynne Kyle	349
Front, Foresters to the—Bristow Adams	453	Making Friends with the Birds—A. A. Allen	484
Fruit Trees of Picardy, The (Poem) Alice Gertrude Field	269	Manzanillo, The Deadly—Frank Coyne	423
Fruits of Forest Trees, Edible	686	Maples—Poem—Richard Butler Glanzer	165
Fuel, Wood to the Front as Wartime	741	Marsh Land and Other Aquatic Plants—R. W. Shufeldt	611
Fundamentals of a Good Hedge, The—J. J. Levison	34	Massachusetts Forestry Association's Tour of the National Parks and Forests	240
Garden Attractions, Window—C. W. H. Douglass	424	Matches, War Styles in	10
Gardens, A Million and More Food	263	Meat Supply Threatened, Our National (Editorial)	501
Gardens, Planting One Million	197	Miami, Saving the Old Wild Fig Tree of	43
Game, Bringing Back the—A. A. Allen	15	Michigan to Plant 4500 Acres Annually	146
Game in the National Forests and National Parks, Conservation of,—E. W. Nelson	139	Midsummer Flowers—R. W. Shufeldt	403
Georgia State Forest School, Changes at the	655	Milkweeds, The American—R. W. Shufeldt	21
Giant Cactus, A—Stanley F. Wilson	427	Million and More Food Gardens, A	263
Gould, Glacier National Park (An illustration) Mount	473	Mining "Claims" in the Grand Canyon—H. H. Chapman	225
Gourds—An Illustration	582	Minnesota, A Great Forward Step by (Editorial)	368
Gouseberries, Ye	303	Mockingbird Family, The—A. A. Allen	539
Grand Canyon, Mining Claims in the—H. H. Chapman	225	Monarch Pine, The—Poem, Leon T. Chamberlain	458
Graft on Cork Elm, Natural—Guy Caldwell	80	Moro Rock, Famous—Mark Daniels	29
Graves in France, Forester	397	Mountain "Doctor"—Mark Daniels	657
Grazing, Waste of Forage through Lack of—Editorial	748	Mount Gould, Glacier National Park (An illustration)	473
Growth, Some Interesting Trees of Singular	430	Mount Vernon on the Potomac, Planting Memorial Oak at—Mrs. Lydia Adams—Williams	96
Grazing Fees on National Forests, Increasing (Editorial)	177	National Defense, Foresters for	268
Grazing Management on the Caribou National Forest, The Value of,—C. H. Shattuck	536	National Emergency Food Garden Commission	197
Guy, The Forestry—Poem, Arthur Chapman	289	National Forests and Parks, Tour of the	240
Harmonizing Lumbering and Esthetics—C. M. Granger	299	National Forests Given Permanence	170
Has The Black Forest Gone?—John B. Woods	481	National Forests in Colorado, The Extension of—H. H. Chapman	399
Hawaii, Aeolian Erosion in—C. S. Judd	239	National Forests, Recreational Uses of the—Henry S. Graves	133
Hawaiian Forests (Editorial)	500	National Forests, Waterpower on	42
Hawaii's Effective Forest Laws	366	National Park Legislation (Editorial)	242
Hearing, Pine Blister Quarantine	241	National Park Service Organized	437
Hedge, The Fundamentals of a Good—J. J. Levison	34	National Parks Versus National Forests (Editorial)	48
Historically Interesting Trees, Some	352	National Graft on Cork Elm—Guy Caldwell	80
Holly Greene, Ye—Poem, Donald A. Fraser	709	Nebraska's Forestration Commission—Woodruff Ball	212
Homestead Law, The 640-Acre Stock-Raising	45	New Hampshire Conference	565
House is Built, How a Successful Suburban—Rawson W. Haddon	693	New Spirit of Public Service, The—C. J. Stahl	234
How Far to Go in Cavity Filling—J. J. Levison	100	New York's Forest Week	548
How Warfare Taxes the Forest	616	New York State College of Forestry Building	363
How We Stand for Efficient State Forestry (Editorial)	729	Nurseries, The Independence of American—David Fairchild	213
Hunters of the Moth Egg Cocoons, The Valiant	498	Nut Trees for Planting, Selecting—C. A. Reed	619
Hybrid Oaks—George B. Sudworth	683	Nuthatches and the Chickadees, The—A. A. Allen	663
Independence of American Nurseries, The—David Fairchild	213	Oahu Rain Forest, The—Vaughan MacCaughy	277
Identity, A Tree of Lost—John Foote	488	Oaks, Hybrid—George B. Sudworth	683
Imported Tree and Plant Pests, Losses Caused by—C. L. Marlatt	75	Oaks, The Le Conte	551
Increasing the Grazing Fees on National Forests	177	One-Tree Public Park, A—Allen H. Wright	99
Indiana, Procastination in (Editorial)	367	Only a Volunteer—Poem by a member of the 20th Engineers (Forest)	718
Indiana's Forestry Work	548	Oregon, Efficiency and Economy in (Editorial)	176
India's Forest Management	172	Ornamental Shade Trees and Their Care—Homer D. House	414
Industry, Forestry and the Paper—D. F. Houston	205	Our Members Like the Magazine	51
Insect World, Paper-Making in the—R. W. Shufeldt	431	Our Snakes a National Asset—Gayne T. K. Norton	555
Insuring Standing Forests	499	Pacific Northwest, Timber Cruising in the—Herman H. Chapman	270
Interesting Trees of Singular Growth, Some	430	Pack, Address by President Charles Lathrop	81
International Forestry Conference and Annual Meeting of the American Forestry Association	46	Paper Industry, Forestry and the—D. F. Houston	205
"In the Place Where the Trec Falleth"—Bristow Adams	94	Paper-Making in the Insect World—R. W. Shufeldt	431
Japanese Cherries, "Witch's Broom" on—C. W. H. Douglass	346	Park Service Organized, National	437
June, Flowers that Bloom in—R. W. Shufeldt	340	Parks and Forests, Children's Playgrounds in—Smith Riley	680
Kelsey,—A Pioneer Pine Planter, S. T.	96	Parks Versus National Forests, National	48
Knot Over Washington's Tomb, The—Gayne T. K. Norton	351	Patrol, Aerial Forest—W. T. Cox	106
Lacey's Organization, Extension of	569	Pecans, Planting	568
Lake Sunapee—Poem, Richard Butler Glanzer	240	Pedigree of a Splendid Tree, The	44
Lands a National Problem, Cut-over (Editorial)	304	Pennsylvania, Free Trees for	726
Lands Bought, Eastern Forest	233	Pennsylvania's State Forests, Valuation of	160
Landscaping and Forestry—Smith Riley	727	Peril of Combinations, The (Editorial)	47
Latimer Elm Destroyed, Famous	20	Pests, Losses Caused by Imported Tree and Plant—C. L. Marlatt	75
Law, The Public Domain and the Stock-Raising Homestead (Editorial)	243	Pests, Save us from Invading—J. G. Sanders	147
Law, The 640-Acre Stock Raising Homestead	45	Picardy, The Fruit Trees of—Poem by Alice Gertrude Field	269
Leaves, Conservation in Autumn	674	Pine, The—Mabel Powers	656
Leaves, Forms of	412	Pine Blister Disease, An Effective Quarantine Law, \$300,000 for	168
Leaves Valuable, Dead	731	Pine Blister Disease, Fighting the	562, 688
Le Conte Oaks, The	551	Pine Blister Disease, The Fight Against the	38
Legislation, National Park (Editorial)	242	Pine Blister Disease Work Progresses	433
Lignum Vitæ in Curacao—Miles Haman	331	Pine Blister Quarantine Hearing	241
Lincoln Memorial University Organizes Forest Ranger Course	275	Pine? Shall We Plant White—C. R. Pettis	70
Locusts, (Identification and Characteristics) The—S. B. Detwiler	88	Pine, The Monarch—Poem by Leon T. Chamberlain	458
Locust Needed for Ships, Black	742	Pine, The Slash—Wilbur R. Mattoon	158
London's Oak, Jack	436	Pine, The Sugar—S. B. Detwiler	280
Losses Caused by Imported Tree and Plant Pests—C. L. Marlatt	75	Pittsburg, Forestry Meeting at	284
		Plant A Garden Now—Charles L. Pack	265

	Page		Page
Planting Memorial Oak at Mount Vernon on the Potomac— Mrs. Lydia Adams-Williams	96	Timber Cruiser, A Ballad of the—Lew R. Sarett	726
Planting One Million Food Gardens	197	Timber Cruising in the Pacific Northwest—Herman H. Chapman	270
Planting Suggestions for April—J. J. Levison	173	Tomb, The Knot Over Washington's—Gayne T. K. Norton	351
Planting, Selecting Nut Trees for—C. A. Reed	619	Totem Tree, The—H. E. Zimmermann	624
Plants and Animals of the Atlantic and Gulf States— R. W. Shufeldt	743	Tour of the National Forests and Parks	240
Playgrounds in Parks and Forests, Children's—Smith Riley	680	Trail Marker, A—Lena B. Hunzicker	667
Porcupine Quills Needed	10	Tree Saved By a Governor—Allen H. Wright	675
Primary Education in Forestry (Editorial)	242	Trees—Poem by Stephen Henry Thayer	93
*Private Property—No Camping—Smith Riley	358	Trees and Their Care, Ornamental Shade—Homer D. House	414
Prize Award at Cornell, Forestry	726	Trees and the War (Children's Department) Bristow Adams	364
Problem of Erosion, A—R. S. Maddox	724	Tree Bows its Head at Night	493
Profession for Young Men in the United States, Forestry as a (Editorial)	691	Tree's Long Journey on Truck	655
Problem, War and The Food—Norman C. McLoud	521	Tree of Lost Identity, A—John Foote	488
Public Domain and the Stock-Raising Homestead Law, The (Editorial)	242	Tree that Produces Soap, A	686
Public Service, The New Spirit of—C. J. Stahl	234	Trees, Food-Producing—J. Russell Smith	228
Public Service, The New Standard of (Editorial)	500	Trees in the War Zone	109
Quails Being Exterminated, Western—R. W. Shufeldt	565	Trees in Winter—Bristow Adams	32
Quaint Bit of Sentiment, A—Gayne T. K. Norton	668	Trees, Some Historically Interesting	352
Quarantine Hearing, Pine Blister	241	Tree Surgery? What about—J. Horace McFarland	531
Quarantine Law, \$300,000 for Pine Blister Disease, An Effective	168	Turning a Desert into Fertile Soil—Robert H. Moulton	549
Quarantines, Pine Blister Disease	302	Twentieth Engineers, Foresters in World's Largest Regiment, The	644
Queen Anne's Lace: The Papaw Tree, and Self-Heal—R. W. Shufeldt	543	Undreamt-of Things, One of the—Lewis E. Theiss	160
Rain Forest, The Oahu—Vaughan MacCaughy	276	Units for England's Need, Sawmill	327
Ranger Course for the Southern Appalachians, A Forest	275	Urban and Suburban Food Production,—Past and Future— Charles L. Pack	676
Ranger, The Diplomatic Forest—W. G. Morison	435	Uses of the National Forests, Recreational—Henry S. Graves	133
Records in the Trunks of Trees, Climatic—A. E. Douglass	732	Using Wood in Fireplaces to Conserve Coal—Rawson W. Haddon	751
Recreation in the Federal Forest Reserves—Ida Agnes Baker	459	Value of Grazing Management on the Caribou National Forest—C. H. Shattuck	536
Recreational Uses of the National Forests—Henry S. Graves	133	Vermont, A Backward Step in (Editorial)	369
Red Spiders Infest Trees,—Eugene M. Mendenhall	14	Vermont, Forestry in—Roderic M. O'zendam	49
Reflection Lake—An Illustration	497	Victory for Efficiency and Economy, A (Editorial)	306
Regiment Goes Aross, The First Forest	517	Vireos, The—A. A. Allen	272
Regiment in Action, A Forestry	325	Volunteer, Only A—Poem by a member of the 20th Engineers (Forest)	718
Regiment off for France, Forest	296	Walnut Tree, A Wonderful—V. W. Killick	731
Regiments, Relief Fund for the	643	War and the Food Problem—Norman C. McLoud	521
Relief and Comfort Fund, A	581	War, Our Forest Resources and the—E. A. Sterling	689
Relief Fund for Forestry Regiments	643	Warblers, The—A. A. Allen	221
Roads and Trails, Money for	114	Warfare Taxes the Forests, How	716
Road under Federal Aid Act, Forest	165	War, Forestry and the—Address by Charles Lathrop Pack	559
Rodent, A. Watchfully Waiting—Lewis Edwin Theiss	395	War, Forests and Lumber	328
Roster of Foresters in Military Service	652	Wartime Fuel, Wood to the Front as	741
Rugged Bear's Breast Peak—Guy E. Mitchell	758	War, Lumber and Ships	261
Russia's Lumber Industry	353	War Styles in Matches	10
Sassafras, A Giant	472	Wartime Uses of the Woodlot—Austin F. Hawes	332
Sassafras Tree, A Large—Bertha M. Tomlinson	14	Wartime Uses, Lumber for	397
Saved the Trees, Community Spirit—Gayne T. K. Norton	292	War Work, Foresters and Woodsmen in	718
Save us from Invading Pests	147	War Work, Foresters in	348
Saved by a Governor, Tree—Allen H. Wright	675	War Zone, Trees in the	109
Sawmill Units for Eng.'and's Need	327	Waste of Forage through Lack of Grazing (Editorial)	748
Scenic Marvels of Sevier Forest	11	Water-Power on National Forests	42
Serappin' Fire on The' Cherokee—Poem by H. L. Johnson	464	Waxwings Family, The—A. A. Allen	98
Selecting Nut Trees for Planting—C. A. Reed	619	Washington's Tomb, The Knot Over—Gayne T. K. Norton	351
Sevier Forest, Scenic Marvels of	11	Western Quails Being Exterminated—R. W. Shufeldt	565
Shade Trees and Their Care, Ornamental—Homer D. House	414	What About Tree Surgery?—J. Horace McFarland	531
Shall the National Forests be made Self-Supporting (Editorial)	305	What Shall We Do About the Pine Blister Disease?—S. B. Detwiler	69
Shall We Cheapen our National Parks? (Editorial)	112	White Ash, A Remarkable—Herbert W. Cornell	93
Shall We Plant White Pine?—C. R. Pettis	70	White Pine Blister Disease	735
Shall We Succeed in Saving our White Pine? (Editorial)	111	White Pine Blister Disease, The—Perley Spaulding	67
Ships, Black Louest Needed for	742	White Pine Blister Disease? What Shall We Do About the—S. B. Detwiler	69
Ships, War, Lumber and	261	White Pine Blister, The Summer Campaign Against the (Editorial)	242
"Shoes and Ships and Sealing Wax"—Bristow Adams	678	White Pine? Shall We Plant—C. R. Pettis	70
Slackers, The—Poem by Norman C. McLoud	598	Widespread Activity in Home Food Thrift—Charles Lathrop Pack	519
Slash Pine, The—Wilbur R. Mattoon	158	Wild Flower Department—R. W. Shufeldt	21; 83; 161; 217; 285; 340; 403; 474; 543; 611; 669; 743
Smith-Lever Extension Work in Forestry, The Need of (Editorial)	368	Wild Flowers that Boys and Girls Should Know—R. W. Shufeldt	474
Snakes a National Asset, Our—Gayne T. K. Norton	555	Willows, The (Identification and Characteristics)—S. B. Detwiler	3
Soap, A Tree that Produces	686	Wind and the Trees, The—Bristow Adams	166
Soil, Enlisting Soldiers of the	334	Window Garden Attractions—C. W. H. Douglass	424
Soldiers of the Soil, Enlisting	334	Wing, Wood on the—Bristow Adams	583
Some Achievements in Food—Norman C. McLoud	593	Wisconsin's Forest Playgrounds	353
South American Forest Resources	295	"Witch's Broom" on Japanese Cherries—C. W. H. Douglass	346
Specimens, Collecting Tree and Flower—R. W. Shufeldt	169	Women Help to Fight Forest Fires	674
Spraying Work of the Season—J. J. Levison	236	Wood Cutting to Overcome Coal Shortage (Editorial)	749
Spring and Summer Flowers, Early—R. W. Shufeldt	161	Wood for Fuel (Children's department) Bristow Adams	494
Spruce for Airplanes	554	Wood in Fireplaces to Conserve Coal. Using—Rawson W. Haddon	751
Stability into the Home, Building an Atmosphere of—Rawson W. Haddon	630	Woodlot, War-Time Uses of the—Austin F. Hawes	332
State Forestry, How We Stand for Efficient (Editorial)	629	Wood on the Wing—Bristow Adams	583
State Reforestation	45	Woodpeckers, The—A. A. Allen	736
Stock Losses Affect Food Supply (Editorial)	370	Woodside Foods, Some of the (Children's Department)	428
Stock Raising Homestead Law, The 640-Acre	45	Woodsmen in War Work, Foresters and	718
Sugar Pine, The (Characteristics and Identification) S. B. Detwiler	280	Wood to the Front as Wartime Fuel	741
Summer Campaign Against the White Pine Blister, The (Editorial)	240	World's Largest Regiment, Foresters in	644
Sunapee, Lake—Poem by Richard Butler Glaenzner	240	Wrens, The—A. A. Allen	419
Suppression of the Pine Blister Disease of North America, The Committee for the	41	Ye Hollye Greene—Poem by Donald A. Fraser	709
Surgery? What about Tree—J. Horace McFarland	531		
Swallows, The—A. A. Allen	18		
That Tent in the Tree	171		
Thatcher, The—A. A. Allen	625		

# American Forestry



SCHOOL OF FORESTRY  
UNIVERSITY OF TORONTO

An illustrated magazine about forestry and kindred subjects published each month by the American Forestry Association Washington, D. C.



The upper view shows the decayed planking and sill of a country church porch. The lower photograph, the decayed siding and sill of an ice-house. Untreated timber in each case (Photos courtesy of U. S. Forest Service).



## The Abuse of Wood is the Real Reason for the Present Epidemic of Substitute Materials

**T**HE floor planking and sill of the porch and the sill and siding of the ice-house shown in the above illustrations are common examples of the flagrant abuse to which structural wood is subjected.

Because of such conditions, the general public's confidence in wood as a structural material has been shaken, and it now demands "more permanent" materials for building purposes. Creosoted wood *is* permanent.

Lumber dealers should educate their customers to preserve from decay the lumber they use, by proper treatment with creosote oil. They should be prepared to furnish a proper grade of coal-tar creosote oil, and instruct the consumer in the most suitable method of application.

Such service will be appreciated by every user of lumber and will largely eliminate conditions as illustrated above, which are detrimental to the entire Lumber Industry.

The U. S. Department of Agriculture, in Farmers' Bulletin No. 744 (just off the press), recommends coal-tar creosote in these words:

"It is considered one of the most efficient preservatives against decay . . .," and further enumerates the following requirements: "There are five chief requirements for a preservative for general use. It should be *reasonably cheap*, should penetrate wood readily, should not be corrosive to metal, should not evaporate or wash out of the wood easily, and should be poisonous to fungi."



Barrett's CARBOSOTA is pure coal-tar creosote oil, and meets all of these requirements.

In addition, it is liquid at low temperatures, which permits of its application without heating if that should be necessary. It is nationally advertised, convenient and profitable to handle and easy to sell.

Write for our bulletin, "A Profitable Opportunity for the Dealer."

The *Barrett* Company

New York	Chicago	Philadelphia	Boston	St. Louis	Cleveland	Cincinnati	Pittsburgh
Detroit	Birmingham	Kansas City	Minneapolis	Nashville	Salt Lake City	Seattle	Peoria
THE PATERSON MANUFACTURING COMPANY, Limited:				Montreal	Toronto	Winnipeg	
Vancouver	St. John, N. B.		Halifax, N. S.	Sydney, N. S.			

# AMERICAN FORESTRY

THE MAGAZINE OF THE AMERICAN FORESTRY ASSOCIATION

PERCIVAL SHELDON RIDSDALE, Editor

## EDITORIAL ADVISORY BOARD

HERMAN H. CHAPMAN  
ERNEST A. STERLING

S. T. DANA  
FREDERICK S. UNDERHILL

JOHN E. RHODES  
S. N. SPRING

JANUARY 1917 VOL. 23

## CONTENTS

No. 277

The Willows—By Samuel B. Detwiler. . . . .	3	The Fundamentals of a Good Hedge—By J. J. Levison. . . . .	34
With twelve illustrations.		With six illustrations.	
War Styles in Matches. . . . .	10	The Fight Against the Pine Blister Disease. . . . .	38
With two illustrations.		Water-power on National Forests. . . . .	42
Porcupine Quills Needed. . . . .	10	With two illustrations.	
Scenic Marvels of Sevier Forest. . . . .	11	Saving a Famous Tree. . . . .	43
With five illustrations.		With one illustration.	
Red Spiders Infest Trees—By Eugene W. Mendenhall. . . . .	14	A Forest Fire Fork. . . . .	43
A Large Sassafras Tree—By Bertha M. Tomlinson. . . . .	14	With one illustration.	
With one illustration.		The Pedigree of a Splendid Tree. . . . .	44
Bringing Back the Game—By A. A. Allen. . . . .	15	With one illustration.	
With eleven illustrations.		The 640-Acre Stock-Raising Homestead Law. . . . .	45
Famous Latimer Elm Destroyed. . . . .	20	International Forestry Conference and Annual Meeting of the Association. . . . .	46
With one illustration.		Editorial. . . . .	47
The American Milkweeds—By Dr. R. W. Shufeldt. . . . .	21	The Peril of Combinations. National Parks vs. National Forests.	
With seven illustrations.		Forestry in Vermont—By Roderic M. Olzendam. . . . .	49
Famous Moro Rock—By Mark Daniels. . . . .	29	How Our Members Like the Magazine. . . . .	51
With one illustration.		Canadian Department—By Ellwood Wilson. . . . .	53
French Forest Destruction—By Urbain Gohier. . . . .	30	Current Literature. . . . .	54
With two illustrations.			
Forestry for Boys and Girls—By Bristow Adams. . . . .	32		
The Trees in Winter.			

## NOMINATIONS FOR MEMBERSHIP

A special request is made to members of the American Forestry Association to nominate for membership, friends whom they believe will be interested in the work of the Association and who would like to secure the magazine, American Forestry.

I Nominate for Membership:

.....

.....

.....

.....

.....

.....

Signed..... Address.....

AMERICAN FORESTRY is published monthly by the American Forestry Association.  
Subscription price, three dollars per year; single copies, twenty-five cents.



## *Bankers Often Make a Loan Solely on a Lacey Report*

*Many bankers will hardly consider making a loan in the absence of a favorable LACEY REPORT. Having made unsatisfactory transactions on the basis of an ordinary "timber cruise" they are, not unnaturally, disposed thereafter to seek the nearest possible approach to scientific knowledge of the facts. This is to be found in a full LACEY REPORT.*

*While not all bankers are as yet sufficiently well versed in timber matters to appreciate fully the security offered them by the facilities of Lacey & Company, the possession of a full and favorable LACEY REPORT on your holdings will usually greatly enhance their value as a basis for financial transactions.*

*Of course there are several degrees of completeness of LACEY REPORTS determined by requirements and cost. Careful bankers, therefore (like careful buyers and sellers), insist on the full LACEY REPORT. Very glad to send you our book of "Pointers." Write for it.*

*James D. Lacey & Co.*  
INTERNATIONAL TIMBERLAND FACTORS  
EST. IN 1880

CHICAGO  
1750 McCormick Bldg.

SEATTLE  
626 Henry Bldg.

NEW ORLEANS  
1213 Whitney-Central Bldg.

# AMERICAN FORESTRY

VOL. XXIII

JANUARY 1917

NO. 277

## THE WILLOWS

### IDENTIFICATION AND CHARACTERISTICS

BY SAMUEL B. DETWILER

THE willow is an everyday tree, so humble that some one has called it "the Cinderella of trees." It has long been considered the symbol of unrequited love, and, from the time when the Psalmist recorded that the Hebrews hung their harps upon the willows and wept by the rivers of Babylon, poets have referred to this tree as the "sad willow," although it is alluded to earlier in the Bible as a "goodly tree," to be used as an emblem of rejoicing. Certainly there is nothing solemn in the shrill piping of the willow whistles that gladdens the heart of the small boy in spring time.

The willows are very difficult to distinguish botanically because the large number of species which are clearly separate and distinct have numerous varieties which grade into one another. There are about 175 different willows in the world, of which approximately 100 are found in North America. In general, the willows are native of the colder temperate regions of the Northern Hemisphere, but several are found in warm climates. The willows grow to the very limits of perpetual snow in

the mountains and no other woody plant except the birch grows so far north in the Arctic regions.

A few kinds of willows grow to be large-sized trees, 50 to 100 feet high and 2 or 3 feet in diameter, but the majority are shrubs which occasionally reach a size large enough to be termed trees. Some of the species that have their home above timber line on the mountains, near perpetual snow, lie prostrate in mats only an inch or two higher than the ground. Nature has provided many plants to clothe the waste places of the earth, and the willow is one of these. Some kinds will grow on dry soils, but mostly they are found along streams, in swamps or on moist soils. They spring up abundantly and, by rapid growth, quickly take possession of the territory suited to them. The Children of Israel were promised to be multiplied like "willows by the water courses."

The willows belong to the lowest order of deciduous broad-leaved trees, and impressions of leaves in rocks show that willows flourished when the earth was young. It is probable that they were one of the



From Pennsylvania Trees.

#### THE BLACK WILLOW

1. A staminate flowering branch. 2. Staminate flower. 3. A pistillate flowering branch. 4. Pistillate flower. 5. A fruiting branch. 6. A seed with hairs. 7. A winter twig. 8. Section of winter twig with bud and leaf scar. 9. A leafy branch



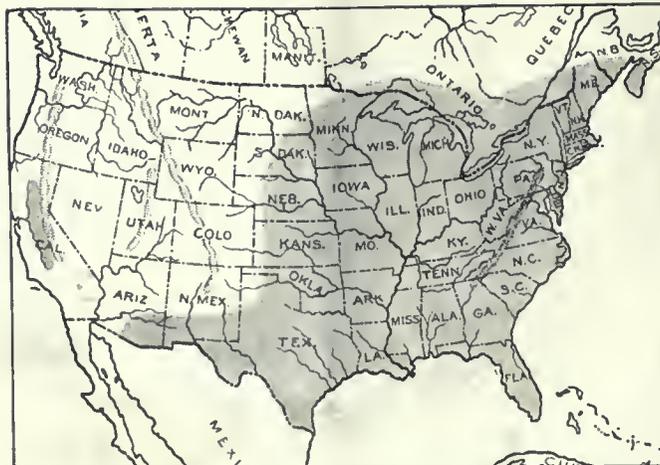
THE WEEPING WILLOW

The tree is very popular for ornamental purpose and in this photograph is shown in one of the situations for which it is best suited.

earliest forms of the large group of plants with netted veined leaves that produce seeds containing an embryo bearing two seed leaves. Although only those botanists who have made a long and careful study of the willows can be certain of accurately separating one kind from another, it is not difficult to learn the general characters of the willow family. The leaves have an alternate arrangement and are generally long, narrow and pointed, with an even margin that is not lobed or deeply cut. The leaf stem is short, and at the point where it is joined to the branch there are two little appendages (stipules) which may be scale-like and fall soon after the leaf expands, or which may resemble small leaves and remain attached until the end of the growing season. The smooth-barked twigs are long, slender and very flexible, swaying in the wind with such light, easy motion that "willow" has become a synonym for gracefulness. The buds are covered by a single visible scale that forms a cap over the tiny silk-lined leaves within the bud. Willow wood is soft, light and easily broken.

The flowers are massed together in dense spike-shaped clusters called catkins. They are of two kinds, each borne on separate trees. The pollen-producing flowers consist of two bright yellow stamens (or sometimes three or more) attached to a scale at their bases. The seed-forming flower is a scale bearing a small sac which terminates in a forked tip. The latter is coated with a sticky substance to hold the pollen grains that lodge there to fertilize the minute undeveloped seeds contained in the sac. Nature has designed most flowers of this type to be fertilized by the wind, but in the case of the willows the sticky pollen

is carried by insects which visit both kinds of flowers in search of nectar. The nectar is exuded from tiny glands near the bases of the scales on which the stamens or the seed sacs are borne. The flowers appear early in the spring, before or with the leaves. In a very short time the seeds are ripe and the small pod, which has developed from the seed sac, splits open and frees a cottony mass. This "cotton" is composed of dense tufts



AREA OF WILLOW GROWTH



ALONG THE BANKS OF THE POTOMAC

These weeping willows on the Mall at the nation's capital add greatly to the beauty of the Potomac River shore line and to the driveway which is just beyond them. There are hundreds of these trees, many of them quite old.

of long silky hairs attached at one end to a tiny seed like the down of dandelions and thistles.

Procrastination is never a failing of the willow tribe. Wherever an opportunity occurs for the willows to gain a foothold in soils favorable for their growth, they are quick to colonize. The seeds ripen early in the growing season and, although they retain their vitality but a short time, they have the advantage of getting a good start

long before many other trees have begun to bloom. The seeds, equipped with thin silken parachutes, float through the air as easily as bits of down. Because the parent trees usually grow near the water, much of the seed is borne away on spring freshets to be cast on a distant sandbar or mud flat exposed by the receding water. The streams carry away willow twigs and branches or entire trees growing along their banks, and these root and grow when



WILLOW USED AS A WIND-BREAK

The effect of the prevailing winds is shown by the form of these white willows on a farm in Iowa. They are planted to shield the adjoining fields from the wind, and they have besides this very evident practical purpose a decidedly ornamental value.

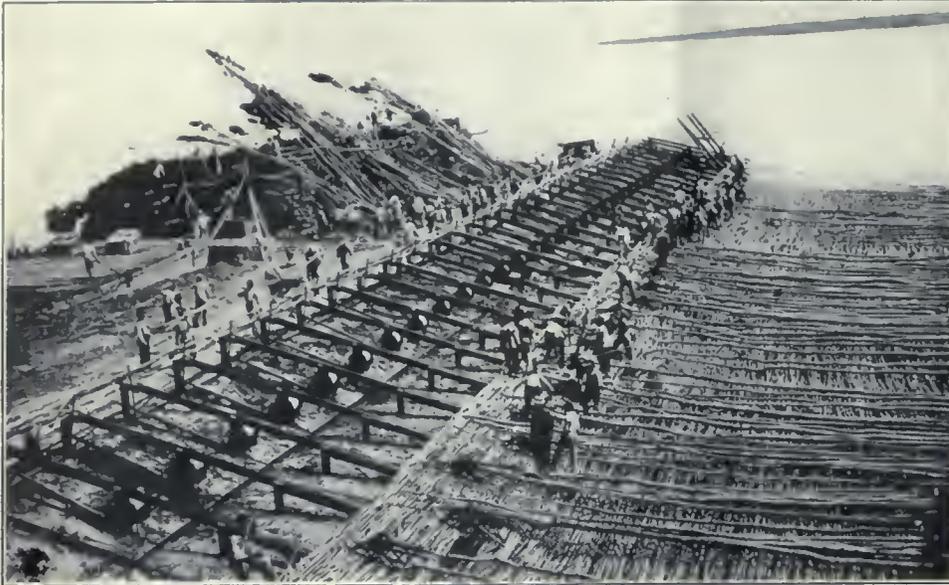
they reach a friendly shore. The willow is easier to propagate from cuttings than any other kind of tree. A small section of a willow twig containing a bud or two, a piece of a root, or even a section of a large branch, when partly

willow leaf, and strikingly like those of the peach tree. The glossy leaf or shining willow (*Salix lucida*) is a small bushy tree or tall shrub that grows from Newfoundland to Pennsylvania, Manitoba and Nebraska. Its name

gives the key to its chief distinguishing characters; it has heavy, dark-green, glossy leaves and highly polished brown or yellowish bark on its twigs.

Pussy willow, also called glaucous willow (*Salix discolor*), rarely grows to be more than 20 or 25 feet high, and is usually a shrub. Wherever it grows, from Nova Scotia to Manitoba, south to Delaware and Missouri, its flowers are well known and welcomed as a sure sign of the coming of spring. The catkins are thick and oval, and at first seem to be covered with gray fur because of the abundance of silky hairs that clothe the flower scales, but later the catkins turn yellow as the flowers develop. The leaves are coarsely toothed on the margins, bright green above, and

covered with a whitish bloom on the lower surfaces. Bebb's willow (*Salix bebbiana*) is found from the lower St. Lawrence valley to Hudson Bay and Alaska, south to Pennsylvania, Minnesota, South Dakota and through



WILLOWS FOR PROTECTING RIVER BANKS

On the Mississippi River these great mats are built to prevent the water from washing away the banks. In the background are seen barges loaded with willows, while in the foreground men are seen completing the mat.

covered by moist soil, rapidly forms roots and shoots, and develops into a tree. Willow twigs snapped off by the wind often take root in the soft soil in which they lodge. As may be surmised, freshly cut stumps of willow trees send up numerous and vigorous sprouts. In Europe, and occasionally in America, willow trees are pollarded, that is, the tops of the trees are cut some distance above the ground to permit the sprouts to grow into numerous large branches, forming a spreading, rounded head.

The black willow (*Salix nigra*) grows to the largest size of any willow native to America. Its name is derived from the rough, flaky, dark-brown bark on its trunk. It ranges over the eastern half of the United States, and it is our largest native willow, reaching a maximum height of 120 feet and a diameter of 3 feet. It has narrow, lance-shaped leaves, finely toothed at the edges, and the tip, or frequently the whole body of the leaf, curves to one side like a sickle. The almond-leaf or peach-leaved willow (*Salix amygdaloides*) ranges across the continent from Quebec and New York to Texas, Oregon and British Columbia. It sometimes forms a medium-sized tree 40 to 70 feet high, and is one of the better-known native willows because its leaves are broader than the usual



SINKING THE BIG MAT

The mat being sunk at Slough Neck Landing, Tennessee. The forepart is seen fast to the bank, and in the background another large mat ready for sinking is visible.

the Rocky Mountains to Arizona. It has showy catkins much like those of the pussy willow. The leaves are short and rather broad, dull green on top, pale-green and hairy beneath, with prominent veins. It is a small bushy tree or shrub, and although it prefers moist soils, as do other willows, it also thrives on dry soil. Sand-

bar willow or longleaf willow (*Salix fluviatilis*) has a wide range, growing from Quebec and Maryland northwest to the Arctic Circle and southwest to northern Mexico and Lower California. It is never more than a small tree, 20 feet high and a few inches in diameter, but it is abundant along rivers and so quickly takes possession of sandbars and newly formed alluvial soils, that it is one of our most familiar and most useful willows. The leaves are 2 to 4 inches long, thin, narrow and coarsely notched on the edges.

In addition to many more native willows that are interesting and well worth study, we have imported several kinds from other countries that are widely planted and have become naturalized. White willow (*Salix alba*) is one of the most important of these. A variety of this species known as the yellow willow, because of the bright yellow color of its twigs in the spring time, is very common. It grows to as large size as the black willow and is far superior in rate of growth and in appearance. Crack



BASKET WILLOW HOLT

These bundles of willow cuttings are placed in the pit, where they remain until the rods are cut up.

willow (*Salix fragilis*), another tree native to Europe, also grows to large size. It has earned its name from the brittleness of its twigs, which causes them to break off at the base when the branches are tossed in a high wind. It is an attractive tree, especially when the leaves turn upward and flash in the sunlight or gleam in the darkness of an approaching storm. The weeping willow (*Salix babylonica*) is a native of the East, as its appearance in the famous Chinese willow-ware indicates. It is said to have been introduced into Europe from Smyrna by the poet Pope; a noted specimen is growing over Napoleon's grave, at St. Helena, and has given rise to the so-called

Napoleon willow. It is one of the finest examples of a "weeping" form of tree, forming a fountain of foliage. The long, drooping branches of this tree are so conspicuous and so familiar a feature in the landscape that it probably is our best-known willow.

Willow trees are always graceful and in old age they



A BASKET-MAKER AT WORK

These baskets are rapidly made by skilled workers, and often blind persons are unusually proficient in the craft. Many of the soldiers blinded in the European war are being taught the work.

attain to dignity. They have considerable value for planting for fuel and shelter in portions of the prairie regions and they also hold high rank for certain kinds of ornamental planting. They are nearly always propagated from cuttings, which should be made from wood of one or two seasons' growth. The use of cuttings is advantageous because it produces trees exactly like the parent, thus making it easier to propagate especially desirable varieties. The rapid growth of most willows on moist, fertile soils is a useful quality, especially where a quick effect is needed. Certain varieties, such as white or yellow willow, Bebb's willow or diamond willow, may be planted on dry soils. The pussy willows have attractive flowers and many other kinds, such as shining willow, peach-leaved willow and yellow willow, are desirable because of the beauty of the twigs and foliage. White and yellow willow are among the hardiest trees for prairie planting and the best for general planting; they are used for wind-breaks, hedges and screens. Crack willow is also a hardy and rapid growing species, and may be substituted for white or yellow willow. Weeping willow gives good effects when planted near streams or waterfalls, or it may be planted with Lombardy poplar where contrasted growth is desired.

The willows are comparatively short-lived, but possess surprising ability to repair broken tops or other injuries they may sustain. They have a strongly developed fibrous root system which is always seeking moisture. For this reason willows may become a nuisance when growing near buildings, since the rootlets will quickly enter and clog drain-pipes with open joints, and may cause trouble

by obstructing wells and giving the water an unpleasant taste and odor from the decaying vegetable matter. The roots also interfere with the flow of water in irrigation ditches. Willows have no very serious insect or fungous enemies, although they are sometimes attacked by a saw-fly larva which somewhat resembles the currant worm.

## COMMERCIAL USES

**W**ILLOW is not important as a tree for producing sawed lumber. Black willow furnishes most of the saw timber, which is logged with cottonwood and the other species with which it grows, and manufactured into box boards, lath and rough dimension stock. Some of the lumber is used for fixtures, such as show-cases, racks, shelving and tables. The total amount of willow lumber cut in 1913 in the United States was slightly less than five million feet, B. M. The lumber warps in seasoning but is fairly durable when exposed to moisture. The wood is tough because of a more or less twisted fiber; for this reason willow is said to make the best steamboat paddles, because it wears better in the water than other woods.

A considerable quantity of willow wood is used in the manufacture of excelsior; Kentucky reports

the use of 3,000,000 feet, B. M., annually for this purpose. The wood is soft and cuts easily on the lathe, and is used for wooden ware, cricket and baseball bats, and novelties. English willow is important for the manufacture of artificial limbs. Willow is also used in slack cooperage, and small saplings are split for barrel hoops and for bands for binding boxes in which nursery stock is shipped. Charcoal made from willow wood has a very fine, even texture, and is used for artists' charcoal, and until recent years was in demand for the manufacture of smokeless powder.

By far the largest amount of willow wood is consumed on farms in the form of fuel, fence posts, bean poles, and for other uses. It makes a quick, hot fire and is a good summer firewood. The diamond willow has the reputation of making a very durable fence post, and the white or yellow willow is credited with a life of seven years if the bark is removed and the wood thoroughly cured before the post is set. Fencing is an important problem in the prairie states, and one solution is presented in raising a

quick growing wood, like willow or cottonwood, and then treating the posts with creosote. The creosote greatly extends the life of the post and thus lessens its annual cost. White willow grows in diameter at the rate of about one inch in three years, and yields from one to three cords of wood per acre per year in a well managed plantation. Growth is slower on upland soil than on rich bottom soils.

Willow has a number of interesting miscellaneous uses. Cork cutters use willow wood for whetting cutting implements. The ancients used this wood for shields because

of its lightness and toughness. Willow bark furnished the South with a substitute for quinine during the Civil War, and it also yields salicylic acid and tannin. The tannin in the bark of several varieties of basket willow was found to range from  $6\frac{1}{2}$  to  $11\frac{1}{2}$  per cent.

Because of its



WILLOW BASKETS

Three useful shapes which are in steady demand in many parts of the world, the high clothes-basket, the two market baskets and the smaller one, which serves several purposes.

fibrous roots, the willow has an important place as a soil-binder. It is frequently planted along the sides of eroding streams, and on embankments or sandy bottoms, to prevent the soil from being washed away. Along the Mississippi River, large quantities of the sandbar willow are cut each year and bound into fascines for building dams that force the current to deepen the main channel and for revetments that prevent the banks from caving in and washing away. Occasionally freshly cut willow fence posts are set with the bark on; these take root and become living fence posts, capable of furnishing shade for cattle and fuel for the farm.

The growing of willow shoots for weaving into furniture, children's go-carts and a great variety of baskets is an important industry. The ancient Romans regarded the willow as one of the most useful trees cultivated, and they developed a number of varieties adapted to weaving. The shoots were made into baskets, beehives and fences. During the Middle Ages the weaving of willow baskets

became important in France and Germany, and later, in England. Previous to the European war, France, Italy, Belgium, Holland, Germany, Austria, and Russia grew basket willows extensively, and had a large export trade in willow rods and basket ware.

Experience has proved that willow makes the most durable and serviceable baskets. Basket willows intended to be used with the bark on must be smooth, tough, flexible, branchless, and cylindrical, and the color of the bark must remain a light brown. Those to be used in the peeled state must have the same general characteristics, and must remain white in color when peeled. In addition to these qualities, the rods must have a small pith and straight grain in order to bring the highest market price. In many places in the United States basket willows are grown on ordinary corn land, but generally if they are planted on high ground, the land chosen is deep and heavy, but when the willow bed is subject to overflow, the land may be poorer in quality. Usually the ground is prepared as for ordinary field crops, and cuttings, 10 or 12 inches long, are planted 9 inches to a foot apart, in



WILLOW WARE ARTICLES

A fine German lunch basket, a dog basket made in New York, and a best quality Liverpool clothes-basket.

rows  $2\frac{1}{2}$  to 3 feet apart, or from 14,000 to 23,000 cuttings per acre. Sufficient cultivation is given to prevent the willows from being smothered by grass and weeds.

Osier culture was begun in the United States by German immigrants, and the industry attained its largest proportions between 1870 and 1875. At present, basket willows are grown only in restricted localities in a relatively small portion of the country. In 1909, Illinois manufacturers used 108,000 pounds of willow rods, mostly imported from Holland and Germany, at prices ranging from 5 to 8 cents per pound. The last two years has seen a decided boom, both in the growing of basket willows and in their manufacture in this country. With the cutting off of supplies of rods from Germany and the curtailment of imports from France and England the price of American rods has steadily advanced. Competition in manufactured wares has also been reduced to the point where foreign goods no longer set the market price.

An attempt to replace European grown willows with imports from Japan has not been on a sufficient scale to affect the market. The importers of Japanese rods of good quality have been asking top prices for their ware, rather than attempting to capture the market by under-



A WILLOW CHAIR

The furniture of willow is growing more and more popular and there has been a steadily increasing demand for it for some years.

selling. It is probable that high transportation costs together with limited amounts of rods available account for this.

In Liverpool, New York, the largest center of the industry in this country, higher prices are ruling than ever before. Wholesale prices of standard baskets had on July 31 increased \$1 per dozen over quotations before the war. Prices ranging from 5 to 6 cents for steam-peeled rods have advanced to 7 to 9 cents per pound; the average price of sap-peeled rods has advanced from 6 to  $7\frac{1}{2}$  cents per pound, with the finer grades commanding a price of from 8 to 12 cents per pound. The crop this year in the vicinity of Liverpool will be over 400 tons greater than last year, owing to the fact that many of the old willow holts which had been abandoned were cleaned up this spring. These holts will yield a crop of about two tons of green willow rods per acre this fall. The season has been particularly good in all sections as there has been very little trouble with either insects or disease.

The problem of peeling the willows still remains acute, as machinery invented for this purpose has not been satisfactory. At present willow strippers are demanding \$18 per ton for green willows and \$20 per ton for dry willows. Willow growers and basket makers are, however,

making every effort to do this work themselves, thereby reducing this cost.

The cost of peeling willows is the one thing that is holding back the willow industry in America. In Europe, where labor is cheap, this is not important, but the cost of peeling here is almost prohibitive. The only permanent relief must come through the invention of a simple inexpensive peeling device that with two men, or with a man and boy, 500 pounds or more can be stripped. Such a machine would cut in two the cost of peeling and make willow growing profitable even in normal times. Several machines have been invented but they have not been

successful, owing more to their size and cost than to the lack of mechanical efficiency. They bear the same relation to the willow growing industry that the large powerful corn sheller would to the small farmer. Unless the growers can band together and several use one machine, such machines can not relieve the situation. As the willow growing industry is mostly confined to numerous small patches, it demands a small inexpensive machine paralleling in cost and usefulness the hand corn sheller.

In spite of labor costs, however, those who have planted willows in the last two or three years are in a position to enjoy at least a temporary prosperity.

## WAR STYLES IN MATCHES

**T**HE war now strikes the match, which, of course, is a very proper thing to do with a match, but in this case it strikes at the supply and sends the cost upward. It is all because the Russian government has prohibited the exportation of aspen wood which is what

and five dozen safety matches per box. About half of the cargo was carried on deck. Quite a lot of matches you will say when you look at it that way, but that is just about enough to supply these United States for a week—and not that long when you think of the “gimme-a-match” pest.



THE VIKEN AT HER DOCK IN PHILADELPHIA

This boat brought over from Sweden 2,440,800,000 safety matches for use in the United States. Owing to the war, styles in matches have changed. They will now be shorter.



CARGO OF THE VIKEN

These boxes contain a week's supply of matches for the United States, and represent a recent shipment from Sweden.

Sweden uses in making her *sikkerhetting tandstickers*, and Sweden gets most of her aspen from Russia.

The good ship *Viken* got into Philadelphia the other day with 2,440,800,000 matches aboard. These were in 5650 cases containing 50 gross boxes of matches per case,

As a result of the Russian embargo on aspen wood the factories in Sweden have announced that the style in matches for a while will be somewhat shorter and more slender, a measure of conservation which will effect a considerable saving, but may result in some burnt fingers.

## PORCUPINE QUILLS NEEDED

**P**ORCUPINE quills are badly needed by the Indians of Michigan, writes John C. Wright of Harbor Springs, Michigan. He says:

“Some months ago I noticed an article in *AMERICAN FORESTRY* regarding the destructive work of porcupines in one of the western states. The article was extensively illustrated, and the author said the farmers in that state considered the porcupine a great pest and of no value whatever. In this part of the state of Michigan our Indians use porcupine quills for doing fancy work on birch bark and they make many beautiful boxes, etc., which find a ready sale among tourists and resorters. Indeed the Indians in the past have almost made a liveli-

hood that way. So you see porcupine quills are very valuable to them. At the present time these animals are practically extinct here, so that the Indians are compelled to send to Canada for their supply of quills, which make them expensive and hard to get. Of course this lessens the profit on their work, which requires a great deal of time and skill to do; and so it is a real hardship. I wish to get in touch with some of those western parties in the states where a bounty is offered on the porcupine as a pest, and let them know that the Indians here use the quills and can use a quantity every year. For the most part, our Indians are poverty-stricken and in a pitiable condition, and I would like to do something to assist them.”

## SCENIC MARVELS OF SEVIER FOREST

WE hear much these days of the scenic wonders of the National Parks, for the National Parks are well advertised; but we hear little, if anything, of the beauties of the National Forests, which, up until now, remain practically unheralded. The tourist who plans a western trip arranges his itinerary so as to take in the Yellowstone, Glacier Park, Crater Lake, the Sequoias, and the Yosemite in three weeks, or thereabouts, and returns home to speak wisely of St. Mary's Lake, going to the Sun Mountains, El Capitan, and the Geysers, and is satisfied that he has seen everything worth seeing. As a matter of fact he has skimmed only a little of the cream of the store of scenic wonders of the West. The National Parks comprise a few million acres of wonderful

mountain scenery and freaks of nature. They are well worth seeing, but let no man, having seen them, think he has seen all or even the best of the western mountains.

The National Forests comprise some 150 odd million acres and are located along the main mountain ranges of the West from the Rio Grande to the Canadian line. They contain every possible form of mountain scenery from the low, monotonous, rolling foothills, dotted here and there with pine, to the stupendous, cliff-crowned peaks of the Uncompahgre or Cœur d'Alene.

Whether the tourist wishes to locate his camp in some quiet

valley by the side of a rushing stream, or to fight his way up along the hostile mountains to the jagged, windswept top; whether he desires merely the peaceful beauty of long, wooded slopes, or the soul-inspiring panorama of towering peak piled on towering peak, of rugged mountain and sheer precipice and endless ranges stretching away in the distance, he will find all his heart desires of such things on the National Forests.

Nor does the charm of these mountain fastnesses lie solely in the wonderful views to be had. The hot springs of the Boise, Challis, and Sawtooth Forests in Idaho are remarkable and interesting. In hundreds of places there are geological freaks which are the delight of the scientist, while in many others the delicate and masterful coloring

with which Nature has painted the canyon walls of some little-known creek is the despair and delight of envious mortals who try unsuccessfully to imitate her handiwork.

Perhaps no better example of these varied attractions is to be found than on the Sevier National Forest, tucked away down in the southern part of Utah, and, except for the local population, known hardly to one person out of ten thousand. Aside from its importance in protecting the water-shed of the Sevier River, the waters of which are used several times over for irrigation, and for the summer range for the cattle and sheep of the nearby ranchers,



Photograph by Arthur W. Stevens.

A VIEW OF THE TEMPLES OF THE GODS FROM THE BRINK OF THE CANYON. The black and white picture of this view on the Sevier National Forest, Utah, can give no idea of the delicate coloring. Some of the pinnacles shown here shade from a brilliant red at the base through lighter red and pink to pure white at the tip.

the Sevier has a number of scenic features which would draw forth many "Oh's" and "Ah's" and other similar appropriate exclamations from thousands of tourists, were it comprised within a National Park.



*Photograph by Arthur W. Stevens.*

**ONE OF THE NARROW GORGES, SEVIER NATIONAL FOREST**

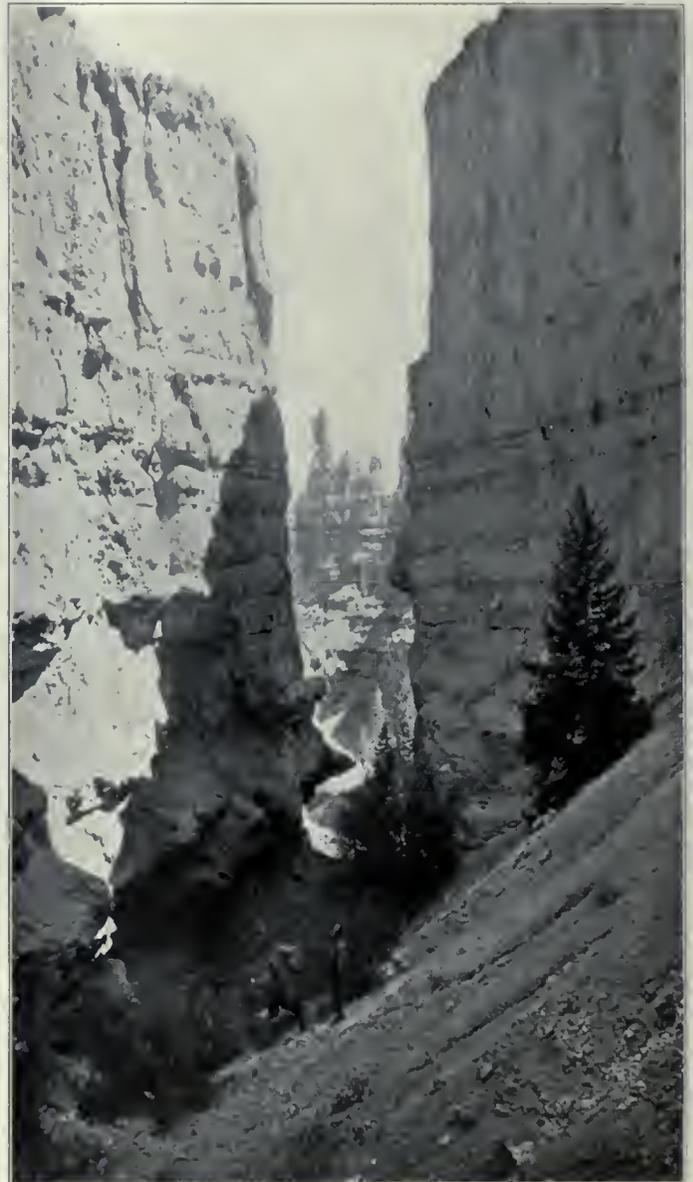
This is one of the many small canyons between the rock walls shown in another picture. Some of them are so narrow and deep that it is dusk in them even at broad daylight.

The region is rough and mountainous. The timber is open and is broken by grassy parks and high, flower-bedecked mountain meadows. Rugged peaks tower from 9500 to 11,000 feet into the air, while others of lesser height but of equal ruggedness and roughness cut the region into a maze of cliff and precipice. Large, impassable lava beds occur everywhere throughout the Forest and from the mountain tops the spectacle of open park and broken cliff, of sharp, jagged mountain and rolling plateau, with the fertile valley far below, is a never-to-be-forgotten sight.

But the crowning glory of the Sevier is a line of cliffs extending for many miles along the eastern boundary of the Forest and locally known as the "Pink Ledges." Here Nature, the master artist—sculptor and painter

alike—has decorated the rock walls with that lavishness and skill which she has employed on so many of the world's show places. Broken by canyons and arroyos, long draws and steep ravines, these "Pink Ledges" present a wealth of color and fantastic architecture which must be seen to be appreciated. And in one of these canyons the form and coloring rise supreme above anything else on the continent, if not on the globe.

A visitor, seeing it for the first time, called it the "Temple of the Gods," and this title perhaps is more fitting and descriptive than any other which could be



*Photograph by Arthur W. Stevens.*

**A GORGE IN THE BOTTOM OF THE CANYON**

Here is a canyon within a canyon. There are dozens of these on the Sevier National Forest in Southern Utah and each with some particular individual scenic feature.

found. Verily each of the old heathen gods would have found him a temple to his liking, no matter how unique his taste.

From the brink of the canyon, one looks down into what seems to be a city of temples. Chinese pagodas stand side by side with pure Doric columns. Bell-shaped towers of the East mingle with stately spires and countless minarets. Nature has been as lavish in her coloring



*Photograph by Arthur W. Stevens.*

**A CLOSE VIEW OF ONE OF THE TEMPLES, SEVIER NATIONAL FOREST**

One of the strangest sights to be seen in all the scenic West. The mass of rocks in this National Forest in Utah in the foreground is a series of perpendicular walls two or three hundred feet high and set ten to twenty-five feet apart. The tops are uniform in height and serrated like a rooster's comb. Their color is bright red, while that of the cliff in the background is white.



*Photograph by Arthur W. Stevens.*

**SOME OF THE FANTASTIC ROCK FORMS, SEVIER NATIONAL FOREST**

Nature was in a playful mood when she made these. A big wad of plastic material dumped down on a ledge, a smaller one on top of it, and then a third one pinched up to a peak—that is what they look like. But in reality they are the result of the inconceivably slow action of particles of sand carried by the wind. The rock throughout all this region is a sandy limestone.

as in the varied forms of the architecture. The main scheme is done in red and white, enlivened with browns and yellows and blues. The colors stand out vividly or shade into each other so imperceptibly that one is reminded of some vast fantastic city of dreams.

From the bottom of the canyon the formations take on new shapes and become grotesque images of strange beasts and men, as startling in their likeness as they differ from the creatures they resemble. It is as though some riotous imagination has carved from the colored rock all the phantasmagorical creatures of its creation and set them there for the favored visitor to see and wonder at.

And all this is in a National Forest, not a National Park, please remember, and an automobile can be driven to the very edge of the canyon. The Sevier is only one of 150 National Forests, each of which has something beautiful and unusual and worth seeing. There are many indeed which have far more of interest than the Sevier, but few people beside the members of the Forest Service known about them.

### 2,000,000 TREES FREE

**T**HE Pennsylvania Department of Forestry announces that 2,000,000 forest tree seedlings will be available for free distribution in the spring of 1917. The following species make up the number: White pine, 1,250,000; Scotch pine, 410,000; Pitch pine, 200,000; Norway spruce, 75,000; European larch, 50,000; Japanese larch, 5,000; Sugar maple, 5,000; White ash, 5,000.

These are the seedlings over and above those which will be planted on State Forests. Anyone can secure an allotment of these trees if he will promise to use them for reforestation within the state of Pennsylvania. No trees will be furnished for shade or ornamental planting, nor will any shipments be made in less than five hundred lots.

### RED SPIDERS INFEST TREES

BY EUGENE W. MENDENHALL

**T**HE red spider was quite bad in Ohio last summer, and this is something rather unusual for this little insect to infest trees and plants in open air, this far north, for it thrives only in dry atmosphere and can be subdued upon house plants by liberal use of water. When it occurs upon plants in the open air it can be combated with any of the washes found useful in destroying scale insects.

I found it quite bad on the Kentucky coffee-nut trees and also on the plum trees.

The Kentucky coffee-nut trees were nearly all defoliated before the trouble was known. The trees are on one of the public school grounds of Troy, Ohio. The silvery webs were spun entirely over the trees.

The very dry summer accounts for the appearance of these spiders in open air in Ohio.

**T**HE College of Agriculture of the University of California announces a correspondence study course on "Lumber and Its Uses." This course is prepared by Professor M. B. Pratt of the Division of Forestry.

### A LARGE SASSAFRAS TREE

BY BERTHA M. TOMLINSON

**I**N a quaint old graveyard, directly opposite to the Friends' Meeting House at Horsham, Pennsylvania, stands a noble sassafras tree, estimated to be 360 years old, whose age and unusual dimensions have made it an object of interest for many years. It stands as a monu-



SASSAFRAS AT HORSHAM, PENNSYLVANIA

This tree, about 360 years old, is now nineteen feet in circumference at the ground and sixteen feet at a point breast high. Pioneer settlers of Pennsylvania are buried under it.

ment to the pioneer settlers of Pennsylvania who were buried here as early as 1719.

The first measurements, of which record can be obtained, were taken in 1852. At that time it was 13 feet in circumference at 16 inches from the ground, carrying with little diminution the same dimension on the trunk for 10 or 12 feet, where it divides into two huge branches. At present it measures 19 feet in circumference at the ground and 16 feet at about 5 feet from the ground. These dimensions are enormous when compared with the average Northern sassafras, which is seldom more than a foot in diameter. The Horsham tree is now on the decline, the trunk being hollow, but it is believed to be the record sassafras tree in the United States. During the past winter the top was broken off by the severe storms, so that but 19 feet of the main trunk is left standing. Before its decline, the tree was estimated to be over 100 feet tall. Some 20 years ago another sassafras equally as large as this stood about half a mile distant.

# BRINGING BACK THE GAME

By A. A. ALLEN

A Department for the instruction and information of members of the American Forestry Association and others regarding birds and the conservation of bird life.

**T**HERE is, in this country today, a widespread awakening to the value and the necessity of conserving our native game. Law-makers, sportsmen, and the people at large, have come at last to the realization that America, at one time the richest game-producing land in the world, has been wantonly devastated. In previous pages of the Bird Department we have traced the development of game laws, culminating in the Federal Migratory Bird Law, and the treaty with Canada. We know that open seasons have been shortened, "bag limits" curtailed, and most potent of all, the sale of game ruled out in numerous states.

Laws in themselves, however, are not sufficient. There must be an organization of public opinion before they will be respected and obeyed. Organizers have not been wanting. The need for protective associations has been met by such men as Dutcher and Pearson, who founded and perfected the National Association of Audubon Societies, Burnham and Quarles, of the American Game Protective Association, Dr. Wm. T. Hornaday, and the scores of leaders of local sportsmen's organizations and bird clubs throughout the country. Through the efforts of these men, there are, today, over 500,000 affiliated sportsmen, and over a million

affiliated bird students and conservationists working for bird and game preservation.

But even though the best laws are respected and enforced by an enlightened public, the natural increase of game cannot meet the demands of the five million

owners of shot-guns. The game must be given a chance to get on its feet before it is knocked down, and unless it is well established it cannot hold its own against such odds. There are three practical methods of accomplishing this end. The first is to proclaim a long closed season for several years upon any species which is apparently losing ground until it can

regain its hold. Thus, the Federal Law provides a continuous closed season for a term of years for the wood duck, cranes and the smaller species of shore birds. The second method is the establishment of refuges where no hunting at any time is allowed. When these refuges have restocked themselves, the excess game spreads to the surrounding country where it may be hunted, but the parent stock, the nucleus, the germ, is never destroyed but goes on producing, multiplying, and restocking the surrounding country. Colonel Roosevelt, during his administration, was particularly active in establishing Federal bird and game reservations, and



Photo by Courtesy of the American Game Protective Association.

## A PEN OF RING-NECKED PHEASANTS

The pheasant has been reared in captivity more successfully than any other game bird and, while not a native of the New World, it is now the commonest upland game bird in many parts of the country.



Photo by Courtesy of the American Game Protective Association.

## YOUNG RING-NECKED PHEASANTS

These birds are in the rearing field of the American Game Protective Association. Questions concerning the rearing of game birds addressed to this association, 233 Broadway, New York, will be cheerfully answered.

numerous states have since followed his excellent example for the same purpose. But there are far too few of these havens to have much general effect upon the game of the country. Every township should have its bird and game refuge or what is very well termed a "community sanctuary."

Several adjoining farms including more or less waste land should be selected, if possible covering from 1000 to 5000 acres, having suitable cover and food-bearing plants.



Photo by Courtesy of the American Game Protective Association.

#### SOME HAND-REARED RUFFED GROUSE

These are on the farm of the American Game Protective Association. Although extremely wild when hunted, the ruffed grouse in captivity shows a very friendly, confiding nature. The breeding of grouse in captivity is still in the experimental stage.

This land should be posted and no shooting whatsoever should be allowed within its boundaries. Local gun clubs and bird clubs should endeavor to increase the available food supply by planting shrubs or even strips of grain, and should make consistent efforts toward trapping the vermin which will naturally be attracted to such spots by the increase of the game and other birds. Great horned owls, Cooper's, sharp-shinned, and gos-hawks, weasels, minks, skunks and foxes, while having their place in a "wild life sanctuary" are incompatible with a "game refuge." The stray cat is everywhere a menace.

It may seem strange to ally gun clubs and bird clubs, giving them a common purpose, when their interests are superficially so at variance with each other. But the sanctuary fulfils the ambitions of both, so they can well work side by side. The bird club will be repaid by the increase of all species of birds and the gun club by the fact that while the available hunting area will be restricted, the sanctuary will act as a great game reservoir and irrigate all the surrounding country. It is far better sport

to hunt a limited country where game is plentiful than twice the area where it is scarce.

The sanctuary, moreover, has proved a more practical method of increasing most game than long closed seasons, because the closed season takes the reputable sportsman, who is, at the same time, more or less of a policeman, from the field, and gives the poacher full sway. Where the closed season alone has been tried out, it has been found that even after five-year periods the species protected has not increased materially, because of the work of unprincipled gunners and the difficulty of detecting them. As long as any shooting is allowed in an area, the protected species will go down with the unprotected because there is such a spirit of competition among hunters. "If I don't shoot it, the other fellow will," is reasoning to which even the best, at times, descend.

The question then arises, would it be better to prohibit all hunting for a term of years until every species could recuperate? Illegitimate shooting could then be more easily detected and more efficient protection be brought about. On the contrary, it has been found the least efficient method. First, the funds for warden service, derived at present from hunting licenses, and the



Photo by Courtesy of the American Game Protective Association.

#### SOME HAND-REARED MALLARD DUCKS

These ducks, on the farm of W. S. McCrea are returning to the home pond. The mallard is very easy to raise and is very prolific.

thousands of dollars which are annually contributed to game protection by the gun and ammunition companies, would be removed. Secondly, the interest of reputable sportsmen would be directed into other channels: they would not be in the field and protection would be entirely in the hands of a few wardens who would be utterly unable to cope with the large number of poachers and law-breakers who would result from the prohibiting of all hunting. Thirdly, the various species of rabbits would multiply so rapidly, and with them the predaceous hawks and owls, that great damage would be done, for it would

be impossible to allow the shooting of rabbits and hope to protect any other game.

After good laws have been passed and enforced, and the community sanctuary made a potent factor in game protection, there remains still another means of bringing back the game its artificial propagation. The reproductive capacity of game birds is far ahead of what is necessary to perpetuate the species, or even to provide for a normal increase. The bob-white, for example, lays from 10 to 17 eggs in a clutch, although, in order to perpetuate the species, it is necessary to raise to maturity only two young during the entire life of the pair. The additional eggs are nature's provision against calamity, and normally, just balance or offset the number of enemies to which the species is subject. Large as the clutch seems, it by no means represents the full capacity of the bob-white, for if the first nest is destroyed, another will be built and another clutch of eggs laid. Domestic fowls have been known to lay 314 eggs in 365 days through artificial stimulation by an abundant and continuous food supply and removal of the eggs as soon as laid. Game birds have never approached this record but the bob-white, in captivity,



Photo by J. T. Lloyd.

#### A WILD MALLARD NESTING IN CAPTIVITY

The egg-laying capacity and the comparative hardness of the mallard make it a favorite with amateur game breeders.

regularly lays thirty to forty eggs and the pheasant fifty to a hundred. Is it not to be expected, then, in this age of science, that man should take advantage of this, as he has all the other resources of nature, and in return for proper care of the eggs and young, and protection from the natural dangers and enemies, reap the benefits of this great reproductive ability. This is the secret of rearing game in captivity and the reason why it brings such great returns compared with mere protection of the birds in the natural state. The first eggs can be taken and placed under a hen and the bird will still produce more than she would in the wild state, and the output is thereby doubled or tripled.

Game breeding in this country is still in its infancy but we are at the beginning of an era of great activity. The greatest strides have been made with those species that already have been bred in Europe for centuries, namely, the mallard duck and the ring-necked pheasant, and during the past few years, much has been learned about breeding the bob-white. Successful experiments are being carried on also with the wild turkey, the ruffed



Photo by J. Heywood.

#### WATERFOWL POND ON A GAME FARM

These waterfowl are owned by John Heywood of Gardner, Mass. Our native Canada goose does well and breeds freely in captivity. White-fronted, Egyptian and blue geese are here also shown.

grouse, the California quail, and several species of native waterfowl besides the mallard including the beautiful wood duck. It is probable that before many years have passed every species of native game bird will have been raised in captivity. Think what this will mean for the game of our country.

In nature probably less than 10 per cent of the eggs of game birds develop into mature birds. By artificial cultivation as high as an 80 per cent yield has often been attained and considering that the yield of eggs can be doubled or tripled it is fair to expect twenty times the efficiency of nature under artificial propagation. How much more rapidly, then, can coverts be restocked?

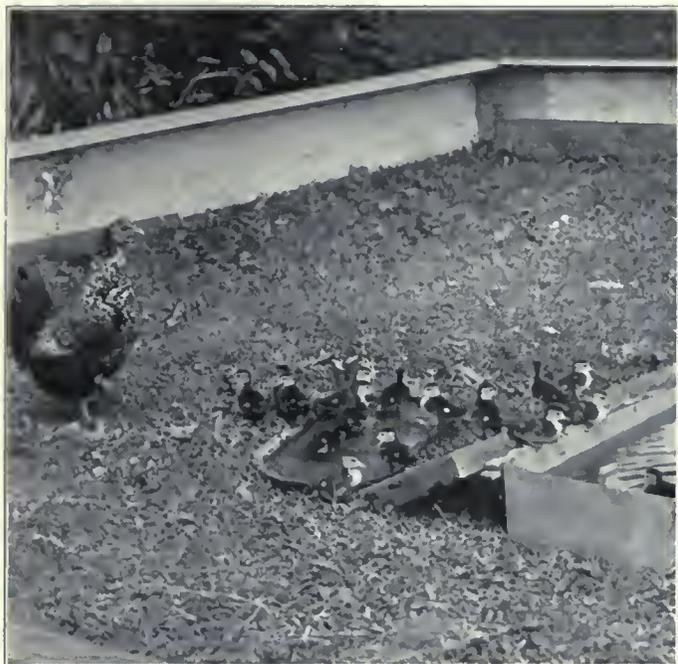
The case of the ring-necked pheasant, although it is not a native game bird, speaks well for this method of bringing back the game. For years, hundreds of birds were imported and liberated in suitable coverts with the result that in only a few places did they establish themselves. Little attempt was made to breed them in captivity since it was supposed that the birds would do much better in the wild state. But the birds, when liberated, scattered so widely that when the mating instinct came they rarely found each other. The result was that up to ten years ago, the pheasant was nowhere sufficiently abundant to be a practical game bird. At about that time, however, several states established game farms, taking up the breeding of pheasants in captivity. Methods were perfected and soon

each farm was producing an annual yield that completely eclipsed all previous efforts. Today, for example, the three New York State farms raise for distribution from ten to twenty thousand young pheasants yearly and send to applicants from 200,000 to 500,000 eggs to be hatched under hens and liberated in the coverts. The effect has been marvelous and today the pheasant is the most abundant upland game bird in most parts of the state.

The reason is threefold. First, we have taken full

those males) can be shot in a season. So successful has this artificial propagation been that the annual output from the game farms and the natural increase of the birds in the coverts more than balances the annual kill and the birds continue to increase while the hunters continue to enjoy good sport.

When other birds can be raised with equal success, we



A POSTER-MOTHER AND HER BROOD OF YOUNG WOOD DUCKS  
The wood duck is the most ornamental of the American waterfowl and does very well in captivity. It has been successfully bred in an ordinary city yard.



A COLONY OF PURPLE MARTINS

These are the largest of our swallows. The many chambered house is placed on a pole seventeen feet from the ground. Birds have occupied this house for twenty years.

advantage of the great reproductive capacity of the birds and have protected them against all kinds of enemies. Secondly, the birds are put into the coverts, not as adults, but either when two-thirds grown or as chicks with the hen, and have formed an attachment to the spot where released before maturing. And thirdly, proper restrictions of the shooting have been enforced. The season is opened for but four days during the fall and only three birds (and

need have no further fear of the extermination of our game. The passenger pigeon and the Labrador duck are irrevocably gone, but the heath hen, which was following them, has been saved in time. Great hope is now entertained for the recovery of all other species, and thus the game will be brought back to our country.

## THE SWALLOWS

(Family Hirundinidæ)

**P**ERHAPS no family of birds is better known or more easily recognized than the swallows. Numbering about one hundred species, they are found all over the world, thirty-five of them being American, although only nine are found in the United States and Canada. All the swallows have long pointed wings and trim bodies, which, together with their trustfulness about the abodes of man, make them the symbol of grace, and favorites with every nation.

Six species of swallows occur in eastern United States and Canada, four of which, the purple martin, and the barn, cliff and tree swallows, are primarily blue, and two, the bank, and rough-winged species, are brown. Of the blue swallows, the purple martin is the largest. The male

is entirely blue above and below, while the female is blue above with a gray breast. Martins nest in colonies in houses provided for them or in gourds raised on poles (See AMERICAN FORESTRY, March 1916). The barnswallow is considerably smaller than the purple martin, and has orange-brown underparts. It is easily recognized by its long forked tail which makes it very similar to the common swallow of Europe appearing so often in art and literature. Its familiar cup-shaped nest is built of mud and straw, lined with feathers, and attached to the rafters of the barn. The cliff swallow is often found about the same barn but it makes a gourd-shaped nest and fastens it beneath the caves. This gives it the common name of "cave swallow" in many places, and it is easily distinguished from the barn

swallow by a buffy patch above its tail. The tree swallow is the fourth blue swallow and it is easily distinguished from the others by its snowy white underparts. It usually nests in an old woodpecker hole but it is easily attracted to the garden by nesting boxes placed on poles. A similar species found on the Pacific coast is the violet-green swallow.

Of the brown swallows, the bank swallow is best known, nesting in large colonies in sand banks. Each pair drills a small tunnel two to three feet deep into the sand and at the end of it builds a shallow nest of straw and feathers. The white underparts of the bank swallow are crossed by a dark band on the forebreast. The rough-winged swallow is perhaps less familiar to us, nesting as it does away from human habitations, in cliffs or creek banks, or occasionally in the deserted burrows of kingfishers.

All swallows are highly beneficial birds, feeding almost entirely upon obnoxious insects, and while the nests of the barn swallow are occasionally objectionable because of the litter of the young birds, anyone who does not encourage them to nest in his barn shows a most foolish and near-sighted policy. The modern barns with closed wagon sheds and small holes for

ventilation offer little encouragement to barn swallows. This has caused them to decrease in many places or even to revert to their original habit of nesting on the cliffs. A colony of purple martins or a few families of the other swallows will do much toward protecting an orchard from various insect pests or freeing a neighborhood of mosquitoes, and no better investment can be made than a few hours spent in building a martin house or a few homes for tree swallows. Directions for building these houses will be found in the March number of *AMERICAN FORESTRY* for 1916. Encouragement can be given to the barn swallows by enlarging the ventilation holes, or letting the loft door stand open, and nailing cleats or driving a few nails in the rafters in suitable places. Cliff swallows, which do not like painted barns, will often accept one if a narrow strip is nailed against the wall a few inches below the eaves

to give support to their nests.

Swallows are highly migratory birds, most of them spending the winter in South America. They begin to assemble in large flocks along lake shores or marshes early in July, and by the middle of September, most of them have left for the South, to be gone until the last of April.



A SMALL FLOCK OF TREE SWALLOWS

These are readily distinguished in the field by their blue backs and snowy white underparts. Bird houses for tree swallows should have but a single compartment and be placed on poles about ten feet from the ground.



THE NEST AND YOUNG OF THE BARN SWALLOW

This nest is built of mud and straw and fastened to the rafter of a barn. All of the swallows are extremely beneficial birds and should be encouraged in every way.



A BANK SWALLOW NEAR ITS BURROW

Bank swallows nest in colonies making tunnels into sand banks and building crude nests at the end of the tunnels.

## FAMOUS LATIMER ELM DESTROYED

**A**T the ditch over against Balliol College" Hugh Latimer, of England, was burned at the stake 361 years ago, according to the books of reference which tell the facts in connection with the martyr's death in terse terms, and what a story the old elm, under which he preached, might tell could it but talk!

The tree became famous after his arrest and death, and has been known as "Latimer's Elm" all these years. It was shattered in a recent storm in Hadley Wood, England. Latimer who rose from priest to Bishop of Worcester, was in and out of favor at court and finally lost his life at the stake in the whirling maelstrom following the Reformation in which Cromwell upset England.

Latimer was born about 1485 at Thurcaston and was graduated B. A. at Cambridge in 1510. He gained the favor of Cromwell and obtained the benefice of West Kington. In January 1532 he was cited to appear before the Bishop of London on a charge of heresy. It was then



*Copyright, Topical Press Agency.*

This tree, known as "Latimer's Elm," was shattered during a recent storm in Hadley Wood, England. It was under this tree the martyr, Hugh Latimer, was preaching when he received his death warrant. The photograph also shows all that remains of the old landmark.

his following became tremendous, for human nature it would seem was much the same then as now and the public fancy turned to one who was being persecuted. Latimer recanted in April and as a reward he was made a royal chaplain in 1534 and Bishop of Worcester in the following year.

Things ran smoothly for him for four years when he resigned, according to information given out by the crown, on account of his opposition to the Act of

Six Articles, but Latimer insisted it was at the request of the king.

During the reign of Edward VI, Latimer regained his favor at court and identified himself more closely with the Reformation. This proved his undoing, and with the accession of Mary he was arrested and sent to the Tower. This was in March, 1553, and on October 16, 1555, he was burned at the stake.

**P**ORTO RICO consumes three times as much wood annually as the forests of the island produce, declares Louis S. Murphy, of the Government Forest Service, in a bulletin on the insular forests. He says in a commercial sense, from the logging stand-point the forests of the island are insignificant, and are being constantly depleted by the burning of charcoal, the native fuel.

**S**O popular was the farm bulletin of National Lumber Manufacturers' Association on the preservative treatment of farm timbers, that it has been necessary to issue a second edition, which points out that decay timber is a disease, caused by infection, and preventable by proper use of creosote.

**T**HE pork packers who boast that they use all of the pig but the squeal have close rivals in several of Pennsylvania's State Forests, where the foresters are using all of the tree but the roots and leaves. This close utilization is practiced in the distillation of birch oil, an old Pennsylvania industry which has been revived "on account of the war."

**N**ORTH CAROLINA has started a campaign to educate school children in forest work and methods, by holding annual contests among the schools. The competition is for exhibits of leaves, fruits, flowers, seed and wood of native trees and shrubs.

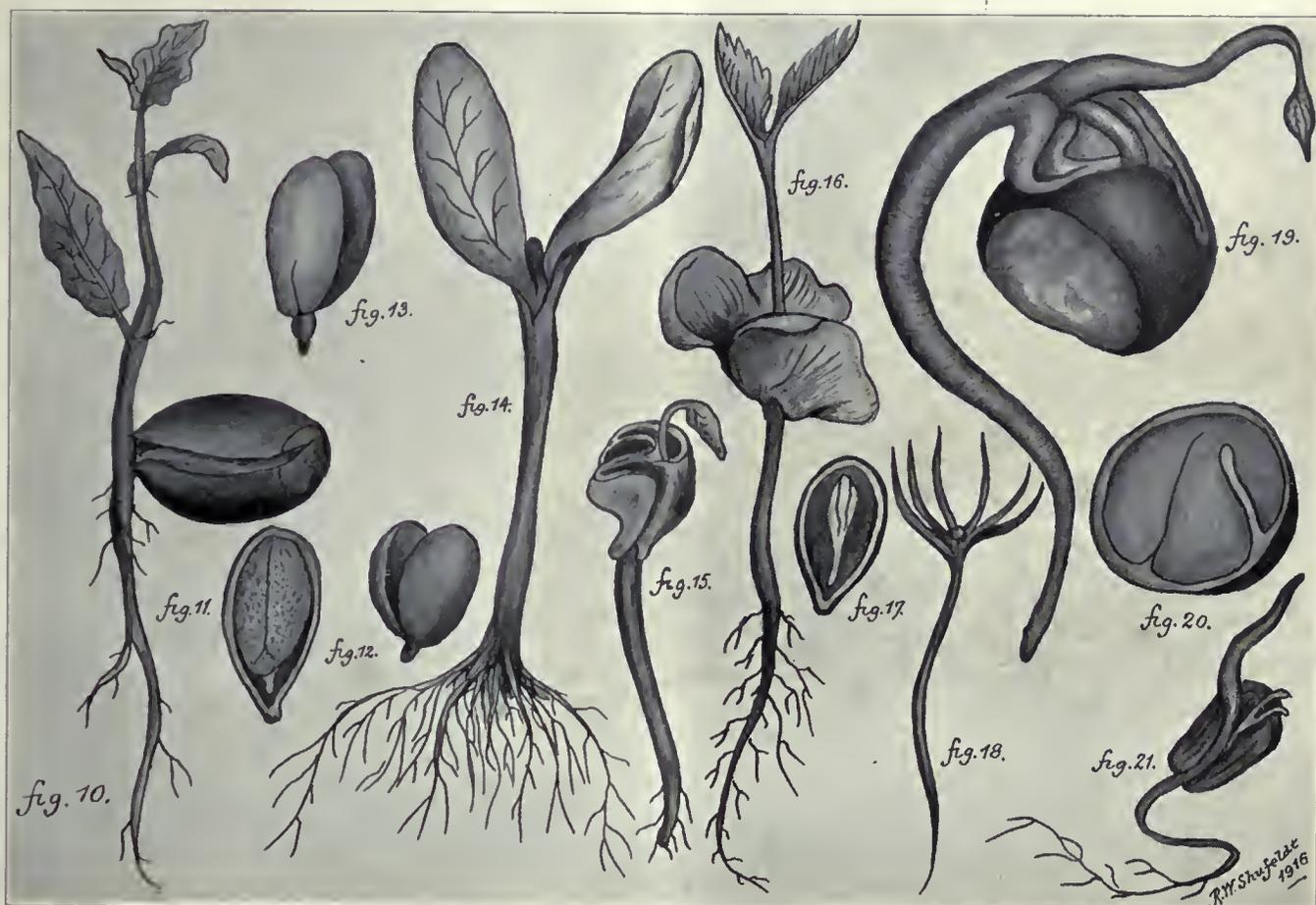
# THE AMERICAN MILKWEEDS

BY DR. R. W. SHUFELDT, C. M. Z. S., EDITOR OF THE DEPARTMENT OF WILD FLOWERS

THROUGHOUT the greater part of the northeastern region of the United States, there are, during the month of January, practically no flowering plants to be found in the woods or in the fields. This is especially true should the winter happen to be a particularly severe one, with little or no snow. However, south of New Jersey, and southward to northern Virginia, it has happened that, during very mild weather, some flowers, as the dandelion for example, have bloomed from late autumn until spring came round once more. The District of Columbia, for

instance, has experienced a number of such winters within the recollection of those who came into the world during the middle of the last century or earlier.

As one tramps over the snow-covered fields, or through the silent forests, where the glistening mantle of snow overlies to a large extent everything that pertains to nature and to earth, flowers are almost the very last things that come into one's head. Still, out in the open, one may meet with things that bring to memory the beauty of the spring, and summer, and fall months that made up the year which



## DESCRIPTIONS OF GROWING SEEDS

Figure 10, an oak seed or acorn, with the young oak fairly started. Note that the former is split open, and that the latter consists of the *ascending axis*, bearing the first leaves, and shooting upwards into the light and air; while below the seed the *descending axis*, with its rootlets, grows downwards into the ground or soil for nourishment and support,—that is, supporting the plant in its position. Roots, as we shall see later on, are of many kinds; but in no case are they ever jointed, nor do they ever bear leaves. However they may branch, they grow for the most part downwards by extension of their free extremities or ends. On the other hand, the *stem* or *ascending axis* grows by a series of joints, which appear in succession, each supporting on its summit from one to a number of leaves. What we see in the young plant is essentially what we see in the full-grown tree, shrub, or plant, only in more marked abundance. In the case of the plants, flowers and other structures are added later on.

In Figure 11 we have a lengthwise section of an apple seed, which exposes the pair of thick *cotyledons* within; and in Figure 12 we have the appearance of the latter after they are taken out. I have separated these a little in order to show their form. In these thick *cotyledons* or embryonic leaves—or seed-leaves as they may be called—is stored the rich food that gives the plantlet its start. The same is seen in a bean (Figure 13) and in an infinite number of other plant-growths. Figure 14 shows a pumpkin seed after it gets a hold upon the ground by its rootlets. Its pair of cotyledons are still giving it nourishment, turning green prior to dispensing their stored food and becoming a pair of true leaves.

Last month, in Figures 7 and 8, there was shown the nut of the beech tree, both whole and bisected; and here we have, in Figures 15 and 16, the young,

growing beech tree. As we know, this nut is sweet and delicious, and so rich is it in nourishment that it gives the young beech tree a tremendous start, the earliest stages of which are shown in Figure 15. In Figure 16 these are expanded, and the first joint of the plantlet bears its first pair of leaflets aloft.

One of the best ways to study this most interesting and instructive part of our subject, is to get a box of convenient size and fill it with good soil, which should be kept moist and in a warm place. In this should be planted seeds of a variety of plants and trees, as those of the lemon, corn (Figure 21), pea, bean, horse-chestnut (Figures 19 and 20), pine tree (Figures 17 and 18), rice, canary seed, and so on. As germination takes place and proceeds, carefully compare the form it takes on in the different species and seeds; you will find that the cotyledons, figured and defined last month, vary enormously in the matter of form and development. Where there are but *two* cotyledons, the plant belongs to the *dicotyledonous* group; but when you observe your onion seed, or your grain of corn as it starts to grow, you will note that such forms send up but a *single leaf*; they are therefore called *monocotyledonous*. In the case of the pines and the like, there may be from *three to five* or even *ten* cotyledons, and when this is the case we term them *polycotyledonous*. These words are very simple when we know what a *cotyledon* is; the prefixes *di*, *mono*, and *poly* mean but one, two, and many, as they do in so many other words in our language.

In Figure 17 we have a bisected pine seed, showing the embryo, while the *polycotyledonous* young pine tree is shown in Figure 18. In some later issue next year I shall devote a few paragraphs to completing what there is to be said in regard to the germinating seed, the growing plantlet, and their various parts.

closed with the last day of December. Standing well up above the carpet of snow, one may see a score or more of the curious and artistic-looking remains of the card teasels. These have already been illustrated and described in a former article in this Department; but not so the scattered band near them of the very interesting seed pods of last year's milkweeds. These appear to be of two or three different kinds, as their varying sizes and appearances would indicate. For the most part they are either of a pale gray, or of an equally pale tan color, and the pods are borne upon tall, rather stout stalks, in groups ranging from one or two to five or six, or maybe more. Almost without exception they are all split open lengthwise, and their winged seeds have, weeks ago, been distributed far and wide, by the wind or other agencies, over the country, in order that other colonies of these remarkable growths may be started next summer.

But these pointed, big and little, empty pods, borne by their dried stalks well above the glistening January snow—out there—by no means constitute all there is to be said and learned about our milkweeds. In the first place, these plants have been given a distinct family in the vegetable world, and to it has been relegated some six other minor groups or genera.

Now, as long ago as the fifth of June, 1656, there was born at Aix, France, a boy who, in the years that followed,

came to be one of the world's great botanists. His name was Joseph Pitton de Tournefort, and he died at the early age of fifty-two. In his short span of life, however, he described many beautiful flowers, and became professor of botany at the Royal Garden of Plants at Paris. Tournefort studied, perhaps, only the milkweeds of Europe; and, in cudgeling his brain for a name for the group or genus to contain them, he somehow hit upon *Asclepias*, having it in mind, for some reason or other, to commemorate the name

of Æsculapius or Asclepios, the god of medicine of Greek mythology. However this may be, our own famous as well as favorite botanist, Dr. Asa Gray, retained this name, and arrayed all of our different species of milkweeds in his *Asclepiodora*, which accounts for the name of the whole milkweed family—the *Asclepiadaceæ*. Upwards of two thousand species and varieties of these have been described for the world's flora, and probably many another is still unknown to science. Ambitious young students of wild flowers may remember this fact; and when exploring in foreign and little known lands, they should not forget to gather specimens of this most interesting and famous assemblage of plants. They call them "weeds" in many places; but somehow I never think of any plant as a weed, the more so as the Century Dictionary defines a weed as "Any of those herbaceous plants which are useless and without special beauty, or especially



OUR MOST ABUNDANT MILKWEED

FIG. 1.—Here we have the beautiful flowers of the Common Milkweed or Silkweed (*Asclepias syriaca*), and also a head of buds belonging to another plant. Both are of natural size, and reproduced from one of the author's photographs of specimens collected in the District of Columbia, in the summer of 1916. In this common and very elegant species, the stem is tall and stout, frequently supporting the finest kind of vegetable hair, which may here be seen with a hand-lens. In other words, the stem is finely pubescent. Note the large and broad leaves which are short-petioled,—that is, the "foot-stalk" of the leaf is short. Distally, some of these leaves are pointed and rather narrow; others are blunt, and all the wavy margins are entire. They are downy on their under-sides. Turning to the flowers, we find them typical of this family, and of a very complex structure (morphology). In color they are cream white, while specimens may be met with in which the flowers are a dull purple, the purple in other specimens shading off into white. This one of our American milkweeds is very prone to furnish hybrids with those species nearest related to it. A study of these hybrids is an interesting field for investigation.

which are positively troublesome." I take the æsthetic side of this question, and I am free to say that all plants, and all flowers, are beautiful to me and worthy of study, however the agriculturist may regard them.

There are some nineteen species of milkweeds in the United States, not counting the Green Milkweeds (*Acerates*), of which there appear to be four species recognized. These latter have greenish flowers and other features distinguishing them; but at this writing they must be set aside, to be described at some future time. This applies also to the plants called "Angle-Pods," three genera of which contain, when taken together, some ten species that are also grouped in the milkweed family.

It is not always an easy matter to correctly identify the American milkweeds, for in their characters some of them are found to be quite near their closest relatives in the family. Such specimens as I have collected and photographed to illustrate the present article have very kindly been verified for me by Mr. P. L. Ricker, of the Division of Plant Industry, of the U. S. Department of Agriculture at Washington.

The buds and flowers of the Common Milkweed, or Silkweed, as it is sometimes called, are well shown here in Figure 1. Structurally, they are very complex,—indeed to such an extent as to render popular description quite out of the

question. This species is now known as *Asclepias syriaca*, though formerly it was called *Asclepias cornuti*. Mathews, in his "Field Book of Wild Flowers," says it is "the commonest of all the *Asclepias*, and remarkable for its cloyingly sweet, somewhat pendulous flower-cluster, which is most æsthetic in color; it varies from pale brownish lilac to pale lavender-brown, and from dull crimson-pink and pink-lilac to yellowish (the horns particularly)

and brownish lavender" (p. 368). As in a good many other species of these plants, the juice is milky white in appearance, being somewhat sticky when handled.

Perhaps one of the most interesting species of all this milkweed group is the one known as the butterfly-weed—for other reasons called the Pleurisy-root. Linnæus named this *Asclepias tuberosa*, and in Figure 5, I show a reproduction of one of my photographs of its very dainty little seed-pods. These give us no conception of the beauty of the flowers which their stalks supported during the midsummer days of last year. One thing about this species is, that, contrary to rule, its juice is not milky, although the plant is a true milkweed. It is generally found growing in old fields, or in dry, worn-out pastures; and as it often comes to be a yard or more high, we can frequently recognize its gorgeous flowers of a rich, glowing orange at a very considerable distance. Some-



THE ROUGHISH PODS OF THE COMMON MILKWEED

FIG. 2.—This illustration presents three pods of the Common Milkweed—one in full view, one crossed by a leaf, and one almost out of sight. They are of a brilliant green color, of a medium shade, and covered by a growth of longish, soft, spinous processes, of the same color as the pod. These processes disappear as the pod ripens; and but two of the pods are ever found on the same stem, consequently two plants are here shown—one behind the other. Were we to open one of these pods, we would find the immature seeds beautifully as well as systematically arranged in a curved plane, with their silk firmly adpressed against them. Note how the stem of the upper pod is bent downwards, so as to be parallel to the stem of the plant. This picture also gives an excellent idea of the leaves of the Common Milkweed of the normal type—that is, not affected in any way by hybridization.

times a single stalk will bear upwards of twenty of these rich flower-clusters. Then, too, it is not long before we appreciate why it was called the butterfly-weed, for its long, small, orange and yellow flowers seem to actually fascinate a number of our prettiest midsummer butterflies. In fact, one exquisite species of butterfly, particularly given to resorting to these flowers, is the Milkweed Butterfly (*Anosia plexippus*)—a very common, but none the less beautiful insect, possessed of a most extraordinary history, as any one may discover by reading the account of its life history, given us by our most distinguished writer on the subject, Dr. Wm. J. Holland, in his elegant volume, "The Butterfly Book."

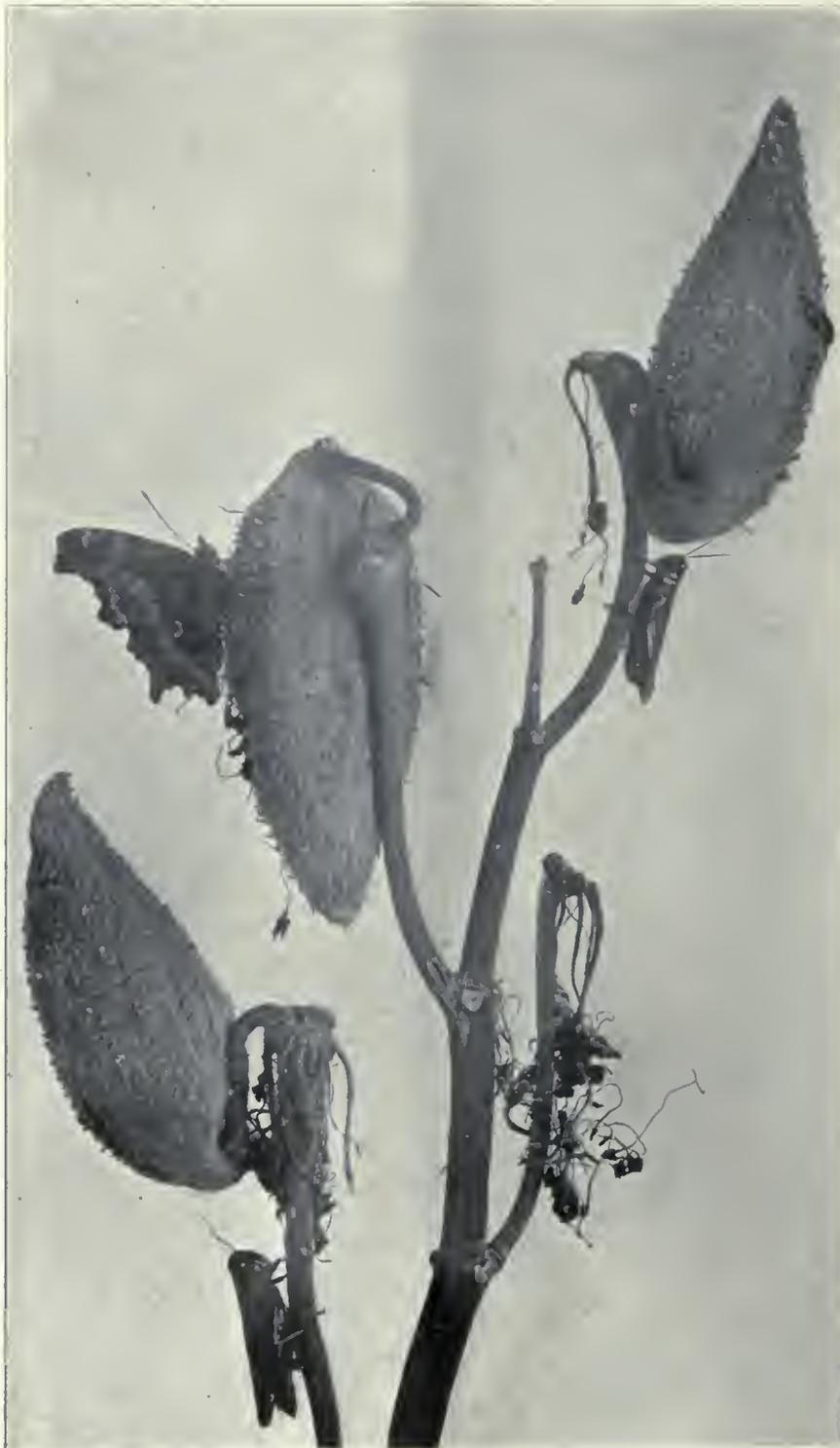
Neltje Blanchan, in her very useful work, "Nature's Garden," gives one instance where nearly *twenty* different species of our most beautifully colored butterflies were attracted at one time to a mass of these milkweeds, all in full flower and growing in one place, on a "mid-summer day along a Long Island roadside."

There is much to be seen in Figure 5 of the present article, and much that sheds light upon the milkweeds as a group of plants. We must note how very slender, elongate, and spindle-shaped these pods are in

the Butterfly milkweed, very different from some of the robust ones of other species (Fig. 2). Any one of these seed-pods is smooth and longitudinally lined on the outside, while inside, the surface is also smooth and more distinctly

grooved from tip to tip. At first they are green outside, turning gradually a beautiful tawny brown as they ripen; these two colors blend in some instances. As in all American milkweeds, the very thin dark brown, flat, and roundish seeds are each attached to a silky and feathery affair, which, when the seed quits the pod after it is fully matured or developed, bears it away on the breeze to a different locality, and to a vast number of very different fates. As will be observed in the illustration, these stalks of the Butterfly milkweed branch near their extremities; the terminal ends of the branches fork, and a seedpod is borne on the tip or end of each fork. Often both pods mature and are perfect; but very frequently one of them will abort and the seeds amount to nothing. This is almost the rule in our Common Milkweed (*Asclepias syriaca*).

The entire history of the fertilization of the milkweed flowers is a thrilling, botanical romance; a whole volume of no mean proportions might be devoted to it and not then exhaust



MILKWEED PODS AS THEY APPEAR JUST BEFORE BURSTING OPEN

FIG. 3.—We have here a most interesting illustration of the seed-pods of the Common Milkweed (*A. syriaca*); it is reproduced from the author's own photograph of a specimen obtained in Maryland, in the fall or late summer of 1916. It will be observed that the leaves of the plant have all fallen off, and that the soft, spinous coat of the exterior of these pods has likewise nearly all disappeared. Note how these pods point upwards as well as downwards, and that in every instance the *twin* pod has aborted and fallen off from the stem. The stem, or *peduncle*, has also shrivelled up, and may still have clinging to it some of the fibres of the outer coat of the seed-pod. These structures are now a pale tan color; their seeds are rapidly ripening inside, and very soon these pods, had they not been collected, would have split open, allowing the silky-winged seeds to escape and to float away to start other colonies of the plant, in other regions far and near. At this stage the juices of the stem of the plant have all dried up; it is light and brittle, the color being nearly the same as the pods. On the middle pod is a beautiful, living specimen of the butterfly known as *Graphia progne*, very nearly natural size. Dr. W. J. Holland states in his "Butterfly Book" that this species occurs only as far south as Pennsylvania, while I captured this specimen in the District of Columbia (summer of 1916). In the work cited it is Figures 3 and 4, of Plate xx. The two grasshoppers are of the common species found in the same section.

the subject. Neltje Blanchan gives us something about this very butterfly milkweed in the following words which require no apology for quoting: "Surely here is a butterfly flower if ever there was one, and such are rare. Very few are adapted to tongues so long and slender that the bumble-bee cannot help himself to their nectar; but one, almost never sees him about the butterfly weed. While other bees, a few wasps, and even the ruby-throated hummingbird, which ever delights in flowers with a suspicion of red about them, sometimes visit these bright clusters, it is to the ever-present butterfly that their marvelous structure is manifestly adapted. Only visitors long of limb can easily remove the pollinia, which are usually found dangling from the hairs of their legs. We may be sure, after generously feeding its guests, the flower does not allow many to depart without rendering an equivalent service. The method of compelling visitors to withdraw pollen-masses from one blossom and deposit them in another — an amazing process — has been already described under the common milkweed. Lacking the quantity of sticky, milky juice which protects the plant from crawling pilferers, the butterfly-weed suffers outrageous robberies from black ants. The hairs on its stem,

not sufficient to form a stockade against them, serve only as a screen to reflect light lest too much may penetrate to the interior juices. We learned in studying the prickly pear cactus, how necessary it is for plants living in dry soil to guard against the escape of their precious moisture" (*loc. cit.* p. 327).

The lance-head shaped leaves of this species of milkweed are of a lovely tawny green, and spring alternately from the stem of the plant.

Sometimes — indeed quite frequently — the stalklets that directly bear the seed-pods in many milkweeds are peculiar in one respect: they are bent or curved like the capital letter S, and sometimes so twisted that the apex of these seed-pod actually points downward to the ground; this feature is well shown in some of my figures illustrating this article, particularly in Figures 3 and 5. Even the flowers themselves turn back toward the main stem in some of the milkweeds. Next summer you will have no trouble in finding the species wherein this feature is well pronounced, for the common poke milkweed exemplifies it beautifully (*Asclepias phytolaccoides*). If in the meantime you would like to see a good cut of one of this kind, you will find it in the "Wild Flowers of the Northeastern States," by Ellen Miller and Margaret



MILKWEED PODS GIVING THEIR WINGED SEEDS TO THE WIND FOR DISTRIBUTION

FIG. 4.—These bursting seed-pods of the Common Milkweed (*A. syriaca*) is one of the most beautiful sights in the plant world. This photograph was made by the author in the late summer of 1916, and satisfactorily illustrates the process or phenomenon. It shows the pods in all stages of opening, the seeds exemplifying every phase of their escape and preliminaries to migration. These pods are still roughish, and of a pale, stone-gray color. They are hard, dry, and tough, but not brittle, while the stems or stalks are easily broken. The flat, thin seeds are of a rich brown or deep tan color, and very easily detached in any case from their silky appendage. In form, they are ovate, with the apex attached to the silk, while the seed proper is convex on one surface, and correspondingly concave on the other, the thin part being the sharp surrounding margin. Neltje Blanchan says: "Like the dandelion, thistle, and other triumphant strugglers for survival, the milkweed sends its offspring adrift on the winds to found fresh colonies afar. Children delight in making pompons for their hats by removing the silky seed-tufts from the pods before they burst, and winding them, one by one, on slender stems with fine thread. Hung in the sunshine, how charmingly fluffy and soft they dry!" (*loc. cit.*, p. 138.)

C. Whitney—a very good book to have on your botanical bookshelf. When you come across this species, either in an illustration or in the field—it is usually found in July, growing on a shady bank or in moist places elsewhere—note its big, oval leaves, sharp-pointed at both ends. Sometimes these leaves are half a foot long by three inches in width, their margins being smooth in outline, and not indented or notched in any manner whatever. The strong mid-rib is always conspicuously developed, the leaf itself being a beautiful clear green color above and lighter beneath. If you handle one, you will find it is soft to the touch and fine in texture. Occasionally you will find the mid-rib pinkish above, and this is sometimes the case with other plants of this group. But we must particularly study the way in which the leaves spring from the main stem. Here in this poke milkweed, they are *in pairs*, and as we go up or down the stem, we find each successive pair placed at right angles to the pair above or below it. In one handsome species of our milkweeds—the four-leaved milkweed (*A. quadrifolia*)—the leaves at the middle of the stalk or stem are arranged in a circle, while above, the leaves are smaller and narrower and arranged only in pairs. The flowers of this species are of a magenta-pink shade and very beautiful.

Students of this assemblage of plants have paid especial

attention to the leaves of the various species, and this is a matter of considerable importance. Leaves of the different milkweeds vary in the several particulars of size, form, and color; they are also arranged on the stems in divers ways in the case of the several species. As a matter of fact, this variance is so great that the best way to study these variations will be to collect, next summer, as many of the milkweeds as possible,

pressing them carefully; you will find that you have a nice lot of material to study during the long winter evenings of 1917–1918. You should have at hand a copy of the last edition of Gray's New Manual of Botany (illustrated); in it the leaves of most of our milkweeds are briefly described. When collecting these plants, be sure to take home the *entire plant*, including the root. This is important in the case of the milkweeds especially; for, from one end to the other, the leaves in many species vary in all particulars,—that is, with respect to position, number, color, form, structure, and size.

Many of the species bear scientific specific names that invite attention to the leaves, as in the case of *A. lanceolata*, wherein the leaves are sometimes almost *linear* in form, or elongolanceolate. Others are the already mentioned four-leaved milkweed (*A. quadrifolia*), the oval-leaved milkweed (*A. ovalifolia*), and so on.

Mrs. Dana, in



PODS OF THE BUTTERFLY WEED MAKING GOOD FOR ANOTHER YEAR

FIG. 5.—What was said in the legend beneath Figure 4 applies, in large part, to what we see here of the bursting seed-pods of the lovely butterfly-weed (*A. tuberosa*). In several places the exact form in the seeds is well shown here, as well as their arrangement and disposition in the interior of the pod. Observe that the latter are supported on *twin stems*, and in many instances both pods may mature and contain their usual quota of seeds. These latter are lightly attached to their silken appendages; and I am inclined to believe that some of them at least may be detached before the silk has an opportunity to escape from its prison. An example of this is seen in the open pod facing the front at the upper right hand side of the illustration. We have still much to learn along these lines, and there is beautiful material here for boys and girls to study at home, as well as under their nature instructors in the schools.

her little work on "How to Know Wild Flowers," says that the "swamp milkweed, *A. incarnata*, grows commonly in moist places. Its very leafy stems are two or three feet high, with narrowly oblong, pointed leaves. Its intense purple-pink flowers gleam from the wet meadows nearly all summer. They are smaller than those of the purple milkweed, *A. purpurascens*, which abounds in dry ground, and which may be classed among deep pink or purple flowers according to the eye of the beholder" (p. 229).

During the latter part of the summer of 1916, my wife and I found ourselves making our way through a rank, old pasture that bordered the Georgetown Canal, about a mile above the Lock Tavern Club at Great Falls, Maryland. It was an ideal day for a tramp, and many species of the early autumn flowers were in full bloom. We soon came to a part of the field where a very large number of milkweeds had flourished—principally the butterfly-weed and the common species or silk-weed (*A. syriaca*). At the time of which I write, they had nearly all gone to seed, and the sight



MILKWEED PODS OF A LONG, SLENDER VARIETY

FIG. 6.—For some reason or other, there has been a disposition on the part of the seed-pods of some milkweeds to become elongated, pointed distally, and of moderate caliber even where the girth is greatest. This is well shown in the pods here represented, which are of the blunt-leaved milkweed (*A. amplexicaulis*). These have a comparatively smooth external surface, with faint indications of longitudinal ridges. Instead of only two pods being attached to the end of the plant-stem, there are three, and all of them are in good condition. The other stem in the picture supports only two, the bases only of which are seen, and they are in perfect condition. This species has been named the blunt-leaved milkweed for the reason that the terminal apex of the leaf is bluntly rounded off, which is unusual in the leaves of this genus of plants. The insects shown on these pods are representatives of either the family *Pentatomida* or the *Coreida*, which contain the well-known stink-bugs and the ill-smelling squash bugs. One other little beetle is very frequently found on the milkweeds in the summer time, especially on the common milkweed, and that is the red milkweed beetle. He is often present in numbers to the extent of two or three dozen on the same plant. Being fully half an inch long, with the body a bright vermilion red, with four black spots on either wing and with black antennæ, he is a very striking little fellow not readily overlooked. There is also another red and black beetle about the same size, with which it must not be confused. Last summer I photographed, natural size, some thirty of these on a pod of the common milkweed, and they were kindly identified for me by Dr. L. O. Howard, Chief of the Division of Entomology of the U. S. Department of Agriculture, as the pupal form of *Lygæus turcicus* Fabr. It is also found on the common milkweed in July. Attention is invited to these insects for the reason that they are so commonly found on our milkweeds that students of these plants should be familiar with them. If you study the milkweeds next summer, you will be sure to meet with the red milkweed beetle (*Tetraopes tetraophthalmus*), and with perhaps the other which is not so abundant.

was really quite a wonderful one. Scores of their dried stalks were in evidence on all sides, and hundreds of the little pods of the butterfly-weed had burst open (Fig. 5), as had many of the common species (Fig. 4). Their seeds were everywhere, borne along by the very gentle breeze that came in fitful puffs, having barely force enough to carry away those seeds that had the feeblest hold upon the pods that harbored them. Some of the pods that had just split open looked as though a brown-scaled fish had been neatly packed away in them; but this illusion was dispelled in the case of others by their being so far matured that the winged seeds were already emerging from them. The sight was truly an extraordinary one, made all the more so by the great abundance of the stalks in view, and by the presence of so many other gorgeous plants in full flower, as great masses of the little, white, wreath-aster, the New England aster, enormous specimens of poke-weed (*Phytolacca decandra*), two or three of which were over six feet in height, with great, intensely scarlet trunks and limbs, and with hundreds

of magnificent bunches of blackish berries drooping from them. Tall, rank grasses grew everywhere; extensive patches of the blue boneset (*Eupatorium caelestinum*), some golden rod and golden aster, and a whole lot of other flowers. But the milkweeds, with their masses of winged seeds gently floating upon the breeze, formed the principal attraction—simply beautiful in the blaze of the sunlight of that exquisite autumn afternoon.

These silk-tufted seeds and these tough milkweed stalks have both some commercial value. The former, mixed with flax or wool, can be woven into a fairly useful fabric, while the latter have been used by our paper manufacturers, which last might well be considered at the present time, when those interested are cudgeling their brains to find material for this purpose. The stalks of the dead cotton plant have a similar use, and there are doubtless others that can be made to furnish stuff from which paper can be made. Prodigal America should promptly turn its attention to this matter, in order to save the thousands of valuable trees that are now being sacrificed to this end.

Some of our milkweeds seem to never have received a common or vernacular name, and descriptions of them are not to be met with in the popular works on our plants and flowers. Among these we find *Asclepias amplexicaulis*, first described by the botanist James Edward Smith, though I believe it was the *A. obtusifolia* of Michaux before him. These are the species the young student should give his best attention to, and let his researches be recorded. The species just named is found in sandy places, from New England to Nebraska and southward. Other species are in the same case, and their scientific names can easily be found in Gray's Manual.

Before leaving them I would invite attention to the peculiar seed-pods of the *A. amplexicaulis* mentioned above. These are of some size and spindle-formed, and I found at least three of them springing from the upper free end of the stem of the plant which bore them; in other cases there were but two (Fig. 6).

Curiously enough, we have at least one species of milkweed in which the seed has, sometimes, no silky attachment,—that is, no coma. This is the case in *A. perennis*. Again, we must be on the look-out for hybrids among these interesting perennial herbs; not a few have already been found, and others will be by careful search in the regions where many kinds of milkweeds flourish.

No member of the milkweed family ever attempts self-fertilization, as is the case in so many other flowering plants. As a consequence, the milkweeds have thriven tremendously, and are now represented in zones and places suited to them around the entire world. Fertilization in them is performed wholly through the agency of insects, and among these are principally to be reckoned many species of butterflies, bees, flies, beetles, and wasps. Doubtless, too, during the night, moths and other insects perform a similar service. The story of the fertilization of milkweed flowers reads like a fairy-tale, and much has

been published on the subject. Professor Robertson has given especial attention to this line of research work, and it is truly marvelous what a chapter it makes in botany and natural history. In short articles like the present one, it will be quite out of the question to take the matter up, but this may be done later in another connection. Next summer, however, no more interesting study could be taken up than that of the intimate structure of a single milkweed flower, with a careful investigation of the suckers, feet, and habits of representatives of all the insects I have enumerated above. When this has been sufficiently mastered, a moderately strong hand-magnifying glass with considerable field can be used to study the flowers *in situ*, as they grow in nature, at times when the insects mentioned are visiting them. Note how the flowers have come to assume structures and forms that compel these insects to carry away the pollen from them, to fertilize the flowers of other milkweeds far and near. It is truly an extraordinary chapter in nature's ways, and by no means an unprofitable one to look well into. Try it! And if you love novelty and ways that are passing curious, I am sure you will make more than one visit to the milkweeds with your magnifying glass.

So it will be seen that the preservation and extension of milkweeds is sure of accomplishment; the flowers are not self-fertilizing, and their seeds, which are very abundant, are provided with a means ensuring widespread distribution.

All plants are not thus fortunate with respect to their conservation—indeed, few plants are—as I have clearly pointed out in AMERICAN FORESTRY in a previous issue. This inclines me to say a word here in regard to a matter recently brought to my attention. I have been given to understand that Mr. Alex. J. Negley, of Pittsburgh, Pa. (305 N. Negley Ave.), who is greatly interested in the conservation of our wild flowers, has lately been making some very important experiments in that direction. Mr. Negley has collected large quantities of the seeds of such plants as foxglove, larkspur and golden aster (*Chrysopsis*) and when down, I think he said somewhere in Florida, he threw these seeds from his motor car into likely places on both sides of the road which he traveled, with the hope that some of them would germinate and spread their kind in the new localities. This they did, more abundantly than he anticipated, and very soon the people living in those places spoke of the new flowers that were appearing in their region; others noticed them in passing over those roads in their cars. This admirable work should be extended over very much larger areas; in fact the U. S. Department of Agriculture should take hold of it, if it has not already done so, and scientifically enlarge upon the suggestion so thoughtfully put on foot by Mr. Negley. Many of our most beautiful flowers are being exterminated over wide areas, and we should most assuredly make every effort to preserve those that are harmless as well as very beautiful, in that our descendants may enjoy them as we have. This should be looked into at an early date, and steps taken to have it assume a practical form.

# FAMOUS MORO ROCK

BY MARK DANIELS

**M**ORO Rock is on the north side of the middle fork of the Kaweah River in Sequoia National Park.

It towers four thousand feet above the river bed directly below it and commands a view of the Great Western Divide to the east. Why it has been named Moro Rock no one can tell, for it has none of that individuality which would suggest its name, although it is about as fittingly named as is Florence Peak.

The road from the Park headquarters in the Giant Forest swings around the edge of the plateau to a point only a few yards from the shoulder of this mountain of granite. From the road a trail leads out on to the rock and a few crude steps have been shaped so that it is possible, with about that degree of safety which our Federal Government generally provides for its tourists, to scale the point of the rock from whence the astounding views to the east and the west may be had.

To one who has sojourned for any length of time in the district, Moro Rock presents an ever-fascinating lure, for the scenes that may be beheld from its summit are never the same. At times, the great canyon of the middle fork of

the Kaweah stands out in bold and sharp relief through the crisp atmosphere. At other times a gentle mist seems to hover over its slopes and the scene takes on much of the character of the Scotch Highlands. Again, black thunder clouds will be rolling up through the canyon, and the lightning flashing over the crest of the Great Divide converts the entire gorge into a great cauldron of infernal tempests.

The headwaters of the Middle Fork of the Kaweah River enter the main canyon only a few miles above

Moro Rock, and at the junction some of the best fishing in the district is to be had. Fishermen who traverse the trail that skirts the head of the canyon invariably complain that the fifteen miles from Park headquarters to the next camping place are the longest fifteen miles they have ever traveled. From my observation, I know that the time necessary to cover the distance need never be so long as that spent by the anglers, but they invariably stop at the stream crossings to cast just once or twice in the tempting pools, which accounts for the length of time which they consume on the trail.



THE GREATEST OF MORO ROCKS

Almost every scenic area has its Moro Rock or castle, but this on the north rim of the middle fork of the Kaweah River Canyon, Sequoia National Park, California, is the daddy of them all.

# FRENCH FOREST DESTRUCTION

By URBAIN GOHIER

At all times war has destroyed men and animals, houses and temples, farms, castles, and cottages. The present war destroys more, the forests. The peril of deforestation and the problem of reforestation, which face us continually, with no actual future results, must gain our attention at once if we wish to live and to work in the future. The agricultural situation which we are studying, and shall continue to study, is only of value when connected with the re-establishment of French forests," writes Urbain Gohier in a recent number of *Le Journal, Paris*. "For, if there are no more trees, there is no fertile soil, no question of cultivation, no agriculture.

"Even before the war it was the Germans who contributed most to the destruction of our forests. They had invaded their own forest kingdom and wished to spare it in the future. They had need of wood for constructing their railways; they had attacked our forests and methodically destroyed them. The Himmelsbaeh firm of Fribourg-en-Brisgau; the Falks of Sarrebourg; the Schmollers of Darmstadt, and other Germans established at Nancy or at Paris, acquired wholesale all the wooded lands, not only in the East in the Vosges, Ardennes, on the Meuse, the Meurthe-et-Moselle, and Upper Marne rivers, but as far as the basin of the Loire. They did not merely exploit these forests—they razed them completely, sold the trees, parcelled out the land, or leased it for hunting. As a rule, the trees paid the purchase price and the sale of the land formed the profit. The owners of the forests succumbed to the temptation of ready cash, at first because the offers were high, later, because a forest owner maintains a seigniorial appearance of extravagance which makes him liable to public exigencies and to the animosity of legislative demagogues. Such domains pay 80 per cent of their products for taxes. The forest owner seized with alacrity the opportunity to realize on his

patrimony and to place the capital in more prudent investments. In a period of ten years two hundred thousand hectares of forest gave place to desert tracts which remained unproductive for some time.

"To this cause of destruction naturally were added other permanent causes. To the ravages of flocks of goats and sheep were added the depredations of mountain dwellers, devastations which should have been punished by law, which the administration tried to reach but which electoral influences encouraged by guarantees of impunity.

"Thus the deforestation of the plains completed that of the declivities. The water courses, formerly well-regulated, were changed into torrents; the climatic conditions of the country were completely overthrown; and inundations alternated with drought in all the French river basins. The old oaks disappeared because they were needed in all parts of the world for railways; stands were felled to furnish tannin to different industries; journals, newspapers and paper of inferior books devoured the pines, beech, poplar, and linden.



A SHELL-SWEPT FOREST OF FRANCE

The utter destruction of these forested slopes "somewhere" along the battle line in France makes the problem of future forests in the war-ridden sections a serious one, and one which is already attracting the attention of French foresters.

"And now the artillery is destroying the trees. Bodies of the dead trunks of trees strew the soil with the debris of men and horses.

"Where the forest once stood are only seen scattered broken stumps. The forest has disappeared. A poet in the good old times arrested the arm of a woodcutter who caused to flow from beneath the "rude bark the life blood of a nymph"; but all the rhymers of the world can avail nothing against the rattle of shells and explosives belched forth by thousands of cannon.

"While the forests and groves of the immense battlefields are effaced or scattered under the lightnings of artillery, the forests of the interior and even the trees bordering the roads all over France are falling under the blows of the ax because railways must be improvised at the front and planks, supports, timbers for crosspieces



WAR'S DESOLATION IN A ONCE BEAUTIFUL WOODED VALLEY

Over this ground, near Verdun, France, has for months swept a storm of shot and shell. Practically every foot of it has been fought over and thousands have died, while where once stood fine trees there remain some gaunt, shattered skeletons, mute monuments to the tremendous struggle.

in trenches, and forts, sheds, magazines, and barracks of the military zone are needed.

"What will remain standing tomorrow?"

"Even in the Bois de Boulogne, at the alarm in the beginning of the war, the trees were cut down which might hinder the 'defense' of three or four ridiculous pallasades. In the Jardin of Foreign Affairs, on the quai d'Orsay, a celebrated tree, venerable and magnificent, was sacrificed to establish a tennis court (15,000 francs) evidently necessary for diplomatic manœuvres. The dryad which protected this place succumbed to the nymphs of the embassy. Down with the trees!

"If we do not restore French forests, we shall gain victories and reconquer our provinces in vain. What happened to Nineveh and Babylon will happen to Paris. Civilization cannot flourish in a desert."

A dispatch from Verdun, France, says: With the close of the war the entire line of trenches in France, extending from Alsace to the Belgium border, may be converted into a sort of national sacred forest, as a permanent tribute to the memory of the French "poilus" who died there defending their national soil.

A proposition to this effect has just been prepared by the general council of the department of the Meuse, and will soon be submitted to the French government. The plan is to buy the battleground from the farmers. Should this plan be finally accepted, future generations, not only of France but of the entire world, would always have the opportunity of visiting the line of trenches over 600 kilometers in length on which the French threw back the tide of German invasion at the battle of the Marne, and which till the end of the war will always remain the basis of France's military effort to rid her soil entirely of the enemy.

The immediate land through which these long lines of trenches run, together with the battlefields of the Somme, of Artois and of Champagne will, it is believed, never again be rendered cultivatable. Aside from the deep trenches and bayous, the ground has been so pitted with shell holes to a depth varying from a few feet to fifteen feet, and all the upper strata of soil on which fertility depends so completely wiped out, that little if any use could ever be made of the ground for agricultural purposes for years to come.

# FORESTRY FOR BOYS AND GIRLS

BY BRISTOW ADAMS

## THE TREES IN WINTER



**S** BETWEEN skating, skeeing, sledging, and tobogganning we manage to be out doors a good deal at this winter season, and also have a better chance than in the summer to study the trees. They have uncovered themselves to us,

and if we know them at all well, this is the time that they are most easily recognized. But most persons do not know them well enough to understand the messages they give us when their cloaks of leaves are off.

Last year our boys and girls went to see the objects sent by other boys and girls to the exhibit of work done by children in the country schools of New York. This was during "Farmers' Week" at Cornell University, when thousands of farmers, with their wives and their children go to school for a week at the college of agriculture. There are lessons for every member of the family, and even a nursery to take care of the "teeniest-weeniest" babies while their mothers learn about cooking, and sewing, and how to look out for these tiny ones, so they may grow up to be straight and strong boys and girls.

But that isn't what I started to tell you. Last year four farm boys came to Farmers' Week with great bundles of twigs,—just a lot of sticks and branches, it seemed. They could tell at sight what kind of a tree or bush each came from. They knew by the shape of the twig, the form of the bud, the color of the broken end,—as with the brown pith in a butter-nut branch,—and by a number of other signs that they had learned. The professors in the forestry school at Cornell owned up that they couldn't have done as well as these boys did unless they had studied pretty hard beforehand.

My boys and girls have an old book-case that is their museum. Here they

have shells, rocks, twigs, and all sorts of butterflies, moths, and other insects that their Aunt Ruby taught them to collect and mount. The twig shelf is always having additions made, and the keys that unlock their secrets are being more and more used. First, we note the bark, then the buds, as to size, shape, and color; sometimes the winter fruits are present, and these help.

**H**ERE are some of the tags we have learned: The position of the buds is a good index; for example, maple buds are opposite one another on the stem, while those of elm, poplar, and beech are alternated or zig-zagged up the stem. The catalpa and a few others have their buds in a circle around the branch. Color will help; sassafras bark stays green all winter, basswood is reddish, and some of the dogwoods a brilliant red.

Taste seems to be Toto's favorite way of telling. Ever since he could first grab anything it went immediately to his mouth; and he has never got over the habit. Sassafras and sweet birch are easy for most of us to tell by taste, but he says that tulip poplar, soft maple, cherry, walnut, elm, and locust are just as easy when you know 'em. The leaf-scar, where the old leaf came off last fall, is another sure sign, when you know it. Some folks say that the horse chestnut got its name from the fact that its leaf scar is shaped like the bottom of a horse's hoof.

Buds are probably the surest way the twigs have of telling their names, even though they can not speak out for our ears to hear. The sign-language of the buds is sure to those who know it. And one can't expect to talk on one's fingers at school unless the alphabet has been learned. Just so with the buds! The horse chestnut buds are large and sticky; those of the beech are long and sharply pointed, smooth and glossy; basswood buds are little fat ones. Some of you will note the silky buds of magnolia, others the red colored buds of maple, and the black ones of the pussy willow. In a general way the buds are something





like the leaves that come out of them. Basswood's leaves are roundish; so are the buds. Beech leaves and buds are similarly pointed.

This can be made a fascinating game if you wish, beginning with the few twigs you know and then adding others, until you have worked up to as many as fifty. You can have contests as to who can tell rightly the names of most of the twigs.

**T**HE TREES themselves, by form or color, are easily told from a distance. Pin oak and black gum have shapes like the spruces, and this shape shows best when the leaves are off. Each has a spire-like top and the lower limbs are drooped and spreading. Yellow willow now gleams golden against the snow, and towards spring the outer twigs are almost startling in their color. Sycamores have erratic branches which seem to have changed their minds after they started growing and gone off in another direction. The branches of the persimmon give the whole body of the tree the shape of a cylinder, and their shape, too, is always angular. This is because two branches start and one fails to develop so the other goes angling off like the Indian swastika sign. The crown of tulip-poplar is generally an oblong and the elm is likely to have a vase form.

**Q**UITE the most remarkable fact about the trees is that they are far from being as dead as they seem to be in winter and even without leaves they

are very much alive. The hardest work a tree does is to produce flowers and fruit and this is done by the witch-hazel without a sign of a leaf to help it. The red-bud, or Judas-tree, will cover itself with bloom in the spring, but it has warmth to help it, while the witch-hazel is not even held back by the dead of winter. We know, too, that it is still pretty cold and snowy when our old friend the sugar maple begins to nearly burst with sap.

The evergreens themselves look dead. Cedars get rusty, scrub-pine and pitch-pine are yellowish, and at least sickly-looking, and the white pine grows ashy and pale. They can be hurt by harsh drying winds in winter, when the ground is deeply frozen and their roots can not keep up the supply of moisture given off by the leaves. The very deadeest-looking trees of all are the larches, and tamaracks, and cypresses, which we think of as "evergreens," but which are quite the barest and most naked in winter. By contrast the fresh soft green of the new larch needles is the "springliest" of all the glad young colors of the spring time.

**L**OOK for the winter fun in the woods, and learn the trees' stories. Have a winter picnic after a good skee-run, if you live where snow is deep, try one anyhow. We think they are more fun than summer picnics, and there's more to see; or else it is easier to see what there is.

## CHARADES FOR CHILDREN

Here Are Some Puzzlers for the Children. Who Can Answer Them? Those Who Cannot May Read the Answer in February American Forestry

My first is a much needed part of a house  
My second a squirrel eats but never a mouse  
Put these two together and then you will find  
That it is a wood of the very best kind.  
What is it?

My first is a part that a ship always needs  
My second the way you always plant seeds  
Now take these two and put them together  
Then feed them some crumbs in this kind of weather.  
What is it?





WHITE SPRUCE HEDGE AROUND AN ENTRANCE-COURT

Such a hedge costs but little more than privet. It is valuable all winter and is far richer in appearance. Now is the time to arrange for spring planting of hedges.

## THE FUNDAMENTALS OF A GOOD HEDGE

BY J. J. LEVISON, M. F., FORESTER FOR THE CITY OF NEW YORK

**H**EDGES are generally planted for practical reasons, and not for mere beauty. As a rule, they serve the practical purpose of adding strength to the boundary line of a lawn or garden, of securing privacy to the premises surrounding the house, of screening out some objectionable object or of furnishing a windbreak. Its lines are thus more or less formal; but, nevertheless, when properly selected and placed the hedge may be in perfect keeping with the surrounding landscape effects and may even add considerably to the beauty of the place.

In deciding what kind of hedge to plant we must not only consider its æsthetic effects, but also its adaptability to the local soil and climate, and light conditions, as well as its freedom from insects and disease. For instance, hemlock will grow in shade and lilac will not. The hawthornes are often menaced by aphid and the rust of the "cedar apple"; lilacs by mildew and oyster shell scale; box by red spider, and spruce continually loses its compactness at the base of its trunk. To avoid all the natural pitfalls, one must thus choose carefully with anticipation of the conditions of the plant's future growth.

The varieties of plants which may be used for hedges are greater than one would ordinarily believe, if we were to observe the hedges of but one vicinity. The local nurseryman sometimes carries a limited variety of plants and the hedges of the locality often reach just that far and no further.

Foremost among the deciduous hedge plants come the privets. The one most commonly used is the California privet (*Ligustrum ovalifolium*). This is quick-growing and endures extremely unfavorable soil, moisture and atmospheric conditions. It is free from insect and fungous pests, and its cheapness makes it desirable for general use. The Japanese privet (*L. ibota*), Regel's

privet (*L. ibota regelianum*) and the Amur River privet (*L. amurense*) are other desirable varieties of privets in common use for hedges. The California privet, above all others, however, is the one that lends itself to formal shearing. Japanese barberry (*Berberis thunbergii*) is beautiful when a low hedge is wanted. It forms a dense hedge and does not need shearing like the privets. It is hardy, droops beautifully and colors charmingly in the fall with bright red berries persisting all winter. The common barberry (*Berberis vulgaris*) and its purple-leaved variety are often used with less effect than the Japanese species.

The Japanese rose (*Rosa rugosa*) is very hardy under all conditions and forms a compact hedge that stands shearing very well. It has good foliage, beautiful flowers and large, red fruit which persist until early winter.

The hawthornes (*Cratægus*) are the favorite in England for hedges. *Cratægus axycantha* is the kind best adapted for hedging. In this country the hawthornes are much subject to fungous diseases, scale insects and borers, and should consequently be used rather cautiously.

*Deutzia lemoine* and *deutzia gracilis* are valuable hedge plants which should be allowed to grow naturally, without shearing.

The Rose of Sharon (*Althea*) makes an excellent hedge for boundaries where a screen is wanted, but its habit is higher than the privet or barberry.

A few other deciduous shrubs which can be used for hedging purposes are: *Hydrangea paniculata grandiflora*; this, of course, must be cut in every winter; the lilacs make satisfactory hedges; Van Houtte's spirea makes a beautiful spring ornamental hedge and *Aralia pentaphylla* is so rapid a grower and adapts itself to poor soil so readily that we must not overlook it in our list of suitable plants.

The Garland Syringa (*Philadelphus coronarius*) makes a tall-growing, informal hedge.

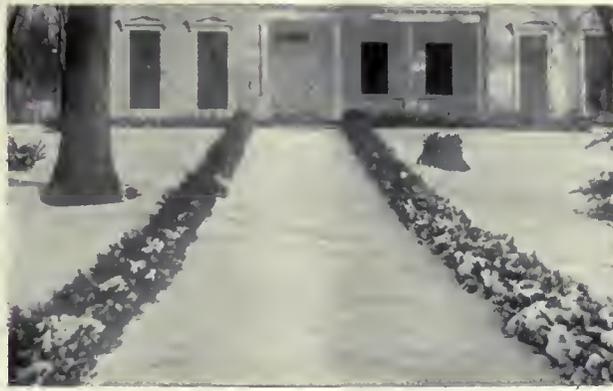
The European beech is useful where a tall hedge is desired. The honey locust is a good defensive hedge and the Lombardy and Bolleana poplars allow close planting and form a tall screen. The Osage orange has the same value as the honey locust but does not grow as tall.

The most desirable species of this group are: box-wood, arbor-vitæ, hemlock, white spruce, common red cedar, yew and dwarf juniper.

Spring and fall are the two seasons for planting, but, if possible, spring is to be preferred.

Before planting, the soil should be thoroughly turned over to a depth of two or three feet and two or three feet wide. Mix in some well-rotted manure, and if the soil is very poor, change it entirely for a rich, black loam. This can all be done in the fall and thus save time in the spring when only the actual planting will be left to do. The distance apart at which the individual plants should be set in will vary from twelve to eighteen inches for shrubs and from eight to twelve feet for tree hedges. Do not plant too closely if you wish your hedge to look compact with plenty of lateral shoots. The roots should be carefully covered during the process of planting and spread out when set in the ground and the soil around the roots should be thoroughly firmed by ramming or by treading.

Immediately after planting, plants like privet which stand heavy cutting should be pruned



A YEW HEDGE

These hedges have many admirers and are unique for dividing rose gardens and flower gardens.



COLORADO BLUE SPRUCE

For seaside planting the Colorado spruces have proved themselves of high value.



By Courtesy of J. Horace McFarland Company.

ALTHEA HEDGE

This is especially desirable for surrounding the flower garden or vegetable garden. Do not trim them in the summer. If you plant them a foot apart they will make a solid, thick, free-flowering hedge this year.

back severely, sometimes to a few inches from the ground. This will insure the formation of a compact growth on all sides of the hedge and a better adaptation of the plant to the soil. The following year the plants should be cut a little less heavily, and by the third year the permanent shaping may be commenced. In the case of privet it should be clipped three times a year.

The after-care of the hedge consists in keeping out all weeds and in trimming the plants to induce bushy growth near the base. This is very important, particularly with young hedges. The hedge should also receive frequent cleaning so no insects can gather there and remain to despoil the growth.

General trimming of established medium-sized hedges is necessary at frequent intervals in order to insure the formation of lateral shoots for a dense appearance. The work can best be done in the early spring while the sap is still down. The formal hedge of privet and similar species should always be cut in some form of a triangle in order to obtain the greatest exposure of surface to sun and light, thereby securing a more vigorous growth of all parts of the hedge. The loose hedge of such a species as the barberry needs just to be kept down to uniform shape by the removal of stragglers. Where high stumps are seen protruding from old hedges, they should be removed and the more vigorous younger shoots allowed to take their place. All these large wounds and cuts should be covered with coal tar

to prevent disease taking hold of the plants and insects from finding an easy entrance to the interior of the plant. Coal tar is preferable to paint for this purpose because the tar has an antiseptic

and extreme cold during the winter months will be found helpful to the growth and even necessary at times.

In the matter of protection from insects and fungi the same principles apply here as to the other plants. The



40-YEAR-OLD HEMLOCK HEDGE

This is a dense evergreen wall, as rich and mature as 100-year-old boxwood; for a garden or service-court, you can consider this hemlock hedge. It is 600 feet long, 11 to 12 feet high and 10 to 12 feet wide.



ANOTHER HEMLOCK HEDGE

This treatment will give an effect similar to old yew hedge in England. Their attractiveness is partly due to the long years of skilful trimming. This hemlock hedge has had this trimming.

as well as a protective influence on the wound, while the paint only remains on the surface, drying up in course of time and eventually peeling off.

An annual mulch of leaf-mold or well-rotted stable manure, put on before the ground freezes, is also desirable for the maintenance of good hedges, and in case of boxwood and the smaller evergreen plants, protection from wind

scale or sucking insects will have to be sprayed with some oil emulsion or fish oil soap, the leaf-eating insects with arsenate of lead and the fungous diseases with Bordeaux mixture. However, these are only general instructions and the only effective way to meet insect and fungous pests is to determine in each case individually just what to do and how to do it.\*

#### ADVICE FOR JANUARY

1. Remove the dead trees marked during the previous fall for removal.

2. Clear out cavities in diseased or injured trees and dress the wounds with coal tar.

3. In the wooded area, one can cut out all chestnut suckers coming from the old stumps of the dead chestnut trees. These suckers are likely to become re-infected with the chestnut blight and had better be cut out to prevent their smothering young trees of greater value.

4. In the wooded area one can also do some light thinning or improvement cutting, which consists of removing all growth interfering with vigorously growing specimen trees or with trees of greater value from an æsthetic point of view. One can also take the young shoots growing out of oak stumps or of stumps of other

desirable species and by cutting off a few of the poorer shoots the better ones can be encouraged to grow more vigorously and straighter.

5. The egg masses of the tussock moth and similar insect pests can be removed and burnt to advantage in this month. Some of these egg masses contain from twenty-five to four hundred eggs and the destruction of a single egg mass means the prevention of that many caterpillars during the following summer. Do not drop these eggs and cocoons on the ground because they will hatch there in the spring just as well as they would on the trees.

6. Look over your tools, ladders, spraying apparatus, hose and rope and do the necessary repairs before the active work time of spring comes.

#### QUESTIONS AND ANSWERS

Q. My neighbor uses arsenate of lead for spraying. Will you please tell me what arsenate of lead is composed of, when and how to use it and how I can make it?

J. L. B., Mt. Vernon, New York.

A. Arsenate of lead is a chemical appearing on the market in either paste or powder form and is used in solution with water as a spray against all leaf-eating insects, such as caterpillars, elm leaf beetle, etc. It is generally used in a mixture of water at the

rate of one pound to 10 or 15 gallons of water. By spraying the leaves with it the leaf-eating insects feed on the poisoned leaves and become poisoned themselves. A chemical analysis of arsenate of lead shows the following constituents: Lead expressed as lead oxid about 30 per cent; arsenate expressed as arsenic oxid about thirteen and a half to sixteen per cent; soluble arsenic oxid about one-half of 1 per cent, and soluble impurities not over 3 per cent, and water not more than 50 per cent.

\*Photographs by courtesy of Isaac Hicks & Sons.

Q. What steps shall I take to prevent fire on my woodland?  
M. J. K., *Tarrytown, New York.*

A. Do not let any loose brush lie around. Put up posters warning trespassers not to drop lighted cigars, matches, etc. Place a tool box in some inconspicuous corner and have it filled with fire-fighting tools, such as old brooms, axes, iron rakes, etc. Have numerous paths through the woodland and keep these free from litter.

Q. When shall I prune my apple trees?  
F. K., *Freehold, New Jersey.*

A. In March, though you may remove the dead branches at almost any other time.

Q. First. What is the scale of which I am sending specimens? Second. What is the best treatment for the tulip scale? Third. Do you think the Norway maple would be successful in this locality? The *Gingko Biloba* (Japan Maiden Hair Tree)? Fourth. What would you suggest for narrow paved street, also for suburban planting?

Fifth. Most of the elms here are in cramped paved streets, seem to go to pieces if allowed to grow large and spread (poor root work presumably) but pick up if heavily pruned. Do you advocate pruning heavily on such elms?

Sixth. Could you give or refer me to the damage or cost of control of the White Marked Tussock Moth in the New England States?

D. L. B., *Charleston, South Carolina.*

A. First. The specimen you have submitted is affected with *aspidiotus ancyclus*, and the remedy is to spray the affected parts with kerosene emulsion, one part to twenty parts of water, in the month of July, when the young insects emerge.

Second. The best treatment for the tulip scale is to scrape all the old insects from the branches in the fall and then spray or wash the infested limbs with kerosene emulsion, one part to ten parts of water.

Third. The Norway maple ought to grow, though not as vigorously as further north, in the vicinity of New York City. The ginkgo will do well.

Fourth. For planting in a narrow street, use ginkgo and Lombardy poplar, and for suburban planting use pin oaks, European and American linden, tulip tree, sweet gum, red maple, red oak, elm—both American and European.

Fifth. As to pruning if done at all, it should be done lightly at frequent periods, instead of resorting to heavy pruning. It is advisable to get at the roots and to encourage them with larger spacing in the sidewalk, better soil, manure and cultivating and watering. Where an elm must be pruned, the work is justified on the ground that an elm as much as most other species will stand pruning.

Sixth. The tussock moth will completely defoliate lindens, maples, etc., in early summer. Work of extermination consists in collecting and burning egg masses in fall and winter and spraying with arsenate of lead for caterpillars in June and early July. The average cost is from 18 cents to 25 cents per tree.

Q. I am writing for your advice about setting out several acres in white pine. Where can these trees be had to best advantage? At what intervals should they be planted with a view to making a dense screen, and how large would you advise setting them out so that they would grow to advantage? Would you suggest any other variety for the purpose indicated? Rapidity of growth and a screen the year around are the principal desiderata. I should greatly appreciate the fullest information you can give me in the premises, prices, number to the acre, etc.

E. G. B., *Dover, Delaware.*

A. With regard to your contemplated planting, I would not wish to recommend for your purpose the white pine, because of the very serious danger which threatens in the shape of the blister rust. Though the disease has not appeared as yet in Delaware, it is in New Jersey and other states close by. Besides the loblolly pine or Norway spruce would be just as good, if not better, for your purpose, in view of the fact that you desire quick growers to make a dense screen all the year round. Would suggest that you plant these in three or four rows and about ten feet apart; alternating the placing of the trees in each row so that in every other row the trees will stand opposite each other. I would not recommend your purchasing larger than four-year-old transplants, as they would not only be very expensive, but these large trees sometimes take several years to start growing properly, during which time the younger ones would catch up with their growth, and you would stand so much better chance of a vigorous growth with this size. None of this applies if your land to be planted is damp or swampy, for you would have no success with these species. You can write with safety to any of the nurserymen advertising in *AMERICAN FORESTRY* and depend absolutely on information or stock they may send you.

Q. Let me know what you advise for spraying apple trees this month. Our farm in New Canaan, Connecticut, has about sixty old apple trees on it. We have sprayed for the past three years, using Scalecide, lime-sulphur and arsenate of lead. When we purchased the farm three years ago we were told that the trees were affected by scale. We think most of that is cured. The tent caterpillar was rather troublesome. The fruit was not as large or perfect this summer and I should like to know what you would advise.

J. E. W., *New York City.*

A. Replying to your inquiry, spray in the fall or early spring, before the buds open, with lime sulphur wash for scale insects. It is good practice to spray once a year with lime sulphur, no matter whether the trees are badly infested with scale or not. The arsenate of lead is only useful against leaf-eating insects such as tent caterpillars. Apply the mixture in early summer, when the leaves are out and in danger of being eaten. To increase the production of fruit, prune the branches in the fall, root-prune in early spring, and fertilize with well rotted manure. If you follow these suggestions you will be well pleased with your results.

Q. I have recently transplanted an American Holly. The work was well done, the tree being moved with a large unbroken ball and few roots exposed. The tree is about 12 feet high and a very good specimen. Some of the supposed experts here tell me I should strip it of its leaves if I wish it to do well. Please let me know what you think necessary to insure successful growth. I have also moved some very large boxes—bush variety.

J. S. F., *Baltimore, Maryland.*

A. As to transplanting your holly I would not feel that it is necessary to strip the tree of its leaves, though this is very often done. Would advise, however, that you mulch both the holly and the box heavily with leaf mold and some well rotted manure, and also that you protect them, at least for the first winter, with a covering of thin canvas or boughs of evergreen trees. I am sure that with the precautions taken in your transplanting operations, you will have success with them.

**D**URING the fiscal year 1916, 705,872 acres of National Forest timberlands were estimated and mapped intensively, and 1,093,006 extensively. In all, 20,815,798 acres have been mapped by intensive methods and 47,291,660 by extensive methods.

# THE FIGHT AGAINST THE PINE BLISTER DISEASE

## Congress and States to Be Asked for Appropriations and for Authority to Enforce Stringent Quarantine Regulations.—The Situation in the Various States and an Outline of What Should Be Done in the Campaign Against the Disease

**T**HE fight against the blister disease which threatens to exterminate the white and other five-leaved pines of the United States and Canada is steadily progressing.

A bill is to be presented to Congress asking for \$500,000 for the Department of Agriculture to use in investigation, scouting, and in coöperation with the states, in determining the presence of and in eradicating the disease.

Another bill will ask that Congress give the Federal Horticultural Board authority to declare a quarantine in any state or district where the members deem such a quarantine is necessary to prevent infection.

Massachusetts is asking its State Legislature for \$60,000 to fight the disease and other states are preparing to demand appropriations and to authorize quarantines.

The American Forestry Association is conducting a nation-wide publicity campaign to acquaint the people with the dangers of the blister disease and with the necessity for immediate action in the effort to retard its progress and if possible to stamp it out.

Governors of various states and of provinces of Canada have appointed delegations to attend the International Forestry Conference at Washington, D. C., January 18 and 19, on the occasion of the thirty-seventh annual meeting of the American Forestry Association, to discuss measures for combating the disease; many coöperating organizations have also appointed delegates to attend this meeting, and members of the Association and kindred organizations from all sections of North America will be present.

Following the addresses, discussions and conferences there will be immediate national and state legislative activity in the endeavor to secure the passage of the necessary appropriation and quarantine bills. Officials of various states where the infection has been found are now preparing bills for submission to the legislatures, many of which convene in January, while in other states where no

infection has appeared, but where there is a growth of white or five-leaved pine which may be infected, state officials are preparing to take the necessary steps to give authority for such quarantine regulations as are needed under the circumstances.

A general résumé of the introduction of the disease into this country, its spread, the present situation, and the needs for the future are here given:

The white pine blister disease has made impracticable the growing of the American white pine in Denmark, Holland, and England, and has seriously interfered with its culture in Germany. All the five-leaf pines of the United States have been shown to be susceptible to the disease, and the conditions favorable for its spread have been found in all regions where these pines grow. Although no personal investigation has been made in Europe by the United States Department of Agriculture, indications are strong that American conditions, particularly climate, and currant and gooseberry hosts, are more favorable to the disease than conditions in Europe. The disease has already become a very serious menace in one of the three great white pine regions in the United States. The white pines, because of their wide distribution, the proportion and high values of their woods, their rapid growth, merchantability at an early age, resistance to brown-tail and gypsy moth, and ability to thrive on poor soils and under adverse conditions, are among our most valuable forest trees, considering both present conditions and the possibility of future production.

Two years ago the disease was known to be present only in very restricted localities, where it had been introduced directly on European nursery stock, mostly from Germany. It has spread rapidly.

In Maine five infected plantings and one infected nursery have been located; in every case the disease has spread to native pine. On currants and gooseberries the disease is generally distributed

### WHAT HAS BEEN DONE TO FIGHT THE PINE BLISTER DISEASE

1. A Federal quarantine against the importation of white pine from Europe was established in 1912, and last year the Federal Horticultural Board requested nurserymen in the East not to ship white pine, currants, or gooseberries west of North and South Dakota, Nebraska, Kansas, Oklahoma, and Texas. This request is known to have been disregarded in at least ten cases. Canadian white pine stock was excluded last winter. A limited number of states have also established quarantines against the importation of white pine stock from outside states.

2. A considerable amount of publicity has been given by Federal and State agencies, the American Forestry Association, and other associations to the prevalence and spread of the disease and its possible results.

3. A large amount of scouting has been done by Federal and State agencies within the areas of possible infection.

4. A large amount of eradication of diseased currant and gooseberry bushes and white pine has been done in the New England states, but much remains to be done. Complete eradication east of the Hudson River is probably not possible. West of the Hudson River practically all of the infections found have been destroyed.

5. The Forest Service last year, after learning of the seriousness of the situation, prohibited the use within the National Forests of white pine and currant and gooseberry stock from Eastern nurseries.

throughout the white pine section of the State.

In New Hampshire infected pine was found in four plantings and infected currants and gooseberries in sixty-nine out of the one hundred and nineteen towns scouted (57 per cent); three nurseries contained infected currants and gooseberries.

In Vermont infected currants and gooseberries, particularly black currant, were found in nearly every section of the State visited during 1916: infected pines were found in ten plantations.

Massachusetts is by far the most seriously infected State. This is well explained by the fact that importation of pine nursery stock from Europe was continued on a large scale and with official encouragement until 1912, or for three years after the state authorities were warned of the danger by the United States Department of Agriculture and by the action of neighboring states. Forty-nine infected plantings have been found. In eight localities the disease has spread to native pines. Currants and gooseberries are generally infected in the eastern and western thirds of the states, scattering infections occur in the central third.

In Rhode Island there is one infected pine plantation near Newport, and scattered infections of currants exist throughout the state.

In Connecticut, out of thirty plantations and sixteen nurseries inspected, the disease was found in ten plantations and one nursery. In northwestern Connecticut the disease has spread from an infected plantation to native pines and covers an area of about 40 square miles on currants and gooseberries. Scattered

### WHAT SHOULD BE DONE BY THE U. S. DEPARTMENT OF AGRICULTURE TO FIGHT THE PINE BLISTER DISEASE

1. Immediate Federal quarantines of the infected states or parts of states to prevent, if possible, the further spread of the serious conditions existing east of the Hudson River to the Lake states and other parts of the eastern white pine region now but slightly infected, and to exclude the disease from the Inland Empire and California. Authority for the necessary action rests with the Federal Horticultural Board, which has had the matter under consideration for more than a year.

2. It is fundamentally important that the country west of the Mississippi, in which the disease is not now known to exist, be protected. If the above quarantine cannot be declared, then Congressional action should be secured, prohibiting the shipment of five-leaf pines or currants and gooseberries from East to West across the Mississippi Valley.

3. Greater efforts should be made to educate the public regarding the seriousness of the situation and to arouse public opinion and force action and adequate legislation to independent states. Inadequate power on the part of many states to eradicate the disease when located is by far the most serious handicap to fight.

4. The strengthening of the police power of the Department to the limit of Congressional authority, if this has not already been done, with the appropriations to make it effective, or if Department authority cannot be made effective, authority to cooperate fully with the states. These powers should be used in experiments to determine the practicability of wholesale eradication of currants and gooseberries, locating infected areas, eradicating isolated infections, and as a minimum holding serious infections within their present boundaries.

cases of infected currants and gooseberries were found in sixty-five of the one hundred and ten towns scouted.

East of the Hudson River in New York there are two large infections of native pine, with general infection of adjacent currants and gooseberries in Essex County, two infected plantings, and three nurseries containing diseased pine. Currant and gooseberry infection is general in Columbia County, having spread from Massachusetts.

It is then obvious that east of the Hudson River infection is so general that white pine growing will only be possible in areas which can be freed from all currant and gooseberry plants and kept free permanently.

Infections west of the Hudson River are not known to be so serious. West of the Hudson River in New York eight infected plantings were found, three nurseries with infected pine, and six nurseries with infected currants and gooseberries. Infected currants and gooseberries were found in forty-two other localities, mostly near Geneva and in Niagara County. In no place can the disease be considered to be beyond control

by the eradication methods now in use.

In New Jersey infected white pine has been found in four nurseries and in two plantings and diseased currants and gooseberries in one nursery and one estate.

In Pennsylvania infected pine was found in two nurseries and in three plantings.

No infections have been found in Delaware, Maryland, Virginia, North Carolina, Kentucky, Tennessee, West Virginia, Michigan, Illinois, or Indiana.

### WHAT THE PINE BLISTER DISEASE INVOLVES FROM THE STANDPOINT OF FORESTRY AND LUMBERING

1. Present merchantable timber values aggregating around \$275,000,000, a part of which are threatened.
2. Present values of immature timber practically impossible to appraise and a part of which has been planted artificially, which in the East are seriously threatened.
3. Nursery stock and investments, Federal, State, and private.
4. Possibility of future production of the most valuable trees in several regions of from two and a half to nine billion feet annually seriously threatened. This means the highest use of from 30 to 40 million acres of comparatively poor lands which otherwise would be used less advantageously or not at all, the support of a local population, local lumber and wood manufacturing industries, and of many allied industries, local and otherwise.

## AMERICAN FORESTRY

Infected white pine was found in one nursery in northeastern Ohio.

In Minnesota four infections, and in Wisconsin two infections, have been found along the St. Croix River, with the possibility of infection in an area about forty miles square.

Considerable infection has been located in the lower Ontario

peninsula of Canada, but the Canadian authorities appear to have this situation well under control. An infection of unknown extent has been located very recently near Montreal.

In the territory west of the Mississippi River, a general search has been made for the blister disease, following obvious clues of shipments of pine, currants and gooseberries. The disease has not been found. There is no natural way in which the disease can spread into this territory, *i.e.*, it can only come in on nursery stock. The danger of its introduction on nursery stock is, however, as great as it ever was.

### IMPORTANCE IN TIMBER PRODUCTION

There are about 13 billion feet of merchantable white pine in the Northeast, worth in the neighborhood of \$75,000,000. The development of private forestry, largely through the presence of the eastern white pine, has gone further in this region than in any other part of the United States. The area planted to white pine is conservatively 50,000 acres, and 10,000,000 seedlings are probably planted each year. Within this region there are



PINE BLISTER INVESTIGATORS

Representatives of practically all the states in the white pine belt, of Canadian provinces, of the United States Department of Agriculture and of the American Forestry Association and state forestry associations met at Albany, New York, recently to report upon the extent of the pine blister outbreak and to discuss ways of combating it.

5,000,000 or nearer 10,000,000 acres more suitable for the production of forest trees than for any other purpose, in which the white pine was an important tree in the original stand and in which it will undoubtedly be the best individual tree for future use. If the blister rust is not or cannot be suppressed, it seriously threatens the elimination of

the white pine as a forest tree of economic value in this region.

There are still in the lake states in the neighborhood of twelve billion feet of merchantable white pine, worth probably \$96,000,000. There are probably 2,000,000 acres or more of young growth in which a considerable percentage of the stand is white pine. At least 3500 acres have been planted. In addition to private and state nurseries the Federal Government maintains others with an output of from 400,000 to 500,000 seedlings annually. At least 5,000,000 and probably nearer 10,000,000 acres in the lake states are undoubtedly more valuable for the production of timber than for any other purpose. White pine was the important tree of the original stand and it should be for future production. Under forest management,



PINE INFECTED WITH BLISTER

Four-year white pine tree diseased with white pine blister disease. Badly swollen but not yet showing fruiting bodies of the parasite.

if the blister disease is kept out, an area now largely unproductive could be made to produce annually from one to four billion feet of the valuable white pine.

Private holdings of western white pine in the Inland Empire amount to about twenty billion feet and Federal holdings to about ten billion. The timber on the average

is worth from \$2.50 to \$3 per M. A Forest Service nursery in western Montana now produces about two and one-half million seedlings of western white pine annually, and the Service has already planted and seeded at least 8000 acres. Merchantable western white pine is found over an area of about 27,500,000 acres. It forms an important percentage of the stand over 5,000,000 acres. From 2,000,000 to 3,000,000 acres bear young growth. Present annual growth equals about 150 million feet and this under continued management could easily be doubled. Selected acres show a production of 100,000 feet per acre in 120 years. The tree occurs largely in a mountainous region where if the blister disease were once established its control would be exceedingly difficult and costly, if not impossible.

The sugar pine of California occurs as a merchantable tree over about 20,000,000 acres, and forms an important percentage of the stand within about 3,000,000 acres. It should be found permanently in forest mixtures on about 10,000,000 acres. There are about 14 billion feet of sugar pine on the National forests and 20 billion in private holdings, worth on the average about \$3. The present

annual growth of sugar pine is about 100 million feet, and this can be considerably increased under management. Sugar pine, like the western white pine, occurs in a mountainous, inaccessible country.

This is the situation reduced to cold facts. The task of preventing the further spread of the disease is now up to the National Government, the State Governments, and the people. It may already be too late to save the pines.

Little attention was given the chestnut blight when it first appeared. Later when its danger was realized hundreds of thousands of dollars were spent in an effort to overcome it. That failed. More money was spent in the effort

to confine it to certain areas. It was too late. That failed also—and now we can consider our chestnuts as doomed.

Is it too late to save the pines? That, the future alone can answer. It is not too early to try to suppress it, to stamp it out, if possible, and, at any rate, to retard its progress or to confine it to areas where it is already apparent. But if action is to be taken, it should be taken at once. There should be no delay. Action prompt, vigorous, and far reaching is desired.



PUBLICITY ON THE PINE BLISTER DISEASE CAMPAIGN

The haste to arouse public sentiment as to the importance of checking the spread of the pine blister disease has been started on a country wide basis by the American Forestry Association with the establishment of a publicity bureau. This department collects data from every state in the Union and in Canada and keeps the newspapers informed. Every Washington correspondent of a newspaper, the Associated Press, the United Press Association and the International News Service, with their daily papers aggregating 10,000 clients, are served with regular news bulletins dealing with developments in the various states. The copy is written on stencils and then put on a machine, so anywhere from a dozen to a thousand copies of a "story" may be run off in a short time. Russell T. Edwards has been placed in charge of the publicity work with a corps of assistants.

#### MEMBERS OF THE COMMITTEE OF SUPPRESSION

The Committee for the Suppression of the Pine Blister Disease of North America comprises the following:

ARIZONA—A. W. Morrill, State Entomologist, Phoenix; E. P. Taylor, Tucson.  
 CALIFORNIA—G. M. Homans, State Forester, Sacramento; E. O. Essig, University of California, Berkeley.  
 CANADA—Dr. C. Gordon Hewitt, Dominion Entomologist, Ottawa; G. C. Piché, Chief of the Forest Service, Quebec; Clyde Leavitt, Forester, Commission of Conservation, Quebec.  
 COLORADO—W. J. Morrill, State Forester, Fort Collins; C. P. Gillette, State Entomologist, Fort Collins.  
 CONNECTICUT—W. O. Filley, State Forester, New Haven; Dr. W. E. Britton, State Entomologist, New Haven; Prof. J. W. Toumey, Director, Yale Forest School, New Haven; Dr. G. P. Clinton, New Haven.  
 DELAWARE—Wesley Wehh, State Board of Agriculture, Dover.  
 ILLINOIS—E. A. Sterling, Mgr. Trade Extension Division, and R. S. Kellogg, Secretary Natl. Lumber Mrs. Assn., Chicago; Stephen A. Forbes, Entomologist, Urbana.  
 INDIANA—Frank N. Wallace, State Entomologist, Indianapolis; E. A. Gladden, Secretary, State Board of Forestry, Indianapolis.  
 IOWA—R. L. Webster, Acting State Entomologist, Ames.  
 KENTUCKY—H. Garmon, Agricultural Experiment Station, Lexington; J. E. Barton, State Forester, Frankfort.  
 MAINE—Frank E. Mace, Forest Commissioner, Augusta; Prof. John M. Briscoe, University of Maine, Orono; E. E. Ring, Bangor.  
 MARYLAND—Thomas B. Symmes, Director, Maryland State College of Agriculture, College Park; F. W. Besley, State Forester, Baltimore.  
 MASSACHUSETTS—Wilfred Wheeler, State House, Boston; Harris A. Reynolds, Sec., Massachusetts Forestry Assn., Boston; F. W. Rane, State Forester, State House, Boston; William P. Wharton, Groton.  
 MICHIGAN—A. C. Carton, Secretary, Public Domain Commission, Lansing; L. R. Taft, State Board of Agriculture, East Lansing.

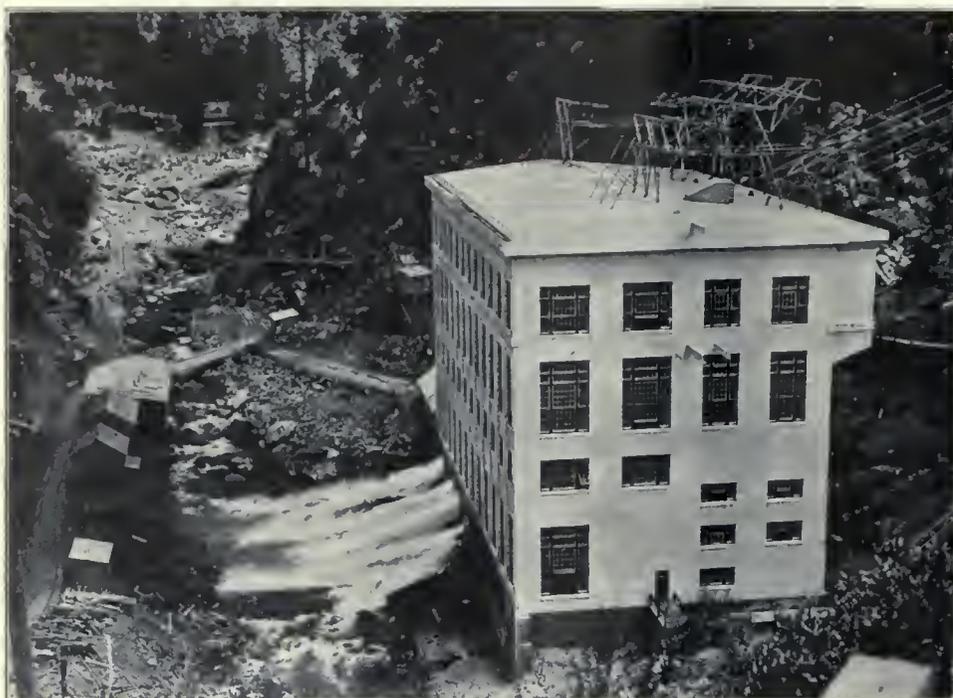
MINNESOTA—W. T. Cox, State Forester, Saint Paul; F. L. Washburn, State Entomologist, St. Anthony Park; E. M. Freeman, Plant Pathologist, St. Paul.  
 MONTANA—John C. Van Hook, State Forester, Helena; M. L. Dean, State Horticulturist, Missoula.  
 NEW HAMPSHIRE—E. C. Hirst, State Forester, Concord; Philip W. Ayers, Forester, Society for the Protection of N. H. Forests; Prof. O. R. Butler, Botanist, N. H. College, Durham; Prof. W. C. O'Kane, Entomologist, Durham.  
 NEW JERSEY—Harry D. Weiss, Chief Nursery Inspector, New Brunswick; Mel. T. Cook, Plant Pathologist, Agricultural Exp. Station, New Brunswick.  
 NEW YORK—C. R. Pettis, Conservation Commission, Albany; Prof. George G. Atwood, Chief, Bureau Plant Industry, Albany; Victor A. Beede, Secretary, New York State Forestry Assn., Syracuse.  
 NORTH CAROLINA—J. S. Holmes, State Forester, Chapel Hill; Franklin Sherman, Jr., Entomologist, Raleigh.  
 OHIO—N. E. Shaw, Chief Bureau of Horticulture, Columbus; Edmund Secrest, Forester, Wooster; A. D. Selby, Botanist, Agricultural Exp. Station, Wooster.  
 OREGON—F. A. Elliott, State Forester, Salem.  
 PENNSYLVANIA—J. G. Sanders, State Entomologist, Harrisburg; Robert S. Conklin, Commissioner of Forestry, Harrisburg.  
 RHODE ISLAND—Jesse B. Mowry, Chepachet; Prof. H. H. York, Brown University, Providence; Dr. A. E. Stene, Entomologist, Providence.  
 SOUTH DAKOTA—George W. Roskie, State Forester, Custer.  
 TENNESSEE—R. S. Maddox, Forester, Nashville.  
 VERMONT—A. F. Hawes, State Forester, Burlington.  
 VIRGINIA—A. C. Jones, State Forester, Charlottesville; W. J. Schoene, Entomologist, Blacksburg.  
 WEST VIRGINIA—A. B. Brooks, Forester, West Virginia University, Morgantown; J. A. Viquesney, Forest, Game and Fish Warden, Belington.  
 WISCONSIN—L. R. Jones, Professor of Plant Pathology, Madison; F. B. Moody, Commissioner, Madison.  
 American Forestry Association—Charles Lathrop Pack, Lakewood, N. J.

## WATER-POWER ON NATIONAL FORESTS

**I**N the fiscal year 1916, says Henry S. Graves, Chief of the Forest Service, in his annual report, twenty new water-power projects which utilize National Forest land began operation. This was an increase of eighteen

Concerning the report prepared by the Forest Service in response to a resolution of the Senate calling upon the Secretary of Agriculture for information regarding the ownership and control of water-power sites and any facts bearing

on the question as to the existence of a monopoly in the ownership and control of hydroelectric power in the United States, Mr. Graves says: "This report presented in far greater detail than has ever been attempted before, an exhaustive analysis of the general power situation. It showed a marked concentration of definite and complete control of a large percentage of developed water power by a very few companies. Data presented regarding interrelationships through common directors and principal officers indicated a marked tendency toward association or community of interests, particularly between the principal holding companies. The movement toward concentration in commercial central stations of all the primary power employed in the electrical industries and in manufactures was found in all sections of the United States, the

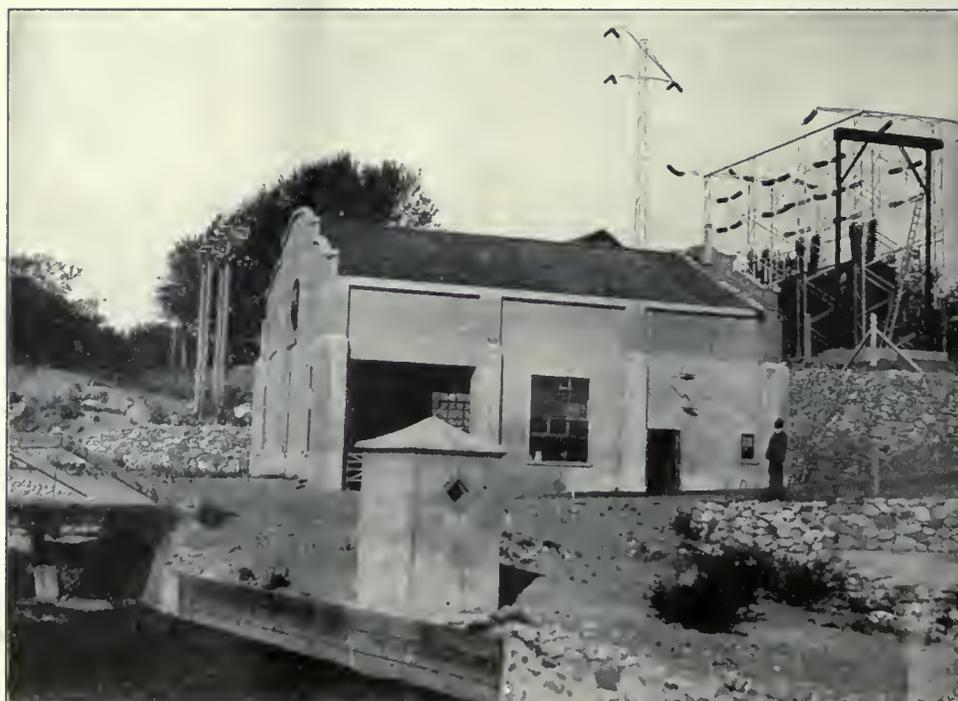


POWER HOUSE NO. 2, PACIFIC LIGHT & POWER CORPORATION

This plant has an installation of 47,000 horsepower which will eventually be increased to 94,000. This and another power house of the same size and owned by the same company are on the Sierra National Forest, California. They are the first units in an ultimate development of about 250,000 horsepower, all on the Sierra National Forest, constructed and operating under a revocable permit issued by the Secretary of Agriculture on July 16, 1913

and one-half per cent in the total number. In the fiscal year 1915 the number of new projects which began operation was twelve. Forty-two per cent of the total developed water-power of the United States utilize National Forest land, the Forest Service figures show.

Development of relatively small projects is particularly in evidence, according to Mr. Graves, in the Rocky Mountain States. California leads in the amount of power under permit and in operation. The number of transmission line permits in effect was increased by thirteen during the year. The forty applications for power-project permits received in 1916 included eight from Alaska—a notable evidence, according to the report, of increased local interest in power development on National Forest lands there.



A POWER HOUSE ON THE INYO NATIONAL FOREST

This is the No. 6 power house of the Nevada-California Power Company on Bishop Creek, Inyo National Forest, California

rate of concentration during the period 1902-1912 being highest in the South Atlantic States and the extent of concentration greatest in the Western States.

"The rate of increase in water-power development for public-service use from 1902 to 1912 was approximately three times as great as in steam power. Primary power installation from all sources and for all uses increased from 1902 to 1912 more than two and one-half times as rapidly in the eleven Western States as in the remainder of the United States, while the increase for primary electric power for the same period was 440 per cent for the Western States, as against 226 per cent in the other States. The development per capita of the Western States in 1912 was two and one-half times as great as in other parts of the country.

"The report showed a considerable over-development in nearly all the power centers of the Western States—California, Oregon, and Washington in particular showing installations far in excess of maximum demands."

SAVING A FAMOUS TREE

JAMES DEERING, of 606 Michigan Avenue, Chicago, has come to the rescue of a tree and as a result the famous old wild fig of Miami, Florida, has a new resting place. This is on the Deering estate at Coconut Grove, Florida, which is one of the most beautiful in the country. The attention of AMERICAN FORESTRY was called to the tree by Mrs. Francis Hall Murdoch of the



FAMOUS OLD WILD FIG TREE

This tree at Miami, Florida, an old Seminole Indian landmark, was about to be destroyed when James Deering, of Chicago, paid \$500 to have it removed to his estate at Coconut Grove and there preserved.

Hotel Schenley, Pittsburgh, who told how it was about to be cut down to make way for improvements despite all the many interesting old Seminole Indian legends that include the tree in their lore.

A contractor told Mr. Deering that for \$500 he could move the tree and guarantee that it would live, so Mr.

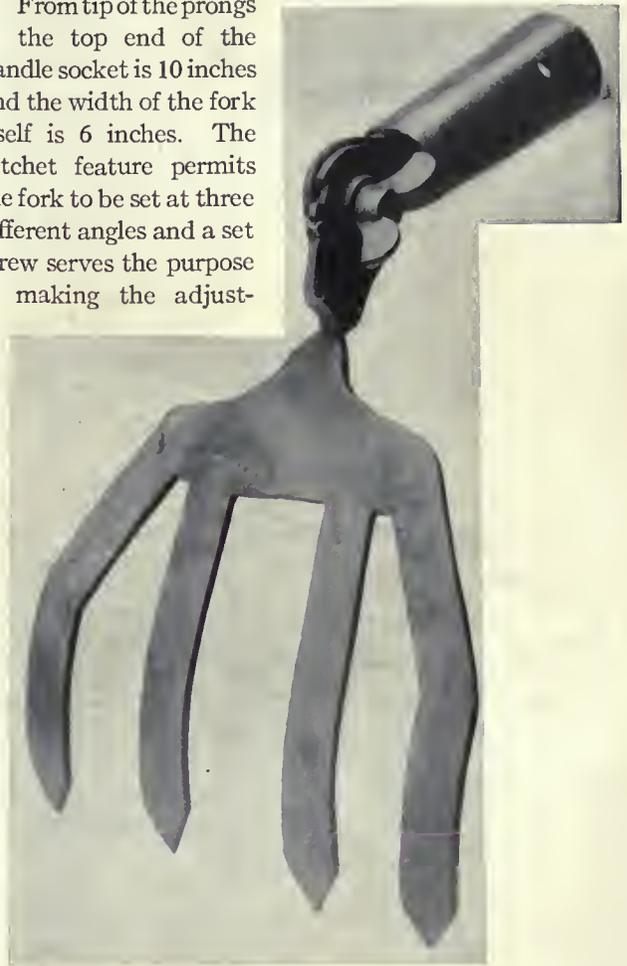
Deering ordered the removal. The tree has a place of honor on the magnificent grounds being laid out by the Chicagoan.

The estate in the Coconut Grove district will be very hard to excell, Mrs. Murdoch writes, as eight hundred men have been at work clearing the grounds and making the improvements. She particularly commends Mr. Deering for not erecting walls eighteen feet high and thus keep the public from enjoying the view.

A FOREST FIRE FORK

THE accompanying picture is that of a fire fork designed by John L. Strobeck, district forester of Pennsylvania for the purpose of being carried conveniently as a handy tool for forest fire fighting.

From tip of the prongs to the top end of the handle socket is 10 inches and the width of the fork itself is 6 inches. The ratchet feature permits the fork to be set at three different angles and a set screw serves the purpose of making the adjust-



ments secure. This fork has been tried out in actual service, and its parts are so proportioned as to give it working balance.

When it is needed, the user cuts a stick for a handle and inserts it in the socket. A nail kept handy may be driven through the hole in the socket into the handle to fasten same.

It may be taken apart and carried in the pocket, or still better, in a small case made to fit the pocket.

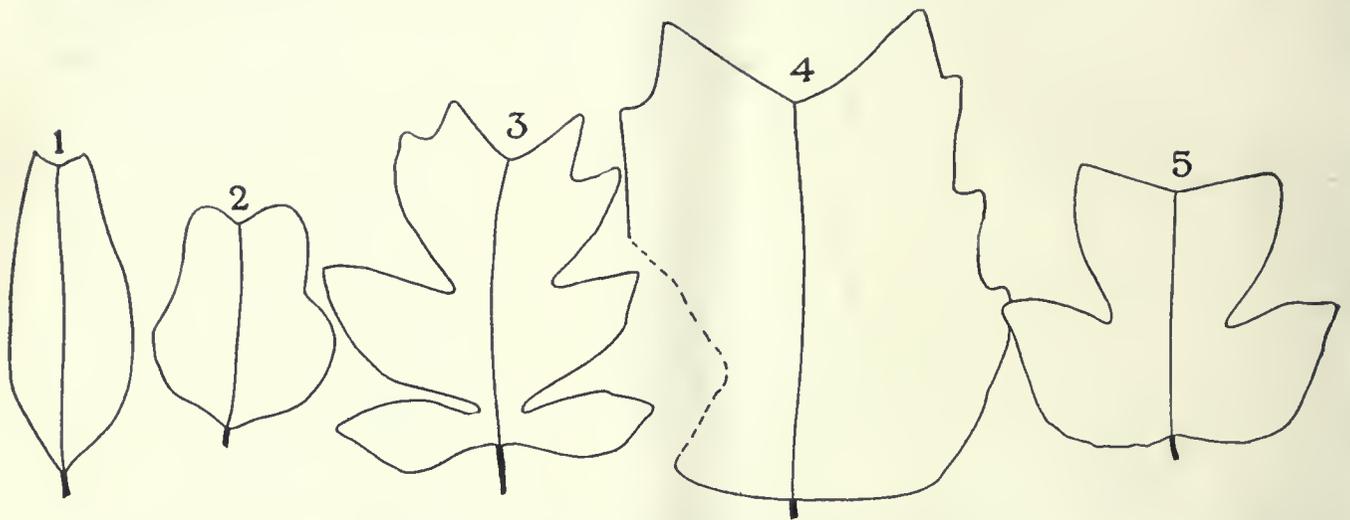
At its various angles, it may be used to rake leaves, to keep the fire lane clear of debris, or for any purpose which is served ordinarily by the naked hand. Leaves do not accumulate on the fork owing to the shape and width of the prongs.

## THE PEDIGREE OF A SPLENDID TREE

**I**F "blood tells" in human beings, and in the lower animals as well, why should not pedigree count in the vegetable world also?

Take the yellow poplar for an example. This is the finest hardwood tree in the world, if judged by size, form, foliage, bloom, and the wide range of uses in which its wood is employed. In girth of trunk it may not equal the largest hollow sycamores; but it overtops in height all its competitors among American hardwoods; and in grace of form, and in yield of excellent lumber, no hardwood of this country equals it. The oak, which is justly called king of hardwoods, if the utilization of its wood is alone considered, must take a back seat when size of trunk

cretaceous age. It was after the coal beds were formed, but before the ice age. Coal was formed of palms, ferns, and the like, in vast swamps, as is supposed; but after that the land became dry, and it was then that the hardwoods made their appearance, and formed forests surpassing anything known on earth today. There are about five hundred kinds of trees in America north of Mexico now. The number was double some millions of years ago. The magnificent forests of that remote time seem to have sprung into existence all at once. The records in the form of leaf prints in the rocks show no gradual and slow development; but the forest's full and wonderful richness came suddenly.



YELLOW POPLAR LEAVES OF VARIOUS GEOLOGICAL PERIODS

1—Willow-leaf poplar five million years ago; 2—Fiddle-leaf poplar four million years ago; 3—Oak-leaf poplar three million years ago; 4—Giant-leaf poplar a million years ago; 5—Yellow poplar leaf of the present time.

is considered and comparison is made with yellow poplar.

There is ancestry back of this splendid tree. No royal house among the kings of earth has anything to compare with it, not even Menelik of Abyssinia who traces his line back to Solomon. When the first white men settled in the United States they made the acquaintance of yellow poplar. They never heard of it before, because it did not grow in Europe. The Virginia Indians called it "vikiok" and made canoes of it.

History goes no farther back than that in its account of the yellow poplar; but that is really the last page of this tree's voluminous and romantic history. Talk of the survival of the fittest. Here is an example of it. Geologists and palæobotanists (those who study fossil botany) are the yellow poplar's biographers. They have dug its life history out of rocks and clays where its leaves and flowers have lain buried during thousands and millions of years. This tree was in America at a time so remote that in comparison with it, the period covered by human history is as a hand's span to the distance round the world.

The records of geology show that yellow poplar made its appearance on earth during what is known as the

Among the earliest of the hardwoods in those forests was yellow poplar—not one solitary species as at present, but sixteen of them, every species apparently being as fine as ours of today, or finer. The climate was warm, and trees which now grow no further north than the United States, then flourished in Greenland. Yellow poplar was in that remote northern land, and its companions were sassafras, red gum, sycamore, bald cypress, and the "big tree" now confined to California. At that remote time yellow poplar grew in Europe where it no longer exists.

The sixteen species which once flourished in America have dwindled to one. Fifteen species perished in a tremendous catastrophe which changed the face of much of the northern hemisphere. It was a winter a million years long, known as the Ice Age. The ice killed every living plant in its path. It pushed from the north down to middle United States, burying everything. A single species of yellow poplar escaped, and that one is with us yet. It was probably growing at that time south of the region of extreme cold, and thus managed to survive, and when the ice sheet finally melted away, the yellow poplar worked its way north again, and reached the southern provinces of Canada. Some of its former companions,

notably red gum, bald cypress and "big tree," never succeeded in working their way again as far north as Canada; while the yellow poplar and the California big tree parted company during the Ice Age, never to meet again.

The apex of the yellow poplar leaf has a characteristic notch. The shapes of the leaves of all the species from the earliest till the present, have varied greatly, but the notch has always been there. Among the earliest poplar leaves were some shaped like a peach leaf, except for the notch. Then came the form like a "fiddle," but still the notch was in evidence. There was one which looked somewhat like an oak leaf, with the notch present. Changes followed until the present form was developed.

—*Hardwood Record.*

### THE 640-ACRE STOCK-RAISING HOMESTEAD LAW

THE 640-acre Stock-Raising Homestead Law is now in force, having been approved by the President on December 29, 1916. All qualified homestead entrymen may share in its benefits. The law requires the Secretary of the Interior to designate the lands as "stock-raising lands" before they may be entered, and he can designate only such lands "the surface of which is in his opinion chiefly valuable for grazing and raising forage crops, do not contain merchantable timber, are not susceptible of irrigation from any known source of water supply, and are of such character that 640 acres are reasonably required for the support of a family. "This means that of necessity a classification of the lands will be made before they are opened to entry. The lands which are to be designated are those upon which it is possible to raise forage crops other than grasses naturally growing upon them, and upon which an entryman may reasonably expect to support his family upon 640 acres. Undoubtedly a portion of the remaining public lands is of the character contemplated by this act and will pass into the hands of settlers under its provisions.

To acquire title to a homestead under this act, an entryman must reside upon the land not less than 3 years and make permanent improvements thereon, tending to increase its value for stock-raising purposes not less than \$1.25 per acre, one-half of which must be placed on the land within 3 years after the date of entry. Cultivation of the land, except so far as this may be necessary to raise forage crops, is not required. Commutation of entry is not allowed. Applications accompanied by affidavits as to the character of the land may be filed in the local land offices and this will give the applicant a preferential right of entry in case the land applied for is designated, but occupancy of the land is not allowed until after it has been classified and designated by the Secretary of the Interior for entry under this law.

Where a homestead entry has already been made upon lands of the character described in this act, additional lands of the same character may be taken in such quantity as will not increase the total holding to more than 640 acres, provided the additional lands are located not more than 20 miles from the original entry. Provision is made

in the bill for withholding waterholes needed to insure public use of the remaining grazing lands and for the withdrawal of driveways needed in the movement of stock between summer and winter ranges and to and from shipping points.

When the lands suitable for entry under this act have been designated there will still remain a large portion of the public grazing lands which are not of sufficiently good character to be suitable for entry as 640-acre homesteads. Some provision should be made under which the remaining grazing lands can be protected and improved and their use for grazing purposes controlled. This could best be accomplished by the application of a plan similar to that which has been worked out for the management of grazing on the National Forests, with such modifications as may be necessary to meet the conditions in different localities. Investigations by experts of the Department of Agriculture into the production of meat on the western ranges and the possibilities of increasing the number of meat producing animals on them have developed the fact that in general the original value of these lands has been gradually decreased through unregulated grazing, and that, in their judgment, with proper supervision and control these lands could be so improved within a reasonably short time as to carry approximately 30 per cent more stock than at the present time. The conservation of the public grazing lands demands that additional legislation for the accomplishment of this purpose should be enacted at an early date.

### STATE REFORESTATION

A DEFINITE legislative program was formulated at the third logged-off land conference in Seattle, says the *West Coast Lumberman*. At this conference bills relating specifically to the handling of logged-off lands were read. J. T. Condon, dean of the University of Washington Law School, and chairman of the committee on the country unit plan for land clearing, read the bill drafted by the committee to be introduced in the state legislature at the next session. Another bill was read by Hugo Winkler, dean of the Forestry School of the University of Washington, who is chairman of the committee on reforestation. This bill has to do with the purchase by the state for reforestation of forest lands or logged-off lands.

### TREES WITH A HISTORY

IS there a tree with a history in your town? What do you know about it? Is it being cared for or is it being allowed to die? AMERICAN FORESTRY would like to know about such trees and would be glad to receive pictures and articles, not to exceed 100 words about such trees. Such as are available will be printed in the magazine from time to time.

# INTERNATIONAL FORESTRY CONFERENCE AND ANNUAL MEETING OF THE ASSOCIATION

**I**NDICATIONS are that the Thirty-seventh Annual Meeting of the American Forestry Association and the International Forestry Conference to be held at the New Willard Hotel, Washington, D. C., January 18th and 19th will be one of the best attended forestry gatherings ever held in this country.

Governors of almost all the states, and officials of affiliated and coöperating organizations have appointed delegates to attend the conferences and many members of the American Forestry Association have signified their intention of being present.

The conferences will be busy ones. The subjects to be discussed are of nationwide importance. Almost every state in the Union has a direct interest in the proceedings, while the Association has grown to such a size that its deliberations and its actions are of great importance in public opinion.

President Charles Lathrop Pack has emphasized the importance of the meeting in his statements regarding the pine blister disease and the danger which it threatens and the members of the Association are very much alive to the necessity for prompt action in regard to efforts to stamp it out where it has appeared and to prevent it spreading to sections adjoining those infected.

Governor Whitman, of New York, at a conference of governors in Washington, D. C., in the latter part of December, called the attention of the state executives to the conference planned by the American Forestry Association, spoke of the need of a vigorous fight against the pine blister and urged the executives to send state delegations to take part in the discussion of ways and means for stamping out the disease and enlisted the assistance of the governors in the campaign being waged against it.

This subject will be discussed by some of the leading experts, men who have made a close study of the disease, and of the measures which should be taken to prevent its spread.

The addresses on public playgrounds on the National Forests, and public uses of the National Parks and the conservation of game in the National Forests and National Parks are all of unusual interest and will attract a large number who are specially interested in these subjects while the information which they give will be of particular service to the members of the Association and to the general public.

A third subject affecting the whole nation is the discussion of the advisability of prohibiting the importation

of all tree and plant stock from other continents, except such as is permitted to enter for special purposes by the Department of Agriculture. Most of the tree and plant pests which have cost, and are costing, this country hundreds of millions of damage annually, were brought into this country on imported stock. There is every likelihood that such pests will continue to come into this country unless prevented by stringent quarantine regulations. The conference is to discuss the advisability of such regulations. It is a debatable subject. Can imported stock be so cleansed that the danger of these pests is removed? Can examination of stock for importation be so regulated that nothing suspected of being dangerous shall be permitted to enter this country? These are questions to be discussed. It is a big subject, an important subject.

There will meet at the Forestry Conference the Society of American Foresters for their annual business session; the Society of Eastern Foresters; and the Committee for the Suppression of the Pine

Blister Disease of North America which will have representatives from each state where the infection has appeared or is likely to appear.

The meetings will be held on the tenth floor of the New Willard Hotel, and delegates when they arrive will be requested to register there early on the morning of January 18. Detailed information may be had at the offices of the Association, 1410 H Street, Washington, D.C.

## THE PROGRAM

**JANUARY 18th, 10 a. m.**

### Annual Meeting American Forestry Association.

Address of the President.....CHARLES LATHROP PACK  
 Report of the Secretary.....PERCIVAL S. RIDSDALE  
 Address—"Economic Justice for Lumber and Forests".....E. A. STERLING, Director American Forestry Association.  
 Election of Officers and General Business.

**JANUARY 18th, 2 p. m.**

### Recreational Uses of National Forests and National Parks.

Address—"National Parks as National Playgrounds".....STEPHEN T. MATHER, Assistant to the Secretary of the Interior.  
 Address—"Recreational Uses of the National Forests".....H. S. GRAVES, U. S. Forester.  
 Address—"Conservation of Game in National Forests and National Parks".....E. W. NELSON, Chief, U. S. Dept. of Biology.  
 Film Story—"National Forests Attractions".....C. J. BLANCHARD

**JANUARY 18th, 8 p. m.**

Meetings:  
 Board of Directors of the American Forestry Association.  
 Committee for Suppression of Pine Blister Disease.  
 Society of American Foresters.

**JANUARY 19th, 9.30 a. m.**

### The White Pine Blister Disease.

Address—"What is the White Pine Blister Disease?".....DR. PERLEY SPAULDING  
                                   In New England.....W. P. WHARTON  
                                   Hudson to Mississippi.....E. A. STERLING  
                                   Pacific Coast.....E. T. ALLEN  
                                   In Canada.....CLYDE LEAVITT  
 Address—"What Shall We Do About the Disease?".....S. B. DETWILER, U. S. Forest Pathologist.  
 Address—"Shall We Plant White Pine?".....C. R. PETTIS, Supt. of Forests of N. Y. State.  
 Address—"The Problem as a Whole".....DR. HAVEN METCALF, Chief of the U. S. Office of Forest Pathology.  
 Discussions and Resolutions.

**JANUARY 19th, 2 p. m.**

### Stopping Importation of Tree and Plant Pests.

Address—"Losses Caused by Imported Tree and Plant Pests".....C. L. MARLATT, Chairman Federal Horticultural Board.  
 Address—"The Independence of American Nurseries".....DAVID T. FAIRCHILD, Agricultural Explorer in charge of Office of Foreign Seed and Plant Introduction.  
 Address—"The Necessity for a Federal Quarantine Against all Trees and Plants".....J. G. SANDERS, Economic Zoologist of Pennsylvania  
 Discussions.

# EDITORIAL

## THE PERIL OF COMBINATIONS

**T**HERE is a marked tendency in many states to revise or reorganize their state governments in an effort to secure greater efficiency and economy. This takes the form of consolidations of various departments into a single commission, and of substituting a single executive head for the board composed of several persons. It so happens that state forestry is nearly always affected by these proposed changes; and many state forestry organizations which have existed for years and built up creditable records for good work have faced, and will continue to meet efforts to bring about fundamental changes in their status, suggested by either newly elected executives with ambitious plans of reform, or by economy and efficiency commissions seeking new and apparently simpler machinery of government. The persistence with which these suggestions recur is based on a real desire for better government, but the effort, as applied to forestry, bids fair to defeat the very ends which it seeks to attain.

Forestry has sought and attained the same form of organization in many states as is used by educational institutions, and for the reason that the demands of the work for a trained forester have led to the creation of the office as a distinct position, requiring educational and technical training. In securing this very real executive, the benefits of the board idea have also been retained by providing, as in the case of university regents, that the Board shall appoint the forester, pass on his expenses, and have the general oversight and veto on his policies and personnel.

Under this plan, state foresters of real ability have been secured and have been retained for a series of years without the office becoming a political plum to be fought over at each election. Unless this system continues, it will be impossible to get results in forestry. Trees do not grow to maturity within the two-year terms accorded most of our governors.

The great point that needs emphasis is that the system of forestry boards, who appoint the state forester, has been entirely free from the weaknesses which have brought other boards into disfavor, and has shown by its results that it is an ideal form of organization. Then why should we seek to destroy this advantage, and are we fully awake to what we are doing?

It is claimed by some that the elimination of several boards, and the substitution of a single department, will cut down expenses. We can speak only for boards of forestry. These boards are not salaried. The persons serving on them give their time and interest to the work—and under the right form of organization this is not too much of a burden. No saving is effected by dispensing with these services.

The service of the executive will be required, as before, and the superimposing of some higher official over the

forester cannot possibly increase the latter's efficiency, and can result in economy only by cutting down his salary, or forcing him to work for less—which means a less able man to fill the place. The salary of the central executive is an additional expense, and is often considerable. The expense for clerical labor is not reduced, unless the work itself is curtailed. The forester, being himself an able executive, is capable of organizing and has already secured the best results from the force under his control, and the efficiency of this unit will not be increased by combining it with others.

Instead of improving the work, combinations of different bureaus under a single executive head infallibly tend to hamper forestry and retard its progress. The forester, on whose knowledge, interest and ability the entire work must rest, finds himself controlled by a superior whose interest is of necessity divided between the several lines of work for which he is accountable. Since it is almost impossible to find a person whose technical knowledge covers more than one line, the chief in all probability knows nothing of forestry, and is interested largely in fish and game, or agriculture. If he is indifferent, there is no appeal. Paralysis of initiative follows, and the forester becomes discouraged and either sinks to the position of a routine clerk, or resigns, to be replaced by some less able and enterprising man.

In some instances, these combinations are proposed as a means of obtaining political control of forestry work which has, by the merits of the system of state forestry boards, been kept free from the grasp of the spoilsman. Economy and efficiency in such cases form a convenient cloak to cover the real aim in view; which is to secure control of the office and of the field force, for political purposes. There can be no other object in deliberately upsetting an organization which is now giving complete satisfaction. A reform which seeks to tear down rather than build up, and which imposes changes of doubtful value on an organization already satisfactory to the public which it serves, should be viewed with suspicion. One of the most plausible arguments used to secure such combinations is that of avoiding the duplication of field agents. This applies especially to states which maintain a force of forest fire wardens, and an additional force of game wardens. The economy experts at once draw the conclusion that those two functions can be combined in the same person. Practical considerations point to just the opposite conclusion. In cities, it would be about as sensible to combine the jobs of fireman and policeman, as it would be to force the forest fire warden to assume the full responsibility for game protection. The time has not yet come when these two officials should be identified in the minds of the public. The game warden must inevitably make enemies in the course of his

duties. No simpler means of revenge exists than the setting of fires. The fire warden should be free from this handicap in an effort to build up public sentiment, especially in frontier communities most in need of fire protection. Where the duties of either office are exacting, one man cannot possibly do justice to both. Poachers would know only too well where the game warden was in case a fire occurred, and the fire warden could not be absent from his duties to attend to the arrest and trial of offenders against the game laws. Coöperation between fire and game wardens is practicable and desirable, but the actual combination of the functions of the two wardens in the same individuals has always failed, wherever tried, to give the best results. The economy and efficiency of combining game and fire wardens exists only on paper.

Not all state forestry boards have an ideal organization. In Indiana we have the anomalous condition of a board with no power to appoint or control the forester, who is a political appointee. In Wisconsin a three-headed commission exists, the forester and two others of equal rank and authority—an even worse form of organi-

zation than that existing in other states as it combines the worst feature of the board idea with that of the combination of departments. Boards might be appointed in such a way that they not only usurp executive functions, but regard the forester's office as a political job. But this has very seldom happened when the law requires that the forester be a technically qualified man.

Attempts recently made in both New Hampshire and Maryland to combine forestry with agriculture by a reorganization were wisely defeated on the basis that the existing form of organization was giving complete satisfaction.

Unless the people of a state, through their state forestry associations or in other ways keep close watch of their legislatures in the coming sessions, similar attempts may succeed in states which have made an enviable reputation for efficiency in forestry. The sophistry of the arguments used to justify these dangers is not always apparent at first glance. The present system of forestry boards has been tested for over a decade and has shown itself to be sound. It is worthy of our united and sincere support.

## NATIONAL PARKS VERSUS NATIONAL FORESTS

**A**FTER thirty years and more of comparative neglect, and haphazard management in the Interior Department, our National Parks have finally been placed by Congress under a definite administration bureau, with a chief and the nucleus of a consistent policy. Up to this time the parks have been the plaything of each succeeding secretary,—managed as separate units, with changing personnel, and no fixed plan except to provide in some way by concessions to private enterprise, for the accommodations demanded by the public.

National Forests first originated in 1891, and in 1897 were put under a system of administration similar to that now provided for the parks. The forests remained in the Interior Department until 1905, when their administration was transferred bodily to the Department of Agriculture, in order to secure complete freedom from political appointments, consistent technical and scientific management, and the attainment of the purposes required by law, the protection of the streams, and the renewal of the forests by use.

Following this transfer the National Forest Service was rapidly established. Its nucleus and inspiration was the body of young, enthusiastic men with high ideals, trained to the work in the best schools the nation afforded, and entering this service as a career worthy of a life work. Upon the character of the service thus secured for the public, has rested the success of the National Forest Administration, which has carried the work on, overcoming enormous obstacles, and has solved tremendous problems. For the National Forester had to build up from the ground, the great fabric of a business organization which is charged with using wisely the resources of over 160,000,000 acres of land, for the best interests of all the public. Timber must be sold under a policy which will protect watersheds,

preserve portions of the forest for scenery, secure reproduction of young trees, prevent fires from the slash, permit the logger a living profit, prevent monopoly of stumpage, and not work an injury by underselling private stumpage. Grazing privileges must be assigned, and fees collected by a system which will protect the small farmer, prevent waste of forage, secure the proper revenue, prevent damage to watersheds and young trees, settle feuds between sheep and cattle men and utilize the resources to the maximum capacity. Water-powers must be leased under terms which will permit development and secure proper rentals, while protecting the public from the evils of monopolistic private ownership. Tourists must be cared for, camp sites, lake shores and streams protected, trails and roads built, fires fought and a thorough system of fire protection inaugurated. Tree diseases and insects must be combated scientifically and efficiently. The public must be dealt with, not merely from the standpoint of summer visitors (of whom increasing numbers make use of the National Forests each year) but, at the same time, from the standpoint of the user of wood, of grazing, the prospector for minerals, the trapper, the small farmer and the representative of big business. There is hardly a form of commercial activity nor aspect of human affairs that the foresters of the National Forest Service have not encountered, and successfully handled in the 12 years since the Forest Service was established. In the year 1916, an income of over \$2,800,000 was secured, half of which was from timber, while grazing produced \$1,200,000 and water-power rental yielded \$100,000.

With this enormous and well-trained body of public officials, and a policy consistent, elastic and successful the question will be asked—why not transfer to the Forest Service the management of the National Parks? Di-

rector Mather voices the needs of the new department in the words, "We must develop a fine body of trained and public-spirited young men to carry on the park work to its great destiny."

The Park Service needs, and must get, men of the same general character, single-minded devotion to public work, and high efficiency as has always characterized the Forest Service. *But the Park Service and the Forest Service should remain separate just as the National Parks must always remain distinct from the National Forests.*

National Parks are created for one definite purpose, to preserve untouched the beauties of natural scenery, with its forests, waterfalls, and wild life. In National Forests the same care is shown to protect small areas whose value for scenic purposes outweighs that of the lumber that may be cut from the trees. But on the 160,000,000 acres of National Forests, the immense timber, grazing and power resources are not to be locked up to serve the single purpose of scenery. A proper balance of uses for the best good of all is attained.

*On the parks this policy cannot and should not be adopted.* Parks are areas of such transcendent interest, such striking beauty, that the desecrating touch of commercialism must not be permitted to defile by unsightly logging, by sheep or cattle grazing, or by power houses and transmission lines the picture of the primitive wilderness. *Let the American public beware of insidious attempts to undermine this policy,* and by introducing grazing, logging and power development, to so cheapen and destroy the unique character of our parks that they will no longer differ from National Forests, and the necessity for distinctive management will disappear altogether.

There is real danger of this degradation of the park standard. Most unfortunately, the new park law al-

ready sanctions commercial grazing in the parks, and permits of timber cutting under the guise of protection from insect ravages. If the public desires to protect the National Parks and preserve them as nature planned them, two things must be demanded—the absolute prohibition of all commercial uses, and the establishment of a non-political and efficient park management equal to that of the Forest Service and as free from pressure on the part of place hunters and politicians.

The specific danger to the whole movement lies in the temptation to create large numbers of new parks, which have but little of distinctive merit to justify the sacrifice of the commercial resources which lie within them—and then, in order to satisfy the local public to permit these resources to be used on a system practically identical with and duplicating that already established by the Forest Service. Let us hold our ideals so clearly that we shall compel their adoption. *National Parks shall not be commercialized.* If scenic features are not sufficiently valuable to the local public to justify the sacrifice of timber grass and waterpower development, they shall remain as National Forests. If the sacrifice is offset by the greater value of the public good, then let the park be declared.

Practically every acre of land suitable for new National Parks is already included in some National Forest. New parks do not mean new areas reserved, but merely a new jurisdiction and policy to supplant an already established management.

Let us not mix commercial developments with park uses. In this way only can we preserve our National Parks, and maintain the present natural distinction between both policy and administration of National Parks and National Forests.

## FORESTRY IN VERMONT

BY RODERIC M. OLZENDAM, SECRETARY OF THE FORESTRY ASSOCIATION OF VERMONT

VERMONT, like so many of her sister states, has suffered in the past and will suffer severely in the future because she has allowed the heavily timbered slopes of her mountains to be stripped and slaughtered, burned and slashed, while the people sat complacently by, never giving even so much as a passing thought to the needs of the generations of Vermonters yet unborn. The extreme seriousness of this situation becomes readily apparent when one considers fully the fact that the total area of forest and waste land in the State of Vermont is 3,719,000 acres, or 64% of the total area of the commonwealth.

Realizing that some active aggressive and powerful force must be brought to bear in interesting the people of Vermont in forest conservation, a small group of influential men organized the Forestry Association of Vermont in 1904, having as its object the preservation and proper handling of this large forest area for the benefit of all the people of the State and their descendants. Filled with a sincere and genuinely unselfish desire to promote the welfare of their commonwealth, these men met frequently and gave unsparingly of their valuable time and ability to the cause of

conservation. It is to these men that the State looks with thankfulness and pride for the progress of forestry in Vermont. The results which have followed their singular forethought are gratifying.

For four years prior to 1908 there had been a Forest Commissioner, not a technically trained man, but in 1908 by act of the legislature the State Forestry Department was established. There were several reasons which convinced the legislature that this action was necessary. One of the foremost reasons was the serious forest-fire situation in 1908 when a great many fires seared and blackened the mountain sides of Vermont and other States. That the action was justifiable from the standpoint of the forest-fire problem alone is evident when one considers that the expense to the State for fighting fires in the seven years 1909-1916, inclusive, has been less than for the one year 1908, even though there have been several seasons just as dry and just as dangerous. This result is attributable to the facts that the Forestry Department has become thoroughly organized under a technically trained State Forester and his assistants, one of whom is the State Fire

Warden; that there are intelligent forest-fire wardens in every town guarding the interests of the forest; that look-out stations have been built on a number of our high mountains where look-out men and patrolmen are maintained, always alert and watching for the faintest sign of a fire; and, lastly, that the people of Vermont in general have been educated regarding the damage which follows in the wake of a forest fire. Thus, the ownership of forest property has been made safer than ever before and the damage done by fires in Vermont is less than in any other New England State. At a meeting of the Society for the Protection of New Hampshire Forests held the past summer, one New Hampshire lumberman made the significant statement that the State Forester of that State had earned a salary of \$100,000 a year in lessening the damage by fire. It is quite unnecessary to say that the said State Forester did not receive what he earned.

Up to 1912 there was no remedial legislation pertaining to forest taxation in Vermont. Land owners throughout the State were compelled to cut off their timber because of excessive taxes. The State Forester succeeded in having Acts No. 40 and 41 passed by the legislature. These acts make it possible for the man who desires to raise timber to do so and to figure in advance just what his taxes will be up to 1950. Vermont, Massachusetts and Connecticut are the three leading States in the matter of forest taxation.

The State Nursery for forest seedlings was established by the legislature previous to the beginning of the Forestry Department. Since the Department was organized the Nursery has been strengthened and enlarged and a very considerable amount of planting has been done throughout Vermont on private and public lands. During 1909-1910, 572,000 trees were planted. During the six years since the establishment of the department over 5,000,000 trees have been taken from the State Nursery and planted from one end of the State to the other. It is quite safe to say that these trees, if properly protected, will be worth in fifty years between one and two million dollars. These plantations will have a stimulative effect upon the wood-using industries which will be highly advantageous and they will serve as demonstration areas to interest other land owners in reforestation.

The policy of State Forests has become solidly entrenched in Vermont because the people believe in State ownership of large forest areas in the main range of the Green Mountains. The State now owns 14,000 acres of forest land in twelve different localities comprising some of the most beautiful scenery in Vermont. The largest tract is on Mt. Mansfield, the highest mountain in the State, and in Smuggler's Notch, one of the most beautiful spots in Eastern America. This tract consists of 5000 acres, the second largest State forest in New England.

**T**HE work of classifying and opening to homestead entry such lands in the National Forests as are chiefly valuable for agriculture is progressing rapidly. Already over seventy million acres have been covered by field examinations and the final reports acted upon.

Another tract of 3500 acres is situated on Camel's Hump, Vermont's most picturesque mountain. These two areas are of sufficient size to prove an increasingly good investment for the State commercially and scenically. The people are coming to realize that the State forests are their forests, that they may wander through them at will enjoying their many matchless attractions. More lands will be purchased as soon as the right kind of opportunities present themselves. All these forests are accessible and are really and in fact a part of the life of the people.

The campaign of education carried on by the Department and the Forestry Association through numerous lectures, field meetings, excursions and through the press has stimulated a keen and healthy interest in the forest and its problems. It is safe to say that the people of no other State are more interested in their forests than are the people of Vermont.

In coöperation with the State University investigative work has been carried on and several bulletins published giving valuable information, not only to Vermonters, but to all the people of the country who are interested in the questions of forest conservation. Vermont, like the other Eastern States, has become infected with the white pine blister disease. The Department of Forestry has carefully inspected all plantations and has the situation thoroughly in hand. Municipal forests have been made possible by act of the legislature and several cities now have their forests. As soon as the people become familiar with this policy many town forests will undoubtedly result. The Department marks trees for cutting on private lands and has just issued a bulletin on the marketing of private woodlands which should prove a help to private land owners.

Thus, briefly, it may be seen that forestry in Vermont has made rapid strides forward since the establishment of the State department composed of men who are technically trained foresters. Unfortunately, however, politics has been permitted to play too large a part in this progress. Forestry in Vermont has advanced in spite of political interferences. Free from politics one hesitates to say what might have been accomplished. Thirty States have Forestry Departments. In those States where the State Forester is appointed by the Governor or some other political officer, politics has interfered to such an extent that dissatisfaction and inefficiency are widespread, the law disregarded and trouble rampant. The preservation of the forests which we now have, the reforestation of the waste places, the education of the people to the vital need of care and forethought in dealing with the forests—these matters, in a State like Vermont, demand that the persons in charge shall be men technically trained, unhampered by politics and free to work unreservedly and fearlessly for the best interests of the State.

**I**NVESTIGATIONS by the Forest Products Laboratory, at Madison, Wisconsin, have resulted in the use of spent tanbark in the manufacture of asphalt shingles to the extent of 160 tons per week. The value of the bark has been thereby increased from 60 cents to \$2.50 per ton.

## HOW OUR MEMBERS LIKE THE MAGAZINE

"I appreciate your efforts . . . and congratulate you on the improved condition of the magazine—AMERICAN FORESTRY. I am interested in its success, and have felt that the lumbermen generally, as they become better acquainted with the paper, will appreciate the efforts which you have made to place before the reading public the proper view of conservation and development of our timber resources."

MAJOR E. G. GRIGGS,  
*St. Paul and Tacoma Lumber Company,  
Tacoma, Washington.*

"I enjoy Dr. Allen's articles (Bird Department) very much and thoroughly approve of the department, as bird life is inextricably involved in the maintenance of our forests."

MAUNSELL S. CROSBY,  
*Rhinebeck, New York.*

"I wish we could place the AMERICAN FORESTRY magazine in every home in the United States. It is a gem, and will inform the people, if we can get it into their hands."

T. P. LUKENS,  
*343 Waverly Drive,  
Pasadena, California.*

"The magazine now is certainly very interesting both to Forest Service men as well as to the general public, and I hope the circulation will increase in leaps and bounds in the future."

E. C. ERICKSON,  
*Portland, Oregon.*

"The last number of the magazine is better than ever, and that is saying 'a whole lot.'"

DR. W. R. FISHER,  
*Swiftwater, Pennsylvania.*

"The AMERICAN FORESTRY MAGAZINE has come, and it is a beauty and a joy,—thoroughly appreciated."

JOHN L. ROBINSON,  
*Swansboro, North Carolina.*

"Hearty congratulations on the handsome appearance of AMERICAN FORESTRY for November."

ELBERT F. BALDWIN,  
*Editor, The Outlook,  
New York City.*

"Allow me to express the pleasure I receive from the freshness of your magazine, AMERICAN FORESTRY. The students enjoy reading it very much."

PROFESSOR JOSEPH BAILIE,  
*University of Nanking,  
Nanking, China.*

"The magazine is a mine of valuable information pertaining to the subjects taken up, and the illustrations are simply beautiful, and engrossing to study. I would not go on without my AMERICAN FORESTRY MAGAZINE."

MRS. D. WILLARD,  
*Riverside, California.*

"The two issues of AMERICAN FORESTRY that I have received so far have been read from cover to cover. The magazine is instructive and inspiring. I am very much interested in the work of the American Forestry Association and will do anything I can to further it. It should have the hearty support of every patriotic American, since the work is intimately bound up with the welfare of this nation."

I. J. SCHULTE,  
*Chief Accountant, Associated Advertising Clubs of the World,  
Indianapolis, Indiana.*

"AMERICAN FORESTRY is a splendid magazine, full of information and inspiration."

THEODORE WIRTH,  
*Board of Park Commissioners,  
Minneapolis, Minnesota.*

"You have made a great magazine of AMERICAN FORESTRY,—it's of good meat from cover to cover."

CHARLES A. SCOTT,  
*State Forester,  
Manhattan, Kansas.*

"I take great pleasure in testifying to the very great excellence of the publication which has increased in interest with each year of its production."

DR. ELDRIDGE F. CUTLER,  
*Boston, Massachusetts.*

"The magazine is very interesting and my neighbors are all much pleased in reading it."

A. R. BALDWIN,  
*Cazadero, California.*

"I find AMERICAN FORESTRY vastly improved as a magazine and also as a medium for successful forestry propaganda. The magazine itself is the best evidence that you are endeavoring to give us all the best there is in forestry matters and also working hard for forestry extension. I hope you prosper."

C. L. HARRINGTON,  
*Madison, Wisconsin.*

"I wish to express my appreciation of the magazine in its new form. You are certainly doing a great work. Best wishes for a successful year."

WOODBIDGE METCALF,  
*Berkeley, California.*

"The Club has a great many lumbermen and business men who take much interest in this magazine, and to whom it furnishes a great deal of useful information, as the articles in the AMERICAN FORESTRY MAGAZINE are original and full of up-to-date information."

ROME G. BROWN,  
*Minneapolis, Minnesota.*

"I heartily hope for the success of your magazine. Beautiful in itself, it is, in all its departments, doing a noble work for the world."

VIRGINIA L. TOWNSEND,  
*Hunting Heights, Massachusetts.*

"Let me take this opportunity to compliment you most sincerely on the character of the articles and the appearance of AMERICAN FORESTRY. In my opinion it is constantly improving, and it is something to be very proud of. I am very anxious to do anything I can to increase its circulation in our state."

R. C. JONES,  
*Charlottesville, Virginia.*

"Like my friend, Dr. B. E. Fernow here, I am one of the founders of the American Forestry Association, and have watched the progress of its monthly magazine, AMERICAN FORESTRY, from very small beginnings to the fine and well illustrated magazine to which, each month, I look forward with pleasure. May I add my congratulations to those of the many others which you can hardly help receiving from both your own country and ours?"

HONORABLE A. T. DRUMMOND,  
*Toronto, Canada.*

"AMERICAN FORESTRY has begun to arrive and we are certainly delighted with it. The illustrations are very good and its articles are stimulating."

SAMUEL E. ELLIOT,  
*Woods Run Settlement House,  
Pittsburgh, Pennsylvania.*

"I have urged friends to subscribe to your most excellent magazine, which I find more interesting and valuable every year."

G. F. BLUMHARDT,  
*Jersey City, New Jersey.*

"The October number of AMERICAN FORESTRY is what the boys would call a 'humdinger' and impresses me as being the best ever."

F. W. KELSEY,  
*New York City.*

"AMERICAN FORESTRY is getting better and better, especially the October and September issues, which contain some articles of real value, not alone to the layman, but to the forester as well, especially if he is interested in forest economics. I hope that some day Detwiler's tree articles and Allen's bird articles can be gotten out in book form."

EMANUEL FRITZ,  
*Flagstaff, Arizona.*



# THE NATIONAL AGRICULTURAL SOCIETY

FOUR WEST FORTY-FIFTH STREET, NEW YORK

President, JAMES WILSON, Iowa. Vice-President, THEODORE N. VAIL, Vermont  
 G. HOWARD DAVISON, Chairman Executive Committee  
 WALTER A. JOHNSON, Treasurer P. C. LONG, Secretary



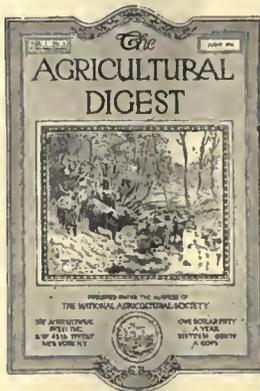
*The National Agricultural Society*

**T**HE HON. JAMES WILSON of Iowa, Secretary of Agriculture in the cabinets of three Presidents, is President of The National Agricultural Society. THEODORE N. VAIL of New York is Vice-President. G. HOWARD DAVISON is Chairman of The Executive Committee.

THE NATIONAL AGRICULTURAL SOCIETY is the first national non-partisan and non-political organization of its kind, affording helpful, profitable co-operation.

Other forms of business have had the benefit of organization, the farmer's profession has drifted along with only the help of local organizations.

This society aims to help those who help themselves. It will PAY YOU fully and well now.



It is in no wise a competitor or antagonist of any other farm paper, but, instead, reviews them all for the common good.

*All its name implies and more.*

THE AGRICULTURAL DIGEST unquestionably fills the greatest existing need in the field of agricultural publishing today.

**BECAUSE:**

six hundred agricultural periodicals, Agricultural bulletins, and new books are analyzed and summarized monthly.

**YOU NEED IT**



*The National Agricultural Society*

Among the organizers of the National Agricultural Society were: the late JAMES J. HILL of St. Paul, GOVERNOR HENRY C. STUART of Virginia, SENATOR JAMES W. WADSWORTH of New York, N. H. GENTRY of Missouri, PETER JANSEN of Nebraska, FRANK O. LOWDEN of Illinois and A. W. FOSTER of California.

*A guarantee of character and service.*

The National Agricultural Society has an advisory board including deans of agricultural colleges, prominent farmers, department of agriculture men and leading editors.

MEMBERS PROFIT AND LEARN WITH THE LEADERS OF THE BEST AGRICULTURAL THOUGHT OF THIS COUNTRY.

*JOIN today in this nation-wide movement. The power rests in a representative membership.*

*Publications valued at more than \$2.*

*It is the great forward movement. The directors are farmers. You can do your part. Please cut out the blank below, now before you forget it.*

40% of the membership fee is for the subscription to THE AGRICULTURAL DIGEST, and the remainder of the fee is devoted to the cost of other publications mailed to members, and to the expenses of the Society



THE HON. JAMES WILSON



**The National Agricultural Society**  
 6-4-A West 45th Street, New York

**MAIL THIS**

I herewith enclose \$2 for membership in THE NATIONAL AGRICULTURAL SOCIETY, with the understanding that I shall receive **The Agricultural Digest** for one year, and other publications issued by the Society, including one other best farm paper.

My name is .....

Address.....



Publications are received without further charge by members of THE NATIONAL AGRICULTURAL SOCIETY, including two high-class papers of a kind that are never sold at reduced prices, or given away. You may select one other from list sent to members

CANADIAN DEPARTMENT

ELLWOOD WILSON, SECRETARY,  
CANADIAN SOCIETY OF  
FOREST ENGINEERS

During the last week in November a deputation composed of representatives of the Canadian Forestry Association, the Canadian Society of Forest Engineers, the Bankers' Association, the Canadian Lumberman's Association, the Insurance Underwriter's Association, the Woodworker's Union, the Carpenter's Union, the Mining Industry, the Railroads, the Fire Protective Association and the Settlers in Northern Ontario, waited on the Hon. Mr. Ferguson, Minister of Lands, Forests and Mines of Ontario and asked him to reorganize and make effective the Forest Fire Protection Department. After the various speakers had finished the Minister stated that he had carefully considered the matter, had consulted with other Provinces, and had decided to reorganize the service and to make it into a separate department under Mr. E. J. Zavitz, Provincial Forester. He promised that he would introduce legislation requiring all settlers to have permits from the fire rangers before burning their clearings, and that he would make all appointments to this service on the basis of merit only and not for political considerations. This will be a long step forward for Ontario and the Minister is to be heartily congratulated on it. This deputation is the culmination of several years' work on the part of the Canadian Forestry Association.

Mr. E. J. Zavitz, who will take charge of this important work, is a technically trained man, one of the first professional foresters in Canada, a member of the Canadian Society of Forest Engineers, the Society of American Foresters and the American Forestry Association. A man of the highest integrity, public spirited and thoroughly capable. He has had charge for many years of the Ontario Government forest tree nurseries and the reforestation work among the farmers and on drifting sands and recently has been Provincial Forester. Under him this fire protection work should attain a high standard and now that his Department will be free from the patronage evil we feel sure he will make a splendid record and wish him all success in his work.

At the meeting of the Technical Section of the Canadian Pulp and Paper Association one of the papers was on the relation of forestry to the pulp and paper industry and there was a very interesting discussion following it. This industry is realizing more and more its absolute dependence on the forests and this means better cutting methods and eventually planting on a large scale.

All the Wild Game You Want

FOR many years we in America have spent much time bemoaning the disappearance of our feathered game. But the fact that we have little game to shoot and little to eat is due solely to our own lack of initiative. We should have an abundance of game in the fields and on the market. We may obtain such an abundance by creating a supply equal to the demand. This can be done by increasing nature's output through game farming. And moreover, the demand may be much greater than at present, and still be easily met.

We have the land available to make America the greatest game producing country in the world. Utilize it, and everyone will have more opportunities to indulge in field sports. There will be more shooting for all of us, whether or not we have access to a preserve, because game that is raised for sporting purposes can not be confined in any restricted area. Wherever game is intensively cultivated, we find improved shooting in all the surrounding territory.

To anyone who has a small amount of land, game farming will prove profitable. The demand for eggs and for breeding stock is much greater than the supply, and will be for years to come. Pheasant eggs sell today at from \$20 to \$25 a hundred. Live birds bring from \$5 to \$7 a pair.

To those who own large acreage, game farming will either provide sport, or profit from those who will pay for sport.

To the city man, it opens the possibility of enjoying good hunting near home.

To everyone who shoots, it will bring increased pleasure afield.

Game farming means an addition to our food supply that will be welcome to all.

But this subject is too big to be properly treated in this space. If you are interested in it, either as a prospective breeder, as a sportsman, or simply because you believe in the movement as constructive and progressive, write for the book, "Game Farming for Profit and Pleasure," which will be sent to you without cost. It tells of the subject in a most interesting and informative manner. It is well worth reading. Fill out the coupon below and a copy will be mailed you at once.

Game Breeding Department, Room 10,  
**HERCULES POWDER CO.**

Manufacturers of Explosives; Infallible and "E. C." Smokeless Shotgun Powders; L. & R. Orange Extra Black Sporting Powder; Dynamite for Farming.

Wilmington, Delaware

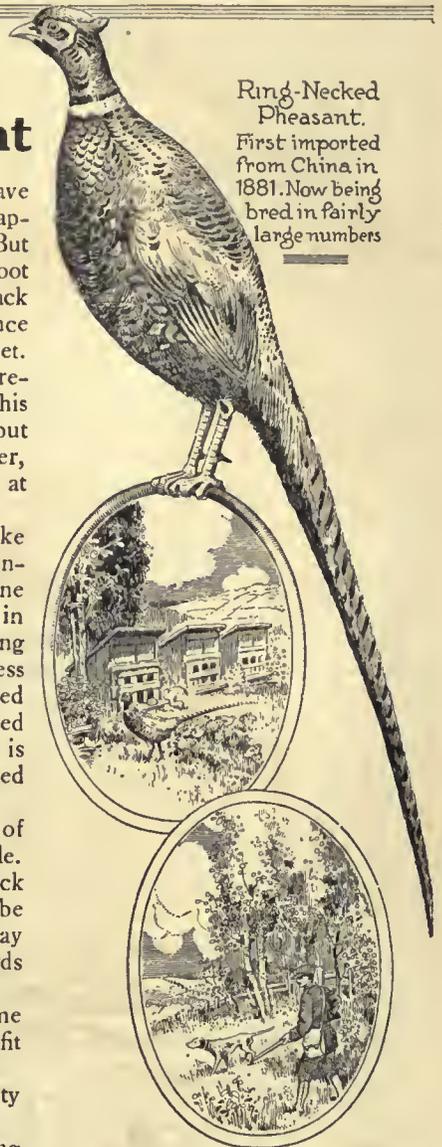


Game Breeding Department, Room 10,  
Hercules Powder Company, Wilmington, Delaware

Gentlemen:—Please send me a copy of Game Farming for Profit and Pleasure. I am interested in game breeding from the standpoint of.....  
Very truly yours,

Name.....

Address.....



Ring-Necked Pheasant.

First imported from China in 1881. Now being bred in fairly large numbers

Honorable H. C. Brewster, the newly elected Premier of British Columbia, has come out flat-footed for civil service principles and the merit system and deserves the highest praise and the congratulations of all good citizens, on his stand. In replying to a letter from the Forestry Association asking him to apply civil service principles to the Forestry Branch, he says, "I note also your intimation that efficient service could be secured best by the entire elimination of the patronage system from the Forest Service. It will be the intention of the new Government to abolish the evils of the patronage system, wherever these have been in evidence, and the Forestry Service will, in no sense, be an exception to this rule."

The membership of the Canadian Forestry Association has increased by 750 new members since last January and its influence and record of accomplishment are constantly growing. The Secretary, Mr. Robson Black, has done most excellent work and his fall lecture tour has been most successful. He is now sending a French-speaking lecturer through the eastern townships of Quebec and he expects to hold a local meeting of the Forestry Association at Sherbrooke.

The appearance of the white pine blister rust in Canada is causing much anxiety and the Forestry Association will urge Dominion action to check it. It is reported that the splendid pine forest planted some forty years ago by the monks at Oka has become infected.

Every year as soon as the snow comes it is the custom and the law that the roads must be marked by trees or poles to show where the road is. The snow becomes so deep and it is so difficult to find the track after a heavy snow or at night that were it not for these guide posts the horses would get off the roads and might not be able to get back. Then too, the roads are all single track and it is necessary to mark the turnouts so that teams coming from opposite directions may arrange where to pass. It has always been customary to use small spruce and balsam trees for this purpose but it is such a wanton waste that a movement is on foot to compel the use of alder, birch and poplar and such species as are of practically no value.

Mr. Piché, Chief Forester of Quebec, has made some very interesting studies during the past summer on cut-over lands of the River Ouelle Pulp and Paper Company, and has laid out some experiments in cutting to be undertaken by them next year. This coming summer he will make some studies on the cut-over lands of the Laurentide Company, Limited, to determine the probable future cut possible.

The Dominion Government Forest Branch have inserted a clause in their cutting contracts requiring the piling and burning of brush, and the Department of Indian Affairs

## Are you on the Mailing List for Catalog of



**Pine and Oak Help Each Other**

## Hicks Nurseries?

It will confirm your decisions on fitting your selection of trees to your soil and climate. It offers trees for dry and acid soils and moist soils in the same region. Many nurseries on alkaline soils do not specialize on oaks and pines.

Trees 20 years old can be selected now. They are guaranteed to grow satisfactorily or replaced free.

**ISAAC HICKS & SON**  
Westbury, Nassau Co., N. Y.

has done the same thing but it is said will make some concession in the way of stumpage reduction to help cover the extra cost.

The Honorable Thomas Dufferin Pattullo has been chosen as Minister of Lands in the new administration formed by the Honorable H. C. Brewster. Mr. Pattullo represents the District of Prince Rupert in the provincial legislature, a section of the country containing considerable forest resources.

The appointment is announced of Messrs. F. A. Sabbaton, Laurentide Company, Ltd., representing the paper industry; Mr. Thorn, Riordon Paper Company, Ltd., the sulphite pulp industry; Mr. Hellin, of the Wayagamac Pulp and Paper Company, Ltd., the sulphate and soda pulp industry; and Mr. G. F. Duncan, the Provincial Paper Company, Ltd., the high grade paper industry, as an advisory committee to co-operate with the Forest Products Laboratories.

## CURRENT LITERATURE

### MONTHLY LIST FOR DECEMBER, 1916

(Books and periodicals indexed in the library of the United States Forest Service.)

#### Forestry as a Whole

Stebbing, Edward Percy. British forestry; its present position and outlook after the war. 257 p. pl. London, John Murray, 1916.

*Proceedings and reports of associations, forest officers, etc.*

Queensland—Department of public lands.

Annual report of the director of forests for the year 1915. 8 p. Brisbane, 1916.

United States—Department of agriculture—

Forest service. Report of the forester, 1916. 36 p. Wash., D. C., 1916.

#### Forest Botany

Stuckey, H. P. The two groups of varieties of the *Hicoria pecan* and their relation to self-sterility. 22 p. il. Experiment, Ga., 1916. (Georgia Agricultural experiment station. Bulletin No. 124.)

#### Forest Ecology

Boerker, Richard Hans. Ecological investigations upon the germination and early growth of forest trees. 89 p. il. pl. Lincoln, Nebr., 1916.

#### Studies of Species

Kapper, O. G. *Kratkaya kharakteristika lyesovodstvennuikh svoistv, otdyel'nuikh lyesnuikh porod* (brief silvical characteristics of forest trees; a reference table). 42 p. Bobrov, 1915.

#### Silviculture

Jolyet, Antoine. *Traité pratique de sylviculture*. 2d ed. 724 p. il. Paris, J. B. Bailliere et fils, 1916.

#### Forest Protection

##### Insects

Minnesota—State entomologist. Special report; work on the white pine blister rust in Minnesota, 1916. 19 p. il. pl. St. Anthony Park, Minn., 1916. (Circular No. 40.)

##### Diseases

Babcock, D. C. Diseases of forest and shade trees. 13 p. il. Wooster, 1916.

Cook, Melville Thurston, and Wilson, Guy West. The influence of the tannin content of the host plant on *Endothia parasitica* and related species. 47 p. New Brunswick, N. J., 1916. (N. J.—Agricultural experiment station. Bulletin 291.)

**Forest Management**

Ferguson, John Arden. Farm forestry. 241 p. pl. N. Y., J. Wiley & Sons, 1916.

**Forest Legislation**

British Columbia—Legislative assembly. An act respecting forests and crown timber lands, and the conservation and preservation of standing timber, and the regulation of commerce in timber and products of the forest. Consolidated for convenience only, July 21, 1916. 59 p. Victoria, B. C., 1916.

Drummond, Nelson L. Game law guide, discussing the New York state conservation law as to forests, fish and game. 374 p. Albany, 1916.

**Forest Utilization****Lumber industry**

Canada—Department of the interior—Forestry branch. Forest products of Canada, 1915: lumber, lath and shingles. 31 p. Ottawa, 1916. (Bulletin 58A.)

Progress publishing company. The "ABC" British Columbia lumber trade directory and year book, 1916-1917. 127 p. Vancouver, B. C., 1916.

Southern logging association. Proceedings of the 6th annual meeting, 1916. 100 p. New Orleans, La., 1916.

United States—Interstate commerce commission. In the matter of rates on and classification of lumber and lumber products; docket No. 8131 and related dockets, statement, brief and argument in behalf of the Southern pine association, Southern cypress manufacturers' association, etc. 61 p. Atlanta, Ga., 1916.

**Wood-using industries**

British Columbia—Department of lands—Forest branch. British Columbia manufacturers of forest products. 16 p. Victoria, B. C., 1916. (Bulletin 19.)

British Columbia—Department of lands—Forest branch. British Columbia red cedar shingles. 2d ed. 16 p. Victoria, B. C., 1916. (Bulletin 18.)

Edgcombe, Chas. R. W. Your garage. 16 p. il. Chicago, Ill., 1916. (National lumber manufacturers' association—Trade extension department. Better buildings No. 1.)

**Wood Preservation**

North coast dry kiln company. The North coast dry kiln. 16 p. il. Seattle, Wash., 1914.

Teesdale, Clyde H. The treatment of wood paving blocks. 16 p. Madison, Wis., 1916.

**Auxiliary Subjects****Conservation of natural resources**

Louisiana—Conservation commission. Report from April 1, 1914, to April 1, 1916. 155 p. pl. Maps. New Orleans, 1916.

**Landscape gardening**

Parsons, Samuel Bowne, Jr. The art of landscape architecture. 347 p. pl. N. Y. and London, 1915.

**Protect the Trees**

**GUARD** them against the ravages of scale, bugs, worms, fungous growths and other plant enemies. The investment in time and money is small—the benefit great.

You get the benefit of 35 years of study when you employ

**DEMING SPRAYERS**

The catalog shows 25 varieties of bucket knapsack barrel and power rigs for shade tree, orchard and garden use. Free on request.

**THE DEMING CO.**

146 Depot St., SALEM, OHIO  
Makers of Deming Hydro-Pneumatic Water Supply Systems



This 40-page catalog is free on request. For ten cents in stamps we will also enclose a 64-page Spraying Guide.

**Hydrography**

Pennsylvania—Water supply commission. Annual report, 1915. 515 p. Harrisburg, Pa., 1916.

Scobey, Fred C. and others. The flow of water in wood-stave pipe. 96 p. il. pl., diags. Washington, D. C., 1916. (U. S.—Department of agriculture. Bulletin 376.)

**It May Save Your Life**

If you are going hunting or fishing in the woods or on the water—the need of dry matches may save your life. "The Excelsior Sportsmen's Belt Safe" made of Brass, Nickel Plated, Gun Metal or oxidized—Waterproof. Furnished complete with Belt and Buckle for \$1.00.



HYFIELD MFG. CO., 48 Franklin St., New York City

**TIMBER CRUISING BOOKLETS**

Biltmore Timber Tables. Including solution of problems in forest finance.

Southern Timber Tables. How to estimate Southern Pine, Southern White Cedar, and Southern Appalachian Timber—Spruce pulpwood, Hemlock bark, Chestnut oak bark, Chestnut tannic acid wood.

Postpaid, 25 cents each

**HOWARD R. KRINBILL**

Forest Engineer

Newbern, N. C.

**PARK and ESTATE FORESTRY**

Logging Reports Utilization Studies  
Timber Estimates Forest Planting  
Etc.

Methods and Cost of Mosquito Eradication

**P. L. BUTTRICK**

Forester and Mosquito Expert  
P. O. Box 607 New Haven, Conn.

FO 1	RE 2	ST 3	RY 4
---------	---------	---------	---------

**THE FOREST IS THREE-FOURTHS OF FORESTRY**

Your opportunities are as unlimited as our forests if you study at

**WYMAN'S SCHOOL OF THE WOODS**  
Incorporated Munising, Michigan

## KELSEY FORESTRY SERVICE

TIMBER ESTIMATING, FOREST MANAGEMENT, FORESTRY PLANTING, ETC.  
Expert service at reasonable cost. This Department in charge of D. E. Lauderburn, Forest Engineer.

FORESTRY STOCK. All varieties of Deciduous and Evergreen material used in Forestry Planting. Our "Quality First" stock and "your requirements furnished complete." Write for Quotation on your list.

F. W. Kelsey Nursery Company  
150 BROADWAY, NEW YORK.

## HILL'S

Seedlings and Transplants

Also Tree Seeds

FOR REFORESTING

BEST for over a half century. All leading hardy sorts, grown in immense quantities. Prices lowest. Quality highest. Forest Planter's Guide, also price lists are free. Write to-day and mention this magazine.

THE D. HILL NURSERY CO.

Evergreen Specialists  
Largest Growers in America

BOX 501 DUNDEE, ILL.

## Forestry Seeds

For many years I have been in complete charge of the Seed business of THOMAS MEEHAN & SONS, and as they are discontinuing the business, I am taking it over and I will conduct it in the future in my own behalf.

I will offer a most complete list of seeds for forestry purposes. My catalogue contains a full list of varieties as well as much valuable information relating to seeds and planting. It will interest you. Send for a copy.

THOMAS J. LANE  
Tree Seedsman  
DRESHER, PA., U. S. A.

## Nursery Stock for Forest Planting

Seedlings	TREE SEEDS	Transplants
\$2.25	Write for prices on	\$6.00
per 1000	large quantities	per 1000

THE NORTH-EASTERN FORESTRY CO.  
CHESHIRE, CONN.

## Orchids

We are specialists in Orchids, we collect, import, grow, sell and export this class of plants exclusively. Our illustrated and descriptive catalogue of Orchids may be had on application. Also special list of freshly imported unestablished Orchids.

LAGER & HURRELL

Orchid Growers and Importers SUMMIT, N. J.

## PHILIP T. COOLIDGE FORESTER

Stetson Bldg., 31 Central Street, Bangor, Me.  
Management and Protection of Woodlands  
Improvement Cuttings, Planting, Timber  
Estimates and Maps. Surveying

United States—Congress—Senate—Committee on commerce. River regulation, flood control and water conservation and utilization; hearings on S. 5736. 154 p. Wash., D. C., 1916. (64th congress—1st session. Senate doc. No. 550.)

### Roads

United States—Laws, statutes, etc. The federal aid road act; summary of the federal aid road act of July 11, 1916, the rules and regulations thereunder, together with an article by Secretary of Agriculture David F. Houston on "The government and good roads." 26 p. Wash., D. C., 1916. (64th congress—1st session. Senate document No. 548.)

### Periodical Articles

#### Miscellaneous periodicals

American city, Oct., 1916.—Protection of forest lands from fire, by Wm. L. Hall. p. 369-73.

Botanical gazette, Oct., 1916.—Ginkgo and the microsporangial mechanisms of the seed plants, by Edward C. Jeffrey and R. E. Torrey, p. 281-92; the staining of wood fibers for permanent microscopic mounts, by H. N. Lee, p. 318-19.

Breeder's gazette, Nov. 30, 1916.—Longhorns and buffaloes, by Will C. Barnes, p. 1020-1022.

Country gentleman, Nov. 18, 1916.—Forest planting in the corn belt, by H. T. Morgan, p. 2009.

Country gentleman, Dec. 2, 1916.—Repairing trees on the home grounds, p. 2082-3.

Country life in America, Dec., 1916.—The battle along the timberline, by Enos Mills, p. 25-8; Live trees for Christmas, p. 36-7; On the trail of the mistletoe, by Robert Sparks Walker, p. 51; The yews, by Leonard Barron, p. 52.

Countryside magazine, Sept., 1916.—The arrangement of tree planting on the home grounds, by Garrett M. Stack, p. 115; Trees for various purposes and conditions; a table, by Garrett M. Stack, p. 116.

Geographical review, Nov., 1916.—Das urwaldphanomen Amazoniens: eine geographische studie, by Ludwig Koegel: Review, p. 390; La fixation des dunes de Gascogne, by Edouard Harlé: Review, p. 394.

Harper's magazine, Dec., 1916.—Coral Islands and mangrove trees, by Richard Le Gallienne, p. 81-90.

International review of agricultural economics, Sept., 1916.—Italian forest policy and the results obtained in relation to the conservation and restoration of forests, p. 108-17.

Journal of heredity, Sept., 1916.—The white-barked pine, by D. F. Higgins, p. 399-401; Pollination in the pine, p. 402-5.

Journal of the college of agriculture, Tahoku imperial university, 1916.—Ueber die hebung der privatforstwirtschaft Japans, by Otokuma Shishido, p. 1-99.



## SUPERIOR ENGRAVINGS

FOR ALL PURPOSES

DESIGNERS AND  
ILLUSTRATORS

HALFTONES · LINE CUTS  
3 COLOR PROCESS WORK  
ELECTROTYPES

NATIONAL ENGRAVING CO.

506-14th Street, N.W.  
WASHINGTON, D. C.

Phone Main 8274

## FOREST NURSERIES

PINE

SPRUCE

Evergreen trees for forest planting in any quantity, from 100 trees to carload lots.

WE GROW OUR OWN TREES

Write us for catalogue

KEENE FORESTRY ASSOCIATION

KEENE, N. H.

AMERICAN NUT JOURNAL Only national publication of the kind. Monthly; comprehensive; highly endorsed. \$1.25 per year. Advertising \$1.00 per inch. Rochester, N. Y.

WANTED An experienced Tree Mover. Also men wanted to learn the tree moving business.

LEWIS AND VALENTINE CO.

Roslyn, Long Island New York

Journal of the New York botanical gardens, Sept., 1916.—The intermittent annual growth of woody plants, by A. B. Stout, p. 147-52; A white pine planting, by N. L. Britton, p. 152-4; Injury to evergreens, by George V. Nash, p. 179-85.

## Pull Big Stumps by hand



Showing  
easy lever  
operation

Clear your stump land cheaply—no digging, no expense for teams and powder. One man with a K can rip out any stump that can be pulled with the best inch steel cable. Works by leverage—same principle as a jack. 100 pounds pull on the lever gives a 48-ton pull on the stump. Made of Krupp steel—guaranteed against breakage. Endorsed by U. S. Government experts.



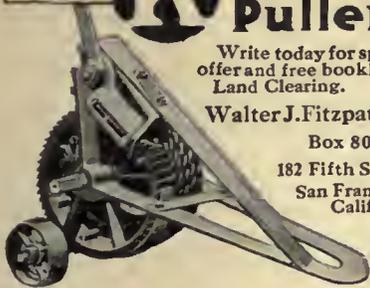
HAND POWER  
**Stump  
Puller**

Write today for special offer and free booklet on Land Clearing.

Walter J. Fitzpatrick

Box 80

182 Fifth Street  
San Francisco  
California



## TENDERS FOR PULPWOOD and PINE LIMIT

Tenders will be received by the undersigned up to and including the 1st day of February, 1917, for the right to cut pulpwood and pine timber on a certain area situated on the Black Sturgeon River and other territory adjacent thereto, in the District of Thunder Bay.

Tenderers shall state the amount per cord on pulpwood, and per thousand feet board measure, on pine, that they are prepared to pay as a bonus in addition to dues of 40 cents per cord for spruce, and 20 cents per cord for other pulpwoods, and \$2.00 per thousand feet, board measure, for pine, or such other rates as may from time to time be fixed by the Lieutenant-Governor-in-Council, for the right to operate a pulp mill and a paper mill on or near the area referred to.

Such tenderers shall be required to erect a mill or mills on or near the territory and to manufacture the wood into pulp and paper in the Province of Ontario.

Parties making tender will be required to deposit with their tender a marked cheque, payable to the Honourable the Treasurer of the Province of Ontario, for ten thousand dollars (\$10,000), which amount will be forfeited in the event of their not entering into agreement to carry out conditions, etc. The said \$10,000 will be applied on account of bonus dues as they accrue, but the regulation dues, as mentioned above, will require to be paid in the usual manner as returns of cutting of wood and timber are received.

The highest or any tender not necessarily accepted.

For particulars as to description of territory, capital to be invested, etc., apply to the undersigned,

G. H. FERGUSON,

Minister of Lands, Forests and Mines. Toronto  
1916.

N. B.—No unauthorized publication of this notice will be paid for.

Journal of the Washington academy of science, Nov. 19, 1916.—Moreh oak, a new name for *Quercus morchus*, by W. H. Lamb, p. 657-8.

National wool grower Nov., 1916.—Artificial reseeding of range lands, by Arthur W. Sampson, p. 23-5.

Nation's business, Nov., 1916.—How Uncle Sam's woodlot helps pay for its keep; a story in pictures, p. 24-5.

Nature study review, Dec., 1916.—The cottonwood, by G. H. Brettnall, p. 401-3.

Outing magazine, Nov., 1916.—Glimpse of the ranger, by W. P. Lawson, p. 174-85.

Outlook, Oct. 11, 1916.—The forests of France, p. 301-2.

Plant world, Oct., 1916.—Improvements in the method for determining the transpiring power of plant surfaces by hygrometric paper by Burton E. Livingston and Edith B. Shreve, p. 287-309.

Popular mechanics, Dec., 1916.—Machine plants thousands of trees in day's time, p. 804-5; Soldier-woodmen cut England's forests, p. 866-7.

Reclamation record, Dec., 1916.—Improving the national forest range, p. 565-7.

Rhodora, Dec., 1916.—*Pinus banksiana* on Nantucket, by E. P. Bicknell, p. 241-2.

Scientific American, Oct. 28, 1916.—The traveler's tree; a popular misconception, p. 392.

Scientific American, Nov. 18, 1916.—Mistletoe, an insidious pest, to be exterminated, p. 400.

### Trade journals and consular reports

American lumberman, Nov. 18, 1916.—Expert tells engineers of cause of wood decay, by C. J. Humphrey, p. 32; Special wood blocks tried out in Toledo, p. 32; Wooden wharves proved economically best, p. 35.

American lumberman, Nov. 25, 1916.—The present and future of the lumber industry, by R. B. Goodman, p. 33-4.

American lumberman, Dec. 2, 1916.—How does sap ascend the body of the tree, p. 28; Take steps to prevent spread of blister rust, p. 35.

American lumberman, Dec. 9, 1916.—Report of Federal trade commission on export lumber trade, p. 1, 33-4; The tree killing beetles of California and possible remedies, by Stewart Edward White, p. 30-1.

Barrel and box, Oct., 1916.—Box shooks in India, H. P. MacMillan, p. 35; Cost data on shell boxes, p. 35.

Canada lumberman, Nov. 15, 1916.—Nova Scotia's revival in shipbuilding, by Elihu Woodworth, p. 25; Transportation of big logs by flumes, by W. D. Starbird, p. 30-2; Timber trade of the British Empire, by Percy Groom, p. 40-2.

Canada lumberman, Dec. 1, 1916.—Work of Canadian forestry battalion, p. 28-9; Preservation of fir stringers and ties, by O. P. M. Goss, p. 32-3.

Engineering news, Oct. 5, 1916.—Creosoted timber floor fire racks Missouri bridge, p. 670-1.

## Forest Insects cause Forest Fires

Great fires in virgin forests usually occur in dead INSECT KILLED TIMBER during dry seasons. Accumulated ground litter and everpresent standing dead, injured and pitchy trees furnish ample fuel to lead the flames into green timber. This necessary fuel largely results from the continuous and intermittent attack of DESTRUCTIVE FOREST INSECTS upon the roots, base, trunks, limbs, branches, twigs and buds of trees throughout their entire life. Forest fires in green timber increase the INSECT RISK by concentrating insect attack and reducing the number of beneficial insects. Avoid your constant annual loss. Reduce your fire risk. Control the insects responsible. It is good business. Efficient inspection of Parks, Watersheds, Estates and Timberlands. Control methods outlined. Control costs estimated. Control work conducted economically.

### BARTLE T. HARVEY

Consulting Forest Entomologist

MISSOULA, MONTANA



## THE MACKENSEN GAME PARK

Bob White  
Pheasants  
Partridges  
Quail  
Wild Turkeys  
Deer  
Rabbits



Peafowl  
Cranes  
Swans  
Ornamental Geese and Ducks  
Foxes  
Raccoons

Everything in wild animals, game, fancy birds for parks, menageries, private preserves and collections of fancy fowl.

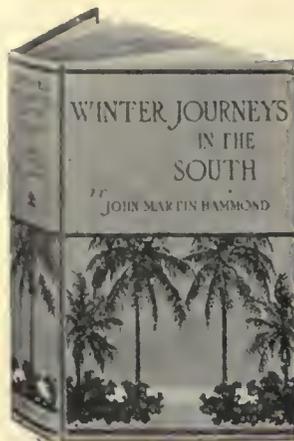
WM. J. MACKENSEN, Yardley, Pa.

Gulf coast lumberman, Dec. 1, 1916.—Forests necessary in war; what wood means to the warring nations of Europe at present, p. 28.

Hardwood record, Nov. 25, 1916.—The industrial future of oak, p. 24-5; The oak boosters of the Spessart, J. M. W., p. 28-9; Standardizing oak finishes, by W. K. S., p. 30-1.

Hardwood record, Dec. 10, 1916.—The pedigree of a splendid tree, p. 18; Wood for artificial limbs, p. 41; Eastern woods in western vehicles, p. 41-2.

## NEW LIPPINCOTT BOOKS



### Winter Journeys in the South

By JOHN MARTIN HAMMOND

64 illustrations. Octavo. Cloth. Net, \$3.50

The kingdoms of wonder for the golfer, the automobilist and almost every other type of pleasure-seeker are revealed in this book. Mr. Hammond is an enthusiastic traveller and a skilful photographer. He believes in the pleasure that may be found in America. He has wandered about the South from White Sulphur to Palm Beach; Aiken, Asheville, Charleston, New Orleans, and many other places of fascinating interest have been stopping points upon his journeyings.

### Parks: Their Design, Equipment and Use

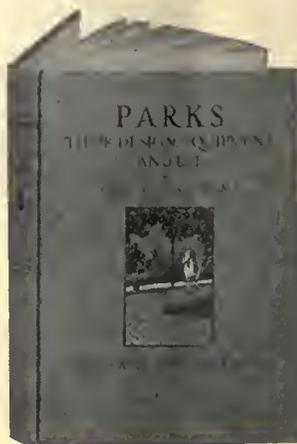
By GEORGE BURNAP, B.S., M.A.

Landscape Architect of Public Buildings and Grounds,  
Washington, D. C.

With an Introduction by RICHARD B. WATROUS,  
Secretary American Civic Association

Frontispiece in color. 163 illustrations and four diagrams. Large 8vo. Decorated cloth. Net, \$6.00

The magnificent volume is primarily for landscape architects, and executives having the development of parks in charge, but it will also appeal directly to all who delight in the problems of bringing nature to the service of man. The sub-title, "Their Design, Equipment and Use," presents the plan of the work. The author believes in principles of design, in equipment that enters into the design, in use of the widest possible scope, so as to be of value to all people of the community and of satisfaction to all tastes. His style is stimulating to such a degree that the layman's very soul is awakened to new beauties and joys in the work his city has done in the preparation of squares and large open places.



### Tree Wounds and Diseases: Their Prevention and Treatment

By A. D. WEBSTER

32 full page plates and other illustrations, Large 8vo. Net, \$2.50

It is now a well appreciated fact that shade and forest trees need the doctor as much as do human beings and livestock.

When left to themselves, cavities or hollows in trees gradually increase in size until the ascending sap is entirely cut off and the tree ruined. The same dire results follow from the neglect of injured bark, poor pruning, fungus growth, bad soil and atmosphere effects and diseased branches. The author tells you how to go about their cure and how to take preventive precautions.

### Practical Book of Early American Arts and Crafts Net, \$6.00

By Harold D. Eberlein & Abbot McClure with its 250 illustrations will delight and instruct all lovers of old pewter, silver, wood, needlework, glass, etc., etc., of early Americans. The professional or amateur collector will find it a treasure. Artistically bound. Boxed.

### Rings Net, \$6.00

By George F. Kunz, Ph.D., contains about 250 illustrations. It tells the story and romance of rings in all ages and climes. Nearly everything you may wish to know about rings is here. Handsome gift binding. Boxed.

### Practical Book of Architecture 225 illustrations. Net, \$6.00

By C. Matlack Price, is just the gift for anyone who contemplates building or for the architect. It is not a technical work, but at the same time describes the various styles and furnishes practical information covering the whole subject.

### Joseph Pennell's Pictures of the Wonder of Work Net, \$2.00

Fifty-two reproductions of Pennell's remarkable drawings of giant bridges, skyscrapers, railway stations, etc. There is an inspiring introduction to each picture.

**J. B. LIPPINCOTT COMPANY PUBLISHERS  
PHILADELPHIA**

Journal of electricity, power and gas, Nov. 11, 1916.—Electric power transmission in logging, by Allen E. Ransom, p. 374-5.

Journal of electricity, power and gas, Nov. 18, 1916.—Electric vs. steam logging, by W. D. Peaslee, p. 389-93.

Journal of industrial and engineering chemistry, Dec., 1916.—The relation between the toxicity and the volatility of creosote oils, by Ernest Bateman, p. 1094-5. Lumber world review, Dec. 10, 1916.—Conditions in the lumber industry, by E. B. Hazen, p. 21-2.

Paper, Nov. 29, 1916.—The paper institutions of Europe, by Olivier Rolland, p. 13-14; World's pulp and paper markets, by George F. Steele, p. 19, 22.

Paper, Dec. 6, 1916.—Forestry and pulp mill operations, by Ellwood Wilson, p. 13-15; Newsprint made of groundwood alone, by A. H. Lefebvre, p. 22.

Paper trade journal, Nov. 30, 1916.—Canadian pulp wood and pulp statistics, p. 44.

Pioneer western lumberman, Nov. 15, 1916.—Lumbering operations of Mitsui and company in Japan, p. 12-15.

Pioneer western lumberman, Dec. 1, 1916.—Osborne fire finder goes to Washington for exhibit purposes, p. 21.

St. Louis lumberman, Nov. 15, 1916.—Saw mill waste from tapered logs, p. 10; Increased efficiency in felling and bucking, by Paul E. Freydidg, p. 16-17; Pulp wood billets and Newton's law; gravity logging in the Blue Ridge, by J. B. Woods, p. 46; Co-operating on hardwood grading rules, p. 72.

St. Louis lumberman, Dec. 1, 1916.—The way of the Rocky mountain logger, by J. B. Woods, p. 53.

Southern lumber journal, Nov. 15, 1916.—Timberland taxation, by S. M. Nickey, p. 37.

Telephone review, Dec., 1916.—The telephone in the forest fire war, by E. R. Stonaker, p. 343-7.

Timber trade journal, Oct. 28, 1916.—The seasoning of home-grown timber, p. 686.

Timber trade journal, Nov. 18, 1916.—Plane trees and throat trouble, by A. D. Webster, p. 802; The kauri gum industry of New Zealand, p. 829.

Timberman, Nov., 1916.—Annual meeting of the Western forestry and conservation association, p. 28-47.

United States daily consular report, Nov. 23, 1916.—A new Argentine dye material, by W. Henry Robertson, p. 731.

United States daily consular report, Nov. 29, 1916.—The paper situation in Brazil, by Alfred L. Gottschalk, p. 805-7.

United States daily consular report, Dec. 7, 1916.—Pulp wood on Crown lands in New Brunswick, p. 910-11.

United States daily consular report, Dec. 12, 1916.—Norwegian wood pulp and paper mills combine, by E. Haldeman Dennison, p. 973.

West Coast lumberman, Nov. 15, 1916.—Analysis of wooden ship-building industry in Oregon and Washington, by Howard B. Oakleaf, p. 22-3, 33; Washington consumes 781,646,745 feet of sawed lumber annually, by Clark W. Gould, p. 27-32.

West Coast lumberman, Dec. 1, 1916.—Washington woods ideal for many uses in foundries and factories, by Howard B. Oakleaf, p. 24-8; Distribution, production, properties and uses of western white pine, p. 29.

Wood preserving, Oct.-Dec., 1916.—Wood preserving plants in the vicinity of New York, p. 75-9; Use of fluorides in wood preservation, by C. H. Teesdale, p. 80-1; An experiment in the preservative treatment of fence posts, by Morris Greenberg, p. 91-2.

Woodworker, Nov., 1916.—Furniture making in New England, by H. R. West, p. 23-4; The manufacture of wood mosaic flooring, by Wm. Clark, p. 39-40.

*Forest journals*

Canadian forestry journal, Nov., 1916.—In Scotland with the Canadian forestry battalion, by D. H. Smith, p. 800-2; Better protection for western forests, p. 804-6; New ways of taking dollars from forest waste, by Frank J. Hallauer, p. 809-11; Developing the forests of Japan, by A. Nakai, p. 815.

Hawaiian forester and agriculturist, Sept., 1916.—The first algaroba and royal palm in Hawaii, by C. S. Judd, p. 330-5.

Hawaiian forester and agriculturist, Sept., 1916.—Arbor day in Hawaii, by C. S. Judd, p. 377-81; Australian red cedar, a new tree introduction, by C. S. Judd, p. 382.

North woods, Nov., 1916.—Work wonders with wood, p. 8.

Quarterly journal of forestry, Oct., 1916.—Woodland ash, by Hugh R. Beevor, p. 249-53. Present prospects of growing timber for profit, by J. Goucher, p. 264-72; Plantations on Dorset downs, by Alfred Pope, p. 294-7; Planting on the south downs, by Alexander R. Lawson, p. 297-301; The late Mr. A. T. Gillanders, p. 305-13; Income tax on woodlands, by M. C. Duchesne, p. 314-18; The relationship of the state to private woodlands, by A. Schwappach, p. 319-33.

Revue des eaux et forêts, Sept. 1, 1916.—M. Bert, by J. Madelin, p. 249-57.

Revue des eaux et forêts, Oct. 1, 1916.—La destruction des forêts et les droits légitimes des Alliés, by Roulleau de la Roussière, p. 278-85; A propos de Pinus murrayana, by R. Hickel, p. 286-7.

Tree talk, Aug., 1916.—How nature plants trees, p. 4-5; The American elm, p. 7-8; A big tree planting operation, p. 14-15.

Tree talk, Dec., 1916.—Adornment of home grounds, p. 37-40; Birds and trees, by B. S. Bowdish, p. 43-6; Curious facts about the cypress, by Katherine Sanley Nicholson, p. 51-2.



Engineer Chris McGinnis of the Santa Fe, California Limited. He has carried a Hamilton for years with perfect satisfaction.

THE railroad man chooses the Hamilton Watch because he cannot run the risk of having the wrong time. When you are sufficiently weary of a faulty watch, ask your jeweler to show you a real timekeeper—the Hamilton.



Hamilton movements alone, to fit your present watch case, cost \$12.25 (\$13.00 in Canada) and up. Cased watches range from \$25.00 up to \$150.00 for the Hamilton Masterpiece in 18k heavy gold case.

# Hamilton Watch

"The Watch of Railroad Accuracy"

Write for Hamilton Watch Book, "The Timekeeper"

A reading of this book gives you a new perspective on watches and watch buying. In it are pictured and described all the Hamilton models.

**HAMILTON WATCH COMPANY**  
Dept. 39 Lancaster, Pennsylvania

## Protect Your Trees

DON'T take chances with your young trees. One rabbit will kill many in a single night. Mice and cut worms will damage and destroy them if you don't protect them. Get dollars' worth of protection at a fraction of a cent cost by using

### Hawkeye Tree Protectors

Absolute protection against gnawers and borers. Prevent trees from becoming skinned and bruised by cultivator or lawn mower. Made of elm veneer, chemically treated. Easily put on and will last until tree is beyond needing protection. Don't wait until some of your trees are killed—order Hawkeye Protectors now. Regular size 10 inches wide, 20 inches high. Price in crates of 100 tree protectors, 1c each; 10 lots of 1000, 3/4c each.

Write for circular and sample.

**BURLINGTON BASKET FACTORY**  
300 Main St., Burlington, Iowa



## Do Business by Mail

It's profitable, with accurate lists of prospects. Our catalogue contains vital information on Mail Advertising. Also prices and quantity on 6,000 national mailing lists, 99% guaranteed. Such as:

- War Material Mfrs.
- Cheese Box Mfrs.
- Shoe Retailers
- Contractors
- Druggists
- Wealthy Men
- Axle Grease Mfrs.
- Auto Owners
- Tio Can Mfrs.
- Farmers, Etc.

Write for this valuable reference book; also prices and samples of fac-simile letters. Have us write or revise your Sales Letters.

Ross-Gould, 1009 C Olive St.

**Ross-Gould**  
Mailing Lists St. Louis



## WE MAKE THE ENGRAVINGS

FOR THE AMERICAN FORESTRY MAGAZINE

OUR SPECIALTY IS THE "BETTER GRADE FINISH OF DESIGNS & ENGRAVINGS IN ONE OR MORE COLORS FOR MAGAZINES CATALOGUES ADVERTISEMENTS ETC

- HALF TONES
- DULLO-TONES
- COLOR PROCESS
- LINE PLATES
- COMBINATION LINE AND HALF TONES
- MULTI-COLORS

—ESTABLISHED 1889—  
**GATCHEL & MANNING**  
SIXTH AND CHESTNUT STREETS  
OPPOSITE OLDE INDEPENDENCE HALL  
PHILADELPHIA

# ATTENTION FORESTERS

AMERICAN FORESTRY will print, free of charge in this column, advertisements of foresters wanting positions, or of persons having employment to offer foresters

**WANTED**—Work during the summer by a young man starting to study forestry. Would accept place of any kind where practical experience could be obtained. Free June 15. Best references, Address W. W. J. care of AMERICAN FORESTRY, Washington, D. C.

**POSITION**—Young man (33), single, seven and a-half years' technical training. Will consider position as City Forester, Park Superintendent, Superintendent of Private Estate or Consulting Landscape Architect for railroad. Education consists of post-graduate work in prominent middle-western school of forestry, supplemented by several years post-graduate work in recognized school of landscape design in the East. Experienced in public and private forestry, including work in the Forest Service, the various phases of municipal forestry such as extension work, and tree surgery; and also the designing of parks, playgrounds, and private estates. References given and required, Address XYZ, care of AMERICAN FORESTRY.

**GRADUATE FORESTER** wants position along any line in forestry, surveying, etc. Have had experience with both U. S. Forest Service and private concerns. Am willing to start at bottom to prove my worth. Can give good references. Address Box 34, care of AMERICAN FORESTRY. (11-1)

**WANTED** a position, preferably in or around Massachusetts, by a Harvard graduate, 24 years old. Has specialized in both fungus and insect diseases of plants. Address Box 36, care of AMERICAN FORESTRY. (11-1)

**PRACTICAL WOODSMAN AND FOREST ENGINEER** with thorough experience this country and Europe will take charge of forested estate or game preserve. An expert in managing and improving woodlands, and can show results. Highest references as to character, training, and ability. Address Woods Superintendent, Care AMERICAN FORESTRY MAGAZINE, Washington, D. C.

**YOUNG MAN** (28), single, technical education, five years' general engineering experience, as instrument man and computer, on surveys, and as inspector and superintendent on construction. Also field and office experience with U. S. Forest Service. Capable of taking charge of party; desires position with forester or lumber firm. Address Box 32, care of AMERICAN FORESTRY, Washington, D. C.

**YOUNG MAN** (19) wishes position where he can learn "Tree Surgery." Would accept place of any kind where practical experience could be obtained. Not afraid of hard work. Address Box 18, care of AMERICAN FORESTRY. (11-1)

**WANTED**—Work during the spring and summer by a young man starting to study forestry. Best of references. Box 37, care of AMERICAN FORESTRY. (1-3)

**POSITION WANTED**—Young man with five years experience in orchard work, tree surgery and agricultural blasting. Some technical education. Opportunity to prove ability of more concern than remuneration. Will go anywhere any time. Box 38, care of AMERICAN FORESTRY, Washington, D. C. (1-3)

**A YOUNG MAN** who has been the head of a successful arboricultural and orchard rejuvenating concern for three years, desires to associate with an individual or a company owning orchards. The reason is to obtain a more thorough knowledge of the work and the salary is a secondary consideration. An able business man. Age 26. Address Box 29, care of AMERICAN FORESTRY, Washington, D. C.

## TIMBER FOR SALE

### 12,000 ACRES HARDWOOD TIMBER AND LAND

Northeast Louisiana, about 7,000 feet mixed hardwoods to acre. Fine land; solid body; 3 miles of railroad. Price \$17.50 per acre, easy terms. Address Box 300, care of AMERICAN FORESTRY, Washington, D. C.

# BOOKS ON FORESTRY

AMERICAN FORESTRY will publish each month, for the benefit of those who wish books on forestry, a list of titles, authors and prices of such books. These may be ordered through the American Forestry Association, Washington, D. C. Prices are by mail or express prepaid.\* :: :: :: ::

AMERICAN BOYS' BOOK OF BUGS, BUTTERFLIES AND BEETLES.....	\$2.00
FOREST VALUATION—Filibert Roth.....	1.50
FOREST REGULATION—Filibert Roth.....	2.00
PRACTICAL TREE REPAIR—By Elbert Pects.....	2.00
THE LUMBER INDUSTRY—By R. S. Kellogg.....	1.10
LUMBER MANUFACTURING ACCOUNTS—By Arthur F. Jones.....	2.10
FOREST VALUATION—By H. H. Chapman.....	2.00
CHINESE FOREST TREES AND TIMBER SUPPLY—By Norman Shaw.....	2.50
TREES, SHRUBS, VINES AND HERBACEOUS PERENNIALS—By John Kirkegaard.....	1.50
TREES AND SHRUBS—By Charles Sprague Sargent—Vols. I and II, 4 Parts to a Volume—per Part.....	5.00
THE TRAINING OF A FORESTER—Gifford Pinchot.....	1.35
LUMBER AND ITS USES—R. S. Kellogg.....	1.15
THE CARE OF TREES IN LAWN, STREET AND PARK—B. E. Fernow.....	2.17
NORTH AMERICAN TREES—N. L. Britton.....	7.30
KEY TO THE TREES—Collins and Preston.....	1.50
THE FARM WOODLOT—E. G. Cheyney and J. P. Wentling.....	1.70
AMERICAN FOREST TREES—Henry H. Gibson.....	6.00
IDENTIFICATION OF THE ECONOMIC WOODS OF THE UNITED STATES—Samuel J. Record.....	1.25
PLANE SURVEYING—John C. Tracy.....	3.00
FOREST MENSURATION—Henry Solon Graves.....	4.00
THE ECONOMICS OF FORESTRY—B. E. Fernow.....	1.61
FIRST BOOK OF FORESTRY—Filibert Roth.....	1.10
PRACTICAL FORESTRY—A. S. Fuller.....	1.50
PRINCIPLES OF AMERICAN FORESTRY—Samuel B. Green.....	1.50
SEASIDE PLANTING OF TREES AND SHRUBS—Alfred Gaut.....	1.75
FAMILIAR TREES—G. S. Boulger.....	1.50
MANUAL OF THE TREES OF NORTH AMERICA (exclusive of Mexico)—Charles Sprague Sargent.....	6.00
AMERICAN WOODS—Romeyn B. Hough, 13 Volumes, per Volume.....	5.00
HANDBOOK OF THE TREES OF THE NORTHERN U. S. AND CANADA, EAST OF THE ROCKY MOUNTAINS—Romeyn B. Hough.....	6.00
GETTING ACQUAINTED WITH THE TREES—J. Horace McFarland.....	1.75
PRINCIPAL SPECIES OF WOOD: THEIR CHARACTERISTIC PROPERTIES—Charles Henry Snow.....	3.50
NORTH AMERICAN FORESTS AND FORESTRY—E. R. Bruncken.....	2.00
HANDBOOK OF TIMBER PRESERVATION—Samuel M. Rowe.....	4.00
TREES OF NEW ENGLAND—L. L. Dame and Henry Brooks.....	1.50
TREES, SHRUBS AND VINES OF THE NORTHEASTERN UNITED STATES—H. E. Parkhurst.....	1.50
TREES—H. Marshall Ward.....	1.50
OUR NATIONAL PARKS—John Muir.....	1.91
THE LONGLEAF PINE IN VIRGIN FOREST—G. Frederick Schwarz.....	.75
LOGGING—Ralph C. Bryant.....	3.50
THE IMPORTANT TIMBER TREES OF THE UNITED STATES—S. B. Elliott.....	2.50
FORESTRY IN NEW ENGLAND—Ralph C. Hawley and Austin F. Hawes.....	3.50
THE PRINCIPLES OF HANDLING WOODLANDS—Henry Solon Graves.....	1.50
SHADE TREES IN TOWNS AND CITIES—William Solotaroff.....	3.00
THE TREE GUIDE—By Julia Ellen Rogers.....	1.00
FOREST PHYSIOGRAPHY—By Isaiah Bowman.....	5.00
MANUAL FOR NORTHERN WOODSMEN—Austin Cary.....	2.12
FARM FORESTRY—Alfred Akerman.....	.57
THE THEORY AND PRACTICE OF WORKING PLANS (in forest organization)—A. B. Recknagel.....	2.10
ELEMENTS OF FORESTRY—F. F. Moon and N. C. Brown.....	2.20
MECHANICAL PROPERTIES OF WOOD—Samuel J. Record.....	1.75
STUDIES OF TREES—J. J. Levison.....	1.75
TREE PRUNING—A. Des Cars.....	.65
THE PRESERVATION OF STRUCTURAL TIMBER—Howard F. Weiss.....	3.00
THE PRACTICAL LUMBERMAN—By Bernard Brereton (third edition).....	1.50
SEEDING AND PLANTING IN THE PRACTICE OF FORESTRY—By James W. Toumey, M.S., M.A.....	3.50
FUTURE FOREST TREES—By Dr. Harold Unwin.....	2.25
FIELD BOOK OF AMERICAN TREES AND SHRUBS—F. Schuyler Mathews.....	2.00
(In full leather).....	2.50
FARM FORESTRY—By John Arden Ferguson.....	1.30
LUTHER BURBANK—HIS METHODS AND DISCOVERIES AND THEIR PRACTICAL APPLICATION.....	48.00
(In twelve volumes, beautifully illustrated in color)	
THE BOOK OF FORESTRY—By Frederick F. Moon.....	1.75
OUR FIELD AND FOREST TREES—By Maud Going.....	1.50
HANDBOOK FOR RANGERS AND WOODSMEN—By Jay L. B. Taylor.....	2.50

\* This, of course, is not a complete list, but we shall be glad to add to it any books on forestry or related subjects upon request.—EDITOR.

**A Practical Service**

More than two hundred applications have been received for service in Forest Extension Work by The New York State College of Forestry during the present winter. These include calls for practical demonstrations of woodlot improvement, planting of idle lands, preservation of farm timbers, and for illustrated lectures before High Schools, Granges, Commercial organizations and Clubs of various natures.

**Empire State Forest Products Association Meets at Syracuse, New York**

Various angles of the forest policy of New York State were discussed thoroughly at the 11th Annual Convention of the Empire State Forest Products Association held at Syracuse, New York, recently. After a short address of welcome by Mayor Walter R. Stone and an address by George N. Ostrander of Glens Falls, New York, President of the Association, Honorable Virgil K. Kellogg of Watertown, New York, reported for the legislative committee. A report from the Forestry Committee by Professor Nelson C. Brown followed this and after other routine business Mr. Henry H. Tryon of the State College of Forestry at Syracuse, New York, read a paper on "Insurance on Standing Timber." The morning session ended with a discussion on "The Present Results of Coöperation between Private Woodland Owners and the State for More Efficient Protection of the Forests Against Fire." This was led by F. A. Gaylord, Chief Forester of Nehasane Park, New York, and William A. Howard, Assistant Superintendent of Forests. The afternoon was given over to papers on "Public Policy in Relation to Management of Forest Lands in the State of New York," by Conservation Commissioner George D. Pratt and "Hardwood Logging in the Adirondack Forests," by Professor A. B. Recknagel of the State College of Agriculture at Ithaca, New York. Following these there was a discussion on "The Relation of Hardwood to Softwood Logging in the Adirondack Forests" led by Ferris J. Meigs, President of Santa Clara Lumber Company and W. C. Hull, Vice-president Oval Wood Dish Company. At the evening banquet addresses were given by Hon. Francis M. Hugo, Secretary of State; Hon. Thaddeus C. Sweet, Speaker of the New York State Assembly; Hon. John M. Clancy, President of the Syracuse Chamber of Commerce and Frank N. Moore, of Watertown, New York.

An automobile trip was arranged for the members of the Association and the new State College of Forestry building was inspected throughout. The College of Forestry also maintained a small exhibit throughout the Convention at the Onondaga hotel.

# Books For Members

of the

# American Forestry Association

**Field Book of American Trees and Shrubs**

465 pages, 275 illustrations, many colored, of trees, leaves, blossoms, fruit, seeds, area of growth, etc. The book contains just what the lover of trees needs, a concise description of the character and color of tree species throughout the United States. The illustrations are reproductions of water color, crayon and pen and ink studies from nature by the author. Price, \$2.00, postage prepaid.

**Field Book of Wild Birds and Their Music**

262 pages, 38 colored and 15 other full page illustrations and numerous musical diagrams. The book is a description of the character and music of birds, to assist in the identification of species common in the Eastern United States. It is a book every bird lover should have. Price \$2.00, postage prepaid.

**Field Book of American Wild Flowers**

587 pages, 24 colored plates and 215 full page illustrations. This book is a description of the habits and character of wild flowers, a concise definition of their colors and a key to their identification, together with general information concerning them. It is a book that should not be missing from the library of any nature lover. Price, \$2.00, postage prepaid.

**Only 600 Copies Left—Order Now**

**Book Department**

**AMERICAN FORESTRY ASSOCIATION**  
WASHINGTON, D. C.

"QUALITY"

---

LONG AND SHORT LEAF YELLOW PINE

MISSOURI LUMBER & LAND  
EXCHANGE COMPANY

R. A. LONG BUILDING

KANSAS CITY, MO.

THE SAME

"TODAY AND TOMORROW"

"Besides the usual Greetings, let us wish our friends, our customers, greater margins of profit and bigger "turnovers" for 1917 than any year yet."

In the National Forest Region

## Colorado School of Forestry

A DEPARTMENT OF  
COLORADO COLLEGE

**T**HE course in theoretical and applied forestry leading to the degree of Forest Engineer covers a period of two years and is open to students who have completed two years of college work, including a sufficient amount of Botany, Geology and Surveying.

Graduate students may enter as candidates for the degree of Master of Forestry.

Fall and Spring Terms in the Manitou Forest, the College Reserve, 6000 acres of pine and spruce timberland on the borders of the Pike National Forest. Winter Term at Colorado Springs.

For particulars address  
Colorado School of Forestry  
Colorado Springs, Colo.

## The New York State College of Forestry

at

Syracuse University  
Syracuse, N. Y.

Under-graduate courses leading to degree of Bachelor of Science. Special opportunities for post-graduate work leading to degrees of Master of Forestry and Doctor of Economics. One-year Ranger Course on the College Forest of 1,800 acres at Wanakena in the Adirondacks. State Forest Camp, which is a month of directed recreation, open to any man over sixteen, held each August on Cranberry Lake. The State Forest Experiment Station of 90 acres and an excellent Forest Library offer unusual opportunities for research work.

For particulars address

THE NEW YORK STATE COLLEGE  
OF FORESTRY  
Syracuse, N. Y.

DEPARTMENT OF  
FORESTRY

## The Pennsylvania State College

**A** PROFESSIONAL course in Forestry, covering four years of college work, leading to the degree of Bachelor of Science in Forestry.

Thorough and practical training for Government, State, Municipal and private forestry.

Four months are spent in camp in the woods in forest work.

Graduates who wish to specialize along particular lines are admitted to the "graduate forest schools" as candidates for the degree of Master of Forestry on the successful completion of one year's work.

For further information address

Department of Forestry  
Pennsylvania State College  
State College, Pa.

## Georgia State Forest School

UNIVERSITY  
OF GEORGIA

Four-year professional course in theoretical and applied forestry leading to the degree: Bachelor of Science in Forestry.

Combination courses in Arts and Sciences giving two degrees in five years.

Wide range of specialization offered. Preparation for Government and State Forestry, City Forestry, Commercial Forestry, Logging and Milling, Research.

Provision for four months in Forest Camp and for four months in specialization.

One-year vocational course in Forestry and Agriculture.

Eight-weeks' Ranger School in Forest Camp.

For announcement address

FOREST SCHOOL  
Georgia State College of  
Agriculture  
ATHENS GEORGIA

## Yale University Forest School

NEW HAVEN, CONN., U. S. A.

**Y**ALE University Forest School is a graduate department of Yale University. It is the oldest existing forest school in the United States and exceeds any other in the number of its alumni. A general two-year course leading to the degree of Master of Forestry is offered to graduates of universities, colleges and scientific institutions of high standing and, under exceptional conditions, to men who have had three years of collegiate training, including certain prescribed subjects. Men who are not candidates for the degree may enter the School as special students, for work in any of the subjects offered in the regular course, by submitting evidence that will warrant their taking the work to their own advantage and that of the School. Those who have completed a general course in forestry are admitted for research and advanced work in Dendrology, Silviculture, Forest Management, Forest Technology, and Lumbering. The regular two-year course begins the first week in July at the School camp near Milford, Pennsylvania.

For further information  
address

JAMES W. TOUMEY, Director  
NEW HAVEN CONNECTICUT

## HARVARD UNIVERSITY

DEPT. OF FORESTRY  
BUSSEY INSTITUTION

**O**FFERS specialized graduate training leading to the degree of Master of Forestry in the following fields:—Silviculture and Management, Wood Technology, Forest Entomology, Dendrology, and (in cooperation with the Graduate School of Business Administration) the Lumber Business

For further particulars  
address

RICHARD T. FISHER  
Jamaica Plain, Massachusetts

# The American Forestry Association

## Washington, D. C.

### President

CHARLES LATHROP PACK, Lakewood, N. J.

### Vice-Presidents

JOSHUA L. BAILY, Pennsylvania

ANDREW CARNEGIE, New York

WILLIAM E. COLBY, California  
Secretary The Sierra Club

DR. CHARLES W. ELIOT, Massachusetts  
President Emeritus Harvard University

DR. B. E. FERNOW, Canada.  
Dean of Forestry, University of Toronto

HENRY S. GRAVES, District of Columbia  
Chief of the Forest Service

EVERITT G. GRIGGS, Washington

HON. DAVID HOUSTON

Secretary of Agriculture

HON. FRANKLIN K. LANE

Secretary of the Interior

HON. ASBURY F. LEVER, South Carolina

United States Representative

HON. THOMAS NELSON PAGE

Ambassador to Italy

GIFFORD PINCHOT, Pennsylvania

FILIBERT ROTH, Michigan

Dean of Forestry, University of Michigan

DR. J. T. ROTHROCK, Pennsylvania

MRS. JOHN D. SHERMAN, Illinois

Chairman Conservation Department

General Federation of Women's Clubs

HON. WM. H. TAFT, Connecticut

Ex-President United States

JOSEPH N. TEAL, Oregon

Chairman Oregon Conservation Commission

THEODORE N. VAIL

President A. T. & T. Co., Vermont

HON. JOHN WEEKS, Massachusetts

United States Senator

DR. ROBERT S. WOODWARD, Washington, D. C.

President Carnegie Institution

### Treasurer

JOHN E. JENKS, Editor, Army and Navy Register, Washington, D. C.

### Executive Secretary

PERCIVAL S. RIDSDALE, 1410 H Street, N. W., Washington, D. C.

### Directors

E. T. ALLEN, Oregon

Forester, Western For. and Conservation Asso.

JOHN S. AMES, Massachusetts

HON. ROBERT P. BASS, New Hampshire  
Ex-Governor of New Hampshire

WM. B. GREELEY, District of Columbia  
Assistant U. S. Forester

W. R. BROWN, New Hampshire

Pres. New Hamp. Forestry Commission

HERMAN H. CHAPMAN, Connecticut

Professor of Forestry, Yale Forest School

DR. HENRY S. DRINKER, Pennsylvania

President, Lehigh University

ALFRED GASKILL

State Forester, New Jersey

JOHN E. JENKS, District of Columbia

Editor, Army and Navy Register

CHESTER W. LYMAN, New York

International Paper Company

CHARLES LATHROP PACK, New Jersey

Pres. Fifth National Conservation Congress

CHARLES F. QUINCY, New York

J. E. RHODES, Illinois

Secretary, Southern Pine Association

ERNEST A. STERLING, Illinois

Forest and Timber Engineer

J. B. WHITE, Missouri

Ex-President, National Conservation Congress

## Declaration of Principles and Policy of The American Forestry Association

**IT IS A VOLUNTARY** organization for the inculcation and spread of a forest policy on a scale adequate for our economic needs, and any person is eligible for membership.

**IT IS INDEPENDENT**, has no official connection with any Federal or State department or policy, and is devoted to a public service conducive to national prosperity.

**IT ASSERTS THAT** forestry means the propagation and care of forests for the production of timber as a crop; protection of watersheds; utilization of non-agricultural soil; use of forests for public recreation.

**IT DECLARES THAT FORESTRY** is of immense importance to the people; that the census of 1913 shows our forests annually supply over one and a quarter billion dollars' worth of products; employ 735,000 people; pay \$367,000,000 in wages; cover 550,000,000 acres unsuited for agriculture; regulate the distribution of water; prevent erosion of lands; and are essential to the beauty of the country and the health of the nation.

**IT RECOGNIZES THAT** forestry is an industry limited by economic conditions; that private owners should be aided and encouraged by investigations, demonstrations, and educational work, since they cannot be expected to practice forestry at a financial loss; that Federal and State governments should undertake scientific forestry upon national and State forest reserves for the benefit of the public.

**IT WILL DEVOTE** its influence and educational facilities to the development of public thought and knowledge along these practical lines.

### It Will Support These Policies

**National and State Forests under Federal and State Ownership, administration and management respectively;** adequate appropriations for their care and management; Federal cooperation with the States, especially in forest fire protection.

**State Activity** by acquirement of forest lands; organization for fire protection; encouragement of forest planting by communal and private owners, non-political departmentally independent forest organization, with liberal appropriations for these purposes.

**Forest Fire Protection** by Federal, State and fire protective agencies, and its encouragement and extension, individually and by cooperation; without adequate fire protection all other measures for forest crop production will fail.

**Forest Planting** by Federal and State governments and long-lived corporations and acquirement of waste lands for this purpose; and also planting by private owners, where profitable, and encouragement of natural regeneration.

**Forest Taxation Reforms** removing unjust burdens from owners of growing timber.

**Closer Utilization** in logging and manufacturing without loss to owners; aid the lumbermen in achieving this.

**Cutting of Mature Timber** where and as the domestic market demands it, except on areas maintained for park or scenic purposes, and compensation of forest owners for loss suffered through protection of watersheds, or on behalf of any public interest.

**Equal Protection** to the lumber industry and to public interests in legislation affecting private timberland operations, recognizing that lumbering is as legitimate and necessary as the forests themselves.

**Classification** by experts of lands best suited for farming and those best suited for forestry; and liberal national and State appropriations for this work.

# American Forestry



PROPERTY OF UNIVERSITY OF TORONTO

An Illustrated Magazine about Forestry and Kindred Subjects Published Each Month by the American Forestry Association  
Washington, D.C.

# The American Forestry Association

## Washington, D. C.

### President

CHARLES LATHROP PACK, Lakewood, N. J.

### Vice-Presidents

ANDREW CARNEGIE, New York  
WILLIAM E. COLBY, California  
Secretary of The Sierra Club  
T. COLEMAN DUPONT, Delaware  
DR. CHARLES W. ELIOT, Massachusetts  
President Emeritus Harvard University  
DR. B. E. FERNOW, Canada  
Dean of Forestry, University of Toronto  
HENRY S. GRAVES, District of Columbia  
Chief of the Forest Service  
EVERITT G. GRIGGS, Washington

HON. DAVID HOUSTON  
Secretary of Agriculture  
HON. FRANKLIN K. LANE  
Secretary of the Interior  
HON. ASBURY F. LEVER, South Carolina  
United States Representative  
HON. THOMAS NELSON PAGE  
Ambassador to Italy  
GIFFORD PINCHOT, Pennsylvania  
MRS. FRANCES F. PRESTON, New Jersey  
FILIBERT ROTH, Michigan  
Dean of Forestry, University of Michigan  
DR. J. T. ROTHROCK, Pennsylvania

MRS. JOHN D. SHERMAN, Illinois  
Chairman Conservation Department  
General Federation of Women's Clubs  
HON. WM. H. TAFT, Connecticut  
Ex-President United States  
JOSEPH N. TEAL, Oregon  
Chairman Oregon Conservation Commission  
THEODORE N. VAIL  
President A. T. & T. Co., Vermont  
HON. JOHN WEEKS, Massachusetts  
United States Senator  
DR. ROBERT S. WOODWARD, Washington, D.C.  
President Carnegie Institution

### Treasurer

JOHN E. JENKS, Editor, Army and Navy Register, Washington, D. C.

### Executive Secretary

PERCIVAL S. RIDSDALE, 1410 H Street, N. W., Washington, D. C.

### Directors

E. T. ALLEN, Oregon  
Forester, Western For. and Conservation Asso.  
JOHN S. AMES, Massachusetts  
HON. ROBERT P. BASS, New Hampshire  
Ex-Governor of New Hampshire  
WM. B. GREELEY, District of Columbia  
Assistant U. S. Forester  
W. R. BROWN, New Hampshire  
Pres. New Hamp. Forestry Commission

HERMAN H. CHAPMAN, Connecticut  
Professor of Forestry, Yale Forest School  
DR. HENRY S. DRINKER, Pennsylvania  
President, Lehigh University  
ALFRED GASKILL  
State Forester, New Jersey  
JOHN E. JENKS, District of Columbia  
Editor, Army and Navy Register  
CHESTER W. LYMAN, New York  
International Paper Company

CHARLES LATHROP PACK, New Jersey  
Pres. Fifth National Conservation Congress  
CHARLES F. QUINCY, New York  
J. E. RHODES, Illinois  
Secretary, Southern Pine Association  
ERNEST A. STERLING, Illinois  
Forest and Timber Engineer  
J. B. WHITE, Missouri  
Ex-President, National Conservation Congress

## Declaration of Principles and Policy of The American Forestry Association

**IT IS A VOLUNTARY** organization for the inculcation and spread of a forest policy on a scale adequate for our economic needs, and any person is eligible for membership.

**IT IS INDEPENDENT**, has no official connection with any Federal or State department or policy, and is devoted to a public service conducive to national prosperity.

**IT ASSERTS THAT** forestry means the propagation and care of forests for the production of timber as a crop; protection of watersheds; utilization of non-agricultural soil; use of forests for public recreation.

**IT DECLARES THAT FORESTRY** is of immense importance to the people; that the census of 1913 shows our forests annually supply over one and a quarter billion dollars' worth of products; employ 735,000 people; pay \$367,000,000 in wages; cover 550,000,000 acres unsuited for agriculture; regulate the distribution of water; prevent erosion of lands; and are essential to the beauty of the country and the health of the nation.

**IT RECOGNIZES THAT** forestry is an industry limited by economic conditions; that private owners should be aided and encouraged by investigations, demonstrations, and educational work, since they cannot be expected to practice forestry at a financial loss; that Federal and State governments should undertake scientific forestry upon national and State forest reserves for the benefit of the public.

**IT WILL DEVOTE** its influence and educational facilities to the development of public thought and knowledge along these practical lines.

### It Will Support These Policies

**National and State Forests under Federal and State Ownership, administration and management respectively;** adequate appropriations for their care and management; Federal cooperation with the States, especially in forest fire protection.

**State Activity** by acquirement of forest lands; organization for fire protection; encouragement of forest planting by communal and private owners, non-political departmentally independent forest organization, with liberal appropriations for these purposes.

**Forest Fire Protection** by Federal, State and fire protective agencies, and its encouragement and extension, individually and by cooperation; without adequate fire protection all other measures for forest crop production will fail.

**Forest Planting** by Federal and State governments and long-lived corporations and acquirement of waste lands for this purpose; and also planting by private owners, where profitable, and encouragement of natural regeneration.

**Forest Taxation Reforms** removing unjust burdens from owners of growing timber.

**Closer Utilization** in logging and manufacturing without loss to owners; aid the lumbermen in achieving this.

**Cutting of Mature Timber** where and as the domestic market demands it, except on areas maintained for park or scenic purposes, and compensation of forest owners for loss suffered through protection of watersheds, or on behalf of any public interest.

**Equal Protection** to the lumber industry and to public interests in legislation affecting private timberland operations, recognizing that lumbering is as legitimate and necessary as the forests themselves.

**Classification** by experts of lands best suited for farming and those best suited for forestry; and liberal national and State appropriations for this work.

# AMERICAN FORESTRY

THE MAGAZINE OF THE AMERICAN FORESTRY ASSOCIATION

PERCIVAL SHELDON RIDSDALE, Editor

## EDITORIAL ADVISORY BOARD

HERMAN H. CHAPMAN  
ERNEST A. STERLING

S. T. DANA  
FREDERICK S. UNDERHILL

JOHN E. RHODES  
S. N. SPRING

FEBRUARY 1917 VOL. 23

## CONTENTS

No. 278

The White Pine Blister Disease..... 67	Planting Memorial Oak at Mount Vernon on the Potomac—By Mrs. Lydia Adams-Williams ..... 96
What the White Pine Blister Disease is—By Dr. Perley Spaulding.	With one illustration.
What Shall We do About the White Pine Blister Disease? By S. B. Detwiler.	The Waxwings Family—By A. A. Allen, Ph. D. .... 98
Shall We Plant White Pine?—By C. R. Pettis.	With three illustrations.
The Pine Blister Disease Problem as a Whole—By Dr. Haven Metcalf.	A One-Tree Public Park—By Allen H. Wright..... 99
With thirteen illustrations.	With one illustration.
Losses Caused by Imported Tree and Plant Pests—By C. L. Marlatt..... 75	How Far to Go in Cavity Filling—By J. J. Levison ..... 100
With twelve illustrations.	With two illustrations.
Natural Graft on Cork Elm—By Guy E. Caldwell..... 80	Efforts to Save the Birds—By Dr. R. W. Shufeldt ..... 103
With one illustration.	With two illustrations.
Address by President Charles Lathrop Pack..... 81	The Forest Service Reveals Lumber Industry Conditions ..... 105
Early Saxifrage, Bloodroot, and Jack-in-the-Pulpit—By Dr. R. W. Shufeldt ..... 83	Aerial Forest Patrol—By C. T. Cox..... 107
With six illustrations.	Annual Meeting and Forestry Conference ..... 108
The Locusts—Identification and Characteristics—By S. B. Detwiler..... 88	Editorial..... 110
With eight illustrations.	The Economic Necessity for Public Forest Ownership.
A Remarkable White Ash—By Herbert W. Cornell..... 93	Shall We Succeed in Saving Our White Pines?
With one illustration.	Shall We Cheapen Our National Parks?
Forestry for Boys and Girls—By Bristow Adams ..... 94	Does State Forestry Need Reorganization ?
"In the Place Where the Tree Falleth."	Book Reviews..... 115
	Canadian Department—By Ellwood Wilson ..... 115
	Current Literature ..... 121

## SPECIAL OFFER TO MEMBERS ONLY

One of the following described books will be presented free of charge to any member of the American Forestry Association who secures ONE NEW subscribing member:

- No. 1—Field Book of American Trees and Shrubs, 465 pages, 275 illustrations of trees, leaves, blossoms, fruits, seeds, area of growth, etc.
- No. 2—Field Book of Wild Birds and Their Music, 262 pages, 38 colored and 15 other full-page illustrations.
- No. 3—Field Book of American Wild Flowers, 587 pages, 24 colored plates and 215 full-page illustrations.

### FILL OUT THIS BLANK

I present for Subscribing Membership in the American Forestry Association, including American Forestry Magazine, and enclose \$3.00 for the 1917 fee—

Name.....

Address..... City.....

Send Book No.  to Name.....

Address..... City.....

\$2.00 of above fee is for American Forestry for One Year.

AMERICAN FORESTRY is published monthly by the American Forestry Association. Subscription price without membership, three dollars per year; single copies, twenty-five cents.

Copyright 1917, by the American Forestry Association



## *This is 1917—Not 1817*

*Only of comparatively late years have we of the lumber and timber industry begun to adopt modern methods. In all too many cases we have not yet begun.*

*The latest types of management, machinery, manufacturing methods, reclamation of by-products, merchandising and advertising still have been adopted all too grudgingly.*

*So in the buying, selling and estimating of timberlands the 37 years' experience of James D. Lacey & Company represent by far the most successful effort to improve on the methods of a century ago, a LACEY REPORT remains the one real guarantee of virtually accurate knowledge of stumpage values, and the International Files of James D. Lacey & Company constitute by far the greatest existing body of facts concerning timberland (both in and out of the market).*

*All our facilities are at your service in any timberland transaction. It often transpires that we know more about a tract of timber than the owner of it.*

*We should be pleased to send you our Booklet, "Pointers."*

*James D. Lacey & Co.*  
INTERNATIONAL TIMBERLAND FACTORS  
EST. IN 1880

CHICAGO  
1750 McCormick Bldg.

SEATTLE  
626 Henry Bldg.

NEW ORLEANS  
1213 Whitney-Central Bldg.

# AMERICAN FORESTRY

VOL. XXIII

FEBRUARY 1917

NO. 278

## THE WHITE PINE BLISTER DISEASE

Congress asked to make an appropriation of \$300,000 to provide for its eradication or control—Experts present facts regarding the disease at the International Forestry Conference of the American Forestry Association—The resolutions adopted.

While the International Forestry Conference called by the American Forestry Association discussed ways and means of fighting the pine blister disease which threatens the five-leaved pines of the United States and Canada, in session, at Washington, D. C., January 18 and 19, 1917, Vice-President Marshall laid before the Senate an official communication asking for a supplemental appropriation of \$300,000 to eradicate or control the disease. This communication was from Secretary of the Treasury McAdoo and transmitted a letter from Secretary of Agriculture Houston asking for the appropriation. It was submitted to the Senate with the signature and approval of President Wilson, was referred to the Committee on Agriculture and Forestry and on February 3 the Senate adopted an amendment incorporating it in the Agriculture Appropriation Bill.

The series of articles which follow are from addresses delivered at the Forestry Conference.

### WHAT THE WHITE PINE BLISTER DISEASE IS

BY PERLEY SPAULDING, U. S. FOREST PATHOLOGIST

**I**F Luther Burbank, the well-known breeder and introducer of new plants, were to announce that he had for sale a perennial plant that in the spring produced seeds of rye, in the early summer seeds of wheat, and in midsummer seeds of barley, a sensation would be produced, which, if his announcement proved true, would surpass any yet known to American agriculture. The white pine blister rust parasite is exactly comparable to such a plant as this, however. Nor is it alone in this power to produce seeds of three distinct kinds. There are

thousands of lowly organized plants closely related to the white pine blister rust parasite which regularly produce three or more forms of seeds, or spores. The life histories of some of these chameleon-like plant parasites are most fascinating subjects for the amateur scientist could they but be presented by an Ernest Thompson Seton or a John Muir.

The white pine blister is a destructive, foreign parasitic disease of the white pines (pines with their needles in bundles of five each). It came to us from Europe in

### RESOLUTION

Passed at the International Forestry Conference of the American Forestry Association  
January 18-19, 1917

#### Whereas

The Pine Blister Disease threatens to greatly injure the white pine forests of Eastern North America, and is a growing danger to the white pine timber of the West, and its origin, propagation and transmission being now generally understood.

#### Resolved

That it is the sense of this Conference that active measures should be taken by the duly constituted authorities and by all good citizens along the lines advocated by the officials competent to recommend practical measures for preventing the further dissemination and, as far as possible, for the elimination of the disease.

#### Resolved

That immediate action should be taken by the Federal governments of the United States and Canada for adequate quarantine measures to prevent the spread of the disease to sections of the Continent not now known to be infected.

#### Resolved

That co-operation by the Federal governments with States and Provinces to eradicate or control the disease in sections now infected should be continued and extended by liberal appropriations.

#### Resolved

That the States and Provinces, both independently and by interstate, National and international co-operation, are urged to conduct complete investigations, provide proper quarantines and take all necessary measures, in keeping with the seriousness of the situation, to eradicate or control the pine blister disease.

#### Resolved

That a copy of this resolution be transmitted to the Secretary of Agriculture, to the chairmen and members of the United States House and Senate Committees on Agriculture and Forestry, to all members of the United States Senate and to the Governments of the Dominion of Canada and of the Canadian provinces.

diseased nursery stock of white pines and in no other way. The parasite is a low form of plant similar to, and closely related to, the wheat rust and cedar apple rust parasites. The former has two phases of development; one upon leaves of the barberry and the other upon the wheat plant. The latter also has two phases of growth; one upon the leaves of cedar and the other upon the leaves

berries. The parasite lives in the bark of an infected pine and after it once appears, produces a crop of spores each spring as long as that pine lives. If there are no currants or gooseberries near enough to the diseased pine for the spores to be blown from the pine to the currants and gooseberries the disease cannot spread any farther, because the "pine" spores cannot attack pines.



Photograph by J. Franklin Collins.

**THESE TREES ARE INFECTED**

Practically all these pines on Gerrish's Island on an arm of Portsmouth Harbor, Maine, are generally infected with the pine blister disease.



Photograph by J. Franklin Collins.

**AN INFECTED PLOT OF PINES**

Eighty per cent of the native white pine on this random quarter-acre plot near Kittery Point, Maine, were, in November, 1916, infected by the pine blister disease.

and fruit of the apple tree. In the same way the white pine blister rust has two phases of growth on two distinct hosts; one phase on the young bark of white pines, and the other phase on leaves of wild and cultivated currants and gooseberries. Three distinct kinds of spores are produced in a season.

In the spring spores are formed on the diseased white pine bark; they are blown about by the wind and infect the leaves of neighboring currants or gooseberries, but they cannot attack pines. They are rather short lived.

In early summer the second spore form ripens on the lower surface of infected currant or gooseberry leaves. These can attack currant or gooseberry leaves but cannot attack pines. The third spore form ripens also on the lower surface of the currant and gooseberry leaves. These spores are able to attack pines but not currants or goose-

**FEDERAL ACTION REQUIRED IN FIGHTING THE PINE BLISTER DISEASE**

1. A federal quarantine prohibiting shipment of all five-leaved pines and all currant and gooseberry bushes beyond the western boundaries of Minnesota, Iowa, Missouri, Arkansas, and Louisiana, to prevent the introduction of the pine blister disease from the eastern white-pine area into the western white-pine forests of the Rocky Mountain and Pacific Coast States.

2. A federal quarantine regulation prohibiting the shipment of all five-leaved pines and all currants and gooseberry bushes from infected areas into regions where the disease has not yet been found. This action could be taken at once and would save the public great prospective loss. At the present time, all pine, currant and gooseberry planting stock, from nurseries or the native woods, must be suspected of being infected. The direct loss through death of diseased pine stock, though considerable, is insignificant when compared to the cost of controlling the disease, or, if not controlled, the early loss of native and planted pines which might otherwise thrive for years.

3. Scouting should be continued on an extensive scale, to determine definitely the boundaries of infected areas, and to locate possible infections in new territory.

4. Large-scale experiments should be undertaken to determine the feasibility of controlling the pine blister disease, and the least expensive means of accomplishing this result most effectively.

The distance that the "pine" spores may be blown is unknown. The greatest distance definitely known is about 400 feet. The spores produced on currants or gooseberries are known to blow one-half mile or over and infect other currants. How much farther they may go no one knows. From currants infection has been traced to pines by McCubbin, of Canada, up to an extreme distance of 100 yards.

This gives us an immense advantage when we attempt to eradicate it from a given locality, the mere separation of the two hosts being sufficient to stop further spread of the disease. But this involves the sacrifice of one host in any given locality. In some places the removal of all white pines involves less loss than does the removal of all currants and gooseberries; while in other places the reverse is true. In either procedure a few hoggish people

are encountered who, rather than sacrifice a few dollars, or in some cases less than a dollar, will object to removal of their bush or tree and thus endanger hundreds and even thousands of dollars' worth of trees or bushes in their locality, besides giving the disease a chance to become so

to the white man, relatively mild disease. In the same way the smallpox destroyed entire tribes:

The same thing that happened to the Indians from newly introduced diseases is already happening to one of our broad-leaved trees. The American chestnut, lacking



Photograph by J. Franklin Collins.

#### TWO MORE VICTIMS

Both these native white pines in Maine have been killed by the pine blister disease and all the trees in the background are infected.

well established that it never can be eradicated. The Federal Government has put a stop to our receiving any more young diseased white pines from abroad. It remains for us to get rid of what we have. Either the white pines or the currants and gooseberries must go in many localities if this disease is to be stopped in its spread.

It is a well proven fact, known to all students of parasitic diseases, either of plants or animals, that constant association for many centuries with a parasitic disease develops some degree of resistance in the host plant or animal. This results from the total destruction of those individuals which fail to develop resistance, thus leaving a residue of partially resistant ones. In the early days of exploration of North America the measles was introduced among the North American Indians from the Old World. The Indians, who had not the slightest degree of resistance to the new disease, were destroyed in thousands, by this,



Photograph by S. B. Detwiler.

#### 175 INFECTIONS ON THIS PINE

This tree at Ipswich, Massachusetts, was imported from France in 1902. It was removed from the plantation in 1916 at which time there were 175 pine blister disease infections on it. Some of them are shown, being marked by white tags.

the ability to resist a new chestnut parasite imported from China, is now well on the road to extermination.

In those places (in this country) where this European pine rust has worked longest undisturbed, it is doing with our non-resistant white pine just what the paleface disease did to the Indians and the foreign chestnut disease is now doing to our chestnuts. It has shown itself positively capable of destroying our white pine. The eastern white pine is not the only American white pine that is threatened by this insidious danger. There are seven other pines of the Rocky Mountain and Pacific Coast regions that will surely be attacked if this disease is not fought to a standstill where it now is. All of these are new to the disease and are likely to go the way of the Indian with the smallpox and the chestnut with the bark disease, if the white pine blister disease once reaches them.

## WHAT SHALL WE DO ABOUT THE PINE BLISTER DISEASE?

By S. B. DETWILER, U. S. FOREST INSPECTOR

**D**EVELOPMENTS in the pine blister disease situation during the past year have crystallized sentiment among those interested in forestry and familiar with the facts into desire for immediate and concerted action. A few conservatives have taken the attitude that it is useless to attempt the control of any forest tree disease in this country because it has never been done. The general opinion among foresters and plant pathologists is that the white pine is too valuable to lose and that vigorous efforts should be made to fight the

pine blister, since there is no longer room to doubt the ability of this disease to completely kill all white pines growing in proximity to currant and gooseberry bushes. Although it is not proved by practical experience on a large scale that the disease can be completely controlled by the destruction of diseased pines and the elimination of all currant and gooseberry plants within areas of general disease, this plan has proved to be effective in checking the spread of the fungus from infected plantations.



TREE AT SWANSEA, MASSACHUSETTS

This white pine tree in native growth is about 30 feet high and shows the main stem girdled near the top. S. B. Detwiler, U. S. Forest Inspector, is making the examination.



THIS WAS DESTROYED

A fine white pine of native growth near Ipswich, Massachusetts, which showed so many pine blister cankers on the branches that it was marked for destruction before the spores which would have developed this year and spread the disease appeared.

It is certain that the blister disease cannot pass from pine to pine without passing through the intermediate stage on currant or gooseberry leaves. Therefore, the only question that can arise concerning the effectiveness of the proposed method of controlling the disease is whether it is possible to destroy all the currants and gooseberries on a given area and thereafter keep it free, and whether the value of the pine will justify the cost of the work. Further experience in eradicating currant and gooseberry bushes on a large scale will undoubtedly develop cheaper and more effective methods, as for instance, killing strongly-rooted bushes or mats of skunk currants by means of chemicals sprayed on the leaves. The destruction of the diseased pines is an additional

#### COÖPERATION BY CITIZENS REQUIRED IN FIGHTING THE PINE BLISTER DISEASE

Federal and State action, to be successful, requires the active coöperation of individual citizens in the following particulars:

1. When the disease is found on pines, currants or gooseberries, the State officials in charge of control work should be notified, and the diseased plants destroyed promptly, according to the recommendations of the authorities.

2. Where State authorities deem it necessary to destroy all currant and gooseberry bushes, or take other drastic action to control the disease, individuals should give all possible aid and influence others to do so.

3. The general planting of five-leaved pines should not be encouraged. The growing of currant or gooseberry stock should not be favored in localities where they may endanger white pines. In the case of white pine planting stock, the nursery from which it is purchased should be required to give a written guarantee that the stock was grown from seed in their own nurseries, that no infections of the white-pine blister disease have ever been found in the nursery or within 500 yards, and that the trees have not stood near currant or gooseberry bushes.

precautionary measure that appears advisable in large control areas to prevent the disease being carried to currants and gooseberries beyond the borders of the area.

When small spots of infection exist beyond the region of generally scattered disease, it will usually be advisable to destroy both pine and currant hosts known or suspected as having been exposed to infection, and the greatest sanitary precautions taken, such as sterilizing the uniform of inspectors, and disinfecting the plants having fruiting bodies of the fungus before they are handled, during such time as the spores are visible.

At the present time, the legal and financial barriers standing in the way of controlling the disease appear even greater than the practical difficulties. It will con-

sume time to secure the required laws and appropriations, and meanwhile the disease will continue to advance rapidly into new territory. Time lost in efficiently applying control measures during the coming season will be dearly paid for if any future control is to be attempted.

It is plain that the greatest immediate need is widespread publication of the facts of the blister rust invasion, and rousing the general public to a realization of the dire results which this disease will cause if not controlled.

The blister canker fungus does not respect state or national boundary lines in its rapid spread. Effective control requires general action—state, interstate, national

and international. Nothing can be accomplished without adequate appropriations, and before the money can be wisely spent, most states need laws giving the authorities full power to apply the necessary steps in control. Publicity will secure the necessary power to act and act quickly; concerted action by state and national authorities is the only possible salvation for the pines. Nature has not intervened in checking the chestnut blight and other imported diseases, and it seems probable that we shall have to pay with the white pine, or a partial cash equivalent, for our open-door policy in importing plant pests.

## SHALL WE PLANT WHITE PINE?

BY C. R. PETTIS, SUPERINTENDENT STATE FORESTS, STATE OF NEW YORK

AS an economic necessity and in the application of true conservation and practical forestry, the wisdom of reforestation cannot be questioned. There are millions of acres of our soil whose productive use can best be and, to a large extent, can only be realized by using them to grow wood crops. This vast territory stands to-day idle. To become productive, it must first be reforested. In order to derive the full measure of use a tree adapted to grow under the prevailing condition must be selected. White pine has no equal in meeting and measuring up to the specifications of a tree that can be most profitably employed in reforestation generally in the northeastern United States. We cannot make many mistakes when we use white pine as an agent for employing the resources of nature in obtaining the productive capacity of these non-agricultural lands.

In the market, white pine is in great demand and on account of its qualities has a wider range of uses than any other wood we can grow. It is our most commonly used tree. Go into nearly any line and study its great variety



BRANCHES AND TWIGS DISEASED

In this tree at Ipswich, Massachusetts, there is to be plainly seen a large amount of pine blister disease on the branches and twigs.

of uses. It measures up to our demands for a wood for general purposes.

White pine is to forestry in the northeastern states what wheat is to agriculture; what iron is to manufacturing or what coal is to transportation.

I have tried to state briefly why we must reforest and what an important factor white pine is in the future planting operations. We must have white pine for planting.

In answer to the question "shall we plant white pine?" I most emphatically say, yes. We must have white pine. We will obtain our chief future supply from plantations.

We to-day face a problem. We do not know all about the distribution of the blister disease, and as reforestation deals in future, we should **defer further white pine planting until we know where it is safe and sane to plant.** We must first make the unsafe places safe and expend every energy toward the control of this disease. We must plant but should defer it for a while.

We are gathered here to repent for haste. Our various forestry departments, associations, land owners and others about 1908 became enthusiastic about planting. The

necessary trees could not be obtained in this country at a reasonable price and, as a result, large quantities were imported and scattered in a thousand places. Unfor-



Photograph by S. B. Detwiler.

#### GIRDLED BY BLISTER DISEASE

A native white pine at Kittery Point, Maine, with the base and lower side branches girdled by the blister rust. The quarter-acre plot in which this tree stood showed 88 per cent of trees infected in November, 1916. Twenty-six per cent of the trees were dead.

unately, some of these trees were diseased and we now must decide what we are going to do about what President Pack so well calls "A Bandit from Abroad."

Let us take a lesson from some of these many unfortunate circumstances. Why not meet the situation frankly? We must stop the spread of this disease. It can only be accomplished through eradication and control measures. We cannot fairly ask the farmer to give up all his currants and gooseberries that the forester may utilize his soil for growing pine. We must both of us make sacrifices. In places, pines will have to be removed as part of the control plan. We cannot now say where the immune strips are to be placed. The extension of white pine planting, under present conditions, may further the spread of the disease as well as make the control measure more difficult. The problem is difficult enough as it to-day exists.

A few years more of idleness of these soils is nothing in comparison to the future safety of white pine. We have not gained but rather lost through past haste. Wait until we first fully know where "we are at."

A study to ascertain the extent of the disease, location of different kinds of soil, also distribution of pine, currants and gooseberries, will add so materially to our knowledge that future plans can then be formulated.

For the time being, we should expend our energies in field investigations, control work and education of the public.

The general progress of reforestation need not be seriously interfered with because we may direct our energies to planting lands not best adapted to white pine with suitable species.

## THE PINE BLISTER DISEASE PROBLEM AS A WHOLE

DR. HAVEN METCALF, IN CHARGE OFFICE OF FOREST PATHOLOGY, U. S. DEPT. OF AGRICULTURE

**T**HE white pine blister disease has invaded America and dug itself in. The earliest importation of white pine nursery stock that we have been able to trace

dates back only to 1899, but in this time the disease has become generally prevalent upon gooseberries and currants in New England, and at many points has established



Photograph by J. Franklin Collins.

#### IN A BADLY INFECTED AREA

This tree, photographed with a white cloth behind it to show the infection, had its main stem and many branches girdled by the pine blister disease. It is in a four-acre plot in Maine. In November, 1916, 87 per cent of the trees on the plot were infected and 16 per cent were dead.



Photograph by J. Franklin Collins.

#### WHERE SPORES WERE PRODUCED

Native white pine at Kittery Point, Maine, showing the main stem and many side branches infected. The rough bark on the main stem and at the bases of some side branches show that the disease has produced spores during the past season.

itself upon pine trees growing under as nearly normal conditions as can still be found in New England. West of the Hudson River the disease occurs at many points, but cannot be considered established, unless possibly in the Minnesota-Wisconsin area. West of the Mississippi River the disease is not known to occur, and it is wholly improbable that it can ever spread across the treeless plains to the forests of western white pine and sugar pine by any natural means. It can, however, get there easily and quickly on diseased nursery stock and indeed may have gotten there already without our knowledge.

It is obvious that the control of this disease presents three very different problems:

(1) The problem for the western states, which is, so far as we know, entirely that of keeping out the disease. We must make sure that the disease does not already occur west of the Mississippi, and then make sure that by some means all movement into this area of nursery stock of five-needled pines, currants and gooseberries is stopped. Except in Oregon, Idaho and Montana, where local quarantines have been imposed, no effective restriction exists at the present time on the movement of five-leaved pines, currants and gooseberries from any eastern locality to any western point. It would obviously be foolish to spend much money in determining where this disease occurs, or in eradicating it where found, as long as nurseries are still free to distribute the disease as fast as it can be located.

(2) Between the Mississippi and the Hudson Rivers we have conditions similar to those obtaining in the coun-



Photograph by S. B. Detweiler.

#### CURRANT AND PINE

Here are seen infected flowering currant bushes in the corner of a yard at Kittery Point, Maine, with native white pine in the background and a large percentage of the pine already show the pine blister disease infection.

try at large seven years ago, that is, scattering infections of the disease, that can still be eradicated. In undertaking this problem we must profit by the experience of the past seven years. Up to this year the problem has nowhere been very vigorously attacked. State laws are mostly inadequate. In many states no eradication outside of a nursery is possible except with the consent of the

owner. In other states the state authorities have no power to destroy diseased currants and gooseberries, because the disease does not seriously damage these plants, and in few if any states is there authority for destroying healthy currants and gooseberries which are so located as to spread

the disease. Nowhere has the Federal Government any power to destroy diseased plants of any kind. Up to a year ago there have been no specific appropriations for fighting this disease, and what has been done on this disease has been done as a side issue, and at the expense of other lines of work. If, then, the disease is to be eradicated over this wide central territory it will mean a sharp revision of law in most states, education of public sentiment to the point where the interests of one citizen cannot prevail against the interests of an entire community, or the interests of one community or one line of business prevail against the interests of an entire state. We must look forward to a long fight, for a disease with a long dormant period, and as strongly entrenched as this one, will not be overcome in three or four years. And finally, all action must be prompt. The time to combat any plant disease is while there is still but little of it.

#### STATE ACTION REQUIRED IN FIGHTING THE PINE BLISTER DISEASE

The various states in the white-pine belt should proceed against the disease, as follows:

1. Adequate laws should be enacted, giving authority to the proper state official to destroy all white pine, currant, and gooseberry plants infected with the disease or in danger of becoming infected. Because of the need for persons handling diseased plants to take the greatest precautionary measures to avoid distributing the spores of the disease from one place to another, eradication of the diseased plants should be done by men in state employ, specially trained and wearing a uniform that can be disinfected before approaching the vicinity of pines or areas of disease-free currants.

2. Each state should establish a quarantine preventing the introduction of any five-leaved pines, or any currant or gooseberry bushes from any area in which infection is known to exist, duplicating the action taken by the States of Wisconsin and Oregon.

3. Each State in which white pine is important as a native or planted tree should appropriate sufficient funds to enable the proper State official to conduct such operations as may be necessary for detailed scouting and the control of the disease when found.

4. Cultivated black currants should be declared a pest, and the bushes destroyed in all States where five-leaved pines grow, regardless of whether the disease has appeared in the locality. This action is advisable because the cultivated black currant is especially susceptible to infection, and the elimination of this plant would do much to prevent the rapid spread of the fungus.



Photograph by S. B. Detwiler.

#### FROM GARDEN TO WOODLAND

A garden of an estate at Ipswich, Massachusetts, in which infected currant bushes are growing. The white pine in the background were planted in 1903 and in the spring of 1916 all of them showed infection.

(3) East of the Hudson River the problem is much more serious, and here the disease is unlikely ever to be eradicated. Here the effect of the disease is essentially to make the pine tree a cultivated plant, dependent for its existence upon the destruction of currants and gooseberries. It will have to be determined for communities or for larger areas whether the people prefer to grow white pine trees or currant and gooseberry bushes, for the two are now incompatible. The probable solution of this problem is that certain areas will be found in New England where the currant and gooseberry can be eradicated and the white pine grown. And there will doubtless be other localities where the eradication of currants and gooseberries is commercially impracticable and where the growing of white pine will have to be given up.



Photograph by J. Franklin Collins.

#### DISEASE PLAINLY INDICATED

Eighty-one per cent of the trees surrounding this on a quarter-acre plot in Maine are infected with the pine blister disease and of these 12 per cent were dead in November, 1916.

The entire problem is, however, but one phase of a larger problem, which may be stated as follows: Does free trade in plant diseases and insect pests pay? Is it an economically sound national policy? Is the entire importing nursery business worth as much to the country as the damage which it causes? Let us not deceive ourselves. Not a single plant disease or insect pest that has once become established in this country has been eradicated or is ever likely to be. No matter how well controlled, it remains in every case a permanent tax against the economic resources of the nation. If we succeed in controlling the white pine blister rust we may be sure that other diseases and pests will be introduced, which will be just as serious, for we know definitely that the

undesirable plant immigrants are not all here yet. It is as important to safeguard the country against further invasions of this kind as to control this or any other disease or pest that has already been carelessly permitted to establish itself.

#### THE SITUATION TODAY

The United States Senate has added \$300,000 to the Agricultural Appropriation Bill for the eradication or control of the White Pine Blister Disease.

\$150,000 of this amount will not be available until states in the pine belt provide state appropriations—then it will be used in state coöperative work.

The United States Senate has also amended the Plant Quarantine Act to permit the Secretary of Agriculture to quarantine any State, Territory or District of the United States, or any section thereof, to prevent the spread of the disease.

Massachusetts asks a \$60,000 state appropriation to fight it.

New York requires \$30,000.

Minnesota desires \$25,000.

Maine asks for \$20,000.

New Hampshire asks for \$28,000.

Vermont wants \$2,000.

Connecticut requests \$15,000.

Rhode Island wishes \$5,000.

Wisconsin needs \$25,000.

Pennsylvania demands \$10,000.

Canada expects \$50,000.

# LOSSES CAUSED BY IMPORTED TREE AND PLANT PESTS

BY C. L. MARLATT, CHAIRMAN, FEDERAL HORTICULTURAL BOARD

In view of the fact that fully fifty per cent of the tree and plant pests which in the past and at the present time are doing millions of dollars' damage every year to the agricultural and forest crops of the United States are imported, the American Forestry Association at its International Forestry Conference at Washington, D. C., January 18-19, 1917, heard addresses and discussions on the advisability of a national quarantine preventing the importation of tree and plant stock from other continents, unless such stock has the approval of the United States Department of Agriculture. The following is one of the addresses.—EDITOR.

THE virgin lands of the new world had originally an enormous advantage over the long-settled areas of the old world in their freedom from the host of plant enemies, insects and disease, which had developed through centuries of cultivation of special crops, and, if proper safeguards had been instituted, this advantage could have been largely preserved. Unfortunately, none of the countries of the new world, until very recently, took any precautions to prevent the introduction of these old-world plant enemies.

Confining our attention to the United States particularly, as a result of this neglect, probably more than

actively recently introduced pest, getting first foothold in Utah, from whence it has extended its devastations over much of the great alfalfa-producing areas of the adjoining states. Among the fruit insects are such well-known enemies as the codling moth, now entailing a cost for the treatment of trees and loss from injury to fruit taken together of approximately \$16,000,000 a year; and the San José scale, introduced with ornamental plants from North China, occasioning a loss in product and cost of treatment of at least \$10,000,000 a year. Among forestry insects are such notable enemies of forest trees as the larch sawfly, which threatens to complete the destruction



COTTON BOLL WEEVIL (*ANTHONOMUS GRANDIS*)

The cost to this country of the cotton boll weevil amounts to about twenty-five million dollars a year. It is gradually spreading throughout the cotton belt, and in 1916 reached northward to the South Carolina line. The picture, enlarged, shows an adult boll weevil.



BOLL WEEVIL LARVÆ

The manner in which the larvæ of the boll weevil injures the cotton boll is indicated by this photograph. The ravages of this insect cost this country annually 25 cents apiece for every man, woman and child.

fifty per cent of the insects and diseases now destructive to our agriculture and forestry are introductions, most of them unnecessary.

Typical examples of these introduced pests, in relation to general agriculture, are the Hessian Fly, introduced from Europe in revolutionary times and now occasioning an average annual loss to the wheat crop of approximately \$50,000,000, and in some years this loss has exceeded one hundred millions; the alfalfa weevil, a compar-

## RESOLUTION

Passed by the International Forestry Conference of the American Forestry Association, January 18-19, 1917

In view of the spread of diseases and insect pests introduced from foreign countries, such as the chestnut blight, gipsy moth and white pine blister.

Resolved

That the American Forestry Association favor the principle of absolute national quarantine on plants, trees and nursery stock, to take effect at the earliest date which may be found economically expedient.

already largely accomplished of the larch timber of the United States and Canada, and the gypsy and brown-tail moths, which have long ravaged the forests of New England and have been the occasion of the spending of many millions of dollars in control efforts and of losses proportionately vastly greater. For mere control alone, the Federal Government has carried an appropriation for many years now of over \$300,000 a year to aid the States in the work

against these insects. Other notable forest and shade tree pests are the spruce twig moth, comparatively recently introduced, the leopard moth, and the elm beetle.

These are merely examples of a vast horde of introduced insect pests. Upwards of a hundred distinctly important injurious insects to agriculture and forestry have been thus introduced, and, in addition to these, hundreds of other minor insect pests. The total loss occasioned by these introduced insect pests to our national forests and farm crops, etc., probably exceeds \$500,000,000 annually.

Losses correspondingly large are chargeable to introduced plant diseases. Familiar examples of such introduced diseases are, the chestnut blight, which has already destroyed the chestnut forests over much of the eastern United States and threatens the existence of the entire native chestnut growth of the country; the white pine blister, a disease already widespread in the eastern white pine area and which ultimately will cause enormous loss to all white pine forests, and which losses will be vastly increased should it spread to the great white and five-leaved pine forests of the Rocky Mountain and Pacific Coast States. Introduced diseases affecting cultivated plants include such important examples as the common scab of the potato, of almost universal occurrence in this country and occasioning tremendous shrinkage in the value of this important crop; the wheat rust, which in

bad years may practically wipe out the entire wheat crop of large sections, as was the case last year in Red River Valley; and a corn mildew recently introduced and already accomplishing very serious losses in the South. Among diseases affecting fruits and fruit trees, the most notable example is the citrus canker, a disease recently introduced from Japan or Asia, and threatening the very existence of much of the enor-



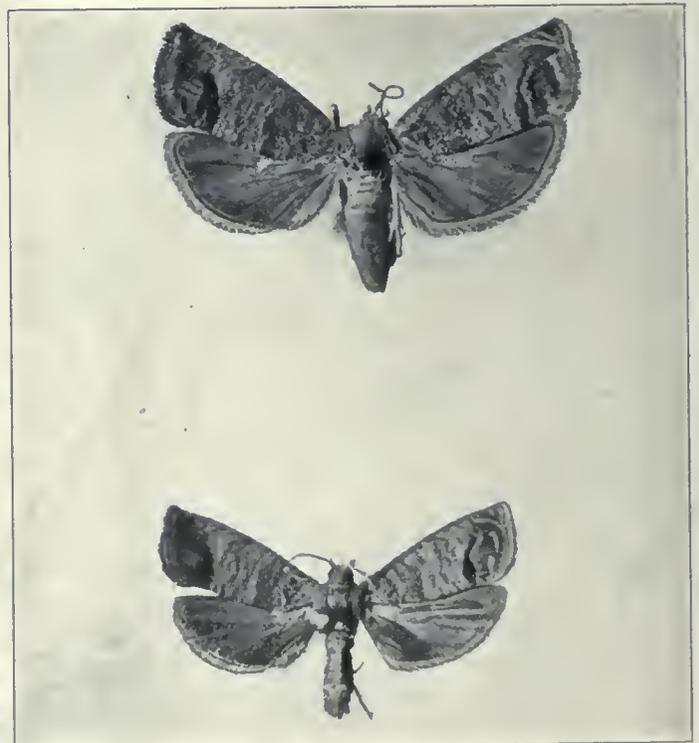
STOPPING THE CODLING MOTH

An apple tree banded in order to collect the larvae of the codling moth so that it may be destroyed.



THE BROWN-TAIL MOTH (*EUPROCTIS CHIRYSORRHEA*)

The brown-tail moth was imported by a Boston florist about 26 years ago on roses from Holland and France. It is a serious enemy to the orchard, forest, and shade trees, and ornamental shrubbery, and has long been recognized as one of the worst orchard pests of Europe. The hairs on the caterpillars produce the brown-tail rash, often causing considerable annoyance to the residents of infested districts.



THE CODLING MOTH (*LASPEYRESIA POMONELLA*)

The codling moth, or apple worm, occasions a loss, in cost of spraying trees and injury to the fruit, of sixteen million dollars a year in the United States.

mous citrus development of Florida and the Gulf Coast, a disease which Congress has joined with the States in an active effort to exterminate with the aid of a large appropriation. In addition to these more important diseases, many minor plant diseases have also been introduced.

While, therefore, much of the original advantage which the western hemisphere enjoyed from freedom from plant pests has been lost, there are still vast numbers of foreign insect pests and plant diseases with large capacity for harm which have fortunately not yet effected successful lodgement in North America or have obtained only limited foothold and may still possibly be exterminated.

For the information of Federal and State inspectors the experts of the Department of Agriculture have prepared descriptive lists of the known plant enemies of the world, insect and fungous, which have not yet reached the United States or become permanently established therein. A manual describing the dangerous insects likely to be introduced into the United States, prepared in the Bureau of Entomology of the Department of Agriculture, and

### PESTS DETECTED LAST YEAR

According to the report of the Federal Horticultural Board of the United States Department of Agriculture, one hundred and ninety-three different kinds of insects which might prove hurtful to American crops and one hundred and sixteen plant diseases of similar significance were detected by State and Federal inspection during the last fiscal year on plants and plant products offered for import into the United States.

Of the insects, fourteen were scale insects, such as Pear Scale, though they range from scales found on Orchids, Cocoanut, and Bamboo to other forms found on Wistaria, Camellias, Hemlocks and Pines. In addition, nests of the Brown-tail Moth, egg masses of the European Tussock Moth, pupæ of the Dagger Moth, and cocoons of the Pine Sawfly were discovered.

Of interest was the finding of a fourth potato weevil in the United States, which was discovered in Irish potatoes imported from the Andes. Of the diseases, Citrus Canker was found in a number of shipments, and the finding of Powdery Scab on wild potatoes from the east slope of the Andes is taken to indicate clearly that it is the home of this disease of the potato.—EDITOR.

now in press, lists and describes over three thousand distinct insect pests. Probably half of these are old-world insects injurious to forest and shade trees, and the balance, insects injurious to various cultivated crops. A similar manual is in preparation on the fungous diseases of the plants likely to be introduced into the United States.

Among the important insect pests thus listed, which we hope to exclude from the American continent, are such notable examples as the Mediterranean fruit fly, perhaps the most destructive of all fruit pests; and the pink boll worm of cotton, recently spreading from India to Egypt and thence to practically every other cotton-producing country of the world except the United States—an insect capable of doing vastly greater damage than the boll weevil. Among forestry insects occur such notable pests as the "nonne" moth of Europe, which is as destructive to conifers as the gypsy moth is in this country to deciduous trees; and many other forest caterpillars and bark-boring and wood-boring insects.

There are also known to occur in foreign countries



VARIOUS STAGES OF THE GYPSY MOTH (*PORHETRIA DISPAR*)

The gypsy moth is one of the worst forest pests of Europe. It was accidentally introduced into Massachusetts 40 years ago, and has now spread to the adjacent States of Connecticut, Rhode Island, New Hampshire, and Maine. It has been recently brought into this country on imported stock and taken to such widely isolated points as Louisiana and Ohio. There is grave risk of its becoming distributed over the entire United States. It has already cost in New England, in mere efforts at control, a good many millions of dollars, and should it become widespread in the United States, damage from it would be beyond calculation.



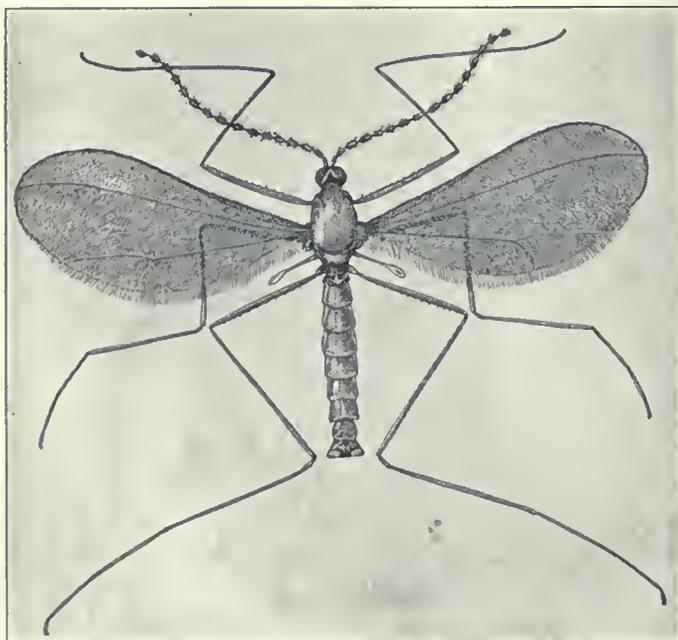
THE GYPSY MOTH PARASITE

These two wagonloads are an importation of gypsy-moth caterpillars from France in 1909, en route to the laboratory at Melrose Highlands, Massachusetts. These caterpillars were brought into this country for the purpose of introducing beneficial parasites to assist in controlling the gypsy moth.

many important diseases of plants which have not yet gained foothold on this continent. Prominent among these are the mildew diseases of the Indian corn occurring in the Orient; the potato wart, and many others affecting cultivated plants and forest trees.

#### DANGERS FROM NEW REGIONS

The increasing commerce of the world with the hitherto little explored regions of China and other Asiatic countries and Africa, Oceania, etc., adds enormously to the



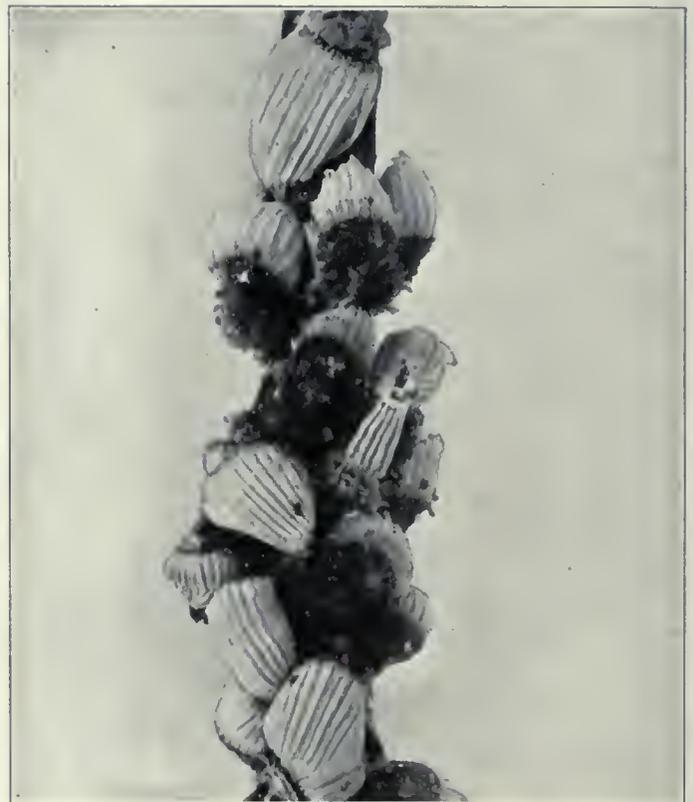
ADULT MALE HESSIAN FLY (*MAYETIOLA DESTRUCTOR*)

When excessively abundant this insect either destroys or badly injures hundreds of thousands of acres of wheat, reducing the yield from 50 to 75 per cent. This pest alone probably causes an annual loss in the United States of fifty millions of dollars.

risk of the importation of new pests. We know very little of the injurious insects of these new countries, but the importation of new stock in the last few years from these regions by the Department of Agriculture and by private agencies has especially demonstrated the existence therein of many very dangerous plant pests. The importance of these may be illustrated by referring again to some important pests now established in this country from these hitherto little explored regions of the old world. In this list comes the San José scale, the chestnut blight, citrus canker, and the corn mildews, introduced into some of our Southern States.

#### EXCLUDING THE PESTS

The more important of these known foreign pests are being excluded by regulating the entry of nursery stock, or, in the case of diseases, by an absolute prohibition of



THE FLUTED SCALE (*ICERYA PURCHASI* MASK)

Introduced from Australia and at one time threatened the entire citrus industry of the Pacific Coast. Fortunately, through the introduction and establishment of its natural ladybird enemy, *Novius cardinalis*, this pest is now under control, resulting in the annual saving of hundreds of thousands of dollars to the citrus growers.

the entry of the plants or fruits affected. There are now in force nine foreign plant quarantines forbidding the entry into the United States of various plants and plant products to prevent the entry of new and dangerous pests. Two of these have relation to forest pests, namely the white pine blister rust and the European pine shoot moth. The others relate to the potato wart; the Mexican fruit fly; the pink boll worm of cotton; the avocado weevil; certain injurious insects and fungous diseases of the sugar cane; citrus canker and other dangerous citrus diseases; and the downy mildews and *Phytophthora* diseases of Indian corn.

This Act also gives power of control within the United States of new and dangerous plant pests by quarantine or regulation of movement. This power is, however, now

limited by the necessity of actually determining the presence of the insect or disease to be quarantined against in the State or district made subject to the quarantine. An enlargement of this power to be able to effectively quarantine against such a widespread disease as the white pine blister rust is now being sought.

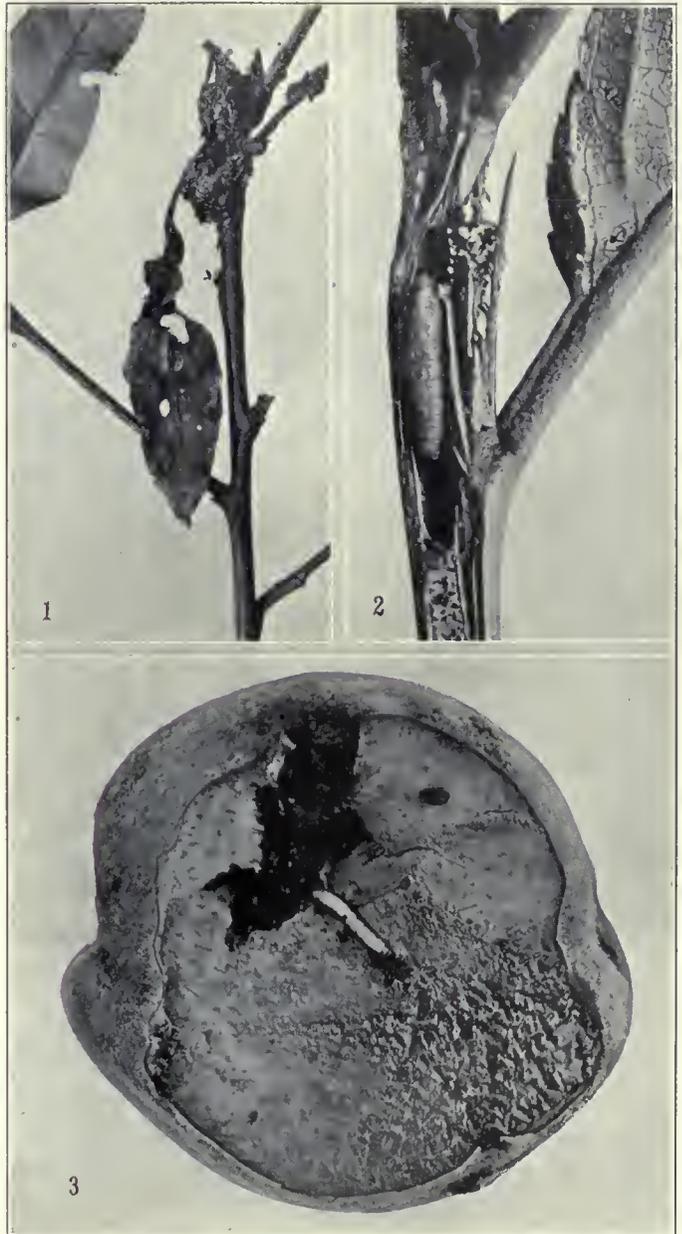
The powers of this act in relation to the exclusion of foreign plant enemies has hitherto been directed towards specific dangers which could be shown by the Federal or State experts in relation to particular plants or plant products. In view of the tremendous losses which are now being occasioned by introduced plant pests and the additional losses which are now threatened by the many new plant pests likely at any time to be introduced, as herein shown, it is perhaps opportune now to seriously consider the advisability of very much restricting the further entry of all foreign plants and plant products capable of being the agency of such introductions; in other words, to put all such introductions under definite Federal con-

trol and supervision, with power of exclusion wherever a reasonable risk is known. This need is emphasized just at this time by a number of important illustrations, already alluded to, of recently introduced pests, including the pine blister rust, chestnut blight, citrus canker, pink boll worm of cotton in Mexico, and a new peach pest from Asia which has scarcely yet come to public knowledge.



PUPATING LARVÆ OF THE ASIATIC LADYBIRD (*CHILOCORUS SIMILIS*)

This beneficial insect, which is a voracious feeder on the San Jose scale in China and Japan, was introduced into the United States to assist in the control of this scale insect, and is helping to prevent destruction amounting to several hundred thousand dollars a year.



AN IMPORTANT NEW INSECT ENEMY OF THE PEACH  
(*LASPEYRESIA MOLESTA*)

Observations during the summer and fall of 1916 seem to indicate that another formidable insect enemy of the peach and other deciduous fruits has become established in America. Larvæ of this insect have been observed injuring the twigs of peach, plum, cherry, and fruit of the peach. No. 1 shows a peach twig with a mass of dried gum and leaf fragments due to attack by the caterpillar. No. 2 shows a peach shoot cut open exposing the larva in its burrow. No. 3 shows the cavity excavated in the peach by larva entering at the side.

but which threatens our peach crop with greater losses than perhaps any of the older established peach pests. It would certainly appear that the enforcement of much more restrictive measures than are now possible is amply justified.

In this connection, and in relation to the natural desire to accumulate from the ends of the earth new field plants for our agriculture, and new fruits for our orchards, and the novelties and curiosities of the plant world for our gardens, lawns and parks, it must not be lost sight of that we have first to consider the safeguarding, that is, the conservation of the big commercial crops of America



THE SAN JOSÉ, OR CHINESE, SCALE (*ASPDITUS PERNICIOSUS*) ENLARGED

Probably no other insect has received so much notoriety as this species. Its international importance is indicated by the vast amount of interstate and foreign legislation which has been enacted relative to it. Millions of dollars are expended annually in efforts to control this pest, which is so injurious to deciduous fruit trees.

such as wheat, corn, cotton, potato, apple, peach, orange, etc., and our enormous natural forests which are and must always remain our chief productions. The risk to these standard products of our soil with all introductions of allied or varietal plants, and especially such plants from the hitherto little exploited portions of the earth, is enormous, as the illustrations already given have shown; and therefore all introductions should be preceded by studies and explorations to determine the risk, if any, in advance of the importation; and such importations should, furthermore, be surrounded with all restrictions and safeguards necessary to prevent the entry therewith of new plant enemies. In other words, the safeguarding of our big established productions should be the first and leading consideration.

## NATURAL GRAFT ON CORK ELM

By Guy Caldwell

**D**OES any lover of trees pass by a phenomenon known as natural graft without entertaining the wish to know just what accident or set of circumstances evolved to bring about the fortuitous growth? The cork elm (*Ulmus racemosa*) herewith was pointed out by the owner, Mr. Brockenbrough, on his summer place near Richmond, and its clean, healthy condition, together with the unusual symmetrical lines dividing the trunk with such nicety at once called forth admiration for the wonders of



NATURAL GRAFTING

This elm, on the summer place of J. M. Brockenbrough, near Richmond, is attracting considerable attention. The man in the picture is Guy Caldwell of Richmond, a tree expert.

nature. It is an interesting speculation to try and imagine just what incident in its life's history caused the union of these young branches after they had previously come to the parting of the ways. Perhaps they believed that "In union there is strength."

## TREES WITH A HISTORY

**I**S there a tree with a history in your town? What do you know about it? Is it being cared for or is it being allowed to die? AMERICAN FORESTRY would like to know about such trees and would be glad to receive pictures and articles not to exceed 100 words about such trees. Such as are available will be printed in the magazine from time to time.

## ADDRESS BY PRESIDENT CHARLES LATHROP PACK

In welcoming the members of the American Forestry Association, attending the Thirty-seventh Annual Meeting, and the United States and Canadian delegates to the International Forestry Conference at Washington, D. C., January 18 and 19, 1917, President Charles Lathrop Pack of the American Forestry Association said:

**I**N the name of The American Forestry Association, I welcome you to this Forestry Conference at Washington. You have come hither in answer to our invitation. Some of you have come long distances, and many have done so at the cost of considerable personal inconvenience. You are here to consider some of the vital questions of forest conservation, and the better protection and use of this great fundamental resource of the United States and Canada. Among the delegates appointed from Ontario and Quebec and from each of many States of this country, we recognize many familiar faces. You are experts in forestry and natural resources, and representatives of National and local organizations concerned in the development and use of the forests. Coming from Canada and from many States, this Conference is, in effect, a meeting of the representatives of the citizens of these States of the Nation and of the people of Ontario and Quebec.

### THE FOREST AND PREPAREDNESS

This is a trying time with those who would protect the forest. New enemies are at work, and you are here to devise plans, ways and means to better protect the forests and better keep and use the great timber resources, which are so valuable and necessary to the economic progress of the United States and Canada. The conservation of the forests is an important factor in National preparedness in this country. If the great test of war comes to our people, it will be as vital to have natural resources available as to have men and ammunition.

We must have natural resources in abundance back of our Navy and our Army for adequate defense. The life of a Navy and of an Army would not be safe without it, and conservation, particularly of the forest and the mine and the soil, is a constructive principle essential to the end that we may be prepared.

I will not undertake before men of your wisdom and experience to discuss any of the details of the important questions you are here to consider. These will be taken up during your deliberations, and I congratulate you on the program you are to hear and consider.

### THE WHITE PINE BLISTER

Expert investigation has established that the white and other five-leaved pines of the United States and Canada are threatened by the white pine blister, a fungus disease imported from Europe. Already the disease has been found extensively in New England and in most of the Eastern and Northern States of the white pine belt, and to some extent in Ontario and Quebec.

What you may here consider and determine will have a large influence and effect for better or worse on the future of the white pine, which is admittedly

our most valuable northern lumber tree, as well as one of the most beautiful. I need not urge upon you the importance of your deliberations.

### THE WAR AND FOREST ECONOMICS

The great war in Europe has increased the importance of the economic value of the forest. Germany has ever been in the lead in the practice of dealing scientifically with these matters. One of the interesting mysteries of the present conflict is the source from which the Central Powers obtain the nitro-cellulose necessary in the manufacture of smokeless powder. This, as you all know, is ordinarily made from cotton. Germany does not now have access to the world cotton market. We have information which would indicate that in this emergency the nitro-cellulose used now by Germany is made from wood. The ordinary black powder is composed of fourteen to eighteen parts charcoal, made from certain varieties of wood. For strategic purposes, of course, smokeless powder is preferred on the battle-fields, but very great quantities of black powder are consumed daily by the contending armies.

We refer to rosin and turpentine, so largely the product of our Southern pine forests, as "naval stores," but now rosin is employed in large quantities in filling the space between the bullets in shrapnel shells, so that when the shells explode the missiles will be evenly distributed in all directions.

Gun-stocks, formerly made almost entirely from walnut, are now made from birch, red gum and other woods. Millions of such have during the past few years been made in America. The peculiar style of warfare which the great war has brought forth, necessitates the use of enormous quantities of timber for trench walls, trench floors, braces and stays. Millions and millions of feet are required for buildings behind the fighting lines, for hospitals, for housing non-combatants, for temporary storehouses and the like. Enormous quantities of forest products go into mine props, bridges and for other military preparations.

The ingenuity of Germany has taught her to make a soft and satisfactory absorbent as a substitute for absorbent cotton for surgical uses, and it is made from wood fiber or cellulose. Nowadays, enormous quantities of cordage and ropes and burlap, rugs and carpets are manufactured from wood fiber and wood pulp. Some may not know it, but many a person, even in this audience, is wearing articles of clothing that are now made wholly or in part from wood fiber. Some beautiful fabrics for ladies' evening wear are made largely of wood fiber and cellulose. The new uses and the increased old uses for the products of the forest increase the economic value of the forest, and add to the importance of all the questions

you are here to consider. The effect on the cost of paper is far-reaching, and of great economic consequence.

Germany was well prepared for this World War, and part of her economic preparation was seen in the fact that she has been unequalled in the perfection and practice of forestry. The care for years with which Germany has protected her timber, and her laws not only compelling in effect the replanting but making replanting profitable and, therefore, economically possible, are among the things that stand out in clear relief from the viewpoint of preparedness.

**NO IMMEDIATE DANGER OF  
SERIOUS LUMBER SHORTAGE**

There is no immediate danger, if we use our forests rightly, of a serious shortage in our lumber supply, but the time is here when the conservation of our forest resources demands more serious and real economic consideration. It seems to me that the conservation of our privately-owned forest resources will never really become effective on a sufficient scale, until there is a prospective profit in practicing forest conservation.

Our great National forests, now under Government administration, should be supplemented to a greater extent by State and Municipal forests, as only the Nation, State or the Town can afford to hold forest lands in reservation, the cost of tax exemption forest management, and protection being a burden of all the people, and these properties thus free from the often heavy local taxation of privately-owned forests should be largely held in reserve until logs at the saw-mill are worth the cost of raising the crop.

**CONSUMPTION AND  
PRICES OF LUMBER**

The official Government figures show that the lumber manufacturer in 1915 received 10 per cent less per thousand feet for his product than in 1906. The average of lumber prices in 1916 at the saw-mills will average little more than those of 1915, and at Southern pine mills not as much as the prices of 1913; and this when the average citizen of this country uses over 400 feet of lumber yearly—more extravagant in the use of lumber than the people of any other land. The best estimate of lumber used in 1916 in the United States was about 42 billion feet as against 38 billion used in 1915.

The forest and lumber industry is the greatest of our

industries which has not greatly benefited by the World War. There are no war brides in the shares of Lumber Companies. Such low prices for lumber at producing points—away below the costs of reproduction through forestry methods—are against the interests desiring the conservation of these resources. You can't continue to have your cake and eat it too, when you buy your cake at less than the cost of raising the grain and sugar.

The values of the trees in the forest—stumpage values we call them—have in recent years steadily increased, but even at present prices forest trees at the source are the most reasonable crop that grows—cheaper, I believe, than wheat at 25 cents a bushel, or corn at 10 cents a bushel, or cotton at 5 cents a pound. Suppose that cotton or grain were century plants, like large pine trees; it would require a comptometer to compute the price of bread for breakfast.

You can't produce a dense population of men and a large stand of pine, or hard wood, on the same land. We raise a useful man in, say, twenty to twenty-five years. It takes very much longer to raise a tree useful for wide boards or timber. A boy usually produces little or nothing until he becomes of age. This is equally true of the tree raised for lumber of considerable dimensions. We have been a happy people in consuming forests that were here before we came, but now we must realize that timber like other crops must be worth the cost of production.

**A BETTER PUBLIC  
UNDERSTANDING**

A striking indication of a better understanding by the public of the problems in forest ownership and lumber production is given by the report of the Special Committee on Natural Resources of the Chamber of Commerce of the United States, which, through Referendum No. 17 of that organization, recommends legislation to permit coöperative agreements under Federal supervision in those industries which involve primary natural resources on conditions that the agreements tend to conserve the resources and promote the public interest. When trade organizations representing every phase of American industry vote in favor of these recommendations—as they have done—it is a most hopeful sign for an ultimate conservation of our natural resources through wise use.

**T**HE announcement of the short practical courses in forestry and lumbering that will be given by the University of Washington, at Seattle, has just been sent out. These courses extend from Jan. 3 to March 30. Dean Hugo Winkenwerder, of the college of forestry, is in charge.

As these are short practical courses and arranged especially for young men who have not had a high school education and who can not afford to spend a long time at the university they offer an exceptionally good opportunity, for men regularly engaged in some form of woods work, and for those who intend to enter such work, to get a practical education.

\* \* \* "This year we are increasing the work in the special course in 'Lumber and Its Uses.' This course is outlined with special reference to presenting this information for the use of persons engaged in office work at the sawmills, lumber salesmen, architects, engineers, builders and building inspectors."

**T**ESTS at the Forest Products Laboratory, at Madison, Wisconsin, indicate that by the use of four additional nails in each end an increase of 300 per cent in the strength of canned food boxes is secured.

**A**PPROXIMATELY 10,390 acres of denuded lands within the National Forests were reforested in the fiscal year 1916. The total number of trees planted was 6,146,637, while 8,280 pounds of tree seed were sown.

**T**HERE were 133,442 more cattle and horses, and 605,338 more sheep and goats using the National Forests in 1916 than in 1915. This increase was in spite of large eliminations of grazing lands from the Forests. It is accounted for by improved methods of handling the stock and by more intimate knowledge of the forage on the ranges and their carrying capacity.



THE ILLUSTRATED GLOSSARY—BUDS AND ROOTS

Figure 22, one-year old horsechestnut shoot, autumn specimen, after the leaves have fallen; this shoot shows a *terminal bud*. Terminal huds are found on the ends of the stems and twigs of certain trees, shrubs, and herbs, and through their evolution and growth the prolongation of the stem takes place. They may easily be studied in the spring in the case of many trees, as the maple (Figure 28), the hickories, and the present subject. Below the terminal hud, on the sides of the stem or twig, we may notice certain small, triangular, naked places. Here is where the leaf-stalks came away the previous autumn. On the upper margins of these areas small huds are discovered; these are called *axillary buds*, as they occupy the axil of the leaf—the place where the leaf is attached to the stem. These axillary huds have a regular arrangement down the stem, as shown in the drawing; and in the case of the destruction of the terminal hud, a number of them may grow to become branches. In many shrubs and trees these huds do not start to grow until spring opens up, while in the sycamore (Figure 26) they may be covered all summer by a cup at the end of the leaf-stem (base of the *petiole*). In this connection, study Figure 6 of this article. Sometimes, as in certain honeysuckles, several of these axillary huds are grouped together, and when this is the case they are termed *accessory* or *supernumerary buds*. This is also found to be the case in various trees, as in the hutter-nut (Figure 27), and here we find that one of the axillary huds is larger than the others, being removed to a point above them on the stem. In the red maple,

however, the axillary huds are seen to be placed side by side (Figure 28). The study of *buds* is extremely interesting, not to say important. Besides the above-mentioned *axillary* and *accessory* huds, we may also have *adventitious* huds, or those that do not occur regularly in the axils, but appear in other places on the stems in no regular order; they may be found even on leaves and roots. Adventitious huds may be *scaly* or they may be *naked*,—that is, without scales. Those that develop into leaves are called *leaf-buds*, but when they do not contain leaves but latent blossoms, they are termed *flower-buds*. One of the best ways to study huds and their development, is to watch them from day to day as they grow in the spring and early summer on plants, trees, and shrubs.

In the next month's *Illustrated Glossary* the subject of *roots* will be taken up; their terminology is quite as extensive as that of buds. Good examples will be given of those that are termed *fleshy roots*, such as carrots, parsnips, turnips, and radishes. Their simple, fleshy enlargements are really store-houses of food for the growing *perennial* or *biennial* herb. When such roots are broad and shallow, resembling some tops in form, they are called *turnip-shaped* or *napiiform roots* (Figure 25); when they are elongate or cone-shaped, as in many species of carrots, beets, and parsnips, they are termed *conical roots* (Figure 30). Finally, we have the *fusiform* or *spindle-shaped roots*, or those like some radishes, which are more or less pointed at the extremities and enlarged at their middles (Figure 29). Still other kinds of roots will be taken up in a future number.

## EARLY SAXIFRAGE, BLOODROOT, AND JACK-IN-THE-PULPIT

BY DR. R. W. SHUFELDT, C. M. Z. S., EDITOR OF THE DEPARTMENT OF FLOWERS

AS winter retreats northward before the steady advance of the ever-increasing warmth of approaching spring, we have a season at hand that rivals any other time of the year in which to ramble over fields, and tramp through the woods with our collecting outfit. Every part of the latter, since the days of the preceding autumn, has lain neglected in some corner of the naturalist's sanctum, patiently awaiting the advent of the first bird migrant; the awakening of the earliest flowering plants; the chirruping of the merry cricket frogs in the ponds and ditches, and a thousand other happenings afield, which, combined, render this vernal season the most delightful of the year. An April-tempered breeze sends the dried and tan-colored fallen leaves of the previous season scurrying before you along the edge of the oak and chestnut woods, exposing here and there a patch of bright green fern leaves; a spray of early arbutus; a few brilliant partridge berries, not to mention a dozen other peeping sprouts of as many different kinds of growing things, making ready to put in as early an appearance as possible.

Ah! There are some charming little Spring Beauties—surely they have been in bloom for a week at least. We all know them; and some of us may even remember that they were named *Claytonia* in the honor of that good, old, American botanist, John Clayton, while the two species of the

genus have received the names of States, being known as *Claytonia virginica* and *Claytonia caroliniana*. But these must be described some other day; for right here, in this deep ditch to my left, I spy the first specimens of Early Saxifrage seen thus far; so my faithful, old-time, five by eight camera is brought into position, and the result here reproduced in Figure 1 is secured. Like the Spring Beauties, Early Saxifrage—the two best-known species of it—is found in suitable localities over most of the upper half of the United States, and have been named specifically for States, as *Saxifraga virginiana*, and *Saxifraga pennsylvanica*. As a family, however (*Saxifragaceæ*),—that is the Saxifrage family,—it is more extensive than this; for it contains in the genus a very large number of herbs and shrubs. They are related to the Rose family (*Rosaceæ*), and are represented by the Mitreworts, Alumroot, and their various allies. Asa Gray, for example, describes an even dozen species of Saxifrage for us in his last "Manual": while in some of the earlier botanies only two species are mentioned—the ones named above.

*Saxifraga*, be it known, is compounded of two Latin names: *saxum*, a rock, and *frangere*, to break or fracture; this for the reason that the plant is often seen growing in the clefts of rocks in the woods. From this fact, some botanists go so far as to say that they always grow in such clefts; while, much to my surprise, I find that we still

have writers on flowers among us who actually believe that the roots of this delicate little plant rend the rocks asunder. Even the close observing Germans call it a "stone-breaker" (*Steinbrech*); while Alice Lounsberry says, in her "Guide to the Wild Flowers," that "we find

dead leaves, semi-frozen ferns, and frost-nipped vegetation of the year before, with not a single sign of a rock in the neighborhood.

Neltje Blanchan believed no such tale, for she says of the Early Saxifrage: "Rooted in clefts of rock that, there-



WHERE SAXIFRAGE THRIVES  
(Slightly reduced)

FIG. 1.—Early Saxifrage (*Saxifraga virginensis*), one of the first flowering plants of the spring, sometimes appearing as early as the first week in March; they grow to be from four to ten inches in height. The dark-green leaves are arranged in a rosette near the ground. Their foot-stems are short and broad, while the leaves themselves are oval in outline, rounded distally, with scalloped edges; they are smooth and somewhat thickish. Petals white, five in number, the flower being small, with ten bright yellow stamens. Stem stout and downy; rises from the middle of the leaf rosette. As the main stem lengthens, the separate flower-stems branch and elongate, until the growth as a whole has a much looser appearance and actually is more spreading on this account. The flowers may remain in bloom for two or three weeks, during which time different species of bees and two or three species of butterflies perform the required cross fertilization.



FLOWERING BLOODROOTS (*SANGUINARIA CANADENSIS*)  
(Slightly reduced)

FIG. 2.—A white-petalled, yellow-centered flower of general range in eastern United States. It is entirely without odor, and grows, as seen in the illustration, on a naked scape of no great height. Pistil single; stamens numerous. This curious plant has but a single leaf that springs from the fleshy root-stock close to the base, the latter containing the same kind of red juice that is found in the stem. There is a short style and a two-grooved stigma, while the ellipsoidal pod is one-celled and two-valved. The seeds are conspicuously crested. In Europe and in northern Asia this low, perennial plant is called the "tormentil," and its juice, which is rich in tannin, is medicinally used as an astringent. Housewives in this country often keep a small bottle of it on hand to drop on sugar, and children are given this when suffering from colds. In general medicine its alkaloid, *sanguinarin*, is sometimes employed as an expectorant, an emetic, or even as a stimulant.

it on the top, or in the clefts, of rocks, which it has been known to break asunder. In fact, to watch this little plant is a moral lesson in the achievements that can be brought about by quiet will power." Of course, this is but a fabulous tale, and our pretty little plant plays no such part in nature. Indeed, I have far oftener met with it growing in just such situations as I photographed it in on the sides of a deep ditch, coming up among the

fore, appears to be broken by this vigorous plant, the saxifrage shows rosettes of fresh green leaves in earliest spring and soon whitens with its blossoms the most forbidding niches." This is distinctly contradicted by Ellen Miller and Margaret Christine Whiting, in their "Wild Flowers of North-Eastern States," when they say: "The roots of this hardy plant, pushing in among the crevices of the rocks, fracture them by their vigorous growth." And so

it goes. It would be quite an interesting point to settle, when Early Saxifrage appears this spring, were some reader of this controversy, as I have presented it here, to photograph a growing specimen of this plant in some rocky crevice, where it might prove or disprove this variance of opinion among botanists at the present time.

Early Saxifrage blooms from the first week in March to well into May in the middle of its range, the plant occurring as far north as New Brunswick, thence southward to southern Georgia, and westward through the valley of the Mississippi. F. Schuyler Mathews tells us that "the buds are formed early, and appear like little (fine-haired) balls in the center of the rosette-like clusters of obovate leaves close to the ground. Eventually a cluster expands to a branching, downy stem (Fig. 1), bearing many little white, five-petaled, perfect flowers, with ten yellow stamens. The flowers are succeeded by rather odd and pretty madder purple seed-vessels which are two-beaked; often the color is madder-brown." Mathews is another botanist who distinctly denies that the roots of this little plant have the power to fracture rock; at least he says so of the Swamp Saxifrage, which is, by the way, a larger plant with greenish-white flowers.

#### THE BLOODROOT

About a week or ten days after the Early Saxifrage is in full bloom, we have the advent of another of our most lovely, not to say most interesting, wild flowers of spring, the Bloodroot, associated with all that the early spring woods have in store for us. The picture, Figure 2, presents a whole lot in the history of this famous plant. In the first place, it shows at least one kind of locality in which they flourish; it is on the almost vertical bank of a miry ditch, where I disturbed not a single dead leaf, twig, or

stick before making the exposure. We see here the flowers of the bloodroot in every stage of their development, as well as their gradual departure after enjoying the most transitory existence, which is more transitory, mark you, than that of any other early flower of our forests and glades. Note the gorgeous specimen in full bloom; the two that are losing their glistening white petals, and the one between them where all the petals are gone but one. Above these we see the two opening buds, and a closed bud between them, nearly shut out of sight.

We have but one species and one genus of Bloodroot in our flora. As *Sanguinaria canadensis* it has been arrayed among the poppies or in the Poppy family (*Papaveraceæ*). As every one who has ever picked a Bloodroot knows, the juice of the plant is of an orange-red color, hence its name—generic name—*Sanguinaria*. In former times, this juice was much in use by some of the American Indians as a stain for their faces, and for certain of their trappings, tomahawks, and arrows. It washes off with great difficulty, and I have seen the evidences of it upon children's fingers a week after they plucked the flowers. This will account for other names which have been bestowed on the plant, as "Indian Paint," "Red Puccoon," and "Indian Plant," with possibly others in other parts of the country where it is found.

Where Bloodroots are seen to the best advantage is upon some dark-soil hillside, sparsely timbered with various trees of the forest. They commence to put in an appearance early in April, after the first spring winds have blown many of the last year's dried leaves off the most exposed areas in the woods. It is then we note, some fine morning, their first appearance as they send up in many places the first evidence of their awakening. That elegantly curled-up leaf there, enclosed in its tissuey bract,



JACK-IN-THE-PULPIT (*ARISAEMA TRIPHYLLUM*)  
(Slightly reduced)

FIG. 3.—This is one of those having the dark purple, light-striped spathes, which arches over the still darker, club-like spadix seen within. Between the plant and the poplar tree near it, is seen growing a fine May flower plant (*Podophyllum peltatum*), and the leaves of the two must not be confused. The Indian Turnip has but two, and far above that which many take to be the flower of the plant. Jack-in-the-Pulpit flowers are, however, known to but few observers, for they are exceedingly small, and situated at the base of the spadix which folds around them. Just above where the tiny florets are found, the club-like spadix becomes suddenly enlarged, thus forming a chamber in which many an insect is entrapped and loses its life. A good account of these tragedies is given in "Nature's Garden" by Neltje Blanchan (p. 368), and it forms most instructive reading for the young botanist. Unfortunately, the story is too long to reproduce in this place.

is a splendid specimen of the plant as it forces its delicate tip into the realm of day, to enjoy its interesting life-cycle. On it comes, straight as an arrow, through the dark soil. When lo! after it has attained a height of some five or six inches, the round, rich, silvery-green and deeply-lobed leaf unfurls, gradually opens out, and exposes to view the treasure it has so well protected. This is nothing less than the future flower—a rather thickish, spindle-shaped bud, which reveals, as soon as it is well above the expanding leaf, its ten or dozen snowy petals, spreading quickly out into a gorgeous star, that may be seen against the dark earth at a long distance, forming, with its many neighbors, a superb floral galaxy indeed.

These delicate flowers last but a very short time—maybe not more than a day or even less; the first stiff spring breeze sends the white star-points in all directions, as it sweeps over the frail band. Still, recruits continue to come up, and bloodroots may be found in one place or another until May is pretty well along—the atmospheric temperature having not a little to do with it.

These flowers secrete no honey, so the insects visiting them leave unrewarded for the important service they perform in the matter of fertilization; bees and certain flies are their chief benefactors in this respect.

Bloodroots close up at night, the closure being accomplished by the petals all rising together, their outer points meeting above the inner structures of the flower, thus protecting them from the chilly air of the nights and evenings of the early spring. This plant is an interesting one to study, if obtained just as its tip appears above ground in the spring, and transplanted to a suitable box filled with rich earth, to be kept on some sunny window-sill at home; in this way all of its peculiarities may be observed at one's leisure.

Spring is now well along in the northern States east of the Mississippi, and many flowers have bloomed and disap-

peared as one of the most remarkable plants we have makes its appearance; this is the Jack-in-the-Pulpit, also called Indian Turnip. It occurs in moist woods, and often along the banks of sluggish brooks and streams in deep, dark woods. Occasionally, numbers of them thrive in

thickets where the ground is moist and soft. Botanists have placed it in the Arum family (*Araceæ*), and christened it *Arisæma triphyllum*, or an arum that is stained as though with blood (Greek). It has but one close relative in our country, the Green Dragon or Dragon Root, found in the same genus—a plant with a history.

Frequently I have photographed the Jack-in-the-Pulpit, both the fruit (Fig. 4) and the flower (Fig. 3), and I have studied this plant under many conditions, in nature as well as in boxes kept in my study. In the Middle Atlantic States we may look for them along in April; and if it be very early, we may brush the dead leaves and sticks aside in the localities where they grow, when, sooner or later, a pale green, sharp-pointed little cone will be seen sticking up in the mire or damp earth. If this be not a May Apple (*Podophyllum peltatum*), it is almost certain to be sprouting Jack-in-the-Pulpit. Right here, my advice would be to carefully take the whole plant up, looking about for three or four other good specimens to go with it, and take them home to plant and study as they develop.

Some should be reared in the sunlight; others in deep shadow, and still others under varying conditions. Notice the root as you plant it; it is called the *corm*, and it is a turnip-shaped affair, rich in farinaceous matter. So bitter is its juice that, if bitten, it will blister the tongue and lips. School-boys call it the "Memory roots," for you are likely to remember it should some young scamp get you to bite it. Boiling removes this acidity entirely, so the early Indians, after thus cooking it, used it as food, as they used the bright scarlet berries which constitute



THE BRILLIANT SCARLET FRUIT OF THE JACK-IN-THE-PULPIT  
(Slightly reduced)

FIG. 4.—There are two plants represented here, collected in southern Maryland on the eleventh of September, 1916. These fruit bunches, containing the ripened seeds of the plant, were originally dark green, and very shiny; they only became red upon ripening. If this be done on the part of the plant in the hope that seed-eating or other birds may carry them off, and, finding the berries unfit to swallow, drop them far from the parent plant, where they perchance may start a new colony, that hope is possibly realized, though we have no evidence of the fact. Gnats of the genus *Mycetophila* are the insects principally responsible for the fertilization of the Jack-in-the-Pulpit, though probably other forms also are. Mathews says that the plant "is possibly developing a dependence upon insects for fertilization; but often one plant develops both staminate and pistillate flowers." The last word about this member of the Arum family apparently has not been said.

its fruit (Fig. 4). Hence "Indian Turnip," as before noted.

This plant grows rapidly, its erect stem (scape) being pinkish and green as it shoots upwards; and the plants vary greatly in height, from a few inches to a foot and a



(Photograph of living insects by the author. Specimens collected by Master Edward E. Court, near Washington, D. C.)

#### HORN PASSALUS OR HORN-BUG (PASSALUS CORNUTUS)

FIG. 5.—Four specimens are seen in the illustration, and the forward-projecting, tiny "horn" is plainly seen upon three of them. These beetles belong to the family *Lucanidae*, members of which are known as Stag-beetles or Stag-horns, their branching mandibles being compared to the antlers of a stag. The common Stag-beetle is *Lucanus dama*, and it is also found in decayed tree-stumps of certain trees, as the apple, oak, and others.

half and more. At first this stem is sheathed in the two leaves; but the latter soon open and grow far above the part containing the flower. Each leaf is divided into three ovate, pointed leaflets, and are of a dull green color. In some specimens these leaves grow to be of enormous size and length. Where the leaf-stems part company they are sheathed, and from between the sheaths springs the stem of the floral part (Figs. 3 and 4). This latter consists of a hood or *spathe*, within which we find a soft, club-like wand or *spadix*. The spathe varies in its coloration, being

sometimes a beautiful pale green, with delicate longitudinal stripes. Again, it is a dark rich purple, with pale yellowish stripes. It is surmised that the former has grown in the bright sunlight, and the latter where they have been deprived of it.

The minute *flowers* of the Jack-in-the-Pulpit are greenish-yellow in color, and are clustered about the base of the *spadix*. The arrangement can be easily studied by taking a fresh plant and splitting the hood or *spathe*, down the side as far as the stem. Doctor Torrey believes that those very light-colored ones, or where the flap of the *spathe* is very light-colored, are sterile plants, while the fertile ones have the dark purple *spathes*. This is an opinion at variance with the one expressed above, but it may none the less be the correct one. In any event, late in the summer the ripened seeds form a bunch on the summit of the stem, about as big as a large horsechestnut or larger, being at first of a very dark green color, and later a magnificent and brilliant scarlet, rendering the plant so conspicuous that it may be seen at some considerable distance in the woods (Fig. 4). Additional information in regard to this plant is set forth in the legends beneath Figures 3 and 4.

Personally, I have never collected the near relative of the Jack-in-the-Pulpit, the Green Dragon or Dragon Root (*Arisæma dracontium*); but a good account of it may be found in any general work on our wild flowers. Next summer I will probably be able to present a reproduced photograph of a specimen here.

In the damp woods where we find the Jack-in-the-Pulpit flourishing in the spring, we often come across a great log of a fallen pine tree, or perhaps that of an oak. Upon tearing off the loosened bark of this, all the evidences of the decayed trunk are in view. A large larva is also to be seen in the pulverized, rotten wood and bark, while channels, borings, and grooves run in all directions, having been cut not only by the larva, but by the adult insect itself. These insects are soon to be seen, and many a collector has asked me the name of them. They are known in entomology as the Horn-Bugs or Horned Passalus (*Passalus cornutus*), and very elegant beetles they surely are (Fig. 5).

#### PENNSYLVANIA TREE PLANTING

THAT the 5,000,000 acres of barren land in Pennsylvania can be reclaimed by reforestation is finally established by reports given out by the Pennsylvania Department of Forestry. These reports cover the planting of 21,000,000 trees on 13,000 acres of State Forest land. Pennsylvania set a record last year when almost 6,000,000 trees were planted in one season, and a single plantation was made which contained over half a million trees. The nurseries will produce many more trees this year, but the work of planting will be hampered considerably by scarcity of labor and lack of funds.

FOREST products of Finland now constitute 70 per cent of the total exports or \$96,500,000 and the government has appointed a committee to look into ways and means for better preserving the forests and enhancing their yield.

# THE LOCUSTS

## IDENTIFICATION AND CHARACTERISTICS

By SAMUEL B. DETWILER

**B**Y a curious power of alchemy, the locusts transform the nitrogen of the air into a fertilizer that greatly enriches the soil in which they grow. This transformation is brought about by bacteria that live on the rootlets and extract nitrogen from the air through complicated chemical processes. Many other members of the Pulse family, which contains over seven thousand distinct species of plants throughout the world and about fourteen hundred in North America, have the same property. The plants in this great group range from small herbs to great trees, and some of them, such as peas, beans, clover and alfalfa furnish highly valuable food for human beings and animals. Others supply important vegetable dyes, including logwood and indigo. Senna and other medicines are also obtained from members of this group.

All of these plants are called legumes or pod-bearers because their fruits are pods on the order of those borne by the common cultivated varieties of beans and peas. The acacias are well-known pod-bearers, closely related to the locusts. A species of acacia furnished the Shittim wood, or "incorruptible wood," mentioned in the Bible as the material used in constructing the Ark of the Covenant and the Altar of the Tabernacle. It also provided the thorns for the

crown of Christ. The Buddhists and the Hindus regard the wood of the acacia as sacred, and burn it on their altars. Chinese doctors place acacia seeds in a vessel and cover them with ox-gall. After these seeds have been dried in the shade for three months, they are prescribed to clear the eyesight, keep the hair from turning gray and to cure hemorrhage. The ancient herbalists are con-

sidered to have given us the foundations of modern botanical science. These learned men carefully observed the marks or signs on various portions of the plant structures, and claimed they could thus determine the medicinal virtues of plants. The acacia was known to them as a plant identified with the eyes and was assigned for use in various eye troubles.

The black locust (*Robinia pseudacacia*), better known in Europe as the false acacia because of its resemblance to the true acacias, is a native of North America. It originally grew in the Appalachian Mountains from Pennsylvania to Georgia, and in eastern Oklahoma and Arkansas. It has been planted throughout the United States, except the extreme southern portion, and in many places it has escaped from cultivation. It is named Robinia in honor of Jean Robin, Director of the Garden of the Louvre, who introduced it into



THE BLACK LOCUST

The characters which identify black locust in summer and winter: (1-2) twigs bearing leaves, flowers, fruit pods and seeds, and (3) a twig as it appears in winter, armed with stout prickles. Sections of winter twigs (4 and 5) enlarged, showing several buds in the protected cavity between the spines.

France about the year 1600. The black locust was one of the first American trees to be planted in Europe, and at once became fashionable for its beautiful flowers and foliage. Later, its culture was neglected until near the close of the eighteenth century, when its value as a timber crop and soil improver was recognized. In 1786, de Crève-Cœur presented a paper before the Agricultural Society of Paris, eulogizing the black locust and giving facts about its culture and uses in the United States. According to this writer, the colonists learned very early of the value of this tree and Massachusetts offered prizes for the best plantations. He mentions a farmer of Long Island who planted 14 acres of pasture land to black locusts and gave the plantation no care except to keep out cattle. Twenty-two years later he sold some of the wood to a ship's carpenter for £260 8s. 4d., and three years later he obtained a similar sum from the sale of additional timber from the planting. De Crève-Cœur continues: "The Americans think so highly of this tree that I have heard many colonists express sentiments to the following effect: 'May Heaven grant that when I die, I may be able to leave to my children 50 acres of land planted with acacias, and well enclosed! My house may be destroyed by fire, my harvest may fail, the contracts I hold be violated by cross events and bankruptcies—whatever else I may have may perish—but if I live long enough to accomplish this great object of my wishes, I shall have no reason to dread death. My family will be secure and will find in this



BARK OF BLACK LOCUST

The bark on trunks of black locust trees of all ages is thick and rough, varying in color from reddish brown to dark gray, and separated into heavy, rounding ridges.



EASILY DISTINGUISHED BY ITS FRUIT

The fruits of the black locust are straight, dull-brown pods, two to four inches long. They split open easily, exposing from four to eight flattened, smooth brown seeds. The seeds ripen in the autumn but many of the pods hang on the trees until the following spring.

treasure all the resources that they may require in order to enjoy a sufficient competence."

It was decreed during the French Revolution that May sixth of each year should be consecrated to the black locust, and the following description appeared in the Cultivator's Year Book, for use in the schools:

"*Acacia* (false), a large spiny tree, a native of North America. It grows rapidly; its foliage is very graceful and casts a light shade; its flowers are white and very odoriferous, and a useful syrup is made from them; the young shoots are good for cattle; the root is tender and saccharine, having the scent and flavor of stick liquorice; the wood is veined and hard, it splits readily and does not decay when exposed to the action of either air or water. It is used for hop poles, vine props, mill work and other machinery. In America it is preferred for the stern posts and knees of vessels."

The black locust is a medium-sized tree, seldom attaining its maximum size of 80 or 90 feet in height and 3 or 3½ feet in diameter. Average mature trees are 50 to 60 feet high and 18 or 20 inches in diameter. Trees growing in the forest have straight, slender trunks, clear of side branches for most of their length and forming a narrow, oval top. In the open, black locust usually branches low or divides into several stems; the top does not spread widely, and is open, rounded and irregular. The bark on trunks of trees of all ages is thick and rough, varying in color from reddish brown to dark gray, and separated into heavy rounding ridges that are free

from surface scales. The leaves are 8 to 14 inches long, and consist of smooth-margined oval leaflets, each about one-half inch in length, arranged in pairs on the sides of the leaf stems with a single leaflet at the tip. At night the leaves droop to prevent excessive evaporation of moisture from the leaf-surface. A little lad who had noted this habit, once objected to going to bed early because the locust leaves "had not yet said their prayers."

Two little spines at the base of the locust leaf-stalk take the place of leaf-like appendages found at this point on many other kinds of trees. These prickles are stout and sharp, like those on the stems of rose bushes, and help to protect the tender leaves from browsing animals. A hairy cavity between these spines contains 3 or 4 tiny buds so small that they may easily pass unnoticed during the winter, but they enlarge in the spring and become plainly visible. Only one bud at a time develops into a shoot; if this shoot is killed, another bud starts to grow. Thus Nature enables the locust

trees to replace twigs and branches which are frequently lost through damage by cattle, wind or insects, and this fact accounts, in part, for the scraggly appearance of many old trees.

The glory of the black locust is in May or June, when masses of creamy white blossoms transform even the most unsightly tree into a bower of beauty and perfume. The flowers resemble those of the garden pea in size and shape, and are borne in drooping clusters, 4 or 5 inches long. Usually, they appear after the leaves, and the bright green foliage furnishes a rich setting for the exquisite blossoms. By the end of summer, each flower has matured into a thin, dark brown pod, 2 to 4 inches long, half an inch wide, enclosing 4 to 8 flattened, smooth, brown seeds. These seeds may be sown in the fall, but a better plan is to store them in a cool, dry place over winter, and sow them in the spring, after danger of frost is past. Unless water heated nearly to the boiling point (from 160° to 180° F.) is poured over them at this time, and the seeds then allowed to soak for some hours until they

swell, many of the seeds are apt to lie dormant until the following year. Treated in this manner and immediately sowed in rich, fresh soil, the seeds germinate well and the young trees are frequently from two feet to six feet high at the end of the first season's growth.



THE BEAUTIFUL BLOSSOMS OF BLACK LOCUST

The glory of the black locust is in May or June, when masses of creamy, white blossoms transform even the most unsightly tree into a bower of beauty and perfume. The flowers generally appear after the leaves, and the bright green foliage furnishes a rich setting for the exquisite blossoms.

the trees are uprooted, since small roots that break off send up abundant sprouts.

Black locust develops rapidly when young, growing 2 to 4 feet in height and one-fourth to one-half inch in diameter yearly, but its rate of growth begins to slacken when it is 15 or 20 years old. It thrives on moist fertile soils, such as river bottoms and coves or ravines in the mountains, and it appears to have especial health and vigor on soils well supplied with lime. It will also do well on poor soils, such as sandy land or rocky slopes—in fact, almost any soil except a wet, heavy, sour soil is adapted to it.

Foresters in Hungary have said that "the locust has been discovered in America especially for the Hungarian plain." Dr. Gifford states that in Europe the black locust is free from its greatest enemy in America—the locust borer. This insect riddles the trunks and branches of black locusts; if it does not kill them outright, it retards their growth and causes them to break and become worthless. Individual trees may be protected from this insect by soap emulsions or lime washes, applied to the

No other broad-leaf tree, except the chestnut, compares with the black locust in its ability to send up vigorous and abundant sprouts. These sprouts spring principally from the roots when a tree is cut down, and they are also produced whenever the roots of standing trees are cut or injured. At one time it was customary to plant rows of black locust trees about 50 feet apart, and the following year plow furrows three feet from the rows. Locust sprouts would spring up along the edges of the furrows, and by repeating this process each year it is claimed that a thrifty plantation was secured at little cost. The sprouts are sometimes so numerous and form such dense thickets, that the trees cannot make a good growth. It is difficult to destroy a black locust plantation even though

trunk and branches before the time the mature beetles lay their eggs in August. The beetles feed on golden rod, and may be collected and destroyed. The expense of special treatment to control the borers is prohibitive in the case of plantations. Therefore, unless careful observation indicates that the black locust will not be seriously



GROWTH FROM SEED PLANTING

Black Locust Grove in Southern Indiana, only nine years old, from seed. Poor soil in an old pasture was ploughed up and seeded to locust nine years before this photograph was taken. Cultivation was given the first year, after which it was neglected and the cattle permitted to enter the plantation. The grove was thinned twice. An estimate of the timber, as shown in the photograph, established the fact that there were 394 trees per acre, estimated to yield 1,028 fence posts, worth 20 cents each on the ground—a value of more than \$20 per acre per year.

injured by its most destructive pest, it should not be set out in plantations. In certain localities the borers have not yet become numerous enough to harm the locust trees to any great extent; this is true especially of Oklahoma and the states west of the Rocky Mountains.

Another insect, a leaf miner, has caused much damage to locusts in portions of the eastern United States. This insect causes the leaves to turn brown, as though scorched by fire. Young trees seem to suffer most, and are weakened so that they easily die from other causes. The remedy is an arsenical spray, but this is practical only in the case of shade trees. A fungus known as the yellow-rot is very destructive to the heartwood of living trees, and is the cause of the hollow trunks of so many old black locusts. Another heart-rot, the sulphur polypore, is a very destructive disease that sometimes attacks this tree. The fruiting bodies of these fungi are shelf-like growths that push their way through the bark.

The wood of black locust is very hard, stiff, strong and durable. Its extreme hardness is due to minute crystals, which soon dull the edges of cutting tools. It is coarse grained and splits readily. The heart wood is yellowish brown and for this reason the tree is frequently called yellow locust. Sometimes the wood has a dark reddish brown or greenish tinge. The sapwood is yellowish white, and forms a very narrow band around the heart wood; it does not resist decay like the latter. The principal uses of the wood are for fence posts and rails, insulator pins for telephone and telegraph cross arms, tree nails and the hubs of carriage wheels. Under average conditions, locust posts will last 20 to 35 years, and accordingly, they have

a high market value. The wood makes excellent fuel, and is also valuable for railroad ties and the ribs of vessels. It does not enter largely into manufactured lumber because the supply is limited, and is used for the special purposes to which it is best adapted. The bark of the roots is poisonous when eaten in large quantities, but in small doses it is used as a tonic in homoeopathic medicines. Black locust leaves furnish a principle similar to that from which indigo is obtained, but it is not known to be of commercial use.

A spineless variety of black locust has a darker colored foliage than the common form. The clammy locust



WITH OR WITHOUT THORNS

Honey locust branches low and forms a spreading, rounded top when growing in the open. The lower branches extend at nearly right angles to the trunk, and the beauty of the tree is emphasized by the light and graceful foliage. The trunk and older branches usually have strong thorns, but a variety free from thorns is available for planting where thorns are objectionable.

(*Robinia viscosa*) is a small tree or shrub of the North Carolina mountains. It is so named because the twigs and leaf stems are coated with a sticky substance. Its flowers are pale rose color, larger and blooming later than those of black locust. The bristly locust or rose acacia (*Robinia hispida*) is another shrub or small tree that grows wild in the Southern Allegheny mountains. It is very prickly, and has large and very beautiful rose-colored blossoms that appear in June or July. It is much planted for ornament, and does well on sandy soils and near the sea shore, but may become objectionable because of its abundant root suckers. The New Mexican locust (*Robinia neo-mexicana*) is found in the semi-arid portions of southern Utah, Colorado, Arizona and New Mexico. It is more of a shrub than a tree, but produces handsome



#### HOW CHILDREN STUDY TREES

Black locust exhibit, illustrating the life history and commercial uses of this tree. The exhibit won a prize in a tree contest in a Washington, D. C., Normal School.

flowers and is valuable for conserving rainfall on the dry slopes on which it grows.

Honey locust is a title sometimes given to the black locust in New England because of its fragrant, honey-laden bloom. The true honey locust (*Gleditsia tricanthos*) differs in so many respects from the Robinias or true locusts that botanists give it a separate classification, but the leaves, fruit and wood show that they are closely related. The honey locust may have a single leaf-stem, 7 to 9 inches long, furnished with 9 to 14 pairs of leaflets, or the leaf-stem may divide into 8 to 14 branches and each branch bear 9 or 10 pairs of smaller leaflets. Honey locust leaflets are in pairs the entire length of the stem, while black locust has a single leaflet at the tip of the stem bearing the paired leaflets. Black locust has oval leaflets with even margins; honey locusts are oblong and the margins are slightly wavy or notched. Black locust has short, stout spines that are merely attached to the bark, like prickles of rose bushes,

and drop off or are easily broken off. Honey locust has long branching thorns that are part of the wood of the tree and cannot be easily detached except by cutting. The fruit of the black locust is a straight, dull brown-pod, 2 to 4 inches long; the pod of honey locusts is 6 to 18 inches long, bright brown or purplish in color and always more or less curved and twisted. The pods of black locust split open easily; those of honey locust must be torn apart. The differences between these trees enable one to readily distinguish them at all times of the year.

Honey locust is native from Ontario to Florida, west to Kansas and Texas. Ordinary trees are 50 to 75 feet high and 18 inches to 2 feet in diameter, but in the rich bottom lands of the Ohio valley honey locusts have been known to grow to a height of 140 feet and a diameter of 6 feet. In the forest, it usually does not have a trunk quite as straight and clean as black locust. In the open it branches low and forms a spreading, rounded top. The lower branches extend at nearly right angles to the trunk, and the twigs droop with considerable grace. The bark of the trunk is very dark colored and may be rather smooth, but on large trees is commonly cleft into very broad, thick ridges. The twigs have a zigzag growth, and are covered with shining brown or greenish-red bark. The older twigs frequently have strong, shining brown thorns, and the trunk is usually equipped with still larger weapons of defense. These thorns are specially developed branches. The fact that most of the thorns are branched near the base to form a cross, has caused the tree to be called the three-thorned acacia and the Acacia of the Passion.

Four of five buds are found at each leaf scar, but only the upper one of these buds can be seen, and that is exceedingly small. The flowers appear late in the spring, in small greenish clusters. They are fragrant and honey laden but not showy, nor are they pea-shaped, like those of the



#### LOCUST AS A SHADE TREE

Honey locust planted as a street tree in Kansas. The honey locust is free from the serious insect and fungous enemies that beset the black locust, and is in every way an admirable tree for shade and ornamental planting. It is one of the hardiest trees for planting in the naturally treeless area of the United States.

black locust. Each cluster is composed entirely of either pollen-bearing or pod-forming flowers. Sometimes both kinds of clusters are found on the same tree; at other times they are on separate trees. The long twisted pods ripen their seeds early in the autumn, and drop from the trees, a few at a time, throughout the winter. The pods contain a sweet pulp, from which the names honey locust and honey shucks originated. They enclose 10 to 15 flat, oval seeds. These may be sown in the fall or kept in moist sand over winter and treated like black locust seeds.

The heartwood is colored bright reddish brown, and is surrounded by a thin band of light colored sapwood. When quarter-sawed, the wood has a beautiful figure. In other qualities it resembles the wood of black locusts, and is used for similar purposes. The seeds sometimes have a local market at country flour mills, where they are used to cleanse the bolting cloth screens.

Honey locust naturally selects the rich soil of moist river bottoms, but will do well on any soil except where it is exceedingly wet. Its annual rate of growth is 1 to 2 feet in height and one-third to one-half inch in diameter. It is very hardy and free from serious insects and fungous enemies. It is a most useful tree not only for planting for shelter belts and hedges in the prairie regions, but as a shade and ornamental tree in a large portion of the United States. If the thorns are objectionable, the thornless variety can be obtained.

Another species, the water locust (*Gleditsia aquatica*) is a small tree found infrequently from South Carolina to Texas, and northward in the Mississippi Valley to Illinois. A third and very rare species of honey locust is found in Texas.

The writer is indebted to the United States Forestry Service for some of the photographs and material in this article.

### TREES

What is the wisdom taught of the trees?  
Something of energy, something of ease;  
Steadfastness rooted in passionless peace.

Life-giving verdure to upland and glen;  
Graces—compelling the praises of men;  
Freedom that bends to the eagle and wren.

Largess—expanding in ripeness and size;  
Shadow that shelters the foolish and wise;  
Patience that bows 'neath all winds of the skies.

Uprightness—standing for truth like a tower;  
Dignity—symbol of honor and power;  
Beauty that blooms in the ultimate flower!

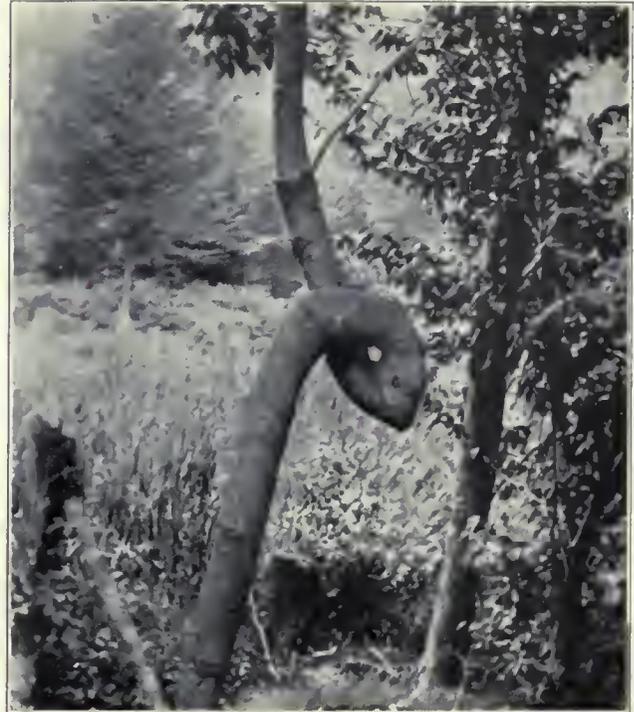
By STEPHEN HENRY THAYER  
In *Pulp and Paper Magazine*

**T**HERE were cut from the National Forests in the fiscal year 1916, 604,920,000 board feet of timber. Of this amount 119,483,000 board feet was cut under free use privilege by 42,055 individuals. In all, 10,840 sales of timber were made, of which 97 per cent were under \$100 in value, indicating the extent to which the homesteader, rancher, miner, small millman, and others in need of a limited quantity of timber draw upon the Forests.

### A REMARKABLE WHITE ASH

By Herbert W. Cornell

**T**HE curiously shaped tree shown in the accompanying photograph was discovered by the writer in the summer of 1916 while studying silviculture in the summer camp of the School of Forestry of the Pennsylvania State College, near Lamar, Pennsylvania. It is a



LOOP IN A TREE

This white ash tree was found near Lamar, Pennsylvania, and is such a curiosity that it was cut down and placed in the collection of the School of Forestry at the Pennsylvania State College.

white ash, about forty feet in height, with a remarkable loop about twelve feet above the ground, the bole at this point being about four inches in diameter. The location of the tree makes it improbable that the deformity could have been brought about by human agency. Most probably the tree was bent over and partially broken when young by another tree falling on it, with the result that a small lateral twig became the main trunk. A careful examination showed some evidence that there had been two breaks, but this was uncertain. The tree was in an apparently thriving condition when found. The trunk was secured by Professor J. A. Ferguson of the Pennsylvania State College and has been removed to the college museum.

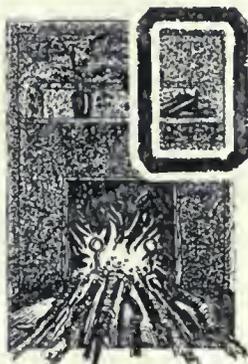
### TREES WITH A HISTORY

**I**S there a tree with a history in your town? What do you know about it? Is it being cared for or is it being allowed to die? AMERICAN FORESTRY would like to know about such trees and would be glad to receive pictures and articles not to exceed 100 words about such trees. Such as are available will be printed in the magazine from time to time.

## FORESTRY FOR BOYS AND GIRLS

BY BRISTOW ADAMS

### "IN THE PLACE WHERE THE TREE FALLETH"



NE meets all sorts of folks who are interested in trees. At one end of the line there is the man who cuts, burns, and wastes the woods with no thought of any one but himself, or of anything but the money he may make, even if he makes it by destroying all hope for any future returns from the same piece of woods. At the other end is the man or woman who cannot bear to see a tree cut for any purpose, and thinks that any use of an ax is wicked.

We think that a middle place is better, and that both of the extreme views are wrong. There is this difference, however: the man who cuts and wastes is sinful; the one who cannot stand the wise harvesting of the wood crop is only foolish. Sometimes this foolishness makes us laugh, sometimes it makes us mad, and sometimes it makes us sad. Then, again, it may cause all three of these feelings.

The children frequently ask me to tell about an old man I once knew, who loved the trees, but not wisely. The youngest thinks the story is funny, and the oldest girl finds it sad; those in between seem to think that it is a curious sort of yarn, and don't know just how to take it. I wonder how it will seem to you!

THIS old man used to write to me about the trees, and finally he asked whether I would come and talk about them before some of the schools near where he lived. He said he would arrange for all the meetings, and that all I would have to do would be to bring along some lantern slides and my voice, and they could do the rest.

My own children will not let me leave out any part of the trip or of what hap-

pened; if I try to skip, or if I forget even the smallest thing they "call me down" and make me put it all in—about the boy who met me at the station and drove me out to the man's house in a rickety old rig like the wonderful one-hoss shay, the horse being very small and very thin, and all shaggy with long matted hair, which looked as if it had been whitewashed in spots.

"Mr. Emanon sent me," said the boy, "because he was sick and could not come." (Emanon is just no name, spelled backward, because I would not hurt the feelings of this old man for all the world.)

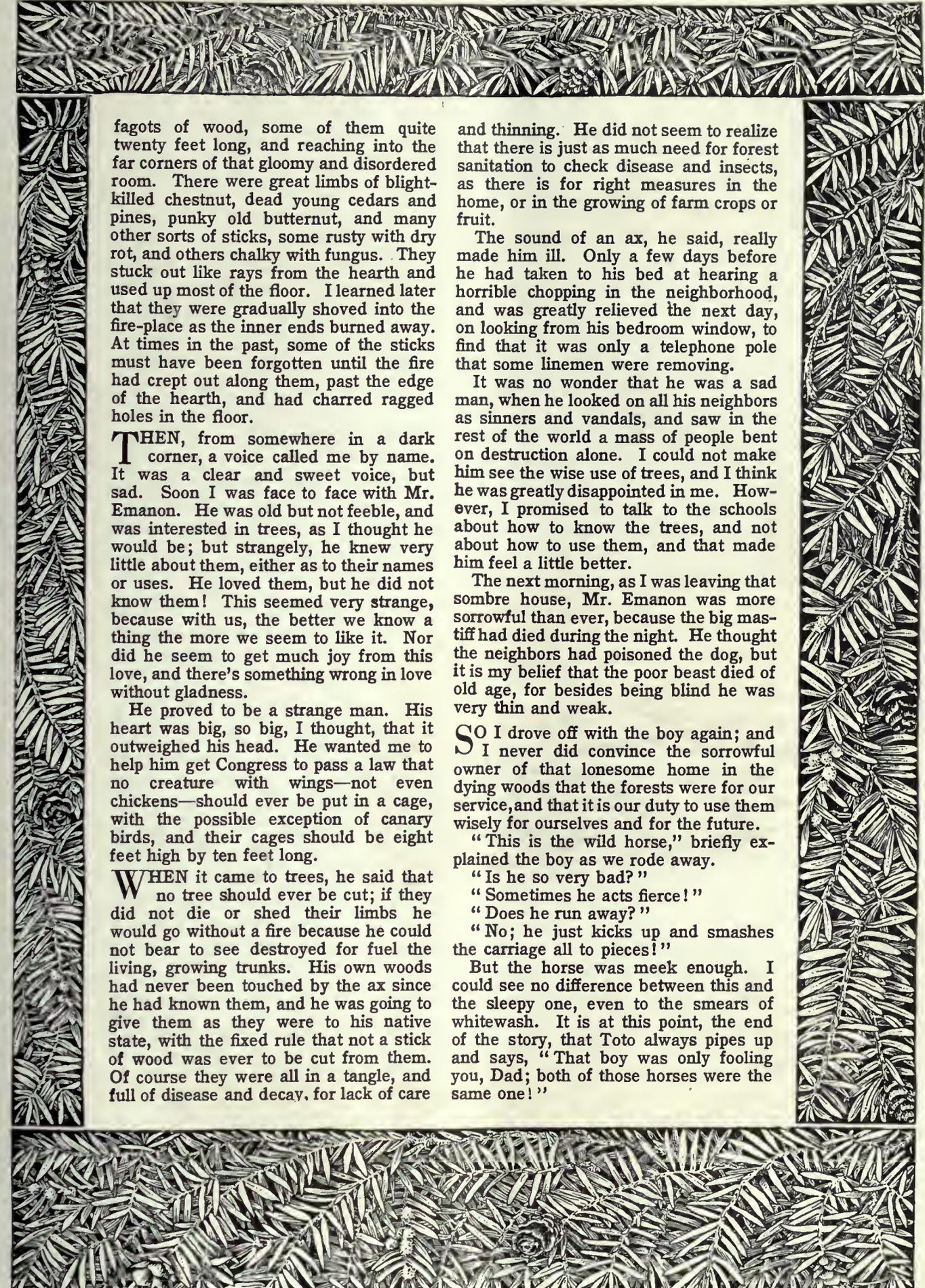
"But I should not go if he is sick; it will make a great deal of trouble for him."

"That don't make no difference," replied the boy. "He always gets sick-like when he's excited about folks coming."

So I climbed into the old shay that was wired together and reinforced in places with umbrella-ribs, and we set off behind the little horse that had all its feathers rubbed the wrong way. The boy said "they had another horse but it was dangerous to drive"; this one, he said, had only one bad habit—"it would lie down and go to sleep jest anywhere!" But it stayed awake and on its feet until we got to the house—a little dark house in a little dark woods.

THERE was a dim light in one of the lower rooms and the boy told me to go in while he put the horse up. I found myself in a dim-lighted hall; there were stuffed birds, old books, pictures, and dead flowers in vases and dying ones in pots. These things I could see from the flames of an open fire in the next room, where there were four dogs—an old blind mastiff, a young setter, a white bull-terrier, and a shaggy Airedale that growled from beneath the piano but did not offer to come out.

Stretched fan-wise out over the floor, with their ends in the fire, were huge



fagots of wood, some of them quite twenty feet long, and reaching into the far corners of that gloomy and disordered room. There were great limbs of blight-killed chestnut, dead young cedars and pines, punky old butternut, and many other sorts of sticks, some rusty with dry rot, and others chalky with fungus. They stuck out like rays from the hearth and used up most of the floor. I learned later that they were gradually shoved into the fire-place as the inner ends burned away. At times in the past, some of the sticks must have been forgotten until the fire had crept out along them, past the edge of the hearth, and had charred ragged holes in the floor.

**T**HEN, from somewhere in a dark corner, a voice called me by name. It was a clear and sweet voice, but sad. Soon I was face to face with Mr. Emanon. He was old but not feeble, and was interested in trees, as I thought he would be; but strangely, he knew very little about them, either as to their names or uses. He loved them, but he did not know them! This seemed very strange, because with us, the better we know a thing the more we seem to like it. Nor did he seem to get much joy from this love, and there's something wrong in love without gladness.

He proved to be a strange man. His heart was big, so big, I thought, that it outweighed his head. He wanted me to help him get Congress to pass a law that no creature with wings—not even chickens—should ever be put in a cage, with the possible exception of canary birds, and their cages should be eight feet high by ten feet long.

**W**HEN it came to trees, he said that no tree should ever be cut; if they did not die or shed their limbs he would go without a fire because he could not bear to see destroyed for fuel the living, growing trunks. His own woods had never been touched by the ax since he had known them, and he was going to give them as they were to his native state, with the fixed rule that not a stick of wood was ever to be cut from them. Of course they were all in a tangle, and full of disease and decay, for lack of care

and thinning. He did not seem to realize that there is just as much need for forest sanitation to check disease and insects, as there is for right measures in the home, or in the growing of farm crops or fruit.

The sound of an ax, he said, really made him ill. Only a few days before he had taken to his bed at hearing a horrible chopping in the neighborhood, and was greatly relieved the next day, on looking from his bedroom window, to find that it was only a telephone pole that some linemen were removing.

It was no wonder that he was a sad man, when he looked on all his neighbors as sinners and vandals, and saw in the rest of the world a mass of people bent on destruction alone. I could not make him see the wise use of trees, and I think he was greatly disappointed in me. However, I promised to talk to the schools about how to know the trees, and not about how to use them, and that made him feel a little better.

The next morning, as I was leaving that sombre house, Mr. Emanon was more sorrowful than ever, because the big mastiff had died during the night. He thought the neighbors had poisoned the dog, but it is my belief that the poor beast died of old age, for besides being blind he was very thin and weak.

**S**O I drove off with the boy again; and I never did convince the sorrowful owner of that lonesome home in the dying woods that the forests were for our service, and that it is our duty to use them wisely for ourselves and for the future.

"This is the wild horse," briefly explained the boy as we rode away.

"Is he so very bad?"

"Sometimes he acts fierce!"

"Does he run away?"

"No; he just kicks up and smashes the carriage all to pieces!"

But the horse was meek enough. I could see no difference between this and the sleepy one, even to the smears of whitewash. It is at this point, the end of the story, that Toto always pipes up and says, "That boy was only fooling you, Dad; both of those horses were the same one!"



Photograph by Fred A. Shutz

## PLANTING MEMORIAL OAK AT

BY MRS. LYDIA ADAMS-WILLIAMS, STATE CHAIRMAN OF CONSERVATION

**T**O perpetuate patriotism, and as a mark of veneration for the Father of his country, the Forestry sub-department of the Conservation department of the District of Columbia Federation of Women's Clubs, recently planted a red oak sapling near the tomb of George Washington at Mount Vernon. The ceremonies were in charge of Mrs. Addie W. Foster, chairman of forestry, who was assisted by Dr. Margaret Huddleson, vice-chairman, to whose efforts the success of many of the preliminary arrangements is due.

Harrison Dodge, superintendent of the Mount Vernon estate, in a congratulatory address, received the tree on behalf of the board of regents. Representatives of the following-named clubs, societies and organizations were present, and each representative threw in a shovelfull of

earth: the District of Columbia Federation of Women's Clubs, the Daughters of the American Revolution, Legion of Loyal Women, Women's Relief Corps, Ladies of the Grand Army of the Republic, New England Society, Sons of the American Revolution, League of American Pen-Women, Woman's National Press Association, Order of Rebeccas, P. E. O., National Woman Suffrage Association, American Forestry Association, Grand Army of the Republic, Abacadabra, General Federation of Women's Clubs, Excelsior Literary Clubs, Capitol Hill History Club, Columbia Heights Art Club, Philo-Classics and several others.

"The oak tree is truly representative of Washington," said Mrs. Wm. E. Andrews, past president of the federation; "he was as strong as an oak and was never worried

### A PIONEER PINE PLANTER

**S.** T. KELSEY, thirty-third degree forester and one of the pioneer white pine planters of the country, was at the annual meeting of the American Forestry Association in Washington. He has attended a lot of these meetings and has been talking white pine since 1856 when he brought down thousands of the seedlings from Canada and planted them in Illinois.

Kelsey, whose home is now in Baltimore, went to Kansas in 1865 and there talked of the virtues of white pine but they were having some exciting times in those days in Kansas and Kelsey had a hard time getting people interested in either white pine or forestry. At last, however, the Atchison, Topeka and Santa Fé Railroad decided

that a few trees here and there would make things look more like home to the settlers and the road put Kelsey to work. He, therefore, became the first forester employed by a railroad. He planted trees all along the Santa Fé for four years but as Kelsey says; "the people did not take much interest when corn was eight cents a bushel and they got more out of it by using it for fuel than sending it to market."

Kelsey tried for years to organize a forestry association but could not get more than a score of men interested at any one time. Now however things have changed and Kelsey rarely misses an annual meeting and at every one of them he is warmly congratulated.



## MOUNT VERNON ON THE POTOMAC

FOR THE DISTRICT OF COLUMBIA FEDERATION OF WOMEN'S CLUBS

by the winds of adversity and sarcasm that blew about him." The ceremony was declared by Mrs. Mary S. Lockwood, chaplain of the Daughters of the American Revolution, to be a sign that the women of the country still revere the memory of Washington and believe in his ideals. Mrs. Carrie E. Kent, another past president, presented the birdhouse for the tree and accompanied the gift with an original poem, in which she urged all to look upward and extolled the oak as the emblem of beauty, strength and power, and all-embracing love.

Mrs. Charlotte Emerson Main, past president, stated that the District of Columbia Federation of Women's Clubs, under her régime, was the first woman's organization to take up Conservation, the work being started by Mrs. Lydia Adams-Williams. Mrs. Main declared that the

oak was typical of the great strength of Washington, making him a "monarch among men." Others who took part in the program were Mrs. Anson Rogers Tracy, who presented the tree; Mrs. Augustus Knight, director to the General Federation, who prophesied that the oak would become great and beautiful with an enduring influence for patriotism and loyalty; Mrs. Jason Waterman, who read an extract from Henry Ward Beecher; Dr. Margaret Huddleson and Dr. Ella Marble Tanberg, each of whom made addresses. Mrs. Harry Cunningham led in singing patriotic music; an original poem by Mrs. Jessie L. Engle was read by Mrs. Main; and the exercises were closed by Mrs. Court F. Wood, president of the federation, who delivered an address on the tree as a memorial to Washington.

### CHARADES FOR CHILDREN

Here Are Some More Puzzlers for the Children. Who Can Answer Them? Those Who Cannot May Read the Answers in March American Forestry

#### NUMBER 3

My first is the name some give to a dog  
While my second you'll find at home 'neath  
a log  
Put these two together and then you will find  
A fruit that makes jell of the very best kind.

Answer next month.

#### NUMBER 4

My first is a name Lincoln gave to his son  
My second boys jump with after a run  
Put these two together and lo and behold!  
You'll find him in pools where it's dark and  
cold.

Answers to last month: 1—Walnut 2—Sparrow.

# THE WAXWINGS FAMILY

(Family Bombycillidae)

By A. A. ALLEN, PH.D.

**T**HE family of waxwings is one of the smallest families of birds, containing but three species. In spite of this, however, the family has a wide distribution throughout the northern hemisphere, one species, the Bohemian waxwing, being found in North America, Europe, and Asia.

Waxwings are easily distinguished from other birds by their sleek, almost silky brownish plumage and their crested heads. They get the name of waxwing from the

sects. With the ripening of the June berry and the choke cherry, however, the waxwing varies its diet with a considerable quantity of fruit, so that often about the sweet cherry trees, particularly where native fruit or mulberies are scarce—together with the robin, the oriole, and the woodpecker—he becomes a veritable pest. He continues his diet of fruit through the winter until insects appear again in the spring, wandering from the wild grapes to the mountain ash, Boston ivy, and Virginia creeper berries, and finally descending to the barberries in the spring when all other fruit is consumed. They travel in compact flocks until the nesting period, flying with a direct, even flight that can be recognized at a distance. Sometimes these flocks number hundreds of individuals but usually less than a dozen. It is interesting to watch them feeding, for they have gained for themselves the reputation of being the only birds or wild animals in which the rudiments



THE NEST AND EGGS OF THE CEDAR WAXWING

This home is in a sweet gum tree. The waxwing waits until midsummer before beginning to nest and lays grayish blue eggs that are doubly spotted.

appearance of the inner feathers of the wing which seem to be tipped with little drops of red sealing wax. Across the tip of the tail in the Bohemian and Cedar waxwings is a band of yellow, but in the Japanese waxwing of eastern Asia the band is rosy red.

The Bohemian waxwing in this country is confined in summer to the Northwest from Alaska to British Columbia, wandering erratically southward to the northern United States in winter, occasionally appearing as far east as New York and New England. It is a much larger and grayer species than the common Cedar waxwing, having white bars in its wings and with the under tail coverts reddish instead of white.

The Cedar waxwing, which is a fairly common bird throughout the United States and Canada, is better known in most places by the name of cherry bird because of its fondness for fruit. Until the fruit ripens in the late summer the waxwings feed largely upon canker-worms, elm-leaf beetles, and other pests of orchard and shade trees, becoming expert fly catchers in the pursuit of flying in-



PATIENCE REWARDED

The cedar waxwing is called the "cherry bird" because of its fondness for fruit. It more than repays for the damage which it does about sweet cherry trees by the large number of insects which it destroys.

of etiquette are developed. It is not an uncommon sight to see a small flock arrange themselves on a branch where only the one at the end can reach the fruit. He plucks it and very politely passes it to his neighbor and thus on down the line until the last bird is reached and he swallows it. This may continue for some time before they scatter and commence feeding by themselves. The origin or meaning of this habit has not yet been ascertained but it certainly seems quite in keeping with their quiet, reserved ways, their dignified bearing and polished appearance.

For some other unknown reason their nesting season is greatly delayed and although they are with us throughout the year, they wait until all other birds except the goldfinches have reared their broods before commencing to build. Some nests are started as late as September but the majority are begun about the middle of July and some as early as the middle of June. The nest is a rather bulky structure placed in a fruit or shade tree or often in a thorn bush from five to twenty feet from the ground, and the



THE CEDAR BIRD RETURNS WITH A FULL MARKET BASKET  
Instead of carrying the food in its beak like most birds, the waxwing fills its crop and later regurgitates it. Here the bird's throat is seen distended by the cherries which it has brought back to its young.

bluish gray eggs are doubly spotted, some of the spots seeming to be put on beneath the surface of the shell.

Waxwings are faithful parents, one bird usually standing on guard on some conspicuous tree top near the nest while the other incubates or broods the young.

The food is brought to the young in the crops of the parent birds, their necks often appearing quite distorted when a half dozen or more cherries are brought back at once. The accompanying picture of the bird at the nest shows the bird's neck thus distended. In the other photograph of the single young, the old bird has just thrown back its head and coughed up a cherry which it is about to present to its hungry offspring.

The best protection against the depredations of the waxwings and other fruit-loving birds is the planting of plenty of native fruit about the orchard to supply the food which they need, and an occasional frightening. Strips of paper or bright bits of glass or tin hung in the trees are sometimes efficacious, although it is usually necessary to frighten the birds occasionally by banging a tin pan or firing a blank cartridge. It is a shortsighted policy to shoot them for they more than repay the farmer for the cherries by the insects which they destroy at other times of the year.

## A ONE-TREE PUBLIC PARK

By Allen H. Wright

**B**ECAUSE a noble oak tree had stood for many years on a highway leading out of the city of Visalia, California, the authorities, when it came time recently to improve this thoroughfare as a city street, decided to permit the tree to remain where it was, in all its glory.

To do this in a legal manner an ordinance was adopted setting aside a plat of ground about the base of



THE COUNTRY'S SMALLEST PARK

This is located in Visalia, California, and was created in order to preserve a noble oak tree on a highway leading out of the city.

the tree, ten feet square, and dedicating it as Askin Park, in honor of the mayor of the city, and the wife of the latter was made the official custodian of the park, situated at the intersection of Main Street and Giddings Avenue.

Now the city of Visalia, in addition to its many other interesting features, claims to have the smallest park, dedicated for public use, in the United States, if not in the world. It can lay claim, in all probability, to having the only one-tree park in the country, also. Visitors to Visalia often take the drive out Main Street in order to be able to say they have viewed this diminutive park.

**A**N immense pecan tree on the farm of W. A. Tonini, a few miles east of Evansville, Indiana, was felled recently. The tree was six feet in diameter and, according to the rings, was 400 years old. The tree was visited by the officers of the National Nut Growers' Association and was declared the largest pecan tree in the United States.

# HOW FAR TO GO IN CAVITY FILLING

BY J. J. LEVISON, M. F., FORESTER FOR THE CITY OF NEW YORK

**R**EADERS of AMERICAN FORESTRY often ask us about cavity filling—just how it should be done, and, what is more important, when to do it and when not to do it. We shall now have a heart to heart talk on this question and see if we cannot come to a mutual understanding on its limitations and advantages.

Generally speaking, there are two classes of cavities: those which are shallow and afford no chance for the accumulation of moisture and those which are deep and afford opportunity for the accumulation of moisture.

The treatment of the *shallow* group of cavities is a very simple one. All soft and decayed wood should be chiseled off so that the water falling on the surface of the wound will naturally run off. The exposed wound should then be thoroughly covered with a coat of coal-tar mixed with creosote; nothing else should be done to it for a year or two, when another coat of tar and creosote may be applied.

In case of *deep* cavities where moisture lodges, the treatment is different. With these we must not only eliminate all decayed and diseased wood but we must also fill the cavity or part of it so as to drain water. The absolute elimination of diseased wood and the prevention of any possible accumulation of moisture are the two main considerations in all cavity filling. This involves considerable experience and knowledge of fundamental principles and for this reason if one has not had enough experience himself it may often be preferable to call upon some one of the tree expert companies. Before filling the cavity, the operator should determine whether it is worth doing the work at all or whether it is more practicable to cut the whole tree or branch off. A cavity may be so permeated with disease or so deep or the tree so old and weak that the entire elimination of disease is impossible; also the condition may be such

that the tree or limb may break soon after the filling is put in. In that case it is wiser to sacrifice the tree and not to fill the cavity.

Where, however, a filling can be put in with advantage, the process should consist in removing all diseased wood from it with the free use of the knife, chisel or gouge. It is far better to enlarge the cavity by cutting out every bit of diseased wood than it is to leave a smaller hole in an unhealthy state. Disease left within the cavity will continue its destructive work behind the filling with more vigor than if there had been no filling at all. Where there are boring insects within the cavity, their destruction must be assured before filling is commenced.

When the cavity is absolutely freed from disease and insects, its walls should be washed with corrosive sublimate and covered with white lead or with Bordeaux mixture. The interior should be studded with nails and solidly filled with bricks, stones, and cement or with charcoal, bricks, and

cement. When that is done, the outer edge of the cavity is interlaced with wire to assist in holding the solid material in place, and a layer of cement, mixed with one-third sand, is then placed over the wire. When dry, this layer should be covered with coal-tar. The exposed face of the filling must not be brought out to the same plane with the outer bark of the tree, but should rather recede a little beyond the growing tissue which is situated immediately below the outer bark. By this method the growing tissue will be enabled to extend over the cement and cover the whole cavity, if it be a small one, or else to grow out sufficiently to overlap the filling and hold it as a frame holds a picture. The growth of this living tissue can be much accelerated by cutting around the border of the orifice immediately before the season of growth commences. Of the many failures in filling cavities, the great majority are due to



FILLING A TREE CAVITY

It is essential that every bit of decayed and diseased wood shall be cut or scraped out and also that the cavity is filled so as to drain water, for when this work is improperly done it is wasteful and often injurious.

an incomplete removal of diseased wood, to the cement being flushed out to the surface of the outer bark, or to the want of tar on the outer surface of the filling.

Cavity filling to a limited extent, when properly done, is very useful and conducive of much good. When improperly done or done unnecessarily, it is wasteful and often injurious. Here are a few instances of the unnecessary and improper kind often met with:

One often sees diseased cavities covered with sheets of tin. This allows all decayed wood and fungous growth to remain undisturbed within. Now, no one would think of filling a cavity in a tooth without first removing all decayed matter from the interior of the cavity and then washing it with some antiseptic solution. Still, here were similar operations tolerated on trees with utter disregard for these fundamental principles. The tin coverings did more harm than good, because they merely shut out the sun and wind and added more dampness to the interior, thereby favoring every possible development of disease.

Another instance which came under my observation was an attempt to replace bruised bark with cement. This was repeated on hundreds of trees at a vast cost and with utter failure. The person responsible for this work did not understand the purpose of filling a cavity, for, had he known that the filling should be put there to prevent moisture from lodging within the cavity or to furnish a support for the growing tissue to roll over, he might easily have seen that in this instance there was no chance for moisture to lodge on the perpendicular smooth surface, and that the exposed wood furnished ample support for the growing tissue to roll upon. The application of a little coal-tar to the exposed wood would have been all that was necessary. The cement covering, however, merely favored decay, and when the growing tissue on each side of the wound began to extend, it pushed out the cement.

On still another occasion the owner was investing a large sum in filling cavities in chestnut trees that were at the time badly afflicted with the chestnut disease. The



THE COMPLETED FILLING

Here the tree cavity is properly filled. The interior, cleansed of all foreign substances, is studded with nails and solidly filled with bricks, stones and cement, the outer edge is interlaced with wire to assist in holding the material in place and the outer layer of cement is covered with coal-tar.

operator should have recognized the presence of the disease; he should have known that there is no remedy for it, and that the speedy death of these trees was inevitable. As it happened, the trees soon began to die, and the impracticability of the treatment became evident.

#### ADVICE FOR FEBRUARY

1. Continue removing and burning trees previously marked during the fall.

2. Clean up the heavy brush in the woodlands and burn the superfluous parts while the snow is on the ground.

3. Work on wounds and cavities, confining yourself to digging out all decayed wood, chiseling out old stubs so as to drain water and covering all exposed wounds with coal-tar in mixture with creosote.

4. Collect and burn cocoons and egg masses of insects.

5. Commence pruning fruit trees. Remove dead and superfluous branches from apple trees and cut the crowns back so as to form low compact heads.

6. Inspect all pear trees for fire blight and cut out all

cankers from main branches and trunks and tar the wounds. Also cut out black knot from plum and cherry.

7. Spray fruit trees for sucking insects and canker. Determine beforehand what you are spraying for by communicating with your local agricultural experiment station or by submitting samples and details to this Department of AMERICAN FORESTRY. Then use chemicals and methods especially prescribed for the particular pest you are spraying for. Choose a mild day for spraying work.

8. Prune and tie up grape vines by the end of this month.

9. Turn over the manure pile or leaf mold compost prepared last fall and see that the liquid manure is not wasted.

#### QUESTIONS AND ANSWERS

Q. I wish to rig up a wagon for moving large deciduous trees from a caliper of eight to fourteen inches.

Can you give me any advice or suggestions concerning the

most successful outfits used in your section, or the names of any parties who manufacture for sale outfits for this work?

H. F. B., Minneapolis, Minnesota.

A. With reference to moving your trees, I beg to say that the best outfits for this purpose may be had from Messrs. Isaac Hicks & Sons, Westbury, Long Island, New York, or from Messrs. Lewis & Valentine, Roslyn, Long Island, New York. Both of these firms operate in the Middle West, or send their apparatus there, and I would suggest your writing them direct.

Q. I am desirous of obtaining about 3000 trees (black or yellow locust) to be used as a wind break for several plots of white pine. Where can they be bought? How long before they mature to fence post size and will they grow in New York State climate and in a dry sandy loam. The New York State Conservation Commission does not handle them.

L. B. G., *Gray, New York.*

A. I am very much interested in your inquiry, and note that you desire about 3000 black or yellow locust to plant as a windbreak to protect white pines. I would not like to recommend this tree for your purpose in your location, as I am afraid it would kill back. The soil condition would be all right, but I am afraid the climate would be too severe. The best thing you could use would be more white pine, or red pine, which would cost you just about as much. We are not, however, recommending the planting of white pine anywhere at present, except under the most rigid inspection, and then never in states where there are areas infected by the white pine blister rust, and this is true of New York. Perhaps you have read or heard something of this, which is a dread disease attacking the white and five-leaved pines of the country and seriously threatens their extinction. My best advice to you would be to write Mr. C. R. Pettis, Superintendent of State Forests, at Albany, put your proposition right up to him, and be guided by his advice. He will tell you what is best to plant under the circumstances and where you can secure it, and you will be perfectly safe in following his suggestions. Let us know if we can help you any further.

Q. There stands in my front lawn a balsam which was planted by me about fifteen years ago, and has, until the last year, been a vigorous, thrifty tree. Last summer I noticed that the needles or leaves of the tree were turning red on the upper half of the tree and that very little new growth appeared, and at present, through the action of the wind, these dead leaves are dropping off. I know of no cause for this unless it be the fact that for quite a time during last winter it was laden with sleet and snow. No abrasions or other injury are apparent anywhere. Can you tell me where the trouble comes from and how to remedy it if I am not already too late? I prize the tree quite highly and would fully appreciate any information which will enable me to re-establish its former healthy condition.

C. F. C., *Hillsboro, Wisconsin.*

A. Replying to your inquiry, it would be hard to tell from just a description what is the trouble with your balsam. I would advise that you spread two or three inches of well-rotted manure around the base of the tree at the present time, and dig the same into the ground in the early spring. Have the manure extend outward as far as the branches of the tree. The tree has probably suffered for water and food. If possible, it may also help to cut off the top of the tree to the extent of a few feet. This will make the tree grow more bushy and compact and decrease the requirement for moisture. A good book for you to have would be Levison's *Studies of Trees*. This sell for \$1.75. The chapter on "Diseases and Requirements of Trees" would be helpful to you.

Q. I transplanted several red oak trees from the woods this fall, some of them about 20 feet high and with long side branches. Will you kindly give me some information in regard to the best way to prune them and at the same time stating whether this should be done now.

I have a young black walnut tree on which the tip end of the main top branch has been split. Is there anything I can do

to enable this main branch to continue growing or shall I be obliged to cut it off, which I suppose would prevent it from growing again. R. M. S., *Cincinnati, Ohio.*

A. I would suggest pruning your transplanted oaks *hard*. Cut in every branch several feet and do it any time. Oak trees can best be moved in spring. Oak trees moved from the forest should have their long tap roots shortened, but it is too late for that now.

As to your young black walnut, try putting grafting wax in split part and tie the affected part with burlap. It may heal next spring. Should you be obliged to cut it off eventually you can bend another twig over and tie it to a stick in order to train it to form a new leader. It will later on become strong and erect enough to form a new leader.

Q. Where can I procure a caliper rule for measuring trees? If you know where one can be purchased I would appreciate your kindness if you would furnish me the name and address.

S. J. C., *Mount Vernon, New York.*

A. A caliper rule can be procured from Keuffel & Esser Company, 127 Fulton St., New York City. Telephone, 80 Beekman.

Q. Can you inform me whether there is any Suffolk County or Long Island Forestry organization in existence, or whether any organization is interesting itself in the forest fire question in this locality, or whether this subject is in your jurisdiction.

E. C. H., *East Hampton, New York.*

A. Replying to your recent inquiry, I beg to say that in Suffolk County, Long Island, Mr. Townsend Cox, Jr., of Setauket, Long Island, has formed a local Forestry association, interesting itself in local tree protection. Also, Mr. Charles M. Higgins, of 271 Ninth Street, Brooklyn, has done about as much as anyone in preventing forest fires on Long Island, and has published a little booklet. The Nassau County Association, with headquarters at Mineola, L. I., is beginning to interest itself in forest fires. I am sending you a special report on State Forest Organization, with special reference to fire protection, which will, I am sure, be of value to you. Mr. J. J. Levison, of Sea Cliff, Long Island, New York, incorporated miles of fire lanes and other systems of forest-fire prevention all over Nassau County on Long Island. There are no other bodies specially interested.

Q. I have a swamp of about an acre, the surface of which is about 12 inches above the water of the nearby lake when the water is at its highest level. The ground is rather soggy, and the soil is very rich. Are there any conifers which will grow under these conditions? I would like to make the place resemble a natural tamarack swamp as nearly as possible, and eventually to grow in it Moccasin flowers, Pitcher-plants, Swamp lilies, etc. To do this I must get shade, and I should like to get a variety of conifer to grow, if possible. Any advice which you may be able to give in reference to varieties, methods of planting, etc., will be very welcome."

A. S. B., *Minneapolis, Minnesota.*

A. You could best use the tamarack and the black or swamp spruce, under the conditions you describe. The latter may not make more than a very small tree, and the tamarack will probably outstrip it, but the combination of colors will be an advantage even though they do not compare in height. Farther north, of course, the black spruce makes a larger tree than the tamarack, and it may be that under your particular conditions they will attain about equal size. There will be no special care required in the planting of these trees, other than that ordinarily exercised in the transplanting of coniferous evergreens. I am sending you under separate cover a bulletin of the Department of Agriculture on tree planting on rural school grounds, which will be helpful to you.

# EFFORTS TO SAVE THE BIRDS

BY DR. R. W. SHUFELDT, FELLOW OF THE AMERICAN ORNITHOLOGISTS' UNION

**I**N the hope of securing an appropriation to provide money for enforcing the provisions of the excellent Migratory Treaty Act with Canada, for which conservationists labored so long, a bill is now before Congress awaiting action. It provides for \$170,000 to be placed at the disposal of the Department of Agriculture, in order that the treaty may be enforced and the migratory birds protected according to its provisions.

The necessity for such protection is readily apparent. In the last forty or fifty years several species of birds have become extinct because they were ruthlessly slaughtered. School children know of the Great Auk and how it was completely wiped out by man on its breeding grounds, being used by countless thousands for fat and fishing bait. Hundreds of our water birds are without protection, doomed to the same fate, to say not a word with respect to a similar number of land birds. I have always held that we are entirely responsible for the disappearance and extermination of the bird-life of this country, and that the same destruction has been, and is now going on in other parts of the world, along precisely the same lines.

In very rare instances it ap-

pears to be difficult to trace the extermination of some bird to man's having been the cause of it; this applies especially to the case of the Labrador or Pied Duck. This beautiful bird disappeared utterly toward the latter part of the last century; there were none left in 1880, and none had been

observed for a number of years prior to that date. In 1868 I saw four or five of them on Long Island Sound, and, to the best of my recollection, these were two males and three females. A good skin of a male will now fetch a thousand dollars or more. A number of years ago I saw a fine male, then owned by John Lewis Childs, of Floral Park, Long Island; it was in his private museum, and, if my memory serves me rightly, he took a trip across the Atlantic to purchase it in London, securing

the specimen for \$1000. Subsequently he disposed of it at such a price that he lost nothing by going to Europe to obtain it.

No cause for the disappearance of this handsome duck has apparently been discovered. It was a marine species that never went inland; indeed it was called, among other things, the Shoal Duck, as it had the habit of frequenting the shoals and banks at low water to feed.

It was an unsuspecting and

## RESOLUTION

Adopted at the International Forestry Conference of the American Forestry Association at Washington, D. C., January 18-19, 1917

### Resolved

That the American Forestry Association respectfully urges the present Congress to make effective, through the necessary legislative action, the recently ratified Convention between the United States and Great Britain for the protection of the useful migratory birds.

Speedy action is desirable in view of the increasing economic loss to all the people, which must ensue if action be deferred until the next Congress.



THE EXTINCT LABRADOR OR PIED DUCK

There are three mounted specimens of this now extinct Duck in the National Museum, two of which are shown in this illustration. The male is the black and white one and is a Long Island specimen presented to the American Museum of Natural History by the late D. G. Elliot, and the Museum later presented it to the United States National Museum. The female in the picture originally belonged in the collection of Professor Spencer F. Baird, who got it from Audubon, who, in turn, received it from Daniel Webster. It is a Martha's Vineyard specimen, and was used by Audubon in making his plate of this species.

conspicuous bird, easily seen at a long distance, and was shot in numbers for the markets, and I shall always believe that its extermination was largely due to its being persistently hunted by man.

There are very few examples of this duck in our museums—not more than five in the National Museum, with six or seven in the American Museum of Natural History; none of its eggs are in existence. Only a few of the eggs of the Great Auk have been preserved, and one of these sold, some years ago, in London at an auction, for \$1200.

Within very recent time, a large species of one of our curlews has been exterminated by our gunners, as shown by the late Mr. W. W. Cooke. Many other species of our birds are being rapidly killed off in the same merciless manner, and among these are the several very beautiful quails or partridges of the Pacific coast.

Perhaps the best known of all these instances, however, is the extermination of our Passenger or Wild Pigeon. In the days of Audubon, flocks of these birds numbered a *great many millions*; they were often miles wide, several hundred feet deep, and flew at a high rate of speed for days at a time. A big forest fire in Arkansas once destroyed thousands upon thousands of them—the trees forming their roosts being burned. High winds blew thousands of them into the Atlantic



THE LAST PASSENGER OR WILD PIGEON

This picture of this beautiful bird, which is now entirely extinct, is a reproduction of a photograph, made by the author, of the mounted specimen of the last wild pigeon (*Ectopistes Migratorius*) that existed upon this planet. The specimen is on exhibition in the United States National Museum, to which institution it belongs. It is here given about two-thirds natural size, and this photograph of it appears for the first time.

Ocean during their migrations, into the Gulf of Mexico, or the Great Lakes. But millions upon millions of them were slaughtered by many at their regular roosting-places, and at such times untold thousands of them were allowed to rot on the ground. Often herds of hogs were turned in upon the dead and dying birds to devour them. Quite suddenly the species ceased to exist—it entirely disappeared.

At New Canaan, Connecticut, in 1872, I witnessed the tremendous flight of these big, blue pigeons; I shot only comparatively few of them, while hundreds of gunners were shooting them for the mere sport of seeing them fall. My old teacher of taxidermy, Mr. James Jenkins, remembered the countless millions of these pigeons in the flights in New York. He described their alighting by thousands upon thousands on the upper part of Manhattan Island, and on houses in Newark, Harlem, and in the outskirts of New York City and Brooklyn. A number of these birds were kept a few years ago at the Zoölogical Gardens, of Cincinnati, Ohio; and the very last Passenger Pigeon in the world, a female—"Martha"—died there early in September, 1915. That specimen was skinned by Mr. William Palmer, of the U.S. National Museum, mounted by Mr. Nelson R. Wood, taxidermist of the National Museum, and placed on a special perch, in one of the cases in an exhibition hall.

**T**HAT wrapping twines which give thorough satisfaction can be made from paper has been demonstrated by experiments made by the Forest Products Laboratory at Madison, Wisconsin. Several hundred packages, each containing a medium-sized book, were wrapped and fastened with the lightest-weight paper twine and were mailed to various points throughout the United States. Reports show that practically every package was received in good order and that in no case was there any damage which could be charged as a fault of the twine.

**T**HERE were cut from the National Forests in the fiscal year 1916, 604,920,000 board feet of timber. Of this amount 119,483,000 board feet was cut under free use privilege by 42,055 individuals. In all, 10,840 sales of timber were made, of which 97 per cent were under \$100 in value, indicating the extent to which the homesteader, rancher, miner, small millman, and others in need of a limited quantity of timber draw upon the Forests.

## THE FOREST SERVICE REVEALS LUMBER INDUSTRY CONDITIONS

**T**HAT unstable and partly speculative forest ownership in the West and South is the cause of frequent over-cutting of the market and waste of forest resources is announced by the Forest Service in a report just off the government press. Too large stocks of timber acquired from the public domain and too much timber speculation mixed with the manufacture of lumber, says the Service, underlie the present instability of the industry.

All this, the Service points out, concerns the lumber user. Many states are paying dearly for lumber because their own timber is largely used up and outside supplies can be obtained only at high costs for transportation. With little being done to grow new forests on cutover lands, a more widespread shortage of forest products is threatened in the future.

The Forest Service advocates various forms of open-price cooperation among lumber manufacturers to make the industry more efficient and check wasteful over-production. But it is strongly against changes in the present competitive character of the business through combinations to control output or regulate prices, even though advocated in the name of conservation.

The report contains the boiled-down conclusions of a study of timber ownership and the lumber business, undertaken by the Forest Service to find out how this business as conducted to-day affects forest conservation and the interests of the millions of users of wood in the United States, and to see whether the public policies for conserving the nation's forest wealth go far enough. It is also sought to help the industry solve the serious problems which confront it. Added weight is given to the report by the concurrence in its publication of the Federal Trade Commission, which cooperated with the Forest Service in the investigation. The Commission, however, reserves its specific conclusions or remedies for a report of its own to be published later.

**T**HE Forest Service finds that the main problem of the lumber industry has grown out of the hundreds of billions of feet of timber acquired cheaply a few years ago from the public domain. Lumbermen in the West are carrying vast quantities of timberland beyond all possible needs of their present sawmills and logging camps. Widespread speculation during a few years of sudden development carried timber values very high, and many western stumpage holdings have been over-capitalized.

The business of making lumber, says the report, has thus been loaded down with investments in timberland. The productive branch of the industry has been interlocked too largely with speculations in its raw material; and instead of standing on its own feet as a manufacturing business, has tended to be the tail of the dog, made frequently to serve the exigencies of timber speculation. According to the report, pressure from an overload of

timber is the first cause of the general instability of the industry. For one thing, it has led to building mills beyond the demand for their products. At least a third of the saws are now idle.

On the other hand, the Forest Service reports that social and economic changes in the United States are reducing its proportionate use of lumber. Uses taken over by other structural materials within the last ten years are estimated at one-fifth of the present yearly cut of lumber; and in the same period the per capita consumption of lumber seems to have passed its peak and dropped nearly one-fourth.

**C**AUGHT with its burden of timberland on the one hand and these changes in the country's use of wood on the other, the lumber industry, the report points out, has been between an upper and nether millstone. The combined result is an ill-adjustment of lumber production to market requirements, with frequent, almost chronic overproduction. Ups and downs have been the rule with most manufacturers in the West and South. Occasional years of high earnings have been followed by usually longer periods of small profits or loss. The latter reached their climax in 1914 and 1915, although 1916 brought somewhat better conditions.

In the regions studied by the Forest Service, it found that lumber production, with local exceptions, is competitive, as a rule keenly so. Competition becomes still more vigorous in its struggle between different regions in selling lumber in the main consuming markets of the country.

Lumber retailing was studied in all of the Middle Western States only. In that region the Service found it to be competitive for the most part, although its competition is less rigorous than in the case of lumber manufacturers. The restraints upon trade in lumber distribution, however, in the Central States studied, are judged to be local rather than general; and developments in recent years have tended to increase competition.

**T**HE rising cost of lumber to consumers, which held generally up to 1907, is attributed by the Forest Service primarily to the exhaustion of the supplies of timber nearest to the bulk of eastern consumers, and the necessity of transporting lumber from greater and greater distances. Railroad freights now take a fifth or more of the consumers' price, retailers about the same amount, and manufacturers, on the average, little more than one-half. The high cost of lumber is thus due in large part to local timber shortage, resulting from the rapid using up of forests without provision for their renewal. Other causes, according to the Service, lie in the greater demands for specialized service made upon the retailer by the purchasing public, in higher labor costs, and in the decreasing purchasing power of money. Since

1907, however, the effects of overproduction have been felt, and the prices of common structural woods have made no sustained increase.

The American public, the Forest Service points out, has no responsibility to protect the security of timber investments or the outcome of speculative ventures. The welfare of many sections, however, depends in no small degree upon lumbering as a large tax payer, a gigantic employer of labor and capital, and the chief consumer of agriculture and other industries. The people of the whole country, furthermore, have a live interest in the economical use of present timber supplies and in continued forest production after logging.

**T**HE report lays special emphasis upon the fact that such waste in the use of our natural forest wealth as is now taking place will tell inevitably in the future cost of lumber, paper, and other products manufactured from timber, as it has told already in many "cut out" states. Furthermore, under present conditions, little is being done to restock the forest lands logged for their virgin timber. The total use of wood in the United States exceeds by a good deal the aggregate growth of its forests; and unless the enormous areas of cutover land, to which millions of acres are added every year, are put to growing new forests, the Forest Service thinks that the danger of a nation-wide shortage of timber and high prices for all wood products will become acute. The unstable condition of the lumber industry, the report says, makes it unable to do much toward renewal of the forests which it has destroyed.

The experts in the Forest Service believe that a more stable kind of forest ownership, divorced from manufacture to a larger degree than now, must come about before the ills of the lumber business can be cured permanently. This kind of ownership must not only carry the present stocks of merchantable timber until the productive industry needs them, but also provide for regrowth on cutover lands. The extension of public forest ownership, both state and national, should, in the judgment of the Service, have a large part in this accomplishment.

According to the Service experts, there is no surplus of forest resources above the country's needs. There is rather a lack of forests, particularly of growing forests to take the place of the reservoirs of virgin timber now being drained. The difficulty lies, says the Service, in the wrong kind of forest ownership.

**A**NATIONAL mistake, the report goes on to say, was made in such rapid and wholesale passing of title to timberlands in the public domain, beyond all immediate needs for local or industrial development. Private ownership, hard pressed to carry these staggering quantities of timber during the long periods which must necessarily elapse before they can be converted into lumber, is now sacrificing them in part by wasteful use because of its own financial exigencies. The carrying of this future resource, the Forest Service declares, should have been a public rather than a private function. The report urges

that this situation be faced frankly and the obvious remedy applied, that of taking part of the western timberlands back.

Much can be accomplished also, the report says, by public and private coöperation in fire protection and in securing methods of taxation better adapted to timberlands; and, to insure the regrowth of logged-off forests, reasonable public regulation of the handling of private lands will unquestionably find a place in working out the problem.

**F**INALLY, the Forest Service disagrees radically with the idea now rooted in many quarters that forest conservation should be sought through permitting industrial combinations for the regulation of lumber production or control of lumber prices. It regards such developments as involving dangers to the public interests through restraint of trade so serious as to offset any possible advantages to the public from such forms of conservation as they might foster. The Service believes, in fact, that such measures as joint control of lumber output by agreement would be ineffective in holding back the pressure to cut timber and in overcoming the other weaknesses which cause overproduction. Betterment in the industry, the Service holds, must come largely through strengthening individual operators or owners, and particularly through a more stable ownership of forest lands, in which the public participates to a much larger degree than now.

The Forest Service advocates such forms of coöperation as trade associations and selling agencies, safeguarded by public supervision and regulation. But changes in the competitive status of the industry, like joint control of production or price, can, in the view of the Service, come about only with an entirely different national conception of the country's basic resources. The adjustment of public and private interests in a national policy which seeks the wisest use of forest resources and controls the industries which exploit them may then become possible, including the principle of regulating output. But in any developments of this nature, the public should have a direct and a ruling voice.

#### PURCHASE OF FOREST LANDS

**T**HE acreage acquired by the Government under the Weeks forestry law during the fiscal year 1916, was more than double that acquired during the preceding year, and in excess of the total acquired under the Act from the date of its enactment in 1911 to the end of the fiscal year, 1915, according to the annual report of the Solicitor of the United States Department of Agriculture. These purchases were in Georgia, Maine, New Hampshire, North and South Carolina, Tennessee, Virginia and West Virginia.

**O**AK is the most suitable wood for carving, on account of its durability and toughness, without being too hard. Chestnut, American walnut, mahogany and teak are also desirable, while for fine work Italian walnut, lime, sycamore, apple, pear or plum are generally chosen.

# AERIAL FOREST PATROL

By W. T. COX, State Forester of Minnesota

THE time has passed when flying machines should be looked upon as toys or experiments. They have been developed to the point where they are being used daily and with comparative safety. Within the past five years thousands of men have been trained to guide aeroplanes and hydroaeroplanes among the clouds with a greater degree of safety than any other kind of machine or conveyance can be driven at the same speed on the ground.

The European War is calling for aeronauts in increasing numbers. They are wanted to carry dispatches, to observe movements of enemy forces, and even to carry on offensive movements against the enemy. They are not only practicable and reliable as machines go, but are now considered almost indispensable for the armies.

Some years ago, when I watched the Wright brothers make the first successful flight for the Government prize at Fort Meyer, Virginia, it occurred to me that aeroplanes were certain to find a field of usefulness in forest patrol. In what other way could a large tract of forest be so quickly seen and fires detected? Since the winning of that prize at Fort Meyer, the Wright brothers and many others interested in aeronautics have been steadily and rapidly perfecting the different types of flying machines. Today they are almost as practical as the automobile.

To appreciate what the advent of the aeroplane means in patrol work, it is necessary to know what constitutes adequate forest patrol and what it costs. Let us figure a little. Ninety-nine forest fires out of every hundred can be extinguished in a few hours by one or two men if the fire is reached within half a day after it starts. That is why the rangers and their patrolmen are effective. But it costs money to maintain the right kind of a patrol force. There should be at least one man to every 72 square miles of forest, 22 to every million acres, 110 men for five million acres. The maintenance of these men for six months at \$70 per month, plus necessary equipment in the shape of canoes, tents, etc., would amount to \$49,500. This is exclusive of the cost of special fire-fighting crews, and winter work to see that loggers burn their slash. Sixty thousand dollars a year, in round numbers, would be the cost of adequately protecting five million acres of forest; and, since that area of forest land represents about \$100,000,000 worth of inflammable property, the protection cost—six hundredths of 1 per cent—is fairly low insurance. It would be a fortunate city government that could maintain its public fire department at anything like so low a rate. Nevertheless, by the use of flying machines even this low cost of protecting the forest can be reduced, particularly in a country like northeastern Minnesota, where there are so many lakes.

Five million acres represents one-quarter of the forest region needing patrol in Minnesota; it represents also the lake-dotted area of Northeastern Minnesota, which is

peculiarly adapted to patrol by the use of hydroaeroplanes or flying boats. An aeroplane, it may be stated, starts from a fairly smooth spot of ground and must alight upon a similar clear space of ground. A hydroaeroplane, as the name signifies, starts from a water surface and alights upon water. Northeastern Minnesota, with its thousands of lakes and numerous streams, is the place above all others on the continent where flying boats can be used to advantage in forest patrol. Three hydroaeroplanes and four officers are required. The machines, allowing for a life of three years, cost \$7750 a year; repairs and supplies \$100 a month, or \$600; two aviators, at \$200 per month; two observers, at \$100 per month; and a mechanic at \$80 per month, cost \$4080 for the six months annual service. This brings the total expense for six months aerial patrol for five million acres to \$12,430. The aerial patrol cannot entirely replace the foot and canoe patrolmen, because a certain number of men are needed at accessible points to respond quickly to calls when fires occur. The number of such men for five million acres varies from 20 to 30, depending upon the kind of season; an average force of 25 men should suffice. In other words, the use of flying boats for one season at a cost of \$12,430 reduces the patrol force by 85 men, whose wages would have amounted to \$38,310—a net saving in patrol cost of \$25,880.

My idea in advocating the use of hydroaeroplanes in northeastern Minnesota was that the U. S. Navy Department furnish the machines and establish a training station for aeronautics in connection with the Naval Militia Station at Duluth. The State of Minnesota might then cooperate, at slight expense, with the Federal Government in the carrying out of systematic aerial patrol. By such an arrangement, Minnesota would profit in having adequate protection over millions of acres of forest, worth to the State millions of dollars a year for timber production and recreation purposes. The United States Government would profit through protecting the Superior National Forest and through training up a corps of competent aeronauts for the national defense. The proposition was taken up with the Washington authorities more than a year ago. Secretary Daniels seems to be favorably inclined toward the plan, and it is probable that some such arrangement can be worked out in the near future.

AT the direction of the King, Spain has passed a law providing for National Parks. The measure also provides for the better protection of the fauna and the flora, according to an announcement of Consul General Hurst at Barcelona, and for a publicity department to better acquaint the traveling public with the scenery of Spain.

## ANNUAL MEETING AND FORESTRY CONFERENCE

**T**HE Thirty-seventh Annual Meeting of the American Forestry Association and the International Forestry Conference held in connection with it at Washington, D. C., January 18-19 proved to be the most largely attended forestry meeting ever held in this country. Not only did members of the Association attend in large numbers, but delegations from many of the states and from several of the provinces in Canada were present.

The sessions were devoted to three main topics: recreational uses of National Forests and Parks and conservation of game on each; reports, addresses and discussions on the white pine blister disease and how to fight it; and addresses and discussions on the advisability of a national quarantine against the importation of tree and plant stock from other continents in the effort to keep out of this country the tree and plant diseases which now do hundreds of millions of dollars, damage each year.

At the annual business meeting of the American Forestry Association the officers were elected as follows:

President; Charles Lathrop Pack of New Jersey.

Vice-presidents: Andrew Carnegie, New York; William E. Colby, California; Coleman Dupont, Delaware; Dr. Charles W. Eliot, Massachusetts; Dr. B. E. Fernow, Canada; Henry S. Graves, District of Columbia; Everitt G. Griggs, Washington; Hon. David Houston, Secretary of Agriculture; Hon. Franklin K. Lane, Secretary of the Interior; Hon. Asbury F. Lever, South Carolina; Hon. Thomas Nelson Page, Ambassador to Italy; Gifford Pinchot, Pennsylvania; Mrs. Frances Folsom Preston, New Jersey; Filibert Roth, Michigan; Dr. J. T. Rothrock, Pennsylvania; Mrs. John D. Sherman, Illinois; Hon. Wm. H. Taft, Connecticut; Joseph N. Teal, Oregon; Theodore N. Vail, Vermont; Hon. John Weeks, Massachusetts; Dr. Robert S. Woodward, Washington, D. C.

Treasurer, John E. Jenks, Washington, D. C.

Directors, John S. Ames, Massachusetts; W. B. Greeley, Washington, D. C.; Alfred Gaskill, New Jersey; Chester W. Lyman, New York; and Charles Lathrop Pack, New Jersey.

At the morning session the address was on "Economic Justice for Lumber and Forests" by E. A. Sterling of Chicago, a director of the American Forestry Association.

In the afternoon the addresses were, "National Parks as National Playgrounds," by Robert Sterling Yard of the Department of National Parks; "Recreational Uses of the National Forests," by Henry S. Graves, Chief Forester, U. S. Department of Agriculture; "Conservation of Game in National Forests and National Parks," by E. W. Nelson, Chief of the Bureau of Biological Survey; and a film story, "Attractions of the National Forests," by C. J. Blanchard, Statistician of the U. S. Reclamation Service.

The morning of the second day was devoted to the pine blister disease situation. The disease was discussed by Dr. Perley Spaulding, U. S. Forest Pathologist; and the situation was described in four great divisions as follows: In New England, by W. P. Wharton of Massa-

chusetts; between the Hudson and the Mississippi by E. A. Sterling of Illinois; on the Pacific Coast by E. T. Allen of Oregon; and in Canada by Clyde Leavitt of Canada. S. B. Detwiler, U. S. Forest Pathologist gave his views on what should be done about the disease; C. R. Pettis, Superintendent of the New York State Forests, discussed the advisability of planting white pine; and Dr. Haven Metcalf, chief of the U. S. Office of Forest Pathology, discussed the problem as a whole.

The substance of these papers and the resolutions regarding the situation as passed by the Conference will be found on another page.

At the concluding session in the afternoon C. L. Marlatt, Chairman of the Federal Horticultural Board, spoke on "The Losses Caused by Imported Tree and Plant Pests"; a paper by David T. Fairchild, Agricultural Explorer in Charge of the Office of Foreign Seed and Plant Introduction on "The Independence of American Nurseries" was read by his assistant, Mr. P. H. Dorsett, and J. G. Sanders, Economic Zoölogist of Pennsylvania, spoke on "The Necessity for a Federal Quarantine Against Tree and Plant Importations." These papers will be found in the magazine.

A fitting climax to the two days of hard work, serious addresses and discussions, committee meetings, etc., was the smoker given on the last evening of the meeting to the visiting members and delegates by the American Forestry Association. President Charles Lathrop Pack presided and there were informal addresses, music and lunch.

### THE RESOLUTIONS

The resolutions adopted by the Forestry Conference, with the exception of the resolution relating to the pine blister disease, which will be found on another page, were as follows:

#### THE BOY SCOUTS

RESOLVED, That the American Forestry Association recognizes The Boy Scouts of America as a movement from which great good has already resulted in Planting Trees and in the prevention of and fighting forest fires, and that under proper direction the Boy Scouts may become one of the great factors in the cause of forestry and conservation.

And it recommends to the Board of Directors the appointment of a committee of three to consult with the officials of the Boy Scouts of America to formulate a proper working plan which the Boy Scouts can put in operation in all parts of the United States, said plan to cover all matters in forestry and conservation that a boy should know.

#### SCHOOL STUDY OF TREES AND FORESTS

Whereas, The child is the heart of society. The secret of permanency lies in its training through the medium of our public school system.

If America is going to conserve her forests, if the dangers from fire, pests and diseases such as the chestnut blight and white pine blister are to be fully appreciated, then it is imperative that our public schools become vitally interested in these subjects.

**THEREFORE, BE IT RESOLVED:** That the American Forestry Association favors the suggestion that the Departments of Public Instruction of the several states in the Union, encourage in their public schools the study of our native trees and forests, with special emphasis on their growth, proper development and preservation from disease and destruction by fire; and to encourage the planting of shade trees on all school grounds, home grounds and surroundings and along public highways.

#### LOUISIANA FORESTRY WORK

*Whereas,* The recent act of the 1916 session of the Legislature of Louisiana, effective January, 1918, which provides that the State Forestry work be in charge of a trained forester, and that the expenditures for Forestry work shall equal twenty per cent of the income derived from the products tax on timber and turpentine, marks a great forward step in that State for forest conservation, therefore be it

**RESOLVED,** That the American Forestry Association heartily commends and endorses this action of Louisiana, and that a copy of this resolution be sent to the Governor of Louisiana.

#### PROTECTING MIGRATORY BIRDS

**RESOLVED,** That the American Forestry Association respectfully urges the present Congress to make effective, through the necessary legislative action, the recently ratified Convention between the United States and Great Britain for the protection of useful migratory birds.

Speedy action is desirable in view of the increasing economic loss to all the people, which must ensue if action be deferred until the next Congress.

#### STATE FORESTRY WORK

**RESOLVED,** That the American Forestry Association commends the progress which has been made in independent State forestry work as shown by the existing State Forestry Departments and deploras any effort or tendency to subordinate this work to that of other Departments which might weaken its influence or eliminate technically trained foresters, such changes in organization not being conducive to efficiency or to the best forest interests of any state.

**BE IT FURTHER RESOLVED,** That a copy of this resolution be sent to the governor of every State.

#### FOREST AND LUMBER PROBLEMS

**UNDERSTANDING** that our Federal Departments dealing with forest and lumber problems have under consideration the formation of an Advisory Board to enable permanent

and systematic consultation with forest and lumber interests, we advocate such a board as contributing to the development of a comprehensive American forestry policy.

#### A NATIONAL QUARANTINE

In view of the spread of diseases and insect pests introduced from foreign countries, such as chestnut blight, gypsy moth and white pine blister.

**RESOLVED,** That the American Forestry Association favor the principle of absolute national quarantine on plants, trees and nursery stock, to take effect at the earliest date which may be found economically expedient.

#### TREES IN THE WAR ZONE

**T**HE struggle of the trees for existence in the battle-swept fields of Europe is one of the things that stands out in the memory of Will Irwin, war correspondent, recently returned from Europe.

"I was never quite so impressed," said Irwin, "and there are many things one will never forget after a visit to those battle-fronts, as I was with the trees and their pathetic endeavor to live where man had given up the struggle and there were heaps of dead to testify to his heroism.

"At Verdun I saw the blackened stumps from which the mighty trunks had been shot away. Clustered around their base I would find a little shoot or two bravely sending forth its green to gladden a sorry place. Time and again on trunks that had been left standing blackened and almost stripped of bark, so fierce had been the fire, I found tiny leaves coming forth—for it was April—and those trees still had life enough left to answer to Nature who goes on and on despite the quarrels of humanity.

"It was the same on the Italian front which I visited. There the fighting has been as fierce as anywhere in Europe, although we have not heard so much about it. I found Nature putting forth her foliage in a feeble way among the crags and the rocks and all this despite the terrific gun fire and spreading of death-dealing gases which no human being had been able to withstand.

"The willow is playing a wonderful part in the war. The Italians particularly are using it to weave masks and deceptive fronts for their trenches."

#### AN ACKNOWLEDGMENT

**A**MERICAN FORESTRY is very glad to acknowledge the assistance and cooperation of the U. S. Forest Service in furnishing photographs and necessary data for the preparation of the following articles which have appeared in the magazine from time to time; September, 1915, Longleaf of Pine; October, 1915, Chestnut; November, 1915, Sugar Maple; April, 1916, White or Paper Birch; August, 1916, Mockernut Hickory.

**WE TAKE PLEASURE IN ANNOUNCING THAT WE HAVE ON HAND JUST TEN COPIES OF THE REPORT OF THE PROCEEDINGS OF THE SOUTHERN FORESTRY CONGRESS, HELD AT ASHEVILLE, NORTH CAROLINA, FROM JULY 11-16, 1916, AND THESE MAY BE PURCHASED FOR ONE DOLLAR EACH, BY MAKING APPLICATION TO THE OFFICE OF THE AMERICAN FORESTRY ASSOCIATION, WASHINGTON, D. C.**

# EDITORIAL

## THE ECONOMIC NECESSITY FOR PUBLIC FOREST OWNERSHIP

THE most striking fact brought out in the report on "Some Public and Economic Aspects of the Lumber Industry," just published by the Forest Service, is the economic need for publicly owned forests. Nearly every starting point in the consideration of this many-sided question leads to the conclusion that private forest ownership under the conditions existing in a large part of the United States has not made good from the standpoint either of the public or of the timber-using industries; and that a large infusion of public forest ownership is the alternative.

There is little use in crying over spilt milk or in trying to find a scapegoat to which responsibility can be fixed. The situation itself was inevitable. The people of the United States deliberately and in pursuit of more or less clearly defined purposes gave away by far the greater part of the forest resources originally held in common. The method of the giving made speculation in timberlands and their subsequent high capitalization a certainty. The concentration of a large share of the timberlands into enormous individual holdings was also an inevitable feature of the system. That timber speculation should be mixed liberally with the manufacture of lumber followed from the method of disposing of public lands with the absolute sequence of night and day. It was unavoidable that the sawmill should often become the cat's-paw of the timber buyer, to pull some speculative venture out of the fire.

All of these things are parts of a whole. They relate back to the conception of public resources and the uses they should serve which dominated the country during the last half of the last century.

And like nearly all such movements, with their many human and dynamic aspects, the wholesale distribution of the public forest lands accomplished some good. It promoted the settlement of the West, built up its taxable values, stimulated its industrial growth. The things that this method of treating public resources set out to do were actually done in part. But the country must now reckon with the cost. The study made by the Forest Service shows very plainly that private ownership assumed, in the days of feverish development in the Western States, a task beyond its strength; that the "overload" of timber thus created has become the principal source of unstable conditions in the lumber industry and the principal cause of a more or less wasteful use of the country's forests.

The bad results of a more or less temporary and speculative kind of forest ownership are not restricted to the lumber industry; nor are they restricted to the states where the passage of title from public to private hands is still fresh in men's minds. There can be little question from this review of forest conditions throughout the

country that the economic value of the forests of the United States to its people and industries as a whole is in part being destroyed by the wasteful use of these forests which the conditions created by private ownership have forced upon the lumber industry, and by the inability of the industry to replace old forests with new. The report of the Forest Service goes to show that there are upwards of three hundred millions of acres of cutover forest lands in the United States. On the greater proportion of this vast acreage there is little forest production or a production representing but a small part of the growing capacity of the land. It is a safe assumption that the cost of freight on the average thousand feet of lumber used in the United States is increasing from year to year. In the Middle West freight charges have already exceeded 22½ per cent of the cost of lumber to its consumers. This is pointed out as the primary reason why the cost of lumber has gone up. It is one large reason why the per capita consumption of lumber in the country has fallen; in other words, why the people have been forced to practice greater economy in the use of wood. It is becoming more dear because it has to be hauled farther.

In parts of Europe where forest production is maintained only by the practice of very intensive methods, the common forms of building lumber cost no more than in the older portions of the United States. This is primarily because the lumber is grown, manufactured and used at home. Transportation upon it is a negligible factor. The forest history of the United States, on the other hand, is a series of widening circles representing local timber shortages and reflected in rising lumber prices proportionate with the greater distance which the material had to be transported. Where shall we stop? As between shipping ordinary building lumber from Louisiana to Philadelphia or from Puget Sound to Philadelphia and from Siberia to Philadelphia, the question is solely one of degree. The timber famine is not a bogey of the future. It is the necessity for reduced consumption, brought about by higher prices, which are brought about in turn by a shortage of nearby forests.

All of these things we may say have been inevitable. They have resulted from a more or less deliberate course followed by the United States in its economic development. The only new feature is that we are finding it a little harder all the time to reckon with the piper. Are we, supposed to excel as a nation in common sense and in ability to grasp and apply economic facts, to continue to reckon with the piper; or are we going to the bottom of a national economic weakness and build up aright? Can we permit continued wasteful use of the great reservoirs of virgin timber remaining in the West, because private ownership has created certain conditions of

capitalization which have got to be met? Can we afford to let a large part of our potential forest production lie idle?

If the conditions set forth in the report of the Forest Service may be taken as a safe guide, forest ownership is at the bottom of the whole business. A different kind of forest ownership is necessary to give the lumber business stability and to meet the permanent needs of the United States for wood. Other things, like many forms of industrial coöperation, are necessary, but after all are largely palliatives rather than real cures. Permanence in the ownership and management of forest lands is the ultimate remedy. The public forest policy should address itself to that accomplishment. The Government report points out possibilities of a more stable kind of private ownership—and they should receive every legitimate encouragement. But the clear necessity remains for the wide extension of public forest ownership, both state and federal.

A large measure of public forest ownership has been necessary to the development of forestry in most of the countries of Europe and, if the findings of the Forest Service are to be accepted, the United States will prove no exception to the rule. Public agencies, state and federal, now own or control about one-fifth of the forest lands in the United States. A material increase in this proportion would inject more stability into the forest-using industries and give the country better assurance of

a future supply of wood adequate to its needs than any other step which could possibly be taken.

The final answer, of course, must be the practice of forestry on all lands suited to forest production, whether made possible by economic conditions or brought about through public regulation of the handling of private forest lands. The general practice of forestry would not only keep up production somewhere near, at least, the wood-using requirements of the country, but would also by its corresponding limitations upon the amount of material cut from the forests stabilize the industries using them. But this happy solution, while the goal which should never be lost sight of, can not come to pass over night. The process must be one of adjustment, in the investments represented by timberlands and manufacturing plants, in legislation, in more intelligent use of land, in the use of wood in relation to other materials. Definite and clear-cut leadership is needed to point out the way. This must be furnished by the state and nation. Public forest holdings in one form or another should be enlarged to the point which will bring about at least some measure of regrowth in cut-out regions, which will lay the basis for some degree of permanence in the forest-using industries in all regions, and which will give the consumers of the country a reasonable degree of protection in the shifts and changes in the supply of forest products.

## SHALL WE SUCCEED IN SAVING OUR WHITE PINE?

**T**HE fight against the imported white pine blister disease, starting as guerilla warfare in 1909, and suddenly developing into a general attack early in 1916, has now reached a critical stage. The enemy, taking advantage of our lack of preparedness, has in this seven year period gained an almost impregnable position in New England, and his advance forces of invasion penetrate to Minnesota and unless quarantining proves efficient, may appear with the coming season in the Rocky Mountains and West Coast States. So insidious is this foe, spreading silently and unobserved by the dissemination of millions of minute spores borne on the wind, that the problem of eradication—as we now realize—calls for the highest type of intelligent leadership. Until this year, it was assumed that the disease could be confined to the plantations made from imported white pines, and no effort was made to scout for its presence in the areas of native pine, until outbreaks were reported of so serious a nature that the Massachusetts Forestry Association became alarmed, and, aided by the Bureau of Plant Industry in the U. S. Department of Agriculture, the American Forestry Association, and the coöperation of certain of the State Foresters, secured funds from Congress and state Legislatures for a general survey to discover its extent and prevalence.

At the close of the season these facts must be accepted as beyond dispute: first, that the disease has gained such a foothold and spreads so rapidly on currants, that it can be checked only by the extermination of either the pines

or the currants bordering on infected areas. Second, that the disease is fatal to all young or small white pines, and is probably equally fatal, though slower in its operation, on mature trees. We quote the field agent of the Bureau of Plant Industry, a man of thorough experience and training, whose judgment should be final.

"In southern Maine, on 5 acres of native pine containing 1000 to 1500 trees per acre from 1 foot high up to 2 feet in diameter, we found nearly 90 per cent infected, and over half the trees already killed or so seriously infected that death is certain. One tree, 15 inches in diameter and 50 feet high, had the trunk girdled 20 feet from the ground, and every main branch of the tree, about 100 in number, diseased. Somewhat similar conditions, on a smaller scale, exist in southern New Hampshire."

Girdling by this disease causes death within the same season. Such facts are conclusive. Southern New Hampshire is the region of most rapid and thrifty growth of white pine, showing that the disease attacks all trees of this species whether sickly or vigorous.

**We must either exterminate or quarantine the blister disease, or the white pine is doomed.**

To do this we demand united support and will no longer tolerate evasion or misrepresentation on the part of those who have either failed to inform themselves of these facts or who for any other reason wish to keep the public in ignorance of the truth. We quote from a public address recently given by an eastern official:

"In no case, as far as the writer is aware, is there any infection of sufficient magnitude to destroy a stand of white pine of any appreciable size. \* \* \* In most cases the trees (infected) were growing in abnormal conditions and were equally unhealthy from an unfavorable environment and were infested with all the other diseases and insect enemies common to their kind. \* \* \* Plantations of native stock are practically free from the disease \* \* \* More harm than good has been done by the unnecessary agitation in the publicity campaign so systematically carried on at a great expense exciting people over a subject about which enough is not yet known by experts themselves. \* \* \* We have millions of trees in our nurseries ready to go out, and all at once under the guise of public-spirited coöperation, and before there has been sufficient evidence, a campaign is set in motion to discourage and thwart all our laudable reforestation endeavors. \* \* \* It is to be hoped that the average citizen will go ahead planting white pine as enthusiastically as ever."

This same official, after attending the first conference in 1909 in New York to consider the suppression of the blister disease, not only failed to warn the public of the danger, but in a bulletin issued in 1910 included a list of European nurserymen from whom white pines could be imported, heading this list with the name of J. Heins Sohne (Sons), Halstenbeck, Germany, the very firm whose diseased stock had given occasion for calling the confer-

ence. And the state which has suffered the most and has apparently been the center of infection for surrounding states, is the one whose citizens received this guidance and advice, and who are now urged to continue enthusiastically planting white pine, and "to leave the problem of its protection from diseases and insects to be looked after by technically trained officials."

State foresters *who have been technically trained in forestry* have in every instance met the situation courageously and wisely. They realize that until the nation and the states affected have shown the possibility of controlling this disease, that the planting of white pine is attended with extreme risk, and they are willing to sacrifice a few thousand or million white pines in nursery stock rather than run the risk of reproach at a future period for neglect to warn the prospective tree planter. The white pine, while our best, is not our only northern pine. Until this menace is removed, safety can only be secured by mixing red or Norway pine with the white pine in plantations, or discontinuing its planting altogether.

Meanwhile, the efforts of the American Forestry Association will be continued, and it is hoped that all friends of forestry will unite in an endeavor to secure from Congress an adequate appropriation, and from the states the necessary legislation and financial aid in overcoming this disease and preserving to our American civilization the white pine, the noblest tree in all our eastern woodlands.

### SHALL WE CHEAPEN OUR NATIONAL PARKS?

**T**HIRTEEN bills are before Congress for the creation of thirteen new National Parks, most of them from areas already under administration as National Forests. Some of these projects, notably that of Mount Whitney in Alaska, are worthy of adoption. But unless Congress is guided in this legislation by something more than the passing whim of some congressman or his constituents, and acts upon clearly defined principles, lasting harm may be done to the cause of National Parks in the west.

Park uses satisfy the needs of but one side of human nature—the demand for recreation. Forest areas supply equally important and vital needs, for shelter, clothing, food, light and power, through the development and use of the timber, grazing and waterpowers.

The older civilized countries cannot afford and do not attempt to exclude these commercial uses from large tracts of productive forest land, in order that the æsthetic sense alone may be gratified. To do this would mean an economic waste which would take visible form in lack of employment, poverty and hunger and the forced emigration of a considerable portion of the local population.

But these communities do not ignore the finer sensibilities of their people, nor overlook the recreational possibilities of their forests. On the contrary, the public woodlands are developed into extensive pleasure grounds by paths and roads. Rest houses are provided for the tourist, and every spot of exceptional beauty or interest is carefully protected and made if possible more attractive.

Our National Forests are devoted primarily to similar economic ends. And what is true in Europe has already

been demonstrated in their management—that recreational uses can be protected and developed on the same areas, by the preservation of strips of timber along water courses, lakes, roads and trails. In this way the highest possible use is made of all portions of the area. Such a policy means stability and permanence.

But what about our National Parks? Will our people, educated by more than a generation of administration for the Yellowstone, the Yosemite, and the Sequoia with its grand trees, abandon the ideal which they have formed of vast spaces untouched by commercial greed, and permit the utilization of the forests, the grazing of the forage by sheep and cattle, and the harnessing of these waterpowers, in these last remnants of our national heritage, the once boundless western wilds? Such a policy is unheard of. As a nation, we intend to hold these parks as they are, and woe betide the influences which may seek to invade them. In the words of Frederick Law Olmsted, one of our foremost landscape architects, "The National Parks are set apart primarily in order to preserve to the people for all time the opportunity of a peculiar kind of enjoyment and recreation not measurable in economic units, and to be obtained only from the remarkable scenery which they contain—scenery of those primeval types which are in most parts of the world rapidly vanishing for all eternity before the increased thoroughness of the economic use of the land."

The ideal here set forth rings true to our national conceptions. It is going to be physically impossible, and wholly undesirable, to attempt to segregate all of our recreational areas as parks. There is not one of our

National Forests but what contains many such areas. *Scenery, and that of a strikingly unusual type, is the distinctive note, for which we expect to pay the price of complete protection from commercialism.* If, by the creation of numerous more or less mediocre National Park areas, we destroy this distinction, and at the same time, throw a sop to local economic needs by breaking down the barriers to grazing, timber cutting and power development, our National Parks will cease to differ in any important respect from the National Forests out of which practically all of them must be created.

With this obliteration of ideals long held and closely cherished, the need for a separate administration of park areas from forest areas will lose its force, and become a drawback and embarrassment instead of an advantage. There would be no valid reason for permitting the Interior Department, by the mere declaration in Congress of the creation of a park out of a National Forest, to take over the administration of the area, if its management permits and requires an exact duplication of all the commercial uses and policies now being supplied by the Department of Agriculture. The common sense of the public will fail to see the advantage of such duplication of administration.

The evils to which we are endeavoring to call the attention of Congress, are embodied in such bills as S. 3486, for the Olympic National Park; S. 3982, to establish a

National Park including Mount Baker; H.R. 16239, for a National Park to be taken from the Angeles National Forest in Southern California. S. 3036, for a Cabinet National Park near Glacier Park, Montana, and certain others, including S. 5913, to greatly enlarge the Sequoia National Park at the expense of the surrounding National Forest areas.

The friends of our parks, and of our National Forests, and the advocates of their continued separate administration, should be vigilant to prevent such hybridization and cheapening of the National Park system, that we may hold fast to a unique national luxury—nay, a necessity—which no others can afford—and which lends to the West its most distinctive charm for the traveler who desires to see the wonders of his own country.

In conclusion, we wish to again call attention to the failure of Congress to pass the bill, H.R. 20447, urged by both Agricultural and Interior Departments, for the creation of a National Park of the Grand Canyon of Arizona, and respectfully suggest that there exists no valid excuse for such neglect. The Grand Canyon needs no defenders. How does it happen that it has no champions in Congress? The public will expect from its representatives a wise, consistent and far-sighted policy in the creation of additional National Parks. Let us begin with the Grand Canyon of Arizona.

## DOES STATE FORESTRY NEED "REORGANIZATION?"

WITH the increasing responsibilities of modern conditions, and a higher standard of public service, old forms of state executive machinery are being weighed in the balance, and found wanting. Steadily mounting state expenditures have stirred our legislatures and executives to inquire into the efficiency and economy of the present conduct of public business, not for the purpose of summary retrenchment by the crippling of useful departments, but in order to eliminate actual waste and get the highest possible returns in service for each dollar expended.

Waste in public administration has been so common that many are tempted to cynically accept the condition as inevitable. Such an attitude is unworthy of a strong nation. When we have grasped the principles upon which efficiency is based, we shall apply them without fear or favor. In determining these principles we are not without guidance. The secret of efficiency is the capable executive; the man of trained mind, initiative, resourcefulness and integrity. *Such men must be secured and retained by any business, public or private.* Mediocrity and inefficiency in men who occupy responsible positions is the direct cause of failure, graft, special privilege, and all the familiar evils which have disgraced our public affairs.

But these evils are equally possible in private enterprise and have wrecked many business structures. In private business such losses mean destruction, and the additional pressure for results has secured far greater efficiency. The form of organization which has grown

from these needs has special significance to the seeker after first principles.

Large private corporations which have grown beyond the ability of a single man and, in this, resemble state organizations, invariably rule their affairs through a board of directors. Their functions are clearly defined. They determine the general policy of the institution, select the executive, and hold him responsible for results. The board scrupulously refrains from meddling interference with the details of management, while the executive is equally careful not to usurp the prerogatives of the board or assume responsibility for innovations in policy requiring their sanction. Nor do private corporations make the mistake of combining two or more dissimilar lines of work under a single manager, well knowing that the secret of success is a clear-cut concentration on familiar lines. Where two such projects are controlled by the same interests, a separate organization, even to the board of directors, is effected for each, as a fundamental requisite of success.

Public business is still groping in the dark after these facts,—yet for the last decade, state forestry, as well as many state educational institutions have demonstrated conclusively that this same plan is as fully effective in public as in private affairs. Boards without an executive are foredoomed to failure—and there are many such state boards. But in forestry, the insistence on the appointment of trained foresters has, in eighteen out of twenty-seven states, provided this executive. When

appointed by the board, and thus placed upon a basis of merit rather than politics, such executives have not failed in a single instance to faithfully and vigorously perform their duties. Fire protection has become an actual fact, rangers give honest service, forestry education and general knowledge is advanced rapidly, and the confidence of the public is secured.

By contrast, in those states which have either blindly or with deliberate intent combined state forestry with other departments, subordinated the forester to a chief whose head is full of a number of other interests, and removed the stabilizing element of the board, state forestry has either failed to develop or has received a severe setback. Equally poor results have followed when a state, although retaining a separate forestry depart-

ment, resorts to the principle of direct appointment of the forester. From close study of the actual results of state forestry since its first beginnings, these conclusions stand out in a manner absolutely convincing. Only ignorance of the facts or wilful desire to corrupt and make partisan use of forestry departmental machinery and appropriations can form any excuse for reorganizing a State Forest Service established along these lines. Yet strong efforts are being made in more than one state to do this very thing. Let the friends of efficiency and of honest government beware of these specious attempts and hold fast to what is good; or in another decade we shall face the task of reconstructing our forestry departments on the same lines as at present, from the ruins of our attempts to "better" them by fusion and reorganization.

### IN THE FRENCH FORESTS

**H.** D. JEWETT, a graduate of Wyman's School of the Woods, and well known by foresters, who is now a member of the American Ambulance Corps serving in France, writes:

"At our present location I am fortunate in being near some small forests where I have a chance to see some of the French forestry in practice. Some of the Service Forestier men are in the woods here and the Boche prisoners do most of the work. About all the hardwoods are oak and beech but the beech, especially, seems better than what we have at home. There is a beautiful pine (maritime) nursery about eight years old. The spruce plantations here are failures because the soil is the poor limestone variety. The woods are all divided into compartments, etc. such as we studied in "Working Plans." There has been a small mill erected near our camp where they are turning out lumber for war purposes; mostly boards for portable houses and heavy timbers for dugouts, etc. There are many German prisoners working in the mill and they seem to be glad they are not in the trenches. Wood is certainly valuable here as we cannot even pick up the dead wood in the forests, and each camp has a regular wood ration. They have made thinnings in many of the woods for fuel and when the operation is finished the woods look like a park. The leaves are about the only part of the tree not used. The French foresters seem a good lot but I can't talk very fully with them because of my slight knowledge of the language. I hope to see more of the real French forests before coming home."

**T**HAT England and Germany, with their realization of the need for conservation of national resources, are far more particular about the use of creosoted timber for heavy construction work than the United States, and the lesson for the United States in this attitude, is a feature of a forest service bulletin issued by the United States Department of Agriculture in cooperation with the American Wood-Preservers' Association, the bulletin being written by R. K. Helphenstine, Jr., of the federal forest service.

### MONEY FOR ROADS AND TRAILS

**S**ECRETARY HOUSTON has announced the amount allotted to each State from the million dollars to be spent during the fiscal year 1918 in constructing roads and trails within or partly within the National Forests. This money is part of the ten million dollars appropriated by the Federal Aid Road Act to assist development of the National Forests, which becomes available at the rate of a million dollars a year for ten years.

The allotments as approved are as follows: Alaska, \$46,354; Arizona, \$58,604; Arkansas, \$9,803; California, \$140,988; Colorado, \$62,575; Idaho, \$108,730; Montana, \$70,042; Nevada, \$19,296; New Mexico, \$42,495; Oregon, \$128,111; South Dakota, \$8,092; Utah, \$41,167; Washington, \$91,944; Wyoming, \$40,684. A total of \$9,995 has been allotted to Florida, Michigan, Minnesota, Nebraska, North Dakota, and Oklahoma. The group of Eastern States—Georgia, Maine, New Hampshire, North and South Carolina, Tennessee, Virginia, and West Virginia—in which the Government is purchasing lands for National Forests, receives \$21,120.

In making allotments, it is explained, ten per cent of the amount available for 1918 is withheld as a contingent fund. One-half of the remainder has been apportioned among the states in amounts based on the area of the National Forest lands in each state, while the other half has been allotted on a basis of the estimated value of the timber and forage resources which the Forest contains.

**T**HE number of fires suppressed on National Forest lands during the calendar year 1915 was 6,324, as against 7,018 in 1914, and an average annual number of 4,759 during the past five years, says Henry S. Graves, Chief of the Forest Service, in his annual report just published. While more than the average number of fires occurred, the timbered area burned over was but 155,416 acres, or 30 per cent less than the average per year for the period 1911-1915 inclusive. The average loss per fire was \$60.41. Forty-four per cent of the fires were confined to areas of less than one-quarter of an acre.

## BOOK REVIEWS

The Story of the Forest, by J. Gordon Dorrance, of the Maryland State Board of Forestry. The American Book Co., New York, 232 pages. Price, 65 cents.

The author in a most interesting and instructive way tells the younger generation what the woodlands of the country are and what they mean. The book is particularly of service in the schools. It tells of the forests of America; of the tree and how it lives and dies; of how to know trees; of work in the woods; of the by-products of the forests and of the most famous trees in American history.

Tree Wounds and Diseases, by A. D. Webster. J. B. Lippincott Company, Philadelphia, 215 pages, \$2.50 net.

Here is a book which will fill a public need. Everybody loves trees, many own them. When a tree is sick, diseased or injured the owner rarely knows what to do for it. This book clearly and simply tells what to do and how to do it. The illustrations add considerably to the practical instruction given. The advice will be of service to every tree lover and tree owner.

Southern Forestry Congress Proceedings, Price, \$1.00.

In this is a compilation of the addresses presented at the Southern Forestry Congress, at Asheville, North Carolina, last July. The book contains nearly 200 pages, is neatly printed and attractively bound and should be on the shelf of every Southern lumberman, forester and landowner.

The Well-Considered Garden, by Mrs. Frances King. Charles Scribner's Sons, New York, 290 pages.

This attractive book, profusely illustrated, is by an author whose practical knowledge, keen insight, and splendid enthusiasm combine to make her so well fitted to instruct, advise and inspire lovers of plants and gardens that it will be found by all of these of unusual practical value.

The Book of Forestry, by Frederick Franklin Moon. D. Appleton & Company, New York, 315 pages.

The author, who is professor of forest engineering at the New York State College of Forestry at Syracuse, states in his preface that "The American people are by inheritance a nation of forest butchers" and he therefore aims in the book to awaken a love of the forest in the heart of young America, and a realization that forestry is necessary for the comfort, health and prosperity of future generations.

Hand-book for Rangers and Woodsmen, by Jay L. B. Taylor. John Wiley & Sons, Inc., New York City, 420 pages, \$2.50 net.

The author is a forest ranger in the United States Forest Service and, realizing the need of such a volume as this to serve as a guide for inexperienced men in woods work, he wrote it. It is so complete in

detailed description and in illustration that it is most valuable. While the book is primarily intended to describe the problems confronting the forest ranger, it is also of use to others whose work or recreation takes

them into rough and unsettled regions. The book covers in considerable detail problems dealing with equipment, construction work, general field work, live stock and miscellaneous conditions.

## CANADIAN DEPARTMENT

ELLWOOD WILSON, SECRETARY, CANADIAN SOCIETY  
OF FOREST ENGINEERS

Suggestions are being made to farmers who have some rough land on their farms, to plant balsam for Christmas trees. They do not take long to grow and should prove a profitable crop.

Practically all of the paper and pulp mills in Canada are preparing to increase their output and many new mills will be built.

The Pulp and Paper Magazine of Canada comes out in a new cover and will hereafter appear as a weekly. This paper is keeping step with the growth of the industry whose organ it is, and is a very creditable one.

The fourth annual meeting of The Canadian Pulp and Paper Association took place January 31st, and was addressed by Sir George Foster, Minister of Trade and Commerce. At the banquet in the evening Sir Robert Laird Borden, Prime Minister of the Dominion, responded to the toast of "Our Country." The Technical Section met on the 30th and 31st. Mr. Herman Guettler read a paper on the "American Barking Drum" and Dr. Bjarne Johnson, one on the "Chemistry of Wood," and there was a general discussion on "The Handling of Wood in Pulp Mills."

In February Mr. Henry Sorgius, Manager of the St. Maurice Forest Protective Association, will be sent on a tour of the Province, by the Department of Lands and Forests, to try to get the limit holders who are not already members of the Coöperative Associations to form new ones in their respective districts.

On February first and second, in the rooms of the Montreal Board of Trade, was held the first general conference on Forest Fire Protection in Eastern Canada. It was under the joint auspices of the Lower Ottawa and St. Maurice Forest Protective Associations and consisted of short papers, by men prominent in different phases of protective work, followed by informal general discussion. Mr. T. B. Wyman, of the Northern Forest Protective Association, Mr. Clyde Leavitt of the Dominion Conservation Commission and other prominent men took part. The subject of the white pine blister rust was discussed. A very important question was also brought up, *i.e.*, the protection of forest areas which

are at present of no commercial value, such as young growth, burnt over territory, second growth, and timber without commercial value, owing to its inaccessibility.

The work of the New Brunswick forest survey is proceeding satisfactorily and at low cost. About 375,000 acres have already been covered. Maps have been made showing the holdings of the Government, boundary lines, drainage, etc., the kinds and amounts of timber and the kinds of soil. The cost has been, including the office work, only 4¼ cents per acre, which is very creditable. This survey will set a Provincial record for thorough and comprehensive work and will put the Province of New Brunswick in a splendid position to lay out future plans for the management of its forests, the regulation of its cut, protection work, etc., and will give all the data necessary for the proper classification of lands so that only those which are really agricultural shall be opened for settlement.

The soil map shows the character of the soil by broad physical types, such as clays, clay-loams, sand-loams, sand soils and swamp soils. The presence of surface and sub-surface stones are also shown, with areas too steep and rugged for cultivation. The timber maps show the main topographic features, and the timber by broad types, with the estimate based on types. This gives the board feet per acre, and the percentage of the different species entering into the estimate.

In the United States, neither the public generally nor the foresters, seem to be aware of the rapid progress which forestry is making in Canada. Almost all of the Provinces now have active and efficient Forestry Services as has the Dominion Government. Fire protection has made rapid progress and public sentiment has reached a point where forest fires will soon be a thing of the past. Public opinion will hold those responsible for poor protection strictly responsible. Proper exploitation is becoming more and more the rule, especially with the pulp and paper companies. A beginning has also been made along silvicultural lines and people at large are beginning to realize that trees must be grown as crops. A large amount of experimental work is being carried on and the outlook for proper utilization and conservation of our forest resources is decidedly bright.



THE GIGANTIC ROOSEVELT DAM WHICH HAS BROUGHT WATER TO THOUSANDS OF DESERT ACRES

## THE LURE OF APACHE LAND

BY RUSSELL T. EDWARDS

"'Neath that inverted bowl we call the sky," as Omar sang at the wall of a Persian garden, there is no finer work of the Master Artist in all the world than the colored glories of Apache Land—a land full of the mystery of the Redman's lore that has come down through the ages to a country that then was old when the Spaniard Coronado passed that way. The cry of the fierce Apache long has been stilled. Instead, the purr of the motor attunes softly with the colorings that were born of a god-like wrath when Morning Green (the Creator) cursed the land with desert wastes and swore nothing there should bloom again. He left the wonder-colorings to taunt the savage who had rebelled and to be forever a sign that the gods were superior to men.

And so it seems

The Moving Finger writes; and, having writ,  
Moves on; nor all thy Piety nor Wit  
Shall lure it back to cancel half a Line,  
Nor all thy tears wash out a Word of it.

But old Omar, despite his wine-visions prophecies, dreamed not the power of man, for there on the Apache Trail today that handiwork of man, the Roosevelt Dam, makes the god-cursed desert bloom and stands second only in the wonder spots of the handiwork of Nature herself, as if mocking the grim pinnacles the gods had left as a warning. This stage for an age-old pageant is always set. True, the actors of another time have gone, but the crags and cliffs that once

echoed Geronimo's call to battle and to tortures such as the witches never fashioned still are there along the Apache Trail.

This trail to wonderland leads out of Globe, Arizona. You leave the Pullmans of the Southern Pacific Railroad, the smoking obelisks, the copper smelters, and step into luxurious motors that are waiting to take you to this new mirage-veiled country where your picture dreams will all come true. For seventeen miles you see an ever-changing panorama from your soft cushioned seat. The wonderful Arizona sky is above you, while all about are crags, rocks and mighty drops of nature's cliff-made curtains which

seem to forever conceal the mystery of an ancient play.

To the northeast the Apache Mountains round the vast amphitheatre in which once the gods did sit in judgment on the passing show. You are climbing the great divide which separates the Tonto and the Salt River Basins, climbing until a mile above the sea, and then suddenly the reason all bursts in upon you, for far across the purple and golden coloring of an Arizona sun you get your first view of Roosevelt Lake, that pearl-like sea penned in by man and mountain.

There what a lesson in forestry—that lake quenching a thirst that for centuries has cursed the land. Beyond are rainbow-colored hills that have been penciled with crimson, gold and azure by a merciless sun that seemed, day by day through all the centuries, to have laughed piteously at what the gods destroyed. In the descent are seen the cragged homes of the Cliff Dwellers whose civilization had tottered before Cleopatra lured Antony to his doom. That the Cliff Dwellers lived a community life seems certain from an examination of their dwellings. Did they solve this—the question that now puzzles the wisest sociologists in this civilization? Does civilization, like history, repeat itself? Perhaps the delver into antiquity, in these ruins that antedate the Roman Empire, can find the answer to the world-old question that Omar sought to answer.



ONE OF THE LAST MEMBERS OF A VANISHING RACE

The traveler seeks the thing tinged with age. Here then he has it—for on the walls of these dwellings are writings, showing that the inhabitants were highly civilized. Traces of canals for irrigation were to be found showing how the people had fought the battle of life against the odds nature had laid down for the game. These were obliterated when modern man took up the fight in the desert and built the reservoir system now famous around the world.

The drop down the descent of the winding trail brings the thrill akin to days when the old swing started on its downward swoop after you had swung to the height of its reach. You remember the breath catching that came. You get it here from your seat as you lean back and the auto sweeps around prehistoric cliffs over this canyon spanning road, cliff-walled on one side since time eternal and man-walled on the other, that you might see nature's handiwork in comfort. The motor stops and you look and wonder how the Little Men of ancient times managed to get to those homes amid the crags when it has taken the engineering genius of the twentieth century to take you to their base surrounded by the rocking-chair comforts of your home.

As against the prehistoric cliff dwellings, the Roosevelt Dam stands out in bold relief as a link between the centuries now gone and a civilization now dead. This big retaining wall is 1,125 feet long and 380 feet high. It holds back a lake 25 square miles in area. This pile is no less wonderful than the cliff dwellings the traveler has just passed and well may one



THE MASSIVE TIME-SCARRED WALLS OF DEVIL'S CANYON

stand in awe as he sees pictured before him the achievements of the two ages and the two civilizations.

There is pause at the Dam for lunch. Refreshed, one again motors toward the land of Sunset over the second half of the trail that leads to Phoenix and the Southern Pacific's train for Los Angeles and the rose country. One vista after another greets the eye. The well-made road now runs along the side of the sky-scarred cliffs. Through Fish Creek Canyon the motor way is carved on the very face of a cliff.

Up, up, up, there is nothing but rock, while in looking down one sees nothing but the marvelously grotesque

and twisted rocky masses. Next we see old "Arrowhead," sentinel-like, hammered from the solid rock—so runs the Redman's tale—by Chief One-Eye whose ill-shaped form, turned to stone by the wrath of the gods, glares at you farther up the trail. Passing Old Woman's Shoe, Eagle Rock, Whirlpool Rock and the Little Alps we cross Black Canyon and come to Superstition Mountain.

In awe of this the Apache lived; and, as sunset glows about it, the traveler is quite ready to believe the legend of how Chief White Feather and his people were wiped out. White Feather escaped the deluge by scaling this mountain when the waters covered the earth. In prayer, with face upturned to the lightning, the chief held out the precious medicine stone he had carried with him. A bolt struck the stone and White Feather and his followers became pinnacles of rock.

With this age-old legend still fresh in your mind the motor glides into the tree-fringed streets of Phoenix. You step out of legend time and Indian lore into civilization. The comfortable Pullmans of the Sunset Limited are waiting. This trip, a side one, which can be made with convenience only over the Southern Pacific Lines, costs but \$15 in addition to the through fare, and can be made either way—from Phoenix or Globe, depending upon which way you chance to be going. By doing this you have dipped into another world where in ages gone another people sprang up in another civilization, then went their way out where the west begins.



THE HOMES OF A PREHISTORIC RACE

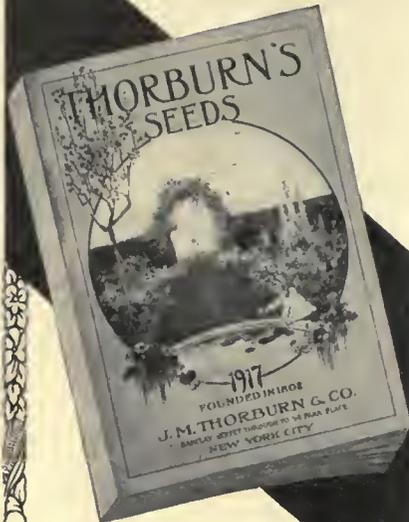


ROCKY PINNACLES IN FISH CREEK CANYON



THE WINDING ROAD BATHED IN ARIZONA'S MATCHLESS COLORS

# Send for this Book



## Dependable Tree Seeds are a special feature of the Thorburn Catalog.

The assortment we carry more than doubles that of any other house, American or foreign, and includes many rare species. There is just one quality—the best.

Thorburn's Seeds have been known for their reliability since the first Thorburn Catalog, "The Gentlemen and Gardeners' Kalendar," was published by the founder of this firm more than a century ago.

*Our 1917 Catalog is a helpful manual for both tree-growers and gardeners. Send for it today.*

**J. M. Thorburn & Co.**

Established in 1802

53 S. Barclay Street through  
to 54 Park Place

New York City

At the annual meeting of the Canadian Forestry Association in Ottawa on the 15th inst. the following subjects were discussed: "The Peril of the White Pine Blister Rust," speakers, Dr. H. T. Gussow, Dominion Botanist; G. C. Piché, Chief Forester of Quebec; E. J. Zavitz, Chief Forester of Ontario. "Slash Disposal in Commercial Logging Operations as a Fire Preventive Measure," Mr. T. J. Welsh, of Bemidji, Minnesota; R. D. Pretti, Superintendent of Forestry, Canadian Pacific Railway, and Mr. G. A. Gutches, Dominion Forestry Branch, Supervisor for Saskatchewan. "Cutting Regulations on Quebec Crown Lands and their Value in Forest Maintenance," Avila Bedard, F. E. Department of Lands and Forests, Quebec.

"The pine blister disease has not assumed anything like the alarming proportions in Canada that it has in the New England States," stated Clyde Leavitt, Chief Forester, Commission of Conservation of Canada, at The American Forestry Association meeting, Washington, D. C., in January. "The seriousness of the menace is, however," said Mr. Leavitt, "pretty generally recognized, and it is believed that the measures taken and contemplated should enable the authorities to prevent material damage to the extensive white pine forests of the country, which are valued at upwards of \$200,000,000, to say nothing of the potential value of the large areas of young white pine growth in all the provinces of eastern Canada.

"The great bulk of our forest lands are owned and administered by the respective governments. The provinces of Ontario, Quebec and New Brunswick derive a direct revenue, into the Provincial treasuries, of about \$4,000,000 per year, from cutting privileges on these Crown lands. Of this, some \$1,250,000 may be credited to white pine. Thus, it is easy to understand why the governmental agencies should take a very strong and direct interest in preventing the spread of the pine blister disease.

"This disease was first noted in the Fall of 1914, in the Niagara peninsula of southern Ontario. The presumption is that it was brought in on white pine nursery stock imported from Europe between 1906 and 1909. During the two succeeding seasons a number of inspectors have been employed under the direction of E. J. Zavitz, Provincial Forester, in locating infections and eradicating diseased plants, both pines and currants.

"The section where the worst infections have been found is about ten to fifteen miles west of Niagara Falls. Here there is a district comprising some 300 square miles in which there are large numbers of currants and gooseberries. The black currants show more infection than the red. The Niagara peninsula is an old-settled section, with practically no white pine of commercial value, but with many scattered trees of this species in fence corners, lawns,

woodlots, etc. The great problem is to prevent the spread of the disease to the commercial white pine region in the more northerly portions of the province. Some outlying infections have been found to the north and west of the Niagara peninsula, but the measures taken to eradicate diseased plants have resulted in keeping such outbreaks under control.

"Under the direction of the Dominion Botanist, Mr. W. A. McCubbin has conducted research work, which promises important results in the development of control measures for this disease.

"In the Province of Quebec, small infections have more recently been found at two points not far from Montreal. The most serious aspect of the situation in this province is the threatened invasion along the International boundary, from northern New Hampshire, Vermont and New York. It is possible that such an invasion may already have taken place, since the U. S. Bureau of Plant Industry last summer discovered an infection in northern Vermont, within a mile and a half of the Quebec boundary. The Provincial Forester, Mr. G. C. Piché, is now planning the organization of a force of inspectors, who will, during 1917, investigate the whole situation fully, with a view to locating existing infections and taking necessary steps for the eradication of the disease.

"It is fully recognized that such action is of the utmost urgency, since the serious spread of the disease in Quebec would threaten the large native pine area up the whole Ottawa valley in both Quebec and Ontario.

"The white pine areas of New Brunswick do not appear to be threatened as yet, but they may become so, unless adequate action is taken to prevent the spread of the infections located last year in the state of Maine.

"The Ontario and Quebec governments both maintain forest nurseries. The movement of white pine stock from both these nurseries has been discontinued, and the planting of white pine is practically at a standstill until it can be determined what will be the outcome of the campaign for the eradication of the pine blister disease. There are no commercial nurseries selling white pine material, so this feature of the situation is under complete control.

"Under Dominion legislation, the further importation of white pines from outside Canada is prohibited. Dominion laws also provide adequate authority for the destruction of diseased plants, whether pines, currants or gooseberries. The Ontario Act is effective along the same lines. Action in Quebec can be taken under the Dominion legislation, pending amendments to the provincial legislation, should such action be found necessary.

"In southern British Columbia we have some 2,700 million feet of western white

# NO TREE LIKE THE NORWAY MAPLE

## *For Lawn or Avenue Planting*

No one disputes the claim to superiority of the Norway Maple — (*Acer platanoides*). No one who knows it can fail to appreciate what an admirable tree it is for either lawn or avenue.

Its symmetrical, somewhat drooping shape, its lovely yellow flowers in spring, its broad dark green foliage, turning to brilliant golden yellow in late autumn, combine to give it an all-season elegance well suited to refined home surroundings.

Its growth is strong, compact and vigorous and it will thrive satisfactorily in most any soil, and even in the smoke-laden atmosphere of cities.



### Meehan's Norways Are Particularly Fine

\*\*\*

We have a specially fine stock of Norway Maples, probably superior to any in America, and can fill all orders, even the largest, in uniform sizes. Our trees have every point of excellence fully developed. They are straight, clean, healthy and good to look at, because they have been grown six feet apart to give plenty of light and air and ample nourishment for the roots. In fact the root systems are wonderfully developed. Every tree is big enough to look well *right now*, but not so big as to be extravagantly expensive.

### Write for Our 1917 Hand Book To-day

\*\*\*

It describes in detail hundreds of specially choice, exceptionally well-grown Trees, Shrubs and Hardy Flowering Plants, and tells how to grow them successfully. Mailed *Free*.

**Thomas Meehan & Sons 6708 Chew St., Germantown, Philadelphia, Pa.**

pine, which must be protected against the spread of the blister disease.

"On the whole, the situation in Canada may fairly be said to be well in hand. The Governments of both Ontario and Quebec have given the most definite assurances that all necessary funds will be provided for this work, and the continued co-operation of the Dominion authorities is assured."

#### Using Cut-over Lands

The lumbermen of a dozen states are to aid in the development of the agricultural resources of the south, through the utilizing of the cut-over lands left after the manufacture of the forests of the south into lumber. How to accomplish this end will be an important part of a conference of representatives of all the southern states from Virginia to Texas, which has been set for March 19 to 22 in New Orleans.

#### Long Life for Wood

Interesting booklets on "Long Life for Wood" have just been issued by The Barrett Company which has branches all over the world. The booklets deal with farm timber and their preservation and the articles are illustrated from pictures from the U. S. Department of Agriculture and the Associated Mutual Fire Insurance companies. The booklets call attention to

Bulletin No. 387 of the Department of Agriculture for treatment of timber and detailed instructions.

#### Strengthening Boxes

Tests at the Forest Products Laboratory, at Madison, Wisconsin, indicate that by the use of four additional nails in each end an increase of 300 per cent in the strength of canned-food boxes is secured.

#### A Forestry Number

The Journal of Agriculture, published by the students of the University of California, devotes the entire November number to forestry and the edition would be a credit to any large publication or publishing house. The articles are contributed by some of the best known men in forestry work and the pictures are well printed.

#### Pine Blister in Canada

In the January number of the Pulp and Paper Magazine a great deal of space is devoted to the white pine blister disease. In addition to an editorial there is an article by H. T. Gussow, Dominion Botanist of Ottawa, which describes the pest and tells of the importance of checking its spread.

#### Forestry Club Meeting

At Seattle, March 1, 2 and 3, will be held the annual convention of the Intercollegiate Association of Forestry Clubs. It is

expected that representatives of all the forest schools of the United States will be present. Many side trips to big mills are planned. The officers for the year are Donald H. Clark, president; Timon Torkelson, secretary; Jesmond Balmer, vice-president.

The State College of Washington will inaugurate this year a short course in farm forestry as part of the winter short course of the department of forestry, this new idea in forestry education being the plan of F. G. Miller, in charge of the department. Washington, since starting its work in teaching forestry problems, has been forging ahead rapidly.

#### Maple Sugar Industry

In coöperation with one of the leading manufacturing companies, The New York State College of Forestry will undertake during the coming spring the study of the maple sugar industry in New York. An experimental orchard will be tapped near the State Ranger School at Wanakena, New York, and among other things to be investigated are the nature of sap flow, character of individual trees giving best yields, cost and efficiency of various types of equipment, and costs of various operations. The results of these studies will be incorporated in a bulletin.

## Why Do You Buy Coal in May or June?

—Ask the man who pays

### YOU GET THE POINT

Why not apply it to your NURSERY STOCK PURCHASES.

### WE HAVE PREPARED A SPECIAL ADVANCE OFFER

of our "Quality First" stock for orders received before February 26th, 1917, for shipment at proper time in spring.

A few items from this Special Advance Offer are noted below:

#### NOVELTY APPLE TREES

5 varieties on One Tree, at \$2.25 per tree  
4 varieties on One Tree, at 1.75 per tree  
3 varieties on One Tree, at 1.25 per tree  
(No order for less than five trees)

RHODODENDRON MAXIMUM  
per Car Load . . . . . \$80.00

BERBERIS THUNBERGI  
Extra Good transplanted, bushy stock 1½ to 2 ft. \$7.50 per 100; \$68.00 per 1000

NORWAY MAPLES  
10 to 12 ft., 1¼" to 1½" cal. \$57.50 per 100

ORIENTAL PLANES  
2" to 2½" caliper . . \$114.00 per 100

If you are further interested in this Special Advance Offer referred to above, just write TODAY for our circular F. Also, send us your full list of Nursery Stock Requirements and we will gladly make you our prompt Special Complete Combination Quotation.

**KELSEY NURSERY SERVICE** "QUALITY FIRST" STOCK  
F. W. Kelsey Nursery Co.  
150 Broadway, New York  
Your Requirements Complete

## KELSEY FORESTRY SERVICE

TIMBER ESTIMATING, FOREST MANAGEMENT, FORESTRY PLANTING, ETC.

Expert service at reasonable cost. This Department in charge of D. E. Lauderburn, Forest Engineer.

### FORESTRY STOCK

Special Advance Offer on Orders Received Before February 26th, 1917.

Write us for the above Special Offer and send us your list of Spring, 1917 Requirements for our Immediate and Special Complete Combination Quote.

**KELSEY FORESTRY SERVICE** "QUALITY FIRST" STOCK  
F. W. Kelsey Nursery Co.  
150 Broadway, New York  
Your Requirements Complete

### Reforestation Lands

Approximately 10,390 acres of denuded lands within the National Forests were reforested in the fiscal year 1916. The total number of trees planted was 6,146,637, while 8,280 pounds of tree seed were sown.

### National Forest Grazing

There were 133,442 more cattle and horses, and 605,338 more sheep and goats using the National Forests in 1916 than in 1915. This increase was in spite of large eliminations of grazing lands from the Forests. It is accounted for by improved methods of handling the stock and by more intimate knowledge of the forage on the ranges and their carrying capacity.

### Decrease in Forest Fires

The number of fires suppressed on National Forest lands during the calendar year 1915 was 6,324, as against 7,018 in 1914, and an average annual number of 4,759 during the past five years, says Henry S. Graves, Chief of the Forest Service, in his annual report just published. While more than the average number of fires occurred the timbered area burned over was but 155,416 acres, or 30 per cent less than the average per year for the period 1911-1915 inclusive. The average loss per fire was \$60.41. Forty-four per cent of the fires were confined to areas of less than one-quarter of an acre.

### Forest Fire Losses

It is estimated that in 1915 about 40,000 forest fires occurred in the United States, which burned over about 5,900,000 acres and caused a damage of approximately \$7,000,000.

### Our Standing Timber

Revised estimates place the amount of standing merchantable timber in the United States at approximately 2,767 billion board feet. Of this amount 1,464 billion board feet, or 53 per cent of the total, is in California, Washington, Oregon, Idaho, and Montana.

### Forest Improvements

During the past fiscal year there were constructed on the National Forests 227 miles of new roads, 1,975 miles of trails, 2,124 miles of telephone line, 89 miles of fire lines, 81 lookout structures, 40 bridges, 222 miles of fence, 545 dwellings, barns and other structures, 17 corrals and 202 water improvements.

### Land Elimination

Since the passage in 1912 of the act providing funds for land classification and as a direct result of the classification work, a total of 13,477,781 acres has been eliminated from the National Forests. This includes an elimination of approximately 5,800,000 acres of land from the Chugach National Forest in Alaska which embraced lands of low value for any purpose other than mining.

## Just Published!

# THE ESSENTIALS OF AMERICAN TIMBER LAW

By J. P. KINNEY, A.B., LL.B., M.F.

THIS volume has been prepared to meet the needs of those engaged in the study or practice of forestry, and the requirements of lumbermen and others interested directly in the production and sale of timber products.

It will also be a valuable book to the attorney who is called upon to determine the law as to timber products in any manner.

The subject-matter is divided into two fairly distinct branches; namely, the law that is concerned with trees, forest and forest products as subject to public or private property interests, and the law that found its stimulus in the interest that the public had in the protection, extension and maintenance of both public and private forests as a means of preserving and advancing the general welfare.

308 Pages, 6x9, Cloth, \$3.00 net

### USE THIS COUPON

JOHN WILEY & SONS, Inc.,  
432 Fourth Ave., N. Y. C.

GENTLEMEN: Kindly send me for 10 days free examination a copy of KINNEY'S "ESSENTIALS OF AMERICAN TIMBER LAW."

It is understood that I am to remit the price of these books within 10 days after their receipt, or return them, postpaid.

Name.....

Address.....

Member of.....

(Indicate here if you are a member of the American Forestry Association. If not, kindly state the forestry society with which you are connected.)

Position or reference.....

(Indicate which you are giving.) Not required of society members.)

## CURRENT LITERATURE

MONTHLY LIST FOR JANUARY, 1917

(Books and periodicals indexed in the library of the United States Forest Service.)

### Forestry as a Whole

Moon, Frederick Franklin. The book of forestry. 315 p. il. New York & London, D. Appleton & co., 1916.

*Proceedings and reports of associations, forest officers, etc.*

Deutsche dendrologische gesellschaft. Programm, 20th, 22d-23d, jahresversammlung. Bonn-Poppelsdorf, 1911-14.

### Forest Education

*Forest schools*

India—Imperial forest college, Dehra Dun. Progress report for the year 1915-16. 24 p. Calcutta, India, 1916.

Yale forest School. Prospectus, 1916-1917. 46 p. New Haven, Conn., 1916.

### Forest Description

Harper, Roland McMillan. A forest census of Alabama by geographical divisions. 7 p. map. University, Ala., 1916. (Alabama—Geological survey. Supplementary to monograph 8.)

### Forest Botany

Bean, William Jackson. Trees and shrubs hardy in the British Isles. 2d ed. v. 1-2. il., pl. London. J. Murray, 1916.

### Silvical Studies of Species

Adams, T. W. The species of the genus Pinus now growing in New Zealand, with some notes on their introduction and growth. 8 p. Wellington, N. Z., Gov't. printer, 1916.

Albert, Federico. El gomero azul o Eucalyptus globulus. 16 p. il. Santiago de Chile, Imprenta Moderna, 1908.

Larsen, Louis T., & Woodbury, T. D. Sugar pine. 40 p. pl., map. Wash., D. C., 1916. (U. S.—Dept. of agriculture. Bulletin 426.)

### Silviculture

Norman, George Warde. Remarks on the preservation and improvement of coppice woods. 21 p. London, Printed for private circulation, 1875.

### Forest Protection

*Fire*

Peters, J. Girvin. Forest fires in the United States in 1915. 6 p. Wash., D. C., 1917. (U. S.—Dept. of agriculture—Office of the secretary. Circular no. 69.)

### Forest Management

Baader, Gustav. Das fachwerk und seine beziehungen zum waldbau. 67 p. Gies-sen, Otto Kindt, 1914.

**Use Tree Tanglefoot**

on Shade and Orchard Trees against Canker Worms, Climbing Cut Worms, Woolly Aphides, Ants and Tussock, Gypsy and Brown-tail Caterpillars. It is equally effective against any crawling insects.

### Band Trees about Two Weeks Before Insects Appear to Get Best Results

Easily applied with wooden paddle. One pound makes about 10 lineal feet of band. One application stays sticky three months and longer—outlasting 10 to 20 times any other substance. Remains effective rain or shine. Won't soften—won't run or melt, yet always elastic, expanding with growth of tree. No mixing, simply open can and use. Will not injure trees.

### For Tree Surgery

Tree Tanglefoot is superior to anything on the market—it is the best application after pruning or trimming. It will waterproof the crotch of a tree or a cavity or wound in a tree, when nothing else will do it.

### Sold by All First-Class Seedsmen

1-lb. cans 35c; 3-lb. cans \$1.00; 10-lb. cans \$3.00; 20-lb. cans \$5.50 and 25-lb. wooden pails \$6.75.

Write to-day for illustrated booklet on Leaf-eating Insects. Mailed free.

### THE O. & W. THUM COMPANY

144 Straight Avenue, Grand Rapids, Mich.

Manufacturers of Tanglefoot Fly Paper and Tree Tanglefoot

## THE MACKENSEN GAME PARK

Bob White  
Pheasants  
Partridges  
Quail  
Wild Turkeys  
Deer  
Rabbits



Peafowl  
Cranes  
Swans  
Ornamental Geese and Ducks  
Foxes  
Raccoons

Everything in wild animals, game, fancy birds for parks, menageries, private preserves and collections of fancy fowl.

WM. J. MACKENSEN, Yardley, Pa.

## PARK and ESTATE FORESTRY

Logging Reports Utilization Studies  
Timber Estimates Forest Planting  
Etc.

*Methods and Cost of Mosquito Eradication*

## P. L. BUTTRICK

Forester and Mosquito Expert  
P. O. Box 607 New Haven, Conn.

**AMERICAN NUT JOURNAL** Only national publication of the kind. Monthly; comprehensive; highly endorsed. \$1.25 per year. Advertising \$2 10 per inch. Rochester, N. Y.

**SUPERIOR ENGRAVINGS**

FOR ALL PURPOSES  
DESIGNERS AND ILLUSTRATORS

HALFTONES • LINE CUTS  
3 COLOR PROCESS WORK  
ELECTROTYPES

**NATIONAL ENGRAVING CO.**  
506-14th Street, N.W.  
WASHINGTON, D. C.

Phone Main 8274

## Modern Spraying

### Rigs

Catalog  
Free



To protect your trees properly be sure your equipment, from pump to nozzle, combines every latest money-making and money-saving improvement.

The new 1917

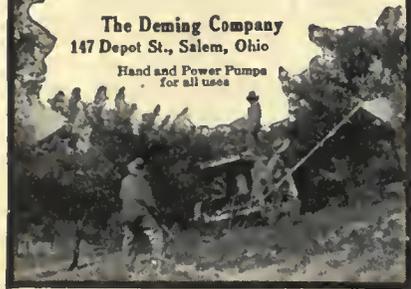
## DEMING

Catalog shows how 35 years of specialization on pump construction enables the Deming spraying experts to lead the way to new spraying improvements.

Every tree-lover should have a copy of this book.

The Deming Company  
147 Depot St., Salem, Ohio

Hand and Power Pumps  
for all uses



## Protect Your Trees

DON'T take chances with your young trees. One rabbit will kill many in a single night. Mice and cut worms will damage and destroy them if you don't protect them. Get dollars' worth of protection at a fraction of a cent cost by using

### Hawkeye Tree Protectors

Absolute protection against gnawers and borers. Prevent trees from becoming skinned and bruised by cultivator or lawn mower. Made of thin veneer, chemically treated. Easily put on and will last until tree is beyond needing protection. Don't wait until some of your trees are killed—order Hawkeye Protectors now. Regular size 10 inches wide, 20 inches high. Price in crates of 100 tree protectors, 1c each; in lots of 1000, \$/40 each.

Write for circular and sample.

BURLINGTON BASKET FACTORY

300 Main St., Burlington, Iowa



## FOREST NURSERIES

PINE SPRUCE

Evergreen trees for forest planting in any quantity, from 100 trees to carload lots.

WE GROW OUR OWN TREES

Write us for catalogue

KEENE FORESTRY ASSOCIATION

KEENE, N. H.

Hardy Native Trees and Flowering Shrubs  
RHODODENDRON MAXIMUM  
A SPECIALTY

SEND FOR PRICE LIST

The Charles G. Curtis Company  
Callicoon, N. Y.

### Forest Legislation

United States Dept. of agriculture—Forest service. State forestry laws, Connecticut. 12 p. Wash., D. C., 1916.

United States—Dept. of agriculture—Forest service. State forestry laws, Ohio. 4 p. Wash., D. C., 1916.

### Forest Economics

#### Forest policy

Elliott, S. B. The present and future of Pennsylvania's forests. 28 p. pl. DuBois, Pa., Penna. conservation association, 1916.

### Forest Utilization

Lamb, George N. Farm woodlot timber; its uses and principal markets. 24 p. il. La Fayette, Ind., 1916. (Purdue University—Dept. of agricultural extension. Extension bulletin no. 51.)

#### Lumber industry

Filippov, N. A. Lyesnoi ruinok Velikobritanii (Lumber markets of Great Britain.) 312 p. diagrs., tables. Petrograd, 1915.

#### Wood-using industries

Paul, C. E., & Buehler, Walter, comp. Timber in pier and wharf construction. 7 p. Chicago Ill., 1916. (National lumber manufacturers' association—Engineering bureau. Technical letter no. 9.)

### Wood Technology

Swan, O. T. The strength of timber; a factor in merchandising. 6 p. tables. Oshkosh, Wis., 1916. (Northern hemlock and hardwood manufacturers' association. Bulletin 393.)

### Wood Preservation

American wood-preservers' association. Handbook on wood preservation. 73 p. diagr. Baltimore, Md., 1916.

National lumber manufacturers' association—Engineering bureau. Standard specification for creosoted wood block pavement. 18 p. Chicago, Ill., 1916. (Technical letter no. 8.)

### Auxiliary Subjects

#### Conservation of natural resources

Wisconsin—State conservation commission. Biennial report, 1st, 1915-16. 160 p. il., tables. Madison, Wis., 1916.

#### National parks

United States—Dept. of the interior—National park service. Annual report of the Superintendent of national parks, 1st, 1915-16. 89 p. pl., maps. Wash., D. C., 1916.

#### Engineering

Arizona—State engineer. Second report, for the periods July 1, 1914 to June 30, 1916. 673 p. il., tables, diagram. Phoenix, Ariz., 1916.

#### Civics

McCarthy, Charles, and others. Elementary civics. 254 p. il. N. Y., etc., Thompson, Brown & Co., 1916.

Members that "never read advertisements" will find only reliable announcements that are worth reading. They are not only interesting and instructive, but may be used as a guide for individual purchases.

## HILL'S Seedlings and Transplants

Also Tree Seeds

### FOR REFORESTING

BEST for over a half century. All leading hardy sorts, grown in immense quantities. Prices lowest. Quality highest. Forest Planter's Guide, also price lists are free. Write to-day and mention this magazine.

## THE D. HILL NURSERY CO.

Evergreen Specialists  
Largest Growers in America

BOX 501 DUNDEE, ILL.

## GRAFTED NUT TREES

Why not combine NUT CULTURE with forestry? My hardy PENNSYLVANIA GROWN trees are the best for eastern or northern planting. Catalogue and cultural guide free.

## WHY NOT BUD OR GRAFT

the seedling black walnuts and butternuts on your farm over to the improved English walnuts; and the hickories to fine pecans and shagbarks. Booklet on propagation and top-working Nut Trees free.

J. F. JONES

NUT TREE SPECIALIST Box A, Lancaster, Pa.

## Nursery Stock for Forest Planting

Seedlings	TREE SEEDS	Transplants
\$2.25 per 1000	Write for prices on large quantities	\$6.00 per 1000
THE NORTH-EASTERN FORESTRY CO. CHESHIRE, CONN.		

## Orchids

We are specialists in Orchids, we collect, import, grow, sell and export this class of plants exclusively.

Our illustrated and descriptive catalogue of Orchids may be had on application. Also special list of freshly imported unestablished Orchids.

## LAGER & HURRELL

Orchid Growers and Importers SUMMIT, N. J.

EVERGREEN SEEDLINGS—We will pull or dig, as requested. From North Michigan, Arbor Vitae, Hemlock, White and Norway Pine, White Spruce and Balsam Fir; from Tennessee, Red Cedar.

DECIDUOUS SEEDLINGS—Ash, Beech, Linden, Sugar Maple, Cherry, Oaks, and many other trees and shrubs, through our many collecting stations. Many of these in transplanted, nursery-grown stock.

PERENNIALS—We get out millions of these. Send list of wants for quotations. Address Dept. A. F..

HOPEDALE NURSERIES, Hopedale, Ill.

## PHILIP T. COOLIDGE FORESTER

Stetson Bldg., 31 Central Street, Bangor, Me.  
Management and Protection of Woodlands  
Improvement Cuttings, Planting, Timber  
Estimates and Maps. Surveying

## TIMBER ESTIMATES

FIRE PROTECTION PLANS

MAPS, LOGGING REPORTS

EMPIRE STATE FORESTERS

156 FIFTH AVE. NEW YORK CITY

*Plant physiology*

Kiesselbach, T. A. Transpiration as a factor in crop production. 214 p. il. Lincoln, Neb., 1916. (Nebraska—Agricultural experiment station. Research bulletin no. 6.)

## Periodical Articles

*Miscellaneous periodicals*

All-Alaska review, Sept.-Oct., 1916—Alaska is opening up, by Arthur C. Ringland, p. 20-1.

American botanist, Aug., 1916—Weight of our native woods, p. 94-6; Tree cisterns, p. 114-15.

American botanist, Nov., 1916—The Ossawatimie pine tree, by Charles Francis Saunders, p. 121-2; Strength of wood, by Henry S. Graves, p. 152.

Bulletin of the Missouri botanical garden, Dec., 1916—The oldest living tree, p. 191-4; Evergreens, p. 194-8.

Cornell countryman, Dec., 1916—The farmer and the forester, by Henry Solon Graves, p. 182-5.

Countryside magazine, Oct., 1916—Trees for special purposes, by Garrett M. Stack, p. 179-81, 191: A wildwood planting, by Garrett M. Stack, p. 195.

Fire protection, Dec., 1916—European methods of forest fire protection and insurance, by John L. Cobbs, Jr., p. 8.

Gardeners' chronicle, Nov. 25, 1916—Reviving woodland industries, by A. D. Webster, p. 259.

In the open, Dec., 1916—Forestry in Pennsylvania, by N. R. McNaughton, p. 38-40.

In the open, Jan., 1917—Forestry; the future timber supply, by N. R. McNaughton, p. 36-9.

Journal of the New York botanical garden, Nov., 1916—Some problems in New York street tree planting, by George E. Stone, p. 202-5.

National wool grower, Dec., 1916—Poisonous range plants, by Arthur W. Sampson, p. 25-7.

Reclamation record, Jan., 1917—Ridding the forest range of poisonous plants, p. 35-6.

Red Cross magazine, Jan., 1917—Safety first in the national forests, by Findley Burns, p. 33-4.

Scientific American supplement, Oct. 21, 1916—Determining the age of blazes, p. 260-1.

Scientific American supplement Nov. 11, 1916—Our national parks; playgrounds for the people unsurpassed in the world, by C. H. Claudy, p. 312-14.

Loyal members can help in making a better magazine by mentioning American Forestry when writing to or calling on advertisers.

## Farm Forestry for Farmers

A special course on the farm woodlot is being given at the New York State College of Agriculture at Cornell University. Like all the other courses offered during the winter, this course is free to residents of New York State. The object of the course is to demonstrate that the farm woodlot may be made a permanent and profitable source of income to the farmer. In addition to the one lecture a week, three Saturday afternoons will be given to trips to neighboring woodlots, or to such places as are of interest to owners of woodlots.

## How to Choose Fine Trees

**YOU** who love trees for their own beauty or value them for the charm they lend to roadside and lawn must have often wished deeply for a more friendly knowledge of how to choose and group them best.

This is to say that at last a book has been written which tells just what you want to know about trees. It is the new catalog of the well-known ornamental trees and

shrubs grown at Andorra Nurseries.

It tells what shrubs and trees are best adapted by nature for each garden and landscape purpose.

"Suggestions for Effective Planting" is not the usual dull nursery list. To read it is like going around your grounds with an old, experienced gardener and discussing in a friendly way what the place needs.

This book is free for the asking. Send for your copy at once. Box 200

**Andorra Nurseries** CHESTNUT HILL  
William Warner Harper, Proprietor Philadelphia, Pa.

### Are you on the Mailing List for Catalog of



Pine and Oak Help Each Other

### Hicks Nurseries?

It will confirm your decisions on fitting your selection of trees to your soil and climate. It offers trees for dry and acid soils and moist soils in the same region. Many nurseries on alkaline soils do not specialize on oaks and pines.

Trees 20 years old can be selected now. They are guaranteed to grow satisfactorily or replaced free.

**ISAAC HICKS & SON**  
Westbury, Nassau Co., N. Y.

**OAKS** For \$25.00 cash we will send you, carefully packed, 1000 each of Black, Pin, Red and Scarlet Oaks, 6-12 inches, or 500 each for \$15.00. 1000 each 12-18-inch White Ash, Catalpa Speciosa, White Elm, Black Locust, Russ Mulberry and Butternut for \$20.00. The above are but a few of the many varieties we grow in Forestry and Ornamental Stocks.

YOU NEED OUR PRICE LIST NOW.

**Atlantic Nursery Company, INC.**  
BERLIN, MARYLAND

### FORESTRY SEEDS

I OFFER AT SPECIAL PRICES

*Pinus strobus*  
*Pseudo-tsuga Douglassi*  
*Pinus ponderosa*  
*Picea Englemanni*  
*Picea Pungens*  
*Thuja Occidentalis*  
*Pinus taeda*

and many other varieties, all of this season's crop and of good quality. Samples upon request. Send for my catalogue containing full list of varieties.

**THOMAS J. LANE**  
TREE SEEDSMAN  
Dresher Pennsylvania

## The Watch that Times the Fast Trains

Thousands of engineers and conductors carry Hamilton Watches. They know they can rely on them absolutely for correct time. Make up your mind now that when you get your watch, it will be a Hamilton—the kind the railroad men carry.



The lowest-priced Hamilton is a movement alone for \$12.25 (\$13.00 in Canada). The highest-priced Hamilton is our Masterpiece at \$150.00 in 18k heavy gold case. Other Hamiltons at \$15.00, \$25.00, etc. Your jeweler can fit a Hamilton movement to your present watch case.

### Send for Hamilton Watch Book "The Timekeeper"

It tells you the story of the Hamilton and a lot of facts about watch making. You will learn much about good watches from this book. It's free. Send for it to-day.

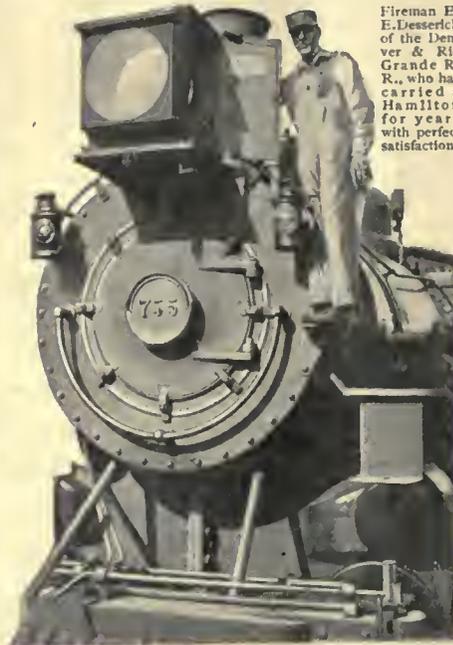
**Hamilton Watch Company**

Dept. 39

Lancaster, Pennsylvania

# Hamilton Watch

"The Watch of Railroad Accuracy"



Fireman E. E. Desserch of the Denver & Rio Grande R. R., who has carried a Hamilton for years with perfect satisfaction.

- United States — Dept. of agriculture. Weekly news letter, Dec. 20, 1916—Reclaiming forest land, p. 7-8.
- United States — Dept. of agriculture. Weekly news letter, Dec. 27, 1916—Imported tree disease, serious outbreak of the European poplar-canker in the U. S., p. 3-4.
- United States — Dept. of agriculture. Weekly news letter, Jan. 3, 1917—The national forests, p. 1-3.

### Trade journals and consular reports

- American lumberman, Dec. 16, 1916—Utilization of south's cut-over lands is progressing, p. 36-42; Managing privately owned forests in Germany, by A. B. Recknagel, p. 60.
- American lumberman, Dec. 23, 1916—Aerial wire tramway a success in operation, p. 34.
- American lumberman, Dec., 30, 1916—The structural qualities of British Columbia fir, by H. R. MacMillan, p. 42-3.
- American lumberman, Jan. 6, 1917—Russia lays plans for developing her lumber industry, p. 26; Fungus growths destroy many wooden roofs, p. 32-3; The use of wood stave pipe for water supply mains by B. L. Grondal, p. 33-4.
- Barrel and box, Nov., 1916—Brief for slack cooerage trade, p. 20; Cost finding in Australia, p. 33-4.
- Canada lumberman, Dec. 15, 1916—Is forestry a business proposition? by M. A. Grainger, p. 28-9. Superiority of the wooden pulley, p. 42; Keeping cooperative logging costs, by R. C. Staebner, p. 42-4.
- Gulf coast lumberman, Jan. 1, 1917—Building yellow pine ships, p. 26-9.
- Hardwood record, Jan. 10, 1917—Heartwood and sap-wood, by Hu Maxwell, p. 15-17.
- Lumber trade journal, Jan. 1, 1917—Changes in grading rules are made at meeting of directors, by Southern pine association, p. 17.
- Mississippi Valley lumberman, Dec. 29, 1916—Waste tanbark now used to make roofing, p. 39.
- Municipal journal, Dec. 7, 1916—Oil for treating wood paving blocks, by P. C. Reilly, p. 702-5.
- Pioneer western lumberman, Jan. 1, 1917—Forest conservation will save United States timber, p. 10.
- Pulp and paper magazine, Dec. 1, 1916—Forestry in connection with pulp mill operations, by Ellwood Wilson, p. 403-5.
- St. Louis lumberman, Dec. 15, 1916—The automobile and the lumber business, p. 13; A log slide of open work design, by J. B. Woods, p. 47; Northern lumberman's salesmanship conference, p. 1-3; List of associations and officers, p. 71-2.
- St. Louis lumberman, Jan. 1, 1917—Wood and wood substitutes, by Rolf Thelen, p. 23; Forester talks wood to architects, by J. E. Barton, p. 61.
- Savannah naval stores review, Dec. 16, 1916—The naval stores industry, by E. S. Nash, p. 13, 18, 26.
- Southern lumberman, Dec. 16, 1916—The development of southern cut-over lands, by R. S. Kellogg, p. 75; Cost of cutting large and small timber, by W. W. Aslie.

Members of American Forestry Association buy quality goods in large quantities. The publication should carry many more pages of advertising. The increased revenue will be put back into the publication and will help to make it better and more valuable.



## WE MAKE THE ENGRAVINGS

FOR THE  
AMERICAN FORESTRY  
MAGAZINE

### OUR SPECIALTY IS THE "BETTER GRADE FINISH OF DESIGNS & ENGRAVINGS

IN ONE OR MORE COLORS  
FOR MAGAZINE CATALOGUES  
ADVERTISEMENTS ETC

HALF TONES      LINE PLATES  
DULLO-TONES    COMBINATION LINE  
COLOR PROCESS   MULTI-COLORS

—ESTABLISHED 1899—  
**GATCHEL & MANNING**  
SIXTH AND CHESTNUT STREETS  
OPPOSITE OLDE INDEPENDENCE HALL  
PHILADELPHIA

## Forest Insects cause Forest Fires

Great fires in virgin forests usually occur in dead INSECT KILLED TIMBER during dry seasons. Accumulated ground litter and everpresent standing dead, injured and pitchy trees furnish ample fuel to lead the flames into green timber. This necessary fuel largely results from the continuous and intermittent attack of DESTRUCTIVE FOREST INSECTS upon the roots, base, trunks, limbs, branches, twigs and buds of trees throughout their entire life. Forest fires in green timber increase the INSECT RISK by concentrating insect attack and reducing the number of beneficial insects. Avoid your constant annual loss. Reduce your fire risk. Control the insects responsible. It is good business. Efficient inspection of Parks, Watersheds, Estates and Timberlands. Control methods outlined. Control costs estimated. Control work conducted economically.

**BARTLE T. HARVEY**  
Consulting Forest Entomologist  
MISSOULA, MONTANA

p. 91-2; After the war, with special reference to the investigation of European lumber markets, by Edward Ewing Pratt, p. 93-5; Vulcanizing lumber, by Harris M. King, p. 95; Fitting the band mill to its proper use, by R. C. Leibe, p. 96; Teachers' cottages, by Warren B. Bullock, p. 97-8; West Virginia's lumber industry, by W. H. Manes, p. 108; The development of forest by-products in the south, by Howard F. Weiss, p. 110; Cut-over land section, p. 121-162B; Dickson county's big poplar, by R. S. Maddox, p. 162B.

Southern lumberman, Jan. 6, 1917—Plan of proposed European lumber investigation outlined, by E. E. Pratt, p. 23.

Timber trade journal, Dec. 2, 1916—The forests of Japan, by A. Nakai, p. 907.

Timber trade journal, Dec. 16, 1916—Revision of American hardwood grading rules, p. 957.

Timber trade journal, Dec. 23, 1916—Forestry and the war, by John Stirling-Maxwell, p. 1023-4.

Timberman, Dec., 1916—Lumbering in the Indian Archipelago, by J. P. Pfeiffer, p. 35; Lumber transportation via aerial cable tramway, p. 38-9; Perforated tie experiments, by O. P. M. Goss, p. 43; Plan of practical home-made log loader, by H. N. Ormsbee, p. 47; Report on lumber export trade, p. 48 A-D.

United States daily consular report, Dec. 21, 1916—Chinese lectures on forestry, by John R. Arnold, p. 1091; Forest wealth on Argentine government land, by William Dawson, p. 1095.

United States daily consular report, Dec. 27, 1916—Wooden ship building in United States, p. 1155-8.

United States daily consular report, Dec. 30, 1916—British Columbia lumber industry, p. 1214.

United States daily consular report, Jan. 13, 1917—High prices for timber rights in New Brunswick, by E. Verne Richardson, p. 165.

West Coast lumberman, Dec. 15, 1916—Some important little known timber bodies in the state of Washington, by Stanton G. Smith, p. 22-3.

West Coast lumberman, Jan. 1, 1917—After twenty years' test Marquette installs a new wood penstock, p. 21; Increasing use of wood, by O. P. M. Goss, p. 27.

Wood turning, Jan., 1917—Timber supply, by H. S. Sackett, p. 5-6; Characteristics of different woods; their adaptability for furniture making, p. 20-1.

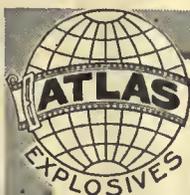
Wood-worker, Dec., 1916—The largest chair town in the world, by Walter Cross, p. 23-4; Filling and finishing various woods, by A. Ashmun Kelly, p. 28-9; Turning bowling balls, by E. T. J., p. 37; Tree felling by machinery, p. 38.

**Forest journals**

Canadian forestry journal, Dec., 1916—A ranger school in operation, p. 850-2;

Only those fit for your patronage are asked to enter the advertising pages. We are careful because we want you to patronize your advertisers. By mentioning the publication you are assisting materially in the development of your magazine and the work of the Association.

**WANTED** An experienced Tree Mover. Also men wanted to learn the tree moving business.  
**LEWIS AND VALENTINE CO.**  
Roslyn, Long Island New York



## Anyone Can Use Atlas Farm Powder

No experience or skill is required, because Atlas Farm Powder is made especially for you. You can do your own blasting without trouble or risk by following a few simple instructions that even children can understand. Many women farmers use

### Atlas Farm Powder THE SAFEST EXPLOSIVE The Original Farm Powder

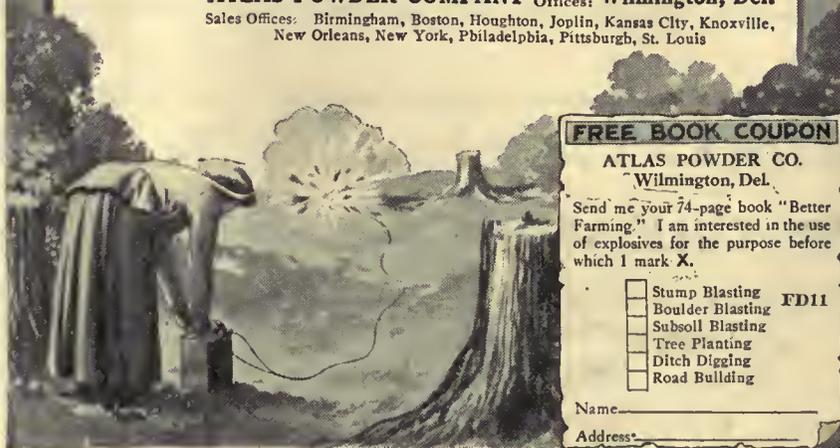
Improve the fertility of your soil, get out stumps and shatter boulders quickly, safely and cheaply with Atlas. Blast beds for tree-planting, dig ditches and do other kinds of farm work in the most economical, up-to-date way.

Atlas Farm Powder costs little compared with the cost of labor that it replaces. You can buy it from a dealer near you. If you don't know him, ask us. We will also tell you exactly what you need for any kind of work.

**Get Our Free Book—"Better Farming"**

It tells you how to save labor on your farm by using The Safest Explosive for stump blasting, ditch digging, tree-planting, subsoling, etc. Fill out the coupon now and mail it today.

**ATLAS POWDER COMPANY** General Offices: **Wilmington, Del.**  
Sales Offices: Birmingham, Boston, Houghton, Joplin, Kansas City, Knoxville, New Orleans, New York, Philadelphia, Pittsburgh, St. Louis



**FREE BOOK COUPON**

**ATLAS POWDER CO.**  
Wilmington, Del.

Send me your 74-page book "Better Farming." I am interested in the use of explosives for the purpose before which I mark X.

Stump Blasting **FD11**  
 Boulder Blasting  
 Subsoil Blasting  
 Tree Planting  
 Ditch Digging  
 Road Building

Name \_\_\_\_\_  
Address \_\_\_\_\_

## Pull Big Stumps by hand



Showing easy lever operation



Clear your stump land cheaply—no digging, no expense for teams and powder. One man with a K can rip out any stump that can be pulled with the best inch steel cable.

Works by leverage—same principle as a jack. 100 pounds pull on the lever gives a 48-ton pull on the stump. Made of Krupp steel—guaranteed against breakage. Endorsed by U. S. Government experts.

**HAND POWER K Stump Puller**

Write today for special offer and free booklet on Land Clearing.

**Walter J. Fitzpatrick**  
Box 80  
182 Fifth Street  
San Francisco California



<b>FO</b>	<b>RE</b>	<b>ST</b>	<b>RY</b>
<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>

**THE FOREST IS THREE-FOURTHS OF FORESTRY**

Your opportunities are as unlimited as our forests if you study at

**WYMAN'S SCHOOL OF THE WOODS**  
Incorporated **Munising, Michigan**

**Do Business by Mail**

It's profitable, with accurate lists of prospects. Our catalogue contains vital information on Mail Advertising. Also prices and quantity on 6,000 national mailing lists, 99% guaranteed. Such as:

War Material Mfrs.	Wealthy Men
Cheese Box Mfrs.	Axle Grease Mfrs.
Shoe Retailers	Auto Owners
Contractors	Tin Can Mfrs.
Druggists	Farmers, Etc.

Write for this valuable reference book; also prices and samples of fac-simile letters. Have us write or revise your Sales Letters.

Ross-Gould, 1009C Olive St.

**Ross-Gould Mailing Lists St. Louis**

## Clearing Costs Reduced

The recent land clearing tests conducted by the University of Wisconsin have revolutionized methods and established conclusively much lower clearing costs per acre.

The leading kinds of stump pullers—hand and power—were represented. The dynamite used was



### RED CROSS FARM POWDER

These tests proved the following important facts:

1st—The cheaper Red Cross Farm Powders will in most soils blast out stumps as well as the most expensive 30% and 40% grades.

2nd—The combined use of Red Cross Farm Powder and a stump puller is often the cheapest and best way to clear land.

3rd—Properly placed charges fired with a blasting machine greatly reduce the amount, strength and cost of the dynamite required.

As a result the average stump covered land can now be cleared at less cost per acre than before the war.

#### Write Now for Full Information

Every farmer with stump covered land should know the full facts about this modern method of land clearing. Write today for

#### Land Clearing Bulletin No. 350

If you are interested in orchard planting, ditching, drainage houlder blasting, subsoiling or post hole blasting be sure to ask for

#### Hand Book of Explosives No. 350

**E. I. du PONT de NEMOURS & CO.**  
Wilmington Delaware



Ontario adopts a forward policy, p. 853-5; The heliograph in forest fire detection, p. 856-7; Canada's white pine in danger of extermination, p. 858-9; How long will our timber last? by Ellwood Wilson, p. 861-4; Finding fires with aeroplanes, by W. E. Boeing, p. 870-2; A Forest service that booms business; how British Columbia's organization seeks new markets, by M. A. Grainger, p. 873-5; The partnership of farm and forest, by Robson Black, p. 876-8; Forest influences on stream pollution, by N. R. Buller, p. 878-9; The farm woodlot, by B. P. Kirkland, p. 881; Effect of forests on stream flow, p. 886-7.

Conservation, Jan., 1917—Drain on our pulpwood supply, by Clyde Leavitt, p. 3; White pine blister rust, p. 4; Care of the wood lot; its proper handling would provide a permanent fuel supply for the farm, p. 4.

Forest leaves, Dec., 1916—Forest protection in Pennsylvania, by Robert G. Conklin, p. 177-81; The farm wood-lot by J. A. Ferguson, p. 181-3; American trees in Germany, by J. S. Illick, p. 184-5; Problems of the Pennsylvania Department of forestry and the use of data to be derived therefrom, by George S. Perry, p. 185-7.

Journal of the New York state forestry association, Oct., 1916—Recreational possibilities of public forests, by Benton MacKay, p. 29-31; Shall we commercialize our parks, by Ottomar H. Van Norden, p. 15-18; Can the State of New York afford an idle playground? by George N. Ostrander, p. 19-22, 31-2; Co-operation in forest administration, by Herbert S. Carpenter, p. 26-8.

Northwoods and wild life, Jan., 1917—Must check white pine blister rust, by E. G. Cheney, p. 3-5; Defending the forests; what its forests are worth to Minnesota, by W. T. Cox, p. 7, 12.

Yale forest school news, Jan. 1, 1917—Forest experiment stations, by Barrington Moore, p. 3-4.

### Conservation Congress Meeting

At the recent meeting of the Executive Committee of the National Conservation Congress in Washington, it was decided that the next session of the Congress should be held in New Orleans the first week in April. The subject will be "Floods and Drainage."

### Aiding Wood Users

Five hundred individuals and firms now appear upon the revised list of correspondents in the Wood Utilization Service of The New York State College of Forestry. The Service is proving of great value in the disposal of wood waste, small tracts of stumpage and various other forest products. A monthly bulletin is sent out listing items available for purchase or exchange and requests for logs, short lengths, saw-dust, shavings, etc.

Your interest in the advertising pages cannot be expressed by responsiveness. You should give the advertising department credit of selecting only those with whom it is a wholesome pleasure to do business.

## FOREST TREE SEEDLINGS

AND

## ORNAMENTAL SHRUBS

We offer for spring 1917 our usual line of Forest tree seedlings and Ornamental Shrubs, Cuttings, etc.

Write for spring trade list.

## Forest Nursery Company

McMINNVILLE

TENNESSEE

## Use Press Clippings

It will more than pay you to secure our extensive service, covering all subjects, such as Polo, Golf, Tennis, trade and personal, and receive the benefit of the best and most systematic reading of all papers and periodicals, here and abroad, at minimum cost. Why miss taking advantage for obtaining the best possible service in your line?

Our service is taken by all progressive business men, publishers, authors, collectors, etc., and is the card index for securing what you want and need, as every article of interest is at your daily command.

Write for terms; or send your order for 100 clippings at \$5, or 1,000 clippings at \$35. Special rates quoted on Large Orders.

**The Manhattan Press Clipping Bureau**  
ARTHUR CASSOT, Proprietor Established 1888

6 East 41st Street, NEW YORK  
Send for Our Desk Colendor

Did it ever occur to you how much the advertising section affects you? It certainly makes possible better publications and increased revenue from a successful advertising department of American Forestry will pay you dividends in a better magazine and a more efficient association. Please mention American Forestry in answering advertisements.

## TIMBER CRUISING BOOKLETS

Biltmore Timber Tables. Including solution of problems in forest finance.

Southern Timber Tables. How to estimate Southern Pine, Southern White Cedar, and Southern Appalachian Timber—Spruce pulpwood, Hemlock bark, Chestnut oak bark, Chestnut tannic acid wood.

Postpaid, 25 cents each

### HOWARD R. KRINBILL

Forest Engineer Newbern, N. C.

Ask for 1917 booklet, "Some Reasons Why."

## High Income Return on Non-Fluctuating Investment

Invest your dividends in 1st Lien Mortgages; collateral value and interest return, 7 per cent. or 8 per cent. always known. Miller's close-in Miami Mortgages are not subject to stock market or international surges, and they are as closely safeguarded as guaranteed mortgages. Millions invested here by America's most prominent men. *Some Reasons Why, free.*

G. F. Miller & Co., Trust Co. Bldg., Miami, Florida

Each member of American Forestry Association can help in obtaining certain logical advertising. Just remember that you own American Forestry—it is your magazine. Without your earnest cooperation the advertising department cannot accomplish a great deal. Any suggestions will be appreciated.

# ATTENTION FORESTERS

AMERICAN FORESTRY will print, free of charge in this column, advertisements of foresters wanting positions, or of persons having employment to offer foresters

**WANTED**—Work during the summer by a young man starting to study forestry. Would accept place of any kind where practical experience could be obtained. Free June 15. Best of references. Address W. W. J. care of AMERICAN FORESTRY, Washington, D. C.

**POSITION**—Young man (33), single, seven and a half years' technical training. Will consider position as City Forester, Park Superintendent, Superintendent of Private Estate or Consulting Landscape Architect for railroad. Education consists of post-graduate work in prominent middle-western school of forestry, supplemented by several years' post-graduate work in recognized school of landscape design in the East. Experienced in public and private forestry, including work in the Forest Service, the various phases of municipal forestry such as extension work, and tree surgery; and also the designing of parks, playgrounds, and private estates. References given and required. Address XYZ, care of AMERICAN FORESTRY.

**PRACTICAL FOREST ENGINEER** desires position. Six years experience. Timber estimates, Reports and Cruises, Logging and Topographic Maps, Logging Railroads, Lumbering, Steam and Horse skidding. Address Box 40, care of AMERICAN FORESTRY, Washington, D. C. (2-4)

**WORK** for summer wanted by a young man about to study forestry, who wants practical experience in the woods. Be able to begin work last of June. High School graduate. References if needed. Address Box 39, care of AMERICAN FORESTRY. (2-4)

**PRACTICAL WOODSMAN AND FOREST ENGINEER** with thorough experience this country and Europe will take charge of forested estate or game preserve. An expert in managing and improving woodlands, and can show results. Highest references as to character, training and ability. Address Woods Superintendent, care AMERICAN FORESTRY MAGAZINE, Washington, D. C.

**YOUNG man** (28), single, technical education, five years' general engineering experience, as instrument man and computer, on surveys, and as inspector and superintendent on construction. Also field and office experience with U. S. Forest Service. Capable of taking charge of party; desires position with forester or lumber firm. Address Box 32, care of AMERICAN FORESTRY, Washington, D. C.

**MARRIED MAN**, (28), desires position as manager of estate, woodland preferred, but no objection to more or less farming. Graduate of agricultural college and Master of Forestry. Best references as to ability and character. Address Box 41, care of AMERICAN FORESTRY. (2-4)

**WANTED**—Work during the spring and summer by a young man starting to study forestry. Best of references. Box 37, care of AMERICAN FORESTRY. (1-3)

**POSITION WANTED**—Young man with five years' experience in orchard work, tree surgery and agricultural blasting. Some technical education. Opportunity to prove ability of more concern than remuneration. Will go anywhere any time. Box 38, care of AMERICAN FORESTRY, Washington, D. C. (1-3)

A **YOUNG MAN** who has been the head of a successful arboricultural and orchard rejuvenating concern for three years, desires to associate with an individual or a company owning orchards. The reason is to obtain a more thorough knowledge of the work and the salary is a secondary consideration. An able business man. Age 26. Address Box 29, care of AMERICAN FORESTRY, Washington, D. C.

# TIMBER FOR SALE

12,000 ACRES HARDWOOD TIMBER AND LAND

Northeast Louisiana, about 7,000 feet mixed hardwoods to acre. Fine land; solid body; 3 miles of railroad. Price \$17.50 per acre, easy terms. Address Box 300, care of AMERICAN FORESTRY, Washington, D. C.

# BOOKS ON FORESTRY

AMERICAN FORESTRY will publish each month, for the benefit of those who wish books on forestry, a list of titles, authors and prices of such books. These may be ordered through the American Forestry Association, Washington, D. C. Prices are by mail or express prepaid.\* :: :: :: ::

AMERICAN BOYS' BOOK OF BUGS, BUTTERFLIES AND BEETLES.....	\$2.00
FOREST VALUATION—Filibert Roth.....	1.50
FOREST REGULATION—Filibert Roth.....	2.00
PRACTICAL TREE REPAIR—By Elbert Peets.....	2.00
THE LUMBER INDUSTRY—By R. S. Kellogg.....	1.10
LUMBER MANUFACTURING ACCOUNTS—By Arthur F. Jones.....	2.10
FOREST VALUATION—By H. H. Chapman.....	2.00
CHINESE FOREST TREES AND TIMBER SUPPLY—By Norman Shaw.....	2.50
TREES, SHRUBS, VINES AND HERBACEOUS PERENNIALS—By John Kirkegaard.....	1.50
TREES AND SHRUBS—By Charles Sprague Sargent—Vols. I and II, 4 Parts to a Volume—per Part.....	5.00
THE TRAINING OF A FORESTER—Gifford Pinchot.....	1.35
LUMBER AND ITS USES—R. S. Kellogg.....	1.15
THE CARE OF TREES IN LAWN, STREET AND PARK—B. E. Fernow.....	2.17
NORTH AMERICAN TREES—N. L. Britton.....	7.30
KEY TO THE TREES—Collins and Preston.....	1.50
THE FARM WOODLOT—E. G. Cheyney and J. P. Wentling.....	1.70
AMERICAN FOREST TREES—Henry H. Gibson.....	6.00
IDENTIFICATION OF THE ECONOMIC WOODS OF THE UNITED STATES—Samuel J. Record.....	1.25
PLANE SURVEYING—John C. Tracy.....	3.00
FOREST MENSURATION—Henry Solon Graves.....	4.00
THE ECONOMICS OF FORESTRY—B. E. Fernow.....	1.61
FIRST BOOK OF FORESTRY—Filibert Roth.....	1.10
PRACTICAL FORESTRY—A. S. Fuller.....	1.50
PRINCIPLES OF AMERICAN FORESTRY—Samuel B. Green.....	1.50
SEASIDE PLANTING OF TREES AND SHRUBS—Alfred Gaut.....	1.75
FAMILIAR TREES—G. S. Boulger.....	1.50
MANUAL OF THE TREES OF NORTH AMERICA (exclusive of Mexico)—Charles Sprague Sargent.....	6.00
AMERICAN WOODS—Romeyn B. Hough, 13 Volumes, per Volume.....	5.00
HANDBOOK OF THE TREES OF THE NORTHERN U. S. AND CANADA, EAST OF THE ROCKY MOUNTAINS—Romeyn B. Hough.....	6.00
GETTING ACQUAINTED WITH THE TREES—J. Horace McFarland.....	1.75
PRINCIPAL SPECIES OF WOOD: THEIR CHARACTERISTIC PROPERTIES—Charles Henry Snow.....	3.50
NORTH AMERICAN FORESTS AND FORESTRY—E. R. Bruncken.....	2.00
HANDBOOK OF TIMBER PRESERVATION—Samuel M. Rowe.....	4.00
TREES OF NEW ENGLAND—L. L. Dame and Henry Brooks.....	1.50
TREES, SHRUBS AND VINES OF THE NORTHEASTERN UNITED STATES—H. E. Parkhurst.....	1.50
TREES—H. Marshall Ward.....	1.50
OUR NATIONAL PARKS—John Muir.....	1.91
THE LONGLEAF PINE IN VIRGIN FOREST—G. Frederick Schwarz.....	.75
LOGGING—Ralph C. Bryant.....	3.50
THE IMPORTANT TIMBER TREES OF THE UNITED STATES—S. B. Elliott.....	2.50
FORESTRY IN NEW ENGLAND—Ralph C. Hawley and Austin F. Hawes.....	3.50
THE PRINCIPLES OF HANDLING WOODLANDS—Henry Solon Graves.....	1.50
SHADE TREES IN TOWNS AND CITIES—William Solotaroff.....	3.00
THE TREE GUIDE—By Julia Ellen Rogers.....	1.00
FOREST PHYSIOGRAPHY—By Isaiah Bowman.....	5.00
MANUAL FOR NORTHERN WOODSMEN—Austin Cary.....	2.12
FARM FORESTRY—Alfred Akerman.....	.57
THE THEORY AND PRACTICE OF WORKING PLANS (in forest organization)—A. B. Recknagel.....	2.10
ELEMENTS OF FORESTRY—F. F. Moon and N. C. Brown.....	2.20
MECHANICAL PROPERTIES OF WOOD—Samuel J. Record.....	1.75
STUDIES OF TREES—J. J. Levison.....	1.75
TREE PRUNING—A. Des Cars.....	.65
THE PRESERVATION OF STRUCTURAL TIMBER—Howard F. Weiss.....	3.00
THE PRACTICAL LUMBERMAN—By Bernard Brereton (third edition).....	1.50
SEEDING AND PLANTING IN THE PRACTICE OF FORESTRY—By James W. Toumcy, M.S., M.A.....	3.50
FUTURE FOREST TREES—By Dr. Harold Unwin.....	2.25
FIELD BOOK OF AMERICAN TREES AND SHRUBS—F. Schuyler Mathews.....	2.00
(In full leather).....	2.50
FARM FORESTRY—By John Arden Ferguson.....	1.30
LUTHER BURBANK—HIS METHODS AND DISCOVERIES AND THEIR PRACTICAL APPLICATION.....	48.00
(In twelve volumes, beautifully illustrated in color)	
THE BOOK OF FORESTRY—By Frederick F. Moon.....	2.10
OUR FIELD AND FOREST TREES—By Maud Going.....	1.50
HANDBOOK FOR RANGERS AND WOODSMEN—By Jay L. B. Taylor.....	2.50
THE STORY OF THE FOREST—By J. Gordon Dorrance.....	.65

\* This, of course, is not a complete list, but we shall be glad to add to it any books on forestry or related subjects upon request.—EDITOR.

“QUALITY”

LONG AND SHORT LEAF YELLOW PINE  
**MISSOURI LUMBER & LAND**  
 EXCHANGE COMPANY

R. A. LONG BUILDING

KANSAS CITY, MO.

THE SAME

“TODAY AND TOMORROW”

“Besides the usual Greetings, let us wish our friends, our customers, greater margins of profit and bigger “turnovers” for 1917 than any year yet.”

# American Forestry



An Illustrated Magazine about Forestry and Kindred Subjects Published Each Month by the American Forestry Association

DEPARTMENT OF FORESTRY

Washington, D.C.

MAR 2 1917



Railroad trestles and coal-storage pockets constructed of creosoted timbers on concrete foundation.

## Creosoted Wood is Permanent

**T**HIS fact is recognized in the structure illustrated above.

Modern engineering practise demands durability and employs such materials as meet this requirement.

Unless wood is *protected* against decay it is *not* permanent when exposed to conditions favorable to the development of wood-destroying agencies.

Creosoted wood for structural purposes is equally as serviceable as concrete and more economical than steel.

The Open-Tank System is adaptable to all conditions; the treat-

ment is economical, and the results are such as to offer an efficient protection against decay of all timber structures which are not exposed to severe mechanical abrasion when in service.



Under certain conditions the Brush Treatment alone is available or desirable, especially where the chief requirement is to re-

tard decay at all points of contact. This method has proved effective and is to be recommended.

CARBOSOTA Grade-One Creosote Oil is a pure coal-tar creosote especially refined for the Brush and Open-Tank Methods of treatment. It is the *standard* and generally recognized as such.

Write for our special booklet, "Long Life for Wood at Low Cost."

The *Barrett* Company

New York  
Detroit

Chicago  
Birmingham

Philadelphia  
Kansas City

Boston  
Minneapolis

St. Louis  
Nashville

Cleveland  
Salt Lake City

Cincinnati  
Seattle

Pittsburgh  
Peoria

THE PATERSON MANUFACTURING COMPANY, Limited:  
St. John, N. B.

Montreal  
Halifax, N. S.

Toronto

Winnipeg  
Sydney, N. S.

Vancouver

# AMERICAN FORESTRY

THE MAGAZINE OF THE AMERICAN FORESTRY ASSOCIATION

PERCIVAL SHELDON RIDSDALE, Editor

### EDITORIAL ADVISORY BOARD

HERMAN H. CHAPMAN  
ERNEST A. STERLING

S. T. DANA  
FREDERICK S. UNDERHILL

JOHN E. RHODES  
S. N. SPRING

MARCH 1917 VOL. 23

## CONTENTS

No. 279

Recreational Uses of the National Forests—By Henry S. Graves. 133 With eight illustrations.	Forestry for Boys and Girls—The Wind and the Trees—By Bristow Adams..... 166
Conservation of Game in the National Forests and National Parks—By E. W. Nelson..... 139 With ten illustrations.	\$300,000 for Pine Blister Disease, an Effective Quarantine Law 168
Sycamore or Buttonwood Tree Flower—By Dr. R. W. Shufeldt 146 With one illustration.	A Feathered Dog in the Manger—By Lewis E. Theiss..... 168
Save Us from Invading Pests—By J. G. Sanders..... 147 With nineteen illustrations.	Collecting Tree and Flower Specimens—Dr. R. W. Shufeldt.... 169 With one illustration.
Birds and the Camera—By A. A. Allen ..... 154 With six illustrations.	National Forests Given Permanence. .... 170
The Slash Pine—By Wilbur R. Mattoon..... 158 With seven illustrations.	That Tent in the Tree ..... 171 With two illustrations.
One of the Undreamt-of Things—By Lewis E. Theiss..... 160	India's Forest Management..... 172
Michigan in the Pine Blister Fight. .... 160	Lowest Forest Fire Loss..... 172
Early Spring and Summer Flowers—By Dr. R. W. Shufeldt... 161 With seven illustrations.	Planting Suggestions for April—By J. J. Levison ..... 173
Forest Road under Federal Aid Act ... 165	Editorial ..... 176 Efficiency and Economy in Oregon. Increasing the Grazing Fees on National Forests.
Boy Scouts Battle Moths ..... 165	Book Reviews..... 178
Maples—Poem by Richard Butler Glaenzer. .... 165	Canadian Department—By Ellwood Wilson ..... 180
	Four Colonial Houses—By Rawson Woodman Haddon..... 181 With six illustrations.
	Current Literature ..... 185

## SPECIAL OFFER TO MEMBERS ONLY

One of the following described books will be presented free of charge to any member of the American Forestry Association who secures ONE NEW subscribing member:

- No. 1—Field Book of American Trees and Shrubs, 465 pages, 275 illustrations of trees, leaves, blossoms, fruits, seeds, area of growth, etc.
- No. 2—Field Book of Wild Birds and Their Music, 262 pages, 38 colored and 15 other full-page illustrations.
- No. 3—Field Book of American Wild Flowers, 587 pages, 24 colored plates and 215 full-page illustrations.

### FILL OUT THIS BLANK

I present for Subscribing Membership in the American Forestry Association, including American Forestry Magazine, and enclose \$3.00 for the 1917 fee—

Name.....

Address.....City.....

Send Book No.  to Name.....

Address.....City.....

\$2.00 of above fee is for American Forestry for One Year.

AMERICAN FORESTRY is published monthly by the American Forestry Association.

Subscription price without membership, three dollars per year; single copies, twenty-five cents.

Entered as second-class mail matter December 24, 1909, at the Post-office at Washington, under the Act of March 3, 1879

Copyright, 1917, by the American Forestry Association

# REAL ESTATE

FORESTS ∴ ESTATES ∴ PRESERVES  
TIMBER LANDS ∴ FARMS ∴ CAMPS ∴ ETC.



RED OAK

## SOUTH CAROLINA TIMBER

Timber on a South Carolina plantation or entire plantation, on the Great Pee Dee River in Marlboro County. Now occupied and under cultivation. Dwelling house occupied by owner. Several new small houses rented to colored help, barn, small saw mill. 1,140 acres cleared. 3,200 acres timbered; 1,250 acres fine large old growth timber, 700 acres large second growth timber over 50 years old; balance mostly thrifty, large second growth timber. Growth of Gum Pine, etc., very rapid. Many very large White and Red Oaks, Yellow Pine, Cypress, Sycamore, Cottonwood, Holly, etc., as shown in accompanying photograph.

A careful estimate shows the following:

BOARD FEET	VARIETY
6,770,000	Sweet Gum
3,520,000	Yellow Pine
1,680,000	Red Oak
1,560,000	White Oak
1,000,000	White Ash
790,000	Hickory
680,000	Sycamore
670,000	Maple
560,000	Elm
460,000	Cottonwood
390,000	Black Gum
390,000	Cypress
100,000	Holly
60,000	Birch
30,000	Willow
250,000	Other species
18,910,000	Total

DESCRIPTION OF THIS AND MANY OTHER TIMBER PROPERTIES FOR SALE MAY BE OBTAINED ON APPLICATION TO

**DONALD E. LAUDERBURN**  
154 FIFTH AVENUE NEW YORK CITY

## PENNSYLVANIA HEMLOCK

Like Father used to peel. The finest body of hemlock in Pennsylvania that may still be bought by operating companies. 700 acres. 10 million feet. Ideal logging conditions. Two trunk line railroads distant 12 miles over a good road down hill. In Susquehanna county.

PAUL P. LYON BRADFORD, PA.

## GREAT HARDWOOD TIMBER TRACT

Thirty thousand acres with over three hundred million feet of timber in Eastern Tennessee. Cheap. Also pine tracts in North and South Carolina. For information, address

W. D. HARRELL ROSE HILL, N. C.

## 100,000 OAK TREES

14" to 40". 71,000 Poplar, White Pine, Hemlock, Chestnut and Yellow Pine 14" to 48" for sale at \$3.50 per tree, tan bark reserved. Principals only please answer.

A. R. THOMPSON  
330 Williamson Bldg. CLEVELAND, OHIO

## One of Westchester County's Most Productive Suburban Farms

### 300 ACRES IN HIGH STATE OF CULTIVATION

On State Road, one and one half hours by motor from New York City, few miles from well-known Hudson River town, in a very desirable section where quality of soil caused two leading Agricultural Schools to locate.

### UNEQUALLED FOR COUNTRY ESTATE

as there are two splendid sites for residence, both with superb views. Extensive farm buildings of most modern type, all completely equipped. Farmer's cottages, dairy plant, cattle range, etc. A small fortune has been spent on this property in order to bring it up to its present fine state.

### BARGAIN PRICE OF \$300 PER ACRE

now asked by the owner is less than half its value. Full details from

### KENNETH IVES & CO., Real Estate Brokers

7 East 42nd Street

Tel. Murray Hill, 6037

New York City

## WOOD WORKING SHOP AND SAW MILL AND PLANING MILL

at Vergennes, Vt., located on a drivable stream. Good shipping facilities by rail or water. Purchase of plant carries with it contract for sawing logs which will run for two years.

**DONALD E. LAUDERBURN**  
154 Fifth Avenue New York City

## VIRGIN YELLOW PINE TIMBER LAND FOR SALE

36,000 acres Arkansas shortleaf yellow pine timber and land, near Iron Mountain Railroad. Will sell all or part. Liberal terms to operators. For particulars address the owners.

THE GRAHAM LUMBER CO.,  
614 Wright Bldg., St. Louis, Mo.

## LONG ISLAND, NORTH SHORE

A high-class country estate in Smithtown Section. 250 acres of land—orchards, fields, meadow, woodland, modern house, fine view, etc. Large fine trees to water's edge. Will sell whole or part. Inquire of

J. R. E., care FIELD  
2 West 45th Street NEW YORK CITY

LONG ISLAND  
REAL ESTATE

## WARD & WARD

22 Exchange Place, NEW YORK CITY

ESTATES, SHORE FRONTS  
FARMS AND PRESERVES



ROBINS ISLAND IS A 500-ACRE PRESERVE NOW OWNED BY A CLUB. THIS IS ONLY ONE OF MANY PROPERTIES THAT ARE AVAILABLE NOW. OUR FACILITIES COVER EVERY KIND OF PROPERTY FOR SALE OR RENT IN EVERY PART OF LONG ISLAND.

FORESTS ∴ ESTATES ∴ PRESERVES  
 TIMBER LANDS ∴ FARMS ∴ CAMPS ∴ ETC.

# REAL ESTATE

## VERMONT TIMBERLAND

3,330 acres containing 7½ million feet Hardwoods, over 2 million feet Spruce, 250 thousand feet Hemlock, also saw mill, 8 miles from railroad, as much more additional timber available.

DONALD E. LAUDERBURN

154 Fifth Avenue NEW YORK

## CAMPS

ST. REGIS LAKES,  
 THE SARANACS,  
 LAKE PLACID,

RAQUETTE, LOON, and LONG LAKES

Consult

## DURYEE & CO.

ADIRONDACK REAL ESTATE BROKERS  
 SARANAC LAKE, NEW YORK

## MURRAY BAY, CANADA

Cottages and Camps for sale or for rent this season. For information on all properties write to

M. G. TOWNSEND

Tel. 2977 Mur. Hill, 297 Lexington Ave., NEW YORK

## PENNSYLVANIA TIMBER TRACT

FOR SALE—3500 acres in Bedford and Huntingdon Counties, in fee reserving mineral rights, average haul to railroad 2 miles or less, all down hill, 20 million feet Oak, Chestnut, Pine, Locust, Poplar, Maple, 15 miles from market for mine props and ties.

DONALD E. LAUDERBURN

154 Fifth Ave., NEW YORK

## ROCKAWAY VALLEY FARMS

Is in Northern New Jersey, only 30 miles or 65 minutes from upper or downtown New York. There is a wholesome community up in the mountains with every living convenience. Here a few acres may be bought at a reasonable price for an accessible, healthful home in the real country, with every natural advantage and every facility for country sport. One house with 5 master rooms may be rented for August and September. All particulars from

B. F. LITTELL

Boonton, R. F. D. No. 1 NEW JERSEY

## WHITE MOUNTAINS, N. H.

Elevation 1000 Feet

For Sale or Lease—An ideal summer home at the base of Mount Washington, midway between Poland Springs and Bretton Woods. 2000 feet frontage on State road enclosed by stone wall. House has 14 rooms, modern improvements, house and keepers' lodge furnished complete; garage and stable combined, 40x110 ft.; cattle barn, 38 x 110 ft.; laundry; work-shop has large open fire-place; lodge; plant-house; ice-house and wood-house filled for season's use; abundance mountain spring water, absolutely pure, supplied to buildings by gravity. Fine rich lawn with fountain in centre. A 1200-acre game preserve will be included if desired.

William H. Mills

7 East 42nd Street, New York



I OWN several well-timbered farms in the White Mountain region of New Hampshire commanding very beautiful views of lake and mountain and ideally situated for summer homes or fish and game preserves. I bought these primarily because of their scenic and timber values and to save them from ruthless denudation by portable saw mill operators. Most of them have trout brooks and some lake area within their boundaries. I will sell, to parties who wish to follow practical forestry methods in handling the timber growth, at prices representing but little more than the actual value of the standing timber. Most of them are located where large additional areas of growing timber can be secured at low cost. Also a forest tract of about 7,000 acres carrying 50 million feet of Birch, Maple, Beech, Ash and Poplar and 12 to 15 million feet of Spruce. Five small lakes and about three miles of shore on a large lake. Near railroad but secluded. No finer property in the East for fish and game club or forest preserve.

*For particulars address*

## E. BERTRAM PIKE

PIKE, NEW HAMPSHIRE





## *“He Found a Million Feet”*

*in the tract he bought from you which he didn't know he was getting and you didn't know you had. This million feet was neither a gift nor a purchase. It did not figure in the price. It was a find—for him. But you?*

## *You Lost a Million Feet*

*or maybe vice versa. Perhaps you sold him a million feet which you thought you had but which he didn't get, in which case*

## *He Lost a Million Feet*

*No matter which way the cat may jump, the truth is that in a sound commercial transaction running into six or seven figures there ought not to be any “cat.”*

*If the 37 years' experience of James D. Lacey & Company had been consulted the transaction might have been based on a LACEY REPORT, internationally recognized as the standard of timber values. Satisfaction and certainty would have resulted.*

*May we send you our Booklet, “Pointers”?*



CHICAGO  
1750 McCormick Bldg.

SEATTLE  
626 Henry Bldg.

NEW ORLEANS  
1213 Whitney-Central Bldg.

# AMERICAN FORESTRY

VOL. XXIII

MARCH 1917

NO. 279

## RECREATIONAL USES OF THE NATIONAL FORESTS

BY HENRY S. GRAVES,  
CHIEF FORESTER, U. S. DEPARTMENT OF AGRICULTURE

ONE of the important public interests in forest regions is their service for recreation and health. There is a rapidly increasing appreciation of the exceptional recreation resources which we have in this country and which our own people are just beginning to seek out and enjoy. There is also a growing appreciation that, like forestry, these resources will not be safeguarded and rightly developed in the public interests unless the public itself participates in their handling. In the past the wild lands of our upland and mountain regions have been more or less open for camping and hunting. Vast areas have been cut and burned off and their special attractiveness destroyed. As the timber stands become restricted greater care is exercised by the owners in their general use. Many owners fear to have campers on the lands because of the increased danger from fire. Some wish to hold the property exclusively for their own use. Others lease their lands to hunting and fishing clubs. The closing of private tracts is therefore constantly contracting the areas available for public use. How common it is for parties to find spots, where formerly they stopped to camp over night, posted with "Private Land—Keep off." More and more large private preserves are posted with "No Trespass" signs, or the camper is met by a warden who requests him to move on. Local resentment in mountain countries at the closing of one large tract after another to the camping and hunting by the public is not wholly lawless. It is hard to see a few privileged persons control the mountains where formerly free access for recreation was allowed. There is the feeling on the part of the men

who have guided, fished and hunted over these areas that they ought to belong to the whole people in common. And they are right, and if I am not mistaken a large part of these mountain lands will ultimately be publicly owned or controlled. The closing of private lands points to the value of publicly owned forest lands, where people living in urban communities and hot agricultural regions can find an opportunity for the refreshment and recreation that can be secured by a sojourn in the forest. More and more, therefore, the lands owned by the nation, the states, and local communities will have an importance as public playgrounds.

These facts apply with special significance to the National Forests. Located as they are chiefly in the mountain regions, the National Forests comprise many regions of superb scenery and unexcelled recreation attractions. It is not only to the noted mountain sections that I refer, as in the Olympic Mountains, the Cascades, Sierras, the Rocky Mountains, or here in the east in the White Mountains and Southern Appalachians. I have in mind also the lakes, both the larger ones like Chelan, Tahoe, Pend Oreille,

Cœur d'Alene, and the innumerable smaller lakes, the streams abounding in fish, the deep forests, the canyons, superb mesas, and other features that in infinite variety and interest occur throughout these forest regions.

The problem of the recreational use and enjoyment of the public forests is not as some think one of mere sentiment. Of course there is sentiment in the enjoyment of fine scenery, in camping, in sport. Indeed, I feel sorry for the man who has no sentiment about the moun-



ONE OF MANY WONDERS

There are hundreds and hundreds of scenic features in the National Forests. This, the Wheeler National Monument in the Rio Grande National Forest, Colorado, is one of them.

tains and their forest scenery. Neither is it a question of protecting the forests and scenic wonders for a few wealthy persons who can afford to take long trips on the railroad, buy expensive pack outfits, and so on. We have a very practical problem of opening up and making available the public properties for as wide a use as possible by people of little means as well as by those better-to-do.

The possibilities of public benefits of the recreational use of the National Forests and Parks was never better illustrated than during the past summer in Colorado. It was a time of great heat in the agricultural regions of the Plains States. Nearly seven hundred thousand people visited the National Forests of Colorado alone. Trains were crowded and hotels filled to overflowing. But thousands came in their automobiles or other conveyances, from the cities and farms, equipped with tents and cooking outfits, and camped in the Forests a day or two here and there, or often for a longer sojourn near a stream, a lake, mountain meadow, or other attractive spot.

The immediate service of the public forests for recreation is just as conspicuous in other portions of the National Forests. It is a regular thing for the people living in the valleys of California and southern Oregon and elsewhere to take during the hot summer frequent camping trips in the mountains, sometimes for a few days, sometimes for several weeks. Throughout the National Forests are found thousands of such campers, a large majority of whom are local residents from

the valleys below, seeking refreshment from the heat. Some of the Forests already are visited by no less than fifteen to twenty thousand people each year; and I estimate that there are at least one and a half million persons who use the Forests in a single year, chiefly for recreation purposes.

In a very real sense the recreation attractions of the

National Forests constitute a natural resource that must be safeguarded, utilized, and developed. It is a resource of great economic importance to the local communities. By its development every citizen in the locality benefits directly or indirectly. It is not only through the added business in furnishing accommodations, supplies, transportation, and so on, to the tourists, but many persons become regular visitors, often building summer homes and becoming permanently identified with the region. In a multitude of ways the local industries are stimulated.

The recreation features of the National Forests are fostered in a variety of ways. First, by protection from defacement of those sections of special value and interest from a scenic and

recreation standpoint. Systematically such areas, both large and small, are being searched out and designated so that the cutting of timber and other uses may not result in their injury. Such areas include mountain peaks, lakes, canyons of special interest, high mesas, roadways, and so on. In effect these constitute a multitude of parks and parkways within the Forests, to be used especially for recreation purposes.



A SUMMER CAMP IN A CALIFORNIA NATIONAL FOREST

It is a regular thing for the people living in the valleys of California and southern Oregon to take, during the hot summer, frequent camping trips in the National Forests. Some of the Forests are visited by no less than fifteen or twenty thousand people each year.



ON A PACK TRIP IN THE FOREST

These tourists were among the 700,000 who visited the National Forests of Colorado during the summer of 1916. Trains and hotels were overcrowded and thousands traveled in their automobiles, or in wagons or, like these campers in the Uncompahgre National Forest, with pack horses.



BEAUTIFUL VIEW FROM SECTION OF NEW ROAD IN THE ROUTT NATIONAL FOREST

A view from the Rabbit Ears Pass road in the Routt National Forest, built by the Forest Service as part of the road system by which the National Forests are being opened up to pleasure seekers. It is estimated that about one and a half million people used the National Forests last year for recreation purposes.

But protection is only the beginning. The areas must be opened up and made available for use by the public. A few examples will illustrate some of our problems and how we are working them out.

In southern California, lying directly west of the Imperial Valley, rise the Laguna Mountains in the Cleveland National Forest. Those of you who have visited the Imperial Valley know something of the intolerable heat in the summer, situated as it is below the sea level. At times the temperature is said to remain above 110 degrees for eight or ten days and nights at a time. Thousands of people leave the valley in summer. In fact, it is estimated that the aggregate cost of these summer flights amounts for those communities to from one to three million dollars. We are now building a road from the main El Centro-San Diego highway into the mountains, to a very beautiful tract of forest situated at 6000 feet elevation. This road will enable people of the Valley to reach the forest tract in a few hours by automobile. The tract will be developed, in cooperation with the citizens, as a resort, with hotels, summer cottages, tents, and public camping grounds. Many hundreds can be accommodated who now have to travel long distances by rail to secure relief from the heat. It is a real problem of public health. It is also a matter of saving many thousands of dollars to the Valley people. Can any one say that from every standpoint that forest tract is not more valuable for recreation use than to cut into lumber?

A similar situation exists in the Coronado National Forest near Tucson, Arizona. Here the Santa Catalina Mountains rise some 5300 feet above Tucson on the desert, and are clothed with a splendid stand of timber, furnishing a cool and refreshing summer climate. Here the Forest Service has worked out a complete plan of public resort development, including a system of roads and trails, a water supply, sanitary provisions, a telephone system, playgrounds, and park areas for motors. The value of this resort, when completed, to the city of Tucson with its 20,000 or more inhabitants will be appreciated when one considers that during the summer months there is a difference of over 20 degrees in temperature of the mountains as compared to that in the city immediately below. Well-to-do people regularly flock to the California coast at this time; a means for recreation will, by the proposed plan, be afforded to all, and it is expected that 5000 or more would avail themselves of the advantage at the first opportunity.

Still another illustration is the development of the Angeles Forest that comprises the mountain ranges back of Los Angeles. Each year many thousand people visit this Forest for short trips or a night's camping. In addition there are being developed scores of summer communities and permanent camps. The canyons are lined with cottages and camps, and the highland forest areas are attracting people by scores for temporary and permanent summer accommodations. Every new road and

trail built by the Forest Service opens up new recreation sites, which are eagerly sought. It is in this Forest that the city government of Los Angeles, through its Playground Commission, has developed a municipal playground. After a diligent but vain search in the mountains and at the beaches for a suitable place nearer the city, the Commission asked for the setting apart of a suitable tract called the Seeley Flats. The purpose of the Commission was for the use of the public as a camping and recreation ground for the children of the city, and for other patrons of the municipal playgrounds. The following results were attained during the first year.

Four hundred and twenty-seven children were accommodated on the camping grounds, each one for a period of two weeks. The Commission estimates that next year this number will be from 1200 to 1500.

The charge for each person taken was \$7.50, which included a trip from Los Angeles by electric car for 61 miles, followed by an auto stage ride of 15 miles to the camp, board for two weeks at the camp, and the use of a tent and cot during the stay, with return to Los Angeles by the same route.

After the opening of the schools, the tract was open to the parents of the children on similar terms.

About \$800 was donated to the Commission by various people with which to defray the expenses of such children as did not have the necessary \$7.50.

During the past summer the Commission expended, exclusive of salaries, \$4552 on this playground, providing, among other things, a large outdoor plunge, a building, and a water system. Telephone connection was also maintained with the city. The plans approved for the coming season are quite elaborate; 25 cabins will be constructed during the spring months, a cement plunge will be built, a substantial building with kitchen, storeroom, and bedrooms will be constructed, and tennis and croquet courts will be laid out.

The Playground Commissioners have provided three instructors to teach the children all kinds of outdoor games and sports. Two or three evenings each week some prominent man from Los Angeles gives the children a "camp-fire talk." Each morning every boy camper donates an

hour's service for cleaning up the camp and improving the grounds: in fact, everything indicates that most careful arrangements had been made for giving the city children an opportunity for recreation and the enjoyment of nature in the mountains.

A persistent effort had been made by one person to secure control of the tract under the allegation that it was chiefly valuable for farming. It would have been very profitable for him, as a real estate venture, to sell lots, for there is an active demand for such sites for summer camps. But the Secretary of Agriculture chose to put it to a public use, with the results I have described.

The action of the Playground Commission of Los Angeles has resulted in the starting of other camps of a similar nature. The Pacific Electric Railway, with 5000 employees, has applied for a tract about two miles distant where it proposes to build tent houses, dining-rooms and a store, and will rent these facilities to its employees at cost. The Masonic Lodge is looking for a site for its orphans.

Many cities are spending thousands of dollars for welfare work among children, but are hard put to find adequate playgrounds. The problem has been met in large measure by the Playground Commission of the city of Fresno, Califor-

nia. This Commission has recently been granted the use of a site of land near Huntington Lake in the Sierra National Forest, and proposes to transport annually 5000 children of the city to this National Forest during the heated months. The children will not only enjoy a unique outing, but, according to the plans of the Commission, will be given instruction in outdoor subjects.

In many cases the development of recreation areas becomes a coöperative enterprise by various public agencies. A conspicuous example is the Columbia Gorge division of the Oregon National Forest. This is located on the Columbia River and borders at many points the Columbia River Highway, which is one of the most famous drives in the world and one of the most attractive scenic features of the West. Certain areas have been permanently set aside in the Forest for protection and development in connection with the Columbia River Highway. The Forest Service has constructed a number of scenic trails like



THIS SHOULD BE FREE TO ALL

The sign on the left-hand wall of the canyon marks a cave on patented land in the Pike National Forest. The public pays twenty-five cents to see it. If it were on Government land the public would pay nothing.

that up to Larch Mountain and up Eagle Creek, and is developing public camping grounds at strategic points. In planning and carrying out this work we have the co-operation of county officials and the citizens of Portland, who are in some cases giving financial aid to various of the projects. The plans are correlated with those of the city and county in the entire Park and parkway enterprise.

A similar plan is being worked out in Denver in connection with development of the Mount Evans region, and with other communities which have direct interests in and adjacent to the Forests.

In the eastern mountains, too, we are fostering the recreational use of the National Forests. For many years the public regarded with increasing interest the efforts of Mr. George W. Vanderbilt to inaugurate a system of forest protection and conservation on Pisgah Forest in North Carolina, and not only that but to protect the natural game resources and to systematically increase them. Mr. Vanderbilt went beyond this. He constructed many miles of highway through the mountains and more than a hundred miles of first-class trails. After 20 years of this sort of care and development, Pisgah Forest passed to the Government and now is the Pisgah National Forest. Already it has been created a national game preserve in addition to being

a National Forest, and definite plans are being carried out to maintain the great beauty of the mountain landscape, to develop the land to highest timber productiveness, and to further increase the fish and game resources. Under a plan of coöperation between the Biological Sur-

vey, the city of Asheville, and Buncombe County in which it is situated, the American Bison Society, and others, a plan is being worked out by which the elk and buffalo will be re-established on this Forest in large enclosures. It will be the purpose of the Government as

far as its resources will permit to maintain and improve the roads and trails and in every way to increase the attractiveness of the Forest.

In the White Mountains the public has an interest developed through many years of constantly increasing use. The point has been reached where hundreds of thousands frequent these mountains both in summer and in winter and find in them unsurpassed conditions for enjoyment and recreation. The state of New Hampshire has coöperated in providing five automobile highways leading through the mountains and various outing organiza-

tions have as a result of many years' enthusiastic work constructed hundreds of miles of trails which are freely opened to the tramping public. Specific plans are being worked out by which the Forest Service will encourage still further the development of facilities for the recreational service of this wonderful region to the public.

The use of the Forests for recreation has been fostered by the fact that term leases may be secured for periods up to 30 years for the construction of hotels,

for summer cottages, and similar purposes. Many are already taking advantage of this opportunity to establish a summer home in the Forests; of special importance is it to secure a systematic development of hotels, rest houses, and other accommodations to visitors. Sites are being



A NATIONAL FOREST LODGE

A type of small summer resort that is becoming popular in the National Forests. It is meant especially for transient guests.



From Biological Survey.

A PARADISE FOR SPORTSMEN

Good fishing can be had in most National Forest streams and lakes. Here at Lake Margarete on the Roubt National Forest is found some of the best. Year by year the number of men who flock to such places on the National Forests is increasing by thousands.

leased and developed for this purpose in a plan-wise fashion, public camp grounds are being improved by the Forest Service, maps and circulars are furnished to visitors, and all are given a cordial and cooperative welcome to use the public facilities.

A rapid development for recreation is following the building of roads and trails that has for its purpose the general opening up of different parts of the Forests. Already there have been built about 25,000 miles of trails and some 3000 miles of roads. Most of the trail work has been done for fire protection or general communication. But many of the trails pass through sections of surpassing scenic interest.

At the last session of Congress there was appropriated a special fund of ten million dollars to be available at the rate of a million a year, which, added to the quarter of a million now annually available from the receipts of the Forests, will result in opening up many regions now inaccessible. While the selection of the roads may be primarily for general development purposes, nearly every new road will greatly add to the recreational use and development of the Forests.

Of great importance as a recreational feature to attract the visitor is the wild life of the National Forests. Through the help of the Bureau of Fisheries and the state hatcheries a great deal is being done to maintain the fish in the numerous mountain streams, and with excellent results. The game problem is a more difficult one. The game is far less than should now be produced in the Forests. Restricted authority has prevented the Government doing what is obviously desirable and necessary in order to restock depleted areas. There is still, however, a good deal of game at certain points, and I hope that it may be possible to secure authority to go forward with the plans which have already been formulated to increase the game supply. Of special interest are the elk herds in the Yellowstone region and the Olympics, and the remarkable moose of the Kenai Division of the Chugach Forest in Alaska. Other elk herds occur in Montana, Colorado, and Arizona. Small bands of sheep range the rugged portions of many of the Forests, and in some places they are increasing under prohibition of hunting; and at numerous points deer and other game are still fairly plentiful. But we hope that the opportunity may be given us to take the steps necessary to restock the depleted areas that could carry abundant game (and that is possible

without interfering with the livestock industry), so that practically all the Forests will produce both big and small game. These would be an added resource valuable in itself, and a special attraction to the visitor, to the real sportsman and to the increasing number that now hunt with the camera.

In considering the recreational features of a large forest



BOY SCOUTS IN THE NATIONAL FOREST

In such regions the boys find everything needed to amuse and interest those who love the outdoors, and in camps and traveling they acquire much-needed instruction regarding nature.

tract one is apt to think first of the points of special scenic interest, such as lakes, mountain peaks, a certain bit of forest, and so on. Of course such areas will be central points of attraction and perhaps visited more than any other portions of the Forest. At the same time every portion of a public Forest furnishes some recreational feature which must be considered in a broad plan of recreational development. As

soon as the visitor enters a Forest he encounters some activity of interest from the public standpoint. It may be the protective system, with its roads and trails, telephones, lookouts, tool and food caches, etc.; or nurseries, or plantations; or timber sales in actual operation; or mines; or water-power development. The Forest system is a great public enterprise, and the visitor is almost invariably interested in seeing how the Forest activities are being conducted and what public results are being secured.

In working out the recreational development there are involved many technical problems. In our road building we have the service of the engineers of the Office of Public Roads. In the game problems, the Biological Survey experts are available for advice and assistance. Problems of landscape and sanitary engineering present themselves in large numbers, and we have associated with us a distinguished landscape engineer to guide our work, each step in which counts large and must be taken right.

An important aspect is the correlation of the work on the several Forests with that of the National Parks, which in many cases are surrounded by National Forests or are adjacent to them. We seek to coordinate the Forest road and trail systems with those in the Parks. The systems of scenic highways should be comprehensive in character. They should comprise the National Parks, the scenic points in the National Forests, and the scenic points in the forest and park systems of states and municipalities, and even those privately owned. It is all a part of the broad policy of making the public recreation resources of real service to the people. The returns of such service are very real and greater than can be measured.

# CONSERVATION OF GAME IN THE NATIONAL FORESTS AND NATIONAL PARKS

BY E. W. NELSON,  
CHIEF, BUREAU BIOLOGICAL SURVEY

LONG after the increasing population of the eastern United States had forced the elk and the bison across the Mississippi, the boundless open plains and forested mountains of the West swarmed with a primeval abundance of game. All are familiar with accounts of the millions of bison, antelope, elk and deer which ranged the great plains and the Rocky Mountain region within half a century, and a writer traveling through the San Joaquin Valley, California, in 1850, records seeing "bands of elk, deer and antelope in such numbers they actually darkened the plains for miles and looked in the distance like great herds of cattle."

The resistless westward advance of settlement continued and now the agricultural lands from the Atlantic to the Pacific are peopled, and where crops cannot be grown the watering places are held for the use of multiplying

game refuges exist, the Grand Canyon and the Wichita, where game is protected under Federal law. In addition, state game refuges have been made on the National Forests in six states. On these state refuges, as elsewhere on the National Forests, state game laws prevail, though the authority of the Federal Government controls the timber and grazing.

In the sixteen National Parks the Federal Government has full authority to protect game in only seven: the Yellowstone, Glacier, Mount Rainier, Crater Lake, Platte, Hot Springs, and the Hawaiian. The states have not ceded jurisdiction for the other nine parks and in the absence of Federal legislation the Federal authorities can punish poachers there only by expelling them from within the park limits. Of the 34 National Monuments, 21 are administered by the National Park Service, 11 by the



*From Biological Survey.*

BISON ON THE FEDERAL BISON RANGE AT DIXON, MONTANA

Within the memory of many now alive there were hundreds of thousands of buffalo in the West, but their indiscriminate slaughter for beef and hides has resulted in their almost complete disappearance.

herds of cattle and sheep. Under these conditions not less than 90 per cent of all the big game remaining between the Mississippi Valley and the Pacific Coast has been forced to retreat to the mountains traversing that vast region. There among the rugged peaks and forest-covered slopes which characterize our remaining wilderness are sheltered the survivors of the wonderful hosts of big game animals which once graced so large a part of the continent. Fortunately the major part of these mountain lands, not being available for agriculture, have remained, and are likely to continue, a part of the public domain.

At present the situation as to game control in the West is extremely chaotic. The game there is practically all concentrated on that part of the public domain included in the National Forests, National Parks and National Monuments. On the National Forests two Federal

Forest Service, and two are under the jurisdiction of the War Department, but the game on them remains subject to state jurisdiction.

To add to the confusion, the states have many varying and conflicting laws which often produce unhappy consequences for the game. Furthermore, in many of the states where the laws appear to give a fair degree of protection, through lack of funds, or for other reasons the protection is extremely ineffective. The fact that game is steadily decreasing in a large part of the West while the number of sportsmen is increasing is indicated by the fact that in the regulations under the state laws there is from year to year a decrease in the number of game animals a hunter is permitted to shoot in a season.

Throughout the West where elk, antelope and mountain sheep were once so plentiful and widely distributed,

elk may be legally shot in three states only; mountain sheep in two, and the hunting of antelope is generally prohibited. In five states west of the Mississippi River deer hunting is entirely prohibited; in eight the limit is one deer to the hunter a year; in five states the limit is two deer; in two states three deer, and in Louisiana the limit is five.

In Arizona, one of the last states where frontier conditions prevailed and in which there is a great extent of superbly forested mountains and plateaus, affording ideal conditions for game, the native elk was exter-



Photograph by Albert Schlechten.

#### MULE DEER IN YELLOWSTONE PARK

Intelligent protection and restocking of ranges may restore these deer in large numbers. Colorado has successfully reintroduced elk and has largely increased the almost exterminated mountain sheep.

minated nearly twenty years ago, the antelope and mountain sheep are so nearly gone that there is a permanent close season on them, and there is a bag limit of one deer a year to the hunter.

The idea of game conservation in the West extends back less than 30 years, and there, as in most comparatively new regions, many people long retain the feeling that wild game belongs to whoever can take it, a survival of the point of view of more primitive times. It has been the history of all new regions that the pioneers depend on game as a source of food supply and kill it freely at all seasons. No thought is given the future until, with the increase of population, the number of animals killed so far exceeds the natural increase that the supply is rapidly destroyed. It is evident from what we know of past and existing conditions in a large part of the West that, although the sentiment for protection is increasing, game will continue to disappear unless some wiser and more effective method than now exists is put into operation, not only for its protection, but for its perpetuation and increase.

The National Forests are patrolled by rangers of the Forest Service of the Department of Agriculture, and the

National Parks by rangers of the National Park Service of the Department of the Interior. For some years the Forest Service has been making a careful survey of game conditions in National Forests and is well informed as to the existing situation. It is well for the remaining wild life of the West that the men in charge of both forests and parks are deeply interested in its conservation.

It is evident that wild game inhabiting a National Forest is as much a natural asset of the forest as the annual crop of grazing or of the timber. Up to the present time our attitude has been that it is something entirely apart and subject to entirely separate control. This has been unfortunate for the game. With the example before us of the efficiency shown by the Forest Service in safeguarding from spoliation and making useful to the public the resources of grazing and timber in its custody, it is



Photograph by Albert Schlechten.

#### WHITE-TAILED DEER IN YELLOWSTONE PARK

In five states west of the Mississippi River deer hunting is entirely prohibited; in eight the limit is one deer to a hunter a year; in five states the limit is two deer; in two states it is three and in Louisiana it is five.

evident that if it were given guardianship over the game on the forests the results would be of far-reaching importance. The trained corps of forest rangers and guards can and do now serve with practically no extra cost as wardens over the game, and a practical constructive program could be developed, not only for conserving the game, but for restoring it to areas where it has disappeared, and in increasing the supply to the full capacity of the available summer and winter grazing. The control of the grazing of cattle and sheep on the National Forests being in the Forest Service, gives that organization the absolutely essential knowledge of summer and winter grazing conditions that is required if the game is to be safeguarded. The use of the forests for domestic stock will continue on a great scale, but with good management great numbers of game animals may exist in the same forests.

In a program for rehabilitating the game resources of the National Forests, where there is abundant room for an enormous number of game animals without seriously interfering with the present livestock industry, three things are essential:

(1) A series of national game preserves located in favorable situations and distributed in National Forests throughout the West in order to provide breeding sanctuaries where game may increase and supply the surrounding areas.

(2) Cooperation between the Forest Service and the states wherein National Forests are located, whereby the Forest Service shall designate the parts of the forests

park there is a superabundance of summer grazing where several times the present number of elk can find abundant forage for all time to come. The high altitude of the park and the severity of the winters there are such that winter grazing is limited, particularly in severe weather, necessitating that a large proportion of the elk pass outside the limits to secure sufficient forage. The park is surrounded on all sides by National Forests on which the forester is authorized to grant grazing permits for livestock. The increasing settlement of the West and the growing demand for grazing permits indicate that within a comparatively short time there will be a call for every acre of grazing



Photograph by Leet.

HOW SHALL THESE ELK BE FED IN WINTER?

The Forest Service and the National Park Service are now making a census of the elk in the Yellowstone Park with a view to providing winter feed for them when the grazing on which they have been depending in the winter is so depleted that it can no longer maintain them. This photograph was taken in early winter at Jackson Hole, Wyoming.

where hunting may be done and the number of animals that may be killed in any particular forest or section of forest each season, the states meanwhile to have full control over issuing hunting licenses and to receive all fees therefrom. The states would thus benefit by the services of the trained force of forest rangers and guardians acting as Federal game wardens to guard the game resources from spoliation just as they now protect the trees and the grazing in the interest of the country at large.

(3) A cooperative arrangement between the Forest Service and the National Park Service whereby the game service in the National Parks and the National Monuments shall be coordinated with that of the Forest Service to the same end, that the game supply may be increased and perpetuated.

The necessity for this mutual cooperation is evidenced in the elk situation in the Yellowstone Park. Within the

available up to the very limits of the park. Should permits to this extent be granted and the range stocked to its full capacity the areas now available to elk for winter grazing would be eliminated. As a result of this only one or two severe winters would be sufficient to decimate the Yellowstone elk herds. The Forest Service has wisely foreseen the approach of this danger and for several years has been planning to safeguard the future of the elk in this area by reserving a sufficient area for their winter grazing. In order to do this intelligently, however, it is necessary to know the number of elk in the park and the location of the ranges to which they naturally drift in winter. Several counts of the elk herds in the Yellowstone have been made, and an arrangement effected whereby the Forest Service and the National Park Service will make a joint census this month, when the elk are on their winter range, the park and forest rangers

working under the direction of a representative of the Boone and Crockett Club.

With information concerning the winter location of the herds and the number of animals thus made available it will be a comparatively simple matter to delimit the necessary winter range for the elk and reserve it for the use of the elk herds. The elk herd which spends its summer along the southern border of the Yellowstone Park and descends in winter into the Jackson Hole region, is now carried through the stress of severe winter storms by being fed hay on the Jackson Hole winter refuge, which has been purchased by the government in order to care for these animals. This refuge is in charge of the Biological Survey, which has a resident warden there who, each summer, superintends the putting up of more than 600 tons of hay. The available lands on the refuge may be planted and made to yield approximately double this amount of hay when it becomes necessary.

The refuge and feeding station in Jackson Hole is located on the ancient wintering grounds of thousands of elk and has been necessitated by the influx of settlers who have taken up a large part of the former wintering ground of the elk for farming and stock raising purposes. The available summer grazing for this herd, which numbers over 20,000 animals, is abundant.

In order to carry out the conservation program for game on National Forests outlined above it will be necessary to secure Congressional action to set aside game refuges on the forests.

As soon as the plans suggested above are well understood, the states will no doubt join in coöperation to secure the benefits which would flow to them from such an arrangement. They would thereby secure the protection and increase of their game resources with no added cost to themselves and with no added burden of wardenship. By this arrangement the rights of the states to legislate for the hunting of its game, making seasons, licenses and other essential features would still remain with them; the only check would be to prevent the waste of their game resources.

With the series of game refuges and control of the game on the forests as outlined above it will be a comparatively simple matter to restock or breed up game on nearly all of the National Forests to a reasonable abundance. Deer, elk, and possibly mountain sheep, may be

restored to the point where excellent hunting may again be obtained, although, of course, never on so large a scale as was possible in the early days. Experiments in restocking ranges have already been made on a sufficient scale to show how simply and easily this may be done under proper conditions.

A herd of about 70 elk introduced a few years ago from the Yellowstone Park to the Sitgreaves Forest in Arizona has thrived amazingly and in a few years will undoubtedly restock a large area in that region. In

Colorado elk have been successfully reintroduced, and, under stringent protection due to local sentiment, mountain sheep which once were on the verge of extermination have bred up in considerable numbers.

A few years ago Alaska contained some of the finest hunting grounds in the world. The giant moose with the noblest antlers of any of the living deer kind existed in astonishing abundance. The snowy white mountain sheep, noted for its gracefully formed horns, was extremely numerous in many places, and caribou of several races roamed the tundras and scanty interior forests in

countless numbers. During the last 15 years all have tremendously decreased, mainly through over-shooting to supply the miners' camps and for dog food. Now the Federal Government is building a railroad from the south coast into the interior to develop the resources of that territory, but the thousands of men employed in its construction have created a demand for meat which is threatening the annihilation of the superb game animals of a belt more than 150 miles broad right through the finest remaining game country; thus at the outset the railroad may become responsible for the destruction of one of Alaska's most valuable resources.

In an effort to stay this ill-judged slaughter the Secretary of Agriculture, under authority vested in him, has issued a regulation prohibiting the sale of game killed on the Kenai Peninsula and adjacent region, but the proximity of the new road to this splendid game field and the number of possible hunters make the outlook there dark for the many moose and mountain sheep.

National Forests in Alaska cover not only the Kenai Peninsula, but also the heavily wooded islands along the south coast, where the Sitka deer lives in great abundance and has been killed in large numbers for commercial purposes. In all this region occur representatives of the huge brown and northern grizzly bears, the largest living carnivores of the world.



*From Biological Survey.*

#### STARVING ELK AT JACKSON HOLE, WYOMING

Before the Federal winter refuge was established by the Government, hundreds of elk died because they were not able to obtain food. The photograph is of a victim of starvation and a survivor.



*From Biological Survey.*

**FEEDING ELK IN WINTER AT JACKSON HOLE, WYOMING**

This winter refuge for elk is now owned by the government. Hay is grown in the summer and some 600 tons are stacked for the winter use of the 20,000 elk in the herd.

In addition to the game the National Forests also shelter another natural asset in the fur-bearing animals such as the beaver, mink, marten, fisher, wolverine and fox, which under proper protection will continue indefinitely to yield a yearly revenue, but which will be completely destroyed if neglected. Beaver are already gone from most of their former haunts, but can be readily restored on many forests. The other species named are becoming steadily less numerous. It would appear reasonable that the same authority covering the game animals should cover the fur-bearers.

For several years efforts have been made to secure authorization from Congress to establish a chain of game refuges on the National Forests as mentioned above. A bill now before Congress provides for the creation of a system of Federal game refuges on the National Forests in all



**ALASKAN WHITE MOUNTAIN SHEEP**

The opening up of Alaska, particularly now that a railroad is being constructed, will naturally, as it makes travel more convenient, result in increased hunting of the fine game there. There should be proper protection for the mountain sheep as well as the other game.

parts of the West. Unfortunately this bill has been amended so as to destroy its effectiveness, and apparently it will require further time and effort in order to secure this most desirable and necessary legislation, if our game is to be properly safeguarded.

But for the creation of the Yellowstone National Park and the guardianship assumed by the Federal Government over its wild life, there is no reason to doubt that the two great elk herds now centering there, and containing some 40,000 of these splendid animals, would to a great extent have shared the fate of their kind elsewhere. This is true despite the fact that about one-half of these animals only touch the southern part of the park in summer, and winter outside it. Their fate would probably have been no happier than that of the Colorado herds without the protection and moral influence

exerted by the preservation of the animals in the park and the constant increment to their number from that source. In addition the usefulness of this park to the game supply of the country is well shown in the fact that during the last five years over 1700 elk have been shipped from there and from Jackson Hole for restocking the ranges in 20 states, which were formerly the home of elk but where they had been nearly or quite exterminated.



*From Biological Survey.*

**ANTELOPE IN THE WIND CAVE NATIONAL GAME PRESERVE**

This is at Hot Springs, South Dakota, and there should be many more like it. The hunting of antelope in the United States is now generally prohibited.

In addition to its notable service in saving the elk, the Yellowstone Park has protected in its native home the last small herd of buffalo that has continued to exist in its original home in the United States.

Another most interesting and valuable result of the protection of game in the Yellowstone has been the preservation from destruction of a moose peculiar to that region. These moose once occupied a considerable area, but the survivors are now reduced to about 1500 in the park and a much smaller number in the immediately adjacent country on the south. There are also within the park limits several hundred antelope and mountain sheep.

With its thousands of herbivorous mammals, the Yellowstone contains wolves, mountain lions, black and grizzly bears, animals among the most notable and interesting of American large game. This park, with its wealth of wild life, has been a wonderful object lesson in game preservation which, as a precedent, has had a powerful influence in encouraging the setting aside of other wild life sanctuaries, both Federal and state.

The interest of the visitors to the Yellowstone in its game animals evidences the strength of the attraction

which wild life has for all. Despite the scenic beauties and natural wonders of this park, the presence of thousands of game animals in their native haunts is widely advertised as one of its most notable features. There is scarcely a well-informed man, woman or child in this country who does not know something of the Yellowstone bears and their free and easy manners.

Glacier National Park is also a game sanctuary where, under government protection, elk, mountain sheep and mountain goats add greatly to the interest excited by the grandeur of the scenery.

For many years there was no Federal law protecting game in the Yellowstone until, in 1894, a poacher wantonly killed a number of buffalo for trophies. This outrage resulted in the prompt passage by Congress of the necessary law, since which time the park herds have been safer from lawless hunters.

It is hoped that in the near future California will cede jurisdiction over the National Parks within her boundaries and thus enable the Interior Department to exercise complete guardianship over the game in Yosemite and Sequoia National Parks. While the variety and abundance of large animal life there can never equal that in the Yellowstone, at the same time



*From Biological Survey.*

**ROCKY MOUNTAIN SHEEP IN YELLOWSTONE NATIONAL PARK**

If there is a series of game refuges and proper control of the game it will be a simple matter to restock or breed up game on the National Forests to a reasonable abundance, so that excellent hunting of even such species as the Rocky Mountain sheep may be obtained.

the numerous black bears and deer which frequent the wooded lower slopes, and the mountain sheep peculiar to the high Sierras, will add the finishing touches to the marvels of this wonderful area of tremendous mountain peaks, rushing torrents and magnificent forests.

An Act creating the Mount McKinley National Park,

in Alaska, has recently been passed by Congress. This establishes one of the finest and most needed game preserves on the continent and provides protection for a large number of mountain sheep, moose, and caribou in one of the greatest game districts of the world. The government railroad which is being built from the coast to the interior of Alaska passes near, and unless the park had been created by the present Congress there was extreme danger that hunters for the railroad camps would exterminate the game in this section.

Considering the interest in this magnificent mountain, the greatest in North America, the extermination of the superb game animals about its basal slopes and immediately outlying mountains would not only be a calamity but would discredit us to those who come after. It is most gratifying to learn that local sentiment in Alaska is strongly favorable to the creation of this splendid National Park and game refuge, even many of the market hunters

having expressed their approval. With the increase of population in Alaska, game conditions there are in specially critical condition since the severe climate renders it nearly or quite impossible to restock its game fields once the game is exterminated.

The National Monuments contain many game animals under state jurisdiction. The two most notable of these are the Olympic Monument in Washington, which includes the Olympic Mountains and a few thousand of the Olympic elk, the main survivors of this elk which is peculiar to the humid forests of the Northwest coast region and was once widely distributed therein, and the Grand Canyon Monument, taking in a part of the Grand Canyon of the Colorado and including most of the surviving mountain sheep of that region.

Game is not only an asset of great value from its return in food and skins, but its recreational value in attracting people to the wilderness has long been recognized. The value of game from the latter viewpoint will become increasingly great as the country becomes more densely populated.

A host of men and women each year go to the woods for varying periods for the purpose of renewing their mental and physical vigor, and to a great number of these the wild life is the magnet which draws them. It is impossible to estimate the tremendous return which is derived in this way from the presence of wild life in our forests.

In this connection it is interesting to note the changes which have occurred in man's attitude and relation to wild animals. In primitive times his interest was that of a hunter towards his prey. As he developed, his whole existence for untold ages was interwoven with and largely dependent upon that of the wild life about him.

To study the ways

of the beasts and qualify himself for their capture was his chief safeguard against starvation. A vague feeling of fellowship led primitive man to endow wild animals with mysterious powers and out of his relation with them grew up his mythology, traces of which still survive in our folk tales. But the day of the hunter has in large degree passed and we are now developing a deeper and kindlier sympathy with these habitants of the wilds and welcome their presence as the living expression of the spirit of the wilderness. This sympathetic pleasure in the presence of wild animals in the forest is shared alike by men, women and children, by those who hunt with the gun or camera and equally by a multitude of others, who find some of the most exquisite joys of life in the forest and in the study of its shy habitants.



From Biological Survey.

THE GREAT ALASKAN MOOSE

These fine animals with the noblest antlers of any of the living deer kind in the world formerly existed in astonishing abundance in Alaska, but now are steadily decreasing in number, and with the opening of railroads will, unless protected, be practically exterminated.

## SYCAMORE OR BUTTONWOOD TREE FLOWER]]

By Dr. R. W. Shufeldt

**O**UR buttonwood or buttonball tree is also widely known as the sycamore, and in the eastern parts of the United States it is a familiar shade-tree in nearly all cities and towns. Tournefort, the distinguished French botanist, gave it its generic name, calling it *Plantanus* from a Greek word meaning broad, he being impressed



THE FLOWER OF THE SYCAMORE TREE

Rare condition of the flower-heads of the sycamore tree, *Plantanus occidentalis*.

with either the breadth of its shade, or with its broad leaf. Its specific name is *occidentalis*, which was bestowed upon it by Linnæus. There is still another vernacular name for it—the plane tree. It ranges from Maine to northern Vermont, thence westward to Minnesota and Ontario, and southward to Kansas. Magnificent examples of it occur in the valley of the Mississippi and elsewhere in the mid-United States; in fact, it is the largest and tallest tree in the forests of the Atlantic tier of states. Sycamores on some of the western rivers attain the height of nearly 140 feet, while those a hundred feet high were not at all uncommon. As these immense trees age, their trunks become hollow, forming fine homes for squirrels and bees.

The familiar flower-heads of this tree are subspherical balls of about an inch in diameter. These are green in fall and summer, but turn a darkish-tan in winter, at which season they form very striking objects in the leafless trees, each ball being suspended by a long peduncle from the twig supporting it. In big trees as many as five or six hundred of these balls may swing there nearly all winter. As a rule, these flexible peduncles bear but a

single button or ball at the free end; but in extremely rare instances there may be two, as shown in my reproduced photograph illustrating this article. When I was a small boy I discovered one of these abnormalities, and I never forgot it. Many a time since I have peered up into sycamore or plane trees in the hope of discovering a second example; but all to no purpose. Among the unnumbered thousands I have seen of them since that day, I have never discovered another like the one I collected over half a century ago in southern Connecticut.

During the latter part of November, 1916, my wife, while walking alone near the National Zoological Park in Washington, observed one of these two-ball abnormalities on a medium-sized sycamore; next day I secured the specimen and photographed it natural size. It will be seen that the peduncle of the upper ball is not more than half the usual length, while that of the lower one is somewhat longer, though not as long as in the case of the normal ones on the same tree. Its proximal end appears as though it were sunk into the side of the upper ball; but whether the peduncles are continuous or not I am not prepared to say, as I have not broken up the upper ball in that I might ascertain the fact. In all probability they are continuous; but it would destroy the specimen to thus investigate the structure.

In some instances the tendrils of a grape-vine had twisted about the stems of some of the leaves of the tree, holding them fast so they could not fall to the ground when all the others did. A case of this kind is also shown in the illustration. The dilated base of the petiole is seen just above where the tendril of the vine has seized the stem, and on the twig of the tree above it is also seen next season's bud, which was covered by the aforesaid dilated petiole, where the leaf grew in position on the twig. This peculiarity is rare among trees.

## MICHIGAN TO PLANT 4500 ACRES ANNUALLY

**B**Y asking the Legislature to increase its annual appropriation to \$150,000, the Public Domain Commission is preparing to carry into effect one of the largest forest conservation or tree planting plans which has ever been tried in this country. The plan has the backing of the members of the Commission and is also approved by the forestry experts at the University of Michigan and the Michigan Forestry Association. The state now owns, in round numbers, 540,000 acres of land. It is proposed to plant trees at the rate of 4500 acres per annum and, in what is known as a period of rotation, consisting of 60 years, all of 270,000 acres can be planted. One-half of the other 270,000 acres will in the next 30 years, under protection, produce sufficient material, which by cutting will clear a gross revenue of \$15 per acre. Beginning with 1947 it is thought advisable, according to the plan, to cut at the rate of 4500 acres per annum and plant at the same rate with the more valuable pines. By 1977 the remaining 135,000 acres will be treated in a like manner, so that the initial restocking of all forest lands will have been completed in 2007.

# SAVE US FROM INVADING PESTS

BY J. G. SANDERS,  
ECONOMIC ZOOLOGIST OF PENNSYLVANIA

THE majority of our citizens should be so well informed regarding the pernicious practices which now obtain in the United States, whereby an open door is maintained for the introduction of immense quantities of infested and infected plant material, that argument for the limitation of this evil would be unnecessary. But I have eminent reasons to believe that not all who are interested in the promotion and maintenance of agricultural and horticultural health have fully sensed the present

These foregoing statements are preliminary to a recital of needed forms of defense against enemies of plants, which are threatening the food product possibilities of our



AVOCADO WEEVIL

The Avocado Weevil seriously injures Avocado seed in Mexico and Central America and has been frequently detected in seed from these regions. To protect the Avocado interests the Federal Horticultural Board has quarantined all seed from Mexico and Central America.

pitiful condition of these interests in our country, nor do I think all of us realize the many dangers which threaten our welfare with every shipload of foreign plants discharged on our shores.

If every teacher and student of the practical sciences, and every member of our many agricultural experiment stations were fully cognizant of the history of plant pest introduction into America, and of the untold millions lost annually through their ravages, it would seem that sufficient publicity could be given the facts to awaken careless America to remedial action. I have used the expression "careless America" advisedly yet truthfully. We Americans are subjects of derision by foreign nations, on account of carelessness in many phases of our national and economic life. Our coasts are inadequately guarded from human invasion, aided by powerful machines of war, and there is but little doubt that charts and plans of many of our coast defenses, and full reports of our vulnerable seacoast are reposing in the vaults of foreign nations.



LATE BLIGHT OF THE POTATO ON THE LEAVES AND THE TUBER ROT WHICH FOLLOWS IT

This is one of the most serious of all potato diseases. It is almost constantly present in the humid North of both Europe and America and was the direct cause of the famous Irish famine. The disease is readily controlled by Bordeaux mixture.

country, just as surely as similar enemies in the past have entered and attacked our agriculture and horticulture, destroying each year several times the total annual appropriations for our army and navy. As the speed of ocean travel lessens the transportation period and increases the frequency and facility of shipments from abroad we cannot expect a diminution of the danger of plant pest



SPREAD OF THE BOLL WEEVIL

The lines show the progress year by year of the boll weevil which has already done millions of dollars' damage to cotton.

introduction in the future. Our judgment from past experiences warns us of even greater evils to come.

Unwise persons have asserted that soon we will have imported all the pests which threaten us, and this danger will have passed. Impossible! No one cognizant of the multitudes of dangerous insects and plant diseases through-

disease, the citrus canker, cotton boll weevil and San José scale are notable examples of development under these circumstances. Every plant-feeding insect has the inherent valency of a destructive pest.

Nature conserves the balance, which too frequently is disturbed by commerce and agricultural practices of civilized men. The pristine condition of America from an agricultural standpoint was ideal for the production of amazing crops at low cost, on account of the paucity of destructive insects and plant diseases. Could our plants and seeds have been introduced without the attendant diseases and insects, we might to-day have been growing potatoes free from late blight and rot, powdery



LOOSE SMUT OF WHEAT

A wide-spread though generally much less destructive smut than bunt. It causes an estimated annual loss of \$7,735,000 to farmers of the United States. It can be prevented by hot water treatment. Infection occurs at flowering time.

out the world as yet unreported in this country would accept an hypothesis. Just as a wise physician can diagnose a dangerous disease in its incipient stage, or can foresee an epidemic, if quarantine regulations were abandoned or unenforced, so can a plant physician and entomologist foresee calamity to agriculture in its various branches, when precautions are ignored, and dangerous pests permitted entry and establishment.

Unknown dangers lurk in every shipment of plants to America from foreign lands. Even though it might be humanly possible to inspect them for known foreign pests, certain insects and diseases which may be insignificant in their original native surroundings, when introduced into new territory without their natural enemies and checks, and, perchance, finding new and more pleasing host plants, will multiply with startling rapidity, and soon become destructive pests. The chestnut blight, white pine blister



BUNT OR STINKING SMUT OF WHEAT

This is controllable by seed treatment. It causes an annual loss of \$54,000,000 to farmers of the United States. A wide-spread disease spread by planting smutty seed and in some sections by winds and smutty heads left in harvested fields. Crushed smut balls smell like decaying fish.

scab and scurf, and there would have been no necessity for the autumn reduction of the midsummer estimates of the potato crop by our Federal Agricultural Department by millions of bushels, occasioned by uncontrolled ravages of the late blight and rot in 1916. The potato, like certain other of our agricultural products, was introduced from abroad, and in the absence of the introduced pests and diseases our crops would be fully returned.

Since the organization of the Federal Horticultural Board, and the subsequent inspection of imported plant

material, 508 distinct species of insects, and 189 distinct plant diseases have been intercepted on plant imports from abroad. It is safe to presume that a considerable number of these would have developed to the stage of serious and destructive pests, if we may judge from performances of similar introductions in the past. By no means, however, has our inspection been able to prevent the introduction and establishment of numerous insects

Among the many plant diseases which have probably been introduced, and are now demanding serious consideration are the asparagus rust, alfalfa leaf spot, bean



a b b c c c

**BARLEY INFECTED WITH DISEASE**

(a) A sound head of barley.  
 (b) Two heads affected with covered smut, an easily prevented disease which causes an estimated annual loss of \$2,100,000.  
 (c) Three heads affected with loose smut, a disease preventable by hot water treatment. Causes annual loss of \$1,225,000 to the farmers of this country.

and diseases, some of which may even now be established and are rapidly multiplying, but as yet have not attracted the attention of the scientists.

A list of the introduced insect pests and plant diseases, which have become established in this country, would be too extensive and lengthy for consideration at this time, but I will enumerate a number of the more important ones, and I am sure that you will recognize a large number of those pests which we consider of prime importance in America.

It is my rather hasty determination that approximately 75 per cent of the major insect pests and plant diseases of the United States have been introduced from abroad. Surely some of the most destructive ones are in this category.



**POTATO POWDERY SCAB**

A disease probably originating in South America, carried from there to Europe, and thence to Canada and the United States—at one time the cause of serious alarm and a temporary quarantine. It has fortunately turned out to be a disease of cool, moist climates, and unable to spread in most parts of this country.

anthracnose and rust, European apple canker, apple scab, pear scab, brown rot of various fruits, the downy mildew of cruciferous plants, the chrysanthemum rust, chestnut blight, diseases of cotton, carnation rust, the hyacinth disease, the hollyhock rust, the loose smut of oats, the olive knot disease, the peach leaf curl and peach scab, ergot affecting rye and allied cereals, violet rust, loose smut and rust of wheat and other grains. Also, those recently introduced diseases, the white pine blister canker, the citrus canker and the poplar disease.

In this list those of you familiar with plant diseases have noted a large number of our serious plant pests; those more familiar with the insect pests will recognize, in the few which I have listed, some of the most serious creatures ever introduced into this country—the San José scale, the fluted scale of citrus, the oyster-shell scale, black scale, red scale of California, red scale of Florida, European fruit scale, European fruit lecanium, cottony maple scale and the tulip tree scale, as well as many other scale insects which are pests in greenhouses throughout the country, the codling moth,



**APPLE SCAB**

This scab affects the leaves as well as the fruit and reduces greatly the food-making surface of the tree.

Hessian fly, anguinois grain moth, the hop plant louse, cabbage worm, several species of weevils affecting peas and beans, three species of domesticated cockroaches, bulb mites, narcissus bulb fly, the elm leaf beetle, gypsy moth, brown-tail moth, leopard moth, cotton boll weevil, the alfalfa weevil and Argentine ant. In this list we find some of our most expensive and costly importa-

lieve that a final adjustment of these lines cannot be effected within a very short time, so that we will not be dependent on other countries for our horticultural products.

Statements have been made by our nurserymen that it is impossible to grow in America plants of such superior quality as are now produced abroad and shipped to this country. This is a debatable question, and will remain

so until absolutely serious efforts have been made in America to produce these desired products. The placing of an embargo on the import of horticultural products would ultimately benefit the nurserymen, florists and horticulturists of this country, by eliminating those pests which are gradually being introduced into this country, and just as surely, after due time and opportunity, are injuring all demand for certain kinds of nursery and florists' stock. As an instance, no one in the region now infected with chestnut blight will buy or plant chestnut nursery stock. If the citrus canker should escape control in Florida and ruin the citrus industry, the nurserymen growing citrus stock would have to seek other business. If the white pine blister canker escapes and destroys our white pine as rapidly as it is planted, there will be no demand for nursery stock of this type. Similar examples might be cited in other lines, if so desired.



BROWN ROT OF THE PEACH

This is a serious disease in the peach growing section of the eastern United States. It may even render worthless the fruit while it is in transit to market.

tions; but by no means have we introduced all which may come to our shores—for there await introduction large numbers of species of insects and discases, which are known to be pests in foreign countries, and might possibly be much more serious if introduced to America.

The question which arises in our minds is a preventive for this amazing and startling condition of affairs, and there seems to be but one method whereby we may eliminate further danger absolutely, and that is by a Federal embargo on the further importation of plants and plant products from abroad. The imposition at once of such an embargo would for a time handicap the nurserymen, florists and seedsmen of this country, but there is no reason to be-



PEACH SCAB

This causes an average loss of 10 per cent of the total value of the peach crop of the eastern United States.

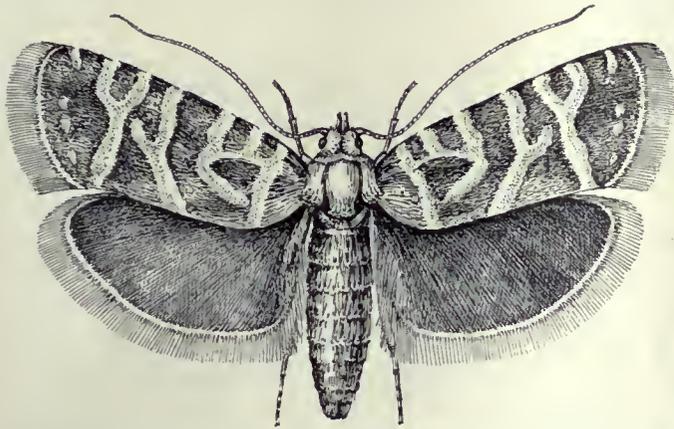


APPLE SCAB

This is the most destructive disease to which this fruit is subject. In unsprayed orchards, it may destroy the whole crop. The total expenditure for spraying in the United States because of this disease is enormous.

The possibility of a Federal embargo being placed on the importation of nursery stock has aroused some of our nurserymen and florists considerably, and they have maintained that an "absolute embargo" would almost ruin their business. Certain of the farsceing, and I may say better informed nurserymen, realize that something must be done to protect their interests from the ravages of pests, and after two or three informal talks with various groups of nurserymen, I am pleased to report that in most cases these men are willing to forego the importation of certain classes of what may be termed "finished nursery products," feeling that they wish to continue the importation of seedling stock for propagation in this country. In

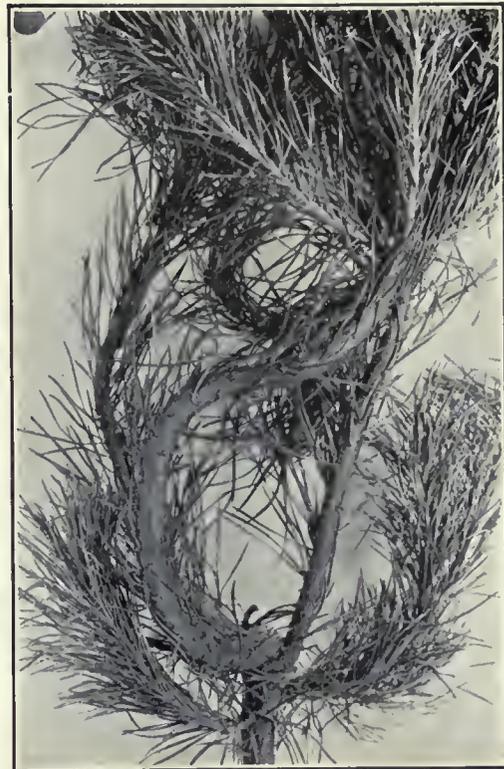
one informal conference with some nurserymen, in which this problem was discussed, there was evidenced the feeling that nurserymen generally would be fairly well satisfied if all "finished nursery stock," including all plants with balls of earth about their roots, were pro-



EUROPEAN PINE SHOOT MOTH

This pest has in recent years been introduced into America on imported pine seedlings and is now established in widely separated localities in the eastern and middle western states.

hibited, and permission given to import (1) fruit tree seedlings; (2) 2-year seedlings, cuttings, buds or grafts of ornamental shrubs; (3) deciduous shade, ornamental and forest trees not to exceed six feet; (4) coniferous evergreen stock not to exceed eighteen inches, except 5-leaved pines, which are prohibited. If a proposition of this sort were maintained and an embargo arranged accordingly, I fully believe that 75 per cent of the present amount of inspection would be eliminated, and, furthermore, this arrangement would eliminate the importation



TWISTED GROWTH OF EUROPEAN PINES

This is a characteristic injury caused by the larvæ of the European pine shoot moth.

of some plants, most dangerous on account of the impossibility of inspecting them thoroughly.

After giving this problem much thought and consideration I feel that I could recommend, without too much injury to the importing nurserymen, an embargo



WORK OF THE EUROPEAN PINE SHOOT MOTH

Showing the fall injury to pine buds by young larvæ of the moth. Many buds are thus destroyed, as in America the larvæ have developed the habit of eating out from two to four buds before winter.



ANOTHER FORM OF INJURY

This malformation caused by the larvæ of the European pine shoot moth is so familiar in European pine forests that it has a popular name in each country, as "posthorn" and "waldhorn" in Germany and Holland and "baionnette" in France.

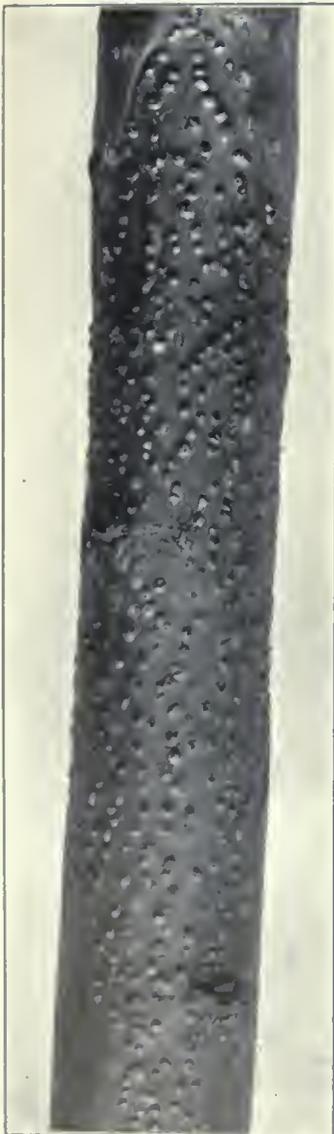
on all importations of plants with earth about the roots, to be enacted as soon as possible, and that a three-year period be allowed for the importation of the classes of nursery stock outlined above, after which all further importations should be prohibited, except importations by the United States Department of Agriculture of such nursery stock as is deemed desirable by said department—this to be grown and propagated under quarantine for a reasonable period before distribution. This proposition doubtless, even though quite lenient, will be opposed strongly by many importers, but the question to be considered is whether we shall continue to permit the importation of a few thousand dollars' worth of plants, any shipment of which may bring in a dangerous pest, which ultimately may cost the country millions every year.

Is it not appalling, in consideration of the long list of imported pests now established in this country, when we learn that \$14,293,500 has been spent in New England by Massachusetts and other infested states, with the Federal Government assisting, to prevent the spread of

the gypsy moth? These figures do not take into account the immense damage to forests, woodlands, private and public premises, nor the amounts of money spent privately for control of this pest. It would be absurd to attempt an approximate estimate of the total cost and losses entailed in this country by the introduction of the San José scale about 1870. The futility of attempts on a large scale to control an insect pest or a disease, which has once gained a firm foothold in this country, is apparent, for in no case have any such attempts succeeded in this country, nor will they ever succeed under the present system of government, unless very broad, comprehensive power is given to some official board. Our experiences of the past show that the actions taken for control are usually several years behind the advance of the pest.

The establishment of an embargo on "finished plant products" would place in the hands of our legitimate nurserymen and growers the very business

in which they are concerned, and would eliminate the present baneful system whereby nursery stock of doubtful origin, variety and quality is sold by brokers, dealers and commission houses everywhere. Much of this stock is shipped to this country to be sold on consignment or at auction, and it is oftentimes of such poor quality that it



EUROPEAN POPLAR CANKER

This disease, recently imported from Europe, is doing serious damage to the poplar trees of the eastern section of this country and is spreading westward.



CHESTNUT BLIGHT CANKERS ON AMERICAN CHESTNUT

This disease has practically exterminated the chestnut trees of this country and has caused losses of millions despite efforts to save the trees.

should have been placed on the brush pile in foreign countries. The nurserymen of this country have done little to protect themselves against this practice, but as a matter of fact the step has been taken for them by an agreement recently signed by all but five of the growers and exporters in Holland, binding them to prevent further shipment of nursery stock for sale at auction in this country.

Adam Smith in his valuable treatise, "The Wealth of Nations," says, "By restraining, either by high duties or by absolute prohibitions, the importation of such goods from foreign countries as can be produced at home, the monopoly of the home market is more or less secured to the domestic industry employed in producing them."

Destruction of the nursery and florist's business would not follow the adoption of a limited embargo as out-

lined above, to be succeeded after a short period by an absolute embargo.

Years ago Germany, France, Austria-Hungary, Holland, Switzerland and Turkey prohibited absolutely all entries of nursery stock from the United States. These countries took this step after one severe lesson, viz., the

Columbia, presumably from Japan, and having multiplied enormously, has spread for miles around, injuring about 90 per cent of these trees in its path. At this time it promises to be one of the most serious fruit pests ever introduced in this country.

Under the present conditions of inadequate and nearly futile inspection, the importation of pests will be a continuous performance. It is beyond human ability of the most expert kind to inspect plant imports with absolute certainty, and past experience has shown the weakness and failure of our present system. More stringent methods



Photograph by R. K. Beattie.

INFECTED BLACK CURRANT LEAF

The white pine blister disease propagates on currant and gooseberry leaves and then spreads to the trees. This black currant leaf is lightly infected. The orange pustules show as dark spots in the photograph.

introduction of the grape phylloxera from America which ruined their vineyards, but we have had numerous severe lessons in the United States and no adequate measure for protection has been adopted and enforced. Had the United States Government taken similar action, even at that time, this country would now be free from the brown-tail moth, leopard moth, citrus canker, chestnut blight, white pine blister canker, alfalfa weevil and many lesser pests introduced since that time.

Only this year we are informed that an extremely dangerous borer of the twigs of peach, apricot, cherry and plum trees has been introduced into the District of



Photograph by T. J. Horton.

WHITE PINE BLISTER DISEASE

Showing the open blisters on the bark of a young white pine from Wisconsin. This is an introduced disease which is extremely destructive to white pine (five-needled pines). In some cases 100 per cent of the trees in a given stand have been found to be infected.

must be adopted. I firmly believe that there reposes in the educated men of this country a sacred trust that they shall pass on to the next generation the best possible conditions for the promotion of agriculture, horticulture, forestry and public health.

FLATHEADED BORERS ON FOREST TREES

**F**LATHEADED borers are among the most important of the borers infesting forest trees in the United States. Some mine the leaves, one burrows into the cones, a number bore into the inner bark and outer wood of the trunk, branches, and roots, while the majority excavate oval winding "wormholes" throughout the sound or decaying sapwood and heartwood.

The bark-borers often girdle and kill healthy trees or those injured by fire, floods, droughts, diseases, other insects, or careless lumbering, and at other times weaken trees so that they become easy victims of diseases, other insects, or unfavorable environment. Sometimes when

they do not kill the tree outright their work causes dead limbs or twigs, or serious defects, checks, or gum spots to form in the wood, or swollen galls to form on the branches. The wood-borers mine the sapwood and heartwood of the trunk, top, and larger branches and thus destroy or seriously injure a large amount of the tree's most valuable product, its timber. Wormholes will cause the finest grade clear lumber to become unfit for the higher grade uses and therefore unsalable at the higher prices.

SEE SPECIAL OFFER TO MEMBERS, UNDER TABLE OF CONTENTS

# BIRDS AND THE CAMERA

BY A. A. ALLEN, Ph.D.,  
ASSISTANT PROFESSOR OF ORNITHOLOGY, CORNELL UNIVERSITY

AS the present wide-spread knowledge of birds has grown and the study of the living creature has superseded the study of the dried museum specimen, nothing has done more to attract public notice or to maintain and increase interest than has bird photography. With the use of the camera in recording the habits of birds and bringing graphically before the world, not only the birds themselves but their interesting ways and their work

It is quite possible to convey an erroneous impression of a bird by means of the camera either because of the bird's fear or merely because of the limitations of the lens and the fore-shortening that often appears when objects are photographed at close range. To be of the greatest value, the photograph must show the bird in a natural and characteristic pose; it must show the bird's characteristic markings, and the bird must be doing some characteristic thing. The photograph must express the bird to the very best advantage. Unfortunately a relatively small percentage of the bird photographs taken come up to this standard and are perfect in every respect. Even of those



THE FIRST SWIMMING LESSON

The camera gives us glimpses of the intimate life of birds that few persons would have the time or patience to seek out for themselves. The newly hatched Pied-billed Grebe is taking its first swim.

in destroying injurious insects, it is little wonder that thousands of persons have awakened to an appreciation which formerly was impossible. By means of the photographic plate, the lantern slide, and the half-tone reproduction, one is now permitted to see glimpses of birdland that most people have neither the time nor the patience to hunt out for themselves. The photograph and the motion picture now bring to all nature lovers the exultant sensations which before were the special privilege of the naturalist when, after hours of exertion, he at last succeeded in lifting the curtain, exposing for a moment the intimate life of the wild bird.

But the naturalist still gets his reward through sensations a hundred times more poignant than the feelings of those who merely view his pictures, and for this reason: the number of naturalist photographers is ever increasing. With the greater number of photographers and the advance in photographic equipment, standards of photography have been greatly raised, so that to-day the perfect photograph is not only a portrait of the bird, photographically correct and artistically arranged, but it is the one which also depicts more fully and more accurately than any pen picture ever could some incident in the bird's life. Such a picture has scientific value. It is more than a photograph, it is more than a portrait, it is a fact permanently expressed in the most accurate manner possible.



SNAPPED WITHOUT THEIR KNOWLEDGE

A feeding station for photographing birds near a window. The camera is concealed beneath the box at the right and focused on the branch where one sees the chickadee.

taken by expert bird photographers, the majority are faulty, for there are so many difficulties to combat.

First, there is the finding of the nest or the feeding place suitable for photographing, within reach of the camera and in sufficient light unspotted by shadows; then the bird must be tamed or accustomed to the blind and camera; the weather must be favorable with sun but no wind; the bird must come within the much-restricted focus of the camera; and when all these difficulties are surmounted, the photographer must wait until the bird assumes some characteristic pose before making the exposure. Then if the bird is not alarmed by the click of the shutter a good picture will result—provided of course there are no mechanical defects in the camera, shutter, plate holder, or plates and that development is performed correctly. If

all the conditions are perfect and one uses keen judgment as to the exact instant when the exposures are made, and if he is lucky, one plate out of three should yield a perfect picture. Taking wind and weather as they come and nests in all varieties of locations, one can count himself fortunate if he secures one perfect picture out of thirty exposures. This does not apply to feeding station pictures where conditions are much simpler and more easily controlled and where a far greater percentage of perfect pictures can be expected. As it is the object of this article to show how bird photography is done, rather than to depict its difficulties, in order that those who are interested may secure another resource for their leisure hours, we might well begin with this simplest form of bird photography.

*The feeding station.*—We will assume that birds have been attracted to a feeding log according to the explanations in the December issue of *AMERICAN FORESTRY* for 1915 and that a number of birds are coming regularly to be fed, either near a window or to a spot in the woods. It is then time to arrange the perch upon which the birds are to be photographed, for in taking bird portraits one soon learns that the field of the camera is extremely small and the focal range very limited. The camera must be focused on a narrowly delimited area and the birds must come to exactly that spot, for a fraction of an inch difference will often ruin the picture. When ready to take the

photograph all other food should be removed or covered so as to increase the chances of the bird's coming to the exact spot. It always takes birds some time to get used to a camera, so a box should be kept where the camera is to be placed for several days previously. In fact it is well, instead of using a tripod, to drive a post in the ground as in the accompanying illustration of a photographic station near a window and keep a box permanently in position where the camera can be concealed. When all is in readiness, a thread or a long rubber tube is stretched from the shutter to the window or hiding place and one waits for the bird to come. Even more convenient than the thread or long tube is a device made from the electro-magnet of a doorbell, which, by the use of a couple of dry cells, can be made to trip the shutter even more successfully than the thread.

*The camera.*—For this type of photography almost any kind of a camera will do—even a kodak with a portrait lens attachment and with no focusing device can be used because the distance from the lens to the spot where the bird will be can easily be measured. The best camera for bird photography, however, is one that has a ground glass for focusing and has a bellows length of at least, fourteen inches (preferably more) so that a portrait attachment will be unnecessary. A 4 x 5 size will prove most convenient for all-around work.

*The lens.*—The longer the focal length of the lens, the better, because it permits one to use the camera at a greater distance, and even when this does not seem necessary it is an advantage because even the tamest birds will jump at the click of the shutter and when the camera is farther away, the sound is not so audible. Telephoto lenses, however, are unserviceable for most bird work because they require too much care when focusing and too much time when exposing. The more expensive anastigmat lenses are the most satisfactory because they permit of shorter exposures, thus decreasing the chances of the bird's moving, and permit of taking pictures on days when the sun is not shining. Any lens, however, is satisfactory when the light is good.

*The shutter.*—For feeding station pictures and most other work, the ordinary lens shutter working at one-fifth, one-twenty-fifth, and

one-fiftieth of a second is satisfactory, although the shutter that makes the least noise is the best. Multi-speed and focal plane shutters which are necessary for flight pictures requiring an exposure of not more than one-eight-hundredth of a second are not necessary here.

*The exposure.*—In photographing birds or other objects at close range, about double the exposure required for landscape work is necessary. Thus in bright sunlight the correct exposure with the diaphragm at F. 11 or U. S. 8 would be one-twenty-fifth of a second. Birds which jump at the click of the shutter show movement in a one-twenty-fifth second exposure, so it is better to open the diaphragm to F. 8 or U. S. 4 and give one-fiftieth of a second exposure. On dull days the exposure must be lengthened as in other photography and many of the negatives will be ruined by the movement of the bird.



LESSON IN NEST PHOTOGRAPHY

The floating nest and environs of the pied-billed grebe. In photographing birds' nests one should try to show as much of the environment as possible without making the nest too small.

*The plate.*—Whether plates or films are used is a matter largely of personal preference, although most naturalists prefer plates. For snapshot pictures the more rapid the plates the better, as they will permit of shorter exposures. The above exposure was given for the ordinary plate such as Seed 27, the speed of which is xl. Seed 30, Graplex, or Lumière plates would permit shorter exposures. For time exposures slower plates are better, double-coated plates giving a wider range of exposure and being more dependable.



UNCONSCIOUS OF THE SHUTTER

A chickadee portrait taken as shown in the preceding photograph. He looks as if he was posing and was proud of the fact, but he does not know the camera man is near.

*Making the exposure.*—In making the exposure one should watch the bird until it is in a good pose and momentarily at rest. Exposures made while the bird is pecking food will usually be blurred. A slight sound will often cause the bird to pause and look up, giving the desired opportunity.

By keeping out food all through the year a series of portraits of many different birds can be secured all on the same log. The author, for example, has secured photographs of nearly twenty species on the same spot in a city yard, and the opportunities elsewhere near a woodland would be far superior. By having the box always in place, even the most timid new arrivals do not realize when the camera is substituted or placed beneath it and one need never waste time waiting for birds to get accustomed to the camera.

We might now proceed to some of the more difficult phases of bird photography. The same equipment with the addition of the tripod will be sufficient for photographing birds' nests and eggs or young birds which prove most fascinating to the amateur photographer. A word of caution is, however, necessary. Young birds should never be removed from the nest nor should they be disturbed just before they are ready to leave. Young birds are never brooded after leaving the nest and unless their feathers are fully developed they cannot stand the rain,

the sun, or the cold nights and usually fall victims to the weather or their numerous enemies. Neither can they be persuaded to remain in the nest when once they have been removed unless they are still helpless. One should wait until they have left the nest of their own free will and then catch them.

In photographing nests and eggs one should be very careful not to destroy any of the surrounding vegetation which conceals them. It is usually necessary to press aside a few leaves or even a branch, but these should never be broken and should be carefully returned to their former position when the photograph has been secured. The nest should never be tipped to show the eggs. It is far better to tip the camera by means of a "tilting top" (a device that may be purchased for a small sum), and to push the eggs to the far side of the nest where they will show. In arranging the camera an effort should be made to show the surrounding vegetation and the nature of the retreat selected by the bird so far as is possible. The accompanying photograph of the floating nest of the pied-billed grebe,



BEFORE AND AFTER TAKING

Young birds make fascinating subjects for the amateur photographer, especially when the old birds will come to feed them. One should wait until they leave the nest and then catch them.

for example, shows it attached to the weeds fringing a pond—the pond and the woodland in the distance. No better description of the nest and nesting habit of the grebe could be desired.

Photographing the birds at the nest is perhaps the most absorbing phase of the whole field of photography. It requires the greatest ingenuity and skill on the part of the photographer and at the same time brings him closer to the intimate life of the birds than anything else could. It permits him unobserved to view at arm's length the home life of his subject—the solicitude of the parent birds for their young and their little attentions for one another—sometimes humorous, sometimes ludicrous, sometimes almost pathetic.

Even greater caution should be used in photographing

birds at the nest than in photographing nests and eggs, for any change in the immediate environment of the nest will not only make it visible to the birds' enemies but will usually cause the bird to desert, unless the young are full grown and nearly ready to leave. The prime requisite in this kind of photography is some sort of a blind for

concealing or disguising the camera. It can be made of branches and leaves just sufficient to hide the camera and tripod, and the shutter then worked from a distance as in feeding station photography, or it can be large enough to conceal the photographer at the same time. This is far the more satisfactory, for one's object should be not only to secure the picture but to learn something new about the bird at the same time. The most satisfactory sort of a blind is the so-called "umbrella blind," which consists of an umbrella strapped to a pole at the right height and a sheet of green or brown cloth hung about the sides—properly fastened and guyed so that it will not

shake in the wind. This blind should be put in place—first at some distance from the nest—and then moved gradually nearer, several days often being allowed for the birds to become accustomed to it. The last step is to push aside the leaves in front of the nest so that, when the lens is pointed through a slit in the blind, an unobstructed view can be obtained. Much time will now be saved if the photographer can have a companion who will go to the blind with him and leave as soon as everything is ready. Unless the bird sees or hears some one leave the blind it will usually remain suspicious for a long time, but, as they cannot count, one person leaving is as good as two and the bird soon returns. After the bird has once decided that all is well, the photographer can make considerable noise and movement within the blind without frightening it. Any number of exposures can be made—plate holders changed—notes written—all within a few feet of the unconcerned birds. If there are eggs in the nest, one will see how carefully they are adjusted, how the feathers of the breast are lifted and parted so that the eggs will come in contact with the "brood spots"; he will see the parent bird preen its feathers—arrange the nest materials or perhaps pull down leaves to better conceal itself. Occasionally the mate will come bringing food, or they will exchange places, often with a delightful little ceremony. If there are young, the old birds can be watched bringing food, cleaning the nest and so forth. One will be close enough to identify most of the food

brought to the young and observations can be made on the economic value of the birds. Best of all, everything can be accurately recorded by the camera and one's observations communicated to others far more graphically than by pen or by word of mouth.

The possibilities for the use of the camera and the blind are almost unlimited.

Every bird presents a different reaction, a new problem to be solved, and while the general principles which have been laid down will hold for all birds, scarcely two birds will respond in the same way, so that one's ingenuity will be continually taxed to the utmost. Some species are extremely stupid, others extremely intelligent; some are very wary, others very tame; some are most easily studied when incubating, others when brooding; and still others only after the young have left the nest. Even within a species no two birds are just alike and one may find dozens of nests where the birds never get tame enough to photograph and suddenly



THE UMBRELLA BLIND

A good method of studying and photographing birds is by means of the "umbrella blind," which is here seen set up in a daisy field near the nest of a bobolink.

stumble onto one where the bird behaves like a domestic fowl. In no way is the individuality of the bird better brought out than by an attempt to photograph it and gain an insight into its intimate life.

But enough has been said to point out the initial steps which the naturalist photographer must take and although the road is beset with difficulties, it is so paved with fascination that, once upon it, it is difficult to leave until the height is reached and one looks back upon his efforts, his failures, and his achievements with the knowledge that what he has done is permanent and that the world is richer for it. What would we not give, to-day, for a photographic record of the hordes of passenger pigeons that once flocked across this country, for a picture of one of the herds of bisons that roamed the plains, for a glimpse of the home life of the Labrador duck, or the Carolina parrot or any of our vanishing wild life that may soon be gone beyond recall! True, we have passenger pigeons in our museums and bisons in our parks, and pages by the score descriptive of their former abundance, and we have artists like Fuertes and Lodge and Thorburne and Brook who can almost make the birds live. True, likewise, the photograph has its limitations, but if we wish to hand down to posterity an exact representation of our wild birds to-day and a few square feet of their environment, no better means has yet been devised than that of the maltreated and much-maligned camera.

# THE SLASH PINE

BY WILBUR R. MATTOON,  
FOREST EXAMINER, U. S. FOREST SERVICE

**T**HERE is a species of pine in the southeastern portion of the United States, little known, yet of notably rapid growth and very high commercial value. It is a better tree intrinsically than the well-known longleaf pine. Its growth is more rapid, its wood heavier, harder, and stronger, and its yield of turpentine larger and of a better grade. This tree is slash pine (*Pinus caribæa*). It is extensively cut and contributes, at a rough estimate, over a billion board feet annually to the yellow pine lumber output.

Slash pine is not well known, either generally to the public or silviculturally to the forester. The cause in each case is clearly apparent. The tree has been designated by at least four different botanical names. And in Forest Service literature it was formerly called "Cuban" pine but is now officially known by the

name here used. The wood of slash pine closely resembles in its structure the heaviest grade of longleaf pine, and as such it is sold on the market without discrimination. The juvenile

and young trees look much like loblolly pine, and the more mature trees equally resemble longleaf. Among persons of trained observation mistakes of identification of slash pine have not been infrequent, while on the part of almost all others, except observant turpentine or logging men, the species as a rule escapes recognition. Furthermore, this section of the country is the last east of the Mississippi River to be included in intensive silvicultural studies by those interested in the future management of the country's forests.

All indications are that slash pine possesses in the highest degree the essential silvicultural qualifications for profitable handling



GROWTH AROUND PONDS

A characteristic of slash pine is its occurrence as almost exclusively the only forest tree in a broad band around the margins of the countless "ponds" scattered over the coastal plain from South Carolina to Louisiana. On the opposite margin of this pond in South Carolina the slash pine trees may be seen in the right background. The measured yield was about 18,000 board feet of saw timber per acre.



TYPICAL LOGGING VIEW IN MATURE SLASH PINE FOREST

The trees are cut and sold on the market without distinction as longleaf pine. The wood of slash pine is the heaviest, hardest, and strongest coniferous wood grown in the United States. It averages a little heavier than hard maple, beech, and sweet birch and is about equal to burr oak, yellow birch, and white ash.



A FIFTEEN-YEAR GROWTH

The characteristic straight, clean trunk of slash pine is apparent in this 15-year-old pole stand. The trees average 42 feet high and about 6 inches in diameter breast high. The inherent high tolerance by which the tree is enabled to grow rapidly in close density—about 1900 trees per acre in this stand—is one of the chief factors for the wide-spread advance of slash pine over lands formerly occupied by longleaf pine.

under forest management. Thinnings, for example, are very profitable on account of the by-product of turpentine derived prior to cutting the trees for ties, cordwood, poles, pulpwood, or other products. Recent studies of the yield of crude turpentine from young slash pine indicate for periods of from 15 to 25 years net returns of from 9 to 11 per cent on the investment in land. A reliable lumber authority in northeastern Florida recently estimated that of the total second-growth pine cut for sap ties and other sap timbers in the region, although all is sold as "longleaf" stumpage, probably not less than 90 per cent, as a rough estimate, consists of slash pine.

Following the removal of the virgin longleaf pine, slash pine is spreading rapidly over large areas of flatlands and moderately hilly uplands of the South Atlantic and Gulf coastal plain. This is due to its prolific seed production, its very rapid growth, its ability to grow under partial shade and in dense stands, and its adaptability for growing on the poorest

sandy soils and poorly-drained flatlands of the South. It adapts itself and grows rapidly on practically all soils except the very deep, dry, upland types, where the mammoth tap-rooted longleaf alone succeeds. The seeds and seedlings of slash pine are not touched as food by hogs, which is in striking contrast to the enormous destruction of longleaf by these animals. In three years it attains a height of from 3 to 5 feet; while at the same age longleaf is just emerging from the ground and beginning its real battle with fires, which burn practically every year in the South. With protection from hot fires for about the first two years, slash pine often succeeds in coming through with a sufficient number of saplings for a good stand.

The range of slash pine extends from Charleston, South Carolina, southward to the Keys of Florida and westward through Georgia, Alabama, Mississippi, and Louisiana to the Mississippi River. It has been found by the writer occurring on several hundred square miles in southwestern Lou-



AN AVERAGE SEVENTEEN-YEAR-OLD

This slash pine is 10.8 inches in diameter (breast high) by 61 feet tall. It is the average tree in a 17-year-old stand near Glen Saint Mary, Florida. In this time the stand has produced 12,600 board feet of saw timber per acre, scaling all trees 5 inches and over in diameter by mill scale. The thick mat of pine needles ("straw") is evidence of the fire protection which has been continuous during the life of the stand.



CHECKING WIND-BLOWN SAND

On Santa Rose Island, on the coast of western Florida and one of Uncle Sam's Military Reservations, slash pine succeeds in spite of the tropical hurricanes and continually shifting sands. The view shows the effect of the trees in checking the movement of wind-blown sand.



AND FOR BEAUTY ALSO

Dr. Charles A. Sargent expressed the opinion that slash pine is "by far the most handsome of all southern pines." This sentiment appears to be borne out by the very pleasing bit of landscape shown here by a bungalow in the town of Slidell, Louisiana.

isiana, many miles west of the westernmost limits of distribution given by any botanical authorities of that region. Its range covers roughly about 35 per cent of the geographical range of longleaf, and extends beyond the latter over some 8 to 10 million acres on the Florida peninsula.

With some 20 to 30 million acres of land, mostly pine "barrens" and other poor, sandy lands, in excess of the maximum amount that will probably be utilized for all



#### HIGH MONEY RETURNS IN EARLY LIFE FROM TURPENTINE

In this 13-year-old slash pine stand, 104 trees per acre are being worked for turpentine. The remaining 524 per acre are yet too small. Unfortunately, the wasteful boxing system, instead of the cupping method, is being used. If cupped and properly handled, well-stocked stands like this will yield naval stores for a period of from 25 to 40 years. At 10 cents per box, the present local price, this stand is bringing its owner \$10.40 per acre for a by-product which does not necessarily appreciably lessen the value of the standing tree. The stand here shown is growing on flat, poor, sandy "pine barrens" in northern Florida, at present valueless for any other commercial purpose.

agricultural purposes during the next half century, it appears certain that slash pine will occupy an increasingly important place in that economic development which aims to put unused lands to their most profitable use. The future will undoubtedly see the pine forests of the South handled as second-growth stands of various ages, generally not exceeding 50 years. The species which will make up the future forest will, as a rule, be those producing in a given period the largest quantity of wood, combined with desirable intrinsic qualities of clearness, grain, and mechanical properties.

#### STATE FORESTS' VALUATION

PENNSYLVANIA'S million acres of forest land, which cost the state \$2,275,000, are now valued at over \$6,000,000, says Commissioner of Forestry, Robert S. Conklin. This increase is due to rising timber values, permanent improvement made by the Department of Forestry, and to tardy recognition of the fact that little trees grow into big trees and have an actual money value which is steadily increasing. Surely money put into an established business of this kind is an investment and not an expenditure.

#### ONE OF THE UNDREAMT-OF THINGS

By Lewis E. Theiss

WHILE pruning a plum tree last spring I found two cocoons which I secured and placed in an open box inside of our screened dining porch. In due season two moths emerged—females of the species *Callosamia promethca*. Though not particularly brilliant in their markings, they were nevertheless very beautiful. Their wings were perhaps three to four inches in spread. Shortly they crawled from the box and up the screening, where they remained.

That evening half a dozen moths of the same kind were fluttering eagerly outside the screening. In the *Girl of the Limberlost* Mrs. Porter tells how a moth in the swamp exuded a yellow fluid on the shoulder on the Girl's mother, where it clung, and thus attracted other moths. We watched to see what would happen here. One of the moths did exude a few drops of a yellow fluid which hung in shining drops in the meshes of the wire. Our interest was now keen and we kept close watch.

That evening fully twenty-five moths, both male and female, of the same kind, came fluttering at dusk to our porch, and all night those without tried to reach the two imprisoned moths within. On the following day several of the moths remained during the entire period of daylight, and at dusk at least forty moths were fluttering about the screens. There were so many it was impossible to count them accurately.

To us, who had never even seen a moth of this kind before, it was a great treat. It convinced us of the truth of Hamlet's observation to Horatio: "There are more things in heaven and earth, Horatio, than are dreamt of in thy philosophy." For we had never dreamt of such a sight as those beautiful moths afforded as they fluttered without our screens.

Now we are going to do what we should have done long ago—learn about some of the undreamt-of things; and already we have a box full of various cocoons and chrysalids, and the spring pruning will yield more. Truly we mortals are a blind race.

#### MICHIGAN IN THE PINE BLISTER FIGHT

THE Michigan Committee for the Suppression of the White Pine Blister, composed of Professor L. R. Taft, state inspector of orchards and nurseries; Dr. Filbert Roth, Director of the Forestry Department of the University of Michigan, and A. C. Carton, of the Public Domain Commission, have prepared an amendment to the Michigan forestry laws, providing reimbursement for the owners of pine trees, gooseberry and currant bushes which may have to be destroyed should the blister invade Michigan. The Commission provides to stamp out the disease the moment it makes its appearance.

PRAIRIE dogs have practically been destroyed over 767,000 acres of National Forest range in New Mexico and Arizona within the last five years by the Biological Survey. During this period, a total of about 2,500,000 acres of Government land in the West has been relieved of range-destroying rodents.



in the matter of fertilization and cross-fertilization. An accurate diary should be kept of all such observations, especially the names of the species and the dates. In certain small receptacles different kinds of seeds may be planted, and their modes of germination carefully studied and recorded. Indeed, there are hundreds of experiments



A WELL-KNOWN HARBINGER OF SPRING

FIG. 1.—Rue Anemone (*Anemonella thalictroides*) is one of the earliest flowers to bloom in the spring, and it belongs to the Crowfoot family (*Ranunculaceae*), in which group we also find such well-known plants as Clematis, Buttercups, Meadow Rue, Marsh Marigold, Columbine, and others. Rue Anemone has no petals, while there are four or five, often as many as ten, white, or sometimes pinkish, oval sepals. The roots are tuberous and small, and from them arises the wiry, slender, black stem. Leaves compound, 2-3-ternately, the leaflets being roundish, moderately three-lobed at the extremity, and heart-shaped (cordate). Flowers arranged in a sort of cluster, the flower-stem seemingly all springing from the same point on the upper end of the main stem. This common little flower occurs in the woods from southern New Hampshire, westward to Minnesota, southward to Kansas, and northwest to Florida.

to be made upon no end of plants in the region in which the observer has his or her home; and if systematically and intelligently conducted, no one may say in advance what important results some of the experiments may lead to in time. In this work do not forget the aquatic plants, but be sure to make provision for studying them through supplying the proper receptacles in which to grow them. As a matter of fact, many other lines of research and investigation will occur to you as the work goes merrily on.

You should visit the woods, fields, and other parts of the country just so soon as the first breath of the coming spring is felt. Go well equipped for collecting, and be sure you do not forget your botanical tin-can that comes for that very purpose. If the season opens up unusually warm, some of the very earliest flowers may make their appearance during the first week in April in the Middle Atlantic States. The best localities for these are bright, sunny places, in woods where the soil is rich, and the trees old and standing well apart, and you will not have gone very far before you discover that the anemones have started to come up; if you chance to be in a region where

they are more or less abundant, you will come upon them almost at once. They are very prone to appear near the roots of some large tree or other. The specimens shown in Figure 1 were growing within a foot of a big tulip tree, where they had sprung up amidst the dead leaves and other débris of the vegetation of the previous year.

This Rue Anemone possesses curious-looking, tuberous little roots, grouped in a small bunch; and if you aim to take the plant home for study, dig up the entire speci-



THE ROSY KING OF THE MARSHES

FIG. 2.—The Swamp Rose Mallow (*Hibiscus moscheutos*), one of the most conspicuous marsh flowers of the summer months, and one of the most beautiful. It belongs to the rather small Mallow family (*Malvaceae*), which contains several genera of Mallows. It is a tall perennial that grows from a yard to seven feet in height. Its late summer seed-pods are shown in Figure 3. The toothed leaves are ovate and pointed, and the stem may be finely hairy above. Often the upper leaves are three-lobed, and inclined to be downy both above and below. The form of the rose pink petals of the flower is well shown here, as well as the shape of the two seed-capsules below it. As to locality and range, Gray states: "River-banks and fresh or brackish marshes near the coast, east Massachusetts and southward; also lake-shores and swamps (especially near salt springs) westward to Ontario and Missouri. July—September."

men, roots and all, packing it properly so it can be carried without injury—otherwise the delicate thing will wilt within the next half-hour. Very frequently you will find the Wood Anemone or Wind Flower (*Anemone quinquefolia*) growing close to the rue anemone; but the two are easily distinguished, as the former bears only a single flower, while the latter bears two, three, or maybe four

in a cluster, as shown in Figure 1. Generally, however, there are but three blossoms to the plant, the middle one opening first, and the remaining two following later. Thus the time of blooming is prolonged, and opportunity is given certain insects to perform the work of cross-fertilization, this service being usually accomplished by various species of early bees and bee-like flies. The leaves of the rue anemone are dark olive green, and in some respects are said to resemble those of the Meadow Rue in form and color.

As spring passes into summer in the Mid-Atlantic States, a great many flowers, representing a great number

tion, or else the lovely days of spring and summer will slip by, leaving us almost where we stood when the anemones began to peep above ground. As we follow the path through some shady wood, keeping ever near the brooklet whose crystal waters tumble along in the same direction, we may note, on every hand, the coming of the elegant early ferns; the patches of brilliant May Apples;



THE PERPETUATORS OF THEIR KIND

FIG. 3.—Along in the early autumn, in the Middle Atlantic States where the Rose Mallows grow, we find their tall, dark-brown stems, bearing a few equally dark-brown and withered leaves. Above these are the blackish-brown and opened seed-pods, arranged as shown in this illustration. The pods represent the fruit of the Rose Mallow, and they are usually 5-celled, with a great number of smallish dark-colored seeds in each cell. These are easily jarred out by shaking the long, dry stems.

of families and a still greater number of genera and species, begin to blossom. The display is almost bewildering to the collector, and still more so to the out-of-door photographer of flowers. However, from this bewitching array of form and color, set in every imaginable shade of green, tan and brown, we must select some subject for descrip-



ONE OF THE RARITIES OF THE SHADY WOODS

FIG. 4.—A beautiful specimen of the Showy Orchis (*Orchis spectabilis*). This by no means abundant plant ranges from New Brunswick and New England southward to Georgia, westward to Missouri and Dakota. Most botanists place the 18 or 20 genera composing the Orchis family between the Arrow-root family (*Marantaceae*) and the Willow family (*Salicaceae*). It is not difficult, however, to recognize the Showy Orchis, especially with such a picture of it as is here presented. Note its two oblong-obovate, shiny leaves; its floral bracts, which are leaf-like and lanceolate in form; they generally exceed the flowers in number. Each flower has an undivided ovate lip, which, while usually white, may be, in some specimens, of a magenta pink. In the center of its range this Orchis is found in flower during the months of May and June.

many grasses and sedges, and scores of other plants which will flower as summer advances. The soft, balmy breezes of early June easily cause the tender leaves of trees and shrubs to tremble, as they come and go in gentle waves, having hardly the force to create so much as a quiver among the plants, now so luxuriantly appearing about their roots.

One very beautiful and very sturdy little plant in particular is quite oblivious to the nodding and bobbing of its breeze-shaken neighbors. This is the early Showy Orchis (*Orchis spectabilis*); and the flora of the region has no representative possessing a more interesting life-history, greater beauty, or more attractive form (Fig. 4). Its pair of large, glossy green leaves are broadly elliptical in outline and quite silvery upon their under sides. Note in Figure 4 how they develop just so soon as they push their way up through the debris of last year's vegetation. Your hand-lens will help not a little here; only you must imagine the flowers to be a bright pink—sometimes a purplish pink—with their lowermost petals white. The fertilization of these little plants is most interesting; for some female bees of certain species seem almost to be built along lines to effect the operation successfully, and this is later carried on by some species of butterflies.

Figures 2 and 3 are reproductions of photographs of the flower and seed-pods of the gorgeous representative

of the Mallow family (*Malvaceæ*), it being the Swamp Rose Mallow (*Hibiscus moscheutos*). This great, rosy-hued beauty may be seen far off, be it growing among the tall, rank grasses of the salt marshes, or among the cat-tails, alder bushes, or forty other species along the edges of pools and ponds, or overgrown swamps, for the matter of that. It is probably the most striking flower of the entire flora of this country, and it reminds one very much

and admits the eager bee to her stores of golden pollen, then we feel that the summer is far advanced. As truly as the wood anemone and the bloodroot seem filled with the essence of spring and the promise of the opening year, so does this stately flower glow with the maturity and fulfillment of late summer. Here is none of the timorousness of the early blossoms, which peep shyly out, as if ready



A MUCH-DESPISED WEED MAY BE A MOST INTERESTING PLANT

FIG. 5.—Upper parts of the longitudinally grooved stems or scapes of the Common Plantain (*Plantago major*), bearing the densely-flowered spikes of this very cosmopolitan and common plant, which occurs everywhere along the roadsides and only too frequently crops up in great numbers on our lawns and pastures.

of the common hollyhock of the gardens. Several true relatives of it, however, are to be found in the genus *Hibiscus*, as the Shrubby Althæa of our gardens (*Hibiscus syriacus*), which was introduced from Asia; the Flower-of-an-hour (*H. trionum*) from Europe, and a number of others, which it would require too much space to describe here. Descriptions of them are to be found in all of our standard botanies. Mathews tells us that "The most frequent visitors of the genus *Hibiscus* are the honeybees and bumblebees." Mrs. Dana gives us the following graceful paragraph on this species: "When the beautiful rose mallow slowly unfolds her pink banner-like petals,



ONE OF FLORIDA'S BEAUTIFUL FLOWERS

FIG. 6.—The Catharine Flower (*Thysanella fimbriata*) flourishes in the sandy regions of certain parts of Georgia and Florida. It belongs in the Buckwheat family (*Polygonaceæ*), and there is but one other species, the *T. robusta*, which flowers all the year around in the pine lands of Florida, while the above species flowers only up to about the first of January, lasting all summer. The flowers are a most delicate pink, with some pink and white and a few pure white. The leaves are very narrow and pubescent. It grows in bushy fashion about a yard in height, the root being small, tough, and for the most part slender.

to beat a hasty retreat should a late frost overtake them, but rather a calm assurance that the time is ripe, and that the salt marshes and brackish ponds are only awaiting their rosy lining."

It will not be necessary to give any further account of the lovely flower here shown in Figure 6, beyond what occurs in the legend beneath it.

In regard to sending flowers to the editor of this Department of AMERICAN FORESTRY for description, they should come in excellent condition if packed as soon after

gathering as possible, and mailed by parcel post direct to No. 3356 Eighteenth Street, N. W., Washington, D. C. Stiff cardboard boxes, or better still, cigar boxes, are the best receptacles in which to send them. They can be placed in several layers of well-dampened newspapers. Collect only the best and most perfect specimens, and send the entire plant if possible—flowers, stems, leaves, seed or fruit, roots, and all. Do not break the stems or roots, but curl them carefully so the specimen can be photographed, as was the Catharine Flower shown in Figure 6, recently received from Mr. R. H. Young, of Haines City, Florida.

Mr. Young, having read what was said about *Smilax vines* in the last November issue of AMERICAN FORESTRY, also kindly sent me fine specimens from his state of the Laurel-leaved Smilax (*Smilax laurifolia*). This particular "Green-briar" forms an exception to the rule, in that it remains "evergreen" throughout the season. Its berries are black, and its leaves vary considerably. We also have the Lance-leaved Smilax (*Smilax lanceolata*), specimens of which I have recently received from South Carolina; in this the leaves vary but little. We have in this country a good many other species of Green Briar, or Cat Briar as they are sometimes called, of the genus *Smilax*.

In Figure 5 we have a very excellent example of the beauty there really is in one of our most abundant and most heartily hated weeds. Every country lad in the United States, in the region where it grows, knows it well, and so does many a city lad, too. How many boys have been directed by their parents to rid the front grass-plot of this weed by the aid of a table knife it would be hard to say. But when we come to examine the plant, especially if we use a high-power microscope, our surprise is very great when we discover what a really beautiful flower this Common Plantain or Ribwort (*Plantago major*) has. It is of cosmopolitan distribution, and has many species related to it in its own genus of the Plantain family (*Plantaginaceæ*); the very rare *Litorella unijlora* belongs in the same group.

#### FOREST ROAD UNDER FEDERAL AID ACT

THE Secretary of Agriculture has authorized the location survey of a section of the first project in road construction submitted under the "National Forest section" of the Federal Aid Road Act. This section is the only one in the law which provides for actual construction of roads by the Federal Government. Roads built under authority of this part of the law are designed primarily to promote economic development and to serve public convenience in localities where much of the land is in National Forests. The proposed road on which action is taken is in the Apache National Forest, Greenlee County, Arizona. The preliminary estimate of the cost of construction of the 71 miles of road to be surveyed is \$342,500. Greenlee County proposes to hold a bond election to raise the necessary funds to contribute fifty per cent of this amount. An additional 29 miles of road in Apache County will be necessary to complete the project,

and, according to the preliminary estimate, will bring the total cost to \$420,000.

Approval of the plans for the survey was based upon the industrial resources which will be opened up and also upon the offer of one-half coöperation by the county.

Several other projects for which coöperation has been offered are pending for roads in California, Montana, and Idaho. Where two projects have equal claim for consideration, the decision will, it is stated, be made in favor of the one for which the best offer of coöperation is made.

#### BOY SCOUTS BATTLE MOTHS

FOR the first time in the history of the organization a state has called upon the Boy Scouts for help to battle a plague.

The state is Ohio and the plague is the Tussock Moth, a pest that was destroying the trees of Canton, President McKinley's home town. In a two weeks' campaign the Scouts collected 3,000,000 of the eggs and as a result Troop No. 3, headed by E. R. Hoover, scout master, was awarded a large parade banner for collecting the greatest number of eggs. James Emsley made the best record for an individual scout.

The banner was awarded by Mayor Stolberg, who commended the work not only in this campaign but of the Scouts as an organization. So great was the interest in the campaign that was waged day and night for the two weeks that Prof. A. S. Barnes, of the Department of Entomology of Harvard, requested a quart of the eggs be sent to him for investigative purposes.

"The Scouts have not stopped the work, however," writes Scout Master Hoover, "but they are keeping right on with the campaign. This precedent of working under direction of state officials may be a help to other cities in looking after the trees and plants. It simply shows that the Scouts are on call and willing to help any municipality in any worthy cause."

The American Forestry Association at its annual meeting passed a resolution endorsing the Boy Scouts' work and urged them to get into the fight against the spread of the white pine blister disease.

#### MAPLES

By Richard Butler Glaenzer

There is beauty in tropical samans,  
Beauty and bountiful shade,  
And the pride-of-India's plumes are fair  
And cool till tempest-frayed;  
There is splendor in poincianas  
When flaming with birdlike flowers,  
And mangoes invite when rich with fruit  
Or blossomed to golden bowers;  
Yet give me our northern maples  
So sweet with sap in spring,  
Even before their gay green gowns  
Tempt robin and thrush to sing:  
And give me their heart-leaved branches  
As shields from the searching sun,  
And their mourning dress of rainbow hue  
When summer's course is run!



## FORESTRY FOR BOYS AND GIRLS

BY BRISTOW ADAMS

### THE WIND AND THE TREES



**F**RIENDS in so many needs, as the sturdy trees are to man, it is hard to tell in just what ways they best serve him. After they are cut for use they may shelter him against the storm and may warm and cheer him before the open fire-place. But as standing trees—in the forest, in the fields, along the fence rows, and by the roadside—they are the best friends in all plant life. They are comrades, too; helpful comrades, each with as true a self as a human friend, and each worth knowing in all ways that we can know them. It is quite as true with trees as it is with folks, that the better we know them the better we like them.

One meets a person who causes a dislike from the first; if one takes pains to try to overcome that dislike and to learn to know what good points there may be, the chances are that the dislike may turn to a kindlier feeling, or at least that it will grow less. Or one meets a person to whom one is drawn from the very first by the ties of a strong love; ten chances to one, the more one sees and knows of the good in that person, the stronger will the ties become. Try this, with either trees or folks, and see if it does not work out!

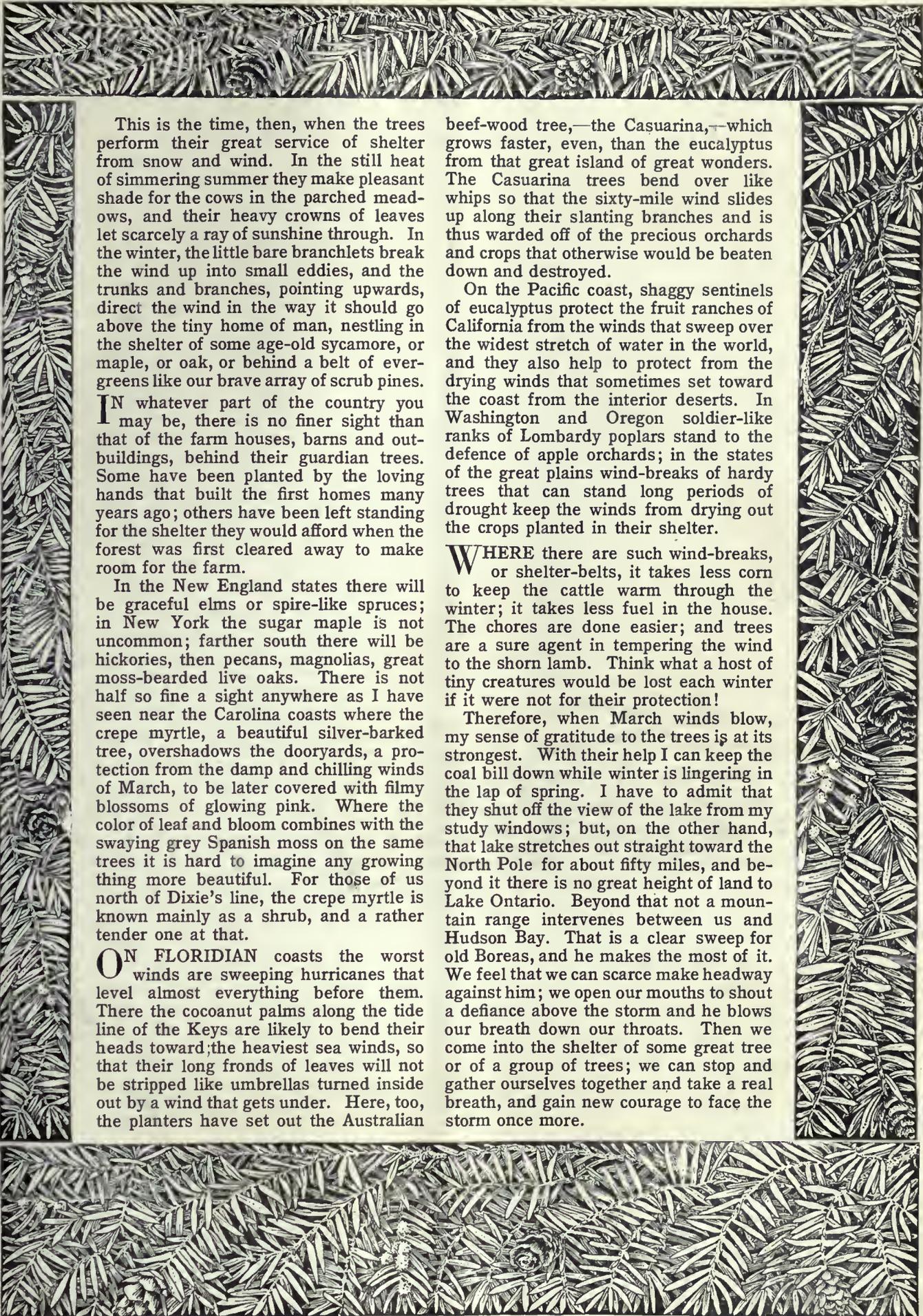
**M**ICHAUX, the great French botanist, among the earliest to describe our American forests, made the great mistake, it seems to me, of setting down in cold black-and-white that our common scrub pine, or Virginia pine, was to him the most uninteresting tree that ever grew. I've always felt a bit sorry for poor little scrub pine ever since I read the sentence that Michaux passed upon it. For my part, I have ever had a tender spot in my heart for the sturdy and cheer-

ful ways of this tree, its ability to thrive on poor land, its rapid growth, its power to bear seed and start new little trees at a very early age, its firm grip on gullied hillsides to hold them from the washing rains. But most of all I like the staunch way it stands against the March winds, and shunts the gales a-roaring upwards, away from the many little negro cabins, and even from the larger homes in Maryland, Virginia, and southward.

We have reason to know about this tree, because the first house that we built, the home in which the two little boys were born, was in a clearing of these scrub pines. The trees that we cut away to make room for the house in the early spring helped to warm us on our hearth-altar during the following winter; and the belt of pines left to the northwest were a great defence against the cold winter winds, and the boisterous gusts of March. How much fuel they saved it would be hard to say; but we know well what a lull seemed to come in the storms when we gained the leeward of our little grove of scrubs. When the snowflakes swirled dizzily over the open fields, they dropped gently down behind our screen of pines and blanketed the garden against the bitter freezes of the exposed hillsides.

**T**HUS, when March comes, I am likely to think of trees and the wind, and of the effects they have upon one another. March winds are very hard on the trees. March never has had a very good name among the months. The name by which we know it comes from Mars, the war god, whose reign all of us would like to see ended on earth forever. It cannot be denied that March is a wild and rough time o' year. The old Saxon name was Rede-monath, or rough month; it was also called Hlyd-monath, or loud month, because it was so boisterous. When the French Revolution set out to reform everything, even the calendar, it was Ventose, or windy month.





This is the time, then, when the trees perform their great service of shelter from snow and wind. In the still heat of simmering summer they make pleasant shade for the cows in the parched meadows, and their heavy crowns of leaves let scarcely a ray of sunshine through. In the winter, the little bare branchlets break the wind up into small eddies, and the trunks and branches, pointing upwards, direct the wind in the way it should go above the tiny home of man, nestling in the shelter of some age-old sycamore, or maple, or oak, or behind a belt of evergreens like our brave array of scrub pines.

**I**N whatever part of the country you may be, there is no finer sight than that of the farm houses, barns and out-buildings, behind their guardian trees. Some have been planted by the loving hands that built the first homes many years ago; others have been left standing for the shelter they would afford when the forest was first cleared away to make room for the farm.

In the New England states there will be graceful elms or spire-like spruces; in New York the sugar maple is not uncommon; farther south there will be hickories, then pecans, magnolias, great moss-bearded live oaks. There is not half so fine a sight anywhere as I have seen near the Carolina coasts where the crepe myrtle, a beautiful silver-barked tree, overshadows the dooryards, a protection from the damp and chilling winds of March, to be later covered with filmy blossoms of glowing pink. Where the color of leaf and bloom combines with the swaying grey Spanish moss on the same trees it is hard to imagine any growing thing more beautiful. For those of us north of Dixie's line, the crepe myrtle is known mainly as a shrub, and a rather tender one at that.

**O**N FLORIDIAN coasts the worst winds are sweeping hurricanes that level almost everything before them. There the cocoanut palms along the tide line of the Keys are likely to bend their heads toward the heaviest sea winds, so that their long fronds of leaves will not be stripped like umbrellas turned inside out by a wind that gets under. Here, too, the planters have set out the Australian

beef-wood tree,—the Casuarina,—which grows faster, even, than the eucalyptus from that great island of great wonders. The Casuarina trees bend over like whips so that the sixty-mile wind slides up along their slanting branches and is thus warded off of the precious orchards and crops that otherwise would be beaten down and destroyed.

On the Pacific coast, shaggy sentinels of eucalyptus protect the fruit ranches of California from the winds that sweep over the widest stretch of water in the world, and they also help to protect from the drying winds that sometimes set toward the coast from the interior deserts. In Washington and Oregon soldier-like ranks of Lombardy poplars stand to the defence of apple orchards; in the states of the great plains wind-breaks of hardy trees that can stand long periods of drought keep the winds from drying out the crops planted in their shelter.

**W**HERE there are such wind-breaks, or shelter-belts, it takes less corn to keep the cattle warm through the winter; it takes less fuel in the house. The chores are done easier; and trees are a sure agent in tempering the wind to the shorn lamb. Think what a host of tiny creatures would be lost each winter if it were not for their protection!

Therefore, when March winds blow, my sense of gratitude to the trees is at its strongest. With their help I can keep the coal bill down while winter is lingering in the lap of spring. I have to admit that they shut off the view of the lake from my study windows; but, on the other hand, that lake stretches out straight toward the North Pole for about fifty miles, and beyond it there is no great height of land to Lake Ontario. Beyond that not a mountain range intervenes between us and Hudson Bay. That is a clear sweep for old Boreas, and he makes the most of it. We feel that we can scarce make headway against him; we open our mouths to shout a defiance above the storm and he blows our breath down our throats. Then we come into the shelter of some great tree or of a group of trees; we can stop and gather ourselves together and take a real breath, and gain new courage to face the storm once more.

# \$300,000 FOR PINE BLISTER DISEASE, AN EFFECTIVE QUARANTINE LAW

CONGRESS passed on Sunday, March 4, just before adjournment, two amendments to the Agricultural appropriation bill which are of vital interest to members of the American Forestry Association and to all interested in forestry and lovers of trees.

The first amendment added \$300,000 to the appropriation for the investigation and eradication of the pine blister disease.

The second gave the Federal Horticultural Board much needed authority to declare effective quarantines in the case of the pine blister disease and other tree and plant diseases.

It is these two measures for which the American Forestry Association and cooperating organizations have been striving since last fall when it became apparent that vigorous measures must be taken to save the five-leaved pines of the United States and Canada which are threatened with destruction by the disease.

If this appropriation and this revised quarantine law are now supplemented by the legislatures of the states in the five-leaved pine belt passing appropriations and adopting stringent quarantine laws to enable their state authorities to deal properly with this menacing disease, there is hope that it will be prevented from spreading and perhaps be stamped out. The various states already infected and others where the disease may appear are now considering legislation to deal with the situation.

One-half of the \$300,000 appropriation will be used by the Department of Agriculture in state cooperation, providing the states do their part in providing appropriations.

The original provision in the Agricultural bill was as follows:

"For the investigation of diseases of forest and ornamental trees and shrubs, including a study of the nature and habits of the parasitic fungi causing the chestnut-tree bark disease, the white-pine blister rust, and other epidemic tree diseases, for the purpose of discovering new methods of control

and applying methods of eradication or control already discovered, \$85,915."

The amendment added the following paragraph:

"For applying such methods of eradication or control of the white-pine blister rust as in the judgment of the Secretary may be necessary, including the payment of such expenses and the employment of such persons and means in the city of Washington and elsewhere, in cooperation with such authorities of the states concerned, organizations, or individuals as he may deem necessary to accomplish such purposes, \$300,000, of which \$150,000 shall be immediately available, and in the discretion of the Secretary of Agriculture of the remaining \$150,000 no expenditures shall be made until a sum or sums at least equal to such expenditures shall have been appropriated, subscribed, or contributed by state, county, or local authorities or by individuals or organizations for the accomplishment of such purpose: Provided, That no part of the money herein appropriated shall be used to pay the cost or value of trees or other property injured or destroyed."

The existing quarantine law permitted the Federal Horticultural Board to declare a quarantine only where a dangerous plant or insect infestation was known to exist. This was entirely inadequate. What was needed was a law giving the Board power to declare a quarantine where such a quarantine was necessary to prevent the spread of the infestation. The amended law gives the Board such power and it may now declare a quarantine which will be effective in preventing the spread of the disease, in any state or territory or any portion of them, and in any section of the country.

It is expected that one of the first acts of the Board will be to establish a dead line through the great plains states in order to prevent the pine blister disease spreading into the West.

## A FEATHERED DOG IN THE MANGER

BY LEWIS E. THEISS

THE story of the dog in the manger was intended to be a take-off on humans, but the situation portrayed sometimes has its counterpart among the dumb animals. A commotion on the back porch of a Pennsylvania home led to the discovery that birds were trying to secure the dry and shriveled berries of some black alder branches that had been used for Christmas decorations and subsequently put temporarily on the porch. In order to see the birds well, these branches were at once fastened to a low limb of an elm tree that swung just outside a window.

Shortly the birds flew down to the berries and proved to be those beautiful creatures, the waxwings. Sixteen of them came to feed, singly or in groups, on the dried berries. Some of these berries, which had fallen to the ground, had been picked up by the householder and put on the window sill; and there the waxwings perched unafraid and ate, although the householder and his family stood on the other side of the glass pane watching them.

When the feast was at its height, an enormous fat robin flew down to the berries, and, darting this way and that, soon drove the waxwings away. But he did not eat the berries. In fact he showed no interest in them. When the waxwings returned, he drove them away again. Then he took his stand on a nearby tree to guard the berries. The waxwings collected in the same tree, and there they sat, eying the robin. He made no move until a waxwing tried to get a berry. Then he darted at the offender. It was a curious sight to see these birds sitting in the tree, motionless, and watching one another.

When it became perfectly evident that the robin's sole motive was to keep the other birds from food he did not want, the householder went out and threw a snowball at him. All the birds flew away. But the berries were an irresistible magnet and soon the waxwings were back. Immediately the robin dashed on the scene and drove them off. Then he perched on the tree and mounted guard.

# COLLECTING TREE AND FLOWER SPECIMENS

BY DR. R. W. SHUFELDT

**A**N invaluable aid in studying our wild and garden flowers is a good microscope, as powerful and standard a one as your purse can buy. You will not proceed very far into the field of even popular botany and wild flower study, before you find that it will require a stronger eye than the one you have in your head ere you can accurately discern all there is to be seen in a flower. Some of the modern microscopes are superb instruments; not only are they great and accurate magnifiers of minute structures, but they admit of the use of special accessories, so that one can either draw or photograph the object under examination. There are many types of fine and inexpensive microscopes on the market, which are almost indispensable to begin with, while the high-powered ones can be commanded after the student is satisfied that the study will be with him as long, perhaps, as he lives.

The forming of a working, scientific herbarium is another step in the study of flowers and it is quite a task, and requires special knowledge along a variety of lines. In the first place, you must know how to collect scientifically: to select in the field, or in nature, to speak more broadly, the class of material worthy of your care, and measuring up to what the specimen demands in any case. Always select the most perfect specimens, from root to flower. Keep collecting until the entire life-history of the plant is completely illustrated. Show the normal as well as the abnormal, and all the necessary variations of all the structures of any plant you bring in. Take leaves, for example: of course the forms assumed by them are infinite, even for the same species. Still we may, by judicious selection, very well illustrate the limits in any direc-

tion with a very few examples. A good way to study such a point as this, is to select some big oak tree, standing so far in the open that there is no danger that its fallen leaves in the autumn have become mixed up with those from any other tree. You will be surprised at the number of

forms the leaves seem to have; yet, when you have judiciously collected forty or fifty of them and arranged them in a row in your study, how few it requires to actually illustrate, not only the variation, but also the fact that the leaves belong to that particular species of oak, provided the tree you selected was not a hybrid.

You must collect your flowers, seeds, seed-pods, roots, buds, and all the rest, in the same scientific manner. Collecting-boxes for use in the field can be obtained at any first-class naturalists' supply establishment, anywhere from fifty cents to two dollars and a half. Get the best every time. There are also admirable contrivances for the pressing of flowers manufactured, with instructions for using them, such as Riker's Botanical Press; wire presses, and plant presses of various models; all are excellent as well as indispensable.

In pressing flowers one must use every bit of one's scientific and artistic sense, in order that the pressed specimen shall exhibit every point and character it possesses, and every point one desires to show. One should likewise be familiar with all that is known up to date with respect to preserving the color of flowers, leaves, and other plant-structures during their pressing and preparation for permanent preservation.

In the summer, after any of your specimens are pressed, you may consign them to temporary folders until your



INSTRUMENTS USED IN PRESERVATION OF PLANTS

Behind the microscope shown in this picture is to be seen one of the covers (Venus covers) used in the Bureau of Plant Industry, of the United States Department of Agriculture at Washington. The specimen is a Rose Marsh Mallow (*Hibiscus moscheutos*), and forms a part of the Economic Collection. Note how the pressed flower is always fastened very carefully with little gummed slips, in the manner shown, on the right-hand page. Note the "data label" in the lower right-hand corner, giving full information about the specimen. The instrument shown is the "Spencer Dissecting Microscope," and near it are the dissecting needles, extra objective, and spring forceps with curved ends. One of these microscopes may be purchased for \$9.00. Directions will later be given for the use of this instrument, with further details on plant preservation.

winter work and studies come around. The larger magazines may be pressed into service for this purpose, while the chief thing to be attended to is to see well to it that your stack is kept in a dry place with a proper weight on it, and where no one will handle it but yourself. When the season's botanizing is over with, you can enter upon the most inspiring and delightful task of starting your permanent herbarium. Special papers come for this, and they are of two kinds: one for the leaves (white or cream), and one for the covers (tan or brown). They are both after the order of parchment paper—heavy, durable, untearable, and of heavy weight. They should be of folio size; each page devoted to a specimen, unless it be too small, when several may be artistically arranged on one page. In the lower left-hand corner there should appear, neatly printed, written, or typewritten, the following data: the scientific name of the specimen according to the most recent authorities; the most widely employed popular name in brackets; the place and date of collection; the name of the collector, with a few lines on the color of the flowers and leaves; sexual characters, and the normal form and color of parts that become much distorted and changed through the process of pressing.

These folios should, as they are being completed, or even when in actual use and being continually added to, be filed in a special cabinet, with the compartments arranged according to the system you are employing in your work as to orders, genera, and so on.

My hope is that the few paragraphs I have been able to give here on this subject will induce many a boy and girl in various parts of the country to start an herbarium of the trees, shrubs, and plants of the region in which they live. Later I will give other rules for the preservation and illustration of plant-life, such as methods of taking imprints of leaves for comparison, and so on.

There is still another powerful adjunct to the flower-student's equipment, which must not be overlooked in this preliminary chapter on the subject: the photographic camera. Flower photography is a very expensive and often very difficult pursuit. Many things enter into it requiring special skill, long training, and experience, before one can hope to be at all successful. Some of the main things to be considered are: the selection of a complete and scientific outfit for studio and field-photography of flowers; as complete a knowledge as possible of the flowers to be photographed, and the use of a camera and its accessories in the field under all conditions, such as time, place, and weather. Your artistic sense will come powerfully into play here, in the studio as well as in the field, and you will soon realize that the point of view from which a flower, a shrub, or a tree is taken makes all the difference in the world when the final result of the operation appears on paper, or is thrown upon the screen at a lecture. Much more may be said on this most important subject, so I will, from time to time, furnish brief, illustrated accounts in *AMERICAN FORESTRY* as to how all manner of specimens in the vegetable world should be photographed.

#### NATIONAL FORESTS GIVEN PERMANENCE

AS a result of land classification work, more than eight million acres were eliminated from the National Forests in the last fiscal year, and, in addition, over 1100 individual tracts within the Forests were made available for homestead entry, according to the annual report of Henry S. Graves, Chief of the Forest Service, which emphasizes the necessarily permanent character of the National Forests, and points out the importance of definitely determining the status of the land which the Forests contain.

"The National Forests," says Mr. Graves, "are gaining in stability through the land classification work. It is important for the general public to know what lands are to be retained permanently by the Government, and what lands will be available for agricultural settlement. The whole Forest enterprise is based on the assumption of permanence. All the work is conducted with a view to constructive development of the property and its constantly increasing usefulness.

"Every timber sale is made with a view to future consequences. The work of protection from fire is not only to prevent the destruction of standing timber but to save young growth and encourage the natural reproduction on lands which have been injured by previous abuse. Millions of trees are established each year which will not come to maturity for a very long time. A regulated system of grazing looks to the upbuilding of the Forest range, as well as to its present use; and the investment of public funds in extensive improvements is predicated on the permanence of the Government enterprise."

The need for consolidating land ownership where Government and private lands are interlocked is pointed out by Mr. Graves. Congress has, he states, already authorized an exchange of lands on the Florida, the Oregon, and the Whitman National Forests. Under the same policy exchanges have been or are being negotiated with South Dakota, Montana, Idaho, and Washington for school lands in the National Forests located in those states. The consummation of three of these exchanges now awaits final approval by Congress.

Other measures which will have a far-reaching significance in relation to the permanence of the National Forests, says the report, are the appropriation by Congress at its last session of ten million dollars for the construction of roads within the Forests and that of three million dollars to extend the National Forests in the eastern mountains by purchase. "The appropriation for the construction of roads will permit the opening up of regions heretofore inaccessible, will greatly increase the use of the resources in the Forests, will shorten lines of travel across the states and between communities, will stimulate prospecting and mining in mineral regions and will aid community upbuilding.

The importance of having public Forests at the headwaters of important streams has been recognized and greatly emphasized through the appropriation of \$3,000,000 for continued purchases of land begun under the so-called Weeks Law.

## THAT TENT IN THE TREE

**D**OUBTLESS a tree is as odd a place as one would choose to pitch a tent, but the birds are not the only ones that select trees for a summer home; the caterpillar uses them as a summer resort and from now on is the time to keep a sharp lookout for the pests. True, the caterpillar does not pick out the same localities every year, for he seems as particular as people when it comes to find-



THE DESTRUCTIVE CATERPILLAR

Having an appetite that is seemingly never satisfied, the apple-tree tent caterpillars should be destroyed wherever he is found.

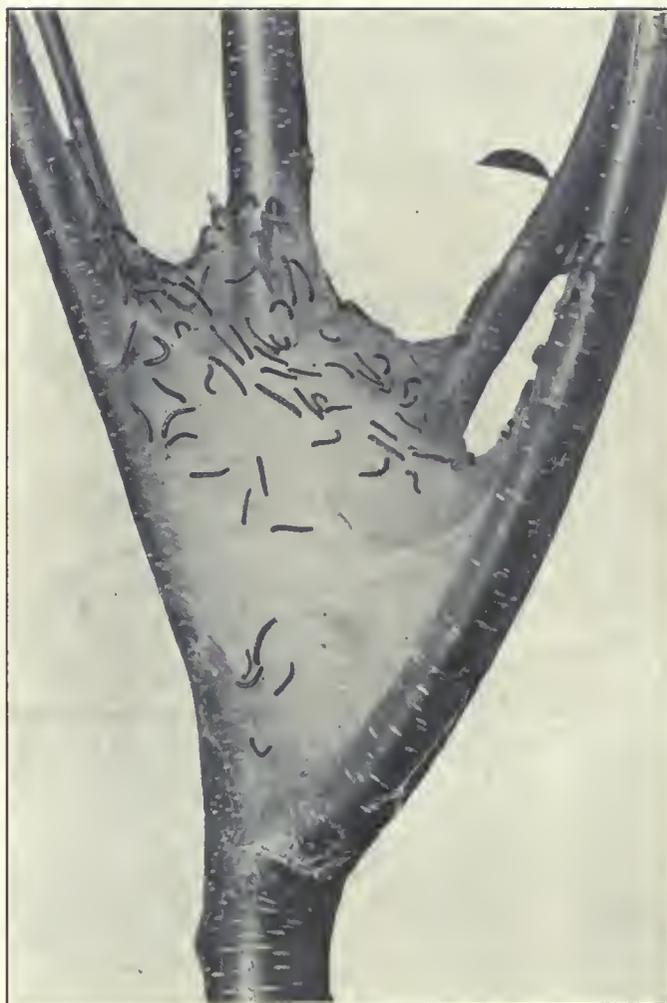
ing a new place to spend the summer. His appearance, however, is always an event; so much so in fact that the caterpillar's visits have been known as caterpillar years. The first of these recorded in this country was in 1646, when the historian of the Bay State Colony mentions the pests. Again in 1649 the new settlers suffered heavy losses from this fruit pest.

Wild cherry leaves are the favorite dish of the caterpillar and he also likes an apple or a plum leaf, although he does not confine his diet to these. The caterpillar will find his way, in the absence of his favorites, to the peach, pear, or rose and even to the beech, elm, and maple. He does this, too, at a time when the trees most need their foliage, and when he gets through, the tree is usually bare of leaves.

With the approach of spring an organized campaign can be inaugurated against the pest. Such organizations as the Boy Scouts could divide a town into sections and thus systematically examine every tree and fence corner. Recently the Boy Scouts of Canton, Ohio, campaigned

against the Tussock Moth with such results that they were highly praised by Mayor Stolberg.

A. L. Quaintance, in charge of the insidious fruit insect investigations for the Department of Agriculture, tells, in an article on this subject, how school children can help in saving the fruit. According to a report sent in by Myron A. Cobb, of the Central State Normal School at Mt. Pleasant, Michigan, the tent caterpillar had decided to spend the summer in that locality. Circulars were issued to rural schools and a "tent caterpillar week"



NEST OF THE TENT CATERPILLAR

The nest of this destructive insect is found in neglected orchards and in trees along roadsides. If these nests are low they may be destroyed by hand, but if out of reach they may be destroyed by some form of torch on a pole.

designated. The Elk Rapids Business Men's Association offered prizes for the greatest number of egg masses destroyed. The results were surprising.

Dr. M. R. Peck, of Cornwall, New York, organized the children of his neighborhood. The youngsters were instructed in destroying the "tents" and rewards were offered for the greatest number of egg clusters. The collection more than filled a bushel basket. What these places have done can be done anywhere if some person or the towns' newspapers take up the campaign and interest

the public by pointing out the tremendous loss from these pests every year.

As to methods of destroying the caterpillars Professor Quaintance suggests two. He says:

"Neglect to search out the egg masses during the winter will result in the appearance of the larvæ about the time the trees are putting forth foliage. The nests, at first small, are soon so increased in size as to attract attention. If the caterpillars are destroyed as soon as the small nests are detected, this will prevent further defoliation and the rule should be adopted to destroy them as soon as detected. In this work either of two methods may be employed, destruction by hand or with a torch.

"When convenient the nests may be torn out with a brush, with gloved hand, or otherwise, and the larvæ crushed on the ground, care being taken to destroy any caterpillars which may have remained on the tree.

"Use of a torch to burn out the nests will often be found convenient in the higher parts of the tree. An asbestos torch will be satisfactory, or one may be made by tying rags to a pole. Saturate either kind with kerosene. In using the torch great care is needed that no important injury be done the tree."

There are spraying methods, but these are not recommended in campaigns of this kind and should be only under the direct supervision of experts.

#### INDIA'S FOREST MANAGEMENT

A MEMBER of the Indian Forest Service, stationed at Mangalore, South Canara, South India, writes the following interesting letter:

The Editor, AMERICAN FORESTRY:

"I see your paper regularly and have a great admiration for it and for the vigorous fight being made in its pages for a sane Forest Policy by the state.

"I am not a United States citizen, nor do I know personally any member of the American Forestry Association, but if eligible I should like to join the Association.

"It is probably impossible for us in this country to realize the opposition which you are up against.

"Here the Government early secured complete control of practically all important forest tracts, and besides vast areas more or less wooded where conservation was deemed advisable. These great state properties, known as Reserved Forests, are administered by the Forest Service with something like a free hand, backed by the all-comprehending Forest Act.

"No important operations are carried on in the Reserved Forests except according to the provisions of carefully drawn up and duly sanctioned working plans, which prescribe, for a term of years, everything which shall be done in that forest. Prominent among such provisions are measures for improving the growing stock, which, with the soil, form the Capital on which fellings should represent only the naturally recurring Interest.

"It seems scarcely credible that Canada, for instance, should have yet to initiate her first working plan, and that the United States should be not much more advanced.

"Though it may be true, however, that our Indian Forests are steadily improving, while a large part of the timber stands of North America are deteriorating or even vanishing, yet I believe you would be astonished at the primitive methods of lumbering usually in vogue in India. There is little doubt that judicious expenditure on improved communications would enormously increase, say double or treble, the output without prejudice to situation or exceeding the possibility of the forests."

#### LOWEST FOREST FIRE LOSS

A LOSS to the Government of \$162,385 in timber, forage and young growth was caused by fires on the National Forests in 1916, according to statistics compiled by the Forest Service. Although there was more than the average number of fires, the loss is the smallest that has been sustained from fires since the National Forests were established. A favorable season in the regions where the most severe damage is usually sustained is given as the chief reason for the relatively small loss.

A total of 299,377 acres of Government land burned over. In addition to this, the fires covered 123,160 acres of privately owned land in the National Forests where timber valued at \$36,214 was consumed. About 44 per cent of the total area burned was located in the National Forests of Arkansas and Florida.

Of the 5655 fires which occurred, 4133, or 73 per cent, were confined to areas of less than 10 acres. Many of these small fires, according to the Forest Service, might have developed into serious conflagrations had they not been extinguished in their incipency.

The average cost of fighting each fire was approximately half that of former years. Lightning was the chief cause of the fires and was responsible for 23 per cent of all those which occurred. The causes of 18 per cent were unknown, while careless campers started 17 per cent. There was a slight increase in the fires of incendiary origin, as well as those started by sparks from locomotives. With the exception of those caused by lightning, all the fires were due to human agencies. One fire in Idaho which burned 600,000 feet of timber was caused by the carelessness of a ten-year-old boy.

The season was one of particular severity in the southwest, as well as parts of Colorado and Wyoming, where local weather conditions created at times a grave situation. In Washington heavy loss was caused by fires which started in inaccessible places and which the rangers were unable to reach for several days because of the lack of trails.

TOWN forests are featured in the annual report of the Massachusetts Forestry Association just issued by Secretary H. A. Reynolds. It is announced that last year saw two more town forests started, those in Brookline and Walpole, and seven other towns are preparing to establish town forests during 1917. The association has offered to plant fifty acres to young trees in the town forest which makes the best showing among the first ten to be established in the state.

# PLANTING SUGGESTIONS FOR APRIL

BY J. J. LEVISON, M.F.,  
FORESTER TO THE CITY OF NEW YORK

**A**PRIL is the month when almost everyone is interested in some form of planting. We may be contemplating the planting of large trees on the lawn or of very small trees in the woodland. Our interest may be centered in setting out shade trees, fruit trees, shrubbery beds, vines or flowers. Every one of these is a field in itself, full of detail and special application. Just how to plant and what to plant, in each case, are questions of special local bearing and can only be discussed on general principles. At this writing we will consider the more important of them as well as the most desirable plants suitable for different purposes.

First of all, the plants should be selected at a nursery as early as possible in order to prevent delay in transportation when the season for planting arrives, in order to secure the plants at the lowest prices and to enable the nurseryman to ship the stock at the earliest possible moment.

With the stock ordered, one's attention should next be directed towards obtaining the proper soil and planning for the location of the individual plants. Where extensive plantations or beds of definite design are contemplated, it is always advisable to prepare a sketch and to plan everything on paper before undertaking the actual field work. The planting accessories, such as spades, trowels, hand shears, etc., should also be provided. With these preliminary steps considered, we are now prepared to undertake the actual planting. We dig the hole and replace the old impoverished soil with rich mellow loam. We see that the roots are protected and kept moist from the time of their arrival until the time they are placed in the soil. Too much stress cannot be laid upon this point, because even a few minutes' exposure may injure the fibrous roots which are the chief feeders of the tree.

Before placing the tree in the pit, the roots should be examined, all bruised roots cut off smoothly and the ends covered with coal tar. This prevents root decay and stimulates the formation of new fibrous rootlets. The tree should then be placed in the hole at the same depth as it stood in the nursery. The roots should be carefully spread out and mellow soil worked in tightly with the fingers among the fine rootlets. Every root fibre is thus brought in contact with the rich soil. More good soil should then be added (in layers) and firmly stamped and, before the last layer is filled in, thoroughly watered. The last layer should remain loose, so that it may act as a mulch or an absorbent of moisture. The crown of the

tree should be slightly trimmed in order to equalize the loss of roots by a corresponding decrease in leaf-surface. Where there is danger of swaying, the tree should then be fastened to a stake. These various stages of the planting process should receive particular care and attention.

*What to Plant:* There is often a wide difference in soil, moisture content and atmospheric conditions of locations which are not far apart. The plant suitable for one place may not suit at all for another place of similar outward appearance. I therefore hesitate very much to suggest any definite list covering all conditions and purposes. Yet a brief outline of the four most desirable trees for important special purposes may prove of service, and the following assortment is offered as a suggestion:

*For city streets:* Oriental Sycamore, Norway Maple, Red Oak, Carolina Poplar (where conditions for tree growth are unfavorable).

*For suburban streets:* American Elm, European Linden, Pin Oak, Sugar Maple.

*For specimens on the lawn:* European Beech and its weeping and cut leaf varieties, Pin Oak, Magnolias, Ginkgo or Maidenhair tree.

*For evergreen screen:* Hemlock, White Pine, White Spruce, Red Cedar.

*For deciduous screen:* Beech trees, Willow trees, Lombardy Poplars, Ash Leaf Maple.

*For flowering trees:* Dogwoods, Hawthorns, Magnolias, Horse Chestnuts.

*For flowering shrubs:* Azaleas, Forsythias, Weigelas, Spiræas.

*Shrubs with colored berries:* Barberry, Bittersweet, Coral Berry, Snowberry.

*Trees that color in the fall:* Sweet Gum, Andromeda Arborea, Japanese Maple, Sour Gum or Pepperidge.

*Shrubs that color in the fall:* Sumac, Eonymus Alatus, Viburnums, White Flowering Dogwood.

*Trees and shrubs with interesting bark:* White Birch, American Beech, Red Stemmed Dogwood (Siberica variety), Yellow Stemmed Dogwood.

*Plants for covering the ground:* Vinca Minor, Pachysandra, Honeysuckle, English Ivy.

*Vines to hold banks:* Rosa Wichuraiana, Hall's Honeysuckle, Matrimony Vine, Forsythia Suspensa.

*For seashore planting:* Willows, Silver-leaf Poplar, Mulberry, Hydrangeas.

*Trees and shrubs for deep shade:* Hemlock, Beech, Viburnums, Privets.

## ADVICE FOR MARCH

1. Prune apple and pear trees. Remove all dead branches, thin out carefully and cut from the top and sides so as to form low, compact heads.

2. Before the leaf buds burst, spray for San José scale.

It may be expected on fruit trees, lilacs, Japanese quince, dogwood, mountain ash, black and white ash, and elm. Use kerosene emulsion one to ten parts of water or some other well-recommended spraying preparation.

3. Remove and burn the cedar apples from the cedar trees. This will prevent the fungus from spreading to the apple trees and hawthorns in the summer time.

4. Prune the shrubs that bloom in the fall, but not the ones that bloom in the early spring. Examples of the former are hydrangeas and Rose of Sharon. Examples of the latter are Forsythias and spiræas.

5. Spray for cottony maple scale. One may expect this insect particularly on soft maples.

6. Prepare for planting. Order plants, have soil and manure in readiness and see that the tools are in good condition. In case of street tree planting also cut the holes in the sidewalk and prepare the stakes, guards, gratings and hose.

#### QUESTIONS AND ANSWERS

Q. I have a ranch in southern Kansas at the headwaters of the Medicine River, about two-thirds of the way across the state going west from the Missouri River. The climate is a typical continental climate, hot in summer and often quite cold in winter. There is generally a fair rainfall in spring and early summer, but from the middle of July till March there is generally comparatively little rain. Some of the land is irrigated, but most of it is not. Much of the land is broken, affording hill slopes with any desired exposure. There are canyons full of trees with walls fifty feet high. I desire to plant nut trees of all the kinds that I can hope to grow under conditions there and want necessary information as to where and how to secure the best seedlings and transplants, how many it would be desirable to plant of each species, and how and when this should be done.

E. D. R., *New Haven, Connecticut.*

A. We would suggest as the only practicable nut trees for planting in your locality black walnut, butternut, Japan chestnut and hickory. Young trees, either seedlings or transplants, may be had from nurseries in the prairie states, such as the D. Hill Company, Dundee, Illinois, or Storrs & Harrison, Painesville, Ohio. Planting is best done in the early spring, digging holes three feet wide and sufficiently deep to well contain the roots, using dynamite to break up troublesome rocks or hard-pan. Fill in with top soil, using no fertilizers, and leave a depression up the slopes to catch the rainfall. Keep circles three feet or more wide about each tree well cultivated for a year or more and protect from rabbits and vermin with wire or veneer tree guards. I would suggest planting about equal numbers of each species, setting the walnuts and hickories thirty feet apart and the chestnuts and butternuts twenty feet apart each way. You will note veneer tree guards advertised by the Burlington Basket Company in the December issue of AMERICAN FORESTRY.

Q. We have some pear trees about 20 years old, dying from what we thought to be pear blight, the trunks are dying. It's new to me, and I have not seen anything just like it. Is there another pear blight attacking in this way? I have been used to see branches dying back, which can readily be checked, but when the trunk itself gets diseased, it is a different proposition. Can you tell us what to do?

A. I am sorry to hear the condition of your trees, but last summer has been a very unfavorable season for pear injury such as you describe. It has been quite general in New York and Connecticut, affecting the trunks of the trees as well as the branches. Cutting out the affected parts is the best remedy we can suggest. Would also suggest that you call upon your State Agricultural Experiment Station to send a representative to examine the trees and advise you. This should be done next spring.

Q. Lawn bowling requires a green about 125 feet square, or larger. It seems a rather difficult matter to get it perfectly level and with the right kind of grass so as to make it perfectly level and true for lawn bowling, such as the greens they have in Canada, some of which are most beautiful and as level as a billiard table. If you have made any investigation of this subject and can give us any information, it will be fully appreciated. Will it be necessary to cover up for the winter a new lawn planted this fall, and what is the best way to protect it during the winter?

A. I am sorry to say that I have not been able to get any very definite recommendations, even from the experts here, with reference to overcoming the difficulties encountered in the preparation of your green for lawn bowling. I can say, in a general way, however, that the ground should be thoroughly prepared early next spring. Plow deep, put into the ground some well-rotted manure or some humus, and harrow. Then seed with a combination of red top, Kentucky blue, Rhode Island bent, and a little white clover—the first three in equal proportions. Then roll and do nothing further for winter protection. Under separate cover I am sending you a special bulletin relative to the cultivation of lawns.

Q. I should like to know which nut trees grow best in the vicinity of Sullivan County, New York.

Mrs. P. J. S., *New York City.*

A. You should have success with the cultivation of the following nut trees in the vicinity of Sullivan County, New York: English walnut, black walnut, pecan hickory (both shagbark and mockernut), butternut, and American beech.

Q. I own a summer home of about 26 acres, near Briarcliff Manor, N. Y. Having lost all my chestnut trees, I find that my hickory trees are now rapidly being destroyed by the borer. Last year I cut down and removed two fine trees, riddled with holes, and now I am losing another. What can I do to protect those still left?

C. F. S., *New York City.*

A. I am sorry to know that you are losing your trees, and want to suggest the following three things as your best method of protecting the remainder. Mark all the hopelessly infested trees in the fall, before the leaves drop, and remove and burn these trees before the following May. This is the most effective and dependable method of all. It is difficult to tell an infested tree at this season of the year, but if you are sure of any, remove and burn them before May of 1917. Remove and burn the branches infested with these insects. Such infestation will become apparent and the branches will show themselves as dead or dying some time in September or early October. You might try spraying the more valuable trees with a special formula put up by the Interstate Chemical Company, Bayview Avenue, Jersey City, N. J. This should be done in early July. Would recommend you to a special article on the hickory borer, in AMERICAN FORESTRY for July, 1915.

Q. What is the best time to trim box hedges and how often should they be cut?

B. R., *Plainfield, New Jersey.*

A. Box hedges can best be trimmed in early May when the growth first starts. Hedges should be sheared lightly. This work could also be repeated in August, but the early spring is the best time.

Q. I would like to get some advice on the transplanting of three arbor-vitæ trees which I must remove, as they are directly in line of where I am going to move a house; these trees are 35 to 50 years old, about 12 inches in diameter at the base and 30 to 40 feet high. Is it possible to move trees this size and this specie with any certainty of their living? I also have a large white birch about 30 feet high and about 15 inches in diameter, a maple about a foot in diameter, and an Italian chestnut about

the same in diameter, but of course not so high, which I want to transplant. If you can give me any advice as to how this work should be done, I would greatly appreciate it. They have to be moved within the next couple of weeks, and I would like to know about how far from the trunks these roots should be cut, and whether it is advisable to take the trees up now with whatever dirt that would adhere to the roots, or dig a ditch around and wait for a ball to freeze, putting manure and other protective material in the ditch as a protection from frost for the ends of the roots.

C. H. S., *Noroton, Connecticut.*

A. It is not a very easy matter to transplant arbor-vitæ trees as old as yours, but with proper methods and care it can be done with a great degree of safety. These trees should be moved with an unbroken ball of soil at least 8 feet in diameter. It would be necessary to dig a trench around the trees about five feet from the trunks and then, in lifting the trees, barricade the ball so that it will not break in the process of transplanting. Messrs. Isaac Hicks and Sons, of Westbury, Long Island, N. Y., and Messrs. Louis and Valentine, Roslyn, Long Island, make a specialty of moving trees of that size, and if you write to them about it I am sure they can do the work in a most satisfactory manner. The white birch about 30 feet high is a more risky proposition to transplant at this time of the year, and I doubt very much whether you can save it. The maple and the chestnut can be moved in the same manner as the arbor-vitæ. It is too bad if these trees have to be moved at the present time, for if the work could be postponed to the early spring it would be a far more ideal time to do it.

Q. I desire some information regarding trees. On a farm near here trees will not grow. The people have tried several kinds, but all die off in no time. The soil is sandy. Long ago the valley was a lake. There is about three inches of real loam on the top and all the rest down is sand. Water is reached at from eight to ten feet. Terrific storms sweep over the valley both in summer and in winter. Farmers in that valley would like to plant trees as a wind-break and also to make the home look better. The winters are very cold and the sand is cold in winter, spring, and autumn. One farmer who has heard that certain chestnut trees stand cold well has thought of planting some. Now can you tell me what trees would be good for that kind of conditions? The soil seems to lack humus or something, for no matter how much you fertilize, it does not seem to decay and mix with the soil at all.

M. S., *Greeley, Colorado.*

A. I do not see why trees that thrive in the region about Greeley should not succeed on the farm you mention. The honey locust, especially the thornless variety; the hackberry, including the common hackberry and the Mississippi hackberry; the black locust, the green ash, and, where it is possible to supply water for the first few years, the American elm, are the trees that we suggest for this part of the country, and they seem usually to succeed. Have you tried any of these? If you have, and they have failed, there must be some other unusual local condition that is the cause of the difficulty. Soil of the character you describe needs the addition of all of the organic matter that it is possible to incorporate with it.

Q. Your December number suggests fertilizing with well-rotted manure the soil about trees requiring nutriment. This I have tried, but with, in my opinion, very poor results—excellent to the surface soil—but distinctly questionable as regards the trees themselves. It is difficult by this means to penetrate through the sub-soil to the fibrous roots, whereas if holes were bored with a sharp crowbar, working the bar when driven, making the aperture larger at the ground surface, and the holes driven a few feet inside of the greatest circumference of the branches and these filled at the season with a proper fertilizer, infinitely better results should be obtained; but the question arises, what combination should be used? I have asked various authorities and all suggest something entirely different from the other—one

even suggesting Rochelle salts, which he has used with wonderful results. I would much appreciate any suggestions you might offer in this connection, as I have many white pines, oaks, maples, and elms that require drastic treatment, if they are to be saved. Would you think well of cow manure, ground bone-meal, and phosphates mixed in suitable proportion?

H. F. G. W., *Rye, New York.*

A. My idea of fertilizing trees with well-rotted manure is to dig a trench from two to four feet wide around the tree at a distance of four to six feet from the trunk. The trench should be about two feet deep and filled with one-third well-rotted manure and two-thirds good soil. Then I would place manure in narrow trenches running like the spokes of a wheel and radiating from the main trench toward the trunk. I have done this for twelve years to the trees in Prospect Park, Brooklyn, of which I have had charge for that period, and also to many of the trees in New York City, and always found this method to work well. My idea in using manure rather than commercial fertilizer is to supply the roots not only with plant food, but also to make that particular part of the soil serve as a mulch for the retention of moisture. After a while the roots penetrate into this new rich layer and form many new fine fibrous rootlets, and this is exactly the kind of action intended to stimulate by digging the trench and practically root pruning many of the large roots. I have even carried this sort of work to valuable evergreens, such as cedars and pines, by the thousands on 60 or more of the largest estates on Long Island. On Mr. C. Oliver Iselin's estate we have treated a whole cedar hill of large extent in this way. The idea of using commercial fertilizer such as bone-meal, phosphate, muriate of potash, etc., is very serviceable in many cases, but more to stimulate growth rather than to produce a permanent improved condition of the surrounding soil. I have used the commercial fertilizers in very large quantities, even this fall, but in each case with special care and for a special purpose.

Q. I have had a granolithic walk laid close by a line of fine elm trees. The work was done some years ago, and in order to get a suitable foundation, many elm roots were cut away. Since that time many small branches of these trees have died, and I suppose on account of the loss of roots. Can anything be done to preserve the trees now?

B. P., *Brunswick, Maine.*

A. The death of small branches on the elm trees is very likely due to the earlier cutting of the roots. Perhaps when larger roots were cut they were not covered with coal tar and have in consequence started to decay. This would be a very difficult condition to overcome at this time, except by exposing these wounds and treating them. If decay did not set in, then the best thing to do is to dig in well-rotted manure around the ends of the roots, especially on that side of the tree where there is a chance for new rootlets to form. This will stimulate root formation. The trees are very likely also suffering from drought, and thorough cultivation and watering of the ground around the base of the trees to a distance of at least eight feet from the trunks in the summer months would do much to keep many of the branches alive.

Q. Can you tell me what a concrete storage house for a 10-acre nursery would cost and how large it would be? I would also like to know how many apple, peach, and pear trees can be grown to the acre in the nursery row. All I care for is the approximate number.

A. H. H., *Detroit, Michigan.*

A. Replying to your inquiry relative to a concrete storage house for a 10-acre nursery, I would say that it would cost from \$500 up, but the best thing you can do is to get quotations from firms specializing in this sort of work.

Apple and pear trees should be planted twenty to twenty-five feet apart, in alternate rows, with about twelve feet between the rows. Plant peach trees about ten feet apart. I am sending you a bulletin on fruit cultivation.

# EDITORIAL

## EFFICIENCY AND ECONOMY IN OREGON

**F**OR several years prior to 1911, the state of Oregon managed its forest fire protection under a state official who combined the functions of forest fire warden with those of fish and game protection. His field force was supposed to fight fire, and at the same time to enforce the game laws. This plan has met with enthusiastic advocacy of efficiency and economy commissions and others in many states, but has been universally opposed by foresters on the ground that it is inefficient, and that men burdened with both of these lines are neither good fire wardens nor good game wardens.

But for the time being, consolidation won, and one man managed two departments, thus saving the state at least \$2000 in overhead expense. But, unfortunately, the forest fires continued to burn despite the alleged advantages of combinations. In the final year of this disastrous period of 1910, Oregon lost timber valued at \$1,640,997 on the stump—a loss which must be multiplied by five when we consider its value in wages and products for manufacture. The average annual loss for the three years 1908, 1909 and 1910 was \$663,935, and the total \$1,991,806.

In that year, the people of Oregon, having for the time being had enough of combination commissions as a means of fighting fires, decided to specialize. A separate forestry board of seven unpaid members was created, the Agricultural College, the State Grange, the State Forest Fire Association, the Wool Growers' Association, the Lumber Manufacturers' Association, and the United States Forest Service being represented. The Governor was a member of the Board. This Board was given power to appoint its own executive agent, who should be the state forest fire warden, free from political pressure and with no duties other than to see that forest fires in Oregon were suppressed.

During the six years following, under this system, with conditions fully as hazardous, the annual loss from fire has been but \$16,254, which is 2½ per cent of the average for the three previous years, an increase in efficiency of 4000 per cent. This state work is conducted at an expense to the state of about \$17,000 per year, out of a total of \$93,000, the remainder being furnished by land owners, and by Federal cooperation, in the knowledge that it is well spent and efficiently administered. The losses in 1915 were but \$9333, and in 1916, \$905. In spite of this fact, the legislature two years ago again endeavored to combine this department with others under one of the familiar efficiency and economy programs, and only the desperate resistance of those whose interests lay in securing actual protection of state timber from fire secured the defeat of the measure.

But neither Oregon nor any other state in which forestry, under the Board system, has by the employment of technical men reached a condition of true efficiency, need

hope to avoid further well-meaning but misguided efforts at improving the machinery of government, until the whole matter is threshed out and the public at large recognizes the serious flaws which cause this theory of combination to fail in practice. That this leaven of education is working in Oregon is evident. In the *Oregon Voter* of January 27th appears the following:

### CONSOLIDATION

**"In this mania for consolidation of state officers and commissions, would it not be well for thoughtful people to consider whether the interests of true economy and efficiency will be advanced by wholesale bunching?"**

"Is one paid political appointee or a paid commission likely to be more economical in the conduct of a lot of state work **with which he or it is entirely unfamiliar** than would be separate unpaid commissions, the members of which are devoting time, energy and judgment to doing public work well for the sake of the public weal?"

"Many of the commissions which it is proposed to consolidate are doing splendid, efficient work, because **the members of those commissions understand what they are doing and have their hearts in the work. Will there be economy in centralizing this work in the hands of a few who have no enthusiasm for it or interest in it beyond that which is hoped for from paid appointees?"**

On this basis, backed by observations of the actual experiences in the thirty or more states which have forestry departments, the American Forestry Association is vigorously opposing the proposed consolidation of forestry with other state departments, especially in Minnesota, Indiana and Vermont, which are now before the legislatures of those states. True economy and efficiency in state departments does not consist of eliminating the boards of directors for important state enterprises, boards of men carefully selected and appointed without salary to supervise the work in the public interest and to substitute therefor a single high-salaried appointee, who, unless all precedents fail, must inevitably be more or less influenced by the system of party spoils to which he owes his office.

If what we have is good, let us hold fast to it, and by demanding cause for every change proposed, force the movement for consolidation to proceed along lines which will safeguard and improve the public welfare, instead of plunging the entire fabric of the state machinery into a political abyss from which it may take a generation to recover.

## INCREASING THE GRAZING FEES ON NATIONAL FORESTS

**T**HE growing efficiency with which national property in the West is being administered is nowhere more strikingly shown than in handling the grazing business on the National Forests and Indian Reservations. The policy of charging fees for grazing, inaugurated by the Forest Service in 1905, was later adopted by the Department of the Interior on the reservations, but was never extended to the public lands.

Grazing privileges on Indian lands are auctioned to the highest bidder under sealed bids on five-year contracts. In this way the market value of the grazing is actually secured. But the system inevitably leads to few and large units, controlled by the larger and wealthier organizations or individuals. The method brings in the maximum revenue to the Indian funds at least expense for administration.

The Forest Service has pursued a different policy. Not having the Indians as their sole beneficiary, they were guided by the principle of the greatest good to the greatest number. In contrast to Indian Reservations, National Forests are opened to settlement wherever agricultural lands are found within their boundaries. One of the chief sources of income for the homesteader is grazing. But he has at most but a few head of stock, and his chances in the free-for-all scramble on the public range are very poor. A policy of large units, auctioned grazing privileges and fencing would inevitably freeze out the small man on National Forests.

To prevent this, the Forest Service created preferential rights in favor of the settler and home-builder. Ten head of stock are grazed free. The remaining carrying capacity is distributed, first to the settler and what is left goes to the stockmen with larger herds or flocks. Grazing permits are for one year, and, to make room for new homesteaders, the number of stock grazed on a permit may be reduced, this reduction to fall on the larger permittees. Under this system, the Forest Service now issues 33,300 separate grazing permits.

Meanwhile, the grazing privilege became more valuable for many well-known causes, chief of which were the growing scarcity of free range and the higher price of meat. The prices received for grazing on Indian, state, railroad and private lands rose accordingly—the fees charged on National Forests remained stationary. Finally, the discrepancy became too great to be further tolerated and the Service gave notice of an increase, which in three years' time would double the present scale of charges.

The various livestock associations uniformly protested against this increase, but the stockmen were united

in support of the system, at the established rates! To quote from a pamphlet recently issued by a stockman in Arizona:

"The Forest Service have promulgated and have now in force a regulated system of grazing on their Forests of which they may justly be proud, covering an almost unbelievable range of conditions as wide as this great country itself.

"The stockmen do not fear, but favor the regulation of their business based upon fairness and the greatest good to the greatest number."

But they quite naturally desired to secure these privileges at as low a cost as possible, and if protests would accomplish this, they were going to protest.

So long as exclusive fenced units are denied, and the gateway of opportunity held open for new permittees, National Forest grazing privileges are not worth as much per head as Indian or private grazing. But the Forest Service should not permit unfair privileges by allowing grazing on these Forests at less than real value. Not only is the Government at present meeting an annual deficit of over \$2,000,000 in administration while the stockmen get grazing for half what it is worth, but the states, through their county, school and road funds, lose 35 per cent of the gross revenue which they should receive from this source in lieu of taxes on the grazing lands.

The result of this agitation was not all that the friends of the National Forest Administration could wish. In spite of the testimony of the grazing experts of the Forest Service, the Department of Agriculture, after a final hearing, reduced its proposed increase from 33½ to 25 per cent, and declared that further increases should be contingent upon future investigations of the actual value of the grazing privileges on each separate forest. Encouraged by this success, the agitation against these normal increases is bound to continue in full force.

In these contests between interests which have special privileges to defend, and the public, it too often happens that the special users are well organized and ably represented, and that the interests of the general public do not receive as vigorous and adequate a presentation as they should. The American Forestry Association desires to see such of our national resources as are retained in public ownership administered in absolute fairness to the user. But in a competitive commercial business such as grazing, or timber sales, justice, both to the public and to other individuals in the same business, demands that forage as well as timber be sold for as nearly as possible what it is actually worth.

**C**ONSERVATION of life and limb in the lumber industry is said to be one of the biggest problems now confronting the nation's lumbermen. Habitual carelessness is reported responsible for ninety per cent of all industrial accidents, and the subsequent condition of the injured, involving lost time, lost faculties, and even loss of life, depends on proper attention the first few minutes after an accident, pending the arrival of a physician.

**O**FFICIALS of the Pennsylvania Department of Forestry are much encouraged by the replies received to a circular letter on reforestation, addressed several weeks ago to all the water companies in the state. To date, ninety-five water companies have written to the Department stating that they are interested in restoring tree cover to the hills on their watersheds, and applications are listed for over 100,000 trees to be used for this purpose.

### Forest Fire-bugs Prosecuted

Setting forest fires in Pennsylvania is no longer the pleasant pastime it used to be. Since the legislature of 1915 put teeth into the forest fire law and provided for the establishment of a bureau of forest protection within the Department of Forestry, more prosecutions and investigations in connection with forest fires have been started than in all the previous years since the creation of the Department. In all, thirty-six cases were referred to the Attorney General's Department by the Commissioner of Forestry during the past year. Legal action was authorized in nineteen of these cases. Four convictions have been secured to date, thirteen cases are still pending, and there have been but two acquittals. In several additional cases criminal action was not directed by the Attorney General because of the extreme poverty of the defendants and the absence of evidence of criminal intent in setting forest fires.

### Red-rot in Arizona and New Mexico

A recent survey of the forests in Arizona and New Mexico, conducted by the United States Department of Agriculture, indicates that the existence of what is known as Western red-rot causes a considerable amount of loss to lumbermen in these states each year. It is said that the percentage of trees found to be infected with this disease varies. No external signs were found which could be relied upon to inform the observer whether or not a given tree was attacked by the disease. It was found, however, that trees growing on very thin soils on steep south or east slopes where growth conditions are poor, appear to be more likely to have the disease than pine situated where growth conditions are good.

Furthermore, it was ascertained that the disease was much more prevalent among the mature yellow pines than among the younger trees or black jacks. Any system of cutting, says the new publication, that will take out most of the older trees (yellow pine) and many of the larger black jacks, as well as all suppressed trees, will do much to rid the future forests of this serious heart-rot. From this point of view, a short rotation is better for the future health of the forest than a longer one.

### Tree Service for Houston

The Public Parks Department of the City of Houston, Texas, is rapidly awakening to the need of more trees and of better tree service for the city. The result is that many trees are being planted, not only in the parks but on the streets and boulevards. This city recently planted one vista in the new Hermann Park with a bordering of Bald Cypress (*Taxodium distichum*). The planting required 415 Bald Cypress, ranging in

size from 5 to 16 feet and from one inch to two and a half inch caliper. A plantation of this kind of tree, even in the South, is somewhat unusual.

The Parks Department is now receiving 500 live oaks, 1 inch caliper, 5 to 7 feet, and 1½ inch caliper, 7 to 9 feet, which are being planted in a double tree line on the new Main Boulevard along the Hermann Park front. The Board of Park Commissioners decreed that nothing but live oaks should be used for the entire length of this boulevard, and this action has caused a greater activity in the planting of trees on this boulevard.

During May, June and July, 1916, more than 200 large oak trees were moved back, to allow a widening of this boulevard and up to the present time less than 5 per cent of these trees have died, though they were removed at an unseasonable time, and it is considered somewhat remarkable that so many of them have lived.

The Public Parks Department of the city has recently started a nursery, in which will be grown all the trees, shrubs and plants that will be used in all the parks in the city, including the new Exposition grounds. A city tree warden will be appointed this year to care for all of the trees under the direction of Park Superintendent C. L. Brock, and steps will immediately be taken to map and index every street in the city, showing all trees.

### Forests as Playgrounds

Devoting much space to the importance of National Forests as playgrounds, *The Railroad Red Book* for January has special articles with several pictures by Smith Riley, district forester, U. S. Forest Service, W. B. Fraser, state game and fish commissioner of Colorado, and T. J. Ehrhart, state highway commissioner. In the article on National Forest playgrounds accessible by the Denver & Rio Grande railroad, Mr. Riley writes:

"The popularity of the National Forests as summer playgrounds is increasing by leaps and bounds each year. These vacation wonderlands were visited by over 2,000,000 people in 1916. Of this number Colorado received 605,000 or 30 per cent of the total."

### Hunters Get 618 Bucks

Six hundred and eighteen deer, 549 turkeys, 37 bears, 1084 coyotes, 117 wolves, and 48 mountain lions were killed by hunters in the New Mexico National Forests during the season just passed, according to the District Forester's annual report on game conditions just submitted to the State Game Warden.

"The number of deer killed is 5 per cent less than in 1915, 4 per cent less than in 1914, and 7 per cent less than in 1913," says

District Forester Redington. "It is safe to assume that the number of hunters has increased. It would seem, therefore, that these figures indicate a steady decrease in the supply of deer. The number of turkeys killed also shows a decrease as compared with 1915. Some people still believe that the game protectionists are alarmists, but these figures speak for themselves, and to the contrary. They emphasize the need for game refuges, better laws, and above all better law enforcement."

The report shows that the number of predatory animals killed has more than doubled as compared with 1915. Forest officers attribute this to the work of the Government trappers employed by the United States Biological Survey, and regard it as about the only encouraging feature of the report.

### BOOK REVIEWS

The latest publication of the Bureau of Forestry of the Philippine Islands, Bulletin 14, entitled "Commercial Woods of the Philippines: Their Preparation and Uses," is just out. This is by far the most comprehensive work so far published on the subject and, from the point of view of the wood-user, also the most practical. The book consists of five parts dealing with different phases of the subject. Part I is a concise description of the forests and of lumbering conditions in the Islands; Part II, a discussion in popular language of the physical and mechanical properties and the structure of wood; Part III, a very comprehensive discussion of uses, the different purposes to which wood is put being arranged in alphabetical order, with frequent cross-references; Part IV gives, also in the least possible technical form, directions for the identification of wood; and Part V, which occupies more than half of the book, gives detailed descriptions of about 360 Philippine woods, with notes on their mechanical properties and workability, their distribution in the Islands, local names, uses, supply and approximate prices. There is also a general index, one of scientific names and one of all the official, commercial and local names.

Lumberjack Bob, by Lewis H. Theiss.

W. A. Wilde Company, Boston, Massachusetts. \$1.25.

This is a book which describes the experiences and the adventures of a young lumberman and forester in the woods, and, with a style of narrative which carries the reader along in a manner which sustains the interest throughout, manages to convey lesson after lesson of the trees and the woods. It is enticing to young people as well as adults, and instructive to both. The author is to be complimented upon his ability in presenting so much valuable information in so attractive a manner.

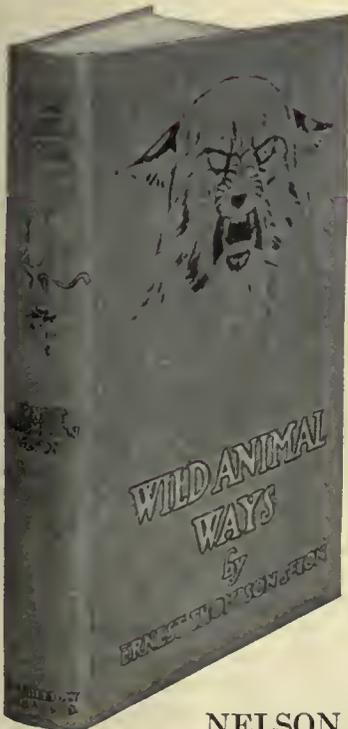


## THE DOG THAT MADE GOOD

He was just a mischievous, wag-tail puppy that wouldn't grow up. He was always getting into trouble; they called him "Silly-Billy." They even started to kill him, but they didn't— And then came his chance. In the flash of an eye he did the thing that amazed them all. After that he was king among them. You will love him—you can't help it—and you will love the hundred other beast-people told about by

## Ernest Thompson Seton

6 Volumes



Send for these books and feel the mysterious thrill of the forest. In the everydayness of life it has faded away. Get it back. Have a year 'round vacation with these books. Feel the scent of the pine needles and the swish of the green trees.

The romantic fascination of the wilderness and its people is your heritage—bequeathed to you through the ages.

Ernest Thompson Seton knows how to bring it home to you. The fierce struggles of the beast-folk, their passions and their tragedies—Seton has known them all.

He has loved them and made them real. And each thing he tells you is based on fact and scientific accuracy. It is the science of the woods, touched with the magic of a romantic pen.

### 6 BOOKS LIKE THIS

These are not ordinary books. They are magnificently made. They are on rich, soft paper, with great, generous margins, and open, clear type that gives a feeling of out-doors. Nearly every page has its own special, exquisite illustration in line, and there are full-page, half-tone illustrations scattered liberally throughout the books. Each volume has an individual, appropriate design of its own on the side and the back, stamped in two colors and gold. So each volume is a rich and splendid gift book, and the whole makes a luxurious set of books.

These books seemed to me so beautiful and luxurious, that I secured a few sets of them from Doubleday-Page & Company. Since they were the end of an edition, I got them at an especially low price, and that low price I can pass on to you.

Don't wait until this edition is gone. There are only a few and they must go to those who answer first. Send the coupon without money today for your set.

### CAN YOU TELL?

- Do you know how to make a fire in the woods?
- Can you tell the difference between the tracks of an old and a young hunter?
- Can you recognize the edible mushroom from the poisonous fungi?
- What would you do for a mad dog or snake bite?
- What did the Indian do to get keen eyes? Do you know the Indian's remedy for near-sightedness?
- What things should a camper have in his "outfit"?
- What would you do if you were lost in the woods?
- Do you know the wood-signs and hlazes used by hunters and surveyors?
- Do you know how to choose the site of a camp?
- Do you know how to make the stars help you find your way at night?
- Do you know how to cure the sting of poison ivy?
- Do you know the signs of the weather?
- Can you tie the standard knots that every woodsman should know?
- Do you know the difference between the tracks of a rabbit and a skunk?

N.F.  
1-17

Nelson  
Doubleday,

Oyster Bay, N. Y.

Send me, all charges prepaid, for examination, Ernest Thompson Seton's works, in six volumes. If they are not satisfactory I will return them at your expense. Otherwise I will send you 50c at once and \$1.00 a month for nine months.

Name .....

Address .....

NELSON DOUBLEDAY, OYSTER BAY, NEW YORK

## CANADIAN DEPARTMENT

ELLWOOD WILSON

SECRETARY, CANADIAN SOCIETY OF FOREST ENGINEERS

The recent meeting of the Canadian Forestry Association in Ottawa was a very successful one. The chief topics of discussion were the white pine blister rust and the proper disposal of debris left by logging operations. The inroads the blister rust is known to have made have not been extensive, but further examination may show other affected areas, especially on the south shore of the St. Lawrence River, near the northern boundaries of New Hampshire and Vermont. The main areas at present affected are the Niagara Peninsula, the Trappist Plantation of pine at Oka and a small area near Montreal. None of these is threatening from the standpoint of merchantable white pine, but must be watched to prevent the spread into the forests. A resolution was passed asking the Dominion and Provincial Governments to make the necessary appropriations for scouting and prevention. The question of the disposal of logging debris came up for discussion and it was pretty generally conceded that burning is the best method and that it is very important from the standpoint of fire protection and protection from insects. The Dominion Entomologist says that the logging debris is one of the best breeding grounds for insects. A committee was appointed to study these matters thoroughly and to report later. The same committee will take up the question of the introduction of civil service regulations in the outside service of the Dominion Forestry Branch and the Forestry Branches of the Provincial Governments which have not already been put on that basis. The banquet held in the evening was a very successful and enjoyable one and the speeches were better than the year previous.

At the meeting of the Commission of Conservation questions of general interest were discussed, including agriculture, fisheries and forests—the proper planning of towns and cities. This latter subject is one of the most important of the activities of the Commission and does not mean simply the making of ground plans for cities, but the proper planning for all the activities which make up the life of the community. Proper location of manufacturing and residential quarters, parks, playgrounds, etc., in accordance with the topography of the site selected and for the greatest efficiency of community life. Planning for proper drainage, streets, water-works and power and light lines. The work also covers villages and farming sections so that the agricultural population will have proper roads and that the farms will be laid out to give the right proportion and location of arable land, pasture and woodlots and will have accessible schools, churches and railway stations. All over the country the sole reason for the lay-out of

our towns and cities and farms seems to have been to make it easy for the surveyor. No one seems to have used any imagination or foresight.

Several very important recommendations in regard to necessary forestry work were made by the Commission: that the Government of New Brunswick should consolidate its present forestry and fire protection work under a central organization with properly trained staff; that Ontario should endeavor to organize coöperative fire protective associations to work with its fire protection Branch; that Quebec should take better measures for the protection of its forest lands not yet under license; that Nova Scotia should appoint a trained Forester; that British Columbia should start a forest school; that the Dominion Government should put into force proper forestry regulations in connection with cutting operations on licensed timber berths, with a view to ensuring the perpetuation of the forest; and that both Dominion and Provincial Governments should put into force regulations which will place their forestry and fire protection systems on the basis of appointments and promotions for merit only.

The report of the Commission of Conservation upon the investigation of the forest resources of British Columbia is nearly completed and will soon be ready for publication and also the report upon the forest resources of Saskatchewan. An investigation of the condition of cut-over pulpwood lands, the timber left, the increased growth after the thinning of the stands, the amount of the probable future cut after periods of years and other matters in connection therewith will be undertaken during the coming summer in coöperation with the Laurentide Company, Limited, and the Canadian Pulp and Paper Association.

There is a great necessity for the foundation of a really good ranger school in Canada. We have enough schools to turn out trained foresters, but there are no men who can fill the places of rangers acceptably—every forester must train his own. The teaching in such a school should be eminently practical and should aim at giving the class of men who work in the woods the theory of elementary surveying, forest mensuration, English and French, simple accounting and mathematics. They should also be trained in woodcraft. This sounds strange, but it is a fact that men who have lived and worked in the woods all their lives are strangely deficient in some branches of this art and in trained observation. They have many superstitions.

The Annual Meeting of the full Pulp and Paper Association and of the Technical Section in Montreal was most successful. The reports of the various sections showed

much work accomplished during the year past and much benefit from coöperation and the exchange of ideas. Especial interest was shown in forestry matters and some work will be done along this line during the coming year. At the luncheon, Sir George Foster, Minister of Trade and Commerce, made a most excellent speech in which he told the members that trade after the war would be large and would require that they prepare early for it and coöperate in handling it. He also said that while the surplus of exports over imports was very large now owing to war conditions, after the war it would drop back and with our heavy war debt we must work hard and increase production and export so as to make the balance of trade in our favor.

On February first and second at the Windsor Hotel in Montreal was held the first Forest Protection Conference ever held in Eastern Canada. All phases of forest protection were discussed, from fire, from insects and from fungi. The white pine blister rust came in for much discussion. The problem of slash burning as a fire preventive measure and also as a means of preventing insects from increasing was touched upon and different views brought out. The use of aeroplanes for discovering and locating forest fires and the use of telephones in reporting them and summoning aid were interestingly presented. The development of mechanical aids to fire fighting was shown and much interest was excited by the Johnson portable gasoline combined engine and pump, weighing only about 150 pounds. This pump was in use during the past season by the Dominion Parks Branch and the St. Maurice Forest Protective Association and did splendid service in checking fires which would have otherwise required large crews of men to prevent from spreading and so saved large sums of money which would have been spent in fire fighting.

M. Allerdale Grainger, for the past two years acting chief forester, has recently been gazetted upon his appointment as chief forester, in succession to H. R. MacMillan.

Dr. W. W. Walkem, in an article appearing in a recent issue of the *Vancouver Daily Province*, gives a striking instance of the durability of Douglas Fir. In the course of some excavation work between Vancouver and New Westminster, a Douglas Fir several feet in diameter was found buried under twenty feet of water-washed gravel and sand, overlying glacial-worn rocks and moraine, presumably contemporaneous with the glacial period. The tree had to be cross-cut twice to permit the passage of the steam shovel, and the wood was found to be perfectly sound. On the surface were other fir trees growing which were many centuries old.

## FOUR COLONIAL HOUSES

BY RAWSON WOODMAN HADDON

**T**HE way by which we may preserve in the domestic architecture of today an undefinable charm—a certain warmth of personality with which American history has invested the wooden house—is what Mr. Joy Wheeler Dow shows us in the buildings he has designed, and in his writings upon the various developments of American architecture, both historic and modern.

To secure this charm—to build a certain amount of convincing historical atmosphere into the house without losing any of the comforts that we have learned to expect in houses of today, and still preserve the splendid qualities of the original Colonial building, is the especial task that this architect has set for himself. How well he succeeds and by what means, we shall see.

In the very first place materials must be selected with care and with a full knowledge of the possibilities of every

with it an authoritativeness recognized by architects and homebuilders alike.

For this reason it is interesting to know that he says, in connection with the selection of materials for the new house, that “if we go further, and by means of accumulated affluence erect the entire structure of the new colonial house in stone—columns, cornices, window and door casings, etc., strange to say we lose an undefinable charm—a certain warmth and personality with which American history has invested wood.”

Undoubtedly we do. And the loss is not owing simply to the fact that we have failed to use wood where our forefathers

used it, but it is because the wood we have not used has been tried and found since the earliest days of American building to be the ideal building material in



“KEEPSAKE,” AT MARQUETTE, MICHIGAN



THE BISHOP HOUSE, NORWALK, CONNECTICUT



THE SWARTZ HOUSE, NORWALK, CONNECTICUT

available source of supply. In the present instance, in addition to being an architect of wide experience, the designer of the houses here illustrated is the author of “The American Renaissance,” one of the best-known books on American architecture, and his word, both in his books and as exemplified in the houses he has designed, carries

this country for reasons of looks, and because of its comparatively low cost and plentiful supply, and for economy of maintenance and repair.

“Keepsake” at Marquette, Michigan, has been known—since it was built in 1913—as one of the most successful buildings yet erected which is based on the

Colonial house of the earliest type. It reproduces the general characteristics of the houses built during the days of Hawthorne's "Scarlet Letter." It fairly breathes the spirit of Salem witchcraft days, and "Colonial governors who sheltered the regicides, or indeed Whalley



FRONT VIEW, "WITCHWOOD," HIGHLAND MILLS, NEW YORK

and Goffe themselves, might for all we know"—save that the house is not quite five years old—have found refuge in it.

The means taken to secure this family resemblance to houses of two and a half centuries ago were neither costly nor complicated. In the first place the exterior clapboards, which are cypress, have never been painted. After the completion of the work, they were simply oiled to preserve the wood and to bring out its fine natural color.

On the side of the house it will be noticed that the clapboards in the gable are wider than those below. The upper ones are eight inches wide and the lower ones are four. These lower boards are beaded, or moulded, on the lower side, as most early siding was.

On the whole, no tricks or "stunts" of design were attempted and the building from top to bottom was simply patterned after the usual manner of early work. An overhang at the second floor (see page 181) is designed as all old ones were. The windows in the first floor rooms are brought high up in the room and well under this overhang, and at the second floor the windows are near the cornice. The brackets under the overhang were carefully designed after the study

of many historic examples, and a typical chimney, large enough to accommodate many large fireplaces, was used.

The construction inside "Keepsake" is the same as that found in the old houses of Salem and other New England towns. And yet, remarkable enough, the cost of this house, with all its good design and construction, was not as great as that of the poorly built and still more



DETAIL OF THE PORCH AT "WITCHWOOD"

poorly designed "Colonial" houses found in every suburb and small (and large, too, for that matter) city or town. Its cost, at a time however when labor and materials were less expensive than they are at present, was \$6000.

Another successful example of early design is "Witchwood" at Highland Mills, New York. In this instance the building might have been put up as late as 1700, or in the "Middle Period" as architectural historians call it. The doorway is an unusually successful one of its kind, and the treatment of the porch at the side of the house is well worth study—and reproduction on houses that make no pretence of being Colonial.

The Bishop house at Norwalk, Connecticut, is an example of a later type. The roof is reminiscent of those found in certain parts of the South. The sides of this house are covered with hand-riven white pine shingles laid nine inches to the weather. Both here and at the Swartz house the roof shingles are cypress. The interior trim of both is white wood, painted, and the floors are oak. In the Swartz house the stairs are oak and the handrail is mahogany. The Swartz house, built in 1907, cost \$12,000, and the Bishop house which was built a year earlier cost \$11,000.



FIRE-PLACE AT "WITCHWOOD." THE CANDLE-STICKS, MUGS AND THE CHAIR ARE UNFORTUNATE; NONE ARE COLONIAL



## SAVES YOUR TREES and YOUR MEN

THIS ladder will not skid and cannot be tipped over. Easily moved about by one man. Never rests against the tree. Two men can work on it.

### The Safety Ladder

will save the time of your men in the care of your estate, give you better results on tree work and remove any danger of accident. Built in 15, 20, 25 and 30 foot lengths. Send for descriptive circular.

The Safety Ladder Co.

695 Reibold Bldg. Dayton, Ohio

## Our Trees

### HOW TO KNOW THEM

Photographs from Nature  
By ARTHUR I. EMERSON

WITH A GUIDE TO THEIR RECOGNITION AT ANY SEASON OF THE YEAR AND NOTES ON THEIR CHARACTERISTICS, DISTRIBUTION AND CULTURE

By CLARENCE M. WEED, D.Sc.

Teacher of Nature Study in the Massachusetts State Normal School at Lowell

One hundred and forty Illustrations  
Size of book, 7½ inches by 10 inches

Cloth, \$3.00 net

Postage extra

ALL nature-lovers will hail this book with delight. Its purpose is to afford an opportunity for a more intelligent acquaintance with American trees, native and naturalized. The pictures upon the plates have in all cases been photographed direct from nature, and have been brought together in such a way that the non-botanical reader can recognize at a glance either the whole tree or the leaves, flowers, fruits, or winter twigs, and thus be able to identify with ease and certainty any unknown tree to which his attention may be called. In the discussion of the text special attention has been given to the distinguishing character of the various species, as well as to the more interesting phases of the yearly cycle of each, and the special values of each for ornamental planting.

Publishers

J. B. LIPPINCOTT COMPANY  
Philadelphia

(Continued from page 182)

Correct design, of course, and strict attention to historic examples, are the things that make the new Colonial house a success or a failure. And also, as has already been said, the materials used in the building must be selected with the greatest care.

"In English Renaissance," says the architect, "local conditions commonly restricted the use of wood to the interiors. In American Renaissance (that in our own Colonial style) the plentitude of this material enabled the Colonial builders to use it for the outside as well, and with great advantage, for it permitted the Colonist to elaborate the elevations of his dwelling, gaining thereby warmth, cheerfulness and grace, and all easily within his means. Without the slightest danger of bankruptcy he could proceed to embellish the curtilage with arched gateways, ornamental fences, terrace rails and summer-houses *ad lib.*"

No wonder then that in early American villages are found so many splendid houses (large or small) that have remained to this day as a model after which the houses of our own time may be patterned, with, however, it is sad to say, sometimes but indifferant success. And no wonder, in view of this realization of the faith that earlier designers had in wood, that practically all of Mr. Dow's most successful houses have been built of that material. And quite naturally of wood, too, for "there was no bit of classic detail from either Athens or Rome transmitted to London" (and from there to America where the Georgian architecture of England became, in course of translation or transplantation, the Colonial architecture of New England) "through what I may call the 'Florentine Clearing-house' presided over by Palladio, Sansovino, Scamozzi and their contemporaries, but what would be carved more readily in wood; and time and history have thrown a glamour over all this wooden development of ours and established its right of succession with a hall-mark."

#### Blasting Tree Holes

"I recently visited Prof. C. B. Waller, Instructor in Chemistry at Wofford College, Spartanburg, South Carolina, writes J. C. Ahl, "I found him to be an enthusiastic advocate of dynamite for blasting tree holes. It seems that recently he planted fifty pecan trees in some hard clay soil. He had read something about the advantages of using dynamite in tree planting and decided to try it. The orchard site was laid out in sections. At each intersecting point, a bore hole was put down to a depth of about thirty inches, each hole being charged with a quarter of a pound of 20 per cent dynamite. When these holes were dug out just before planting the trees, it was found that the blasting had shattered the hardpan very nicely. The blasting also saved a good deal of time and much hard work. The use of dynamite for tree planting is becoming very general all through this section of the state."

# Send for this Book



### More Necessary than ever before!

WHEN you plant vegetables this year you want to be sure that your yield is as near 100% perfect as possible. With wars and food shortage, vegetables and wealth are becoming synonymous.

You'll plant Thorburn's *this* year because you can rely on THORBURN'S. No time to take chances now if you're planting for profit. Thorburn's seeds have been of superlative quality for 115 years.

Whatever you want, we have it.

Today send for our latest catalog—it's free and it contains much interesting, useful information. Write today!

J. M. Thorburn & Co.

Established in 1802

53 S. Barclay Street  
Through to 54 Park Place  
New York

## A Most Helpful Catalog of Plants, Shrubs, Trees

**Y**OU who love trees for their own beauty or value them for the charm they lend to roadside and lawn must have often wished deeply for a more friendly knowledge of how to choose and group them best.

This is to say that at last a book has been written which tells just what you want to know about trees, shrubs and plants. It is the new catalog of the well-known Andorra Nurseries.

It tells what shrubs and trees are best adapted by nature for each garden and landscape purpose.

"Suggestions for Effective Planting" is not the usual dull nursery list. To read it is like going around your grounds with an old experienced gardener and discussing in a friendly way what the place needs.

This book is yours for the asking. Send for your copy at once. Box 200.

### ANDORRA NURSERIES

William Warner Harper, Proprietor  
Chestnut Hill Philadelphia, Pa.

## Pull Big Stumps by hand



Showing easy lever operation

Clear your stump land cheaply—no digging, no expense for teams and powder. One man with a K can rip out any stump that can be pulled with the best inch steel cable. Works by leverage—same principle as a jack. 100 pounds pull on the lever gives a 48-ton pull on the stump. Made of Krupp steel—guaranteed against breakage. Endorsed by U. S. Government experts.

### HAND POWER Stump Puller



Write today for special offer and free booklet on Land Clearing.

Walter J. Fitzpatrick  
Box 80  
182 Fifth Street  
San Francisco  
California

### Are you on the Mailing List for Catalog of



Pine and Oak Help Each Other

## Hicks Nurseries?

It will confirm your decisions on fitting your selection of trees to your soil and climate. It offers trees for dry and acid soils and moist soils in the same region. Many nurseries on alkaline soils do not specialize on oaks and pines.

Trees 20 years old can be selected now. They are guaranteed to grow satisfactorily or replaced free.

**ISAAC HICKS & SON**  
Westbury, Nassau Co., N. Y.

### BUSINESS FOR SALE

AN OPPORTUNITY for some rich man's son, in a profitable out of doors occupation. I will give three months of my time to teach the purchaser—renovating old orchards, tree surgery, spraying and moving large trees. Lots of orders on hand. Present owner is classed as one of the most expert in Massachusetts. Situated near 300,000 people. Included in the sale will be automobile and sprayers, tools and a great many hooks on forestry, etc. For further information address Box 400, care of AMERICAN FORESTRY.

**TIMBER ESTIMATES**  
**FIRE PROTECTION PLANS**  
**MAPS LOGGING REPORTS**  
**EMPIRE STATE FORESTERS**  
156 FIFTH AVE. NEW YORK CITY

### TIMBER CRUISING BOOKLETS

Biltmore Timber Tables. Including solution of problems in forest finance.

Southern Timber Tables. How to estimate Southern Pine, Southern White Cedar, and Southern Appalachian Timber—Spruce pulpwood, Hemlock hark, Chestnut oak bark, Chestnut tannic acid wood.

Postpaid, 25 cents each

**HOWARD R. KRINBILL**

Forest Engineer

Newbern, N. C.

## Check Fires at the Start—

Deming  
Prize  
Knapsack  
Sprayer  
No. 654



get to them quickly and quench the flame before it spreads.

### THE DEMING KNAPSACK OUTFIT

carries the water on the back; both hands are free for climbing or working through the underbrush. The rustproof brass pump forces water at high pressure through a flexible hand hose. Refilling is quick and easy. Complete description of this convenient fire fighter gladly sent free.

**THE DEMING COMPANY**

148 Depot Street

SALEM, OHIO

Ask for 1917 booklet, "Some Reasons Why."

## High Income Return on Non-Fluctuating Investment

Invest your dividends in 1st Lien Mortgages; collateral value and interest return, 7 per cent. or 7½ per cent. always known. Miller's close-in Miami Mortgages are not subject to stock market or International surries, and they are as closely safeguarded as guaranteed mortgages. Millions invested here by America's most prominent men. *Some Reasons Why, free.*

G. F. MILLER & CO., Trust Bldg., Miami, Florida

Your co-operation with your own magazine will boost American Forestry to an exalted position among advertising media. One way to co-operate is to patronize our advertisers, or ask for suggestions and advice.

## CURRENT LITERATURE

### MONTHLY LIST FOR FEBRUARY, 1917

(Books and periodicals indexed in the library of the United States Forest Service.)

#### Forestry as a Whole

*Proceedings and reports of associations, forest officers, etc.*

India—Forest department. Annual return of statistics relating to forest administration in British India for the year 1914-1915. 25 p. diagr. Simla, 1916.

New South Wales—Department of forestry. Report for the year ended 30th June, 1916. 17 p. pl. Sydney, N. S. W., 1916.

South Australia—Woods and forests department. Annual progress report upon state forest administration for the year 1915-16. 13 p. pl. Adelaide, 1916.

Southern forestry congress. Proceedings held in Asheville, N. C., July 11-15, 1916. 187 p. Chapel Hill, N. C., 1916.

Texas—State forester. First annual report. 16 p. College Station, 1917. (Texas—Agricultural and mechanical college—Dept. of forestry. Bulletin 4.)

Washington—State board of forest commissioners. Annual reports of state forester for the years ending Nov. 30, 1915, and Nov. 30, 1916. 41 p. pl. Olympia, Wash., 1916.

Western forestry and conservation association. Proceedings, 1916. 29 p. il. Portland, Ore., 1916.

#### Forest Education

##### Arbor day

Newark, N. J.—Shade tree commission. Arbor day, 1916. 20 p. il. Newark, 1916.

##### Forest schools

India—Forest research institute. Progress report for the year 1915-16. 21 p. Calcutta, 1916.

#### Forest Description

Massachusetts—State forester. The forests of Worcester county, by H. O. Cook. 88 p. pl. Boston, 1917.

#### Forest Botany

Burbank, Luther. The birth of a new industry; the Burbank royal walnut, a new timber tree for both beauty and profit. 8 p. il. Santa Rosa, Cal., 1916.

Burns, G. P., and Otis, C. H. The trees of Vermont. 244 p. il, pl. Burlington, Vt., 1916. (Vermont—Agricultural experiment station. Bulletin 194.)

Going, Maud. Our field and forest trees. 222 p. il, pl., map. Chicago, Ill., A. C. McClurg & Co., 1916.

Rock, Joseph F. The sandalwoods of Hawaii; a revision of the Hawaiian species of the genus *Santalum*. 43 p. il. Honolulu, 1916. (Hawaii—Board of agriculture and forestry—Division of forestry. Botanical bulletin No. 3.)

#### Forest Investigations

Algeria—Service des forêts. Bulletin de la Station de recherches forestières du Nord de l'Afrique, v. 1, No. 4. 22 p. pl. Alger, 1916.

Harshberger, John W. The vegetation of the New Jersey pine barrens; an ecological investigation. 329 p. il, pl., map. Phila., C. Sower Co., 1916.

#### Silvical Studies of Species

Munger, Thornton T. Western yellow pine in Oregon. 48 p. pl., map. Wash., D. C., 1917. (U. S.—Dept. of agriculture. Bulletin 418.)

#### Forest Influences

Dana, Samuel T. Farms, forests and erosion. 28 p. pl. Wash., D. C., Gov't. printing office, 1917.

Hill, M. Note on an enquiry by the government of India into the relation between forests and atmospheric and soil

### KELSEY NURSERY SERVICE



"Quality First" stock at a reasonable price and your requirements furnished complete.

**SHADE TREES.** Our Stock for Lawn, Street and Park Planting is specially selected for effective planting results. Trees that please—Maples, Planes, Elms, Lindens, etc.

**EVERGREENS.** Our choice Extra Transplanted stock as furnished the leading country estates for years—Retinosporas, Blue Spruces, Cedars, Pines, Arbor Vitae, Junipers, etc.

**SHRUBS.** Including all the leading ornamental and flowering varieties, in transplanted, bushy, well-rooted stock for immediate effect.

### KELSEY FORESTRY SERVICE

**TIMBER ESTIMATING, FOREST MANAGEMENT, FORESTRY PLANTING, ETC.** Expert service at reasonable cost. This Department in charge of D. E. Lauderburn, Forest Engineer

**FORESTRY STOCK.** All varieties of Deciduous and Evergreen material used in Forestry Planting. Our "Quality First" stock and "your requirements furnished complete." Write for Quotation on your list.

## F. W. KELSEY NURSERY COMPANY

"Everything Worth Planting"

150 Broadway

New York

### W. & T. SMITH CO.

Geneva Nursery

### NURSERY STOCK AT WHOLESALE

SEND FOR CATALOG AND PRICE LIST



GENEVA, N. Y.

### FOREST NURSERIES

PINE

SPRUCE

Evergreen trees for forest planting in any quantity, from 100 trees to carload lots.

WE GROW OUR OWN TREES

Write us for catalogue

### KEENE FORESTRY ASSOCIATION

KEENE, N. H.

### RHODODENDRON MAXIMUM A SPECIALTY

SEND FOR PRICE LIST

The Charles G. Curtis Company  
Callicoon, N. Y.

### FORESTRY SEEDS

I OFFER AT SPECIAL PRICES

Pinus strobus  
Pseudo-tsuga Douglassii  
Pinus ponderosa  
Picea Englemanni  
Picea Pungens  
Thuja Occidentalis  
Pinus taeda

and many other varieties, all of this season's crop and of good quality. Samples upon request. Send for my catalogue containing full list of varieties.

THOMAS J. LANE

TREE SEEDSMAN

Dresher Pennsylvania

### OAKS

For \$25.00 cash we will send you, carefully packed, 1000 each of Black, Pin, Red and Scarlet Oaks, 6-12 inches, or 500 each for \$15.00. 1000 each 12-18-inch White Ash, Catalpa Speciosa, White Elm, Black Locust, Russ Mulberry and Butternut for \$20.00. The above are but a few of the many varieties we grow in Forestry and Ornamental Stocks.

YOU NEED OUR PRICE LIST NOW.

Atlantic Nursery Company, INC.

BERLIN, MARYLAND

## Clearing Costs Reduced

The recent land clearing tests conducted by the University of Wisconsin have revolutionized methods and established conclusively much lower clearing costs per acre

The leading kinds of stump pullers—hand and power—were represented. The dynamite used was



### RED CROSS FARM POWDER

These tests proved the following important facts:

1st—The cheaper Red Cross Farm Powders will in most soils blast out stumps as well as the most expensive 30% and 40% grades.

2nd—The combined use of Red Cross Farm Powder and a stump puller is often the cheapest and best way to clear land.

3rd—Properly placed charges fired with a blasting machine greatly reduce the amount, strength and cost of the dynamite required.

As a result the average stump covered land can now be cleared at less cost per acre than before the war

#### Write Now for Full Information

Every farmer with stump covered land should know the full facts about this modern method of land clearing. Write today for

#### Land Clearing Bulletin No. 350

If you are interested in orchard planting, ditching, drainage, boulder blasting, subsoiling or post hole blasting be sure to ask for

#### Hand Book of Explosives No. 350

**E. I. du PONT de NEMOURS & CO.**  
Wilmington Delaware



moisture in India. 41 p. maps. Calcutta, 1916. (India—Forest dept. Forest bulletin No. 33.)

Silveira, Alvara A. da. As florestas e as chuvas. 54 p. pl., map, diags. Bello Horizonte, Brazil, 1916.

#### Silviculture

#### Planting and nursery practice

Conklin, W. Gardiner. Reforesting Pennsylvania's waste land; what and how to plant. 34 p. pl. Harrisburg, Pa., 1916. (Pennsylvania—Dept. of forestry. Bulletin No. 15.)

Foster, J. H., and Krausz, Harry B. Tree planting needed in Texas. 32 p. il. College Station, Tex., 1917. (Texas—Agricultural and mechanical college—Dept. of forestry. Bulletin 2.)

Scott, Chas. A., and Burr, Walter. Tree planting in Kansas. 29 p. il. Manhattan, Kan., 1916. (Kansas state agricultural college—Division of college extension. Extension bulletin No. 11.)

#### Forest Protection

#### Insects

Burke, H. E. Flat-headed borers affecting forest trees in the United States. 8 p. pl. Wash., D. C., 1917. (U. S. Dept. of agriculture. Bulletin 437.)

Hopkins, A. D., and Snyder, T. E. Powder-post damage by Lyctus beetles to seasoned hardwood. 20 p. il. Wash., D. C., 1917. (U. S.—Dept. of agriculture. Farmers' bulletin 778.)

Webster, R. L. The white-marked tussock-moth. 4 p. il. Ames, Ia., 1916. (Iowa—Agricultural experiment station. Circular No. 33.)

#### Diseases

American forestry association. The pine blister disease which threatens the death of the white and five-leaved pines of the United States and Canada. 5 p. il. Wash., D. C., 1917.

Brisco, John M. Forest planting and the white pine blister rust. 4 p. Orono, Me., 1917. (University of Maine—Agricultural extension service. Extension bulletin No. 110.)

Hartley, Carl. The control of damping-off of coniferous seedlings. 32 p. pl. Wash., D. C., 1917. (U. S.—Dept. of agriculture. Bulletin 453.)

Long, W. H. Preliminary report on the occurrence of western red-rot in Pinus ponderosa. 8 p. Wash., D. C., 1917. (U. S.—Dept. of agriculture. Bulletin 490.)

Pack, Charles Lathrop. An invasion from abroad, what shall we do about it? 3 p. Wash., D. C., American forestry association, 1917.

Paul, B. H. The pine blister. 18 p. il. map. Albany, N. Y., 1916. (N. Y.—Conservation commission. Bulletin 15.)

Shear, C. L., and others. Endothia parasitica and related species. 82 p. pl. Wash., D. C., 1917. (U. S.—Dept. of agriculture. Bulletin 380.)

Webster, A. D. Tree wounds and diseases; their prevention and treatment; with a special chapter on fruit trees, 215. p. il. pl. London, Williams & Norgate, 1916.

#### Fire

Cœur d'Alene timber protective association. Eleventh annual report. 12 p. Cœur d'Alene, Idaho, 1916.

Washington forest fire association. Ninth annual report, 1916. 19 p. Seattle, Wash., 1916.

#### Forest Legislation

United States—Dept. of agriculture—Forest service. State forestry laws: Massachusetts. 21 p. Wash., D. C., 1917.

#### Forest Economics

#### Forest policy

Sherfese, Wm. Forsythe. The industrial and social importance of forestry in China. 26 p. Peking, The Chinese social and political science review, 1916.

## THE MACKENSEN GAME PARK

Bob White  
Pheasants  
Partridges  
Quail  
Wild Turkeys  
Deer  
Rabbits



Peafowl  
Cranes  
Swans  
Ornamental Geese and Ducks  
Foxes  
Raccoons

Everything in wild animals, game, fancy birds for parks, menageries, private preserves and collections of fancy fowl.

**WM. J. MACKENSEN, Yardley, Pa.**

*In these days of active competition it is only fair to see that your magazine gets all deserved credit for influencing purchases made by you and your friends.*

## PARK and ESTATE FORESTRY

Logging Reports Utilization Studies  
Timber Estimates Forest Planting  
Etc.

Methods and Cost of Mosquito Eradication

**P. L. BUTTRICK**  
Forester and Mosquito Expert  
P. O. Box 607 New Haven, Conn.



## SUPERIOR ENGRAVINGS

FOR ALL PURPOSES  
DESIGNERS AND ILLUSTRATORS

HALFTONES • LINE CUTS  
3 COLOR PROCESS WORK  
ELECTROTYPES

**NATIONAL ENGRAVING CO.**

506-14th Street, N.W.  
WASHINGTON, D. C.

Phone Main 8274

American Forestry is your magazine. It will increase in value and influence when the advertising revenue is larger. You can help by patronizing our carefully selected advertisers.

**Forest Administration**

United States—Dept. of agriculture—Forest service. January field program, 1917. 29 p. Wash., D. C., 1917.

United States—Dept. of agriculture—Forest service. National forest areas, June 30, 1916. 8 p. map. Wash., D. C., 1916.

United States—National forest reservation commission. Annual report for the fiscal year ended June 30, 1916. 10 p. Wash., D. C., 1916.

**Forest Utilization****Lumber industry**

Greeley, William B. Some public and economic aspects of the lumber industry; studies of the lumber industry, pt. 1. 100 p. maps, diagrs. Wash., D. C., 1917. (U. S.—Dept. of agriculture. Report No. 114.)

United States—Interstate commerce commission. Docket No. 8131, in the matter of rates on and classification of lumber and lumber products, and related dockets, and study of present tariff provisions relating to the transportation of lumber and lumber products in the United States; supplemental and reply brief on behalf of West Coast lumbermen's association; Eastern Oregon lumber producers' association, Western pine manufacturers' association, California white and sugar pine association, California redwood association. 36 p. Portland, Ore., 1916.

**Wood-using industries**

McCright, Arthur M. Poles purchased, 1915. 4 p. Wash., D. C., 1917. (U. S.—Dept. of agriculture. Bulletin 519.)

Oakleaf, Howard B. Douglas fir ship building. 9 p. il. Portland, Ore., Peninsula shipbuilding co., 1916.

Winslow, Carlile P., & Thelen, Rolf. The purchase of pulp-wood: some suggestions. 8 p. Madison, Wis., 1916.

**Wood Technology**

Mell, C. D. True mahogany. 24 p. il, pl. Wash., D. C., 1917. (U. S.—Dept. of agriculture. Bulletin 474.)

Schneider, E. E. Commercial woods of the Philippines: their preparation and uses. 274 p. pl. Manila, P. I., 1916. (P. I.—Bureau of forestry. Bulletin No. 14.)

**Auxiliary Subjects****Natural resources**

Hopkins, Albert A. Our country and its resources. 598 p. il. N. Y., Munn & Co., Inc., 1917. (Scientific American series.)

**National and state parks**

American scenic and historic preservation society. Twenty-first annual report, 1916. 956 p. pl. Albany, N. Y., 1916.

Palisades interstate park, N. Y. Sixteenth annual report, 1915. 31 p. pl., map. Albany, N. Y., J. B. Lyon co., 1916.

United States—Dept. of the interior. Progress in the development of the national parks, by Stephen T. Mather. 39 p. map. Wash., D. C., 1916.

**Mathematics**

Leaver, James M. The official estimator. 172 p. Oakland, Cal., Leaver manufacturing co., 1916.

**Periodical Articles****Miscellaneous periodicals**

American city, town and county edition, Jan. 1917.—Municipal use of the national forests for public recreation, by Henry Solon Graves, p. 1-4.

Breeders' gazette, Jan. 18, 1917.—The grazing homestead bill, by Will C. Barnes, p. 141-2.

Country gentleman, Jan. 13, 1917.—In a turpentine orchard, p. 41.

Country gentleman, Jan. 20, 1917.—Trees and lightning, by H. R. C., p. 31.

Country gentleman, Jan. 27, 1917.—Dwarf trees, by Albert A. Hansen, p. 7.

Country gentleman, Feb. 3, 1917.—Getting



Two minutes saves each tree.

Tree Tanglefoot saved the tree on left.

## Use Tree Tanglefoot

on Shade and Orchard Trees against Canker Worms, Climbing Cut Worms, Woolly Aphides, Ants and Tussock, Gypsy and Brown-tail Caterpillars. It is equally effective against any crawling insects.

### Band Trees about Two Weeks Before Insects Appear to Get Best Results

Easily applied with wooden paddle. One pound makes about 10 lineal feet of band. One application stays sticky three months and longer—outlasting 10 to 20 times any other substance. Remains effective rain or shine. Won't soften—won't run or melt, yet always elastic, expanding with growth of tree. No mixing, simply open can and use. Will not injure trees.

### For Tree Surgery

Tree Tanglefoot is superior to anything on the market—it is the best application after pruning or trimming. It will waterproof the crotch of a tree or a cavity or wound in a tree, when nothing else will do it.

### Sold by All First-Class Seedsmen

1-lb. cans 35c; 3-lb. cans \$1.00; 10-lb. cans \$3.00; 20-lb. cans \$5.50 and 25-lb. wooden pails \$6.75.

Write to-day for illustrated booklet on Leaf-eating Insects. Mailed free.

### THE O. & W. THUM COMPANY

144 Straight Avenue, Grand Rapids, Mich.

Manufacturers of Tanglefoot Fly Paper and Tree Tanglefoot

## FOREST TREE SEEDLINGS

AND

## ORNAMENTAL SHRUBS

We offer for spring 1917 our usual line of Forest tree seedlings and Ornamental Shrubs, Cuttings, etc.

Write for spring trade list.

### Forest Nursery Company

McMINNVILLE

TENNESSEE

the most out of the woodlot, by Vico C. Isola, p. 4.

Countryside magazine, Dec., 1916.—Mahogany, by Harold Donaldson Eberlein and Abbot McClure, p. 277-8.

Fire protection, Jan., 1917.—European methods of forest fire protection and insurance, by John L. Cobbs, Jr., p. 7.

Ford times, Jan., 1917.—Fords and forests, p. 261-7.

Garden magazine, Feb., 1917.—Transplanting big trees, p. 44; Protecting trees against animals, by M. G. Kains, p. 52, 54.

Good roads, Feb. 3, 1917.—Wood block paving specifications of the American wood preservers' association, p. 84-5.

National geographic magazine, Jan., 1917.—Our big trees saved, p. 1-11.

National wool grower, Jan., 1917.—Grazing fees in national forests, by A. F. Potter, p. 21-3.

### Use Press Clippings

It will more than pay you to secure our extensive service, covering all subjects, such as Polo, Golf, Tennis, trade and personal, and receive the benefit of the best and most systematic reading of all papers and periodicals, here and abroad, at minimum cost. Why miss taking advantage for obtaining the best possible service in your line?

Our service is taken by all progressive business men, publishers, authors, collectors, etc., and is the card index for securing what you want and need, as every article of interest is at your daily command.

Write for terms; or send your order for 100 clippings at \$5, or 1,000 clippings at \$35. Special rates quoted on Large Orders.

### The Manhattan Press Clipping Bureau

ARTHUR CASSOT, Proprietor Established 1888

6 East 41st Street, NEW YORK

Send for Our Desk Calendar

Nature study review, Feb., 1917.—A plan for the study of the elm tree in primary grades, by Susan B. Sipe, p. 55-8; Mountain laurel, by Leah Wheeler, p. 59-61.

- Proceedings of the National academy of sciences, Nov., 1916.—The oaks of America, by William Trelease, p. 626-9.
- Purdue agriculturist, Jan., 1917.—Why Indiana should have more trees, by E. A. Gladden, p. 20-1, 56.
- Revue horticole, Dec. 16, 1916.—Les pins du Mexique, by S. Mottet, p. 191-4.
- Scientific American supplement, Dec. 9, 1916.—The raw materials used by the rubber manufacturers, by B. D. Porritt, p. 374-5.
- Scientific American supplement, Jan. 6, 1917.—The pottery tree, p. 7.
- Successful farming, Feb., 1917.—Evergreen windbreaks, by F. E., p. 48-9.
- Trade journals and consular reports*
- American lumberman, Jan. 13, 1917.—The case for and against the wooden shingle, p. 33; How insect pests affect national forests, by Henry Solon Graves, p. 35; Exhibit of wood for sporting goods completed, p. 36; Economy and safety in farm house construction, by R. S. Kellogg, p. 38D.
- American lumberman, Jan. 20, 1917.—1916 remarkable year in building construction, p. 31; Confer on blister rust, p. 46; Shipbuilding in Canada has revived, p. 51.
- American lumberman, Jan. 27, 1917.—Lumber industry conditions revealed by the Forest service, by W. B. Greeley, p. 34-5, 79; A uniform cost system for hardwood lumber, by T. L. Hoskins, p. 38-9; The necessity for co-operation in the lumber export trade, by J. J. Donovan, p. 39-40. Tells of Russia's timber resources, by Felix Willoughby Smith, p. 81.
- American lumberman, Feb. 10, 1917.—Large amount of lumber used in musical instruments, p. 57; Black walnut comes into greater use, p. 61.
- Barrel & box, Jan., 1917.—Transportation of cooperage stock, by Fred Esch, p. 20; Box material, by Fred Esch, p. 20; Lumber footage scale, by N. G. Near, p. 35; Crating and loading of veneers, by H. F. Arnemann, p. 39.
- Canada lumberman, Jan. 15, 1917.—Douglas fir export trade problem, by H. R. MacMillan, p. 28-9.
- Canada lumberman, Feb. 1, 1917.—Blister rust threatening white pine, p. 25; Forest telephone erection costs, p. 28.
- Furniture manufacturer and artisan, Dec. 1916.—The artificial bending of wood, by J. St. C. McQuilkin, p. 242-3; Spun paper and some of its uses, by Rolf Thelen, p. 244-5.
- Hardwood record, Jan. 25, 1917.—The strength of wood, by Hu Maxwell, p. 18-21.
- Hardwood record, Feb. 10, 1917.—The elasticity of wood, by Hu Maxwell, p. 15-17; Canoes made from single molded panel, p. 37; A mill scale study of maple, by David G. White, p. 41a-f.
- Lumber trade journal, Jan. 15, 1917.—Timber conservation versus taxation, p. 11.
- Lumber world review, Jan. 25, 1917.—Lumber favored for farm structures, by R. S. Kellogg, p. 23-6.
- Package, Jan., 1917.—Result of box test, p. 23-4; Standardize poultry package, p. 46.
- Pulp and paper magazine, Dec. 15, 1916.—The Christmas tree trade, p. 429-30; Pulpwood measurements and some factors involved in chipping and baling pulpwood, by O. F. Bryant, p. 431-6.
- Pulp and paper magazine, Jan. 4, 1917.—The pulp and paper industry in Canada, by O. F. Bryant, p. 11-28; A fire protection system for the upper Ottawa region, p. 31-2.
- Pulp and paper magazine, Jan. 11, 1917.—The press machine for wood pulp, by Knud Dahl, Jr., p. 43-4; Canada's white



## "Here's What Guides Her, Boys"

America's fastest trains are governed by Hamilton Watches. Engineers and conductors depend upon Hamilton accuracy. Wouldn't you like to own this watch that has become famous as the Railroad Timekeeper of America? Decide now that you will.

# Hamilton Watch

"The Watch of Railroad Accuracy"

You can buy a Hamilton movement alone for \$13.00 (\$14.00 in Canada). Other Hamiltons cost \$26.50, \$30.00, up to \$150.00 for the Hamilton Masterpiece in 18k heavy gold case. Hamiltons are made in many models—in cased watches; also in movements which your jeweler can fit to your present watch case.

Write for Hamilton Watch Book  
"The Timekeeper"

It tells many interesting facts about watch making. We will send it to you free

**HAMILTON WATCH COMPANY**  
Dept. 39 Lancaster, Pennsylvania

Engineer Jakey Brown, the oldest Engineer on the Denver & Rio Grande R. R. and a staunch booster for the Hamilton Watch

## HILL'S Seedlings and Transplants Also Tree Seeds

FOR REFORESTING

BEST for over a half century. All leading hardy sorts, grown in immense quantities. Prices lowest. Quality highest. Forest Planter's Guide, also price lists are free. Write to-day and mention this magazine.

### THE D. HILL NURSERY CO.

Evergreen Specialists

Largest Growers in America  
BOX 501 DUNDEE, ILL.

### GRAFTED NUT TREES

Why not combine NUT CULTURE with forestry? My hardy PENNSYLVANIA GROWN trees are the best for eastern or northern planting. Catalogue and cultural guide free.

### WHY NOT BUD OR GRAFT

the seedling black walnuts and butternuts on your farm over to the improved English walnuts; and the hickories to fine pecans and shagbarks. Booklet on propagation and top-working Nut Trees free.

J. F. JONES

NUT TREE SPECIALIST Box A, Lancaster, Pa.

### Nursery Stock for Forest Planting

Seedlings	TREE SEEDS	Transplants
\$2.25	Write for prices on large quantities	\$6.00
per 1000		per 1000

THE NORTH-EASTERN FORESTRY CO.  
CHESHIRE, CONN.



WE MAKE THE

## ENGRAVINGS

FOR THE  
AMERICAN FORESTRY  
MAGAZINE

OUR SPECIALTY

IS THE "BETTER GRADE FINISH OF

DESIGNS & ENGRAVINGS

IN ONE OR MORE COLORS  
FOR MAGAZINES CATALOGUES  
ADVERTISEMENTS ETC

HALF TONES

DULLO-TONES

COLOR PROCESS

LINE PLATES

COMBINATION LINE

AND HALF TONES

MULTI-COLORS

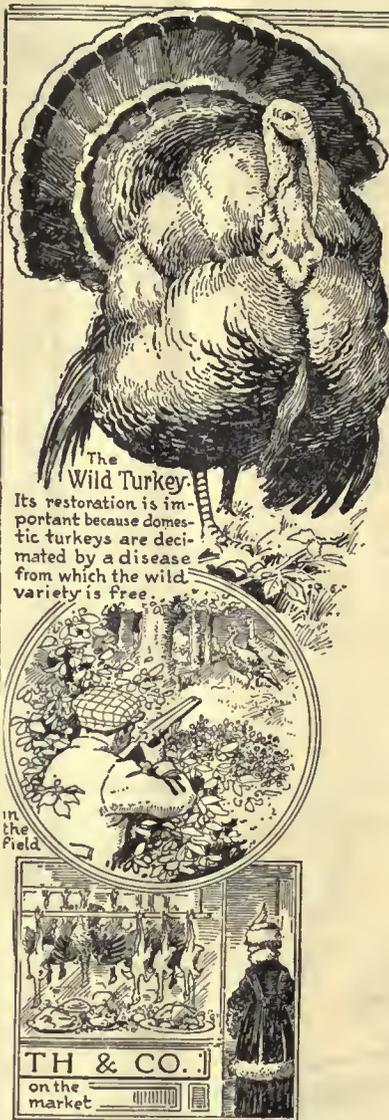
—ESTABLISHED 1889—

## GATCHEL & MANNING

SIXTH AND CHESTNUT STREETS  
OPPOSITE OLDE INDEPENDENCE HALL

PHILADELPHIA

- pine possessions threatened with extermination, by H. T. Gussow, p. 45-6.
- Railway review, Jan. 13, 1917.—Timber treating plant of the Boston elevated railway, by E. W. Bright, p. 67-8.
- St. Louis lumberman, Feb. 1, 1917.—Further facts about white pine blister rust, by George Latta Barrus, p. 51; Co-operation in the lumber industry, by R. S. Kellogg, p. 56-7; Some notions of an outsider on lumber distribution, by W. B. Greeley, p. 59-61; The Greeley report, by E. T. Allen, p. 86.
- Southern lumber journal, Feb. 1, 1917.—The value of North Carolina and forest resources of other southern states, by Job Taylor, p. 38-9.
- Timber trade journal, Dec. 30, 1917.—A useful tree; the silver fir in Ireland, p. 1031; The utilization of sawdust, p. xxiii-xxiv.
- Timber trade journal, Jan. 27, 1917.—Creosoted timber fire resisting, by J. E. Barton, p. 142; Scientific lumber drying, by Z. Clark Thwing, p. xxi, xxiii.
- Timberman, Jan., 1917.—Taxation of timber, p. 28-9; Wooden shipbuilding, by Fred A. Ballin, p. 41-3; Organization of Chinese forest service, by Forsythe Sherfesse, p. 45-6; Lumber and shingle making in Chile, by Albert Banderet, p. 46-7; Possibilities of Siberian lumber development, by Waldemar Toritch, p. 47; American opportunities in Russia, by Nicholas P. Melnikoff, p. 48.
- United States daily consular report, Jan. 17, 1917.—Spain provides for national parks, by Carl Bailey Hurst, p. 211; Forestry development in Finland, p. 212.
- United States daily consular report, Jan. 23, 1917.—British supplies of paper-making materials, by Ripley Wilson, p. 290; British utilization of kapok, by Hamilton C. Claiborne, p. 295.
- United States daily consular report, Jan. 27, 1917.—Wooden shipbuilding in the United States, p. 355-7.
- United States daily consular report, Jan. 30, 1917.—Forest resources of Bulgaria, by Dominic I. Murphy, p. 396-8.
- United States daily consular report, Jan. 31, 1917.—Growth of Canadian pulp and paper industry, p. 407.
- United States daily consular report, Feb. 2, 1917.—Supply of mahogany in the Gold Coast colony, by W. J. Yerby, p. 444-5.
- United States daily consular report, Feb. 3, 1917.—Chinese wood oil industry, by R. C. Mackay, p. 457-61.
- United States daily consular report, Feb. 7, 1917.—Paper-pulp possibilities in Brazil, by Alfred L. M. Gottschalk, p. 508-10.
- United States daily consular report, Feb. 13, 1917.—Argentine market for lumber, p. 600-1.
- Veneers, Feb., 1917.—Difficulties in shipping mahogany logs, p. 14; Wooden musical instruments, p. 14.
- Wood-worker, Jan., 1917.—Log sawing with the English frame, by W. J. Blackmur, p. 36-7; Something about coffins, by John Carter, p. 37-8.
- Forest Journals*
- Canadian forest journal, Jan., 1917.—Better apparatus for forest fire fighting, by H. C. Johnson, p. 896-9; Forests in Italian and Balkan war zones, by J. S. Illick, p. 919-22.
- Conservation, Feb., 1917.—White pine threatened, p. 5; Lookout towers, by Clyde Leavitt, p. 8.
- Conservationist, Jan., 1917.—Public policy in relation to forest lands, by George D. Pratt, p. 3-7.
- Forest leaves, Feb., 1917.—Annual meeting of the Pennsylvania forestry association, p. 2-6, 9-11; Recent news about forests of the war zones, by C. A. Schenck, p. 11-13; The United Sports-



## When Our Land Is Filled With Game

A FEW years ago America was the greatest game country in the world. Our woods, our fields, our water-ways, were teeming with game birds. Wild turkeys, quail, grouse, ducks, were familiar sights—to the sportsman; on the table; and in city markets.

These conditions should again prevail. They may successfully be brought about through game farming.

Game farming does not necessarily require a large amount of land and involves little expense in time and money. The work in itself is intensely interesting and affords both profit and pleasure to those who indulge in it.

### Results from Game Farming

In the first place game birds of many kinds command high prices in city markets. Their eggs are eagerly sought by breeders. Secondly, if you are fond of hunting, the birds you raise will provide excellent sport and food. Or if you prefer, and if you own large acreage, you may lease the privilege of hunting over your land. This does not mean that the sport of hunting, so far as the general public is concerned, will be restricted. On the contrary

it will be increased; for game raised for sporting purposes cannot be closely confined in any given area.

If you are interested in game farming from any stand point, you should write for a booklet which takes up the subject in a broad way and gives much interesting and valuable information regarding it.

The book is called "Game Farming for Profit and Pleasure." It is well worth reading. Write for a copy. Use the coupon below.

Game Breeding Department, Room 11

**HERCULES POWDER CO.**

Wilmington, Delaware



Manufacturers of Explosives; Infallible and "E. C." Smokeless Shotgun Powders; L. & R. Orange Extra Black Sporting Powder; Dynamite for farming.

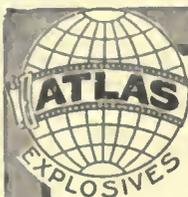
Game Breeding Department, Room 11  
Hercules Powder Company, Wilmington, Delaware

Gentlemen:—Please send me a copy of Game Farming for Profit and Pleasure. I am interested in game breeding from the standpoint of.....  
Very truly yours,

Name .....

Address .....





## Blast beds for trees; get sturdier roots

"Both apple and peach trees planted in blasted beds developed deeper and stronger root systems than those in spade-dug holes," the New Jersey Experiment Station found. "Soil around spade-dug trees was hard; around blasted trees it was loose for yards." Plant your fruit trees in beds made with

### Atlas Farm Powder

**THE SAFEST EXPLOSIVE**

The Original Farm Powder

Just punch a hole, charge it, light a fuse and the work is done! You can do your own blasting easily and quickly with Atlas Farm Powder—made especially for agricultural use. It is sold by dealers near you.

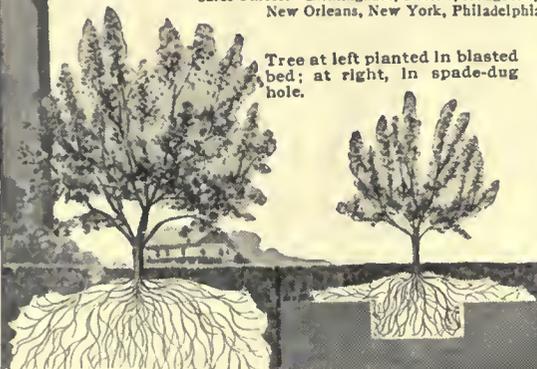
The Safest Explosive replaces expensive labor in many kinds of farm work. It is most economical for blasting stumps, digging ditches, shattering boulders, etc. By blasting the subsoil with Atlas you can get bigger crops.

#### Mail Coupon Now for Free Book

Our illustrated book, "Better Farming," shows how to save money and increase the productiveness of your farm by using Atlas Farm Powder. Sent free on request—mail the coupon now.

**ATLAS POWDER COMPANY** General Offices: **Wilmington, Del.**

Sales Offices: Birmingham, Boston, Houghton, Joplin, Kansas City, Knoxville, New Orleans, New York, Philadelphia, Pittsburgh, St. Louis



Tree at left planted in blasted bed; at right, in spade-dug hole.

#### FREE BOOK COUPON

ATLAS POWDER CO.  
Wilmington, Del.

Send me your 74-page book "Better Farming." I am interested in the use of explosives for the purpose before which I mark X.

- Stump Blasting **FD15**
- Boulder Blasting
- Subsoil Blasting
- Tree Planting
- Ditch Digging
- Road Building

Name \_\_\_\_\_  
Address \_\_\_\_\_

## Orchids

We are specialists in Orchids, we collect, import, grow, sell and export this class of plants exclusively. Our illustrated and descriptive catalogue of Orchids may be had on application. Also special list of freshly imported unestablished Orchids.

### LAGER & HURRELL

Orchid Growers and Importers **SUMMIT, N. J.**

**EVERGREEN SEEDLINGS**—We will pull or dig, as requested. From North Michigan, Arbor Vitae, Hemlock, White and Norway Pine, White Spruce and Balsam Fir; from Tennessee, Red Cedar.

**DECIDUOUS SEEDLINGS**—Ash, Beech, Linden, Sugar Maple, Cherry, Oaks, and many other trees and shrubs, through our many collecting stations. Many of these in transplanted, nursery-grown stock.

**PERENNIALS**—We get out millions of these. Send list of wants for quotations. Address Dept. A. F.

**HOPEDALE NURSERIES, Hopedale, Ill.**

## PHILIP T. COOLIDGE FORESTER

Stetson Bldg., 31 Central Street, Bangor, Me.  
Management and Protection of Woodlands  
Improvement Cuttings, Planting, Timber  
Estimates and Maps. Surveying

<b>FO</b> 1	<b>RE</b> 2	<b>ST</b> 3	<b>RY</b> 4
----------------	----------------	----------------	----------------

## THE FOREST IS THREE-FOURTHS OF FORESTRY

Your opportunities are as unlimited as our forests if you study at

### WYMAN'S SCHOOL OF THE WOODS

Incorporated **Munising, Michigan**

#### Do Business by Mail

It's profitable, with accurate lists of prospects. Our catalogue contains vital information on Mail Advertising. Also prices and quantity on 6,000 national mailing lists, 99% guaranteed. Such as:

- War Material Mfrs. Wealthy Men
- Cheese Box Mfrs. Axle Grease Mfrs.
- Shoe Retailers Auto Owners
- Contractors Tin Can Mfrs.
- Druggists Farmers, Etc.

Write for this valuable reference book; also prices and samples of fac-simile letters. Have us write or revise your Sales Letters.

Ross-Gould, 1009C Olive St.

**Ross-Gould**  
Mailing  
Lists St. Louis

men and what they are doing for forests and wild life, by Frank Gray, p. 15-16.

Forestry quarterly, Dec., 1916.—Some suggestions on the control of mistletoe in the national forests of the northwest, by James R. Weir, p. 567-77; Some characteristics of slash pine, by Wilbur R. Mattoon, p. 578-88; National forest organization, by S. W. Wynne, p. 589-94; Fire-season forecasts on a California forest, by R. W. Ayres, p. 595-8; Conversion methods; a visit to the forests of Chaux and Faye de la Montrond, France, by H. R. MacMillan, p. 599-604; Passing views of forestry in British South Africa, by H. R. MacMillan, p. 605-23; Forestry in India from a Canadian point of view, by H. R. MacMillan, p. 624-49; China's forest laws, by F. Sherfese, p. 650-61; The significance of certain variations in the anatomical structure of wood, by R. P. Prichard and I. W. Bailey, p. 662-70; Douglas fir fiber, with special reference to length, by H. N. Lee and E. M. Smith, p. 671-95; The economic woods of Hawaii, by Vaughan MacCaughy, p. 696-716.

Indian forester, Nov.-Dec., 1916.—Teak taungya plantations in the Henzada-Maubin division, by C. W. Allan, p. 533-7; The road drag, by A. J. S. Butterwick, p. 537-45; The forest resources of Newfoundland, p. 567-70.

Quarterly journal of forestry, Jan., 1917.—Relationship of the Douglas fir to lime in soil, by William Somerville, p. 1-6; The improvement and maintenance of soil fertility in woodlands; by W. L. Taylor, p. 6-16; Discussion on the present position and future development of forestry in England and Wales, p. 20-58; Large Sitka spruces in Scotland, by A. Henry, p. 65-6; Income tax on woodlands, by H. J. Elwes and Wm. A. Haviland, p. 66-8; The pine beetle in larch shoots, by Wm. Somerville, p. 68-72; A scheme to encourage afforestation, by James Smith, p. 74-6; Memorandum on the Danish moorland society, p. 77-9.

Revue des eaux et forêts, Nov. 1, 1916.—Influence de l'intensité des éclaircies sur le rendement des peuplements réguliers de sapins, by Emile Mer, p. 305-9; Forêts russes d'extrême-orient, Province maritime, by A. Arnould, p. 310-16; Le service forestier aux armées, p. 322-8.

Revue des eaux et forêts, Dec. 1, 1916.—Étendue des forêts domaniales en France, by G. Huffel, p. 337-48; La réparation des dommages de guerre aux forêts, by J. Demorlaine, p. 349-53; L'exploitation des bois au Tonkin, by J. Prades, p. 354-6; Le bois digestible, p. 360-2.

Tidsskrift for skogbruk, Dec., 1916.—Gammelskog og nutidsskog (Former forests and present forests), p. 417-24; Australiens skoger (Australia's forests), by D. E. Hutchins, p. 424-8; Hr. forstmester Vestby og mine beregninger (Hr. Vestby and my calculations concerning a timber shortage), by Agnar Barth, p. 428; Skog og planting paa Dovre (Forests and plantations in Dovre), by Haakon Lie, p. 433-8.

Tidsskrift for skogbruk, Jan., 1917.—Om snauhugst og blaedning (Concerning clear cutting and selection cutting), by K, p. 2-8; Efter en liten Vestlands-visit (After a little visit to the west coast), by A. K. Myhrwold, p. 8-14; Landbrukshiskolen og dens skogbruk-savdeling (The agricultural college and its department of forestry), by J. G. Böhmer, p. 14-20.

"QUALITY"

---

LONG AND SHORT LEAF YELLOW PINE

MISSOURI LUMBER & LAND  
EXCHANGE COMPANY

R. A. LONG BUILDING

KANSAS CITY, MO.

THE SAME

"TODAY AND TOMORROW"

# The American Forestry Association

## Washington, D. C.

### President

CHARLES LATHROP PACK, Lakewood, N. J.

### Vice-Presidents

ANDREW CARNEGIE, New York  
 WILLIAM E. COLBY, California  
 Secretary of The Sierra Club  
 T. COLEMAN DUPONT, Delaware  
 DR. CHARLES W. ELIOT, Massachusetts  
 President Emeritus Harvard University  
 DR. B. E. FERNOW, Canada  
 Dean of Forestry, University of Toronto  
 HENRY S. GRAVES, District of Columbia  
 Chief of the Forest Service  
 EVERITT G. GRIGGS, Washington

HON. DAVID HOUSTON  
 Secretary of Agriculture  
 HON. FRANKLIN K. LANE  
 Secretary of the Interior  
 HON. ASBURY F. LEVER, South Carolina  
 United States Representative  
 HON. THOMAS NELSON PAGE  
 Ambassador to Italy  
 GIFFORD PINCHOT, Pennsylvania  
 MRS. FRANCES F. PRESTON, New Jersey  
 FILIBERT ROTH, Michigan  
 Dean of Forestry, University of Michigan  
 DR. J. T. ROTHROCK, Pennsylvania

MRS. JOHN D. SHERMAN, Illinois  
 Chairman Conservation Department  
 General Federation of Women's Clubs  
 HON. WM. H. TAFT, Connecticut  
 Ex-President United States  
 JOSEPH N. TEAL, Oregon  
 Chairman Oregon Conservation Commission  
 THEODORE N. VAIL  
 President A. T. & T. Co., Vermont  
 HON. JOHN WEEKS, Massachusetts  
 United States Senator  
 DR. ROBERT S. WOODWARD, Washington, D.C.  
 President Carnegie Institution

### Treasurer

JOHN E. JENKS, Editor, Army and Navy Register, Washington, D. C.

### Executive Secretary

PERCIVAL S. RIDSDALE, 1410 H Street, N. W., Washington, D. C.

### Directors

E. T. ALLEN, Oregon  
 Forester, Western For. and Conservation Asso.  
 JOHN S. AMES, Massachusetts  
 HON. ROBERT P. BASS, New Hampshire  
 Ex-Governor of New Hampshire  
 WM. B. GREELEY, District of Columbia  
 Assistant U. S. Forester  
 W. R. BROWN, New Hampshire  
 Pres. New Hamp. Forestry Commission

HERMAN H. CHAPMAN, Connecticut  
 Professor of Forestry, Yale Forest School  
 DR. HENRY S. DRINKER, Pennsylvania  
 President, Lehigh University  
 ALFRED GASKILL  
 State Forester, New Jersey  
 JOHN E. JENKS, District of Columbia  
 Editor, Army and Navy Register  
 CHESTER W. LYMAN, New York  
 International Paper Company

CHARLES LATHROP PACK, New Jersey  
 Pres. Fifth National Conservation Congress  
 CHARLES F. QUINCY, New York  
 J. E. RHODES, Illinois  
 Secretary, Southern Pine Association  
 ERNEST A. STERLING, Illinois  
 Forest and Timber Engineer  
 J. B. WHITE, Missouri  
 Ex-President, National Conservation Congress

## Declaration of Principles and Policy of The American Forestry Association

**IT IS A VOLUNTARY** organization for the inculcation and spread of a forest policy on a scale adequate for our economic needs, and any person is eligible for membership.

**IT IS INDEPENDENT**, has no official connection with any Federal or State department or policy, and is devoted to a public service conducive to national prosperity.

**IT ASSERTS THAT** forestry means the propagation and care of forests for the production of timber as a crop; protection of watersheds; utilization of non-agricultural soil; use of forests for public recreation.

**IT DECLARES THAT FORESTRY** is of immense importance to the people; that the census of 1913 shows our forests annually supply over one and a quarter billion dollars' worth of products; employ 735,000 people; pay \$367,000,000 in wages; cover 550,000,000 acres unsuited for agriculture; regulate the distribution of water; prevent erosion of lands; and are essential to the beauty of the country and the health of the nation.

**IT RECOGNIZES THAT** forestry is an industry limited by economic conditions; that private owners should be aided and encouraged by investigations, demonstrations, and educational work, since they cannot be expected to practice forestry at a financial loss; that Federal and State governments should undertake scientific forestry upon national and State forest reserves for the benefit of the public.

**IT WILL DEVOTE** its influence and educational facilities to the development of public thought and knowledge along these practical lines.

### It Will Support These Policies

**National and State Forests under Federal and State Ownership, administration and management respectively;** adequate appropriations for their care and management; Federal cooperation with the States, especially in forest fire protection.

**State Activity** by acquirement of forest lands; organization for fire protection; encouragement of forest planting by communal and private owners, non-political departmentally independent forest organization, with liberal appropriations for these purposes.

**Forest Fire Protection** by Federal, State and fire protective agencies, and its encouragement and extension, individually and by cooperation; without adequate fire protection all other measures for forest crop production will fail.

**Forest Planting** by Federal and State governments and long-lived corporations and acquirement of waste lands for this purpose; and also planting by private owners, where profitable, and encouragement of natural regeneration.

**Forest Taxation Reforms** removing unjust burdens from owners of growing timber.

**Closer Utilization** in logging and manufacturing without loss to owners; aid the lumbermen in achieving this.

**Cutting of Mature Timber** where and as the domestic market demands it, except on areas maintained for park or scenic purposes, and compensation of forest owners for loss suffered through protection of watersheds, or on behalf of any public interest.

**Equal Protection** to the lumber industry and to public interests in legislation affecting private timberland operations, recognizing that lumbering is as legitimate and necessary as the forests themselves.

**Classification** by experts of lands best suited for farming and those best suited for forestry; and liberal national and State appropriations for this work.

# American Forestry



An Illustrated Magazine about Forestry and Kindred Subjects Published Each Month by the American Forestry Association  
Washington, D.C.

FACULTY OF FORESTRY

APR 2 1917

# The American Forestry Association

## Washington, D. C.

### President

CHARLES LATHROP PACK, Lakewood, N. J.

### Vice-Presidents

ANDREW CARNEGIE, New York  
 WILLIAM E. COLBY, California  
 Secretary of The Sierra Club  
 T. COLEMAN DUPONT, Delaware  
 DR. CHARLES W. ELIOT, Massachusetts  
 President Emeritus Harvard University  
 DR. B. E. FERNOW, Canada  
 Dean of Forestry, University of Toronto  
 HENRY S. GRAVES, District of Columbia  
 Chief of the Forest Service  
 EVERITT G. GRIGGS, Washington

HON. DAVID HOUSTON  
 Secretary of Agriculture  
 HON. FRANKLIN K. LANE  
 Secretary of the Interior  
 HON. ASBURY F. LEVER, South Carolina  
 United States Representative  
 HON. THOMAS NELSON PAGE  
 Ambassador to Italy  
 GIFFORD PINCHOT, Pennsylvania  
 MRS. FRANCES F. PRESTON, New Jersey  
 RILBERT ROTH, Michigan  
 Dean of Forestry, University of Michigan  
 DR. J. T. ROTHROCK, Pennsylvania

MRS. JOHN D. SHERMAN, Illinois  
 Chairman Conservation Department  
 General Federation of Women's Clubs  
 HON. WM. H. TAFT, Connecticut  
 Ex-President United States  
 JOSEPH N. TEAL, Oregon  
 Chairman Oregon Conservation Commission  
 THEODORE N. VAIL  
 President A. T. & T. Co., Vermont  
 HON. JOHN WEEKS, Massachusetts  
 United States Senator  
 DR. ROBERTS S. WOODWARD, Washington, D.C.  
 President Carnegie Institution

### Treasurer

JOHN E. JENKS, Editor, Army and Navy Register, Washington, D. C.

### Executive Secretary

PERCIVAL S. RIDSDALE, 1410 H Street, N. W., Washington, D. C.

### Directors

E. T. ALLEN, Oregon  
 Forester, Western For. and Conservation Asso.  
 JOHN S. AMES, Massachusetts  
 HON. ROBERT P. BASS, New Hampshire  
 Ex-Governor of New Hampshire  
 WM. B. GREELEY, District of Columbia  
 Assistant U. S. Forester  
 W. R. BROWN, New Hampshire  
 Pres. New Hamp. Forestry Commission

HERMAN H. CHAPMAN, Connecticut  
 Professor of Forestry, Yale Forest School  
 DR. HENRY S. DRINKER, Pennsylvania  
 President, Lehigh University  
 ALFRED GASKILL  
 State Forester, New Jersey  
 JOHN E. JENKS, District of Columbia  
 Editor, Army and Navy Register  
 CHESTER W. LYMAN, New York  
 International Paper Company

CHARLES LATHROP PACK, New Jersey  
 Pres. Fifth National Conservation Congress  
 CHARLES F. QUINCY, New York  
 J. E. RHODES, Illinois  
 Secretary, Southern Pine Association  
 ERNEST A. STERLING, Illinois  
 Forest and Timber Engineer  
 J. B. WHITE, Missouri  
 Ex-President, National Conservation Congress

## Declaration of Principles and Policy of The American Forestry Association

**IT IS A VOLUNTARY** organization for the inculcation and spread of a forest policy on a scale adequate for our economic needs, and any person is eligible for membership.

**IT IS INDEPENDENT**, has no official connection with any Federal or State department or policy, and is devoted to a public service conducive to national prosperity.

**IT ASSERTS THAT** forestry means the propagation and care of forests for the production of timber as a crop; protection of watersheds; utilization of non-agricultural soil; use of forests for public recreation.

**IT DECLARES THAT FORESTRY** is of immense importance to the people; that the census of 1913 shows our forests annually supply over one and a quarter billion dollars' worth of products; employ 735,000 people; pay \$367,000,000 in wages; cover 550,000,000 acres unsuited for agriculture; regulate the distribution of water; prevent erosion of lands; and are essential to the beauty of the country and the health of the nation.

**IT RECOGNIZES THAT** forestry is an industry limited by economic conditions; that private owners should be aided and encouraged by investigations, demonstrations, and educational work, since they cannot be expected to practice forestry at a financial loss; that Federal and State governments should undertake scientific forestry upon national and State forest reserves for the benefit of the public.

**IT WILL DEVOTE** its influence and educational facilities to the development of public thought and knowledge along these practical lines.

### It Will Support These Policies

**National and State Forests under Federal and State Ownership, administration and management respectively;** adequate appropriations for their care and management; Federal cooperation with the States, especially in forest fire protection.

**State Activity** by acquirement of forest lands; organization for fire protection; encouragement of forest planting by communal and private owners, non-political departmentally independent forest organization, with liberal appropriations for these purposes.

**Forest Fire Protection** by Federal, State and fire protective agencies, and its encouragement and extension, individually and by cooperation; without adequate fire protection all other measures for forest crop production will fail.

**Forest Planting** by Federal and State governments and long-lived corporations and acquirement of waste lands for this purpose; and also planting by private owners, where profitable, and encouragement of natural regeneration.

**Forest Taxation Reforms** removing unjust burdens from owners of growing timber.

**Closer Utilization** in logging and manufacturing without loss to owners; aid the lumbermen in achieving this.

**Cutting of Mature Timber** where and as the domestic market demands it, except on areas maintained for park or scenic purposes, and compensation of forest owners for loss suffered through protection of watersheds, or on behalf of any public interest.

**Equal Protection** to the lumber industry and to public interests in legislation affecting private timberland operations, recognizing that lumbering is as legitimate and necessary as the forests themselves.

**Classification** by experts of lands best suited for farming and those best suited for forestry; and liberal national and State appropriations for this work.

# AMERICAN FORESTRY

THE MAGAZINE OF THE AMERICAN FORESTRY ASSOCIATION

PERCIVAL SHELDON RIDSDALE, Editor

## EDITORIAL ADVISORY BOARD

HERMAN H. CHAPMAN  
ERNEST A. STERLING

S. T. DANA  
FREDERICK S. UNDERHILL

JOHN E. RHODES  
S. N. SPRING

APRIL 1917 VOL. 23

## CONTENTS

No. 280

Planting One Million Food Gardens . . . . .	197	Illustrated Glossary—Further Descriptions of Roots—Dr. R. W. Shufeldt . . . . .	235
With seventeen illustrations.		One illustration.	
Forestry and the Paper Industry—By Hon. D. F. Houston . . . . .	205	Spraying Work of This Season—By J. J. Levison . . . . .	236
With thirteen illustrations.		With three illustrations.	
Nebraska's Forestation Commission—By Woodruff Ball, Secretary . . . . .	212	Æolian Erosion in Hawaii—By C. S. Judd . . . . .	239
The Independence of American Nurseries—By David Fairchild . . . . .	213	With two illustrations.	
With four illustrations.		Tour of the National Forests and Parks . . . . .	240
The Dogwood—By Dr. R. W. Shufeldt . . . . .	217	Lake Sunapee—Poem by Richard Butler Glaenger . . . . .	240
With five illustrations.		Pine Blister Quarantine Hearing . . . . .	241
The Warblers—By A. A. Allen, Ph.D. . . . .	221	Editorial . . . . .	242
With ten illustrations.		The Summer Campaign Against the White Pine Blister.	
Mining "Claims" in the Grand Canyon—By H. H. Chapman . . . . .	225	National Park Legislation.	
With four illustrations.		Primary Education in Forestry.	
Food-Producing Trees—By J. Russell Smith, Ph.D. . . . .	228	The Public Domain and the Stock-Raising Homestead Law.	
With nine illustrations.		Building Bungalows—By Rawson Woodman Haddon . . . . .	244
Eastern Forest Lands Bought . . . . .	233	With seven illustrations	
The New Spirit of Public Service—By C. J. Stahl . . . . .	234	Canadian Department—Ellwood Wilson . . . . .	248
With one illustration.		Current Literature . . . . .	248

## SPECIAL OFFER TO MEMBERS ONLY

One of the following described books will be presented free of charge to any member of the American Forestry Association who secures ONE NEW subscribing member:

- No. 1—Field Book of American Trees and Shrubs, 465 pages, 275 illustrations of trees, leaves, blossoms, fruits, seeds, area of growth, etc.
- No. 2—Field Book of Wild Birds and Their Music, 262 pages, 38 colored and 15 other full-page illustrations.
- No. 3—Field Book of American Wild Flowers, 587 pages, 24 colored plates and 215 full-page illustrations.

### FILL OUT THIS BLANK

I present for Subscribing Membership in the American Forestry Association, including American Forestry Magazine, and enclose \$3.00 for the 1917 fee—

Name . . . . .

Address . . . . . City . . . . .

Send Book No.  to Name . . . . .

Address . . . . . City . . . . .

\$2.00 of above fee is for American Forestry for One Year.

AMERICAN FORESTRY is published monthly by the American Forestry Association.

Subscription price without membership, three dollars per year; single copies, twenty-five cents.

Entered as second-class mail matter December 24, 1909, at the Post-office at Washington, under the Act of March 3, 1879

Copyright, 1917, by the American Forestry Association

# REAL ESTATE

FORESTS : ESTATES : TIMBERLANDS  
PRESERVES : FARMS : CAMPS : ETC.



## FOR RENT, CAMP AT "GRAND LAC STE. ANNE"

Saint Urbain, Charlevoix County, Quebec, P. Q.

45 miles northeast of Murray Bay, 15 square miles, with four lakes—splendid trout fishing. Camp on Island—contains 6 bedrooms, living-room, dining-room, laundry facilities, etc. Also three tents for outdoor sleeping accommodation. Fresh milk, chickens, eggs, potatoes—may be purchased from guide; other provisions supplied from Montreal. Reasonable rent for season—includes services of three guardians.

*Full particulars from*

WORTHINGTON WHITEHOUSE, Inc., Sole Agent, 9 East 46th Street, New York  
Telephone: Murray Hill 1000



Timber on a South Carolina plantation or entire plantation, on the Great Pee Dee River in Marlboro County. Now occupied and under cultivation. Dwelling house occupied by owner. Several new small houses rented to colored help, barn, small saw mill. 1,140 acres cleared. 3,200 acres timbered; 1,250 acres fine large old growth timber, 700 acres large second growth timber over 50 years old; balance mostly thrifty, large second growth timber. Growth of Gum Pine, etc., very rapid. Many very large White and Red Oaks, Yellow Pine, Cypress, Sycamore, Cottonwood, Holly, etc., as shown in accompanying photograph.

DESCRIPTION OF THIS AND MANY OTHER TIMBER PROPERTIES FOR SALE MAY BE OBTAINED ON APPLICATION TO

**DONALD E. LAUDERBURN**

154 FIFTH AVENUE NEW YORK CITY

**C A M P S** ST. REGIS LAKES  
THE SARANACS  
LAKE PLACID  
RAQUETTE, LOON, and LONG LAKES—Consult

**DURYEE & CO.**

ADIRONDACK REAL ESTATE BROKERS

SARANAC LAKE NEW YORK

## MURRAY BAY CANADA

Cottages and Camps

For sale or for rent this season.

For information on all properties write to

**M. G. TOWNSEND**

297 LEXINGTON AVE. NEW YORK  
TEL. 2977 MURRAY HILL

## In the Heart of Crawford Notch WHITE MOUNTAINS, N. H. 500 Acres of Woodland Suitable for One Splendid Estate

or I would divide it into a few smaller estates, each equally attractive as it offers 4 or 5 sites particularly suited for the location of buildings. State Highway runs through this land. Views of the Crawford Notch and entire Presidential Range. Many streams and springs.

Also a Small Farm in Crawford Notch, 15 acres of field and orchard with fine spring (no buildings). It is on the state highway between Bemis and Bartlett.

Has few acres of woodland. Easily developed.

All of the above property is within 12 miles of Bretton Woods with its golf courses, etc. This is the only land for sale in the Crawford Notch and is a part of my large estate adjoining Crawford Notch State Park. Nowhere in New England is there better scenery or finer locations for country estates. For plans and terms, apply

**CHAS. H. MOREY, BOX 25, BEMIS, N. H.**

LONG ISLAND  
REAL ESTATE

## WARD & WARD

22 Exchange Place, NEW YORK CITY

ESTATES, SHORE FRONTS  
FARMS AND PRESERVES



ROBINS ISLAND IS A 500-ACRE PRESERVE NOW OWNED BY A CLUB. THIS IS ONLY ONE OF MANY PROPERTIES THAT ARE AVAILABLE NOW. OUR FACILITIES COVER EVERY KIND OF PROPERTY FOR SALE OR RENT IN EVERY PART OF LONG ISLAND

FORESTS : ESTATES : TIMBERLANDS  
PRESERVES : FARMS : CAMPS : ETC.

# REAL ESTATE

### TIMBER CRUISING BOOKLETS

Biltmore Timber Tables. Including solution of problems in forest finance. Southern Timber Tables. How to estimate Southern Pine, Southern White Cedar, and Southern Appalachian Timber—Spruce pulpwood, Hemlock bark, Chestnut oak bark, Chestnut tannic acid wood.

Postpaid, 25 cents each

**HOWARD R. KRINBILL**

Forest Engineer

Newbern, N. C.

### PENNSYLVANIA TIMBER TRACT

FOR SALE—3500 acres in Bedford and Huntingdon Counties, in fee reserving mineral rights, average haul to railroad 2 miles or less, all down hill, 20 million feet Oak, Chestnut, Pine, Locust, Poplar, Maple, 15 miles from market for mine props and ties.

**DONALD E. LAUDERBURN**

154 FIFTH AVE.

NEW YORK

### VIRGIN YELLOW PINE TIMBERLAND FOR SALE

36,000 acres Arkansas shortleaf yellow pine timber and land, near Iron Mountain Railroad. Will sell all or part. Liberal terms to operators.

*For particulars address the owners.*

**THE GRAHAM LUMBER CO.**

614 WRIGHT BLDG.

ST. LOUIS, MO.

### VERMONT TIMBERLAND

3,330 acres containing 7½ million feet Hardwoods, over 2 million feet Spruce, 250 thousand feet Hemlock, also saw mill, 8 miles from railroad, as much more additional timber available.

**DONALD E. LAUDERBURN**

154 FIFTH AVENUE

NEW YORK

### PENNSYLVANIA HEMLOCK

Like Father used to peel. The finest body of hemlock in Pennsylvania that may still be bought by operating companies. 700 acres. 10 million feet. Ideal logging conditions. Two trunk line railroads distant 12 miles over a good road down hill. In Susquehanna County.

**PAUL P. LYON**

BRADFORD, PA.

### 100,000 OAK TREES

14" to 40". 71,000 Poplar, White Pine, Hemlock, Chestnut and Yellow Pine 14" to 48" for sale at \$3.50 per tree, tan bark reserved.

*Principals only please answer.*

**A. R. THOMPSON**

330 WILLIAMSON BLDG. CLEVELAND, O.

### GREAT HARDWOOD TIMBER TRACT

Thirty thousand acres with over three hundred million feet of timber in Eastern Tennessee. Cheap. Also pine tracts in North and South Carolina.

*For information, address*

**W. D. HARRELL**

ROSE HILL, N. C.

### WANTED

**SOFTWOOD STUMPAGE**

Large and Small Tracts

**MEIGS PULPWOOD COMPANY**

10 EAST 43rd STREET NEW YORK CITY

### TIMBER TRACTS AND PRESERVES

Many tracts are suitable for timber investments; others are admirably adapted for game preserves. Some are suited for both. This department will provide a market-place for both commercial and sporting properties of value. All information, etc., from

**ADVERTISING DEPARTMENT**

2 WEST 45th STREET

NEW YORK

Tel. 4275 Vanderbilt



I OWN several well-timbered farms in the White Mountain region of New Hampshire commanding very beautiful views of lake and mountain and ideally situated for summer homes or fish and game preserves. I bought these primarily because of their scenic and timber values and to save them from ruthless denudation by portable saw mill operators. Most of them have trout brooks and some lake area within their boundaries. I will sell, to parties who wish to follow practical forestry methods in handling the timber growth, at prices representing but little more than the actual value of the standing timber. Most of them are located where large additional areas of growing timber can be secured at low cost. Also a forest tract of about 7,000 acres carrying 50 million feet of Birch, Maple, Beech, Ash and Poplar and 12 to 15 million feet of Spruce. Five small lakes and about three miles of shore on a large lake. Near railroad but secluded. No finer property in the East for fish and game club or forest preserve.

*For particulars address*

**E. BERTRAM PIKE**

PIKE, NEW HAMPSHIRE





## *"Lacey Says It's a Bargain"*

*Means that you may safely close your eyes and make the purchase, whether from or through our house or elsewhere. Our favorable advice, when given, is securely based on knowledge.*

## *"Lacey Says the Price Is too High"*

*means that the purchase is surely not the best to be had.*

*In our 37 years as scientific timberland factors we have earned the right to be considered the authoritative source of knowledge and reliability in counsel on timberland matters by lumbermen, by bankers and by lay investors.*

*You'll be interested in reading our booklet, "Pointers."*

*May we send it?*

*James D. Lacey & Co.*  
INTERNATIONAL TIMBERLAND FACTORS  
EST. IN 1880

CHICAGO  
1750 McCormick Bldg.

SEATTLE  
626 Henry Bldg.

NEW ORLEANS  
1213 Whitney-Central Bldg.

# AMERICAN FORESTRY

VOL. XXIII

APRIL 1917

NO. 280

## PLANTING ONE MILLION FOOD GARDENS

**I**N the existing national emergency the American Forestry Association is "doing its bit." Realizing that the most important feature of economic preparedness is to provide a sufficient food supply, and knowing that owing to the demands from abroad, transportation difficulties at home, and a crop shortage last year there was an actual deficiency in the food supply, the Association has lent the aid of its Conservation Department, its headquarters, and its secretary to the National Emergency Food Garden Commission. This Commission, of which Mr. Charles Lathrop Pack is the president, is for one thing inspiring and aiding the planting of 1,000,000 food gardens in cities, towns and villages. The product of these gardens will supply more than 1,000,000 families, and be valued at \$250,000,000. The members of the American Forestry Association are asked to give their approval and their active assistance in furthering this movement and adding to its success.

**T**HE country's food supply is less than the country's need for home consumption and for export. Something must be done to increase it, and a plan, feasible, rational, simple, has been worked out and given to the people through the newly created National Emergency Food Garden Commission, affiliated with the Conservation Department of the American Forestry Association, which may mean the adding of \$250,000,000 to the annual food supply of the nation. It will mean also the creation and tilling of a million more vegetable-producing gardens in the back yards of thousands of towns, villages and cities of the nation, the utilization of vacant lots and idle land, and the creation of a condition which will enable the civilian population to be helpful to the military arms of the nation.

Charles Lathrop Pack, of Lakewood, New Jersey, president of the American Forestry Association, has been made the president of the National Emergency Food Garden Commission. He is the originator of the Commission and of the idea of a nation-wide campaign for the production of home-grown vegetables. He found upon investigation that there are hundreds of thousands of acres of vacant and untilled lots, neglected back yards, and idle, tillable land accessible to those who might wish to utilize it. He found further that the food supply of the nation was dwindling, that prices for the necessities of life were soaring and destined for still greater altitudes; that if war gripped the nation the great railroad systems would be commissioned for troop and military supply movements, that the products of the farm and stock from the ranch would have difficulty in finding an outlet and that a considerable portion of all foodstuffs would be required for the fighting forces.

Mr. Pack conceived the idea that the home garden, the back lot garden, as an adjunct to the school garden, would

solve the problem. He conferred with eminent men—leaders of thought—and they agreed unanimously that the back yard movement was the solution of the problem, and the National Emergency Food Garden Commission was created.

It was at once affiliated with the Conservation Department of the American Forestry Association, which lent its headquarters and business organization to the work.

The main feature of this work is to supply thousands of newspapers with articles inspiring the planting of food gardens and with a daily service of practical advice on the making and the care of these gardens, the selection of seeds and the cultivation of the vegetables. By this means an average of 10,000,000 people are supplied with daily information for every 1,000 newspapers printing the information. At this time some 2,000 papers are printing the information, which thus becomes available for 20,000,000 people to whom back yards, school gardens or vacant lots are accessible.

Percival S. Ridsdale, secretary of the American Forestry Association and editor of AMERICAN FORESTRY, was chosen as secretary of the Commission. The other members of the Commission are Luther Burbank, perhaps the most noted horticulturist in the world, Dr. Charles W. Eliot, of Cambridge, Massachusetts; John Hays Hammond, the noted mining engineer; Fairfax Harrison, president of the Southern Railway; Dr. John Grier Hibben, president of Princeton; Dr. Irving Fisher, of Yale; Emerson McMillin, of New York; A. W. Shaw, of Chicago; assistant secretary of agriculture, Carl Vrooman; Captain J. B. White, noted lumberman and conservationist and now a member of the United States Shipping Board; James Wilson, former secretary of agriculture, and Hon. Myron T. Herrick, of Ohio. In this list of men of action may be found the foremost thinkers of America. They are men

### THE NATIONAL EMERGENCY FOOD GARDEN COMMISSION

CHARLES LATHROP PACK, <i>President</i>	PERCIVAL S. RIDSDALE, <i>Secretary</i>
LUTHER BURBANK, Calif.	DR. JOHN GRIER HIBBEN, N. J.
DR. CHARLES W. ELIOT, Mass.	EMERSON McMILLIN, N. Y.
DR. IRVING FISHER, Conn.	CHARLES LATHROP PACK, N. J.
JOHN HAYS HAMMOND, Mass.	A. W. SHAW, Ill.
FAIRFAX HARRISON, Va.	HON. CARL VROOMAN, Ill.
HON. MYRON T. HERRICK, Ohio	CAPT. J. B. WHITE, Mo.
HON. JAMES WILSON, Iowa	



A FOOD GARDEN IN A SMALL TOWN

Here are the back yards, with side fences torn out, thrown together to make one large garden in order to make possible the use of labor-saving machinery. Thus the whole tract was plowed, which saved much laborious spading, and when the crops were small a horse cultivator was employed, all these operations being paid for out of a joint fund provided by the gardeners. Operations on such a scale are impossible in the more crowded cities, but the picture shows the productivity of food gardens.

who have devoted their lives to the solving of vital problems and whose aim through life has been to master some one given profession that their knowledge might reflect good upon their fellows.

The Commission, immediately following the organization, took up the work of spreading the gospel of food preparedness. Mayors of towns and cities, boards of trade, newspapers and other publications were appealed to and within a remarkably short time the campaign caught the hearty support of the nation as a whole. Mayors of scores of cities have wired the Washington headquarters of the Commission that they have entered the campaign, and in many cities central bodies have been organized to correlate efforts toward successful gardening and to put these efforts on a systematic basis.

Public-spirited men and women are serving on the central bodies, and all over the country city councils, chambers of commerce, boards of trade, mothers' clubs, citizens'

associations, boy scouts, girl scouts, and playground associations have taken up the business of actually getting the nation into condition where it may cease to tremble for food.

Thus has been laid a foundation upon which may be built the future self-sustaining agricultural policy of every American household.

School gardens of course have been maintained in certain communities for years, but the home garden as an adjunct, or rather its significance as a social, an educational, and an absolutely and positively necessary factor, is just beginning to be appreciated by the nation. In most cities



LET'S HAVE 1,000,000 OF THESE

Here is the ideal back yard as seen by the National Emergency Food Garden Commission—cabbages, beets, and turnips in trim, fertile rows instead of lawn, or, as is more likely, unsightly sheds, ashes, tin cans, and rubbish heaps. Give us enough back yards like this and the cost of living will have no terrors for Americans.



AMERICA'S MAN WITH THE HOE—1917

This American man with the hoe happens to be wielding a rake tidying up the paths in a community garden, and his age happens to be 11 years, but nevertheless, in this time of short food supplies and fearful prices, he may be the hope of the nation. There are 4,000,000 graded school children in the United States. Put them all to work in gardens and America's food problem would be solved.



CABBAGES AND KINGS

Some years ago the Walrus got a big laugh with that line, because kings then were so much more important than cabbages. This year kings are a drug on the market while cabbages by the ton bring about the same price as gold ore. If America is to have enough cabbages and other vegetables this year, men, women, and children must turn to and raise them in town and city home gardens.

there are hundreds of acres of land in the form of back yards and vacant lots that might profitably be used for the production of food necessities. In these same cities there are thousands of boys and girls who, with proper guidance, would be willing to utilize this non-productive land. Furthermore, now that the Commission has enthused the nation, these same cities no longer will be importing yearly thousands of dollars' worth of vegetables, but will be raising foodstuffs themselves.

Considering the low average labor income, the amount spent for fresh vegetable and small fruit foods is large, an average outside of large cities of \$138 per year for a family of five persons. About thirty per cent of such families have home or vacant-lot vegetable gardens, but the method of planting and cultivation are not intensive, and the money value of the product is small. But this condition, which existed during the past

## THE FOOD CRISIS

BY CHARLES LATHROP PACK

President of the National Emergency Food Garden Commission and  
President of the American Forestry Association

**T**HE National Emergency Food Garden Commission aims to assist in making food more plentiful in villages, towns and cities by inspiring the planting of food gardens this year. This is a measure of economic preparedness of vital importance. It will release, in case of military necessity, the use of thousands of trains otherwise required to carry food; it will relieve transportation difficulties which even now cause a deficiency in food supplies; it will reduce the high cost of living.

Hundreds of thousands of individuals, thousands of organizations, would raise vegetables in home gardens, school gardens and vacant lots if they were aroused and if they knew how. The National Emergency Food Garden Commission will arouse them and will tell them how. It has secured the cooperation of hundreds of newspapers which will publish daily instruction and advice on when and how and what to plant. It is being assisted by thousands of city and town officials, civic bodies and planting organizations.

We face a national emergency—a food deficiency. The way to meet and overcome it is by enlisting our boys and girls and men and women to plant vegetables on any plot of ground available.

European nations cannot supply their own needs for food—they must buy from the United States. This buying depletes our own supply. Crops were short last year and the year before. Scarcity of labor will make them short this year. The problem is serious. Patriotic Americans wish to help their country. They can best help by relieving the government of this food problem. They can solve this economic crisis and benefit themselves financially and physically by planting food gardens.

Patriotic words are empty air. Patriotic acts alone will help. Plant a food garden and do your part towards the economic victory.

We expect to induce more than one million young people, women and elderly men this year to plant a food garden who have not done so before. This alone should add much more than two hundred and fifty million dollars to the food value of this season's crop. Those who have made such gardens before should increase their efforts.

You are anxious to do something patriotic because you feel that way. You want to help your country. You can plant a vegetable food garden. Are you doing so? Start now.

several years, now will be overcome when it is realized that the need of intensive food gardening is knocking at the door of nearly every home in America.

In twenty of the important cities of the country last year the public school officials, recognizing the importance of the gardening idea, voted appropriations to carry on the work. Philadelphia spent nearly \$20,000; Los Angeles, California, \$19,000; Cincinnati, \$8,000; Pittsburgh, \$7,000; Kansas City, \$5,000; Chicago, \$4,000; St. Paul, \$3,500. Other cities included in the list, and which spent \$1,000 or more in the work, were Portland, Oregon; Crockett, Texas; Cleveland, Ohio; Birmingham, Alabama; Brockton, Massachusetts; Framingham, Massachusetts; Hartford, Connecticut; Marshall, Texas; Milton, Massachusetts; Pasadena, California; Marlin, Texas; Minneapolis, Minnesota; Tampa, Florida.

Minneapolis, since the Garden Commission began its work of education, is at



#### OUT WHERE UNCLE JOE LIVES

The Darnall boys, Gene and Jack, who are neighbors of the Honorable Joseph Gurney Cannon in Danville, Illinois, and know him familiarly as Uncle Joe, have gone in exclusively for corn in their joint garden, thereby setting at defiance a precept of scientific farming which prescribes mixed crops. However, Gene and Jack seem to be doing well with their corn, which is to be expected in the corn belt. The Civic Federation of Danville is behind the gardening movement in that city. This year many other civic organizations are aiding the home gardeners.

the forefront of the food preparedness campaign with a new method of stimulating interest in the work. Three thousand vacant lots, in addition to back yard gardens, are to be tilled by individuals in the Minnesota city. At the end of summer, after all the gardens have been harvested, a crop festival will be held to which every amateur gardener will be asked to bring specimens of the product he has raised. Prizes and blue ribbons will be offered for the best samples shown. Several other cities are to take up the Minneapolis plan which is expected to develop the same spirit of rivalry among vacant lot and back yard tillers which exists in farming communities through the medium of the county fair.

As a concrete example of what may be accomplished



#### JACK AND THE BEAN STALK

Jack's name is Mike—last name Kelly—and his curly hair is red. From which it may be gathered that his nature is energetic. Private affairs took him away from his bean stalks so much last year that from an investment of \$4.68 his food garden produced only \$18.56. His next-door neighbor in the school garden tract—a girl, too—profited so much by Mike's horrible example that she made one of the best gardens in town.

through home gardening, the National Emergency Food Garden Commission points out that, for instance, in Chattanooga, Tennessee, in the summer of 1914, nearly five hundred school children tilled 12 acres in back yards, growing \$2,500 worth of vegetables in the three summer months. In the summer of 1916, 718 pupils tilled 13 acres in back yards, and the vegetables grown aggregated in value \$3,786. In Charlotte, North Carolina, 168 children tilled 7 acres and produced \$1,225 worth of vegetables. In Asheville, the same state, school authorities prevailed upon the children to follow similar pursuits, with the result that the little folk produced considerable food-stuffs. So it has been in Raleigh and Lexington, North Carolina; in Augusta and Atlanta, Georgia;



in Lexington, Kentucky; Chester, Pennsylvania; Wilmington, Delaware; Georgetown, and in Michigan, South Dakota, Ohio and other states and cities the movement has made its impress on the minds of the thinking people.

The Commission which has aroused the nation to the realization that millions may be saved annually through the employment of agencies which in the past have been neglected, feels that the future of American agriculture is largely dependent on the boys and girls of today, and it is the purpose of this institution



MAKING DAME NATURE HURRY

With a saw, a hammer and an empty grape juice box, this boy has the equipment which will vie in effectiveness with the expensive hot beds and forcing frames of the scientific market gardener. From the deep box he makes three shallow seed boxes, bores holes in their bottoms for drainage, fills them with rich earth, and plants good seed. Then, if he sets the boxes in south windows of his house, by the time the spring sun warms the outdoor soil he will have thriving tomato plants for his garden.

to assist the other forces now at work to interest, instruct, and direct the youth of the country in the possibilities of garden raising as a profitable and dignified pursuit.

The Commission does not undertake to make an accurate estimate of the value of crops grown in the food gardens of the United States, but from careful investigation it is enabled to say that a well-kept garden will yield a return ten to fifteen times greater than would the same area and location if devoted to general farm crops. A little work and a little land will easily



THE COÖPERATIVE GARDEN

Here in a Massachusetts town we see the neighborhood coöperating in a garden, the cheapest and easiest plan. Coöperative funds paid for the plowing and fertilizing of the lot and then the individuals planted whatever they chose and took care of their own crops. The National Emergency Food Garden Commission is calling this plan to the attention of apartment house dwellers who can have access to large vacant lots.



HELPING OUT IN THE LIVING PROBLEM

This boy has a task better for himself and more profitable than selling newspapers to help out his father's weekly pay envelope. His garden, on land the use of which he got for the asking, is the pleasantest spot in this dreary street of workmen's houses, and the most productive, for it furnishes the vegetables which his hard-working mother would have to buy at high prices or go without.



A BOUNTIFUL HEDGE

In the smaller towns where lots are broad and deep and vacant property plentiful the larger garden is advised by the National Emergency Food Garden Commission. The family living on this beautiful, shady street has a garden which provides its every food need so far as fresh vegetables are concerned. The details of this garden are concealed from the street by a hedgerow of corn, which not only is pleasing to the eye but produces luscious ears of green corn.

supply a family with \$100 worth of vegetables during the year. And the Commission feels that a bountiful supply of vegetables close at hand where they may be secured at a few moments' notice is of even more importance than the mere money value.

Men who are looked upon as the ablest trained thinkers identified with conservation problems of the country, believe in the wholesomeness of home-grown vegetables. They point out that fresh vegetables from the home garden are not subjected to ex-



A FRONT YARD GARDEN

Across the street the school house spreading the garden propaganda. Factories of the scattered suburban type in the vicinity. The cottage, standing well back in a broad lot, looks upon its neighborhood not across a lawn but over an exceptionally abundant garden. In his zeal for gardening this boy induced his father to tear out the wide front walk and substitute a narrow plank to give greater room to the garden. The picket fence (or a wire one) is much better for gardening and the looks of the city than a tight board fence which often conceals untidy yard conditions.

posure on the markets or in transportation and are not liable to become infected in any way. Many of the garden products lose their characteristic flavor when not used within a few hours after gathering. By means of the home garden, the production of the vegetable supply for the family is directly under control, and in many cases is the only way whereby clean, fresh produce may be secured.

In the cities, towns, manufacturing villages, and suburban communities of the United States there are approximately 13,000,000 children between

the ages of 6 and 20 and if this small army takes up the hoe and the rake and plants food gardens the food problem becomes no problem at all.

It is not difficult to estimate the benefits to mankind once the plans of the Commission are in full operation throughout the country. For the children it will mean health, strength, joy in work, habits of industry, and understanding of the value of money as measured in terms of labor and such knowledge of the phenomena and forces of nature as must be had for an understanding of most of their school lessons. They will also learn something at least of the fundamental principle of morality, that every man and woman must make his or her own living; must, by some kind of labor of head, hand or heart, contribute to the common wealth as much as he or she takes from it; must pay in some kind of coin for what he or she gets.

President Pack also believes that the economic and sociological results are worthy of consideration. Experiments already made show that with proper direction an



BACK YARD BLUE RIBBONERS

The rural county fair no longer has the monopoly of lettuce heads 21 inches in diameter, nine-pound cabbages, and one-pound beets such as the young planter on the right is holding. These products, which would take blue ribbons against the best entries of the professional gardeners, were raised on city back yard gardens.

average child of reasonable years can produce on an eighth of an acre of land from \$50 to \$100 worth of vegetables. A third of the children in the city schools of the United States might easily produce the \$250,000,000 worth of foodstuffs which is predicted by the Food Garden Commission can be added to the annual crop supply if 1,000,000 more gardens are planted this year than were in existence last season.

Aside from the fundamental and essential reason why the nation should take up whole-heartedly the Commission's injunction to produce, and produce at once, the fact that a generation of men and women would be produced who would find their recreation, after the close of their labor day of eight hours, in profitable home gardening, is a phase of the situation which should commend itself to everyone. A man's worth is measured largely by his ability to produce, and the wealth and prosperity of

the nation is mainly dependent upon the productive powers of its people. Business and professional men appreciate the value of recreation, but oftentimes neglect it for lack of interest. If such men understood the principles of



GARDEN SABOTAGE

No back yard for gardening, this tenement child has her pathetic little garden anyhow—in an old pair of wooden shoes, or sabots. For the benefit of those who have the gardening desire but not the land the food garden movement is being aided in many cities by owners of vacant property permitting its cooperative cultivation by volunteers.

gardening, they would find sufficient incentive to exercise and would take much pleasure from work in the home garden during the evening hours.

With precise knowledge at its command, the National Emergency Food Garden Commission gives the following advice on the location of a garden:



FOOD INSTEAD OF FLOWERS

When you have no land, but live in a tenement with a concrete yard, the best you can do in gardening is in the window box. And if you are homesick for the taste of vegetables crisp from your own garden, you plant the window box to corn, beans, and radishes, such as are growing in this window garden, instead of flowers. The National Emergency Food Garden Commission urges owners of vacant lots to donate them for free garden use to those who wish such an opportunity.



WASTE MADE USE

Before these boys and their garden instructor carried their tools and vegetable seeds upon this vacant lot it produced nothing but weeds, which scattered their seeds over adjacent lawns. Now it is giving a large measure of economic independence to several families, in addition to improving the quality of their food. "The waste of vacant lands in and about American cities, particularly in the East, is appalling," wrote Albert Shaw, editor of the *Review of Reviews*, to the National Emergency Food Garden Commission.

"The question of proximity to the house should be given first consideration. As the work of caring for the garden is usually done in spare time, the location selected should be as near the house as possible. The slope and type of soil should be the next consideration. A slope to the south or southeast is usually preferable, because here the soil warms up early in the spring, which permits early planting and stimulates the early growth of crops. Practically any type of soil can be used for the garden, but a sandy loam is to be preferred.

"Good drainage is of prime importance. The land should have sufficient slope to drain off surplus water during heavy rains, but the slope should not be so great as to wash the soil. If the land near the house is level, artificial drainage should be employed. Open ditches or tile drains will be satisfactory. On level land that is not artificially drained it is necessary to plant on ridges or in beds to prevent drowning the crops during wet weather. The ridges or beds should be as wide and flat as conditions will allow, for narrow, sharp ridges dry out quickly.

"In planning the location of crops, consideration should be given to the matter of succession, in order that the land may be occupied as large a part of the time as possible. It is not advisable to have a second planting of the same crop or a closely related crop follow the first. For instance cabbage should not follow cauliflower, Brussels sprouts, mustard, or kale, for many of the same diseases and insects affect all of these crops. Tomatoes, egg-plants, and peppers should not follow each other. In some sections of the country two crops can be grown on the same land each year, while in other sections three or four crops can be grown to advantage."

The Commission is spreading its campaign throughout the country, and the press of the nation, furnished daily with bulletins and other information for the guidance of the amateur gardeners, is aiding the Commission in a laudable manner. It is realized only too well by the men behind the movement that it is not so much a question of production but a question of transporting the foodstuffs. This difficulty confronts the country even today, and with a declaration of war the government heads say most positively that the trains could not be utilized for transporting food supplies across the continent.

President Pack believes that it is the patriotic duty of every man in the United States who owns or controls land to plant and cultivate it. He has studied the conditions in Europe closely and with that dreadful picture of hunger and starvation before him he feels with every government official that no time should be lost in arousing the nation from a lethargic condition to one of bustling vigor, and his plea is to plant food gardens at once. He explains that no campaign of his knowledge has met with such instant success as the food garden plan of the Commission.

"But the work has just begun," he adds. "There must be a million recruits to the army of home garden makers. Wherever there are no clubs they should be formed to foster the work. Effort of any kind seems to be more successful where the individual feels that his neighbor is working with him. There must be no letup in the work started throughout the nation. American cities are to be put to the supreme test—their vacant land must be made to produce a large portion of the vegetables that they consume."

# FORESTRY AND THE PAPER INDUSTRY

BY HONORABLE D. F. HOUSTON  
SECRETARY OF AGRICULTURE

CONDITIONS in the paper industry have constituted one of the most serious of our domestic problems during the last year. Due to the exorbitant prices charged for news print, the profits of the great dailies were either wiped out entirely or else reduced to a minimum, while the small publishers were brought face to face with suspension and even absolute ruin. Periodical publishers have fared no less badly, the profits of book publishers have changed to losses in many cases, and the price of paper of every kind has risen by leaps and bounds.

The Federal Trade Commission has brought some measure of relief to the newspaper publishers. Competition has been freed from restraint, prices have been made to bear a closer relation to the cost of production, and a more equitable system of distribution has been devised so that the "little fellows" will get their fair share of the manufactured product. But, while the inquiry of the Com-

mission developed artificial control, it developed also that there is almost an *equal balance* between supply and demand in the paper industry.

In 1914, we used about 5,000 tons of news print every day. Our present use has reached 6,000 tons a day and the demand appears to be increasing at the rate of 10 per cent a year, materially faster than the increase in population. To supply our presses with news print requires annually about 3,000,000 cords of pulpwood. To meet our requirements for magazine and book paper, stationery and business papers of all forms, wrapping papers, wall papers, cardboard, fiber board and the like, 4,000,000 cords more of pulpwood are consumed annually. Production barely keeps pace with this consumption. For instance, the estimated demand for news print for the first six months of 1917 is 888,000 tons. Against this is placed an estimated supply of 930,000 tons.



THE GLENS FALLS BOOM, GLENS FALLS, NEW YORK

Pulpwood in the Hudson River on its way to the paper mill, indicating in a small measure the vast quantities of pulpwood taken from the forests of northern New York to be made into print paper.

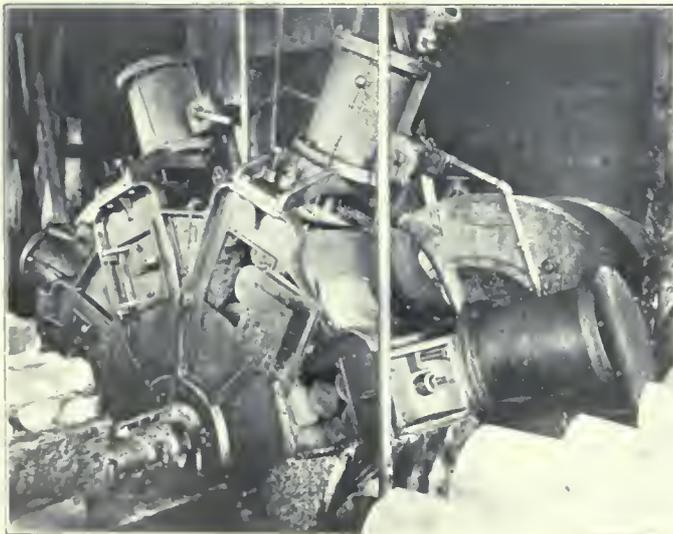
As if this close balance was not peril enough, there is the added fact that the United States depends upon Canada for a third of its news-print paper, either in the form of finished product or raw material. This proportion is increasing rapidly. The pressure of economic conditions and lack of foresight in cutting the forests have so depleted



BEATING OR MIXING MACHINE

The different ingredients which are used in the manufacture of the sheet of paper are put in these tubs, where they are thoroughly mixed and refined by passing the stock between a revolving roll filled with knives, and a stationary plate made up in a similar manner. This process takes place just before putting the stock on the paper machine.

the available private supply of pulpwoods in many of the paper manufacturing states that there is not enough left to last more than ten or fifteen years. As a consequence, Canada is more and more called upon for pulpwoods,



MECHANICAL WOOD PULP GRINDER

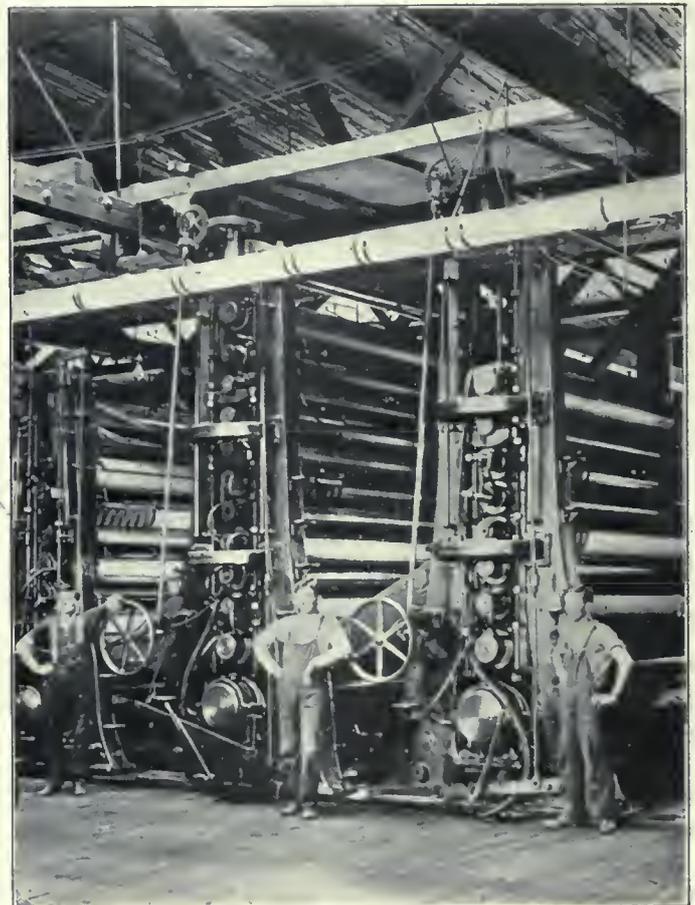
This machine reduces the wood blocks to fine fiber, hydraulic pressure holding the blocks against a revolving sand-stone.

and American manufacturers are showing an increasing disposition to slip across the border into the virgin forests of the Dominion.

It is this condition of dependence that should be ended. Changes in Canadian policy might at any time cut off our newspapers from this source of supply or make it available only at excessive cost. On the other hand, our own forest resources are ample to meet all the paper requirements of the country. Aside from the waste materials produced in the manufacture of lumber and the possible growth on 65 or 70 million acres of cut-over forest lands in the Northern States, the publicly owned National Forests contain enough pulpwood to supply the entire paper needs of the United States for the next eighty years. Cut intelligently, it constitutes virtually an inexhaustible supply for all time.

#### RAW MATERIALS AVAILABLE IN THE WEST

The Forest Service has estimated the pulpwood in the National Forests at three hundred billion feet. This



THE PAPER-MAKING MACHINE

This illustration represents the finishing end of a paper machine. The stacks of chilled steel rolls shown in the illustration are used for surfacing, or, in other words, ironing the sheet of paper to a smooth surface. The lower section of the machine represents so-called reels, slitters and winders. Here the paper is trimmed into the desired widths.

means six hundred million cords, and for all paper of all kinds we use but seven million cords a year. There are other large supplies of pulpwood on privately owned lands in the West. These western raw materials are much cheaper than the woods now used by paper mills in the Northeast. While pulpwood stumpage in the Northern States costs from \$2.50 to \$5.00 per cord standing in the forest, first-class western timbers are available at prices ranging from 25 cents to \$1.50 per cord. Long-distance transportation and the large investments tied up in paper

plants necessarily will retard the westward expansion or migration of this industry; but unquestionably it should afford one means of increasing the production of paper to keep pace with current demands.

From the standpoint of geographical location and transportation to the bulk of the paper users in the Central and Eastern States, the western paper woods fall into two broad belts. The first is available to tidewater shipments from the Pacific Coast, lying principally on the west slope of the Cascade Mountains in Oregon and Washington, including vast areas tributary to Puget Sound, and running up along the seaboard in southeasterly Alaska. There are 70 billion feet of spruce and hemlock in the National Forests of Alaska alone. In many respects, its condition as to abundant forests of paper-making woods, water power, and direct tidewater transportation duplicate those of Norway, the leading country of the world in its paper industry. It is a safe prediction that in the

with proper development, should supply both the paper required for local consumption and that necessary to replace the diminishing supplies of the Lake States for the needs of the Middle West.

#### NEWS-PRINT PAPER FROM NEW VARIETIES OF WOOD

Extending the supply of raw materials by determining the paper-making qualities of new woods is an important factor in the problem. Tests conducted by the Forest Products Laboratory of the Department of Agricul-



SULPHUR BURNERS

These burners are used in the acid plants of the sulphite or chemical pulp mills or generating the sulphur gases, which are combined with milk of lime for the manufacture of liquor, used in combination with steam pressure, for reducing the wood, which is in chip form, to chemical fiber.

last analysis the value of Alaska to the United States as a source of paper will be found to exceed the value of any other of her enormous resources, coal, minerals, or fisheries.

The second timber belt of western paper woods extends through the northern Rocky Mountains from the Canadian line into Colorado and Utah. This belt, shut off from water transportation, can hardly be considered a practical source of supply of paper for the Eastern States; but is a logical storehouse of raw materials for the paper requirements of the Mississippi Valley. The Rocky Mountains contain a number of excellent paper woods and,



NORTH CLEAR CREEK FALLS

The natural fall shown in the picture was included in a power project for which application has been made by F. W. Bosco, Rio Grande National Forest, Colorado. This indicates character of water powers on National Forests.

ture have demonstrated the suitability for various grades of paper of no less than twelve new or little used woods, including Englemann spruce, lodge pole pine, white fir, and other cheap and abundant coniferous woods of the Western States. At least ten of these woods were proved good enough for news print, and papers made from some of them actually were used in editions of the *New York Herald* and *St. Louis Republic*.

Almost equal in importance to the timber of the Pacific Coast belt and the Rocky Mountain belt are the publicly owned water powers, a second primary essential of the paper industry. Undeveloped power is there in sufficient quantity and available for exploitation and use under reasonable measures of Government control. This is equally true with respect to coal, almost as important in paper manufacture as pulpwood itself. Both in Alaska and in the Rocky Mountain region the Federal Govern-



ON THE COPPER RIVER, ALASKA

The prevailing type of combination of water, forest and mountain scenery in Alaska. It is country like this that may supply much of the pulpwood used in the future and which, if need be, can also supply the water power for paper mills.

ment owns great coal fields of tremendous richness, abundantly able, so the experts report, to supply every National need for many years. The one problem to be faced is that of the best means of utilization. How may our tremendous natural resources be given the quickest and most effective relation to the National needs?

The first plan is that of public sales of raw material to the manufacturers. This already is being done to some extent. During the last year National Forest timber sales to lumber companies, railroads, and mining companies and one western paper mill amounted to \$1,795,000. This plan calls for contractual relations between the Government and private capital. New mills might be erected in Alaska, the Puget Sound country, or the Rocky Mountain region, under agreements with the Government for a long term supply of raw material, guaranteed under an equitable adjustment of prices from time to time. This already is being done in the case of certain saw mills. Such contracts may readily contain provisions which give the public effective control of possible industrial combinations or monopolies.

#### PRACTICABLE TO MANUFACTURE NEWS PRINT IN ALASKA

Experts of the Forest Service report that it is entirely practicable to manufacture news print in Alaska and deliver it to New York through the Panama Canal at a cost of not more than \$35 a ton. When it is considered

that recent prices have ranged from \$60 a ton upward, it is evident that an excellent competitive basis exists for the introduction of western papers.

The development of private paper plants in the West might be supplemented by the erection of mills by the Federal Government itself. It is estimated that a mill with a capacity of one hundred tons of news print a day can be built in Alaska for two and a half million dollars. Even if the output of the mill was confined to the needs of the Government alone, it is probable that such a mill would pay for itself in no great length of time, while adding something to the paper supply of the nation.

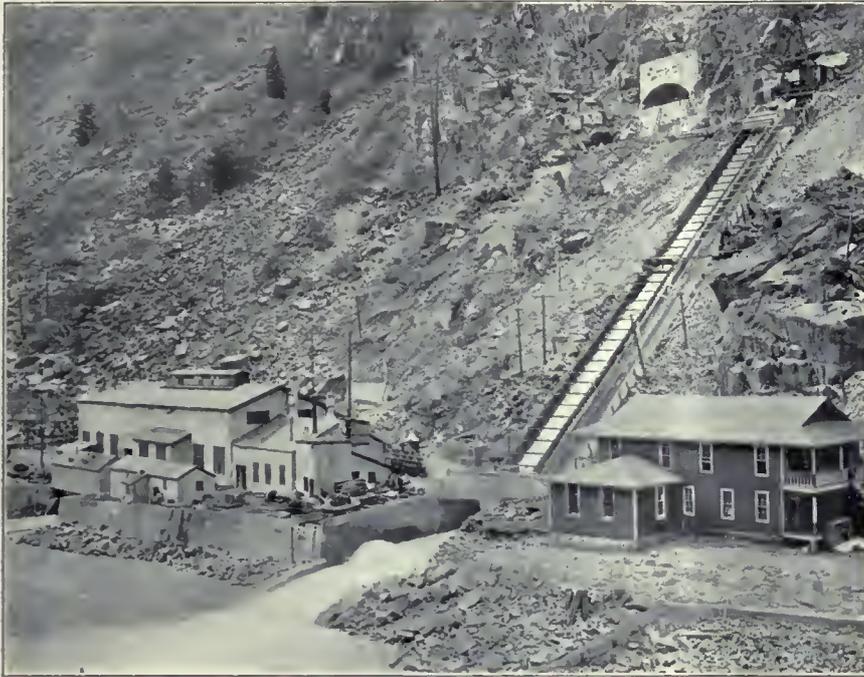
#### SHOULD THE FEDERAL GOVERNMENT ENTER THE INDUSTRY?

The fundamental problem is to build up paper production in the United States to keep pace with a growing demand and afford a sufficient supply at all times to hold prices at reasonable levels. To the extent that private enterprise will do this, it would appear unnecessary for the Government to undertake it, particularly if the publicly owned forests can be utilized for the purpose under conditions which give the public control of industrial organizations. In the event that private capital cannot be enlisted, however, to meet the needs of a larger paper supply available at fair prices, it may be well that the Federal Government should enter the industry as a direct method of controlling the situation.

These are the larger aspects of the situation. There are certain direct and simple approaches, however, that call for nothing more than greater economy. The waste which now occurs in the manufacture of lumber is estimated by the Forest Service at something over 60,000,000

often sell their hemlock slabs to paper mills for from two to three dollars per cord. This is a form of conservation that should be given speed and drive.

So much for the immediate problem of supplying the paper requirements of the United States to-day. For the



NATIONAL FOREST POWER PLANT

Colorado River Company's power plant on Grand River, showing power house building, and spillway flume. This is located on the Holy Cross National Forest, Colorado.

cords annually. At least 40,000,000 cords consist of coniferous woods, a part of which is suitable for the manufacture of various grades of paper, although the cost of assembling it in sufficient quantities to support a paper plant is often prohibitive. Experiments at the Forest Products Laboratory show that much of this waste can be utilized for the manufacture of kraft wrapping papers, fiber board, and other pulp products. In the case of saw mills that cut up spruce, hemlock, etc., the waste can often be gathered and shipped with profit to news-print mills.

The use for pulp of waste material left after lumbering has recently been introduced in lumbering operations in Pennsylvania and parts of the South. Hemlock tops and broken, defective logs are peeled in some Pennsylvania lumber camps, cut into five-foot lengths, and sold for pulpwood. From 250,000 to 260,000 cords of slab wood and other mill waste are now consumed every year for pulp. In 1908, hemlock formed 41 per cent of the saw mill waste used, and its average value was \$4.07 per cord, about two-thirds that of hemlock cordwood in the round. In Wisconsin, saw mills

the second phase of the problem, that of an assured future supply of paper within our own borders, there is only one solution: *the practice of forestry to keep up a continuous production of pulpwood.* There is nothing difficult about this solution if the latent producing capacity of the forest lands in the United States is utilized. There is no reason why the regions now supporting large paper-making plants should not do so permanently, as Norway does, if the native resources of those regions are but properly organized and intelligently used. The production of pulpwoods, in fact, offers one of the best opportunities for forestry in the United States because small, quickly-grown material can be utilized for this purpose, and because many of the fastest growing trees, like poplar or Norway spruce, are adapted to it.

With intelligent cutting and protection from fire, the land will restock itself. Unintelligent cutting that "skins" the



SHIPPING ALASKAN LUMBER

The weight of the lumber broke down the Hadley Dock in Alaska. The steamer Melville Dollar is lying in front of the dock. This was the first full cargo of lumber to leave Alaska. It comprised 1,200,000 board feet.

land, however, may call eventually for artificial reforestation. Denuded land can be planted with 1,000 young trees per acre, nursery grown, at a cost of about \$10 per acre. Some of the paper companies in New England are acquiring and protecting large areas of forest land, many



POWER AND PULPWOOD COMBINED

Waterfall at head of E-gal-ik Bay, Prince William Sound, Alaska, a possible source of power for a paper mill and dense forest of pulpwoods on the mountain side.

of them culled or cut over, in order to insure a future supply of raw material to protect the enormous investments represented by their paper plants. In a few instances, a limited amount of planting has been done. Considerable areas of inferior pasture land, worn-out farms, and the like in New England have been restocked with trees, either through a gradual reversion to forest by natural causes or by artificial planting, because their owners have realized that these lands of low value could be utilized to the best advantage for producing wood.

In other sections, like considerable portions of the Lake States, reforestation is not coming about through economic development, or is coming about so slowly that it will be far behind the need of forest-using industries for raw material. In such regions public initiative and enterprise must take the lead. Probably the greatest need is for an intelligent, farsighted administration of the forest lands now in public ownership, in one form or another, and for the addition of cut-over forest lands of low value to the

public holdings, state and Federal alike.

Practically all European countries have found that a considerable body of publicly owned forests was essential in working out their problem of keeping up continuous forest production. The United States will prove no exception to this rule; and the building up of state and Federal forest holdings, under expert, non-partisan administration, is one of the most important steps to insure a future supply of paper as well as other basic forest products.

On the 165 million acres of Federal forest holdings in the National Forests, the timber is being used under scientific methods of cutting as there is demand for it and the lands denuded by old fires are being reforested by planting to the extent of 20,000 acres annually. Federal holdings also are being extended by purchase in the Eastern States, under the Weeks Law, for the protection of navigable streams.

#### STATE FOREST RESERVES

A number of states have made valuable beginnings in this direction. Pennsylvania has acquired state forest reserves aggregating more than a million acres and consisting largely of culled or cut-over lands which the State has been



AN ADIRONDACK FOREST

Heart Pond and Mount McIntyre from Mount Jo. Typical Forest clearly shown; mixed hardwoods on lower levels with balsam fir and red spruce on margin of pond. Spruce and balsam dominate on higher elevations.

able to purchase at low valuations. New York has extensive state holdings; Wisconsin and Michigan both have small areas; Minnesota recently has passed a constitutional amendment which will permit the creation of permanent state reserves. All these efforts, in the aggregate, fall far short of the need. Particularly in the Lake States, in whose early economic development forest resources probably had the largest part, there is a general lack of an intelligent public conception of this problem and of adequate measures toward its solution.

The right kind of land ownership is fundamental in working out the problem of a sustained supply of lumber, paper and other essential forest products. There must be a stable interest which insures permanent forest production. This may be supplied by general economic development. Otherwise, it must be supplied by the farsighted point of view of the community, either through direct public ownership or a sufficient measure of public control to secure the results necessary.

An immediate necessity in the accomplishment of this object is to build up the forest departments of the various states—to get behind fire protection, to push reforestation of state lands, to demand acquisition of permanent forest reserves, and to support expert investigative work in forestry. Expert classification of receded



ALASKAN SPRUCE FOREST

At Fish Bay on the Tongass National Forest, Alaska, is the pure spruce stand shown in this photograph. It could well be used for pulpwood.



TYPE OF ALASKAN FOREST

A log boom at Whitewater Bay, Admiralty, Alaska. It is this kind of forest which can furnish quantities of pulpwood in the future.

tax lands should have an important place in this development. Cut-over lands not suited to agriculture or which have a low or questionable value for tillage should be kept by the states and added to their forest reserves so that an aggressive public policy of reforestation may be pursued. This is one line of attack upon the vital and general problem of how to put all classes of land to their most productive use.

Another thing that must be brought about is full recognition of the public interest in *all* forest lands. It is not enough that the state should look after its own holdings; it must extend its authority to the management of private holdings as far as may be necessary to meet public needs. We must recognize, in other words, that forest lands have, in a measure, the nature of public utilities.

A first step in such regulation is compulsory fire protection, the starting point of forestry. Not only, however, should each landowner be required to do his share in preventing or suppressing forest fires, but the public itself should cooperate by furnishing the necessary machinery for correlating and directing this work as a whole. The State of Oregon has taken an advanced step in this direction, through a law making the protection of timbered lands obligatory upon their owners and authorizing the State Forester to protect lands whose owners fail to discharge this duty.

The cost of such protection, within limits prescribed by the act, becomes a lien against the property. At the same time the state itself expends a considerable sum for a system of fire wardens upon which the entire protective organization is built up and correlated.

In many cases, the protection of cut-over forest lands from fire is sufficient. In other cases it should be supplemented by the enforcement of simple forestry measures, such as the disposal of slashings and the regulation of cutting to make certain that the land will be left in a condition which will insure its regrowth.

#### TAXATION OF FOREST LANDS

With public regulation, however, should go a vigorous encouragement of private owners to keep their forest lands continuously at work and thus do away with the economic loss represented by the idleness of millions of acres of "skinned" land. Such encouragement is justified by the community benefits afforded by the reforestation of private lands and the burdens imposed upon their owner

in deferring income from them. The community may share in these burdens, as it shares in the advantages of reforestation, by applying the yield, or harvest, tax to forest lands which are properly managed so as to meet their public obligations. The owner thus will be released from the burden of annual property taxes, paying instead a tax on the returns from his property at the intervals when its wood crops are harvested. This concession, of course, should apply only to owners whose lands are kept in continuous forest production.

A number of the states have taken progressive steps in accord with some of these suggestions. Their local forest departments furnish the ground work for building up and expanding the forest activities of the state. The Department of Agriculture also stands ready to give aid and encouragement. Experts of the Forest Service are available to advise with state legislatures regarding forest legislation and to cooperate with state commissions or local associations of citizens in developing the forest policy of the state.

## NEBRASKA'S FORESTATION COMMISSION

BY WOODRUFF BALL, SECRETARY

THE State Forestation Commission of Nebraska has drafted for presentation to the Legislature, four bills. One provides for the creation of a permanent Forestry Commission; one for an exchange between the State and Government of the State school lands upon the present National Forest Reserves; two will permit of the counties, cities of all classes and villages of the State establishing and maintaining municipal or communal forests, with power to vote bonds for their purchase and levy taxes for the maintenance thereof, the intent being that these communal forests may also be used for public park purposes and a protection of the potable water sources. The Commission has taken this step in hopes of thereby awakening an interest in similar work on the part of the State Government itself.

The Commission was created in 1913 to investigate the feasibility and desirability of afforesting the State school lands in Western Nebraska, that region of the State which is commonly termed the "Sand Hills." The members are Carl Rhode of Columbus, A. H. Metzger of Rolf and Woodruff Ball of Valentine.

After a careful survey of conditions, the Commission shortly following its appointment arrived at the conclusion that at that time the forestation of the school sections or State land was not feasible owing to the fact that these State school lands were in isolated tracts of 640 acres each. Wherefore, the cost of planting and maintenance would be prohibitive. They further found that in view of the work accomplished by the Government Forestry Service upon its two reserves in Western Nebraska, to wit, the Bessey Division and the Niobrara Division, that under proper conditions such a policy as

was contemplated in the resolution could be carried to a successful conclusion.

In the forepart of 1914, the Forestry Service had under consideration the elimination of the Niobrara Division in its entirety and parts of the Bessey Division from the Nebraska National Forest areas. The Commission was able to but demonstrate to the Forestry Service that it was inadvisable to do so and was able to secure an additional appropriation for the Forestry Service which has enabled it to establish upon the Niobrara Division a second nursery to be used in connection with their operations upon this Division. The Commission further secured a soil survey of the two Divisions which conclusively demonstrated that the lands embraced within these Divisions could not be classified as agricultural land and hence was not available for homesteading purposes. This, in view of the additional fact that the Forestry Service is meeting with great success in its plantations, has doubtless put an end for all time to the question of further eliminations.

The Commission, recognizing the fact that the late Dr. Charles E. Bessey of the Nebraska State University was primarily responsible for the establishment of the Nebraska National Forests, felt that it would be a most fitting memorial and monument to Dr. Bessey's memory to name for him one of the Divisions. Acting upon their suggestion, the Forestry Service last fall officially designated the former Loup Division and Halsey Nursery as the Bessey Division and Bessey Nursery of the Nebraska National Forests. The Commission has now made a further suggestion to the Forestry Service that it designate the Niobrara Division and Niobrara Nursery as the Morton Division and Morton Nursery in honor of the late Honorable J. Sterling Morton.

# THE INDEPENDENCE OF AMERICAN NURSERIES

BY DAVID FAIRCHILD

AGRICULTURAL EXPLORER IN CHARGE OF FOREIGN SEED AND PLANT INTRODUCTION

**T**HE nurseries of this country are quite as independent of foreign plant material as are the other industries which American ingenuity and industry have built up, but, like all the other great industries, that of the production of small plants has not confined its activities to the growing of American plants or the handling of home-grown material.

I have ridden through nurseries in the West where the rows of nursery stock were a mile long and where there were thousands of these rows of small plants waiting to be sent out all over this country and into Canada.

The customs returns for the year 1915 give an import of plants in a living condition, as distinct from food materials of a plant nature, amounting to \$3,731,000. Of this amount about one million represents what might be called hard wooded plants such as evergreen and deciduous trees and shrubs which are set out with the idea of their becoming permanent residents of our parks, our orchards or our roadsides. The remainder represents the large importations of so-called florists' stock—such things as lily of the valley clumps for florists, hyacinths, tulip bulbs, bleeding hearts, lily bulbs, narcis-



GOVERNMENT BULB CULTURE

Portion of nursery planting of narcissi at the United States Department of Agriculture Bulb Garden, Bellingham, Washington. Madame Plemp in the foreground, Sir Watkin in the background. This picture demonstrates the possibility of bulb culture becoming an American industry.

This one firm alone plants a million and a half peach pits and half a million apple seedlings each year, and lists from 1800 to 2000 different varieties of plants for sale in its catalogue. Sixteen horses harnessed in teams together were pulling the machine which undercuts the small apple trees preparatory to lifting them for packing and shipping. Twenty-five miles of tile drains had been laid under the ground to carry off the superfluous moisture.

The nurseries of this country cannot be said to be dependent upon foreign sources in the way in which this term is commonly understood, but that there are thousands of species of plants needed by our nurserymen for the development of the greatest possible number of superlative varieties of native plants cannot be doubted.

sus bulbs, begonias, gloxinias, orchids, palms, azalea plants for forcing; iris, cannas, dahlias and amaryllis—plants which as a rule are either grown under glass or for a season or two in our flower borders or on our lawns and which, with perhaps one or two exceptions, can be grown in this country.

If we consider the imports of hard-wood material, for example, we find that we import 8,776,000 young seedlings of the apple, pear, quince, and St. Julien plum valued at \$41,314. If we assume that a half of these grow and are budded or grafted and set out in the orchards of the country, they will represent in the course of time 4,388,000 fruit trees, and assuming that the average distance apart of these trees in the orchard would be 20 feet,

these would represent an orchard or orchard areas totaling over 40,000 acres in extent. An orchard a mile square is a large orchard even to-day, and this 40,000 acres would represent 62 such square-mile orchards which would have root systems developed in American soil from the tiny rootlets which were produced first in the soil of some foreign country, be it France or England or Japan.

The question then is open for discussion as to what advantages and as to whether there are any disadvantages in having such a proportion of our orchards which

We know that there are root diseases, and serious ones, and there is no question that they may be carried by seedlings, but whether these are of such a nature as to make it advisable to shut them out of the commerce of the country is a question for the experts to decide and not one to be settled by political action.

The nursery firms of the country can grow apple and pear and quince and plum seedlings, and many are now growing such stock, but they could not grow the quantities required to supply the demand in the first year after



CHINESE WILD PEACH PLANTING

Portion of a nursery planting of the Chinese wild peach, *Amygdalus davidiana*, at the United States Plant Introduction Field Station, Chico, California. This peach has proven very valuable as a stock for dry lands and regions too cold for the cultivated peach.

we set out every year upon a root system taken bodily from a foreign soil and perhaps carrying the diseases of that country with them. Certainly it must be admitted that this whole question of the proper stock for our orchard trees is one the importance of which can hardly be over-estimated. The fact that the plants which were imported cost us only \$41,000 or a dollar an acre and is a small import item should not mislead us, for the potential value of these trees will run easily into the millions.

On the other hand, it would be eminently unfair to assume that because we do not know that these little apple seedlings from the old world or from Japan are as clean and free from disease as any which we can produce in America, they represent undesirable immigrants and should be excluded from the country. Or that the diseases which they have are ones which will prove as serious or even more so in this country than they have in their native land, or that they will infect our soils and through this infect our orchards with diseases which they would get in no other way.

It is probably true that the principal reason why these seedlings are imported is because they are cheap—cheaper than it would be possible to produce them in this country. The question is one for a thorough and exhaustive investigation and the facts discovered will point the way to an intelligent handling of the question of their importation.

the foreign supply is cut off, supposing it should be, because they would have difficulty in getting the seeds and in establishing them in seed beds, and it would take two years or more for them to adjust themselves to the changed conditions.

When we turn to the imports of fruit and ornamental trees, evergreen shrubs, vines and all trees and vines known as nursery stock of which we imported \$805,305 worth in 1915, the conditions are different. Millions of this class of plants are already being grown in this country by our more progressive nursery firms.

There can be no question that the nurserymen of this country, at least the best of them—and there are no keener plant students in agriculture than are these American nurserymen—question the advisability of the large importations of so-called ornamental evergreens and other dooryard shrubs which are made from Europe largely through the department stores where they are used for advertising purposes. The department stores make no pretence to a knowledge of the quality of this class of material. It is cheap and they can almost afford to give it away. But often the purchaser has never before bought a plant for his dooryard. He looks upon a plant as a plant and puts it in carefully—as carefully as he knows how to—and it dies and he is discouraged and when the legitimate nurseryman tries to sell him a real plant that

will grow and thrive in his dooryard his mind goes back to his unhappy experience and he shakes his head and turns away with the thought in his mind that he has an unlucky hand with plants. The department store has advertised its own name, but the nurseryman has lost a customer, and the dooryard of at least one house is still ugly with dirty bricks and an ugly ground line.

Now I am not in possession of the facts to accuse the department stores of doing this wittingly, neither do I have any figures to show that the percentage of failures from this imported material is greater than from home grown nursery stock. I do know of instances where totally unsuitable plants have been imported and sold cheaply through department stores and others and died, and the stores have shifted the responsibility upon the foreign importer. The question concerned here is not one of the dependence of our nurseries at all. They do not, as I understand it, court or countenance this trade in cheap plants from abroad.

But how large a part of this item of \$805,305 represents plant material of this kind, I am unable to state. The fact ought to be determined and the advisability of its exclusion considered, provided that it represents a danger to our forest or street or park or ornamental plants.

That the American nurserymen need foreign plants in their business is a fact which ought to be given due consideration. Thousands of plant breeders and horticulturists are working in the gardens and orchards and nurseries of other parts of the world and an increasing number of new and valuable plants are being brought into existence, so to speak, and many of these are of dis-

tinct value to the people of this country, and the nurserymen of America represent the machinery through which these new plants can reach the commercial orchards and gardens of the country.

The inroads of diseases which we already have among our trees and other plants may make it imperative at any time to import some other species or variety to take its place. The spread of the chestnut bark disease and the search in China for a resistant form has led to the importation of millions of seeds of the downy chestnut of Eastern China, a resistant form unfortunately of small size but producing excellent chestnuts. The devastation produced by the pear blight which has swept the orchards of the Pacific Coast and causes millions of dollars' loss each year has centered attention recently upon a sturdy wild pear immigrant from the hills around Jehol north of Peking, which Reimer of Oregon has discovered is practically immune to this disease and at this present moment Mr. Meyer, our explorer, is buying up as many seeds as he can get of this disease-resistant species in order to test it in commercial orchards throughout this country.

Of course, it is conceivable that the Phylloxera might have been kept out of Europe indefinitely, but when it did get in, what are we to say about the rôle which the French and American nurserymen played in the rehabilitation of their vine-growing areas? And what would the vine growers have said to a policy which had restricted all the imports of the Phylloxera-resistant American stocks to the few hundreds or thousands which might be brought in through the slow and deliberate process of Government importation? It is true that in importing



MILLIONS OF YOUNG TREES GROWING IN A NURSERY

This view in one of the D. Hill Nurseries, Dundee, Illinois, gives one but a faint impression of the extensive nurseries of this firm, which are now growing millions of young, home-grown trees for planting out in this country. White Cedar, *Thuja occidentalis*, to the left; Norway Spruce, *Picea excelsa*, to the right.

the American vines, France imported the black rot of the grape and had to learn how to combat it, but the vineyards of France, so far as I know, are as flourishing as they were a generation ago. The wave of prohibition sentiment and legislation has made more difference to the vineyardists of this country already and makes more in France than all the grape diseases which have yet been discovered.

The shifting character of our plant industries is a matter which should not be lost sight of, I believe, in the consideration of any policy of national independence of our nurseries. This is true of both our annual and perennial crops, the areas of which are changing constantly. Look at the shift made by the flax area. Flax growing for oil has been pushed clear up into the extreme Northwest, even over into Canada. Consider the abandoned rice fields of the Carolinas and the immense new rice areas in California and Texas. Think of the great pear orchards of Georgia of twenty years ago which have been abandoned and are rapidly going to decay, or the great pear orchard areas in California which are now planted to barley. Consider the ghastly spectacle which Europe now presents where thousands of square miles of forest have been destroyed and strips of land miles in width and hundreds of miles in length have been so torn up by the shell fire that it is unfit for crop cultivation. Think of the readjustments that are going to take place in the agriculture of Europe where whole populations have been either wiped out of existence or find themselves reduced to abject poverty. I walked out under the forest trees on my place in Maryland and considered the changes which have taken place in the policies of the world since they were little seedlings.

The owner of my property was in those days ready to lay down his life in defence of the principle of slavery. The destruction of the forests was the advocated policy of the time. The discovery of paper pulp had not been made. The match and kerosene and gasoline and all the great chemical discoveries were still unmade when those trees were little seedlings. And when I look ahead and try to imagine what will be the situation in this country with regard to the plants which constitute our forests and our agriculture by the time the seedlings under my feet are grown up, I cannot feel the same degree of confidence which some people seem to have, that we can

decide now a policy which will protect these little seedlings for the next hundred years, in the face of the gigantic changes in transportation and commerce which those years will produce.

We can say to ourselves, "let us be independent of foreign plant production. Let us protect our own by

building a wall of quarantine regulations and keep out all the diseases which our agricultural crops are heir to and have this great advantage over the rest of the world." But the whole trend of the world is toward greater intercourse, more frequent exchange of commodities, less isolation, and a greater mixture of the plants and plant products over the face of the globe.

It seems to me that it will require the keenest research talent, the vastest amount of knowledge, the greatest ingenuity, unthought of amounts of money, and the wisest possible legislation to prevent the spread of the diseases of our economic plants and I cannot help feeling that each disease will require individual consideration and special legislation perhaps, and that in the end

there will be some sad failures and that mankind will not be able to preserve from destruction all the species of plants which he loves, even though he does devote to the task more intelligent labor than he has given to the preservation of the great food animals of the world which are so rapidly disappearing from its surface.

How far the restriction of plant immigration will lead to the building up of our horticulture and forestry it is difficult to say. The restriction of the breeder and the nurseryman in the species which he would have at his disposal would tend to limit his activity and his interest and slow down the process of the production of new forms. I believe there is no stimulus to the breeding and selection of plants which is greater than that produced by the placing in one's hands of other and different forms from those which one is accustomed to have about, and it seems to be an undoubted fact that the creation of new hybrid forms depends largely upon the possession of many species of a genus which can be crossed and recrossed until the desirable characters of all are gathered into one or more superlative hybrids which possess the great commercial value which is sought after. Any policy which slows down the active work of the country in this most important regard should be scrutinized with the greatest care and, if necessary, modified so as to allow of its development.



DISEASE-RESISTANT CHESTNUTS

A block of the Chinese Chestnut, *Castanea mollissima*, which inoculation experiments have shown to be quite resistant to the chestnut bark disease. The seed from which these young plants were grown was collected in China by Frank N. Meyer, Agricultural Explorer, and the plants were sent to experimenters in the area where the native chestnut was killed by the chestnut bark disease. It forms too small a tree to take the place of our American chestnut, but it produces excellent sweet nuts.

# THE DOGWOOD

BY DR. R. W. SHUFELDT, C. M. Z. S.

CORRESPONDING MEMBER, THE ACADEMY OF NATURAL SCIENCES OF PHILADELPHIA

**I**F there be one growth which more than any other impresses us with the charms of the early days of May in the country, the Flowering Dogwood is most assuredly the one. More than this: the same magnificent tree or shrub is equally decorative for a long time in the autumn. At the latter season, however, it is the leaves and not the flowers that are the parts so brilliantly in evidence. They are simply gorgeous in their coloring, and their blaze of scarlets, crimsons, reds, and golden yellows may be perceived through the woodlands and forests fully as far as one can see. The bunches of waxy berries, a rich vermilion in color, take part in all this, adding their share to the general rich color scheme.

This Flowering Dogwood is the species that generally comes up in one's mind in speaking of dogwood; but as a matter of fact, it is but a single representative of quite a numerous group or family, which botanists have designated as the Dogwood family, or *Cornaceæ*. Some of these may be herbaceous growths, but only rarely is such the case; as a rule, they are either trees or shrubs. In structure they are all interesting. In one genus of them the flowers are found to be perfect, and the leaves generally alternate. In a second group of dogwoods the flowers are unisexual—the two kinds being found on separate, individual shrubs. In this genus, too, the leaves are alternate, and the flow-

ers greenish. It has received the name of *Nyssa*, and to it have been relegated the Tupelos, the Pepperidges, and the Sour Gums. These are all trees, and the word *Nyssa* is derived from "Nymph," as the original species is a tree that grows in the water. All the species are trees, indeed *Nyssa aquatica* is a large tree. There is also the Black Gum (*N. sylvatica*), and its variety *biflora*, which is also a tree flourishing in the marshes of some of the Southern States. These three are all the species in the genus *Nyssa*; and the already mentioned Black Gum, with its dense, close-grained wood, finds some use in particular trades where such a wood is in demand.



AN EXCEPTIONALLY HANDSOME DOGWOOD TREE

FIG. 1.—This magnificent specimen of Dogwood in full blossom presents the correct form of its growth when not impinged upon by surrounding trees. It will be observed that, when in full flower, its leaves are but little more than started.

Strange to say, the Dogwood family is related upon the one hand to the Parsley family, and upon the other to the Heath family (*Ericaceæ*); this brings us to a consideration of its typical genus or group, the genus *Cornus*, containing the Cornels or true Dogwoods. The wood of all these dogwoods is verily as hard as horn; and, as the Latin name for a horn is *cornu*, we have the generic name *Cornus*. Apart from the characters of the more minute structures, there are three very prominent ones: the bitterness of the bark, which possesses certain tonic properties; the tough, hard wood, and the entire, opposite leaves (except in one species).

Next to the Flowering Dogwood, in the matter of being a favorite plant, is, perhaps,

the Dwarf Cornel or Bunchberry, which not only has a range from Maine southward to New Jersey, and westward to California, but is known to occur in the White Mountains and Adirondaeks at elevations ranging up to 4000 feet. Its center of abundance is in the rich, damp woods of New Jersey, where it is well known; and, as its beautiful, red berries are very conspicuous in the fall, it is likely that people there gather and eat them, as it is a well-known fact that they are quite edible. Smallest of all the cornels, it blooms in June, in the center of its range; its tiny and greenish flowers are centered in a bunch as in the Flowering Dogwood, and they are, as in the latter, surrounded by a pointed, four- to six-leaved involucre resembling true petals. Gray says that the leaves and involucre may be, indeed often are, variously colored; and Mathews remarks that "the leaves are light yellow-green, broadly ovate, pointed, toothless, and deeply marked by about 5-7 nearly parallel, curving ribs; they are set in eircles." After one knows this attractive plant, it will never be forgotten, so striking are its characters. Neltje Blanchan says that the tight clusters of round berries are lifted upward on a gradually lengthened peduncle after they fade, and in some of the popular botanies they are figured in that way; in fact, one author has even figured the flowers and involucre upon such an elevated stem, describing it so in the text. This is an interesting point to settle with respect to the

bunchberry. Gray says not a word about the flowers and their involucre being borne on a stem *above* the whorl of leaves.

Around Quebec and in Newfoundland, and as far northward as Alaska and Greenland, there is another species of dogwood (*C. suecica*), which is very much like the bunchberry but slenderer; it flourishes upon the headlands and cliffs, and it is probable that but few botanists have seen it growing in nature.

Reference has already been made to the Common Cornel or Dogwood. It

is the *Cornus florida* of the books, and it is found in dry woods from southern Maine and Minnesota northward to Ontario and southward to Texas and Florida. It may occasionally become quite a substantial tree, as will be appreciated by a study of Fig. 1 illustrating this article. If the involucre is regarded here as the four petals of a flower, more than two thousand flowers can be counted on this tree; but, as a matter of fact, each involucre surrounds many flowers (see Fig. 3), therefore there are in reality many thousands of flowers upon such a growth. Some dogwood trees are fully forty feet in height.

Not a few of the winter birds in the North Atlantic and New England States feed upon the brilliantly red berries of this dogwood; and the hard seeds being indigestible, they are certain to be dropped far and wide in other forests and woods, the species thus being distributed in new

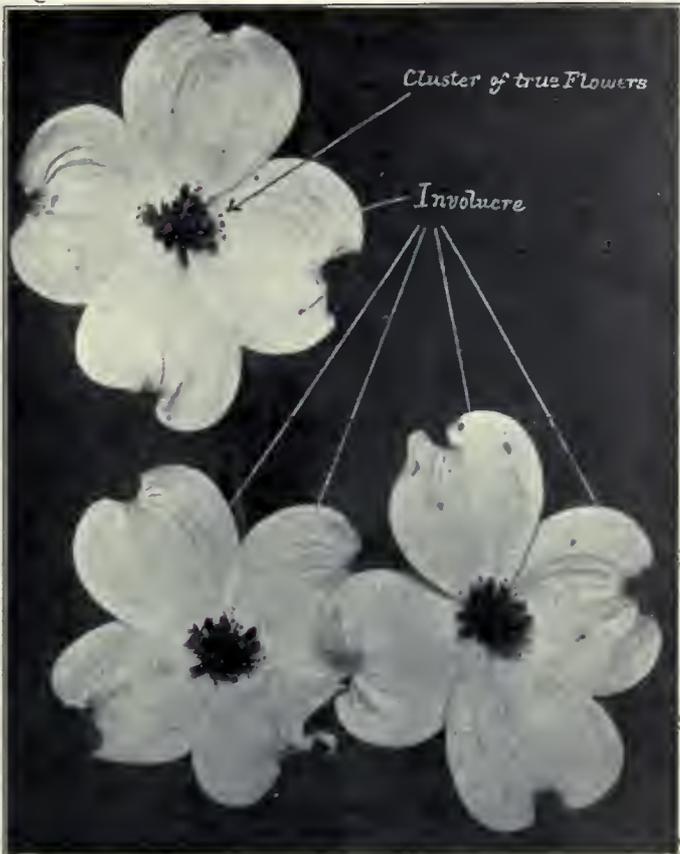


BEAUTIFUL DOGWOOD FLOWERS IN EARLY SPRING

FIG. 2.—This picture presents an example of Dogwood (*Cornus florida*) in full blossom; it was collected at Thrifton, Virginia. They are here represented about one-sixth natural proportions; the leaves are few, but of some size, as it was obtained during the middle of May (1915).

localities, often at long distances from where the parent tree grew. Many times flocks of hungry cedar birds have been seen in the winter hurriedly flying into one of these dogwood trees, laden with its scarlet berries, there to bolt these down. As is known the berries, while attractive to the eye, contain but little nutriment beneath their skins.

Thousands of ruthless hands break off the branches of the Flowering Dogwood during the months of May and



FLOWERING DOGWOOD BLOSSOMS SHOWING TRUE FLOWERS BUNCHED IN CENTER

FIG. 3.—Three full flowers of the Common Dogwood (*Cornus florida*), the two larger ones being quite perfect. The several true, small flowers are bunched together in the center, in open, naked cymes. The four surrounding, petal-like white leaves form a false corolla, and is known as an involucre. A true corolla formed of petals is seen in such a flower as the common buttercup, where they are yellow. Note the curious notches in the middle of the outer border of these pseudo petals—an ever-present character in these blossoms.

June, and this easily accounts, not only for its steady disappearance at this time, but for the poor, mutilated examples of this splendid shrub so often seen by the roadsides, or at short distances from them in the woods.

Thoreau says that when the farmers in some parts of New England hear the notes of the brown thrasher in April about corn-planting time, they translate them to mean "drop it, drop it—cover it up, cover it up—pull it up, pull it up"; but they will not heed this advice until satisfied of its soundness through observing that the Flowering Dogwood is in full bloom.

Many insects are responsible for the fertilization of the dogwood flowers, especially certain butterflies, bees and flies—a fact any one may observe by simply selecting some dogwood tree in the spring, when it is in full flower, and watching the numerous insects that visit it.

The wood of the flowering dogwood is very smooth, close-grained, and hard, and owing to these qualities, it

has been extensively used for making toothpicks. It has been called priek-wood or skewer-wood, as it has long been used to make butchers' skewers in some parts of the country. An authority at hand says that this wood "is so exceptionally free from silx that watchmakers use small splinters of it for cleaning out the pivot-holes of watches, and opticians for removing dust from small, deep-seated lenses." Medical works state that the bark as well as the root of this species is used in the United States as a substitute for Peruvian bark in cases of fever. There is scarcely any grit in its wood, and it is therefore useful for making bobbins and shuttles for weaving; for still other uses the cabinet maker will use no other wood. Other species of Cornels do not come in here, for the reason that they are mere plants, never even attaining the size of a small shrub.

There are two kinds of dogwood in which the fruit is blue, associated with other distinguishing characters; these are the Round-leaved Cornel or Dogwood, and the Silky Cornel or Kinnikinic, the first being the *Cornus circinata* of science, and the other the *Cornus amomum*. We may find the round-leaved species from Nova Scotia to



BUMBLE BEES DELIGHT IN VISITING DOGWOOD FLOWERS

FIG. 4.—Two flowers of the Common Dogwood (*Cornus florida*), seen upon side view. This picture shows a number of the young leaves about a week after they have started to grow. They are thick, pale green, and lanceolate in outline. This specimen was obtained very early one cold spring morning, and the bumble-bee in the upper flower was so chilled that he never so much as moved during the operation of photographing it.

Virginia and Iowa, westward to North Dakota. It is a shrub that may grow to be some nine or ten feet high, occurring chiefly in open forests and on hillsides where the sun rarely penetrates. It favors rocky localities, and may sometimes be found growing along roadsides. Its twigs are greenish, and curious waxy growths may be discovered upon them. Examine the leaves, and they will be found to be woolly upon their under sides. In shape

they taper to a point, though the general form is roundish, hence the name of the species. Blossoming in May and June, or in July farther north, they are easily recognized by their small, flat flowers, which are white, and may measure as much as two inches in diameter; they are arranged in clusters, and no involucre is present. Petals are gen-



FRUIT AND LEAVES OF FLOWERING DOGWOOD IN THE AUTUMN

FIG. 5.—Extremities of dogwood twigs in the autumn. Note the curled form of the large orange and scarlet leaves. At the end of the twigs the berries or fruit are of a splendid vermilion color, and look as though they were made of red sealing wax. Each is of an ellipsoidal form, and the eight to ten in each cluster are bunched together at their bases. In the upper bunch note the single little round white buds, which represent the early stage of the flowers of the succeeding spring.

erally four in number, and branches are sometimes streaked with white. From the bark of this round-leaved dogwood is extracted "cornine," which has many of the medicinal properties of quinine, and is sometimes prescribed by physicians in the country where a strong tonic is indicated. Its light blue berries are not edible, and this shrub will grow in any kind of soil imaginable, whether it be of the richest, or of a quality so poor that it would not support any other kind of plant life, as Dr. Asa Gray goes so far as to say actually "on rock."

Another dogwood which has light blue fruit in the autumn is the Silky Cornel or Kinnikinic—a shrub that may sometimes grow to be nearly nine feet in height, while the branches, instead of being whitish as in the last species, are purplish. It gets its name of "Silky" from its silky, downy leaves, which are so upon their undersides, and which are of a rusty color. Formerly it bore the scientific name of *C. sericea*, but it is now the *C. amomum*. In form, the leaves are pointed, and are subject to vary somewhat. This has led one botanist to describe the supposed variety as a new species (*C. purpusi*, Koehne). As a rule, the Silky Cornel grows in wet localities from Newfoundland westward to North Dakota, and southward to all the Gulf States as far as Louisiana. Some people call it the Swamp Dogwood; and in the old days some of the American Indians smoked its powdered bark, believing that it acted as a tonic.

Some of the Cornels have white or pale, lead-colored fruit, generally pure white, as is the case with *C. asperifolia* and *C. baileyi*, the form being rather a tall shrub, and may occur from Lake Erie to Minnesota and far southward; it flowers in May and June. In another group is found still other species, as *C. alternifolia*, *C. paniculata*, and also the Stiff Cornel or Dogwood (*C. stricta*).

For the present purpose it will be necessary to describe but one more, and it, too, belongs in the same assemblage as the last three species. It is the Red-Osier Dogwood (*C. stolonifera*). It may easily be recognized by its lead-colored but oftener pure white fruit. Its branches resemble osier shoots; those of the year are of a brilliant reddish purple and quite smooth, and to this Gray adds that its ovate leaves are roundish at their bases, abruptly short-pointed, roughish, with a minute close pubescence on both sides, whitish underneath. It is partial to wet soils or soft, moist soils. By the aid of its running shoots, it is now found from Newfoundland to Mackenzie, south to the District of Columbia, then across the United States to the Pacific Coast region. It bears small, flat-topped flower clusters as late as July, and still later, August, to the northward.

Thus it is seen that the Dogwood family is far more extensive than is generally supposed. Economically, their wood is of considerable use, even in the arts, while their wide distribution, their decorative and attractive appearance, and early blossoming, all invite one to be extremely considerate of their conservation, and to encourage their more extensive cultivation in large gardens, on the border lines of estates and similar properties.

**T**HE United States Forest Products Laboratory [at Madison, is trying by many experiments to find ways to cut the price of paper, and thus give material aid to publishers. The increasing cost of pulpwood has focalized attention upon the possibility of utilizing sawmill waste for the manufacture of chips suitable for pulp. An exhaustive study has been completed showing the extent to which mill waste is now used in making pulp as well as methods of barking, chipping, screening, drying, and baling chips.

# THE WARBLERS

(Family Mniotiltidæ)

BY A. A. ALLEN, PH.D.

ASSISTANT PROFESSOR OF ORNITHOLOGY, CORNELL UNIVERSITY

**P**ERHAPS no family of birds plays a greater part in the protection of our forests than the warblers.

Being primarily woodland birds, they arrive in the spring when the leaves are just beginning to unfold and the hordes of caterpillars emerging from the eggs in which they have passed the winter. Not a twig goes unnoticed, scarcely a bud unscrutinized, as this army of busy travelers sweeps on to its northern breeding ground. During April, May, and June, when the migration is in progress, they practically rid the trees of insect pests which otherwise would defoliate them in a single season.

But besides this economic appeal they have an æsthetic one, and certain it is that no group of birds is more attractive to the beginner in the study of ornithology than these multi-colored, active, forest-dwellers. At first they baffle him with their great variety of colors and rather nondescript songs, but they lure him ever to more persistent effort by challenging his acuteness, his perseverance, his woodcraft.



A WATER SPRITE

A Louisiana water-thrush with larvæ of the black fly for its young. Rocky streams and dashing cascades make a home for this graceful warbler.

The Mniotiltidæ is one of the larger families of birds, containing about one-hundred and fifty-five species confined entirely to the new world. In summer they are found from northern Alaska to Argentina but only about fifty-five species visit the United States. Forty species are confined to South America, thirty to Central America and Mexico, twenty to the West Indies, and ten to the Galapagos Islands. Thus it will be seen that, although the warblers are undoubtedly of tropical origin, they now reach their highest development in North America. Of

the North American species, it seems that quite a number have come into the United States from the West Indies, while others have originated in Mexico. The former, which include principally the genus *Dendroica*, notably the black-throated blue, the black-throated green, the magnolia, the chestnut-sided, and the bay-breasted warblers, are, as yet, confined mostly to eastern United States.



THE DOMED NEST OF THE OVEN BIRD

The oven birds and water-thrushes belong to the warbler family in spite of their common names. They are terrestrial birds, the oven bird spending its life among the leaves of the forest floor. Its ordinary song resembles the words—"teacher—teacher—teacher—teacher," but it has also a remarkable flight song.

Those of Mexican origin have spread over both the east and the west so that, today, there are about twice as many species in eastern United States as in the west.

Each species is characteristic of some particular faunal area as well as some particular habitat. Thus, after they have settled down for the summer, we find that certain species never nest north of Virginia, others never south of New York or Pennsylvania, and still others always north of the boundary of the United States. Among the warblers that go far north to breed might be mentioned the blackpoll, the Tennessee, the palm, the myrtle, the bay-breasted, the Blackburnian, the orange-crowned, and the Cape May warblers, and a little farther south, the magnolia, the black-throated blue, the black-throated green, the Nashville, the mourning, the Canadian warblers, and the water-thrush. The common breeding warblers of the northern United States are the yellow warbler, the red-start, the oven-bird, the yellow-throat, the black and

white, the chestnut-sided, and the pine warbler, and of southern United States, the Louisiana water-thrush, the Kentucky, the yellow-throated, the prothonotary, the



DOWN WITH THE CANKER WORM

A female mourning warbler feeding its young one of these leaf-destroying caterpillars. The warblers are the tree doctors and keep the trees in good health by defending the foliage against the ravages of caterpillars, aphids, etc.

blue-winged, the cerulean, the hooded, the worm-eating warblers, and the yellow-breasted chat.

Each species is characteristic also of some particular habitat; the oven-bird and water-thrushes are terrestrial, the Kentucky, blue-winged, and chestnut-sided warblers, and chats are birds of the undergrowth, while the black-



THE LARGEST OF THE WARBLERS

The yellow-breasted chat is a bird of bizarre habits whose timidity makes a close acquaintance impossible and photography extremely difficult.

burnian and yellow-throated warblers confine themselves largely to the tree-tops.

Since all the warblers are insectivorous, they are, perforce, highly migratory, seeking southern climates when the insect supply is exhausted in the North. Some of our species go only to southern United States for the winter, and the myrtle warbler, which is rather an exceptional species, and perhaps the hardiest of all, winters often as far north as southern New York, changing its diet to one of bayberries. Sometimes it even takes suet from a feeding station, together with the chickadees and nut-hatches. The pine warbler, which nests throughout the eastern United States, merely withdraws in winter to the southern third of its breeding range, from North Carolina southward. Thus it probably has the shortest migration of any of the species. The palm and orange-crowned warblers and a few black and white, yellow-throated, worm-eating, parula, black-throated blue, prairie warblers, northern



IMPOSED UPON

A nest of a redstart containing an egg of the parasitic cowbird as well as two of its own. The cowbird imposes upon many of the warblers but some of them have learned to build another floor over the unwelcome egg and thus prevent it from hatching.

water-thrushes, and oven-birds remain in Florida for the winter, but the majority of species and individuals continue farther south. The actual distance traveled varies a great deal. The prairie, black-throated blue, Swainson's, Bachman's, Cape May, and Kirtland's spend the winter in the West Indies; the worm-eating, magnolia, chestnut-sided, black-throated green, hooded, blue-winged, Nashville, orange-crowned, parula, palm, and Wilson's warblers, and the chat fly across the Gulf of Mexico to Central America, while the black and white, prothonotary, golden-winged, Tennessee, yellow, cerulean, bay-breasted, blackpoll, blackburnian, Kentucky, Connecticut, mourning, and Canadian warblers, the redstart, oven-bird, and both the water-thrushes continue into South America—some even to Brazil. The shortest journey which any blackpoll makes is thirty-five hundred miles, while those that nest in Alaska probably travel seven thousand miles

yearly to their winter home in Brazil. Nearly all the warblers of western United States spend the winter in Mexico and northern Central America.

It might be expected that those species which migrate to South America would follow the chain of West India Islands, keeping thus always within sight of land, but such is the case with only a few species, the majority preferring the direct flight of five hundred miles across the Gulf of Mexico. They migrate mostly at night, although they continue their northward journey slowly during the day, feeding as they go. Occasionally they make long flights across bodies of water by day, but usually this is done at night. What guides them on these journeys may always be a mystery, but it is now thought, and there is good evidence for so believing, that birds have a special and very highly developed "sense of direction." Ordinarily they migrate from a few hundred feet to nearly two



A COZY HOME IN THE MARSHES

A female yellow-throat on its nest among the sedges. One of these yellow-throats holds the record of having eaten 3500 plant-lice in forty minutes.

miles above the earth but, on cloudy nights, they descend to escape the clouds and then often become confused by the illuminations in light-houses or tall buildings and dash themselves to death against the glass. Several hundred birds, a large percentage of them warblers, have been picked up at the foot of a single light-house, the Washington Monument, and similar places, after a foggy night.

As might be expected, the first warblers to push northward in the spring are those which are the hardiest and whose migration routes are the shortest. Thus the pine and the myrtle warblers arrive in northern United States while the trees are still bare, and the blackpolls do not begin to arrive until the middle of May. In the fall the redstarts and yellow warblers start back before August while insect food is still most abundant, but the myrtles and others of short migration routes remain until the leaves have fallen.

One might assume from the name of the family that these little birds are beautiful singers. The truth is, however, that there are very few whose songs are much more musical than the calls of insects. Others whose songs are weak make up in sweetness what they lack in volume. The water-thrushes with their wild, ringing notes, the chat with its loud, bizarre calls and whistles, the oven



THE WORLD BEFORE THEM

Young cerulean warblers ready to leave the nest. The lichen-covered nest is one of the more unusual types found in the family and is extremely inconspicuous and difficult to find.

bird with its varied flight song, are, perhaps, exceptions. The simple trill of the yellow warbler, the wheezy notes of the black-throated blue, the insistent calls of the Tennessee and the blackpoll, the vivacious notes of the redstart and the chestnut-sided warblers fix themselves readily in our minds like the chirp of the cricket and the belated love calls of the katydid. They are expressive of the first green of gardens and hedgerows and the dark shade of northern forests, and when once learned they make the discovery and identification of the warblers a simple task, but no satisfactory method of transcribing them to paper has yet been found.

The nesting habits of warblers are as varied as their colors and present many surprises. Most birds nest where they find their food, so that one expects terrestrial birds to nest on the ground and tree-loving birds to nest in the tree-tops. One is not surprised, therefore, to find the nests of the oven-bird and water-thrush on the ground, those of the chestnut-sided warbler and the chat in the low bushes, and the blackburnian warbler's in the tops of the evergreens. It is strange, however, that the black and white warbler, which spends its life creeping about the trunk and larger branches of trees, descends to the ground to nest as do also the Nashville and Tennessee warblers which we find most frequently singing in the tree-tops. The roofed-over nest, which gives the oven bird its name, the lichen-covered nest of the cerulean warbler, and the

cottony cradle of the yellow warbler, are, perhaps, the most unusual of the warblers' nests, the others being fashioned of grasses, rootlets, leaves, and other common materials into the ordinary cup-like form. The eggs of the warblers are remarkably uniform, being creamy-white, more or less spotted with brown, and it requires ten or eleven days for them to hatch. The young remain in the nest from eight to twelve days but are cared for by their parents for some time thereafter, since only one brood usually is raised in a season.

To the warblers is given the care of the foliage of the trees and therefore the good health of the forest. They are the tree doctors just as the woodpeckers are the tree surgeons. As long as the foliage is kept in good condition the trees will be healthy and produce good wood. Conifers will scarcely stand a single defoliation and deciduous trees are seriously devitalized even by a single stripping of the leaves. Never a year passes when sufficient caterpillars are not hatched to defoliate every woodland in this country, so prolific are the moths which lay



A CONFIDING CHESTNUT-SIDED WARBLER FEEDING ITS YOUNG  
Many of the warblers are apparently without fear of man and do not hesitate to feed their young even when held in the hand.

the eggs. It is possible and practical, nowadays, to spray the shade trees of city streets and thus protect them from these pests, although it is always an expensive process, but it will never be practical to spray entire woodlands. We must continue to rely upon the protection which birds give. Chief among these arboreal guardians are the warblers, and the thoroughness with which they do their work can be proved by any one who will observe a tree infested with the canker worms, aphids, gypsy moths, or almost any other pest of the foliage. Once the migratory troops of warblers discover it, they will remain about it for days, new birds frequenting it all through the migrating season, until the caterpillars become so

scarce that they are difficult to find. The number consumed by a single bird seems almost incredible, but much careful and accurate information has been accumulated by E. H. Forbush, the State Ornithologist of Massachusetts, giving actual numbers consumed, which attest the tremendous economic importance of this family.

Mr. R. H. Coleman counted the number of insects



"WOOL GATHERING"

The yellow warbler and the redstart can be encouraged to nest in the garden by supplying them with nesting material. Here a yellow warbler is taking some cotton that has been put out for it.



A CANADIAN LUNCHEON

A Canadian warbler bringing a crane fly to its young. The Canadian warbler is one of the common warblers of the north woods.

caught by a palm warbler and found that it varied from forty to sixty per minute. The bird observed spent at least four hours at the task, and in that time must have gathered almost ninety-five hundred insects.

Mr. F. H. Mosher observed a pair of yellow-throats feeding upon the aphids on a gray birch. One of the birds took eighty-nine of these tiny insects in a minute and 3500 in forty minutes. A chestnut-sided warbler was observed to take twenty-two small gypsy moth caterpillars in fourteen minutes, another, twenty-eight brown-tail caterpillars in twelve minutes, and a Nashville warbler ate forty-two caterpillars in thirty minutes, together with some other insects not identified. Many other observations could be listed, but the foregoing will give some idea of the good work the warblers are ever doing. While it is

true that the warblers and most birds do not like the large, full-grown, hairy caterpillars, they destroy them while small in great numbers, and such disagreeable species as tent caterpillars and tussock moths are relished, even in the adult stage, by cuckoos and orioles. If we should list all of the insects that have been taken from the stomachs of warblers, in the economic studies of the biological survey, they would run nearly the entire gamut of insect life.

Fortunate it is that the country is at last awake to the value of birds, that Federal laws for their protection have been enacted, and that we are learning to appreciate them not only from the economic standpoint, but also for the beauty and pleasure which they bring into life.

## MINING "CLAIMS" IN THE GRAND CANYON

BY H. H. CHAPMAN

A GREAT victory for public ownership has recently been won by court and departmental decisions, which will have a far-reaching effect in protecting public rights in all of our National Forests and Parks, and especially in the Grand Canyon. This is, in effect, that fraudulent mining "claims" or locations can no longer be occupied and held in defiance of authority and for purposes other than those contemplated by the mining laws.

There are many mining claims in the Grand Canyon, locations made years ago, ostensibly for mineral, but in reality covering portions of the canyon rim and trails in such a way as to give the claimants control of land to which the public should have access, hence carrying with them the chance to levy tribute on the tourist.

Mining claims can be filed on any public land, including National Forests, but not upon lands withdrawn as National Monuments, or National Parks. A claimant does not own the land until he "proves up" and gets a "patent," but the claim, if valid, does give him the right of exclusive possession, which is a property right, enabling

him to interfere with or prevent the public access and use of his claim. The statute reads, "no location of a mining claim shall be made until the discovery of the vein or lode within the limits of the claim located." Locations made where no mineral exists are fraudulent.

Before the creation of National Forests there was no incentive on the part of the Land Office to investigate the validity of mere mining locations. The claimant could maintain his rights for an indefinite period by doing a specified amount of work annually—termed "assessment" work—until he chose to bring the claim up for patent. The Land Office then examined the claim and if mineral was present in paying quantities, title or patent was issued.

But as soon as the National Forests were placed under proper administration, the officials in charge found that their management of the Forests was being greatly handicapped by the filing of numerous "lode" or "placer" mining claims covering the choicest bodies of Government timber, preventing timber sales and threatening the integ-



ON THE RIM OF THE GRAND CANYON

In the middle foreground is the Hotel El Tovar. Near it is the home and business place of the Kolb Brothers, and along the rim are numerous sites of mining claims.

city of the forest policy. They appealed to the Land Office, upon which rests the responsibility for passing upon the validity of claims to title, requesting immediate examination of those claims to determine whether or not there was mineral present. Perhaps certain advertisements appearing in California papers offering mining claims for sale and guaranteeing that they would "assay 12 sugar pines per acre" hastened this action.

Urged by this necessity, the Department looked up the precedents and decided that it was entirely within the authority of the Secretary to investigate the character of a mining claim at any time, without waiting for the claimant to seek a patent. It is generally known that but few claims filed are ever patented, and that in thousands of cases the claimants' rights are kept alive for many years by complying annually with the assessment requirements; hence in the absence of such authority, the Government would be powerless to interfere with a mining claim regardless of whether it is valid or fraudulent. This new policy was clearly set forth in a Department decision in the case of *H. H. Yard, et al*, 1909, in which the right to examine such claims at any time was announced.

A few of the most troublesome mining claims in the Grand Canyon were the property of one R. H. Cameron. The Canyon lay within and was a part of a National Forest. In order to protect this area from encroachments under the mining and other land laws, the Canyon was withdrawn in 1908 as a National Monument, and the Department held a hearing on several of the Cameron claims to determine their validity. The evidence showed that no mineral had ever been discovered on these claims; and under the precedent established by the *Yard* case, they would have been cancelled.

But at this juncture, the entire policy of the Interior Department was overturned by a new decision touching this very question. Two mining claims located by J. B. Nichols and Cy Smith on the Wallowa National Forest in Oregon were challenged by the Forest Service as fraudulent and intended for uses not contemplated by the

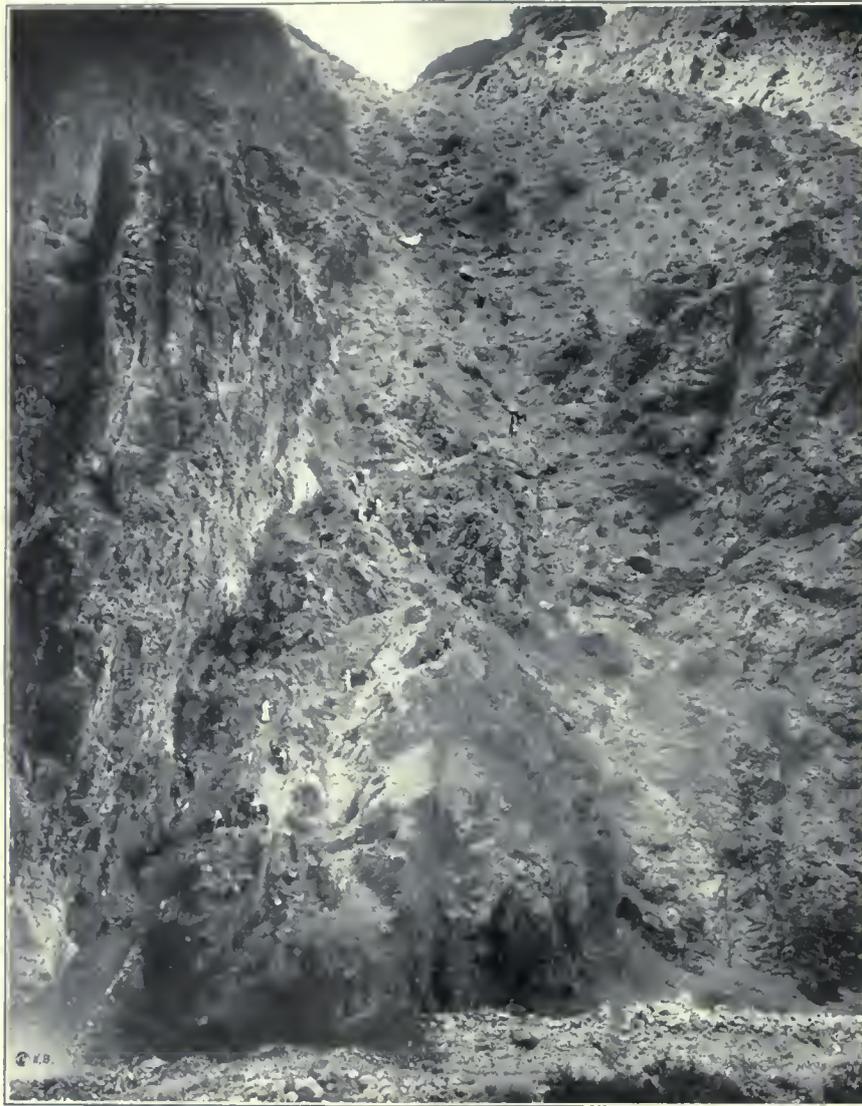
mining laws. The Land Office examined and cancelled the claims. But when this case was appealed, the decision which was rendered declared that the Department had no authority whatever to interfere with a claimant until he chose in good time to bring up his own case for patent, and that questions of the validity of such claims must be settled in the courts. This revolutionary decision was rendered in 1913.

The owner of the Cameron claims in the Grand Canyon was quick to seize the advantage thus offered and throw the case into the District Court of the District of Columbia at Washington, which court, acting upon the decision of the Interior Department, upheld the claimant.

Owing to the gravity of the issue involved, the Secretary permitted the case to go to appeal in order that the courts might be permitted to pass upon the policy of his subordinates, and settle the question. The courts soon spoke and in no uncertain terms.

In September, 1915, Judge Sawtelle of the District Court of Arizona refused to Cameron an injunction against the Department of Interior, and denied that the courts had any jurisdiction in such cases.

In December, 1916, the Court of Appeals of the District of Columbia upheld this view in case 2971, *Franklin K. Lane, Secretary of Interior, vs. Ralph H. Cameron*, and placed the responsibility of protecting the public against fraud squarely on the shoulders of the Depart-



THE DEVIL'S CORKSCREW

In this picture are shown the holes dug in prospect work by some of the men who established mining claims. If their claims were declared legal and the land became theirs they could charge tolls to the tourist who descended into the Canyon.



FINISHED ROAD OVER A MINING CLAIM

In the immediate foreground the road is part of one of the mining claims on the rim of the Grand Canyon.

ment, reaffirming the principles announced by this Department in the Yard case in 1909, which had been overturned by the Cy Smith decision in 1913.

As soon as this court decision was rendered, the Interior Department issued an order restoring the rights and responsibilities of the Department as declared in 1909.

It is significant that this latest decision cites numerous convincing precedents, including a clear-cut opinion rendered by the Supreme Court of the United States (Knight vs. U. S. Land Association, 142 U. S. 161) in which Justice Lamar says: "The Secretary (of the Interior) is the guardian of the people of the United States over the public lands. The obligations of his oath of office oblige him to see that the law is carried out, and that none of the public domain is wasted or is disposed of to a party not entitled to it.

. . . The mode in which supervision shall be exercised in the absence of statutory direction may be prescribed by such rules and regulations as the Secretary may



THE LINE OF A MINING CLAIM

On this road around the Grand Canyon the portion finished by the Government, and the unfinished section on the only mining claim where the road is uncompleted, are plainly discernible.

tions in the Grand Canyon or elsewhere. The control of the Grand Canyon is now secure forever to the people of the United States.

**T**HE report covering the spring and fall forest fire seasons of 1916, issued by the Pennsylvania Department of Forestry, shows that while almost as many forest fires burned in Pennsylvania in 1916 as in 1915, the area burned over was less than half that of 1915, and the timber loss was only a trifle over one-fourth as large.

**T**HAT mine timbers of white spruce, Sitka spruce, white birch, and western hemlock grown on the Chugach National Forest, Alaska, are fully as good as Douglas fir from the Rocky Mountain region and are superior to other Rocky Mountain species for use as mine timbers has been demonstrated by the Forest Products Laboratory at Madison, Wisconsin.

# FOOD-PRODUCING TREES

BY J. RUSSELL SMITH, PH.D.

PROFESSOR OF INDUSTRY, UNIVERSITY OF PENNSYLVANIA

**H**ERE is a hybrid idea in search of a father. I seek not its creative father, but rather adoptive fathers who may take the hybrid idea and give it such fathering and fostering as it may merit. The idea itself is a hybrid between horticulture and forestry. It might be called fruitful forestry, if the foresters would not take offence. It is nothing worse than the production of food and wood on the same tree.

We have now reached the state in our industrial development when we need large areas of land put to trees that will produce many crops of useful fruit, nuts, beans, or other annual or occasional product before the final crop of wood. It is merely the intensification of tree culture that shall parallel the intensification of animal husbandry. In Australia, in the early days, cattle were reared for their hides and tallow, all else being thrown away. Then came the export of

meat, and lastly the daily crop of milk and its derivatives for several years before the final crop of meat. The wood of a tree is no poorer for the fact that it has supported fifty or a hundred crops of nuts, fruit, or beans.

I hope I may not cause any one to miss the main point by rousing questions of definition as to whether I am talking about horticulture or about forestry. My greatest delight would be for both foresters and horticulturists to adopt the idea and act on it. I have the notion that the forester has been missing great opportunities and has been limiting the field of his usefulness when he thinks of trees merely as producers of wood. Similarly, I think the horticulturist has been grossly neglecting opportunities when he has limited his energies to the production of crops for men to eat. Both forester and horticulturist have been too bashful. The great need of American agriculture to-day is not primarily things for men to eat, but things for the beasts to eat. Our domestic animals eat many times as much as we do, and trees, whether attended to by horticulturist or forester, can undoubtedly be made to yield vast amounts of forage if care

and attention are directed to that object. I suppose most foresters are aware of the fact that half or two-thirds of the entire weight of pork grown in Portugal is produced by the acorns of the cork oak and evergreen or ilex oak. There are many other trees that might join the oaks and make a series of crops that would supply a surprising proportion of the needs of domestic animals, especially swine and sheep.

With this idea of tree crop forage in mind, and with the added fact that with the rising price of meat we are steadily increasing our consumption of nuts and are importing them by the millions of dollars a year, it becomes evident that foresters have been giving us, particularly farmers, bad advice in merely advising us to raise wood. There is little doubt that this idea of fruit harvests as well as wood harvests should have its proper place of beginning on the farmers' wood lot.



A GIANT GRAFTED OAK

This tremendous oak stands in a garden in Majorca. It produces a crop of acorns which provide food for a number of pigs.

Over and over again I have heard the foresters' advice to the farmer to "plant his steep hillsides in trees." The hillsides need the trees but the advice as given is often bad for two reasons: (1), the process is so slow that the farmer is not reached by appeal; (2), the yield is so small that the farmer can't afford to put part of his small acreage into this low and slow form of production. Instead of being told to plant trees and wait until they die to get something, he should be told to plant trees that will yield annually, or certainly every other year, and then finally a crop of wood. With this advice, the chances of getting him to plant his hillside into trees are greatly enhanced, because he can begin to profit in three, five or ten years instead of waiting twenty-five or fifty or seventy-five.

## CROP TREE AREAS AND WOOD TREE AREAS

I am not advocating that all forests should be of harvest-yielding trees. We need the utilization of land in the many ways which combine to the best service of the nation. Some lands should be in wood-producing forests only. These lands, however, should be those which have from man's standpoint some climatic handicap. Unfor-

unately there are plenty of such lands. Lands with first-class climate are too valuable to grow mere wood. Some part of our country to the South, as indicated by climatic studies,<sup>1</sup> as well as by history and present development, seems not to have a first-class climate for the development of numerous, vigorous, energetic and healthy men. Here timber should be grown. Certain parts of America are too cold and have winters too long for the easy support of large numbers of people. Here also timber should be grown up to the limit of trees. But in that large middle



NOTE THE COMPARISON

On this ground, twenty miles north of Seville, Spain, is seen on one side of the fence a fire-desolated goat pasture, on the other grain fields interspersed with oak trees producing forage for fattening hogs.

territory of which the United States has so much, and Canada has some, where it is neither too hot nor too cold, where the malaria does not prevail, and the climate stimulates man to activity, and climate permits production, there land should be made to feed him in the largest numbers. There trees should not loaf their lives away. Under the present system of land utilization most of Appalachia with its splendid climate has no economic future except in forests. Present tillage for it means destruction through the gully. Yet we have the very stimulating example of Corsica where similar mountain slopes as steep as a house roof and even steeper are clothed for miles in a continuous expanse of trees which look strangely like a forest, yet every tree is a grafted chestnut. Every acre is as valuable as good corn land in Indiana, and scattered along the magnificent macadam roads are the substantial stone villages of the numerous population that supports itself in comfortable prosperity from the combined income of chestnuts, chestnut wood, and the by-product of pasture and a small garden patch. The chestnut industry has continued in Corsica for centuries. Certainly the earth offers few examples of agriculture so permanent, so automatic, and so easy. When a Corsican gets pushed for money he goes out and cuts down an old giant worth often from \$10 to \$25 in American gold.

<sup>1</sup> See Ellsworth Huntington, *Climate and Civilization*.

There are many crop trees that may rival or equal the chestnut. Such utilization of our hills and mountain slopes would increase rather than decrease the tree area of much of the hilly part of our country and at the same time give the needed soil conservation, the needed water conservation, the needed scenic effects, and the spiritual comfort of the great trees.

MAKING OVER THE WILD TREES

It should not be forgotten that the thing I am advocating is quicker than forestry. The man, even the young man, who plants an oak tree has little reason to expect to live to utilize the timber from its trunk. Yet it is a fact that most of our oaks have specimens which will bear fruit in from three to seven years when grafted upon the suckers growing up around the stumps of their own or allied species. Thus, instead of having the forest fire follow the lumberman, he should be followed by the tree grafter, converting mediocre oaks into prolific oaks, mediocre hickories into good shag-barks, wild persimmons into fruitful persimmons, average black-walnuts into those few



BEARS 1200 LITERS OF ACORNS YEARLY

The food value of the annual crop of this evergreen oak tree near Algarve, Portugal, with its spread of fifty feet, is indicated by its record production of acorns.

excellent ones that will furnish kernels in whole quarters, ever-bearing mulberries in place of the prolific but quick-ripening wild variety. All the above kinds of grafting are from present knowledge known to be feasible.<sup>2</sup> I have taught ignorant mountaineers how to do the whole lot except the oak, and that is a common practice in English parks and gardens.

This process of establishing crop trees need not be limited to the conversion of wild trees. Many of the fruit-yielding trees are easy to transplant, and some of them yield quickly, especially the mulberries, which fruit wild at the height of a man's head, while specimens of the selected "ever-bearing" varieties will actually bear in the nursery row. The mulberry is so highly prized by the pig,

<sup>2</sup> See reports of Northern Nut Growers' Association, W. C. Deming, Secretary, Georgetown, Connecticut.

so easy to transplant, so prolific, that it is probably the easiest point of approach to the farmer who wishes to experiment along these lines.

The practice of the Corsican mountaineers in their tree crop agriculture or fruitful forestry, whichever you choose to call it, is very suggestive of a proper method of handling the technical question of getting a stand of trees and keeping it, and at the same time utilizing the by-product of pasture. The Corsican goat, whose milk makes much good cheese, browses in the chestnut forests and keeps down most of the undergrowth. When a Corsican sees a chestnut tree which in five, ten, or twenty years is likely to be ready to go to the pulp mill, he goes off to his little nursery, digs out a ten-foot chestnut, and plants it near the one which it is to succeed. He puts two stakes beside it to keep it from being ridden down by the goats. When it is established in two or three years, he grafts it, and there it stands leading a submerged kind of life for five or twenty or thirty years. But when the old monarch by which it stands finally comes down, it is ready to spring promptly into rapid growth and the fullest possible utili-



PRODUCTION OF MULBERRY TREES

This grove on a Carolina farm is producing posts, firewood, and an estimated crop of twenty-five dollars' worth of pork each year. The Everbearing variety feeds the pigs for two months.

zation of the vacated light, space and fertility. It is true that the natural way to propagate a chestnut is to graft the suckers that grow up around the stumps, but the Corsican finds it is quicker to have the understudy tree established in advance. This method also saves the necessity of protecting the suckers from the merciless teeth of the ingenious and industrious goat.

#### FRUIT AND LIGHT

Perhaps some forester, if he has read this far, has raised the objection that to produce timber, trees must be tall, to be tall they must crowd, and crowding cuts off light and limits fruit. I at once grant all this. To make the tree yield the best amount of fruit, it must have light on all the ends of its branches, a fact which the Corsican knows well and practices carefully.

But just here I wish to call attention to the fact that the primacy of the saw log is passing; we are ever finding more uses for our wood in the form of pulp, and I will be glad to hear from any forester who can give me actual figures on the relative yield of total wood per acre on a crowded stand of tall timber and the open stand of well-lighted trees capable of yielding fruit. This comparison, if it is really to test out my point, should be made of fruit-yielding trees growing in conjunction with some form of



WILD OLIVE TREES IN ALGIERS

The land not only furnishes sustenance to these revenue-producing trees but also excellent grazing for the numerous sheep seen browsing there.

leguminous nurse plant, either leguminous bushes or leguminous pasture plants.

#### LEGUMES TO FEED THE OTHER TREES

Here is a simple device which has been little used, but which has great possibilities. It is well known that the legume, gathering nitrogen in the tubercles on its roots, can share it in that same season with a non-leguminous plant growing alongside. This has been shown by experiments that reveal much higher protein content in non-leguminous plants growing in a mixed stand with legumes than in the same species growing without legumes. There are many legumes which, granted lime and phosphorous, will riot in the half-shade and interspaces of trees that are so spaced as to produce fruit. One at least of these legumes, the ordinary yellow locust tree (*Robinia pseud-acacia*), is one of the surest land improvers I know. In 1904 I planted an apple orchard in an abandoned field that had in it some locust thickets. In four years' time the trees that stood near the stumps of the leguminous locusts were two or three times as big as the others, and in thirteen years they have not lost their lead. Similarly I find that the persimmon, that goat among trees, capable of surviving on such starved land as the cotton farmer abandons, also waxes near the locust tree.

I submit that the locust is a very admirable nurse plant for such non-leguminous fruit trees as the chestnut, walnut, hickory, pecan, persimmon, mulberry. It need not be allowed to grow up and shade them. The tree will

live and make roots and survive an annual cutting even in August. In fact, I have been nearly driven to despair by seeing the way they have survived where I have attempted to kill them by ten consecutive August cuttings. But there is an easier way of keeping them down and yet keeping them alive. Turn in every winter or every other winter a bunch of goats. They will gladly peel the bark from every locust bush, permitting it to start again which it will cheerfully do *ad infinitum*, thus keeping the ground full of nitrogen and humus, furnishing nitrogen for some nearby big fruit tree and furnishing winter forage for goats. The fact that these trees are much beset in some localities by borers will rarely cause their complete extermination, but merely make them less of a menace to the tree they are intended to feed and not to shade.

Fortunately we do not have to depend on more self-perpetuating and continuously murdered trees, or even the clovers, to get this leguminous nitrogen supply. The honey locust tree is one of the most promising of fruit-yielding trees for the reason that it possesses two excellent qualities: (1) it is a timber tree of high order; (2) its nitrogenous and also sugary beans are much prized by cattle, and have an analysis value which would give them, in the ground form, a market value approaching that of corn, and

a nutritive value so high in protein as to make the meal a rival to wheat bran. It is a close duplicate to the carob bean meal of the Mediterranean and of American patent stock foods, and to the mesquite bean meal which is becoming so important in Hawaii. This honey locust, with its good timber and good beans, could therefore be interplanted with walnuts, hickories, persimmons, pecans,

mulberries, or other non-legumes all of which love the nitrogen, and thus the land could have two crops and at the same time be bringing forward timber trees of the highest quality.

The honey locust tree is a heavy yielder of beans. A specimen growing in my neighbor's yard yielded 350 pounds in 1912, and I have heard of higher records. The tree survives much aridity, grows on the platcaus of western Kansas, Western Colorado, and joins territory with the mesquite, whose nutritious beans have fed cattle, deer, antelope and Indians for centuries. Between the honey locust species and the mesquite genus we have a good forage bean tree that will grow over at least 2,000,000 square miles of the United States, an undeveloped resource of amazing possibility, and one that requires immediate experimentation by forest experiment stations and farm experiment stations.

For increase of fruit areas, there is a compromise method which may appeal to the forester because it gives a crop of wood and at the same time brings us to the possibility of quick, cheap, easy, and effective fruit production. I have in mind the habit of the tall slim forest-grown trees which when left in clearings throw branches down their erstwhile bare trunks and make of themselves tall cylinders of foliage, affording the maximum possible leaf surface ex-

posed to the sunlight, and at the same time a long log in the middle which will at least make second-class lumber, strong. This habit of feathering their long bare legs is part of the equipment of the chestnut, the walnut, the oak, and probably many other trees, and if the trees did not do it naturally themselves, it could doubtless be induced by a few well-placed strokes of the hatchet.



PORTUGUESE CORK FOREST

The thrifty trees in the background yield a large revenue, while the harvesters in the foreground thrive upon the auxiliary crop of acorns.



IS THIS A FOREST?

This is a view on the Sorrento Peninsula, Italy. Every tree seen in the photograph is a food tree. In the foreground are walnuts and in the background olives.

To use this device effectively, logged-over land that is to grow up again could be grafted to choice varieties which, with a little care, could be permitted to grow up tall and straight with the other timber. I have seen the Paragon and other grafted chestnuts do this. When merchantable pole size had been reached, all timber could be cut, but the grafted trees which, with their height of 30 to 60 feet, would at once start to bearing useful crops, and, with the development of the side branches down their trunks, reach a high maximum of productivity in a few years.

#### FRUIT IN THE ORTHODOX FOREST

It is not necessary for all of this article to be heterodoxy. There is one place where I can be orthodox, and urge the foresters to keep any definition of forestry they want and still have other crops than wood. Plant the cork oak tree. We undoubtedly have a large area with suitable climate, judging by the ability of this tree to survive and reach its best in poor and rocky lands in the Iberian Peninsula as well as to thrive in experimental plantings over a wide area in this country. The argument that springs to so many persons' minds, namely, the Old World with cheap labor, does not hold in connection with the

cork oak, in which the number of days' labor for stripping a ton is very small, and the value per ton high and increasing with our increased demands for it. I may say, from some examination of cork-producing areas in Spain, that there is very little increase in output promised in that country, and those responsible for American forests will do well to plant considerable areas of it.

In its home land cork forest makes a considerable part of its income by feeding swine with acorns. I want to call attention to the apparently easy possibility of having a cork oak tree as far up as we want to raise cork, and grafting an evergreen (ilex) oak at the top. This latter tree, with its greater acorn qualities will undoubtedly increase the yield through acorns, and there is no apparent theoretic reason why it should hurt the cork. The general practice of grafting oaks is not difficult, and I have been told by Spaniards of successful inter-grafting between these two species. The work would not be extensive if the Barcelona type of cork tree, namely, the straight

trunk, were favored, while the Portuguese shape with four or five branches would not require an unreasonable amount of grafting. An even simpler process for the getting of desired types of oaks on large areas would be the planting of oak forests, using seed that would come true to type of desired strains. I have been told by the plant breeders that it would be a comparatively simple matter to get

such strains of acorns, and the time involved would not be so long as first thought would suggest if one would follow some such device as this. Select the desired strains, hybridize them, sprout the hybrids, test them by grafting on mature trees so that in a comparatively short time the true yielding strains could be found, and then these could be grown in some isolated spot where no other oak trees nearby could cross fertilize. Such spots might be found in islands like the Catalina Islands, in isolated places in evergreen forests, or say out in the great plains. In fact the opportunity of establishing such botanic islands is very great.

#### PROGRAM

Apparently the steps in the development of this piece of work should be somewhat as follows:

1. Search for and test of new useful species, such as the honey locust, which is yet nowhere a crop.

Another example of this possibility is the osage orange, a magnificent timber tree producing heavily of big fruit from which undoubtedly we could extract a number of useful things if we handled them in carload lots. I have been told that they contain starch.

The list of trees valuable for both wood and fruit is doubtless large, especially if we consider the possibilities from the best tree of the species, and of breeding from a selection of such trees. That brings us to the second part of the program.

2. Search for good parent trees.

We know that the persimmon is a tree capable of thriving in a field that is so poor as to be "thrown away." All over the territory below Mason and Dixon's Line, and in some places above it, we know that it is a heavy yielder of fruit, that it is the most nutritious fruit grower east of the land of dates, that it is prized by pigs, sheep, horses, cows and humans, that it grafts easily, but we do not yet know where are the best parent trees. The recent



SUCKERS OF SCRUB OAK

These, locally known as "turkey oak," grew in thirty months on a very poor sandy soil over which a forest fire had swept. The soil was of Cambrian sandstone formation on the crest of the Blue Ridge Mountains near Bluemont, Virginia.

discovery of the finest pecan in America, growing in Indiana,<sup>3</sup> is again suggestive of the lack of botanic exploration in this country, especially economic botany. There are shag-barks that will come out of their shells in whole halves. The same is probably true of black walnuts. Where are the best of these parent trees? There are doubtless mazzard cherry trees with kernels in their seeds

and resistance to pests. The tree world is to the botanist as clay in the hands of the potter and the botanist has scarce begun. I hope that the ensuing years may see a vast increase of constructive work looking to the fuller utilization of our tree resources as a factor in production and conservation.

#### EASTERN FOREST LANDS BOUGHT

**T**HE National Forest Reservation Commission has authorized the purchase by the Government of 32,266 acres of land in the Southern Appalachian and the White Mountains, for inclusion in the eastern National Forests. In accordance with the policy of the Commission, only tracts were approved which block in with the land already owned or acquired in the established "Purchase Areas."

The largest and most important purchase is that of a number of tracts in Lawrence and Winston Counties, Alabama, which total 14,360 acres. The Alabama Purchase Area was authorized two years ago in order to protect the headwaters of the Sipsey River, an important tributary of the Black Warrior River, on which an expensive system of locks has been installed by the Government to facilitate navigation. Within the boundaries of the Purchase Area and adjoining the tracts just approved there are approximately 13,000 acres of rough mountain timberland to which the Government still retains title and which have been withdrawn from entry for inclusion in the National Forest.

A total of 11,116 acres in Oxford County, Maine, and Coos and Carroll Counties, New Hampshire, in the White Mountain National Forest, was also approved. Of this amount about 7,000 acres was comprised in a single tract on the Kilkenny Division. Other tracts whose acquisition was authorized include 998 acres in Caldwell, Henderson, Macon, McDowell, and Yancey Counties, North Carolina; 954 acres in Shenandoah and Amherst counties, Virginia; 600 acres in Oconee County, South Carolina; 738 acres in Randolph County, West Virginia; and 3,500 acres in Monroe County, Tennessee.

**N**EW uses for wood are being developed constantly, but the first wooden tennis court of which there is any record has been built at the country home of E. B. Hazen, who lives several miles from Portland, on the Columbia highway. The tennis court is built of inch pieces, three inches wide, set on edge, and sufficiently close together to make a solid floor, yet sufficiently spaced to give ventilation and allow the water to run off without gathering and promoting decay.

**T**HE day of the wooden golf club shaft is not passing. There is enough hickory in America to provide all the shafts for the golf clubs that American golf players can want for years to come. It has been asserted of late that the time was coming when, from scarcity of hickory, club shafts would have to be made of steel, but there is no foundation for such a statement.



A GRAFTED PERSIMMON TREE

This tree, burdened with fruit, is standing where it sprung up by chance in a Georgia cow-pea field. Peas and persimmons are both gathered by foraging pigs.

big enough and nutritious enough to make them a crop for pig feed, but no one as yet has taken the pains to search them out or make tests.

3. Finally comes plant breeding, and its possibilities when applied to the native and imported fruit trees growing in America are quite beyond adequate contemplation. The well-known experiment of Dr. Van Fleet with the chestnut is, however, so suggestive as to merit a brief rehearsal. By using the useless, small, but very sweet chinquapin, and the large, prolific, Japanese chestnut, useless because of its poor quality, he has produced a hybrid good enough to eat, big enough to handle commercially, and with two added highly useful qualities: First, high immunity to the ravaging chestnut blight and such prolificacy that the seedling will sometimes bear eighteen months from the sprouting of the seed. That does not agree with our ideas of the slowness of nut trees, or the slowness of tree breeding. It should be remembered that trees are individuals, and that they vary in almost all respects, such as speed of growth, flavor of fruit, size of fruit, abundance of fruit, frequency of fruit-

<sup>3</sup>This is the Posey. It was awarded the prize at a Mobile meeting of the National Nut Growers' Association, an organization practically limited to southern pecan growers.



UNITED STATES FOREST SUPERVISORS AT DENVER

The spirit of public service shown by such men in their work has brought about the active coöperation and marked confidence of the citizens with whom they come in contact, which is a distinct aid in the Government's policy of forest conservation. The names of the Forest officers in the photograph are: A. L. Sweitzer, James F. Conner, John W. Spencer, C. A. Neeper, Earl S. Peirce, Chas. Farr, Jay Higgins, Fred B. Agee, R. W. Allen, Ray Peck, James A. Blair, J. W. Langworthy, C. L. Cecil, Lee E. Cooper, Geo. A. Duthie, Grover C. Hougham, M. J. Sweeney, Lynn H. Douglas, Arthur T. Upson, Alva A. Simpson, Peter Keplinger, Steve Doering, John McLaren, H. H. French, O. R. Craft, A. G. Hamel, Earl B. Tanner, C. M. Granger, John W. Lowell, John H. Hatton, Wm. O. Sauder, Fred R. Johnson, James Blackhall, Leslie Brownell, T. V. Vencmann, P. G. Redington, H. N. Wheeler, Arthur M. Cook, M. W. Thompson, Gordon Parker, W. J. Barker, Wm. R. Kreutzer, R. E. Clark, H. L. Borden, A. F. C. Hoffman, H. C. Hilton, Paul D. Kelleter, Dwight S. Jeffers, C. G. Poole, P. J. Paxton, Smith Riley, E. W. Tinker, Crosby A. Hoar, W. J. Pearce, F. H. Carroll, Fred W. Morrell, Theo. Shoemaker, J. B. Cammann, Ress Philips, G. E. Marshall, Chas. Gosorn, H. Earl French, Sandford Mills, W. I. Hutchinson.

## THE NEW SPIRIT OF PUBLIC SERVICE

BY C. J. STAHL

**I**N the early-history days of the National Forests in the West, the administration of the then so-called "Timberland Reserves" was carried on by a small force of officers whose duties consisted largely of fire protection, construction of improvements and timber sale reconnaissance and inspection, and who were obliged to refer practically all matters of importance to the Washington headquarters for decision. In time, this system of central control, which was found to result in delay and dissatisfaction to Forest users, was replaced by a scheme of local management in which the business of the National Forests was entirely handled by individual Supervisors under the direction of District Foresters with headquarters conveniently located as regards the geographical distribution of the Forests.

Today, as a result of this new system of management, a marked change has taken place in the West, both in the understanding of the Government's conservation policies and the feeling on the part of the public towards the National Forests and the men of the Forest Service. You find it everywhere—this spirit of "partnership," of lending a helping hand to the "other fellow," and it may be truly said that no body of Government officers in

the country are now more looked up to and respected than the men who carry the burdens of administration of our National Forests.

"What has brought about this change?" you may ask. The answer is—the new spirit of public service, which carries with it a downright personal interest in all matters of State, community and public welfare, and nowhere has this new spirit ever shown to better advantage than at the Forest Supervisors' convention held in Denver, Colorado, recently.

Organization, efficiency and progress were the keynotes of the meetings. Not "what is the Government going to do for us?" but "what can we do to make the National Forests better known and more useful to the public?" were questions oft repeated by the Supervisors. Many men who in past conventions were able only to discuss local Forest problems or minor points of official procedure, were here to be found on their feet speaking fluently and convincingly on subjects of general public interest. To one who has watched the steady growth of the Forest Service during the past fifteen years, this conference marked the beginning of a new era which promises much of achievement and success.

The convention lasted six days and was attended by over sixty Supervisors and officers of the National Forests of Colorado, Wyoming, South Dakota, Michigan, Minnesota, and Nebraska. Twenty-nine National Forests were represented, and a wide range of topics closely related to the upbuilding of the West discussed. District Forester Smith Riley presided at the meetings, and each day was given over to the consideration of some particular branch of National Forest work, such as good roads and their relation to State and community development; organization and up-to-date business methods; opportunities for public service and educational problems for Forest Service men, etc.

Lectures on organization and efficiency were delivered by the manager of the Ford Motor Company's plant in Denver, the superintendent of the Mountain States' Telegraph and Telephone Company and the efficiency engineer of the Denver Tramway Company. Good roads problems were presented by officers of the Bureau of Public Roads, United States Department of Agriculture, and the subject of game conservation dealt with by the director of the Colorado Museum of Natural History. Other interesting papers were delivered by members of the Colorado Mountain Club and officers of the Boy Scouts' organizations.

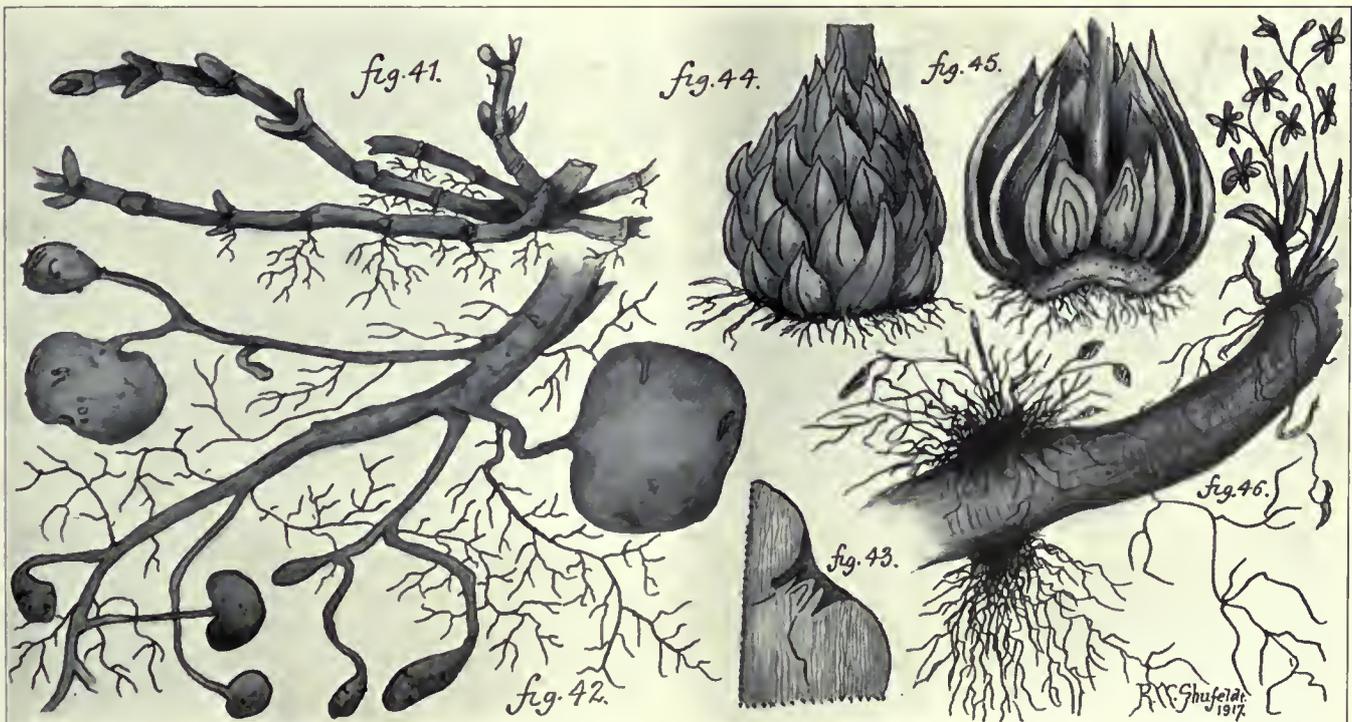
The possibilities for the development of the National Forests as great recreation centers; for the use of the poor man as well as the rich, was one of the paramount topics

of the convention. Figures were presented showing that the Forests of District 2 had over 667,000 visitors in 1916 and of that number the seventeen Forests of Colorado contributed over 600,000 visitors.

On one day of the convention the Supervisors made a special trip to Fort Collins as guests of the Colorado State Agriculture College. After inspecting the experiment station the men attended a series of lectures on various subjects connected with the grazing of livestock on the National Forests, delivered by members of the College faculty. The program concluded with a banquet in the evening.

During the convention in Denver the "get-together" spirit was fostered by a series of dinners at which prominent speakers addressed the Supervisors, and by social dances and theatre parties. At the close of the meetings resolutions were adopted commending and supporting the work and administration of H. S. Graves, Forester of the United States Department of Agriculture and Smith Riley, District Forester.

**T**HE shortage of labor in the lumber industry is being felt even in the government operations on the Menominee Indian reservation at Neopit, Wisconsin. The supervisor, A. S. Nicholson, is having difficulty in finding two hemlock inspectors and a yard superintendent.



ILLUSTRATED GLOSSARY—FURTHER DESCRIPTIONS OF ROOTS

Figure 41, the rootstock of the peppermint; this is nothing more than an underground creeping stem. Such *rhizomas*, as they are called by botanists, are more generally known as running, creeping or scaly roots. From their manner of growth and structure of their stems, it is clear that they are subterranean branches, having joints or nodes with axillary buds at their points of union, with other evidences of branch structure. Such underground stems are extremely difficult to get rid of, and are therefore of great annoyance to the agriculturist and farmer.

Figure 42 illustrates the nature of a *tuber*, and shows the subterranean growth of the common Irish Potato, which gives every stage of an ordinary tuber. The eyes of the potato are merely axillary buds, and one of these is shown on section in Figure 43.

*Corms*, or solid bulbs have already been briefly touched upon and illustrated.

Another form of the corm is seen in the bulb, though the two plans of growth merge into each other. When perfectly typical, however, they are such growths as we see in the Canada Lily (Figure 44), shown on section in Figure 45. The thickened scales there shown are bases of leaves which are loaded with nourishment for the plant. There are hundreds of examples of such growths to be studied, being duplicated many times in fleshy plants.

Parasitic plants like the mistletoe grow upon other plants, and their roots draw sustenance from them. This, however, is not the case with certain air-plants or Epiphytes, for these live entirely upon what they get from the air. Two species of them are shown in Figure 46, the one with the flowers being the *Epidendrum conopseum*, and the other the "Black Moss" (*Tillandsia usneoides*); both are from our Southern States, and are very instructive plants to study.

# SPRAYING WORK OF THIS SEASON

BY J. J. LEVISON, M.F.

FORESTER TO THE CITY OF NEW YORK

**T**HIS is the time when all nature awakens. The insects awaken also, and we have to meet their destructive invasion. Just what to spray and what material to use is a matter that varies with the plant and the insect, and before one can determine what is needed, an effort should be made to receive specific advice based on the

the outer tissue of the leaf and suck the sap from the interior. To be effective against sucking insects, the chemical required must be of such a nature as to injure the insect by contact with its tender body. The various oil emulsions in the market, such as kerosene emulsion, lime sulphur wash, scalcicide, miscible oil, fish-oil soap, and the nicotine and tobacco concoctions are all based on this principle. Which one of these to use and at what strength is a matter that varies with the season, the insect and the plant.

In dormant seasons one can use a stronger solution than in the summer time because then there is no likeli-



INJECTING CARBON BISULPHIDE FOR BORING INSECTS

The liquid is injected by means of a metallic syringe and the orifice clogged with soap to hold the fumes generated by the liquid within the burrow.

particular insect and the tree in question. Without considering individual questions, we can, however, to advantage discuss in a general way the important methods of spraying and how to combat some of our most serious enemies.

We spray for insects that either chew or swallow the leaves of trees or those that merely suck the sap from leaves or bark. A poison applied to the surface of the leaves will cause the chewing insects to swallow it with the leaves and become internally poisoned. Arsenate of lead serves that purpose and is most commonly used—at least more so than Paris-green, which is another poison occasionally substituted.

To combat the sucking insects, no such application of arsenate of lead to the surface of the leaves would ever reach the insects, because the latter penetrate through



HAND-POWER SPRAYING APPARATUS

This is a very convenient way of applying the spray to trees. More powerful gasoline sprayers are required where very tall trees are to be sprayed.

hood of burning the leaves or the open buds. In the dormant state one may also have to meet an insect heavily protected with an outer scale or possibly in the egg stage, and consequently requiring a stronger solution. The particular species of tree would also make some difference because some trees are more tender to oil emulsions than others.

With these preliminary remarks to put us on the right track, let us make up a simple spraying calendar which will hold good for the majority of cases of spraying during

the present season, though it may not cover the numerous specific troubles which we may also have to meet.

*Spraying For Scale Insects.*—While the trees are in dormant state, before the buds open, it may be advisable to spray for some sucking insects on fruit trees, and possibly on elms, poplars, willows, ash and lilac.

Some sucking insects, like the oyster shell and the scurfy scales, have their young emerge in May and it is advisable to take advantage of the tender state of these young crawling insects and to spray the trees at that time with an oil emulsion which will be more effective than if applied during the dormant season.

If kerosene emulsion is applied, it may be used at the rate of 1 gallon to 10 gallons of water before the buds open, or 1 to 25 gallons of water, after the buds have opened.

In the case of scalecide, it should be used 1 to 15 gallons of water before the buds open and 1 to 40 after the buds open.

In the case of fish-oil soap, about 1 pound to 10 gallons of water.

*Spraying For Red Spider and Aphis.*—During the month of May, it may be necessary to spray some of the evergreens, such as boxwood, etc., for red spider, and in that case one should use fish-oil soap at the rate of 1 pound to 5 gallons of water. The underside of the leaves of beech trees and Norway maples may be often seen affected with soft-bodied insects and in those cases the same treatment as for red spider is effective.

*Spraying For Leaf Eating Insects.*—During the latter part of May the elm leaf beetle becomes active on the leaves of the elm trees and the caterpillars of the Tussock Moth and other similar insects begin their work. For all such leaf-eating insects, one should spray the trees with

arsenate of lead at the rate of one pound to about 12 gallons of water.

*Spraying For Mildew and Fungous Diseases.*—Such spraying may be necessary on fruit trees, etc., and the application should consist of Bordeaux mixture or Bordo-

lead at the rate of 1 pound to 5 gallons of water before the buds open, or 1 pound to 10 gallons of water after the buds open. Never apply the Bordeaux spray while the trees are in blossom. Pyrox is another material often used effectively as a substitute for Bordeaux mixture.

*A Few Practical Hints For All Spraying Work.*—The following reminders during the spraying season may prove of value:

Examine your spraying apparatus and see that the nozzles are clear, that

the hose does not leak; that the machinery works well. Always try to spray with a fine mist. Spray thoroughly, covering the leaves on the top of the tree as well as on the lower branches. The Tussock Moth and most of our other leaf-eating insects feed on the under side of the leaves and, therefore, all spraying for such insects must be applied to the under side of the leaves.

Keep the mixture within the spraying tank thoroughly stirred. Do not spray on a wet day or at a time when you anticipate rain.

Be more careful with contact poisons because too strong a solution will burn the foliage and tender bark, while arsenate of lead will have no such effect.

In spraying for sucking insects try to hit as many of them as possible because it is the contact of the poison with the insect that kills.

With the foregoing instructions one can get an idea what general spraying he has to do this month, and if any specific questions arise at any time one should take them up individually and obtain definite advice.



COCOONS OF THE BAG-WORM

This is merely one illustration of the many forms of winter nests of leaf-eating insects. Note how numerous they are on a single twig.

#### ADVICE FOR MAY

1. Plant evergreens during the first part of May.
2. Spray for all varieties of insects, including those kinds that chew, suck and bore.
3. Spray for fungous diseases.
4. Commence cultivating and watering trees and shrubs.
5. Complete the removal of trees hopelessly infested

with boring insects, such as the Hickory Bark Beetle, the two-lined Chestnut Borer, etc.

6. Examine trees in early May and see that they are free from eggs of the Tussock Moth, Gypsy Moth, etc., and from cocoons such as those of the Brown-tail Moth, the Bag-worm, etc.

## QUESTIONS AND ANSWERS

Q. I am much interested in the question of the saving of the white pines, and in this connection I wish to take advantage of the offer, extended in your magazine, to answer helpfully any questions about trees. I own a good many acres of woodland on the shore of Sunapee Lake, and during the last few years have noticed at times a peculiar condition of some of the pines. About three years ago, and again in the spring of 1916, I noticed that some of the pines had tufts of brown needles at the extremity of the branches. At first only a few of the trees were so affected, but last year there were a good many more. In the one or two years between, I did not notice this condition. Is this the result of what you are now calling the white pine blister disease? I did not notice anything unusual on the trunks, and the main part of the tree did not seem to be injured. Nothing was noticeable except this dying of the tips. If it is not the disease in question will you tell me what it is, and whether it is harmful to the trees, and what should be done about it.

A. D., Wellesley, Massachusetts.

A. With relation to the condition of your pines, I do not believe that it is caused by the pine blister disease. Very likely it is simply due to a condition of drought which varies with the year and the season. There has been much of this during the past few years all over the East. There have also been of recent years several pests that worked principally in the terminal shoots of certain species of pine. We had the white pine weevil, destroying the leaders and tips of white pine trees, and the pine shoot moth, attacking Scotch and other pines. Just what your trouble is can best be told by submitting to us a sample of the affected branch and letting us examine it.

Q. We have a suburban home place and would like your advice about the best trees and shrubbery to plant. We have two catalpas, a hedge and some miscellaneous bushes and some fruit trees that are not doing much. I want to plant some hardy shrubbery and also some trees that will produce good fruit in our climate.

A. J. N., Kansas City, Missouri.

A. I am glad to send you the best advice and suggestions I can as to planting for the improvement of your place. The best varieties of apples for your use would be Red Astrachan, McIntosh, Baldwin or Rhode Island Greening. The best pears are Bartlett and Sheldon. The best peaches would be Champion and Elbert, and the best varieties of cherry, Early Richmond and Montmorency.

For shrubbery, I would suggest forsythia, weigela, California privet, *Aralia pentaphylla*, *Cornus siberica*, *Rosa rugosa*, Rose of Sharon, lilacs, hydrangea, Regel's privet, *Symphoricarpos racemosus* and *Symphoricarpos vulgaris*. In the January issue of AMERICAN FORESTRY you will find an article on hedge planting and cultivation.

Q. Can you tell me what is the matter with the tree of which I send you a specimen leaf, under separate cover?

E. H. K., Philadelphia, Pennsylvania.

A. The leaf of aspidistra received proves to be severely infested with the Florida red scale (*Chrysomphalus ficus* Ashm.). Remedies recommended for use against this insect are described in the enclosed circular.

Q. Will you please explain the difference in the Red Gum and the Sweet Gum?

R. J. M., Chelyan, West Virginia.

A. There is no difference between the Red Gum and the Sweet Gum. They are one and the same tree, also called *Liquid-*

*ambar*, meaning liquid gum, referring to the sweetish, fluid, gummy exudations. The Black, or Sour Gum, sometimes called Tupelo, is an entirely different tree. I enclose an article from the November issue of our monthly magazine, AMERICAN FORESTRY, covering fully the identification and characteristics and commercial uses of Red Gum. I think you will find this interesting and valuable.

Q. Will you please tell me what to do for a tulip tree that has some kind of a scale. They come on the branches and on the new wood. They are dark brown, shaped like an oyster. When you crush the shell, they are pink and like thick milk and honey. In the spring the young ones are white and look like a bed-bug and can crawl.

H. R. T., Sands Point, New York.

A. The scale is the tulip scale and very commonly infests tulip trees in your vicinity. The best way to eradicate the pest is to brush off the scale insects with a coarse hair brush and then wash the infested branches with a solution of soap and water or kerosene emulsion, one part to ten parts of water. Before brushing the scales off, it is advisable to spread some canvas or paper on the ground in order to collect the insects and burn them afterwards. This work should be done immediately and the trees watched again next summer for a second crop of the insects. Within about a year, the pest can be permanently eradicated.

Q. Is *Thuja plicata* the correct name of Western Red Cedar? And will you give me the common and technical names of the Southern pines?

R. C. F., Flushing, New York.

A. Yes, *Thuja plicata* is the correct technical name for Western Red Cedar. The correct common and technical names of the Southern pines are as follows: *Pinus palustris*, known as Long-leaf Pine, or Georgia pine; *Pinus echinata*, or Short-leaf Pine, Yellow pine; *Pinus Tæda*, the classical Latin name for pitch pine, which was used for torches; *Pinus caribæa*, or slash or Cuban Pine.

Q. I wish to obtain your opinion relative to the practice, now so common, of scraping the outer bark from our shade trees for the purpose of removing scale and other insects, and furnishing no places for their concealment. Many of our most beautiful shade trees, generally elms, have been given this treatment and occasionally the trunk is afterwards painted with some insecticide. All this operation entails great expense to the tree owner. Personally I have been opposed to this treatment of trees, but I would appreciate a discussion from you on the subject.

W. W. M., Chicago, Illinois.

A. There is no justification for the practice of scraping the bark of shade trees. It does no good and sometimes does harm and many varieties of shade trees, such as Norway maples, Oriental planes, etc., very seldom have any scale insects on their trunks. If you spray the infested trees with oil solution at the proper time, especially when the young scale insects hatch and become active, you will generally catch most of the insects, no matter where they are—under the loose bark or on top of it. Scraping off the old bark exposes very suddenly the young, tender bark underneath to sun, heat and dust and smoke, and produces better bait for scale insects than the old bark because scale insects prefer to live on young, tender bark. We think that if you would allow nature to take care of the loose, superfluous bark and not scrape it off prematurely, the trees would be better off.

# AEOLIAN EROSION IN HAWAII

BY C. S. JUDD

SUPERINTENDENT OF FORESTRY

**A**N unusually good instance of æolian erosion is to be seen on the island of Kahoolawe in the Hawai'ian group, which I have recently visited. It is a striking illustration of damage done by goats and sheep and wind.

This island, which is one of the smallest of the group, and only ten miles long, six miles wide, and 1425 feet above the sea at its highest point, was proclaimed a Territorial Forest Reserve in 1910 with the idea that it could be reclaimed from its present deplorable condition, which has resulted from over-grazing during the past fifty years. Kahoolawe was always a more or less barren island, for in the early days its inhospitable shores were used as a place of exile for criminals and historical records show that at no time were there more than eighty Hawaiians living there.

In 1864 the island was leased by the King for fifty years as a sheep ranch. Wild goats, descendants of those brought by Vancouver and other early navigators, were already on the island, and these with the sheep, which soon multiplied and overran the island by the thousands, upset the balance of nature on the upper reaches which were exposed to the full force of the constant trade winds. The consequence was that the remaining turf on about one-third of the island at the upper elevations was destroyed, and the loose soil exposed in this manner soon began to be carried out to sea by the wind. This

æolian erosion has been going on for at least forty years, and ship captains always know of their approach to Kahoolawe on windy days by the cloud of light red dust that pours off in the lee of the island. In a few protected places on the summit, islets of soil from six to ten feet high, crowned with turf, remain as mute testimony of pristine conditions, but the soil on the remainder of the summit of the

island has been blown away until nothing remains but bare hardpan, as bleak and as desolate as the bad lands of the Dakotas, and still scoured by the howling trade winds.

One of the accompanying illustrations shows how a native wili wili tree, *Erythrina monosperma*, has been undermined by wind erosion and left stranded, as it were, on this shore of desolation with only a few roots to carry on the functions of life. In the lee of the tree there still remains a mass of original protected soil which has been augmented by dust drift.

Although the reclamation of the summit of the island seems hopeless, unless stone-wall barriers to the wind are erected at great expense preliminary to tree planting, the remaining two-thirds of the island gives greater promise of early improvement. The first step in the plan of reclamation has been to get rid of the wild stock on the island, and during the last eight years over 4,000 goats have been exterminated. I have returned from the island with a party of fifteen members



WHAT THE WIND HAS DONE

Wili wili tree on Kahoolawe Island, Hawaii, undermined by the strong trade winds blowing the soil around it out to sea, after sheep and goats had cropped the turf so closely that the wind tore it off and exposed the underlying soil.



AN AERIAL BATTLEFIELD

On the summit of Kahoolawe Island, Hawaii, lie trunks of dead trees killed when the strong trade winds swept away the soil about their roots after the soil had been exposed by over-grazing by sheep and goats.

of the National Guard of Hawaii and two cowboys, and during the short stay of two days our bag was 286 goats and 2 sheep. The island has already begun to show improvement on account of the reduction of stock, by the increased growth of native grasses and weeds, and the algaroba, *Prosopis juliflora*, or mesquite of the Southwest, which has been spread by the few work horses which have been allowed to graze on the island, is coming up abundantly on at least 18,000 acres along the lower elevations and promises soon to become an extensive forest valuable for the production of wood for fuel, beans for stock feed, and blossoms for bee pasturage.

#### TOUR OF THE NATIONAL FORESTS AND PARKS

**A** COMBINATION of recreational and educational features is the plan for a tour of the National Forests and National Parks proposed by the Massachusetts Forestry Association for the coming summer. The Association proposes to give its members and others who were interested in conservation and the development of the National Forests and Parks an opportunity of seeing at first hand, under the most favorable circumstances, what has been done with these great areas and to learn what the plans for the future are concerning them.

The Association is deeply indebted to the officers of the United States Forest Service and those of the National Parks Service for their cooperation in the preparation of the plans for this tour. Through their advice and kindly assistance, those who are fortunate enough to make this tour will have at their service in many of the parks and forests the men who are most familiar with those areas and who are charged with the development of them.

On Thursday, June 28, the party will leave Boston, arriving in Denver the following Sunday morning, there to visit Rocky Mountain Park, Pike's Peak, and to inspect the reforestation work of the Forest Service in the Pike National Forest.

Six days will be spent in Yellowstone Park and six more in Glacier National Park. From the Glacier National Park the party will journey to Lake Chelan in the Chelan National Forest, there to be guided by a representative of the United States Forest Service.

The party will have two days for rest at Seattle and an afternoon sail through Puget Sound to Tacoma will be made on the way to Rainier National Park and Forest and then on to Portland. From there the party will take an all-day journey over the beautiful Columbia highway to the Eagle Creek Camp which is one of the best examples of the recreational facilities furnished by the National Forest Service. The next day another auto ride takes the party among the foothills of Mount Hood to the Forest Nursery of the Wind River Valley where over 5,000,000 young trees are growing. On this trip will be seen the scientific logging methods used on a timber sale area of the National Forest. Crater Lake National Park and Forest will be the next destination.

After the trip to Crater Lake three days will be spent in San Francisco in rest and sight-seeing. A conference on the various aspects of the conservation problem will be held with the representative interests of the Pacific Coast. From San Francisco the party goes to the Yosemite National Park where five days will be spent in the camps, and in seeing the beauties of this famous valley. Leaving the park, the party passes through the Sierra National Forest on the way to Fresno. The next point of interest will be the General Grant National Park where the Big Trees will be seen at their best. A visit to Hume, a lumber town in the heart of the Sequoia National Forest, will give a new idea of transportation of timber, by a fifty-four-mile flume winding down the mountain. Los Angeles for three days with short excursions to Pasadena and the island of Santa Catalina follows. An optional visit may be made to the Los Angeles Municipal Camp in the Angeles National Forest, where public recreational facilities have been highly developed. San Diego and its exposition will next be visited, followed by a motor trip to Redlands and San Bernardino where will begin the homeward journey, interrupted only by a two-days' stop at the Grand Canyon.

Arrangements are being made by boards of trade and similar organizations in the Coast cities to give the party a hearty welcome. A nominal guest fee will be charged to non-members of the Massachusetts Forestry Association, but this will not apply to applicants who are members of other forestry or conservation organizations. Further details of the tour can be obtained by writing to the Tour Director, Dr. C. L. Babcock, 31 Trinity Place, Boston, Massachusetts.

#### LAKE SUNAPEE

By Richard Butler Glaenzer

Oh, do you know that lovely lake not far from Croydon  
So like some girlish dreamer when asleep;  
When wide-awake, so like some hoyden?  
That lake which seems so shallow, yet is deep, so deep?

There are a thousand lakes more large, oh, far more spacious,  
Basined among great mountains capped with snow;  
But none with marge more brightly gracious,  
And largeness counts for little: here is glow and glow!

The glow, the gentle silver gleam of far more birches  
Then ever Indian wanted for canoe:  
A waking dream for one who searches  
For gleam of haunting silver—such as you and you!

**T**HE Grand Rapids, Michigan, Y. M. C. A. is starting an innovation in the organization of an educational class for members of the many lumber and forest products factories of the city. Such problems as methods of cutting, sawing, piling and air-drying are to be considered.

## PINE BLISTER QUARANTINE HEARING

A PUBLIC hearing to consider the restriction or prohibition of shipments of pines and of currant and gooseberry bushes, to prevent the spread of white pine blister disease, was held by the United States Department of Agriculture on April 10, at Washington, D. C.

The question of whether a quarantine line should be drawn either at the western border of the States of North Dakota, South Dakota, Nebraska, Kansas, Oklahoma, and Texas, or at the Mississippi River, or at some intermediate point, was considered.

The white pine blister disease has continued to spread in New England and eastern New York and has been found to a limited extent in Minnesota and Wisconsin. Energetic measures for its eradication or control are being taken by Federal and State Governments and by the American Forestry Association in realization of the danger which threatens our immensely valuable pine forests. To assist in this control work and to prevent the blister disease from getting a foothold in the western United States, consideration was given to the desirability of prohibiting all shipments of white pine nursery stock from the Eastern and Central States to the Western States. Currant and gooseberry nursery stock must also be considered in this connection, since they are hosts for the blister disease, and are a necessary stage to its development.

A domestic quarantine to protect the pine forests of the West was proposed a year ago and a hearing held in February, 1916, by the Federal Horticultural Board. It was then found that the most effective results would be secured by prohibiting the shipment of Eastern pines and gooseberry and currant bushes west of a line drawn beyond

the Mississippi. Such a quarantine was not then legally possible nor was sufficient knowledge available of the distribution of the disease in the Central States; consequently, Federal action was limited to securing the voluntary coöperation of nurserymen to prevent shipments west of the Great Plains.

Congress at the last session amended the Plant Quarantine Act to permit the drawing of quarantine lines where needed to prevent the spread of plant pests rather than at the boundaries of infected States.

### WHAT VARIOUS STATES ARE DOING

That the introduction of the white pine blister disease into California may be prevented, and to coöperate with the Eastern States in its suppression, G. H. Hecke, State Commissioner of Horticulture, has issued a quarantine against the introduction into California of all five-needled pine trees, and all species and varieties of currant and gooseberry plants and cuttings imported or brought from any and all States of the United States east of the Mississippi River. The disease has not yet been noticed in California, and it is believed that this quarantine will prevent its introduction.

Indiana and Kansas prohibit the importation into the State from outside sources of all species of currants and gooseberries and of all five-leaved pines.

New York, March 24, 1917, prohibited the importation into the State of any five-leaved pines from Maine, New Hampshire, Vermont, Massachusetts, Rhode Island, Connecticut, Pennsylvania, Illinois, New York, Ohio, Indiana, Minnesota, and Wisconsin.

### National Forest Enlarged

Acting under the authority of a special Act of Congress approved September 8, 1916, the President has, on recommendation of the Secretary of Agriculture, signed a proclamation adding approximately 50,000 acres to the Whitman National Forest, Oregon. The lands involved are situated on the divide between the John Day, Powder, and Burnt Rivers, in east-central Oregon.

Over 4,000 acres consist of timber lands which were included in patented entries. As the result of suits brought by the United States, the patents for these entries were cancelled by the courts because they were acquired through fraud or mistake, and the lands were returned to Government ownership. The cancelled claims carry a total estimated stand of nearly 46,000,000 feet B. M. of timber.

Much of the other land included in the addition is privately owned. It consists largely of out-over timberland, on which the timber growth is rapidly reproducing.

One portion of the Act of Congress authorizing the addition provides especially for the exchange of Government timber for privately owned lands in the Whitman National Forest which may be chiefly valuable for the production of timber or the protection of streamflow. Several applications for exchanges of this character have already been submitted.

### Saw Expert Addresses Forestry Students

Thomas Oakland, one of the saw experts representing the Simonds Saw Company of Fitchburg, Massachusetts, lectured to the forestry students at Wyman's School of the Woods, Munising, Michigan, March 7th, on the use and care of the cross-cut saw. He explained how saws were made, how to select them when buying, and how to keep them in good working order when in use. Mr. Oakland is an old woodsman and a past master with the cross-cut saw. His actually fitting and filing a saw before

the students made it especially practical and instructive.

### Forester Appointed

Trevor S. Goodyear, a student in the department of forestry of Washington State College, has received notice of his appointment as assistant state forester of Washington. He has accepted the position and expects to assume his duties about June 1. Mr. Goodyear graduated from the State College, last June, but returned to take another year in forestry. During the vacation he was employed by the Washington Forest Fire Association with headquarters at Seattle, and there came under the observation of State Forester Pape, who was so favorably impressed with his qualifications that he recommended the appointment to the state board of forest commissioners, who confirmed the recommendation. Mr. Goodyear was a member of the varsity football squad for three years, and was president of the State College Forest Club last year. He is also commander of the Sigma Nu fraternity chapter.

# EDITORIAL

## THE SUMMER CAMPAIGN AGAINST THE WHITE PINE BLISTER

AS a direct result of the policy of education and information adopted by the American Forestry Association and others, Congress passed the additional appropriation of \$300,000 required for the work of suppressing the white pine blister disease. This action was taken at a time when bills calling for immense appropriations for national defense were under consideration, and the appropriation was secured in spite of assurances from Congressmen that it would be impossible to obtain it. The result is a vindication of the policy of publicity, without which, in a democratic form of government, we cannot hope to achieve anything worth while.

But the real task lies before us. Appropriations alone will not exterminate the disease—and it is by no means certain that the effort will succeed, no matter how conscientiously the work is handled. One thing has been pitilessly demonstrated—that the policy of suppressing information and belittling the danger has not gotten us anywhere. By this act of Congress we now stand com-

mitted to a thorough and widespread effort to stamp out the infection. This season will probably show whether or not it is too late. All that the agents of the United States Government can do in expending this appropriation is to scout for and reveal the presence of diseased pines or currants. It is up to the states and to individuals to destroy the infected trees and plants, and if this cooperation is not forthcoming, all efforts elsewhere will fail.

The work of preventing the spread of the disease will be greatly aided by the enlarged powers granted to the Federal Horticultural Board to declare quarantines in tree and plant diseases by districts, states or sections of the country under which they may prevent absolutely the shipment of currants or gooseberry bushes or white pines into the Rocky Mountain section. So far, no cases of infection have been reported west of Minnesota. Such a quarantine may save the immensely valuable western white pine and the sugar pine of California from ultimate destruction.

## NATIONAL PARK LEGISLATION

THE bill to create the Grand Canyon National Park failed of passage in the last Congress for lack of time. This bill, as drawn, excludes from the proposed park lands chiefly valuable for commercial grazing and timber, and not part of the Canyon itself. It should be reintroduced and passed at the first opportunity. But we protest against permitting the development of water-power within the Park, and will continue to strive for the principle of exclusion from National Park areas of all forms of commercial exploitation—a danger which is not properly safeguarded in the recent law establishing a National Park Service.

Of the numerous bills introduced in this Congress to create new National Parks, only one was passed, which establishes the Mount McKinley National Park in Alaska. In this matter, Congress has acted with commendable discretion. The merits of the Mount McKinley Park project were unquestioned. As America's highest peak, possessing scenery of unsurpassed grandeur, the setting aside of this mountain as one of our National Parks fully maintains the standard set by the Yosemite, the Yellowstone and the Sequoia. This cannot be said of any of the other park projects, which have met at least temporary defeat. It is to be hoped that most of them will not be revived.

## PRIMARY EDUCATION IN FORESTRY

IT has been thought by some that the development of forestry on a large scale in Germany is due to the fact that an autocratic form of government enables the rulers to impose upon the unresisting masses public measures of common benefit, while in a democratic country the instability of government and the influence of individual opinion will prevent the consistent development of any great constructive forestry policy.

What, then, shall we say of forestry in republican France, where both science and practice have been developed to fully as great an efficiency and with equal benefits to the people?

That stability of policy in forestry is necessary goes without saying. Trees cannot be grown unless the land on which they are produced is protected and managed for long periods under intelligent supervision for that definite purpose. Otherwise the forest will be destroyed by unregulated lumbering, fires, insects, disease, and grazing, or by the clearing of much land for indifferent and unprofitable agriculture that had better be devoted to forest production.

What we do not yet realize fully is that forestry in Imperial Germany rests on the same basis as it does in republican France, and on which it must eventually depend in this country—a *thorough education of children in the grade schools in the first principles of forestry*, and its true place in the economic life of the nation.

As the twig is bent, the tree is inclined. If the right conception of forestry is implanted in the mind of the child, his attitude towards it for the rest of his life will be equally free from that destructive bent which makes vandals of half-grown boys, and the equally unreasoning sentimental attitude of protection expressed in the poem "Woodman, spare that tree," which would deny the value and use of wood products to the community.

Some of the greatest difficulties that the advocates of rational State and National forest policies encounter are created by the attitude and opinions of influential men who are profoundly ignorant of forest economics, and in a spirit of cocksure self-assertion sometimes appear as

champions of legislation whose tendency is to cripple or destroy efficient and sound forest administration. As an illustration, during the consideration of a dangerous bill in the Philippine legislature recently, whose purpose was to combine the forestry department with that of lands and mines, an American of some prominence remarked, "What has the forestry department of the Islands ever accomplished—they haven't even pruned the trees!" Again, many of our best citizens can see but one, and that by no means the most important, aspect of forest production, namely, the æsthetic value of forests as parks. This type of enthusiast has effectually paralyzed the proper development of the state forests of New York, and if permitted full sway would render the economic use of every acre of National Forest land impossible. The intentions of these citizens are of the best, but they have utterly failed to understand the basic facts of forestry, which recognize *all* the uses of the forest in both æsthetic and industrial life. The remedy for this condition lies in a *better system of primary education on the value and uses of forests in the life of the nation.*

But what can we expect to teach a grade school pupil about forestry? An answer is found in the following statement by a young German of high school age, who has been a resident of this country since he was ten years old, but has never received any instruction in the subject except that which is given to all grade pupils in the schools of his native land.

"In the *third grade* I was taught the meaning of care for a tree and a forest. We were given a course in the growth and development of trees and forests. We learned that a tree is of great value to the country. It affords shade, consumes carbon dioxide *and yields lumber.* The abundance of trees means that the adjacent land will be fertile. I remember I was told that the massive foliage of the trees softened the downpour of torrential rains. The same foliage when dropped by the trees in the fall served as a fertilizer. Leaves, being a poor conductor of heat, preserve the moisture in the ground. *Forests increase the agricultural products of agricultural communities. Forests also have tremendous financial value in the lumber a forest will yield.* I was also shown the beauty of trees as well as their value in other respects."

When every citizen of a nation has such fundamental and *well balanced* conceptions of forestry—and when even an eight-year-old boy knows that the beauty of trees is only one feature, "as well as their value in other respects," is it any wonder that rational forest management, by which the forests are both *utilized*, and *renewed*, has taken the place of our primitive policies, which seek either to utterly destroy them or to preserve them intact?

Let us use every effort to introduce a short but effective course in forestry into every public school in the land. In this way only will the forest policies of our great country be built upon the rock foundation of popular intelligence and approval.

## THE PUBLIC DOMAIN AND THE STOCK-RAISING HOMESTEAD LAW

**I**N AMERICAN FORESTRY, October, 1916, page 619, a statement was given based on most recent investigations showing the extent of the public lands in western states, reserved and unreserved. Outside of the National Forests these lands are largely non-timbered, and non-irrigable, and can be used only for grazing.

For years the question of the proper policy for their management was debated in Congress. The struggle lay between the advocates of a leasing law permitting the Interior Department to administer grazing and to collect fees and the plan proposed of facilitating the private acquisition of these lands. By the latter method the lands would be placed on the tax list and would produce local or state revenues, either by taxes or later by confiscation for unpaid taxes, when the states could lease the lands and get the grazing revenue. Incidentally, such a law would greatly increase the business and the fees of the officials of the United States Land Office.

With the three great forces behind it, the desire of the individual for land, the desire of the state for revenue and the desire of the land office for business, nothing could stop the passage of the stock grazing law.

The law was safeguarded by stipulating that only non-forested and non-irrigable land could be filed upon and then only after the Interior Department had examined and designated it as land suitable only for the purpose of the law, namely, for stock grazing. Mineral rights were reserved to the Government. The area allowed to each individual is 640 acres.

But here comes the rub. Land which cannot be irrigated, lying in arid regions and not capable of dry farming, in other words, land of the character contemplated by this bill, will graze only one cow on from ten to forty acres, depending upon the local conditions. The average capacity is perhaps twenty acres, giving a herd of 32 range cattle as the possibility from which to make a living. To obtain title to this land, improvements worth \$1.25 per acre are required.

It is the judgment of stock raisers that fully 100 head of cattle are required to yield a competent living and this requires from four to ten sections of grazing land. If these facts are true, *the stock grazing law is based on a fundamental economic error* and only about one man in from four to ten of those who file on these homesteads and invest their time, health and capital in improvements can hope to win out, and then only by acquiring title to the lands of those who fail. But as these failures may not all prove up before quitting, an extended period of economic disturbance and adjustment will be inevitable, during which the present winter range for stock will be split up, fenced off and made inaccessible, to the disruption of the stock business as now conducted. Unless economic questions affecting the public welfare are settled on some other basis than immediate self-interest, the public inevitably pays the piper in the long run. In this instance, private interest has won. Let us hope that similar questions which may arise in the future will be looked at from a broader and more far-reaching standpoint.

# BUILDING BUNGALOWS

BY RAWSON WOODMAN HADDON

WHEN all other methods of arrangement for the interior of the house have failed, one may turn, with fair expectation of success, to the one-story type of building which we have come to know—quite improperly—by the name of “bungalow.”

smaller cost in a two-story house, or a larger number of rooms might have been had in a two-story house for the same amount.

These items, of course, are naturally to be taken into consideration in estimating the comparative costs of a one- or two-story house, before deciding upon the type of plan to be used.



FRONT ELEVATION OF HOUSE AT SOUTH RIVER, MARYLAND. AYMAR EMBURY II, ARCHITECT

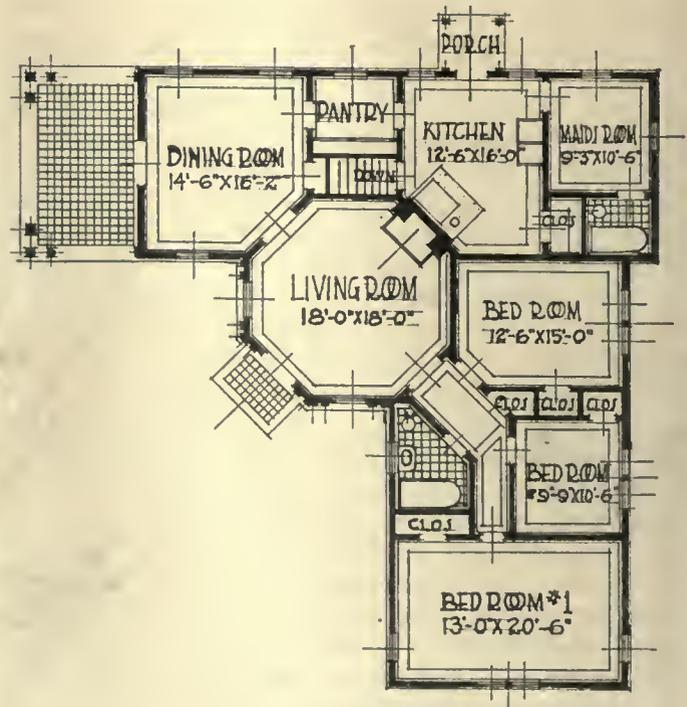
It is probable that we are in the habit of considering the “bungalow” type inexpensive because of the fact that in many instances, where the cost of erection has been low, the building itself was little more than a camp. In it the owners were, perhaps, satisfied with the barest accommodations and cheap workmanship and material of a kind that would not be tolerated if a larger or more permanent structure were used.

A very general idea seems to be that this one-story house arrangement is so simple a problem that it need be by no means as carefully thought out and studied as a more formal type of residence; and a second unfortunate idea is that it is a cheap method of building. Both are serious mistakes.

Even with the rooms of the house spread out on a single floor, the plan may be a failure notwithstanding many good points in favor of the general type. It may be its very simplicity, or what we take for simplicity, that so often lures us into a false sense of security and into a certain amount of carelessness and thoughtlessness in planning at the very points where the greatest care has been exercised in the successful examples of the type that the prospective builder may have seen and admired.

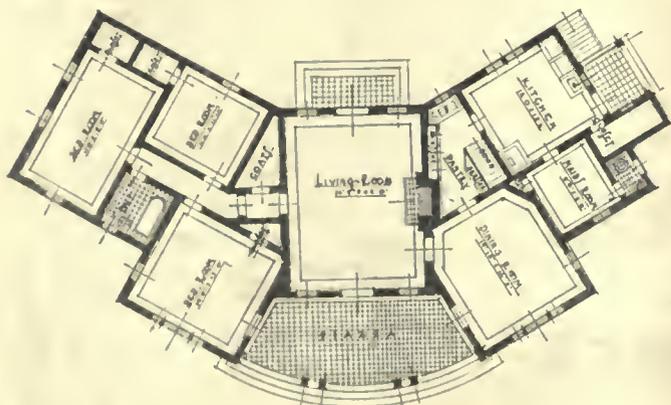
But the very fact of its simplicity in plan and in exterior design brings new problems and new chances for

In the first place, it is well to remember that in the “bungalow” there is more outer wall surface to be covered, and more roof area in proportion to the enclosed part of the building than in a house of two, let us say, or more stories in height. And it is probable that in the majority of cases the same accommodations in the number and size of rooms could have been secured at a somewhat



PLAN OF HOUSE NO. 2

At Southern Pines, North Carolina. Aymar Embury II, Architect.



PLAN OF HOUSE NO. 1

At Southern Pines, North Carolina. Aymar Embury II, Architect.



ELEVATION OF HOUSE NO. 1

At Southern Pines, North Carolina. Aymar Embury II, Architect.



ELEVATION OF HOUSE NO. 2

At Southern Pines, North Carolina. Aymar Embury II, Architect.

failure or success. At the same time, the advantages of the type are many.

There is the total absence of stairs, for instance, and an opportunity, in laying out the plan, of arranging the rooms in such a manner that important rooms may have two, if not three, walls with windows in them, assuring a constant cross-circulation of air. The most popular arrangement of rooms is that in which the living-room occupies a central unit of the plan, with wings or extensions at either side, in one of which is the service portion of the house, with the dining-room closely connected with it and adjoining the living-room.

On the other side of the central room in this plan are the sleeping-rooms, sleeping-porches, bath-rooms, etc. The natural advantages of this arrangement are obvious.

Being built usually on more or less isolated tracts of land, where the surroundings are more often trees, or at least broad expanses of lawn or field, the long, low lines of the house "fit" far more naturally and pleasingly into the landscape than the bulk of a higher and smaller building in ground area would.

Greater opportunities are given the designer by these conditions for interesting composition in his design. And—

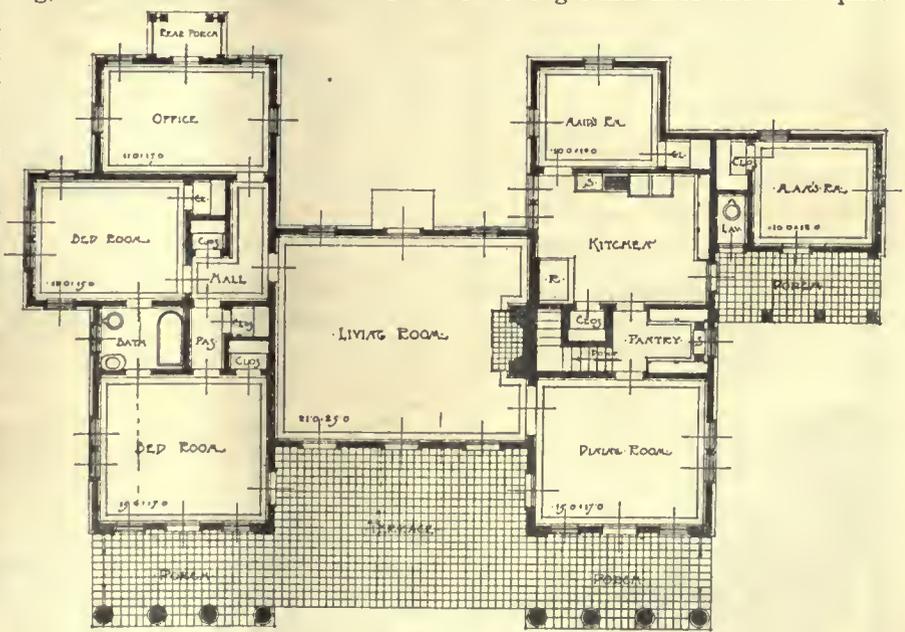
always—the long, low, unbroken roof lines give the house a feeling of homelikeness that is seldom secured in buildings of greater height.

Here, again, we come face to face with a certain amount of wastefulness in the one-story arrangement of rooms. Taking into consideration the previously mentioned large expanse of roof necessary to cover the floor space below, we find ourselves with a large amount of room under the roof that, while it helps the general appearance of the house, is, however, not easily made use of, excepting possibly for storage or similar purposes.

The insertion of dormer windows here will immediately spoil the most interesting feature of the exterior design. If we raise the roof high enough to get room height and window space in the side walls below the roof, the character of the building is automatically and immediately changed, and we no longer have a one-, but a two-story house. Bed-rooms on the ground floor are now quite



REAR ELEVATION OF THE HOUSE AT SOUTH RIVER  
Showing the office entrance and the court formed by the kitchen and bedroom wings.



FIRST FLOOR PLAN

PLAN OF THE HOUSE AT SOUTH RIVER, MARYLAND

Illustrating the most successful arrangement of the one-story house. Aymar Embury II, Architect.

BUILDING BUNGALOWS

(Continued.)

unnecessary and we find ourselves with a conventional and—if the exterior design follows “bungalow” character and lines—a thoroughly unsuccessful and ugly house.

The buildings designed by Mr. Embury, and illustrated here, are successful examples of one-story houses erected in various parts of the country and arranged to meet the requirements of occupancy and location brought about by conditions of site and location, and by the widely differing personal needs of the families occupying them.

The object of the unusual arrangement in plan of the two Boyd bungalows at Southern Pines, North Carolina, for instance, was to get certain conditions of view and sunshine in the principal rooms, with the possible entrances from the street from what was practically the rear. These houses, which cost about six thousand dollars each, were built throughout of North Carolina pine. The clapboards were laid four and one-half inches to the weather and the shingles four inches. The framing timbers, interior and exterior door and window trim, the doors, floors, etc., are all North Carolina pine.

In addition to considerations of design, Mr. Embury used the material chosen because it was also the cheapest. “North Carolina pine down there,” he says, “was then about seventeen dollars a thousand, while everything else was much higher.”

The St. George Barber house at South River, Maryland, illustrates the central living-room type which has been mentioned as the most successful “bungalow” plan. The living-room is in the center of the building, with wings at either side in close connection with the central room and at the same time entirely separated from each other.

The dining- and bed-rooms all have exposures on three sides. The hall cuts off—by the simple closing of a door—the bedroom wing from the entire remainder of the house. The bath-room is especially well placed in its relation to the bed-rooms adjoining it.

If the room at the end of the wing, now used as an office, was used as a bed-room, some slight rearrangement of the bathroom fixtures would make it possible to enter the bath from the hall. A separate porch for servants is provided with an entrance to the kitchen.

This house was built for about eight thousand dollars. The shingles were laid in random widths, and the finish is much the same as in the Boyd houses.



FOR STRONG, PERFECT TREES

AFTER carefully planting the seed and giving it all proper attention it is disappointing to have it fail, and if the seed should start out nicely, it is doubly disappointing to have the baby tree die away.

Thorburn's seeds are chosen with the utmost care. Experience of over a century has taught us how to select and offer to you those from which you will get excellent results.

Thorburn's seeds are sure seeds—you can rely on them and that counts for a lot!

Send for our latest catalog. It contains much that will interest you and that will be useful to you.

J. M. Thorburn & Co.  
ESTABLISHED 1892  
53 S. Barclay Street

Through to  
54 Park Place  
NEW YORK



Send for  
this Book

Use This Catalog  
SUGGESTIONS  
FOR  
EFFECTIVE PLANTING

AT last a book has been written which tells what plants and trees and shrubs are best adapted by Nature for each garden and landscape—and how to group them most effectively.

“Suggestions for Effective Planting” is not the usual mechanical, deadly dull nursery catalog. It is arranged in departments. To read it is like going over your problems with an experienced plantsman and having the proper materials listed for you.

Send for your copy

Andorra Nurseries

William Warner Harper, Proprietor  
Box 200, Chestnut Hill, Phila., Pa.

W. & T. SMITH CO.

Geneva Nursery

NURSERY STOCK  
AT WHOLESALE

SEND FOR CATALOG  
AND PRICE LIST



GENEVA, N. Y.

**OAKS** For \$25.00 cash we will send you, carefully packed, 1000 each of Black, Pin, Red and Scarlet Oaks, 6-12 inches, or 500 each for \$15.00. 1000 each 12-18-inch White Ash, Catalpa Speciosa, White Elm, Black Locust, Russ Mulberry and Butternut for \$20.00. The above are but a few of the many varieties we grow in Forestry and Ornamental Stocks.

YOU NEED OUR PRICE LIST NOW.  
**Atlantic Nursery Company, INC.**  
BERLIN, MARYLAND

Nursery Stock for Forest Planting

Seedlings	TREE SEEDS	Transplants
\$2.25	Write for prices on large quantities	\$6.00
per 1000		per 1000
THE NORTH-EASTERN FORESTRY CO. CHESHIRE, CONN.		

Hardy Native Trees and Flowering Shrubs  
**RHODODENDRON MAXIMUM**  
A SPECIALTY  
SEND FOR PRICE LIST  
The Charles G. Curtis Company  
Callicoon, N. Y.



The bungalow above is described elsewhere in this issue. It is the work of one of America's best known architects, Mr. Aymar Embury, who has placed the stamp of his approval on a splendid wood by building it throughout of

## NORTH CAROLINA PINE

North Carolina Pine is your one best answer to the high cost of building. Not only is it less expensive than most woods but it is also quickly obtainable throughout the East.

Moreover, North Carolina Pine is endowed with a natural beauty and variety of grain figure possessed by few other woods. As an interior trim you will find it highly susceptible to every known stain and enamel treatment. With it, therefore, you can secure any desired artistic effect. Used as a bare flooring, it can be given a high polish, either wax or oil, and will require nothing more than ordinary attention.

This wood, also, has ample stiffness and strength for all portions of your home's framework. As an exterior wood, properly protected by paint, it will last for generations. In fact, Southern homes built of North Carolina Pine before the Revolution are standing today in an excellent state of preservation.

Write for Home-Builders' Book and Book of Interiors.

North Carolina Pine Association

103 Bank of Commerce Building

Norfolk, Virginia

### Wess Takes New Position

Edward F. Wess, Director of the Forest Products Laboratory, at Madison, Wisconsin, has resigned to accept a position with the C. F. Burgess Laboratories (Chemical Engineers), at Madison, and will engage in the development of products and processes involving a more profitable utilization of wood and timber. As Director of the largest government laboratory in the world devoted to the study of wood, Mr. Wess has had charge of numerous investigations in kiln drying, wood preservation, wood distillation, the manufacture of pulp and paper, the mechanical testing of timber, and the production of ethyl alcohol, acetone, etc., which work has thrown him in direct contact with timber problems in the United States, Canada, Cuba and South America. Several of the government publications are written by him, and his book, "The Preservation of Structural Timber," is the most exhaustive written on this subject.

### Thrasher Destroy Insects

A study of six species of thrashers by the Biological Survey shows that the economic tendencies of these birds are in keeping with their other desirable qualities. They commit no depredations on crops, and destroy large numbers of insects.

## CANADIAN DEPARTMENT

### ELLWOOD WILSON, SECRETARY, CANADIAN SOCIETY OF FOREST ENGINEERS

Forest Protection for the woodlands of Quebec is making most satisfactory progress. All of the timberland owners in the valley of the upper Ottawa River have decided to join the Lower Ottawa Forest Protective Association. This will bring the territory protected by this association up to nearly fifty thousand square miles. The territory will be divided up into districts, each under the control of an inspector.

On March sixth, at the Ottawa Forestry Club, in Quebec, a meeting of the timberland owners in the south shore of the St. Lawrence River, from a point south of the City of Quebec to the end of the Gaspé Peninsula, was held under the chairmanship of Ellwood Wilson, President of the St. Maurice Forest Protective Association. The question of forming a new protective association for this region was thoroughly discussed, and it was decided to organize. A committee was appointed to draw up a constitution and by-laws. Later in the day the committee reported, and after a discussion had waited on the Minister of Lands and Forests to ascertain his position and what the Government would do to help the

new association. It was formally organized. Mr. Gerald Power of the River Quebec Pulp Company, was elected President, and Mr. Paul G. Owen, who has been for many years Secretary of the Quebec Limit Holders' Association, was made Secretary-Treasurer. The territory of this Association, which is to be called the Southern St. Lawrence Forest Protective Association, will comprise about twenty thousand square miles and will be divided into two sections, each with a board of five directors, with a vice-president and general manager. The Province of Quebec is now being well covered with protective associations, the only important section left out being the Lake St. John Region, and it is hoped that the limit holders in that section will soon follow the lead of the rest of the Province.

Another Forestry Institution for use in England and France is being organized in the Province of Quebec by Major H. J. Lyons, of the Canada and Gulf Terminal Railway. His acting chief engineer, Mr. E. S. Whitway, has enlisted as lieutenant Major Lyons and already entered a railway construction institution which is doing good service in France. These construction institutions are employed in France as long the lines of communication following close up to the first line so that big guns, ammunition, men and supplies may be moved up rapidly.

Dr. Howe, of the University of Toronto, with two technical assistants, will commence for the Commission of Conservation and in cooperation with the Laurentide Company, Limited, a survey of the cut-over pulpwood lands. This survey will determine the amount of wood left after logging, the reproduction, rate of growth and probable yield of timber after a certain number of years, and will make recommendations as to improved methods of cutting.

The Belgio-Canadian Pulp and Paper Company, Limited, of Shawanigan Falls, Quebec, has decided to commence planting trees on its holdings, making the third large paper company to undertake such re-forestation work.

The Canadian Forestry Association has just issued a very instructive and attractive little book, "Mon Premier Livre sur la Forêt," for distribution to school children throughout the Province of Quebec. It is most attractively gotten up, is about four and one-half by six inches, and is full of illustrations, showing well and badly managed forests, those unmanaged and those damaged by fire, the destruction wrought by lumberjacks of forest areas in France, lumbering scenes, fire ranging work, erosion and so forth. The text is also exceedingly interesting and the whole book will be of great help in educating the young people about their most important natural resource and its proper care. The

association has also issued a small folder in both French and English, called the "Picture of Your Estate," which, on being opened, shows an excellent colored picture of a forest fire and warns everyone to be careful.

Here, as elsewhere it is being more and more fully realized that the greatest measure of protection for our forests comes through education. This has been so strikingly shown in the work of the St. Maurice Protective Association that further efforts are continually being made to educate and interest the people in this work and to secure the active cooperation of all who live in or near forested sections.

The new Forest Protective Department of the Province of Ontario is getting well into harness, and has made elaborate plans for good protection during the coming danger season. A fire tax will be imposed on timberland holders and everything possible will be done to give them first-class protection.

## CURRENT LITERATURE

### MONTHLY LIST FOR MARCH, 1917

(Books and periodicals indexed in the Library of the United States Forest Service.)

#### Forestry as a Whole

Taylor, Jay L. B. Handbook for rangers and woodsmen. 420 p. 2. N. Y., J. Wiley & sons, 1917.

Proceedings and reports of associations, forest officers, etc.

California—State forester. Sixth biennial report, 1915-16. 36 p. 2. Sacramento, Cal., 1916.

Royal Scottish arboricultural society. Transactions, vol. 31, pt. 1. 80 p. Edinburgh, 1917.

#### Forest Botany

Coker, W. C. and Torrey, H. E. The trees of North Carolina. 106 p. Chapel Hill, W. C. Coker, 1916.

Maiden, J. H. A critical revision of the genus *Eucalyptus*, pt. 28. 26 p. pl. Sydney, Gov't printer, 1916.

Maiden, J. H. The forest flora of New South Wales, pt. 61. 40 p. pl. Sydney, Gov't printer, 1916.

#### Silvical Studies of Species

Sargent, W. D. and Holmes, J. S. The ash in North Carolina. 8 p. Chapel Hill, N. C., 1917. (North Carolina—Geological and economic survey. Press Bulletin no. 156.)

#### Forest Protection

##### Diagnoses

Davey tree expert co., Ind. When your trees need the tree surgeon. 16 p. 2. Kent, Ohio, 1916.

Long, W. H. Investigations of the rotting of slash in Arkansas. 15 p. Wash., D. C., 1917. (U. S.—Dept. of agriculture. Bulletin no. 496.)

**FOREST NURSERIES**

**PINE SPRUCE**

European trees for forest planting in any quantity, from 100 trees to several lots.

WE GROW OUR OWN TREES

Write us for catalogue

**KEENE FORESTRY ASSOCIATION**

KEENE, N. H.

**FORESTRY SEEDS**

I OFFER AT SPECIAL PRICES

- Pines seedlings
- Prunella-Myrt Douglas
- Pines ponderosa
- Pines Engelmanni
- Pines Progress
- Thorns Occidentalis
- Plants seeds

and many other varieties, all of this season's crop and of good quality. Samples upon request. Send for my catalogue containing full list of varieties.

**THOMAS J. LANE**

Tree Seedman  
Dresher Pennsylvania

**HILL'S**  
Seedlings and Transplants  
Also Tree Seeds

FOR REFORESTING

BEST for over a half century. All leading hardy trees, grown in immense quantities. Prices lowest. Quality highest. Forest Planter's Guide, also price lists are free. Write to-day and mention this magazine.

**THE D. HILL NURSERY CO.**

Emergent Specialists  
Largest Growers in America  
BOX 511 DUNDEE, ILL.

**Orchids**

We are specialists in Orchids, we collect, import, grow, and export this class of plants exclusively. Our illustrated and descriptive catalogue of Orchids may be had on application. Also special list of locally imported unestablished Orchids.

**LAGER & HURRELL**

Orchid Growers and Importers  
SUNBURY, N. J.

**Fore**  
Black, Robert. A matter of opinion. 24 p. Ottawa, Canadian forestry association, 1916.

**Forest Economics**

**Forest policy**  
Hudson, D. E. Scientific national forestry for New Zealand. 45 p. Wellington, N. Z., 1916.

**Forest Utilization**

**Lumber industry**  
Berry, Swin. Lumbering in the sugar and yellow pine region of California. 99 p. gl. map. Wash., D. C., 1915. (U. S.—Dept. of agriculture. Bulletin 441)

Coxley, William Buckland. Forest ownership in relation to the lumber industry. 29 p. Minneapolis, Northern pine manufacturers association, 1917.

Lumbermen's credit association. Reference book. Feb., 1917. Chicago and New York, 1917.

Southern pine association. Selling lumber: being the full and complete report of the first school of salesmanship, held at St. Louis, Mo. June 26, 27 and 28, 1916. 312 p. Kansas City, Mo., 1916.

Zan, Richard. Lumber markets of the Mecklenburg region and the near east. 82 p. Wash., D. C., 1917. (U. S.—Dept. of commerce—Bureau of foreign and domestic commerce. Miscellaneous series, no. 2.)

**Wood-using industries**

French, Edward H., and Withrow, James R. The hardwood distillation industry in America. 12 p. Columbus, O., 1914. (Ohio state university—College of engineering. Bulletin no. 11.)

Palmer, R. C. Fields from the fermentation distillation of certain hardwoods. 8 p. Wash., D. C., 1917. (U. S.—Dept. of agriculture. Bulletin 518.)

Smith, W. H. Studies on paper pulps. 13 p. Wash., D. C., 1915. (U. S.—Dept. of commerce—Bureau of standards. Technologic paper, no. 38.)

**Auxiliary Subjects**

**Geography and travel**  
Williams, Ira J. The Columbia river gorge: its geologic history interpreted from the Columbia river highway. 131 p. gl. map. Corvallis, Ore., 1916. (Oregon—Bureau of mines and geology. The mineral resources of Oregon, v. 2, no. 1.)

**Natural resources and their conservation**  
Camp fire club of America—Committee on conservation of forests and wild life. Conservation bulletin, no. 1. 15 p. New York, 1917.

**KELSEY'S MORE BEAUTIFUL AMERICAN PLANTS AND CHOICER MOUNTAIN FLOWERS**

Traps, rock-roses,  
The most beautiful Hemlock spruce  
Knapweed-like rock-roses,  
New clear pink dwarf spruce  
Lewinsia catesbeiana,  
Most graceful of small-leaved winter plants  
Lilium carolinianum,  
Only fragrant native eastern species  
Andon lilies, Great Pacific Andon,  
Most brilliant flowers American South  
NEW ILLUSTRATED CATALOG

**HARLAN P. KELSEY, Owner**  
Salem, Massachusetts

Highlands Journey  
1917. Illustrations in the  
Caroline Mountains  
Salem, Mass.  
Salem, Mass.

**GRAFTED NUT TREES**

Why not combine NUT CULTURE with forestry? My hardy PENNSYLVANIA GROWN trees are the best for eastern or southern planting. Catalogue and cultural guide free.

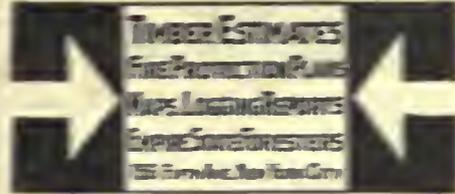
**WHY NOT BUD OR GRAFT**

the seedling black walnuts and domestics on your facts over to the improved English walnuts and the facilities to fine pecans and sugar-buds. Booklet on propagation and top-working Nut Trees free.

**J. F. JONES**

NUT TREE SPECIALTY Box 1, Lancaster, Pa.

**Illustrated Catalogue**—We offer you the latest information from the Michigan, New York, Vermont, Wisconsin, Oregon, Utah, West Virginia and Kansas Fir Tree Growers. Leaf Catalogue.  
**Illustrated Catalogue**—See Black, Canada, Sugar Maple, Cherry, Elm, and many other trees and shrubs, through our top-selling catalogues. Many of these are transplanted, ready to grow.  
**Illustrations**—We get out millions of these. Send for a work list free. Address Dept. A. J. J.  
**BIPELOLE NURSERIES, Hopewell, Ill.**



**High Income Return on Non-Fluctuating Investment**

Invest your dollars in the safe, non-fluctuating, reliable, and non-liquidating, 7 percent or 14 percent, income bonds. Millions of dollars of these bonds are now being placed in the hands of investors. Write for our complete information and prospectus. Write to-day for our literature. Address Dept. 100, New Haven, Conn.  
**C. F. YELLEN & CO., Trust Bldg., Miami, Florida**

**PARK and ESTATE FORESTRY**

Logging Reports Utilization Studies  
Timber Estimates Forest Planting  
Etc.

Methods and Cost of Mosquito  
Evaluation

**P. L. BUTTRICK**

Forester and Mosquito Expert  
P. O. Box 407 New Haven, Conn.

**FOREST TREE SEEDLINGS**

AND

**ORNAMENTAL SHRUBS**

We offer for spring 1917 our usual line of Forest tree seedlings and Ornamental Shrubs, Cuttings, etc.

Write for spring trade list.

**Forest Nursery Company**

McMINNVILLE

TENNESSEE



## "It was no trouble at all

to get rid of the stumps by blasting," writes R. C. English, Port Matilda, Pa. "I had never used an explosive before and had never seen the work done. But I understood it thoroughly after looking at the pictures in your book. It is easy to blast stumps with

### **Atlas Farm Powder** THE SAFEST EXPLOSIVE The Original Farm Powder

It costs little compared with the cost of labor that it replaces. You can buy it from a dealer near you. If you don't know him, ask us. Mail the coupon for our book, "Better Farming," 74 pages, 84 illustrations, shows how to blast stumps and boulders, drain land, make beds for trees and increase soil fertility by using Atlas Farm Powder.

**FREE  
BOOK  
COUPON**

ATLAS POWDER CO., Wilmington, Del.

Send me your 74-page book, "Better Farming." I am interested in the use of explosives for the purpose before which I mark X: **FD56**

<input type="checkbox"/> STUMP BLASTING	<input type="checkbox"/> DITCH DIGGING
<input type="checkbox"/> BOULDER BLASTING	<input type="checkbox"/> ROAD BUILDING
<input type="checkbox"/> SUBSOIL BLASTING	<input type="checkbox"/> TREE PLANTING

Name \_\_\_\_\_

Address \_\_\_\_\_

Are you on the Mailing List for Catalog of



Pine and Oak Help Each Other

## Hicks Nurseries?

It will confirm your decisions on fitting your selection of trees to your soil and climate. It offers trees for dry and acid soils and moist soils in the same region. Many nurseries on alkaline soils do not specialize on oaks and pines.

Trees 20 years old can be selected now. They are guaranteed to grow satisfactorily or replaced free.

**ISAAC HICKS & SON**  
Westbury, Nassau Co., N. Y.

North Carolina—Geological and economic survey. Some facts and figures about North Carolina and her natural resources. 2d ed. 51 p. Raleigh, N. C., 1917.

Virginia—Dept. of agriculture and immigration. Virginia; its agricultural and industrial resources. 103 p. il., pl. Richmond, Va., 1916. (Bulletin no. 104.)

#### Public lands

North Dakota—Board of university and school lands. Twelfth biennial report for the period beginning July 1, 1914, and ending June 30, 1916. 33 p. Fargo, N. D., 1916.

South Dakota—Dept. of school and public lands. Fourteenth biennial report, from July 1, 1914, to June 30, 1916. 290 p. tables. Pierre, S. D., 1916.

#### National parks and monuments

Eliot, Charles W., and others. Sieur de Monts national monument; addresses upon its opening. 22 p. n. p., 1916. (Sieur de Monts publications, 2.)

Eno, Henry Lane. The Sieur de Monts national monument as a bird sanctuary. 17 p. pl., n. p., 1916. (Sieur de Monts publications, 3.)

United States—Dept. of the interior. Glimpses of our national parks, by Robert Sterling Yard. 48 p. il. Wash., D. C., 1916.

#### Ecology

Braun, E. Lucy. The physiographic ecology of the Cincinnati region. 97 p. il., maps. Columbus, O., 1916. (Ohio—Biological survey. Bulletin 7.)

Clements, Frederic E. Plant succession; an analysis of the development of vegetation. 512 p. pl. Wash., D. C., Carnegie institution, 1916.

#### Commerce

United States—Federal trade commission. Report on cooperation in American export trade, pt. 1-2. charts. Wash., D. C., 1916.

United States—Federal trade commission. Report on trade and tariffs in Brazil, Uruguay, Argentine, Chile, Bolivia, and Peru. 246 p. pl. Wash., D. C., 1916.

#### Periodical Articles

##### Miscellaneous periodicals

Bulletin of the Torrey botanical club, Jan., 1917.—A quantitative, volumetric and dynamic study of the vegetation of the Pinus taeda belt of Virginia and the Carolinas, by Roland M. Harper, p. 39-57.

Country gentleman, Feb. 10, 1917.—Stumps worth money, by C. J. Zintheo, p. 56, 58.

Country gentleman, Feb. 24, 1917.—Natural birch oil; fair profits for farmers during winter months, by Joseph S. Illick, p. 39-40; Roadside trees, p. 43.

Country gentleman, March 3, 1917.—Conserving the woodlot, by Walter D. Ludwig, p. 42-4.

Country life in America, Feb., 1917.—The fall of the leaf, by S. Leonard Bastin, p. 76-78; The tree surgeon, by Cordelia J. Stanwood, p. 122.

Fins, feathers and fir, Dec., 1916.—District forester's report on game conditions on Minnesota national forests, by Smith Riley, p. 12-13.

Fire protection, Feb., 1917.—Fire protection on the national forests of the United States, by John L. Cobbs, Jr., p. 6.

Gardeners' chronicle, Jan. 27, 1917.—The home timber trade in 1916, by A. D. Webster, p. 33; The cluster oak of Savernake forest, by A. Henry, p. 34-5.

- Geographical review, Feb., 1917.—A map of the vegetation of the United States, by Forrest Shreve, p. 119-25.
- Good roads, Feb. 24, 1917.—Recent practice in wood block pavements, by Ellis R. Dutton, p. 129-31.
- Harvard graduates' magazine, Dec., 1916.—Some unwritten records in the Harvard forest, by Richard T. Fisher, p. 191-3.
- House and garden, Dec., 1916.—A study of trees in winter, by E. P. Powell, p. 29.
- International review of the science and practice of agriculture, Sept., 1916.—Historical review of Canada's timber industry, by James Lawler, p. 1227-34; The forest trees of Canada, by R. G. Lewis, p. 1234-41.
- Journal of commerce, Feb. 5, 1917.—Discovering native woods for dye materials, by Howard F. Weiss, p. 19; Finding new uses for the waste of forests, by A. W. Schorger, p. 41.
- Journal of geography, Dec., 1916.—Influence of the lumber industry upon the salt industry of Michigan, by Charles W. Cook, p. 117-25.
- Journal of heredity, March, 1917.—The Texas palmetto, *Inodes texana*, p. 123-4.
- Michigan farmer, Jan. 13, 1917.—The woodlot, its place in farm management, by W. I. Gilson, p. 25, 27-8.
- National wool grower, Feb., 1917.—Decision regarding grazing fees, by David F. Houston, p. 27-8.
- Philippine agricultural review, 1916.—Notes on cinchona in Java, by P. J. Wester, p. 273-7.
- Phytopathology, Feb., 1917.—The penetration of foreign substances introduced into trees, by W. H. Rankin, p. 5-13; Does *Cronartium ribicola* winter on the currant, by W. A. McCubbin, p. 17-31; Some new or little known hosts for wood-destroying fungi, by Arthur S. Rhoades, p. 46-8.
- Plant world, Jan., 1917.—Notes on the history of the willows and poplars, by Edward W. Berry, p. 16-28; A quarter-century growth in plant physiology, by Burton Edward Livingston, p. 1-15.
- Reclamation record, March, 1917.—Protecting the water user by land classification, p. 143-4.
- St. Nicholas, Dec., 1916.—Protecting the nation's forests, p. 168-9.
- Scientific American, Feb. 3, 1917.—Doux nuts of commerce, p. 129.
- Scientific American, Feb. 17, 1917.—Science in the lumber industry; tremendous saving of waste products now being effected upon a commercial scale, by Wm. J. Ferry, p. 178.
- Scientific American supplement, Dec. 16, 1916.—Where the motor truck has displaced the horse; records made hauling heavy logs in Washington forests, p. 388-9; Experiments in the cultivation of the cork tree in Sardinia, p. 395.
- Scientific American supplement, Jan. 13, 1917.—The Brazil nut of commerce; how it grows, and how it is gathered, p. 20-1; The oaks of America, by William Trelease, p. 23; Hevea rubber tree, p. 23; Trees in medicine, by John Foote, p. 26-7.
- University of California journal of agriculture, Feb., 1917.—Forest service conference, by L. W. Taylor, p. 190, 200-1; Depreciation factors in lumber study, p. 191, 204-5.
- World's work, Feb., 1917.—A mechanical tree feller, p. 453-4.

*Trade journals and consular reports*  
American lumberman, Feb. 17, 1917.—Plan to control blister rust is suggested, p. 52.

## Clearing Costs Reduced

The recent land clearing tests conducted by the University of Wisconsin have revolutionized methods and established conclusively much lower clearing costs per acre

The leading kinds of stump pullers—hand and power—were represented. The dynamite used was

**DU PONT**

### RED CROSS FARM POWDER

These tests proved the following important facts:

1st—The cheaper Red Cross Farm Powders will in most soils blast out stumps as well as the most expensive 30% and 40% grades.

2nd—The combined use of Red Cross Farm Powder and a stump puller is often the cheapest and best way to clear land.

3rd—Properly placed charges fired with a blasting machine greatly reduce the amount, strength and cost of the dynamite required.

As a result the average stump covered land can now be cleared at less cost per acre than before the war.

#### Write Now for Full Information

Every farmer with stump covered land should know the full facts about this modern method of land clearing. Write today for

#### Land Clearing Bulletin No. 350

If you are interested in orchard planting, ditching, drainage, shoulder blasting, subsoiling or post hole blasting be sure to ask for

#### Hand Book of Explosives No. 350

**E. I. du PONT de NEMOURS & CO.**  
Wilmington Delaware



## WE MAKE THE ENGRAVINGS

FOR THE  
AMERICAN FORESTRY  
MAGAZINE

### OUR SPECIALTY IS THE "BETTER GRADE FINISH OF DESIGNS & ENGRAVINGS

IN ONE OR MORE COLORS  
FOR MAGAZINES CATALOGUES  
ADVERTISEMENTS ETC

HALF TONES	LINE PLATES
DULLO-TONES	COMBINATION LINE AND HALF TONES
COLOR PROCESS	MULTI-COLORS

—ESTABLISHED 1889—  
**GATCHEL & MANNING**  
SIXTH AND CHESTNUT STREETS  
OPPOSITE OLDE INDEPENDENCE MALL  
PHILADELPHIA

*Continued Success and Growth of American Forestry is dependent upon the manner in which our advertising pays. No advertiser unworthy of our recommendation is knowingly admitted in these columns.*

## Our Trees

### HOW TO KNOW THEM

Photographs from Nature  
By ARTHUR I. EMERSON

WITH A GUIDE TO THEIR RECOGNITION AT ANY SEASON OF THE YEAR AND NOTES ON THEIR CHARACTERISTICS, DISTRIBUTION AND CULTURE

By CLARENCE M. WEED, D.Sc.

Teacher of Nature Study in the Massachusetts State Normal School at Lowell

One hundred and forty illustrations

Size of book, 7½ inches by 10 inches

Cloth, \$3.00 net

Postage extra

ALL nature-lovers will hail this book with delight. Its purpose is to afford an opportunity for a more intelligent acquaintance with American trees, native and naturalized. The pictures upon the plates have in all cases been photographed direct from nature, and have been brought together in such a way that the non-botanical reader can recognize at a glance either the whole tree or the leaves, flowers, fruits, or winter twigs, and thus be able to identify with ease and certainty any unknown tree to which his attention may be called. In the discussion of the text especial attention has been given to the distinguishing character of the various species, as well as to the more interesting phases of the yearly cycle of each, and the special values of each for ornamental planting.

Publishers

**J. B. LIPPINCOTT COMPANY**  
Philadelphia

Two minutes save each tree

Tree Tanglefoot saved the tree on left

## Use Tree Tanglefoot

on Shade and Orchard Trees against Canker Worms, Climbing Cut Worms, Woolly Aphides, Ants and Tussock, Gypsy and Brown-tail Caterpillars. It is equally effective against any crawling insects.

### Band Trees about Two Weeks Before Insects Appear to Get Best Results

Easily applied with wooden paddle. One pound makes about 10 lineal feet of band. One application stays sticky three months and longer—outlasting 10 to 20 times any other substance. Remains effective rain or shine. Won't soften—won't run or melt, yet always elastic, expanding with growth of tree. No mixing, simply open can and use. Will not injure trees.

### For Tree Surgery

Tree Tanglefoot is superior to anything on the market—it is the best application after pruning or trimming. It will waterproof the crotch of a tree or a cavity or wound in a tree, when nothing else will do it.

### Sold by All First-Class Seedsmen

1-lb. cans 35c; 3-lb. cans \$1.00; 10-lb. cans \$3.00; 20-lb. cans \$5.50 and 25-lb. wooden pails \$6.75.

Write to-day for illustrated booklet on Leaf-eating Insects. Mailed free.

### THE O. & W. THUM COMPANY

144 Straight Avenue, Grand Rapids, Mich.

Manufacturers of Tanglefoot Fly Paper and Tree Tanglefoot



## SUPERIOR ENGRAVINGS

FOR ALL PURPOSES  
DESIGNERS AND  
ILLUSTRATORS

HALF-TONES · LINE CUTS  
3 COLOR PROCESS WORK  
ELECTROTYPES

NATIONAL ENGRAVING CO.

506-14th Street, N.W.  
WASHINGTON, D. C.

Phone Main 8274

### R. MORGAN ELLIOTT & Co.

PATENT ATTORNEYS

MECHANICAL, ELECTRICAL & CHEMICAL EXPERTS

723-731 WOODWARD BUILDING

WASHINGTON, D. C.



## PATENTS

Often the slightest improvement, protected by patent, means thousands of dollars to the inventor. Our Bulletins list hundreds of inventions greatly needed, especially in farm implements, automobile accessories, household specialties and toys. Bulletins and book of advice free. Simply mail a postcard.  
Lancaster & Allwine, Registered Att'ys  
886 Curay Bldg., Washington, D. C.

American lumberman, Feb. 24, 1917.—Building codes and lumber production, by Julius Seidel, p. 35; The outlook for forestry in the northwest, by T. T. Munger, p. 64.

American lumberman, March 3, 1917.—The tree-killing beetles of California, by Stewart Edward White, p. 32-3; Influence of the silo on modern agriculture, p. 41; Many ways of using southern pine mill waste, by Howard F. Weiss, p. 57.

American lumbermen, March 10, 1917.—Will aid government in national defense; data collected by Forest products laboratory on properties of wood most

comprehensive, p. 34; Surface burning, by Stewart Edward White, p. 36-7.

Canada lumberman, March 1, 1917.—Burning the slash after logging, by B. W. Lakin, p. 29; Logging operations in Newfoundland, by J. Wilfrid McGrath, p. 30; Striking results from forest patrol, by Arthur H. Graham, p. 38.

Hardwood record, Feb. 25, 1917.—Hardwoods and softwoods, by Hu Maxwell, p. 18-20; Plea for closer discrimination in the use of the words "grain" and "texture," with reference to wood, by Arthur Koehler, p. 21-2.

Hardwood record, March 10, 1917.—Value of weight in wood, by Hu Maxwell, p. 15-17; New Zealand teak, p. 20; Veneering with two woods, p. 25-6.

Journal of industrial and engineering chemistry, March, 1917.—The fixation of nitrogen, by John E. Bucher, p. 233-53; A study of commercial beechwood creosote, by H. K. Smith and S. F. Acree, p. 275-6; A method of producing crude wood creosote from hardwood tar, by R. C. Judd and S. F. Acree, p. 276-7; Some observations on the influence of humidity on the physical constants of paper, by Otto Kress and Philip Silverstein, p. 277-82; Further studies on a numerical expression for color as given by the Ives tint photometer, by Otto Kress and G. C. McNaughton, p. 282-4; The chemistry of wood decay, by Robert Evstafieff Rose, p. 284-7.

Lumber trade journal, March 1, 1917.—Wood exports for 1916, p. 21-8.

Lumber world review, March 10, 1917.—Wood preservation at low cost, p. 25-7.

Packages, Feb., 1917.—Cost chart, National association of box manufacturers, p. 20; How to determine costs, by S. J. Glanton, p. 42-4.

Paper, Feb. 14, 1917.—Electricity in the paper industry, by W. W. Cronkhite, p. 42-54; Bleached groundwood, by Otto Schutz, p. 64-6; Baled pulpwood chips, by Rolf Thelen, p. 82-6; The manufacture of pulp and paper, by Lucien Buck, p. 88-123; First use of groundwood in papermaking, by Warner Miller, p. 128-32; American paper in export trade, by Benjamin Labree, p. 132-4; Technical association of the pulp and paper industry; 2d annual meeting, p. 136-63.

Paper, Feb. 21, 1917.—Paper pulp possibilities said to be big in Brazil, by Alfred L. M. Gottschalk, p. 40.

Paper, Feb. 28, 1917.—How paper is affected by humidity, by Otto Kress, p. 13-17.

Paper, March 7, 1917.—This country's pulpwood resources, by W. B. Greeley, p. 17, 40.

Paper mill and wood pulp news, Feb. 10, 1917.—Wood waste for paper, by Howard F. Weiss, p. 245; Using the whole tree, by A. W. Schorger, p. 246.

Paper trade journal, Feb. 8, 1917.—A year of unusual activity in the paper and pulp industry in 1916, p. 5-17; A year of eventful conditions in England in the paper industry, by A. L. Wise, p. 19-21; Manufacture of paper in France shows decrease, by E. Bardet, p. 23-5; Quebec and maritime provinces are busy; paper industry prosperous, by C. L. Sibley, p. 26-39; Pulp and paper work during the year of the Forest products laboratory, by Otto Kress, p. 43-7; Forestry and forest products for pulp, by Martin L. Griffin, p. 53-5; Chinese mill has American machinery, by L. M. Lamm, p. 66, 75; Production of methyl alcohol from the spent liquors of soda pulp process, by Albert E. White and John D. Rue, p. 109-17; Hemlock may be good substitute for spruce pulp, p. 163; United States paper laboratories, by L. M. Lamm, p. 305-9; Paper-making in Great Britain during 1916, p. 333-5; Improvements in

- quality of ground wood pulp, p. 337-9; "Enge" and other ground pulp, by Ch. Vig, p. 347-9.
- Pulp and paper magazine, Jan. 25, 1917.—The future of sulphate and kraft pulp, by Hans Lagerlof, p. 94-5; Control of the white pine blister rust, by H. T. Güssow, p. 96-7; The disposal of slash, by R. H. Campbell and R. D. Prettie, p. 97-8.
- Pulp and paper magazine, Feb. 1, 1917.—The classification of the crown lands of New Brunswick, by P. Z. Caverhill, p. 115-17.
- Pulp and paper magazine, Feb. 15, 1917.—Forestry and forest wood products for pulp, by Martin L. Griffin, p. 171-2.
- Railway review, Feb. 17, 1917.—Timber treating processes used in the United States, p. 242-3.
- St. Louis lumberman, March 1, 1917.—List of associations and officers, p. 62-3.
- Southern lumber journal, Feb. 15, 1917.—Fire protection for North Carolina now in sight, p. 26-7; Asphalt shingles denied use where wooden shingles have been barred, p. 32-3; Some facts regarding the amount of lumber entering into the manufacture of musical instruments, p. 34.
- Southern lumberman, Feb. 24, 1917.—Use of southern yellow pine in shipbuilding, by A. C. Powers, p. 29.
- Southern lumberman, March 10, 1917.—How to measure the conditions in seasoned lumber, by James E. Imrie, p. 29-30.
- Timber trade journal, Feb. 10, 1917.—Epping forest, by Charles White, p. 216.
- Timber trade journal, Feb. 17, 1917.—British-made wooden toys, p. 283-4.
- Timber trade journal, Feb. 24, 1917.—The natural growth of forests, by Henry S. Graves, p. 290; Afforestation in Wales, by Fraser Storey, p. 291; The artificial drying of wood, p. 21.
- Timberman, Feb., 1917.—Russian forest development, p. 28; Oregon logging stream legislation, p. 32-2; Testing Douglas fir bridge stringers, by O. P. M. Goss, p. 37; Common types of South American doors, p. 40; Afforestation a necessity in New Zealand, by Sir James Wilson, p. 40-1; Forests of the Tropics, p. 41; First aid in lumber industry, by W. N. Lipscomb, p. 48B.
- United States daily consular report, March 9, 1917.—Improved conditions in Finnish lumber trade, p. 899; Reforesting western Norway with Douglas fir, p. 909.
- United States daily consular report, March 10, 1917.—Forestry work in New Zealand, by Alfred A. Winslow, p. 924-5.
- Veneers, March, 1917.—Sawing veneer flitches, by James F. Hobart, p. 13-14; Increased use of figured gum veneers, by S. E. H., p. 17-18.
- West Coast lumberman, Feb. 15, 1917.—California promulgates permanent logging and saw mill safety orders, p. 32-3.
- Wood turning, March, 1917.—Making split hickory spokes, by A. L. Brown, p. 11-12; D shovel handle making, p. 15; Development of sawdust, p. 19.
- Wooden and willow ware trade review, Feb. 8, 1917.—Canada's toy industry grows, by John G. Foster, p. 81-2.
- Wood-worker, Feb., 1917.—Piling lumber to keep it straight, by Fenwick Faulkner, p. 23.
- Forest journals*
- American forestry, March, 1917.—Recreational uses of the national forests, by H. S. Graves, p. 133-8; Conservation of game in the national forests and national parks, by E. W. Nelson, p. 139-45; Sycamore or buttonwood tree flower, by R. W. Shufeldt, p. 146;



## "Here's What Guides Her, Boys"

America's fastest trains are governed by Hamilton Watches. Engineers and conductors depend upon Hamilton accuracy. Wouldn't you like to own this watch that has become famous as the Railroad Timekeeper of America? Decide now that you will.

## Hamilton Watch

"The Watch of Railroad Accuracy"

You can buy a Hamilton movement alone for \$13.00 (\$14.00 in Canada). Other Hamiltons cost \$26.50, \$30.00, up to \$150.00 for the Hamilton Masterpiece in 18k heavy gold case. Hamiltons are made in many models—in cased watches; also in movements which your jeweler can fit to your present watch case.

*Write for Hamilton Watch Book  
"The Timekeeper"*

It tells many interesting facts about watch making. We will send it to you free

**HAMILTON WATCH COMPANY**  
Dept. 39 Lancaster, Pennsylvania

Engineer Jakey Brown, the oldest Engineer on the Denver & Rio Grande R. R. and a staunch booster for the Hamilton Watch

**SPRAY** Use  
a high pressure  
driving spray that clings  
**DEMING**

POWER SPRAYERS make short work of big spray jobs. Their high pressure and simplicity of operation guarantee thorough, effective work at a minimum labor cost. *Investigate!* let us send you 40-page spray catalogue free.

**THE DEMING COMPANY**  
149 Depot St. Salem, Ohio

*Over 1000 types and sizes of pumps for all uses*

FO 1	RE 2	ST 3	RY 4
---------	---------	---------	---------

## THE FOREST IS THREE-FOURTHS OF FORESTRY

Your opportunities are as unlimited as our forests if you study at

**WYMAN'S SCHOOL OF THE WOODS**  
Incorporated Munising, Michigan

**AMERICAN NUT JOURNAL** Only national publication of the kind. Monthly; comprehensive; highly endorsed. \$1.25 per year. Advertising \$2 10 per inch. Rochester, N. Y.

## Use Press Clippings

It will more than pay you to secure our extensive service, covering all subjects, such as Polo, Golf, Tennis, trade and personal, and receive the benefit of the best and most systematic reading of all papers and periodicals, here and abroad, at minimum cost. Why miss taking advantage for obtaining the best possible service in your line?

Our service is taken by all progressive business men, publishers, authors, collectors, etc., and is the card index for securing what you want and need, as every article of interest is at your daily command.

Write for terms; or send your order for 100 clippings at \$5, or 1,000 clippings at \$35. Special rates quoted on Large Orders.

## The Manhattan Press Clipping Bureau

ARTHUR CASSOT, Proprietor Established 1888

6 East 41st Street, NEW YORK

Send for Our Desk Calendar

## Do Business by Mail

It's profitable, with accurate lists of prospects. Our catalogue contains vital information on Mail Advertising. Also prices and quantity on 6,000 national mailing lists, 99% guaranteed. Such as:

War Material Mfrs.	Wealthy Men
Cheese Box Mfrs.	Axle Grease Mfrs.
Shoe Retailers	Auto Owners
Contractors	Tin Can Mfrs.
Druggists	Farmers, Etc.

Write for this valuable reference book; also prices and samples of fac-simile letters. Have us write or revise your Sales Letters.

Ross-Gould, 1009C Olive St.

**Ross-Gould**  
Mailing Lists St. Louis

Your co-operation with your own magazine will boost American Forestry to an exalted position among advertising media. One way to co-operate is to patronize our advertisers, or ask for suggestions and advice.



## PLANT NUT TREES NOW

**\$141 yielded last year  
by one of our trees**

Hardy Pomeroy English Walnut trees are famous for hardiness, rich yields and quality. Beautiful lawn shade trees, profitable for orchards.

Send address now for well-illustrated facts and prices.

**Daniel N. Pomeroy & Son**  
English Walnut Orchards  
Lockport Box A. F. New York

Get our offer of free trees for public planting for Arbor Day

## BUSINESS FOR SALE

AN OPPORTUNITY for some rich man's son, in a profitable out of doors occupation. I will give three months of my time to teach the purchaser—renovating old orchards, tree surgery, spraying and moving large trees. Lots of orders on hand. Present owner is classed as one of the most expert in Massachusetts. Situated near 300,000 people. Included in the sale will be automobile and sprayers, tools and a great many books on forestry, etc. For further information address Box 400, care of AMERICAN FORESTRY.



## Did You Get Your Copy?

Every one who seeks to improve the appearance of or protect public buildings, forestry tracts, private residences, parks, etc., should be interested in the information given and handsome designs illustrated in this book.

The large quantities of Fiske Fencing, Gates, Lamp Standards, Tree Guards, Vases, Fountains, etc., furnished to public and private institutions enable us to offer valuable advice and a wide variety of standard designs.

If your requirements are special we will build to order, and where desired will erect complete and assume all responsibility.

**J.W. FISKE IRON WORKS**

Established 1858

100-102 PARK PLACE NEW YORK

## BRITISH COLUMBIA TIMBER

Our knowledge of the timber resources of the Coast is based on 20 years' experience in the woods of British Columbia. We have never lost a dollar for a client on an investment. We will be pleased to hear from you if you are interested in British Columbia stumpage.

**W. L. KEATE**

441 SEYMOUR ST. VANCOUVER, B. C.

Michigan to plant 4500 acres annually, p. 146; Save us from invading pests, by J. G. Sanders, p. 147-53; Flatheaded borers on forest trees, p. 153; Birds and the camera, by A. A. Allen, p. 154-7; The slash pine, by Wilbur R. Mattoon, p. 158-9; State forests' valuation, p. 160; One of the undreamt-of things, by Lewis E. Theiss, p. 160; Michigan in the pine blister fight, p. 160; Early spring and summer flowers, by R. W. Shufeldt, p. 161-5; Forest road under federal aid act, p. 165; Boy scouts battle moths, p. 165; Maples, a poem by Richard Butler Glanzer, p. 165; The wind and the trees, by Bristow Adams, p. 166-7; \$300,000 for pine blister disease; an effective quarantine law, p. 168; A feathered dog in the manger, by Lewis E. Theiss, p. 168; Collecting tree and flower specimens, by R. W. Shufeldt, p. 169-70; National forests given permanence, p. 170; That tent in the tree, p. 171-2; India's forest management, p. 172; Lowest forest fire loss, p. 172; Planting suggestions for April, by J. J. Levison, p. 173-5; Efficiency and economy in Oregon, p. 176; Increasing the grazing fees on national forests, p. 177; Canadian department, by Ellwood Wilson, p. 180; Four colonial houses, by Rawson Woodman Haddon, p. 181-3; Blasting tree holes, p. 183.

Canadian forestry journal, Feb., 1917.—Improving the farmer's trees, by B. R. Morton, p. 945-6; A children's school in the forest, by W. E. Struthers, p. 947-50; New light on tropical forests, p. 954-5; Stock taking on the public domain; New Brunswick is developing plans to guide settlement and devise future timber policies, by P. Z. Caverhill, p. 959-60; Tree-felling by machine, p. 965; Better equipment to cope with fires, by T. McNaughton, p. 969; How menace to white pine may be controlled, p. 970-2.

Hawaiian forester and agriculturist, Nov., 1916.—Progress of forestry during 1916, by C. S. Judd, p. 410-15; Tree investigation; working plan, p. 416-18.

Indian forester, Jan., 1917.—Extraction of blue pine and fir beams from Kulu forests, by C. G. Trevor, p. 1-2; Fuel and bamboo plantations in the Sittang delta of the Pegu district, Lower Burma, by J. M. D. Mackenzie, p. 2-9; Some problems in connection with grazing in the Central Provinces, by C. A. Malcolm, p. 10-15; Progress of silvicultural works in North Kanara division, by J. Dodgson, p. 15-17; Possible use of phenyle in nurseries, by H. H. Haines, p. 17-18; Growth of Soyimida febrifuga in trichinopoly, by M. Rama Rao, p. 19-20; Sundri, Heritiera minor, by Bijay Kumar Bhattacharji, p. 21-5; The system of marking in the South Canada division, by G. M. Willford, p. 25-7; Butea frondosa evolving simple leaf, by S. S. Shivapuri, p. 28-9; Development of Indian forests, p. 30-4; Distillation of sandal-wood oil, p. 50-2.

Journal of forestry, Jan., 1917.—The situation, by B. E. Fernow, p. 3-14; Continuous forest production of privately owned timberlands as a solution of the economic difficulties of the lumber industry, by Burt P. Kirkland, p. 15-64; What of the future of the eastern forests of the United States, by S. B. Elliott, p. 65-7; Forest terminology; report of committee, p. 68-101; Site and site classes, by Samuel N. Spring and E. J. Hanzlik, p. 102-4; Sandy Ridge improvement cutting, by J. S. Illick, p. 104-5; The moisture withholding power of soils, by Barrington Moore, p. 110-17; A glimpse of the Siberian forests, by Theodore S. Woolsey, p. 120-1.

## Forestry at University of Michigan

Ann Arbor, Michigan

A FOUR-YEAR, undergraduate course that prepares for the practice of Forestry in all its branches and leads to the degree of **BACHELOR OF SCIENCE IN FORESTRY**

Opportunity is offered for graduate work leading to the degree of Master of Science in Forestry.

The course is designed to give a broad, well-balanced training in the fundamental sciences as well as in technical Forestry, and has, consequently, proven useful to men engaged in a variety of occupations.

This school of Forestry was established in 1903 and has a large body of alumni engaged in Forestry work.

For announcement giving complete information and list of alumni, address

**FILIBERT ROTH**

## TIMBER SALES, KLAMATH RESERVATION, OREGON

SEALED BIDS WILL BE RECEIVED UNTIL twelve o'clock noon, Pacific time, Thursday, May 31st, 1917, for the purchase of the timber upon three large tracts on the Klamath Indian Reservation in southern Oregon. Upon one tract containing two hundred and sixty million feet and upon another containing one hundred and seventy million feet, a minimum price of \$3.25 per thousand has been placed upon yellow and sugar pine, and upon the third tract of two hundred million feet, the minimum price for sugar and yellow pine has been made \$3.00 per thousand feet. The minimum for red fir is \$7.75 and for white fir \$8.50, but the cutting of these species is optional with the purchaser. The timber is nearly all yellow and sugar pine. The right to reject any and all bids is reserved. Full information may be obtained from the Superintendent of the Klamath Indian School, Klamath Agency, Oregon.  
Washington, D. C., March 24th, 1917. CATO SELLS, Commissioner of Indian Affairs.

## PHILIP T. COOLIDGE FORESTER

Stetson Bldg., 31 Central Street, Bangor, Me.  
*Management and Protection of Woodlands  
Improvement Cuttings, Planting, Timber  
Estimates and Maps. Surveying*

Ohio forester, Oct., 1916.—White pine rust, by D. C. Babcock, p. 44-5; Some pressing needs in the study of forestry, by A. D. Selby, p. 45-6.

Schweizerische zeitschrift für forstwesen, Jan., 1917.—Kulturversuch mit ausländischen holzarten in der waldung des Schlosses Marschlins, Gemeindegebiet von Igis, in Graubünden, by J. Coaz, p. 1-14; Forstliches aus dem Binnental, by A. Pillichody, p. 14-40; Ueber die auflösende wirkung von baumwurzeln bei der zersetzung von gesteinen, by Flury, p. 23-4.

Tree life, March, 1917.—A talk on naturalistic planting, by Theodore F. Borst, p. 3-5; The evergreen note in the landscape, p. 6-7.

# BOOKS ON FORESTRY

AMERICAN FORESTRY will publish each month, for the benefit of those who wish books on forestry, a list of titles, authors and prices of such books. These may be ordered through the American Forestry Association, Washington, D. C. Prices are by mail or express prepaid.\*

FOREST VALUATION—Filibert Roth.....	\$1.50
FOREST REGULATION—Filibert Roth.....	2.00
PRACTICAL TREE REPAIR—By Elbert Peets.....	2.00
THE LUMBER INDUSTRY—By R. S. Kellogg.....	1.10
LUMBER MANUFACTURING ACCOUNTS—By Arthur F. Jones.....	2.10
FOREST VALUATION—By H. H. Chapman.....	2.00
CHINESE FOREST TREES AND TIMBER SUPPLY—By Norman Shaw.....	2.50
TREES, SHRUBS, VINES AND HERBACEOUS PERENNIALS—By John Kirkegaard.....	1.50
TREES AND SHRUBS—By Charles Sprague Sargent—Vols. I and II, 4 Parts to a Volume—per Part.....	5.00
THE TRAINING OF A FORESTER—Gifford Pinchot.....	1.35
LUMBER AND ITS USES—R. S. Kellogg.....	1.15
THE CARE OF TREES IN LAWN, STREET AND PARK—B. E. Fernow.....	2.17
NORTH AMERICAN TREES—N. L. Britton.....	7.30
KEY TO THE TREES—Collins and Preston.....	1.50
THE FARM WOODLOT—E. G. Cheyney and J. P. Wentling.....	1.70
IDENTIFICATION OF THE ECONOMIC WOODS OF THE UNITED STATES—Samuel J. Record.....	1.25
PLANE SURVEYING—John C. Tracy.....	3.00
FOREST MENSURATION—Henry Solon Graves.....	4.00
THE ECONOMICS OF FORESTRY—B. E. Fernow.....	1.61
FIRST BOOK OF FORESTRY—Filibert Roth.....	1.10
PRACTICAL FORESTRY—A. S. Fuller.....	1.50
PRINCIPLES OF AMERICAN FORESTRY—Samuel B. Green.....	1.50
MANUAL OF THE TREES OF NORTH AMERICA (exclusive of Mexico)—Charles Sprague Sargent.....	6.00
AMERICAN WOODS—Romeyn B. Hough, 13 Volumes, per Volume.....	5.00
HANDBOOK OF THE TREES OF THE NORTHERN U. S. AND CANADA, EAST OF THE ROCKY MOUNTAINS—Romeyn B. Hough.....	6.00
GETTING ACQUAINTED WITH THE TREES—J. Horace McFarland.....	1.75
PRINCIPAL SPECIES OF WOOD: THEIR CHARACTERISTIC PROPERTIES—Charles Henry Snow.....	3.50
HANDBOOK OF TIMBER PRESERVATION—Samuel M. Rowe.....	4.00
TREES OF NEW ENGLAND—L. L. Dame and Henry Brooks.....	1.50
TREES, SHRUBS AND VINES OF THE NORTHEASTERN UNITED STATES—H. E. Parkhurst.....	1.50
TREES—H. Marshall Ward.....	1.50
OUR NATIONAL PARKS—John Muir.....	1.91
LOGGING—Ralph C. Bryant.....	3.50
THE IMPORTANT TIMBER TREES OF THE UNITED STATES—S. B. Elliott.....	2.50
FORESTRY IN NEW ENGLAND—Ralph C. Hawley and Austin F. Hawes.....	3.50
THE PRINCIPLES OF HANDLING WOODLANDS—Henry Solon Graves.....	1.50
SHADE TREES IN TOWNS AND CITIES—William Solotaroff.....	3.00
THE TREE GUIDE—By Julia Ellen Rogers.....	1.00
MANUAL FOR NORTHERN WOODSMEN—Austin Cary.....	2.12
FARM FORESTRY—Alfred Akerman.....	.57
THE THEORY AND PRACTICE OF WORKING PLANS (in forest organization)—A. B. Recknagel.....	2.10
ELEMENTS OF FORESTRY—F. F. Moon and N. C. Brown.....	2.20
MECHANICAL PROPERTIES OF WOOD—Samuel J. Record.....	1.75
STUDIES OF TREES—J. J. Levison.....	1.75
TREE PRUNING—A. Des Cars.....	.65
THE PRESERVATION OF STRUCTURAL TIMBER—Howard F. Weiss.....	3.00
THE PRACTICAL LUMBERMAN—By Bernard Breton (third edition).....	1.50
SEEDING AND PLANTING IN THE PRACTICE OF FORESTRY—By James W. Toumey, M.S., M.A.....	3.50
FUTURE FOREST TREES—By Dr. Harold Unwin.....	2.25
FIELD BOOK OF AMERICAN TREES AND SHRUBS—F. Schuyler Mathews..	2.00
(In full leather).....	2.50
FARM FORESTRY—By John Arden Ferguson.....	1.30
LUTHER BURBANK—HIS METHODS AND DISCOVERIES AND THEIR PRACTICAL APPLICATION.....	48.00
(In twelve volumes, beautifully illustrated in color)	
THE BOOK OF FORESTRY—By Frederick F. Moon.....	2.10
OUR FIELD AND FOREST TREES—By Maud Going.....	1.50
HANDBOOK FOR RANGERS AND WOODSMEN—By Jay L. B. Taylor.....	2.50
THE STORY OF THE FOREST—By J. Gordon Dorrance.....	.65
THE LAND WE LIVE IN—By Overton Price.....	1.70
WOOD AND FOREST—By William Noyes.....	3.00
THE ESSENTIALS OF AMERICAN TIMBER LAW—By J. P. Kinney.....	3.00

\* This, of course, is not a complete list, but we shall be glad to add to it any books on forestry or related subjects upon request.—EDITOR.

## 70,000,000 Feet National Forest Timber For Sale

**Location and Amount** All the merchantable dead timber standing or down and all the live timber marked or designated for cutting on an area embracing about 1580 acres in Township 5 N., R. 7 E., W.M. unsurveyed, Wind River watershed, Columbia National Forest, Washington, estimated to be 70,000,000 feet B.M., more or less, of Douglas fir, western hemlock, western red cedar, western white pine, amabilis fir, grand fir, and other species, approximately 64 per cent Douglas fir.

**Stumpage Prices** Lowest rates considered, \$1.40 per M for Douglas fir and western red cedar, \$3.00 per M for western white pine, and 50 cents per M for western hemlock, amabilis fir, grand fir, and other species.

**Deposit** With bid \$5000, to apply on purchase price if bid is accepted, or refunded if rejected. Ten per cent may be retained as forfeit if the contract and bond are not executed within the required time.

**Final Date For Bids** Sealed bids will be received by the District Forester, Portland, Oregon, up to and including May 14, 1917.

The right to reject any and all bids is reserved.

Before bids are submitted full information concerning the character of the timber, conditions of sale, deposits, and the submission of bids should be obtained from the

DISTRICT FORESTER  
or the  
FOREST SUPERVISOR  
PORTLAND, OREGON

"QUALITY"

---

LONG AND SHORT LEAF YELLOW PINE

MISSOURI LUMBER & LAND  
EXCHANGE COMPANY

R. A. LONG BUILDING

KANSAS CITY, MO.

THE SAME

"TODAY AND TOMORROW"

# American Forestry



ULTY OF FORES  
 MAY 2 1917  
 LIBRARY OF TORO

An Illustrated Magazine about Forestry and Kindred Subjects Published Each Month by the American Forestry Association Washington, D.C.

# The American Forestry Association

## Washington, D. C.

### President

CHARLES LATHROP PACK, Lakewood, N. J.

### Vice-Presidents

ANDREW CARNEGIE, New York  
WILLIAM E. COLBY, California  
Secretary of The Sierra Club  
T. COLEMAN DUPONT, Delaware  
DR. CHARLES W. ELIOT, Massachusetts  
President Emeritus Harvard University  
DR. B. E. FERNOW, Canada  
Dean of Forestry, University of Toronto  
HENRY S. GRAVES, District of Columbia  
Chief of the Forest Service  
EVERITT G. GRIGGS, Washington

HON. DAVID HOUSTON  
Secretary of Agriculture  
HON. FRANKLIN K. LANE  
Secretary of the Interior  
HON. ASBURY F. LEVER, South Carolina  
United States Representative  
HON. THOMAS NELSON PAGE  
Ambassador to Italy  
GIPFORD PINCHOT, Pennsylvania  
MRS. FRANCES F. PRESTON, New Jersey  
FILIBERT ROTH, Michigan  
Dean of Forestry, University of Michigan  
DR. J. T. ROTHROCK, Pennsylvania

MRS. JOHN D. SHERMAN, Illinois  
Chairman Conservation Department  
General Federation of Women's Clubs  
HON. WM. H. TAFT, Connecticut  
Ex-President United States  
JOSEPH N. TEAL, Oregon  
Chairman Oregon Conservation Commission  
THEODORE N. VAIL  
President A. T. & T. Co., Vermont  
HON. JOHN WEEKS, Massachusetts  
United States Senator  
DR. ROBERT S. WOODWARD, Washington, D.C.  
President Carnegie Institution

### Treasurer

JOHN E. JENKS, Editor, Army and Navy Register, Washington, D. C.

### Executive Secretary

PERCIVAL S. RIDSDALE, 1410 H Street, N. W., Washington, D. C.

### Directors

E. T. ALLEN, Oregon  
Forester, Western For. and Conservation Asso.  
JOHN S. AMES, Massachusetts  
HON. ROBERT P. BASS, New Hampshire  
Ex-Governor of New Hampshire  
WM. B. GREELEY, District of Columbia  
Assistant U. S. Forester  
W. R. BROWN, New Hampshire  
Pres. New Hamp. Forestry Commission

HERMAN H. CHAPMAN, Connecticut  
Professor of Forestry, Yale Forest School  
DR. HENRY S. DRINKER, Pennsylvania  
President, Lehigh University  
ALFRED GASKILL  
State Forester, New Jersey  
JOHN E. JENKS, District of Columbia  
Editor, Army and Navy Register  
CHESTER W. LYMAN, New York  
International Paper Company

CHARLES LATHROP PACK, New Jersey  
Pres. Fifth National Conservation Congress  
CHARLES F. QUINCY, New York  
J. E. RHODES, Illinois  
Secretary, Southern Pine Association  
ERNEST A. STERLING, Illinois  
Forest and Timber Engineer  
J. B. WHITE, Missouri  
Ex-President, National Conservation Congress

## Declaration of Principles and Policy of The American Forestry Association

**IT IS A VOLUNTARY** organization for the inculcation and spread of a forest policy on a scale adequate for our economic needs, and any person is eligible for membership.

**IT IS INDEPENDENT**, has no official connection with any Federal or State department or policy, and is devoted to a public service conducive to national prosperity.

**IT ASSERTS THAT** forestry means the propagation and care of forests for the production of timber as a crop; protection of watersheds; utilization of non-agricultural soil; use of forests for public recreation.

**IT DECLARES THAT FORESTRY** is of immense importance to the people; that the census of 1913 shows our forests annually supply over one and a quarter billion dollars' worth of products; employ 735,000 people; pay \$367,000,000 in wages; cover 550,000,000 acres unsuited for agriculture; regulate the distribution of water; prevent erosion of lands; and are essential to the beauty of the country and the health of the nation.

**IT RECOGNIZES THAT** forestry is an industry limited by economic conditions; that private owners should be aided and encouraged by investigations, demonstrations, and educational work, since they cannot be expected to practice forestry at a financial loss; that Federal and State governments should undertake scientific forestry upon national and State forest reserves for the benefit of the public.

**IT WILL DEVOTE** its influence and educational facilities to the development of public thought and knowledge along these practical lines.

### It Will Support These Policies

**National and State Forests under Federal and State Ownership, administration and management respectively;** adequate appropriations for their care and management; Federal cooperation with the States, especially in forest fire protection.

**State Activity** by acquirement of forest lands; organization for fire protection; encouragement of forest planting by communal and private owners, non-political departmentally independent forest organization, with liberal appropriations for these purposes.

**Forest Fire Protection** by Federal, State and fire protective agencies, and its encouragement and extension, individually and by cooperation; without adequate fire protection all other measures for forest crop production will fail.

**Forest Planting** by Federal and State governments and long-lived corporations and acquirement of waste lands for this purpose; and also planting by private owners, where profitable, and encouragement of natural regeneration.

**Forest Taxation Reforms** removing unjust burdens from owners of growing timber.

**Closer Utilization** in logging and manufacturing without loss to owners; aid the lumbermen in achieving this.

**Cutting of Mature Timber** where and as the domestic market demands it, except on areas maintained for park or scenic purposes, and compensation of forest owners for loss suffered through protection of watersheds, or on behalf of any public interest.

**Equal Protection** to the lumber industry and to public interests in legislation affecting private timberland operations, recognizing that lumbering is as legitimate and necessary as the forests themselves.

**Classification** by experts of lands best suited for farming and those best suited for forestry; and liberal national and State appropriations for this work.

# AMERICAN FORESTRY

THE MAGAZINE OF THE AMERICAN FORESTRY ASSOCIATION

PERCIVAL SHELDON RIDSDALE, Editor

## EDITORIAL ADVISORY BOARD

HERMAN H. CHAPMAN  
ERNEST A. STERLING

S. T. DANA  
FREDERICK S. UNDERHILL

JOHN E. RHODES  
S. N. SPRING

MAY 1917 VOL. 23

## CONTENTS

No. 281

War, Lumber and Ships.....	261	The Forestry Guy—Poem by Arthur Chapman .....	289
A Million and More Food Gardens.....	263	Forestry for Boys and Girls—Some Forest History—By Bristow Adams.....	290
With eight illustrations.		Community Spirit Saved the Trees—By Gayne T. K. Norton..	292
Foresters for National Defense.....	268	With one illustration.	
The Fruit Trees of Picardy—Poem by Alice Gertrude Field....	269	An Epoch-Making Conference—By Herman H. Chapman.....	293
Timber Cruising in the Pacific Northwest—By Herman H. Chapman.....	270	South American Forest Resources .....	295
With six illustrations.		With six illustrations.	
The Vireos—By A. A. Allen, Ph.D. ....	272	Harmonizing Lumbering and Esthetics—By C. M. Granger...	299
With seven illustrations.		With four illustrations.	
A Forest Ranger Course for the Southern Appalachians.....	275	Pine Blister Disease Quarantines .....	302
With one illustration.		Editorial.....	304
The Oahu Rain Forest—By Vaughan MacCaughey .....	276	Cut-over Lands a National Problem.	
With five illustrations.		Shall the National Forests be Made Self-Supporting?	
Cascade Pass, Washington—An Illustration.....	279	A Victory for Efficiency and Economy.	
The Sugar Pine—Identification, Characteristics and Commercial Uses—By Samuel B. Detwiler .....	280	A Group of Low-Cost Country Houses—By Rawson Woodman Haddon.....	307
With eight illustrations.		With four illustrations.	
Daisies, Corn Cockle, Bugloss, and Other Summer Flowers—By Dr. R. W. Shufeldt .....	285	Canadian Department.....	314
With seven illustrations.		Book Reviews.....	315
		Current Literature .....	316

## SPECIAL OFFER TO MEMBERS ONLY

One of the following described books will be presented free of charge to any member of the American Forestry Association who secures ONE NEW subscribing member:

- No. 1—Field Book of American Trees and Shrubs, 465 pages, 275 illustrations of trees, leaves, blossoms, fruits, seeds, area of growth, etc.
- No. 2—Field Book of Wild Birds and Their Music, 262 pages, 38 colored and 15 other full-page illustrations.
- No. 3—Field Book of American Wild Flowers, 587 pages, 24 colored plates and 215 full-page illustrations.

### FILL OUT THIS BLANK

I present for Subscribing Membership in the American Forestry Association, including American Forestry Magazine, and enclose \$3.00 for the 1917 fee—

Name .....

Address ..... City .....

Send Book No.  to Name.....

Address..... City.....

\$2.00 of above fee is for American Forestry for One Year.

AMERICAN FORESTRY is published monthly by the American Forestry Association.

Subscription price without membership, three dollars per year; single copies, twenty-five cents.

Entered as second-class mail matter December 24, 1909, at the Post-office at Washington, under the Act of March 3, 1879

Copyright, 1917, by the American Forestry Association

# REAL ESTATE

FORESTS : ESTATES : TIMBERLANDS  
PRESERVES : FARMS : CAMPS : ETC.



## FOR RENT, CAMP AT "GRAND LAC STE. ANNE"

Saint Urbain, Charlevoix County, Quebec, P. Q.

45 miles northeast of Murray Bay, 15 square miles, with four lakes—splendid trout fishing. Camp on Island—contains 6 bedrooms, living-room, dining-room, laundry facilities, etc. Also three tents for outdoor sleeping accommodation. Fresh milk, chickens, eggs, potatoes—may be purchased from guide; other provisions supplied from Montreal. Reasonable rent for season—includes services of three guardians.

Full particulars from

WORTHINGTON WHITEHOUSE, Inc., Sole Agent, 9 East 46th Street, New York  
Telephone: Murray Hill 1000

**CAMPS** ST. REGIS LAKES  
THE SARANACS  
LAKE PLACID  
RAQUETTE, LOON, and LONG LAKES—Consult

### DURYEE & CO.

ADIRONDACK REAL ESTATE BROKERS  
SARANAC LAKE NEW YORK

## MURRAY BAY CANADA

Cottages and Camps  
For sale or for rent this season.  
For information on all properties write to

M. G. TOWNSEND  
297 LEXINGTON AVE. NEW YORK  
TEL. 2977 MURRAY HILL

## SOUTH CAROLINA TIMBER



RED OAK

Timber on a South Carolina plantation or entire plantation, on the Great Pee Dee River in Marlboro County. Now occupied and under cultivation. Dwelling house occupied by owner. Several new small houses rented to colored help, barn, small saw mill. 1,140 acres cleared. 3,200 acres timbered; 1,250 acres fine large old growth timber, 700 acres large second growth timber over 50 years old; balance mostly thrifty, large second growth timber. Growth of Gum Pine, etc., very rapid. Many very large White and Red Oaks, Yellow Pine, Cypress, Sycamore, Cottonwood, Holly, etc., as shown in accompanying photograph.

A careful estimate shows the following:

BOARDFEET	VARIETY
6,770,000	Sweet Gum
3,520,000	Yellow Pine
1,680,000	Red Oak
1,560,000	White Oak
1,000,000	White Ash
790,000	Hickory
680,000	Sycamore
670,000	Maple
560,000	Elm
460,000	Cottonwood
390,000	Black Gum
390,000	Cypress
100,000	Holly
60,000	Birch
30,000	Willow
250,000	Other species
18,910,000	Total

DESCRIPTION OF THIS AND MANY OTHER TIMBER PROPERTIES FOR SALE MAY BE OBTAINED ON APPLICATION TO

DONALD E. LAUDERBURN  
154 FIFTH AVENUE NEW YORK CITY

### BIDS WANTED

## TIMBER FOR SALE

Desirous of clearing tract of land for early farm development, same being located in Charleston and Berkeley counties, in South Carolina, about six miles from water at Bull's Bay and about nine miles from the Seaboard Air Line Railway. The Atlantic Coast Lumber Corporation is now building a logging road that will pass within about three miles of the tract. This tract has been estimated to cut 24,000,000 feet, about equal amounts long and short leaf pine, cypress and gum. Wish to sell the timber preparatory to land development.

A. G. BLOTCKY  
SPARTANBURG S. C.

## CORN CATTLE HOGS

Three-crop Corn Land  
Virgin Soil  
No Crop Failures

JOHN L. ROPER LUMBER CO.  
Norfolk, Va.

### BRITISH COLUMBIA TIMBER

Our knowledge of the timber resources of the Coast is based on 20 years' experience in the woods of British Columbia. We have never lost a dollar for a client on an investment. We will be pleased to bear from you if you are interested in British Columbia stumpage.

W. L. KEATE  
441 SEYMOUR ST. VANCOUVER, B. C.

### 10,000 Acres VIRGIN TIMBER and LAND

82 million, white and red oak, red and black gum, magnolia and cypress, one solid body, bordering 6 miles on Sabine River, near KCS Railroad, in Beauregard Parish, Louisiana. Price, \$185,000. Terms, also other tracts, write me.

A. P. LORENZ  
317 SOUTH SALCEDO ST., NEW ORLEANS, LA.

## PHILIP T. COOLIDGE FORESTER

Stetson Bldg., 31 Central Street, Bangor, Me.  
Management and Protection of Woodlands  
Improvement Cuttings, Planting, Timber  
Estimates and Maps. Surveying

### VERMONT TIMBERLAND

3,330 acres containing 7½ million feet Hardwoods, over 2 million feet Spruce, 250 thousand feet Hemlock, also saw mill, 8 miles from railroad, as much more additional timber available.

DONALD E. LAUDERBURN  
154 FIFTH AVENUE NEW YORK

### WANTED

SOFTWOOD STUMPAGE  
Large and Small Tracts

MEIGS PULPWOOD COMPANY  
10 EAST 43rd STREET NEW YORK CITY

## In the Heart of Crawford Notch WHITE MOUNTAINS, N. H. 500 Acres of Woodland Suitable for One Splendid Estate

or I would divide it into 4 or 5 estates (100-150 acres) each one with a particularly ideal site for the location of building a few smaller estates, each equally attractive as it offers 4 or 5 sites particularly suited for the location of buildings. State Highway runs through this land. Views of the Crawford Notch and entire Presidential Range. Many streams and springs.

Also a Small Farm in Crawford Notch, 15 acres of field and orchard with fine

spring (no buildings). It is on the state highway between Bemis and Bartlett. Has few acres of woodland. Easily developed. All of the above property is within 12 miles of Bretton Woods with its golf courses, etc. This is the only land for sale in the Crawford Notch and is a part of my large estate adjoining Crawford Notch State Park. Nowhere in New England is there better scenery or finer locations for country estates. For plans and terms, apply

CHAS. H. MOREY, BOX 25, BEMIS, N. H.

FORESTS : ESTATES : TIMBERLANDS  
PRESERVES : FARMS : CAMPS : ETC.

# REAL ESTATE

## SALE OF TIMBER FLATHEAD INDIAN RESERVATION

**SEALED BIDS MARKED OUTSIDE "BID Flathead Timber, Ronan Unit"** and addressed to Superintendent of the Flathead Indian School, Dixon, Montana, will be received until twelve o'clock noon, Mountain time, Tuesday, September 11, 1917, for the purchase of the merchantable timber upon tribal and allotted lands situated within Sections 4 and 5 T. 19 N., R. 19 W.; Sections 5, 6, 7, 8, 9, 10, 15, 16, 17, 18, 19, 20, 21, 22, 27, 28, 29, 32, 33, and 34 T. 20 N., R. 19 W.; Section 21, 22, 27, 32, 33, and 34, T. 21 N., R. 19 W.; Section 1 and Section 12 T. 20 N., R. 20 W. M. P. M. containing approximately 57,000,000 feet of timber, over 80 per cent Western Yellow Pine. Each bid shall state the amount per thousand feet B. M. offered for Yellow Pine (including "bull pine") and the amount per thousand feet offered for Fir, Larch and other species. Each bid must be submitted in triplicate and be accompanied by a certified check on a solvent national bank, drawn in favor of the Superintendent of the Flathead Indian School, in the amount of \$2500. The deposit will be returned if the bid is rejected, and retained as a forfeit if the bid is accepted and the bond and agreements required by the regulations are not furnished within 60 days from the date when the bid is accepted. No bid of less than \$3 per thousand feet for Yellow Pine and \$1.25 per thousand feet for Douglas Fir, Larch and other species will be accepted. The right to reject any and all bids is reserved. Copies of regulations and other information regarding the proposed sale including specific description of the sale area may be obtained from the Superintendent of the Flathead Indian School, Dixon, Montana.

Washington, D. C., May 4, 1917. CATO SELLS, Commissioner of Indian Affairs.

## TIMBER SALES, KLAMATH RESERVATION, OREGON

**SEALED BIDS WILL BE RECEIVED UNTIL** twelve o'clock noon, Pacific time, Thursday, May 31st, 1917, for the purchase of the timber upon three large tracts on the Klamath Indian Reservation in southern Oregon. Upon one tract containing two hundred and sixty million feet and upon another containing one hundred and seventy million feet, a minimum price of \$3.25 per thousand has been placed upon yellow and sugar pine, and upon the third tract of two hundred million feet, the minimum price for sugar and yellow pine has been made \$3.00 per thousand feet. The minimum for red fir is \$.75 and for white fir \$.50, but the cutting of these species is optional with the purchaser. The timber is nearly all yellow and sugar pine. The right to reject any and all bids is reserved. Full information may be obtained from the Superintendent of the Klamath Indian School, Klamath Agency, Oregon.

Washington, D. C., March 24th, 1917. CATO SELLS, Commissioner of Indian Affairs.

## BUSINESS FOR SALE

**AN OPPORTUNITY** for some rich man's son, in a profitable out of doors occupation. I will give three months of my time to teach the purchaser—renovating old orchards, tree surgery, spraying and moving large trees. Lots of orders on hand. Present owner is classed as one of the most expert in Massachusetts. Situated near 300,000 people. Included in the sale will be automobile and sprayers, tools and a great many books on forestry, etc. For further information address Box 400, care of AMERICAN FORESTRY.

## PENNSYLVANIA TIMBER TRACT

**FOR SALE**—3500 acres in Bedford and Huntingdon Counties, in fee reserving mineral rights, average haul to railroad. 2 miles or less, all down hill, 20 million feet Oak, Chestnut, Pine, Locust, Poplar, Maple, 15 miles from market for mine props and ties.

DONALD E. LAUDERBURN

154 FIFTH AVE. NEW YORK

## TIMBER CRUISING BOOKLETS

Biltmore Timber Tables. Including solution of problems in forest finance. Southern Timber Tables. How to estimate Southern Pine, Southern White Cedar, and Southern Appalachian Timber—Spruce pulpwood, Hemlock bark, Chestnut oak bark, Chestnut tannic acid wood.

Postpaid, 25 cents each

HOWARD R. KRINBILL

Forest Engineer Newbern, N. C.

## TIMBER TRACTS AND PRESERVES

Many tracts are suitable for timber investments; others are admirably adapted for game preserves. Some are suited for both. This department will provide a market-place for both commercial and sporting properties of value. All information, etc., from

ADVERTISING DEPARTMENT

2 WEST 45th STREET NEW YORK  
Tel. 4275 Vanderbilt



**I** OWN several well-timbered farms in the White Mountain region of New Hampshire commanding very beautiful views of lake and mountain and ideally situated for summer homes or fish and game preserves. I bought these primarily because of their scenic and timber values and to save them from ruthless denudation by portable saw mill operators. Most of them have trout brooks and some lake area within their boundaries. I will sell, to parties who wish to follow practical forestry methods in handling the timber growth, at prices representing but little more than the actual value of the standing timber. Most of them are located where large additional areas of growing timber can be secured at low cost. Also a forest tract of about 7,000 acres carrying 50 million feet of Birch, Maple, Beech, Ash and Poplar and 12 to 15 million feet of Spruce. Five small lakes and about three miles of shore on a large lake. Near railroad but secluded. No finer property in the East for fish and game club or forest preserve.

*For particulars address*

**E. BERTRAM PIKE**

PIKE, NEW HAMPSHIRE





## *You Can Insure Your Investment in Standing Timber*

*In timberland transactions a mistake is worse than a fire. In what other field than lumbering will you find men investing a half-million or a million dollars in raw material on a MERE GUESS as to what they are getting for the money? Yet how many lumbermen do you hear lament that a tract doesn't cut over two-thirds of what the "cruise" indicated?*

*A LACEY REPORT will INSURE you against that sort of thing. It is much more than a "cruise"—is, in fact, the nearest possible approach to modern scientific accuracy of actual knowledge—made under a system of notes, measurements, original volume tables and cross-checks which it has taken the LARGEST TIMBER FACTORS IN THE WORLD, James D. Lacey & Company, thirty-seven years to perfect.*

*The cost of the insurance afforded by a LACEY REPORT is scarcely a fair insurance premium on the values protected.*

*Send for Booklet, "Pointers."*

*James D. Lacey & Co.*  
INTERNATIONAL TIMBERLAND FACTORS  
EST. IN 1880

CHICAGO  
1750 McCormick Bldg.

SEATTLE  
626 Henry Bldg.

NEW ORLEANS  
1213 Whitney-Central Bldg.

# AMERICAN FORESTRY

VOL. XXIII

MAY 1917

NO. 281

## WAR, LUMBER AND SHIPS

**W**ITHIN the three weeks that followed the decree by Congress that a state of war exists with Germany, no industry has moved more quietly, sanely and orderly than the great lumber industry of the United States in its efforts to bring ultimate victory to America, her allies and democracy.

Hardly had the United States entered the war when Lloyd George delivered his famous address in which he declared: "The road to victory, the guaranty of victory, the absolute assurance of victory, has to be found in one word, ships, and a second word, ships, and a third word, ships."

Both the commissions to America, that of England headed by the Right Honorable Arthur James Balfour, and the French headed by Marshall Joffre and M. Viviani since their arrival in America, have stressed the need of ships even more than has Lloyd George.

This imperative need, President Wilson decided, must be met by the construction of wooden ships of about 3,000 tons each, with a speed of about 10 knots an hour in the peaceful lanes of the oceans and 12 knots in the areas where submarines ply.

Here is a big order to fill. Obviously big men had to be obtained for the task and big men have been obtained. These men are William Denman, of San Francisco, chairman of the United States Shipping Board; Raymond Stevens, of New Hampshire; John A. Donald, of New York; Captain James M. White, of Kansas City, Missouri; and Theodore Brent, of New Orleans. General George W. Goethals, builder of the Panama Canal, is to supervise the construction of the wooden merchant marine, and the big lumbermen of the country are aiding him in his gigantic task.

One of the first things Mr. Denman did when he got down to the business of executing plans for the fleet was to call in the lumbermen of America. He got immediately into touch with every man of consequence in the industry, and these men laid aside their private business and came forthwith to Washington to give the Government the advantage of their experience.

From the forests of the Pacific Coast and the Northwest will go to shipbuilding yards the best of the hardy Douglas fir, the South will supply its yellow pine, and Maine will contribute its hard pine, for conversion into bottoms to carry food, and, if necessary, men, to America's allies over the seas.

One of the big men whose advice is proving of inestimable value to the Government is Frederick A. Eustis of Boston. Mr. Eustis has volunteered his services to the Government during the duration of the war, and is re-

ceiving a salary of \$1 a year. He is an expert on the country's lumber supply, its transportation to the shipbuilding yards, and is supplying this vast technical knowledge for the benefit of the Government.

Captain John B. White, of Kansas City, Missouri, noted lumber conservationist, also gave up vast interests to let the Government have his time in this critical moment, and every member of the Shipping Board and the big lumbermen of the country have done likewise.

Mr. Eustis believes that wooden ships can be built at the rate of 200,000 tons a month, beginning October 1, without interfering with the construction of steel vessels. His idea is to build them of green wood as fast as it can be cut. Only the best wood will go to the shipbuilding yards and the cut-back will be used for the regular construction in which it has heretofore been applied.

Mr. Eustis also believes that within from fourteen to sixteen months America can have between 800 and 1,000 of these vessels. He has figured upon the highest degree of destruction by the submarine and is confident that the steel vessel supply of the Allies makes them safe for 10 months longer, after which time he is confident our output of wooden vessels can keep far ahead of the highest ship mortality rate the U-boats can inflict.

To give an idea of the supreme task ahead of Chairman Denman, Colonel Goethals and their associates, it is only necessary to remember that wooden shipbuilding is an art. The work must be done in shipbuilding yards at ports on either the east or west coasts or at Great Lake ports. The ships cannot be riveted together as steel ships are. There are known to be only 12,000 expert wooden shipbuilders in the United States and 150,000 are needed. Hence 130,000 men have to be mobilized and educated to do the work.

From one million to one-and-a-half million feet of lumber will be required for each vessel, yet surveys by the Government have shown that the amount of timber required for the ships will hardly make a dent in our great forests, only about 2 per cent of the total lumber supply being used.

The fixing of prices by agreement on the lumber to be sold to the Government has been one of the problems, among the first steps being an exchange of messages between the Southern Pine Association, and the committee on raw material of the National Defense Board. The lumbermen have agreed to throw all their efforts to the assistance of the Government, and to establish maximum and minimum prices for lumber to be used in such directions as barracks, shipbuilding, and other war necessities.

The work toward the building of wooden ships is progressing rapidly, and many keels are being laid, and many more are soon to be added to those now building. Oregon builders have already arranged to build forty wooden ships, and are preparing to turn out completed ships of 1,500 tons each in six months, and 3,000-ton vessels in eight months. Ten new shipbuilding plants may be located at Portland alone, with many others at Puget Sound and Gray's Harbor points. Similar contracts are being made on the Gulf Coast, and all along the Atlantic, with the Maine shipyards getting a new lease of life.

The big task is to get the men to build the ships. There will be seen in hundreds of American shipyards scenes not unlike those which once were common in Maine before the steel ship all but preëmpted the seas. That every shipbuilding yard in the United States will be running at full capacity, right up to the minute, when the German government is forced to its knees is fully realized.

The foresight of the men in the lumber industry in preparing for all eventualities months ago is proving of great aid to the shipping board. More than 900,000 men are engaged in the lumber trade, two and a third billion dollars are invested in it, and the most recent Government census showed that there are 49,738 lumber plants in the country. Since the great war's first guns were fired in August, 1914, lumbermen have been casting about to study the lumber markets of the world and to fill their orders.

Before the war Germany was the second greatest exporter of lumber in the world, being exceeded only by England and her colonies. German efficiency—the combination of manufacturing, shipping and banking interests—was responsible for this. When the Federal Reserve law was passed and national banks began taking on foreign branch banks the lumbermen saw their opportunity for expansion. Then came the war with the total elimination of Germany as a factor and the curtailment of English activity in foreign lumber sale.

So lumbermen of the United States began to get strongly in the market. In 1916 42,000,000,000 feet were cut, and then only one-third of the sawmill capacity of the country was used. With this fact in mind the shipping board knows that lumber for the wooden vessels can be supplied, the domestic trade cared for, and plenty left for export.

Coöperating with the Shipping Board to facilitate dealings between the Government and the producers is a committee of lumbermen composed of R. H. Downman, of New Orleans, president of the National Lumber Manufacturers' Association, chairman, Henry S. Graves, chief forester of the United States; D. O. Marion, South Carolina; E. T. Allen, Portland, Oregon; E. A. Selfridge, San Francisco; George B. Lewis, Holyoke, Massachusetts; W. M. Ritter, Welch, West Virginia; G. S. Long, Tacoma, Washington; Charles S. Keith, Kansas City; J. F. Gregory, Tacoma, Washington; C. H. Worcester, Chicago; W. H. Sullivan, Bogalusa, Louisiana; and W. R. Brown, Berlin, New Hampshire.

That the forests of the United States will not only furnish the lumber needed for the new ships but will also take care of the domestic demand and allow the sawmills of the country to accumulate a surplus for reconstruction

in Europe when the war is ended and without noticeably depleting these forests is the belief of this committee. In fact, it is known that there is an over-production of lumber to-day and its increased use is badly needed.

If the plans of the Shipping Board and the lumbermen are carried out there is little doubt that the object of the submarine campaign will be defeated. In the part the United States is to take in helping its allies to victory, nothing is of so much importance as helping to combat the European food-shortage, for food ranks ahead of men, money and munitions. Plenty of ships will not merely fend off the enemy, but will smite him down by assuring the transportation of the necessary supply of food.

Observers see in the efficient manner in which lumbermen have taken up the task to which the President of the United States has called them an impetus which will last long after peace is declared and as an outgrowth of this activity a large merchant marine to care for America's peace overseas trade and carrying out America's foreign trade ambitions.

But the big task right now is to supply ships. The Shipping Board has \$50,000,000 at its disposal immediately. It has the brains of the best lumbermen in America and these two agencies have set about determinedly to do the work assigned.

The standard ship, the Shipping Board announces, will be about 280 feet over all, with a 24-foot depth of hold and with two full decks, and will be capable of developing about 1,500 horsepower.

Bidders may propose to furnish completed ships or hulls only. Any firm desiring to submit proposals to build completed ships from their own plans may do so, but such plans will have to be approved by the Board's engineers.

Scores of shipbuilders have assured the Board that they will take contracts up to the limit of their capacity, and many of them at this writing have sent inquiries as to how soon specifications would be submitted and bids accepted. It is understood that some of the delay has been due to revisions made at the suggestion of the visiting war missions, particularly in regard to means of protecting the vessels from submarines. On that feature of the construction the naval consulting board also is giving advice.

To permit builders to make tentative plans, it was announced that the standard dimensions would be about as follows: Length between perpendiculars, 260 feet, over all, 280 feet; extreme beam, 46 feet; moulded depth, 26 feet; depth of hold, 24 feet; two full decks, forecastle, midship bridge house and poop and house on bridge for officers, power, steam; 1,500 horsepower, single or twin screws.

**SPRING** planting plans for the Pennsylvania State Forests, allotting 3,800,000 forest tree seedlings for this year's reforestation operations, have been approved by Commissioner of Forestry Robert S. Conklin. In addition to these trees for the State Forests, about 1,750,000 will be distributed free of charge to private individuals and corporations interested in reforestation. Almost 400,000 of these trees will be used by water companies in reforestation barren water-sheds upon which boroughs and cities depend for their water supply.

## A MILLION AND MORE FOOD GARDENS

**I**N order to "Do Its Bit" in answer to the call for the mobilization of the nation's resources in this war period, the American Forestry Association has decided to cooperate with the National Emergency Food Garden Commission. The work to be done is to secure the planting of a million and more food gardens. If successful, and there is every indication that it will be, this work will be of tremendous service in relieving the food deficiency and solving the vitally important problem of feeding the nation and helping the nation's allies. The earnest assistance of every member of the Association is requested.—THE EDITOR.

**H**OME gardens, small, inexpensive but abundantly productive, today are flourishing in every city, town and village in the United States. There are thousands upon thousands of them. Men and women, old and young; boys and girls, debutantes, college students and workers, are toiling in the army of "universal service" to the nation. Hoes and rakes, spades and sprays, hold equal honor with rifle and sword. Corporate wealth, the greatest industries of the land, the most eminent of statesmen, scholars and scientists have enlisted in the army of food producers. States and cities, with their legislatures and city councils, governors and mayors aiding, have responded to the home garden call. In truth, the virgin soil of the nation is being put to the greatest test in all history.

For two months the nation-wide campaign for the planting of a million and more vegetable gardens in back yards

and vacant lots, conducted by the National Emergency Food Garden Commission, of which Charles Lathrop Pack, president of the American Forestry Association, is president and which is working in cooperation with the Conservation Department of the Association, has been in full swing. In that period war between the United States and Germany has been declared, the country's resources mobilized, industrial and commercial conditions revolutionized and, through presidential proclamation and governmental plea, the people have been urged to aid in the production of food that this country may escape a food crisis such as has afflicted the war-torn nations of Europe. And the people have responded. The one great menace—the lack of food—was early appreciated, and while the Government sought to stimulate farm production, the National Emergency Food Garden Commission directed its attention to



HOME TOMATOES

This is not a view of a nursery, but one of the home gardens in Danville, Illinois, where home gardening is encouraged by the Civic Federation. The response of public-spirited societies to the appeal of the National Emergency Food Garden Commission this year is putting such gardens as this in hundreds of American municipalities. This is a patch of exceptional tomatoes, with clean and sturdy stalks, trim tops and heavy with fruit, and staked and cultivated with the precision of an expert florist. Yet a school boy did it.

city production, the organization of the city millions into a vast agricultural army for the creation of a million food gardens, and the campaign has assumed proportions beyond even the most sanguine expectation of President Paek and his colleagues.

Since President Paek inaugurated the garden campaign the heads of all the great Government departments have sent out warnings of a national food crisis. President Wilson, in his appeal to the united nation to undertake measures of conservation, dwelt with much force on the imperative necessity of home gardening. He pointed out that "every man, woman and child must help," that the "railroads must suffer no obstruction of any kind," and that "everyone who creates or cultivates a garden helps solve the problem of feeding the nations."

President Paek and his co-workers, men of eminent standing in the world of science and letters, had expressed views similar to those enunciated by the President. The Commission realized the significance of the crisis hovering over the nation,—realized that no matter what the yield of the farms, the great transportation systems of the country would be powerless to transport the products, and it was distinctly this view which found expression in President Wilson's appeal to the nation in its greatest hour of need.

Secretary of Agriculture David Houston, when reports from his field agents and statisticians poured in on him, was convinced of the menace which threatened the country. Prognostications from every source pointed to the danger of a failure of crops and consequently the failure of a nation to feed its people.

This situation was foreseen by the Commission, hence the urging, the pleading, and the imploration that the people as a whole turn to individual agricultural pursuits; that they convert back yards and vacant lots into vegetable gardens, and that those products be raised which might take the place of meat and other food

#### PRESIDENT WILSON'S CALL TO SERVICE

"**W**E must supply abundant food for ourselves and for our armies and our seamen, not only, but also for a large part of the nations with whom we have now made common cause, and in whose support and by whose sides we shall be fighting. \* \* \*

"The world's food reserves are low. Not only during the present emergency, but for some time after peace shall have come, both our own people and a large proportion of the people of Europe must rely upon the harvests in America. \* \* \*

"Let me suggest, also, that every one who creates or cultivates a garden helps, and helps greatly, to solve the problem of the feeding of the nations."

President Wilson's Proclamation, April 16, 1917.

products which the town and city dweller could not produce.

Such was the far vision of the Commission, and such was the beginning of a campaign which has spread from the Atlantic to the Pacific, and from Maine to the Gulf of Mexico. Governors of the biggest states in the Union, mayors of the most influential cities in the country (three hundred mayors assembled in New York during the past month for the specific purpose of discussing and devising ways and means of mastering the food situation), great railroads of the East and the West, the mightiest corporations and industrial institutions of the country, the most eminent men and women of the social and official sets of thousands of communities, have all taken up the campaign of garden planting. The corporations and industrial and commercial institutions have procured land for their employes to till, have shouldered the expenses, that the food problem might be met. The big railroads induced their employes and those living along their lines to plant gardens and raise vegetables. Garden clubs, like a tented city rising during the night, were organized in every community, and so the movement spread, like a prairie fire until President Paek and his colleagues were forced to send into the various states field organizers, men who were experts in agricultural fineness, who might unite the various forces and inspire hearty and friendly coöperation that the food producing gardens might be of real benefit.

Nearly two thousand newspapers now are using daily planting lessons which are sent out from the Washington

headquarters of the Commission. These lessons are supervised by experts from the Department of Agriculture, and tell how, when and what to plant, and what must be done to insure a full and healthy crop. In scores of cities and in hundreds of villages and towns gardens are flourishing, and already fresh vegetables are being gathered for the individual households. The tiny "farmlets" are saving families



THE FOOD GARDEN HARVEST

No, this is not the first prize table in the exposition building at the county fair. It is just a neighborhood exhibit in Gloucester, Massachusetts, to show that the back yards are as fertile as the best farms. Any market gardener would be proud of such squashes, such pumpkins, turnips, tomatoes, and beets as these. To stimulate the growing of tons of such crops this year on the idle lands of cities, the National Emergency Food Garden Commission is urging civic organizations to conduct gardening competitions with prizes for the best crops grown.



MAKING CITY SOIL PERFORM

Not a large patch, but look how it grows. This boy took first prize in his class (children over 13 years of age) in the city-wide gardening contest conducted by Portland, Oregon. Productivity per square yard rather than gross produce or profits was the test. Rich soil and an exceptionally good location—on a well-drained southern slope—aided his success, but what he did can be approximated by the amateur gardener anywhere in the United States. In the distance can be seen another contestant on a bottom-land garden.

considerable money, and are proving of inestimable value to the Government. The good the movement thus far has accomplished cannot be measured adequately, for those who have embraced the opportunities offered by the Commission are perhaps enthusiastically over-indulgent in their praise, while others report they cannot conceive how the city millions could have met food conditions had not the garden idea been implanted in the hearts and brains of the people.

When the White House issued the garden plea the employes of the Executive Mansion immediately began plans for a garden. The Department of Justice gave permission to till a plot of ground opposite the White House, and President Pack sent to Nelson Webster, ex-

ecutive officer at the White House, \$100 worth of seeds. Mrs. Wilson, and members of social Washington, announced that only a three-course meal would in the future be served at formal functions. Garden clubs throughout the city of Washington began a systematic recruiting of boys and girls and men and women who were able to shoulder

a hoe and rake. Prizes have been offered for the most productive garden, and this phase also is being given much consideration in other cities. In Washington the campaign receives enthusiastic support, for it is realized, perhaps, that all governmental or nationwide campaigns of any character must at least have some connection with the capital of the nation.

But the work of the Com-

#### PLANT A GARDEN NOW

**W**AR has now made the planting of food gardens an imperative obligation upon every American citizen who has access to land, no matter how restricted its area. The man, woman, or child who allows any soil fertility or available labor to go to waste this year deserves the opprobrium that goes to the military slacker. We are perhaps approaching the time when we must adopt meatless days either voluntarily or by governmental fiat. Let us see to it that the food substitutes for meat are produced independently of the farms by a great host of home gardeners. Because it is late in the season, do not neglect to plant a garden for that reason; prolific gardens may be seeded until July. Plant a garden now and help win the war.—CHARLES LATHROP PACK.

mission has just begun, President Paek explains. William C. Redfield, Secretary of the Department of Commerce, says that the whole world is short of food supplies and that the future of civilization is dependent upon the crops of 1917. The war has taken from the fields of Europe the men needed to till the soil, and the women, though valiantly struggling behind the plow with that imperishable fire of



WHAT GIRLS CAN DO

In Europe the farming is now being done largely by women who have taken the place of men now at the front. In America this year girls are doing a great part toward realizing the ambition of the National Emergency Food Garden Commission—2,000,000 town and city gardens to insure sufficient food. These Pittsburgh children agree that girls make as good gardeners as their brothers or parents.

patriotism burning in their breasts, are unable to produce the food necessary for millions of hungry, desperate men who battle because they are told to battle.

The truth of the matter is that hunger stalks abroad, armies waver, and nations are trembling at their very foundations. For without food, revolution comes, and with revolution comes chaos and death and destruction to all alike. Without grain and meat from this country, and ammunition and arms, these latter the product of food-fed men, the nations of Europe must perish. The world knows this, and seeks not to discount the truth. There are periods in history when truth towers above all chicanery and petty artifices of diplomatists. Such is the case today. Sophistry is giving way to humble truthfulness. The cry for food is "heard around the world."

The one great question which now confronts the people of this country is whether the Government can cope with a problem the magnitude of which never before has any nation contemplated. Food is the one dominating, all-powerful creative force which holds the destiny of the civilized world within its grasp. President Paek and his fellow members of the Commission feel that the farmer and rancher cannot alone supply food in sufficient quantity to feed this and the great nations of Europe, and that it is urgently necessary that the millions of individual city dwellers continue with undiminished vigor the home garden cultivation campaign. Unless this is done it is believed not only by President Paek and his colleagues but by the

Government itself that a shortage of food will result that will cause national, and, indeed, international suffering on the part of millions.

The Commission feels that every man and woman, boy and girl, should "do his bit." The schools soon will be closing for the summer period. Hundreds of thousands of youths and young girls who heretofore have indulged in baseball, tennis, golf and other forms of outdoor life, should cast aside such indulgences and rush to the aid of their country by mobilizing in the ranks of food-producing toilers. As Disraeli once said, "Old age is unknown to genius," and so the Commission repeats in its appeal to the men and women who are unable to aid their country other than through cultivation of gardens, "take up the hoe and rake and make America efficient." Old men, veterans of past conflicts, may well shoulder the spade, may well devise new methods of food production, for the time for "universal service" to mankind is at hand. Age is no limit, no barrier to achievement. Milton was 57 and



A NEIGHBORHOOD POTATO PATCH

The summer school vacation of three months was originally a rural institution, invented by farmers to give their sons time to help with the harvesting. When city schools fell heir to the vacation habit the problem arose of keeping the boys busy. The food garden largely solves the problem, and the boys like it. Potatoes take too much room for a small garden, so this street in a Massachusetts town has a community potato patch, cultivated largely by the children.

blind when he wrote "Paradise Lost," Dante was almost 70 when he composed his famous epic, Haydn produced his sublime "Creation" at 68, while Verdi was past 70 when he wrote the score of "Falstaff." Names of others might be multiplied indefinitely to prove conclusively that men and women only outlive their usefulness when they think their usefulness is past. The Commission points to these examples merely as an illustration for the guidance of those who because of age harbor the belief that they are incapacitated for "duty." For, says the Commission, "We are old only when we think ourselves old."

Back in 1902 Rudyard Kipling lashed his countrymen for their blindness in not being able to see that the future was preparing for them just the fate that did befall when the world-war broke out. In the poem which Kipling called "The Islanders," and which might almost as aptly have been written for the United States, he said; "Ye set your

leisure before their toil and your lusts above their need." Twenty millions of men have been withdrawn from production, and today three million women in England and more than four million in France have been drawn into employments hitherto monopolized by men. Why cannot the women in this country through the home garden perform the same patriotic service their sisters over the seas are offering up to their kindred sufferers?

Within the past month there gathered in this country for consultation leaders of the British, French and American peoples. Our allies at Yorktown, our enemies at Lexington are both in accord in the presence of a common enemy, and their common cause—the feeding of their embattling forces—perhaps was the most momentous topic of the deliberations. Food makes the sinews of war. Today the food yield is insufficient for the 100,000,000 who



SOME PRIZE GARDEN CABBAGES

This determined-looking young gardener is Cliff Morton, who has the distinction of being the best farmer in a certain fertile county in the West. The camera caught Cliff in the act of defying the world to raise better cabbages than his. His farm is an acre within the corporate limits of the town where he lives and goes to school. The National Emergency Food Garden Commission calls attention to the waste land on the outskirts of cities and towns which might be donated for the garden use of those who can cultivate larger spaces than the average hack yard.

populate the land; yet, this country not only is expected to feed itself but to provide food in abundance for its allies in arms. "Can this be done?" the world asks.

The National Emergency Food Garden Commission, which means President Pack and every single member thereof, feels that we are in this war, and we must win it. Victory in this war means ample FOOD SUPPLIES. An army is just as strong as its food supply, and not one bit stronger. Men who have not plenty to eat, cannot march and cannot dig trenches or fight. Our allies are pleading for food, but we have little food to spare and can only produce a surplus above our own necessities by the swiftest organization of labor and definite mobilization of an agricultural army on the firing line of the farms.

Thus with the winter crop of wheat a disappointment, with the wheat crop of the great northwestern states, called the "granary of the world," which soon will be

reaped, and which already is predicted a failure by Government experts; with Russia, the second largest producer of wheat in the world, with twelve million men under arms, barely able to produce enough to feed her millions; with England, France and Italy looking to this country for succor; with Argentina, upon which the consuming world has



OVER THE FENCE FROM THE FACTORY

The toiler who has hard work making his pay keep the family in food need not worry if he has a back yard as deep as these in South Bethlehem, Pennsylvania. The fence acts as a windbreak from the north, giving early maturity to plants. All these hack yards are cultivated as gardens this year. The National Emergency Food Garden Commission is trying to turn every hack yard of this sort into a vegetable garden.

long relied, placing an embargo on wheat and flour to protect her own people against the high cost of living; with the financial resources of all Europe almost exhausted; with the man resources of Europe failing the great war in truth has brought the whole world, neutral nations as well as belligerent, to the very verge of economic exhaustion.

The concrete situation before the American people today is this: What will be the result when the Government begins transferring our millions of stalwart laborers from the wheat fields to the battlefields? The calling out of the National Guard means a loss of 30,000 men to the agricultural states alone. What will it mean when the needs of the regular army and navy are supplied and universal training takes away from the farms the youth of our land? Shall we impoverish ourselves by this action?

The answer to this problematical situation, in the opinion of the National Emergency Food Garden Commission, and coincided in by the most important Government officials, from the Secretary of Agriculture down to his clerk-statistician, is home gardening. It is recognized that the agricultural yield of the farms must of necessity be utilized by the Government for military and industrial purposes, that the city millions then must endeavor to cope with the situation through individual effort, through the transforming of back yards, vacant lots and all untilled land into small productive vegetable gardens. In this man-

ner millions of dollars worth of food may be raised, the food yield of the nation thus becoming doubled, and the vast populations of the cities and towns and villages of the country will be self-supporting in a large measure. The movement already has gained much headway. Gardens by the thousands are flourishing, but gardens by the millions must spring up if the situation is to become permanently beneficial to a stricken world.

Aiding President Pack and Secretary Ridsdale in their efforts to assist the nation and the people to produce sufficient food are men of renown, including Luther Burbank, noted horticulturist, Dr. Charles W. Eliot, of Massachusetts, Dr.



A PRIZE CORN GROWER

The gardening ability of children is not overlooked in the campaign of the National Emergency Food Garden Commission for 2,000,000 home gardens this year. Children are the most numerous class who have much time to give to spade and hoe—but they are something more—they make splendid gardeners. Much of the leaven of better farming has been spread through many sections by the boys' corn clubs fostered by the Department of Agriculture. This is one of the prize winners—very proud of his crop.

Irving Fisher, of Yale, Fred H. Goff, of Ohio, John Hays Hammond, famous mining engineer, Fairfax Harrison, president of the Southern Railway, Hon. Myron T. Herrick, of Ohio, Dr. John Grier Hibben, president of Princeton, Emerson McMillin, of New York, Mrs. John Dickinson Sherman, of Chicago, Chairman, Conservation Department of the General Federation of Women's Clubs, A. W. Shaw, editor of *System*, of Chicago, Carl Vrooman, assistant Secretary of Agriculture, Capt. J. B. White, of the United States Shipping Board and a noted lumberman and conservationist, and Hon. James Wilson, former Secretary of Agriculture.

## FORESTERS FOR NATIONAL DEFENSE

**T**HE United States Forest Service is now bringing to bear every resource to assist the Council of National Defense and the military branches of the Government. "It is yet too early to give out details," stated Chief Forester Graves. "The Forest Service is, however, actively engaged along two broad lines—assisting the War Department through the use of our field forces in the protection of public property in regions remote from stations of the regular Army or the National Guard; and in coöperation with the Council of National Defense and its Advisory Committee on Lumber in the mobilization of forest supplies needed for the Army and Navy and the Shipping Board.

"Wood and wood products enter into the art of war to an astounding degree and to an extent hardly considered by the layman—for use in all manner of equipment, vehicles, airplanes and containers, for the manufacture of explosives, chemicals, surgical supplies and the like. Our problem is to marshal the great wood industries—lumber, hardwood specialties, naval stores, wood distillates, paper and pulp—to the end that the essential products of these organizations may be used to the highest advantage by the agencies charged with the prosecution of the war. In this work the Council of National Defense has secured active help and advice of prominent lumbermen who have in a very patriotic way volunteered their services."

The Executive Committee is composed of R. H. Downman of New Orleans, President of the National Lumber Manufacturers' Association; E. T. Allen of Portland, Oregon, Manager of the Western Forestry and Conservation Association; C. H. Worcester, of Chicago, President of the

Worcester Lumber Company; W. M. Ritter, of Welch, West Virginia, President of the Ritter Lumber Company; W. H. Sullivan, of Bogalusa, Louisiana, Manager, Great Southern Lumber Company and Henry S. Graves, Chief of the United States Forest Service. Other members of the Committees are D. O. Anderson, lumber manufacturer of Marion, South Carolina; E. A. Selfridge of San Francisco, President of the Redwood Manufacturers' Association; Geo. B. Lewis, lumber manufacturer of Holyoke, Massachusetts; G. S. Long of Tacoma, Washington, Manager, Weyerhaeuser Timber Company; W. E. Delaney, of Lexington, Kentucky, President, Kentucky Lumber Company; Charles S. Keith, of Kansas City, President of the Southern Pine Association; J. F. Gregory, of Tacoma, Washington, logger and lumber manufacturer, and W. R. Brown, of Berlin, New Hampshire, lumber and paper manufacturer.

Back of the census of the Government Forest Service men for war needs is a committee of professionals, members of the Society of American Foresters, named by the advisory council of that body for the purpose. Gifford Pinchot is chairman and associated with him are A. C. Ringland, Earle H. Clapp, and Herbert A. Smith of the Forest Service and Major George B. Ahern. E. T. Allen, forester for the Western Forestry and Conservation Association, is actively in charge of the gathering of information with regard to private and state foresters in his section.

Mobilization of the wood industries, as well as woodsmen, may well prove a very important work for experts in woods and the characteristics which fit them for certain special uses. A good many things—rifle stocks, saddle trees, supply wagons, planks for pontoons, wooden aero-

plane parts, and numerous other wooden articles—will be needed by our armies. The specifications must be drawn up, the proper woods selected, the proper methods and machinery for working them up chosen, and the actual work done. All this must be done quickly, and, to insure satisfactory results, must be supervised by experts.

An example shows how important a seemingly insignificant point may be. Early in the war a British buyer placed a contract here for more than a million rifles. Specifications called for seasoned walnut stocks. Such walnut could not be found, so the contractor turned to green walnut and began to make the rifles. But the green wood cracked and checked to such an extent that there was a ruinous loss of sixty per cent of the wood. It became imperative to kiln-dry the green walnut. The Forest Service expert was called in and by control of kiln conditions overcame the trouble and reduced the loss from sixty to one per cent. This Government will need hundreds of thousands of rifles. It will not even be able to secure green walnut, except at prohibitive cost. And so the new specifications will call, in all probability, for birch and before the birch can be used without excess waste there will be another problem for the Forest Service expert to solve. Similar problems will arise in the selection of suitable substitutes for the white pine planks, now unobtainable but since time immemorial considered the only wood for pontoons, and in supplying the demand for suitable woods in the manufacture of aeroplane propellers, now that the woods considered essential are becoming scarce to the point of exhaustion.

With the double purpose of best serving the nation's needs in the war and at the same time furnishing adequate protection for the forests of the West, the Western Forestry and Conservation Association has conducted a "Defense Census of Trained Woodsmen" among forestry men throughout that section. So simple and efficient has the plan proved itself that most of the state and private forest organizations throughout the country have taken it up. The result is that the nation has a splendid body of trained men ready to do the things which they can do best. Their abilities are not lost through random enlistment in military organizations not able to make the fullest use of them but are concentrated for special service, the demands of which they best meet.

With the dangers of the forest fire season directly ahead, it is also essential to know how many and what men will be available for forest protection work. Under certain circumstances forest organization men can be most useful where they are, not only in fire prevention but in guarding bridges, rail and telegraph lines and the like. In lumbering operations, particularly, are many foremen, engineers, woodsmen, and the like who are qualified for special service and who might be more needed in the woods than in a military organization.

The nature of their work places the majority of forest organization men ahead of the ordinary civilian in ability to care for themselves under adverse circumstances, to meet conditions with initiative, to handle men, horses, and supplies, and in other ways to give a good account of themselves under war conditions with the minimum of

officering and care such as must be given ordinary recruits. They also know much of organization and discipline. In addition to these fundamentals, most of them have special competence, if not in the accepted work of the soldier, in work no less necessary in military operations, such as mapping and reconnaissance, trail, bridge, and telephone building, signaling, scouting, packing, teaming, auto driving, use of fire arms, feeding and transporting men, etc. Many also have military experience. These qualifications make these men especially valuable.

## THE FRUIT TREES OF PICARDY

By Alice Gertrude Field

Last May they held you captive,  
Sweet orchard-trees of France,  
Like fearless eyes your buds unclosed  
On desperate mischance,  
Looking on strife and sick heart-break  
With gentle, steadfast glance.

The little dark-eyed children  
Looked up and smiled at you.  
Your gallant branches bloomed in grief,  
Like France, gay, brave and true.  
Cheered by your snowy burgeoning,  
Her sad folk hoped anew.

Today your ravished soil is free,  
Slight little trees of France.  
Your people keep glad festival  
With joyous circumstance,  
And you, dear comforters, should toss  
In rosy triumph—dance!

Your sacrifice was not in vain,  
Brave martyred trees of France,  
For your avenging countrymen  
Sweep on in stern advance,  
And through all time your sweet ghosts breathe  
A fragrant Vive la France!

A NEW use for wood has been developed in the making of canoes by a new system. The new idea is the stamping out of the finished canoe, from veneer, instead of the old-fashioned manner of building up a canoe from ribs of prepared wood, and the cutting of the thwarts and gunwales, and the covering of the whole with canvas.

THE New York State College of Forestry has taken up a new line of work, in the opening of a course to teach city forestry, along lines of city forestation on practical lines, arboriculture, park administration and landscape construction. Summer camp work is part of the course, to give the students training in the real out-of-door work of the forest. The forestry school has just issued a technical publication on the hardwood distillation industry in New York, to outline the work being done in this State, which is one of the leading states engaged in this industry. The latest practice in the industry is reviewed as part of the work of assisting in the further development of the industry.

# TIMBER CRUISING IN THE PACIFIC NORTHWEST

BY HERMAN H. CHAPMAN

**T**HE enormous size and great value of individual trees in the coast forests of Washington and Oregon have led to the adoption of careful, detailed methods of timber cruising. The old-time cruiser, who produced his results by methods as mysterious as those of the professor of legerdemain, is giving place to the man who has a definite system and does not care who knows it. Timber cruising does not differ from other kinds of inventories or stock taking, except that it is immensely more difficult to obtain accurate and consistent results except at considerable cost.

The fundamental requirement in large and valuable timber is a count which will show the exact number of trees of each species on a "forty." Cruisers who attempt to estimate timber of this character by any shorter method cannot hope to attain even reasonable accuracy.

An example of modern methods is a report sent to the writer by the St. Paul and Tacoma Lumber Company, prepared by their timber inspector, Charles A. Billings, of Olympia, Washington, covering a section or square mile of heavy timber near Everett, Washington. The method employed by



YOUNG DOUGLAS FIR

This timber is mature for cutting and the stand has not yet begun to deteriorate or open up. Cruiser Charles A. Billings in the foreground.



SEMI-MATURE DOUGLAS FIR

This timber is typical of that found in the Puget Sound Region of Washington.

Mr. Billings was to divide each forty-acre tract into sixteen squares of  $2\frac{1}{2}$  acres each. The center of each square plot was blazed with a cross and the plot numbered.

Then the cruiser counted every tree of merchantable size by the following classes: Douglas Fir, Young Douglas Fir, Red Cedar, Spruce, Hemlock, Cedar telephone poles, slow growth fir piling. For each of these classes, the average

diameter was arrived at, and the average merchantable length to nearest a 16-foot log. From these dimensions the contents of an average tree of this size was computed and the total stand determined in board feet by the Scribner Log Rule. These data were completed separately by species on each  $2\frac{1}{2}$ -acre plot, with sixteen plots per forty, and sixteen forties in a section. This requires separate estimates on 256 plots to cover a single section, or over 9000 plots on a township of 36 sections.

The cruiser also estimates the per cent of the stand which will yield logs of three grades, respectively: No. 1, "merchantable," and No. 2, logging conditions are noted, a sketch map is drawn showing



RED CEDAR

This species is the source of nearly all the famous red cedar shingles shipped from the West Coast.

topography, streams and 50-foot contours, and the stumpage value of the timber is arrived at by determining the cost of logging the tract, and the value of the logs at the mill.

The estimating of timber is far from being a mechanical undertaking. Concerning his methods, Mr. Billings says, "To be a successful estimator of timber in the Puget Sound country requires much experience in actually logging said timber. A person should have had experience in felling and sawing into proper log lengths and measuring same after the hearts have been exposed, and carefully examining all the different indications of defect which appear on the surface of the tree, and which can be detected only by a person having knowledge of said signs, which indicate the condition of the interior. I have had seventeen years' experience in estimating the standing timber and have been able to check my estimates with the actual cut on many thousands of acres. I have compiled a table of the contents of standing trees which have several butts based upon a butt measurement four feet above the ground and under the bark, from thousands of measurements of different trees having different lengths and tapers. All measurements were made upon windfall timber or trees felled and cut up or sawed into log lengths in the logging camps. The top diameter of the first 32-foot log in very large trees is generally reduced about 14 inches for the butt dimension. Taper on each log above may be as much as 6 inches.

"Nearly all the different stands of timber differ owing to soil, exposure and altitude. Some have much longer and smoother bodies with less taper and a greater per cent of No. 1 logs. All this must be determined by the estimator when on the work.

"I do not pretend to know all about the work. Ten years



**MORE YOUNG DOUGLAS FIR**  
In this dense stand the trees average about forty inches on butts, three feet above the ground.



**GIANT RED CEDAR**  
This tree is seven feet in diameter and is in a mixed stand with hemlock. Note typical undergrowth of brake.



**MATURED DOUGLAS FIR**  
Stands of this age begin to decline in vigor and are ultimately replaced by hemlock and cedar unless logged or burned.

ago I considered I knew more about it than I do now. I have since concluded that there is much yet to learn."

The character of the stands requiring this detailed estimate may be judged by the accompanying photographs, which were taken by Mr. Billings on the various plots. There was found to be a total stand of 41,611,000 board feet of timber on this one section, or an average of 65,000 feet per

acre, valued, on the stump, at \$92,974.20 on the basis of stumpage prices varying from \$3.00 per thousand feet for No. 1 fir logs, to 50 cents per thousand for hemlock.

Mr. Billings' work is an example of the highest type of skilled timber estimating in which the cruiser combines the system and routine employed by a technically trained forester with knowledge of the character and defects of the timber. This report and the accompanying photographs were obtained through the courtesy of Mr. E. G. Griggs, of Tacoma, a vice-president of the American Forestry Association.

# THE VIREOS

(Family Vireonidae)

BY A. A. ALLEN, PH.D.

ASSISTANT PROFESSOR OF ORNITHOLOGY, CORNELL UNIVERSITY

**M**AY is the month of migration. Ever since the last of February the birds have been moving northward, but it is not until this month that the flood-tide of bird migration passes over us. The early spring migrants are those that winter but a short distance south of their breeding range and have not far to travel, but the last of April and the first of May bring the birds that have been wintering in Central and South America. Wave after wave of bird life pours upon us; the woods and fields

The vireos do not come in a body by themselves but usually are mixed in with the flocks of warblers. They do not even come at the same time. The blue-headed vireo which winters in the Southern States is the first to arrive in the North; then come the warbling and yellow-throated species from Central America, while the red-eyed from South America is last to arrive.

The vireos are not brightly colored birds, but they wear greens, grays, and yellows in modest, pleasing combinations. Although not much larger than their brightly colored congeners, the warblers, they move about much more slowly, peering under leaves, examining crevices in the bark, or gleaning about the outer twigs in a thorough-going manner, usually singing as they go. Their larger heads and heavier bills likewise distinguish them.

With few exceptions the vireos are arboreal birds, fre-



A FEARLESS BLUE-HEADED VIREO ON ITS NEST

All of the vireos are confiding birds and will often allow one to stroke them while on the nest or even take worms from the hand like a pet canary.

are animated with a new influx of life; hedgerows and roadsides resound with song and demand our attention. We can step out into the open almost any cloudy evening, when the birds are flying low to escape the moisture-laden clouds, and hear their calls to one another as they wing their way northward under the protection of darkness. Some of them are flying high, others are flying so low that they barely skim the house-tops and a few ill-fated birds, confused by bright lights, dash themselves to death against tall buildings or become entangled in the meshes of telegraph wires.

The robins and bluebirds and blackbirds have been on their nesting grounds for nearly two months, many of the sparrows, the hawks, and the woodpeckers, have been common for some time, the ducks have come and gone, and now come the big flights of fly-catchers, warblers, orioles, thrushes, and vireos.



VIREO BUILDS FLOOR OVER COWBIRD'S EGG

Nest of a blue-headed vireo showing how a cowbird's egg was kept from hatching by having a floor built over it. The vireos suffer as much as any bird from the parasitism of the cowbird, but sometimes they circumvent disaster in this way.

quenting the shade trees of the city streets or small groves and wood lots, although they are not out of place even in the dense forests. They are almost entirely insectivorous, and to them, as much as to any other group of birds, is given the protection of the foliage. Leaf miners and leaf rollers, cankerworms, elm leaf beetles, gypsy and brown-tail caterpillars, and even the tent caterpillars are acceptable to them. In their seasons the berries of the elder and mulberry, wild cherries and even the hard blue berries of the Virginia creeper attract the vireos and make a welcome variation to the usual diet.

Vireos are great singers. They are singing when they come in the spring, and they continue to sing all summer, even after the exhausting moulting period has caused other

birds to cease. They sing under the hottest noonday sun when other birds are resting, and even on their way back to their winter homes, they indulge in snatches of their cheerful, measured music. Unlike the warblers, their songs are uniformly loud and musical, and though sometimes marred by a discordant chatter, they have a finesse unusual in bird music. Their songs, however, are simple, usually repeating the same phrase over and over with regular rests between each syllable. So measured is the time that it is rather easy to distinguish the songs of the common species by the rate of deliverance. The red-eyed vireo, for example, calls: "Look up"—1, 2, 3—"way up"—1, 2, 3—"tree top"—1, 2, 3, etc., while the yellow-throated vireo, which has a somewhat harsher song, delivers it more slowly: "Cherries"—1, 2, 3, 4, 5—"sweet cherries"—1, 2, 3, 4, 5, "have some," etc.

This method of singing has given them the name of "Preacher birds" and, as Wilson Flagg has well said of



#### BUT THE COWBIRD WAS PERSISTENT

The same nest containing two eggs of the vireo and two more of the cowbird. The cowbird's eggs are larger and heavily specked. These eggs were removed, but later another cowbird found the nest and the result is shown in the next photograph.

the red-eyed vireo, "his style of preaching is not declamation. Though constantly talking, he takes the part of a deliberate orator, who explains his subject in a few words and then makes a pause for his hearers to reflect upon it." The songs of the warbling and the white-eyed vireos are exceptional, for the former indulges in a single, long, musical warble, similar to the song of the purple finch, except that it has a rising inflection at the end, while the latter, being an excellent mimic, often combines the songs of other birds with his own, into an indescribable jumble of musical cadences.

The nests of vireos are basket-like structures hung in the forks of the smaller branches. They are built of strips of grape vine bark and fibers, such as the milkweed supplies, skilfully fastened together and bound in place by spider or tent caterpillar webs. One can be fairly certain of the species of the nest by its position in the tree or shrub.

The white-eyed vireo, for example, always builds its nest in berry bushes or tangled thickets within a few feet of the ground. The red-eyed vireos nest on the lowest branches of trees or in young saplings from five to ten feet from the ground. The warbling vireo builds high in a full-grown tree toward the tip of the branches, while the yellow-throated builds near the trunk or one of the main branches, hanging its nest in the fork of a small shoot. The eggs of vireos are always white with just a few specks of black about the larger end.



#### —AND THIS IS THE RESULT

The young cowbird now ready to leave the nest of the blue-headed vireo from which it has long since crowded the rightful young.

The whole vireo family is very commonly parasitized by the cowbird, a species of blackbird, which, like the European cuckoo, builds no nest of its own but always deposits its eggs in the nests of smaller birds. The cowbird's eggs are easily distinguished because they are larger and heavily specked with brown, but, in spite of the great dissimilarity, the vireo seems not to recognize the difference and never throws the egg from the nest. If, however, the cowbird deposits an egg before any of the vireo eggs have been laid, the vireo seems to realize the intrusion and will often build a floor over the cowbird's egg and thus prevent its hatching, or it may even desert its nest and build another. Apparently the vireos cannot count higher than one, and, while they recognize the difference between an empty nest and one containing an egg, they do not seem to differentiate between one egg and two, or between two and three.

If the cowbird's egg hatches it is seldom that even one of the young vireos reaches maturity, for the young cowbird quickly outstrips them and gets all the food, so that they are either starved to death or crowded from the nest. The vireo, however, is no less faithful to this changeling



A RED-EYED VIREO

This bird is repairing its nest during incubation. The vireos' nests are built of strips of bark and plant fibers skilfully woven together and bound into place by means of spider-webs and the webs of tent caterpillars. Here the bird is repairing its nest that has become loosened by swaying in the wind.

than to her own, in fact, she seems quite proud of her prodigy offspring and continues to answer its cries for food long after the cowbird is larger than its foster parent and should be caring for itself. The accompanying photograph of a blue-headed vireo's nest shows how the first cowbird's egg was buried in the bottom of the nest by the



A YELLOW-THROATED VIREO

This bird is stepping onto its nest in the fork of a chestnut tree about twenty feet from the ground. The yellow-throated vireo is a common bird of the shade trees, even along city streets, where its musical notes are heard much more often than the bird is seen. It hangs its cuplike nest in the fork of a small branch sprouting from one of the main limbs usually toward the center of the tree.

addition of a second floor. Later, after the vireo had deposited two eggs of her own, two more of the cowbird's eggs appeared. These I removed, but, nevertheless, when I returned about three weeks later, hoping to study a family of vireos, one young cowbird was all the vireos had to show for their labors. Still another cowbird's egg had been deposited in the interim and the ugly intruder here pictured had crowded the rightful young from the nest.

All of the vireos are trustful birds, seeming to have little fear of man. They sometimes nest on branches close to windows and often allow one to stroke them when on the nest.

The three commonest vireos are the warbling, red-eyed, and yellow-throated species. The first two resemble each other closely, being greenish above and pure white below. The red-eyed, however, has a grayer crown and a black line through its eye. The warbling vireo usually keeps to the tree tops, where its loud warbling song can be heard even in the heart of big cities, though the bird itself



Photo by G. C. Embury.

A WHITE-EYED VIREO AT ITS NEST

This vireo is an aberrant member of the family, nesting in thickets and berry bushes.

is seldom seen. There, likewise, it hangs its cuplike nest. The red-eyed vireo is more at home among the lower branches or even in the undergrowth of woodlands, although it, too, makes the best of city parks, where it has to consort with the warbling vireo on account of the lack of undergrowth. The yellow-throated vireo is easily distinguished from these two by its yellow throat and breast, resembling more some of the warblers. The blue-headed vireo and the less common Philadelphia vireo are more northern in their breeding range than the others, and prefer woodlands for their homes. The blue-headed species is quite distinct from any of the others with its bluish-gray head and white eye-ring, but the Philadelphia closely resembles the common red-eyed, even in its song. Its under parts, however, are lightly suffused with greenish-yellow, and its song is somewhat weaker and higher pitched. The eastern and southern white-eyed vireo and the Bell's vireo of the Middle West are aberrant members of the

family which frequent thickets and berry patches from which they scold at every passer-by in an amusingly impudent manner. The white-iris of the white-eyed vireo is quite distinct in the fields, indeed much more so than the red iris of the red-eyed species, and gives the bird a quizzical expression.

Several other species of vireos are found in the South

and in the West and their numbers increase through Mexico and Central America, reaching their maximum abundance in the tropics, where the majority of the one hundred or more species are found. Vireos are confined to the New World and find their nearest relatives either with the waxwings or the shrikes.

## A FOREST RANGER COURSE FOR THE SOUTHERN APPALACHIANS

**T**HE Lincoln Memorial University in the Cumberland Mountains at Harrogate, near Cumberland Gap, Tennessee, has lately organized under the guidance of Henry S. Graves, Forester of the United States, a department of forestry with the purpose in view of furnishing a training suitable to the needs of farmers and other owners of woodland; one which will equip boys as rangers in government, state, or private employ.

As a forest laboratory, in which the students will do their practical work, the University has secured a timber tract of 2080 acres extending along the picturesque Cumberland Mountains from Cumberland Gap, Tennessee, east into Virginia. This tract will offer many problems for the students to solve. At present the reserve contains many thousand feet of merchantable timber, a large part of which is mature and will be cut as soon as possible.

No attempt will be made to develop a type of forestry school comparable to those in Northern Universities. The course will cover one year of twelve months divided into four terms of three months each. Each term is made a unit in itself so that a student who may have to drop out of the course before its completion will have a definite knowledge about at least some one phase of the practical work which will be of use to him in securing a position.

The largest part of the instruction will be given in the forest or in connection with practical field problems. The course will cover the following subjects:

1. Elements of forestry; a class-room course, supplemented by field excursions designed to show the student the fundamental needs and purposes of forestry, the relation of forests to water resources, the effect of forest destruction, the benefits to a community in maintaining forests in a productive condition, etc.

2. Forest botany; an elementary course to acquaint the student with the different species of trees and shrubs occurring in the forest, and their distinguishing characteristics.

3. Elementary field surveying, designed to train the student in making simple land surveys by the use of an ordinary compass, in simple levelling, etc.

4. Forest protection, with emphasis on practical measures to protect forests from fire and depredations of insects.

5. Timber cruising and mapping; a practical course to train the student in determining the amount of standing timber on a tract, to appraise its value, and to record the information on maps.

6. Logging and scaling; a practical course in methods of logging and measuring the volume of logs.

7. Manufacturing and marketing of products; a course especially adapted to the conditions in the Southern Appalachians.

8. Silviculture; a course dealing with the methods of the care of woodlots, cutting timber in a way to secure natural reproduction, the making of thinnings to improve the stand, and practical reforestation.

9. Forest improvements; a course, principally in the field, in the construction of trails, telephone lines, and other improvements needed in forest protection, and elementary work in the construction of roads.

10. Elementary land law; a brief course designed to acquaint the student with the land system of the South and simple land law with particular reference to titles, transfers of property, contracts, etc.

The University is fortunate in being situated as it is among the mountains of northeastern Tennessee, since it draws upon a fine type of men, for forest work, men who are strong, active, used to the forests and mountains and know how to combine their hands and minds in solving the problems placed before them.



LINCOLN MEMORIAL INSTITUTE RANGERS

A group of the boys who are learning enough forestry to give them a working knowledge of the proper way to handle woodlands in connection with farms and also to make them eligible to places as forest rangers.

# THE OAHU RAIN FOREST

BY VAUGHAN MacCAUGHEY

**Y**OUR first view of the island of Oahu in the Hawaiian group is predestined to disappointment. During the lazy steamer week of tranquil blue Pacific you have indolently recalled all you ever read or heard of the alluring "South Seas." You picture the coral beaches, the langorous palms, the smiling forest against far purple peaks; surf lullaby and throbbing bird song; hospitable natives whose child-like pleasures and occupations sweetly link them to their bounteous and ever-smiling Nature Mother. Pleasant day dreams, these, for you are sailing to the isle of Paradise.

The last morning of the serene voyage dawns. As you are in your cabin, dressing, and packing your grips, a friend excitedly calls down to you. You rush on deck,—and in that shattering instant your iridescent dream-picture of tropic isle is irretrievably broken! You gaze at arid, weary, time-scarred headlands. A heavy surf beats relentlessly against the barren cliffs. The lonely shore is branded by melancholy sphinx-like craters and black dead lava flows. The bare soil is parched and red, as though burned and reburned in fierce plutonic furnaces. Where are your shimmering forests? Your sunny strands . . .

your friendly palms? Here are no signs of habitation, save the lonely lighthouse. It is a dead land—the volcanic fires have long been drawn, leaving to corrosive wind and water the demolition of its clinkered cinder heaps. And this is Paradise Isle!

The steamer, running slowly now, and standing well out from the surf-marked reef, rounds Diamond Head.

With delightful smoothness the panorama is metamorphosed by life and greenery. Now you look far back into magnificent sunny amphitheatres, hung with forest drapery, and scored by shining waterfalls. The valley floors are bright with the vivid green of the wet-land crops; their stately portals open onto the basking lowlands. Bold ridges separate these lovely vales and rise majestically to the cloud-capped mountains of the interior. Your sea-weary eyes are charmed by the rich and diversified green of the unbroken forest, that like a sumptuous tapestry drapes the mountains, ridges, and valley walls. This is Oahu's rain forest—this is the crowning scenic glory of the Purple Isles.

Before one can intelligently view this radiant mountain mantle one must know something of Oahu's volcanic history. This island is formed of two ancient crater masses—Waianāe and Koolau. Waianāe is much the older of the two and existed long before the Koolau Range rose up out of the sea. In that early period the Waianāes supported luxuriant forests, well-watered by abundant rain from the perpetual cloudcap. When the great Koolau volcano reared itself to the wind-

ward, it shut off from the Waianāes the rain-bearing trade winds. The Waianāes thus gradually lost most of their original forest cover; the Koolaus received very heavy precipitation, and were soon mantled by the beautiful humid forest.

My first trip into the Koolau Mountains elucidated the term "rain forest" and the relation of this forest to the zones of plant



DEEP IN THE RAIN FOREST

It is a dwarf forest appearing very rich when viewed from the lowlands but in reality made up of short, gnarled trees and tall, stout shrubs.



LOOKING TOWARDS THE SEA FROM A HIGH RIDGE

During the rainy season in the Rain Forest landslides are common. They usually start near the top of a slope and cut straight narrow wounds down through the forest blanket.

life that lie below it. Leaving Honolulu at early morn, our party of four men traversed the narrow lowland, with its wealth of exotic vegetation—banana plantations, papaia orchards, flooded rice and taro patches, guava thickets, algaroba groves. A half-hour's walk brought us to a grassy foothill—the seaward outpost of one of the long ridges that rise to the main summit of the range. The foothills are dry and hot, and are covered with an uninviting, stultified growth of coarse grasses, thorny lantana, prickly cactus, and other pugnacious weeds. These tough and dogged vagabonds have exterminated from Oahu's lowlands most of the indigenous vegetation.

When we reached the lower skirts of the forest we gave a shout of relief and sat down amidst the fragrant ginger beds in the cool moist shade of a *kukui* grove. The gray trunks, wide-spreading boughs, and shady domes of silver-green foliage were so soothing after the glare and sterility of the foothills that with reluctance we resumed the laborious climb. A few upward steps lifted us from the tranquil twilight of the trees into the brilliant sunshine that poured down upon the ridge trail. The comb of the ridge was very narrow, never exceeding a few feet in width, and dropped abruptly on either side into the deep valleys. The ridge itself was overgrown with bushes and stunted trees.

We were now in the rain forest, the fourth and uppermost of the plant zones that engirdle the mountains. It begins at an elevation of 1500 to 1800 feet, and extends to the ragged skyline of the Koolaus, which reach three thousand feet. The appropriateness of the term "rain forest" soon becomes evident to us. Although but mid-morning, the sunshine was at first deadened and then completely hidden by the dull gray fog that rolled down over the ridge. The cumulus clouds that an hour before



THE TAPESTRY FOREST

Deeply eroded ridges and gulches in the Rain Forest of Oahu Island. So steep are these luxuriously wooded slopes that they have aptly been termed "tapestry forests."

had dazzled us with their high effulgent whiteness, now settled lower and lower over the mountains, concealing the upper slopes and filling the air with wind-driven showers. The rain continued for so long a time that we finally halted and endeavored to find temporary shelter. This proved no easy undertaking, as the ridge trail was exposed to the full blast of the wind. The ground was thoroughly wet, and the rain seemed heavier under the scraggly, crook-armed trees than anywhere else.

We turned our backs against the cold, driving wind and scanned the long ridge that we had ascended. Its foothills were baking in the sunlight! The distant sea was blue and serene, the white beach line, the drowsy palms, the lowlands, were all drenched with sunshine! We, a few miles mountainward, were under the cloud-canopy of the rain forest, and the prey of every pouncing shower. We abandoned our original plan to ascend the summit,—now engulfed in clouds,—and returned to the *kukui* grove. Here we ate our very soggy sandwiches,

and in equally soggy shoes and clothing retraced our trail to the sunny lowlands of Honolulu.

This trip was our introduction to the chief factors in the formation of Oahu's forest mantle—abundant fog, frequent rains, temperatures much lower than those prevailing on the subtropic plains. The soil on the steep slopes and ridges is water-soaked throughout the year. The dense, squat, stunted woody mantle that maintains itself

under these strange conditions is itself perpetually humid. The rain forest occupies the region of maximum rainfall, and in this zone the annual precipitation is astounding, attaining a yearly average of several hundred inches.

The continuous humidity of the rain forest encourages a profuse undergrowth of ferns, mosses, liverworts, and other lowly plants. Trunks and branches are envel-



A RADIANT MOUNTAIN MANTLE

A densely wooded ridge in the Rain Forest zone, Oahu Island, elevation about 2200 feet. These forests from a distance look wonderfully rich, but the average height of the forest growth is well under thirty feet.

oped in dense layers of delicate, water-saturated vegetation. One may pull off a great handful of this material and wring a stream of water from it as one would wring a wet sponge. These clumps and festoons are veritable creations of the mist — beautiful translucent green, and exquisitely delicate in the form and texture of their foliage. Many of the epiphytic ferns are so small, fragile and translucent that they resemble large mosses rather than ferns.

The forest is composed of a considerable variety of short, gnarled trees and tall, stout shrubs. In stature it contrasts strikingly with the very tall tropical forests of such regions as the Amazons and Java. It is a dwarf forest, a stunted formation, appearing very rich when viewed from the lowlands, but under close inspection revealing all the ecologic earmarks of restrained development under relatively adverse conditions. The steep slopes which it covers; the thin, wet, humus-lacking soil; the comparatively low temperatures; the poor insulation due to prevailing fogs; the repressive influence of strong continuous winds; the endless repetition of landslides and reforestation, as the valleys relentlessly eat back into the mountains; all of these conditions have tended to prevent the growth of large trees. The average thickness, or height, of the Oahu forest blanket is well under thirty feet. This contrasts with the splendid *ohia lehua* forests on the island of Hawaii, which rise to a height of one hundred feet, many individual trees attaining one hundred and fifty feet.

In these forests there are absolutely none of the familiar continental trees, and none of Hawaii's indigenous trees occur upon the mainland. The old-time Hawaiians were good woodsmen, and had specific names for most of the trees; for example,—kukui, koa, lehua, hoawa, alani, hame, kawau, olomea, ohe-ohe, lapa-lapa,



FOREST TRAIL THROUGH A KUKUI GROVE

Note the shade and the beautiful undergrowth. Here the rainfall reaches the maximum, the annual precipitation is astounding, attaining a yearly average of several hundred inches.

pukeawe, lama, kopiko, etc. The forest canopy is a rich blending of greens of many hues, but these hues are its only wealth. In blossoms it is poverty-stricken. Like the tropical forests of many other regions, it is a flowerless forest. Not botanically flowerless, for of course every plant at its season puts forth flower and fruit, but flowerless in the artistic sense.

The flowers are, with few exceptions, small, greenish, inconspicuous, infrequent, scentless. One may clamber all day along the steep ridges of Oahu's rain forest, and see scarcely a dozen beautiful blossoms.

Many of the wooded slopes are exceedingly steep. These forested walls are so precipitous, and mask so many impassable cliffs, that the phrase "tapestry forest" correctly designates their aborescent drapery. One's first trips are made in momentary expectation of seeing the thickly wooded cliffsides drop down like a green garment, and expose the naked brown lava-body below. This very stripping off of the forest does occur, not in any spectacular manner, but intermittently here and there throughout the range. The slippery soil is a thin and easily-separated skin over the lava substratum from which it is decomposed. During the rainy season, when the whole range is water-soaked, landslides are common. They usually start near the top of a slope and cut straight narrow wounds down through the forest blanket. Sometimes a single hillside will be scarred by a dozen of these savage claw-marks; adjacent slopes may long remain unscathed. The scars vary in width from twenty to one hundred and fifty feet, and in length from several hundred to a thousand feet. They cut through to bed-rock, like a slash to the bone, and are therefore slow to heal. Little by little the mosses, ferns, and grasses creep over the raw rock, and finally, after many seasons, the moist forest closes above the ancient wound. Thus the perennial green tapestry mends its own rents, and so serenely beautifies the fire-built Pacific Islands.

ON parts of the Angeles National Forest in California the packrats are so abundant that many of the young pines planted by the Forest Service have been killed or injured by the rodents. The damage seems to take place chiefly in the late summer and fall and is more extensive in dry than in wet seasons. It is thought that the rats tear off the tender bark of the trees to obtain moisture at times when water is scarce.

RETURNS from 160 wood-pulp mills throughout the country, received in connection with the census of pulp-wood consumption and wood-pulp production being made by the Forest Service in cooperation with the Newsprint Manufacturers' Association, show that the reporting mills used in 1913, 419,000 cords of wood and had an output of approximately 2,229,000 tons of pulp.



CASCADE PASS, WASHINGTON

Cascade Pass, below Glacier Peak, Washington, is one of the most beautiful and awe-inspiring mountain sights in the Northwest. The peak is a rugged mountain mass, 10,436 feet above sea level, according to the United States Geological Survey, and the so-called "pass" is an eternal glacier, a great river of ice, moving slowly down its steep valley. The timber line creeps up to the very foot of the glacier, represented by majestic mountain spruce and sugar pines 100 and 150 feet in height. The melting ice from the glacier finds its way into the Wenatchee River which, miles further down, is utilized for the irrigation of the fertile valleys of the Evergreen State.

# THE SUGAR PINE

## IDENTIFICATION AND CHARACTERISTICS

BY SAMUEL B. DETWILER

THE "Man of Grass," as the Indians styled David Douglas, the intrepid English plant collector, discovered the Great Sugar Pine ninety years ago. These "truly grand" pines were too tall to climb, so the botanist used his gun to bring down several of the large cones for his collection. The fusillade quickly brought eight painted and well-armed Indians on the scene, who displayed unmistakable signs of hostility. Douglas modestly records the incident in his journal: "I came on an abundance of *Pinus lambertiana*. I put myself in possession of a great number of perfect cones, but circumstances obliged me to leave the ground hastily with only three—a party of eight Indians endeavored to destroy me."

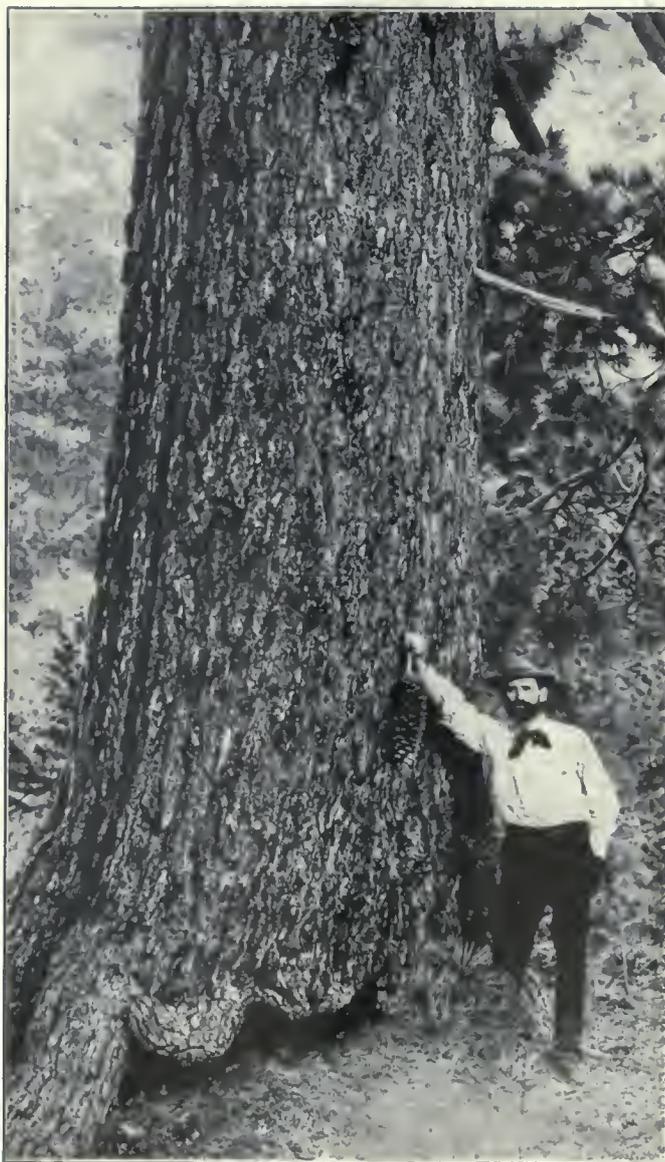
Douglas named this magnificent tree *Pinus lambertiana* in honor of his friend Doctor Lambert, a distinguished botanist and author of a noted work on pines. Forty-two years after Douglas' exciting discovery of this tree, John Muir, a man whom his friends loved to call "John o' the Mountains," made his first trip into the Sierras. He has left us a legacy of the most beautiful and vivid word pictures of our Western wonderlands. At a meeting of the Sierra Club, he gave the following account of his first acquaintance with "the Sun-tree of the Sierras":

"For the first time I saw the giants of the Sierra woods in all their glory. Sugar pines, more than 200 feet high, with their long arms outspread over the spiry silver firs and the yellow pine, libocedrus and Douglas spruce. . . . The sugar pine seemed to me the priest of the woods, ever addressing the surrounding trees—everybody that has ears to hear—and blessing them. Few are

altogether deaf to the preaching of pine trees. Their sermons on the mountains go to our hearts; and if people in general could be got into the woods, even for once, to hear the trees speak for themselves, all difficulties in the way of forest preservation would vanish."

The extreme geographical range of the sugar pine covers a narrow strip about 1000 miles long, extending from Marion county in western Oregon, through the Sierra and Coast Ranges of California to Mount San Pedro in lower California. While it is not entirely a California tree, like the Big Tree, the Golden State contains the

principal wealth of sugar pine. Of the three most important lumber-producing trees of California, sugar pine ranks below redwood and western yellow pine in quantity of standing timber and annual output of lumber, but in money value it holds first place. The amount of standing sugar pine timber of commercial value as reported by the Forest Service is about three billion feet in southwestern Oregon and thirty-nine billion feet in California. While there is a large amount of sugar pine in the forests of the Coast Range north of San Francisco, the great bulk of the timber is found in the Sierra Nevada Mountains. The largest individual trees and finest bodies of sugar pine are found on the western slopes of the Sierra Nevada Mountains from Tulare to Eldorado counties, California. The Sierra forests are noted the world over for their variety and magnificence. Helen Hunt Jackson has given us a beautiful description of her first impression of this wonderful region: She says: "Now we began to climb and to enter upon forests—pines and firs and cedars. It seemed as if the whole



A GIANT SUGAR PINE IN THE ANGELES NATIONAL FOREST, CALIFORNIA

This is a splendid specimen, six feet in diameter, and is typical of the tree at its best. It shows very clearly the characteristic bark, deeply and irregularly furrowed into long, narrow plates, as well as the huge cone, by which the sugar pine may be instantly identified.

world had become forest, we could see off so far through the vistas between the tall, straight, branchless trunks. The great sugar pines were from one hundred to two hundred and twenty feet high, and their lowest branches were sixty to eighty feet from the ground. The cedars and firs and yellow pines were not much shorter.



VETERAN SUGAR PINE NEAR PROSPECT, OREGON

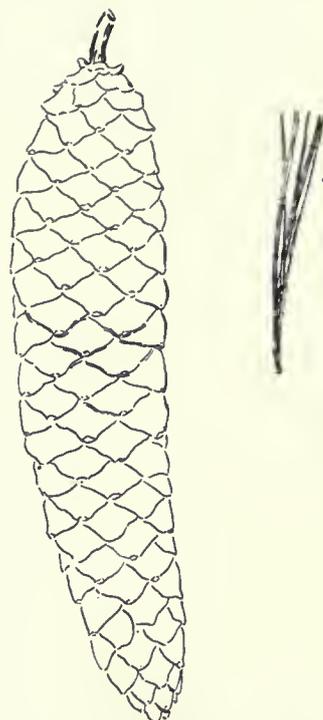
A giant sugar pine, seven feet ten inches in diameter at breast height, growing in the Crater National Forest, Oregon. The clear, straight trunk is characteristic of sugar pines, and is one of the reasons why this species ranks as the most valuable timber tree of the Pacific Coast.

The grandeur of these innumerable colonnades cannot be conceived. It can hardly be realized, even while they are majestically opening, receding, closing, in your very sight. Sometimes a sunbeam will strike on a point so many rods away, down one of these dark aisles, that it is impossible to believe it sunlight at all. Sometimes, through a break in the tree-tops, will gleam snowy peaks of Sierras, hundreds of miles away; but the path to their summits will seem to lead straight through these columns of vivid green. Perspective becomes transfig-

uration, miracle when it deals with such distance, such color and such giant size. It would not have astonished me at any moment, as I gazed reverently out into these measureless cloisters, to have seen beings of Titanic stature moving slowly along, chanting service and swinging incense in some supernatural worship."

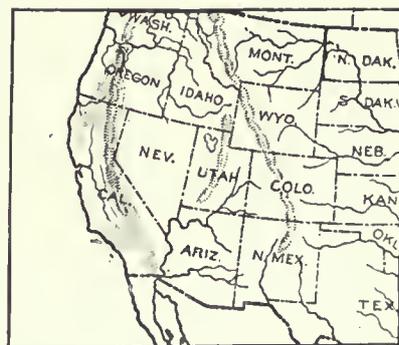
Sugar pine is the tallest and largest of all the pines. It sometimes grows to a height of 240 feet with a breast-height diameter of 11 feet. The average sugar pine is 175 feet high and  $4\frac{1}{2}$  feet in diameter. The mature trees have straight, cylindrical trunks and frequently are clear of branches for 50 to 80 feet. Young trees have a tapering stem, and the branches develop in whorls of five, so that at first the trees, although graceful and flexible, have the regular, spire-like outline of most young conifers. Old patriarchs resemble the old white pine trees of our Eastern forests in developing a marked individuality of form. The tops become flattened and often develop more on one side than the other because of the constant pressure of the prevailing winds. Here and there great branches feathered with short, pliant tassellike twigs, reach out at nearly right angles to the trunk, sometimes to a distance of 30 to 40 feet. The title "Priest of Pines" is appropriate for this tree whose giant plumes, aloft upon their mighty shafts, are most suggestive of sublime beauty and tranquility.

The bark of young trees is thin, smooth and ash-gray in color. Later the bark is thick, deeply and irregularly furrowed into long, narrow plates. The old bark is of an attractive purplish hue which becomes red-brown where the wind blows away the small scales on the surface of the bark. Sugar pine is a member of the white pine group, hence the needle-shaped leaves occur in clusters of five, en-



CONE AND NEEDLES OF THE SUGAR PINE

It requires two years for the seed of the sugar pine to mature, and when fully developed the cones are of startling size—sometimes nearly two feet long, the average length being from 12 to 18 inches. The needles are dark green, stout and stiff and from  $2\frac{1}{2}$  to 4 inches long.



AREA OF SUGAR PINE GROWTH

California contains the principal wealth of sugar pine, although commercial stands are found in southwestern Oregon. The extreme geographic range of sugar pine is shown in the outline. The great bulk of the timber is found on the western slopes of the Sierra Nevada Mountains, especially from Tulare to Eldorado Counties, California.

closed at the base in a paper sheath. The dark green needles are  $2\frac{1}{2}$  to 4 inches long, stout and stiff. Sugar pine received its name from the resin that exudes from the bark. When it is injured, white, crisp globules are formed which are palatable and sweet to the taste, but which should be eaten in limited quantities.

Early in the spring the light yellow pollen-bearing flowers add a touch of brighter color to the dark foliage. These flowers are one-half inch to an inch long, borne in clusters on the young twigs. The cone-producing flowers are light green, appearing two or more together at the tips of the branches. It requires two years for the seed to mature, and when fully developed the cones are of startling size — sometimes nearly 2 feet long, and with an average length of 12 to 18 inches. Drooping from the extreme ends of the branches, the young green cones resemble the weights of a Swiss clock. When the scales expand to permit the seeds to disperse, the trees resemble huge Christmas trees strikingly decorated with shining brown cone ornaments, making it easy to recognize this tree from near or far. The cones contain 200 to 400 dark brown seeds nearly as large as grains of corn, but plump and containing an edible kernel that is relished by human beings as well as an army of squirrels. The seeds have a short and very broad wing attached to one end. The seed is seldom carried by the wind to a greater distance than the height of the tree.

Sugar pine has a strong, widespreading root system, and is not often uprooted by wind storms. As with other forest trees, forest fires, grazing animals, snow and other agencies at times cause serious damage to sugar pines. Insects an-

nally destroy large quantities of merchantable sugar pine timber, the principal losses being due to several kinds of bark borers. At present the damage caused by fungi is of minor importance, but since sugar pine is one of the hosts of the white pine blister disease, there is a possibility that this destructive parasite may be introduced into the West from the eastern white pine region and cause great loss.

Sugar pine is usually found growing with western yellow pine, or Douglas fir, and white fir, and less important species, such as incense cedar and Jeffrey pine.

Its best growth is where the annual rainfall is 40 inches or more. It has been found growing at an altitude as low as 600 feet above sea level and as high as 11,000 feet. The merchantable stands are found at altitudes of 3,000 to 6,000 feet in the northern Sierras, and from 5,000 to 9,000 feet in the southern Sierras. Young sugar pines require partial shade, but as they mature they demand an increasing amount of light. Rapid growth depends on an adequate supply of moisture in the soil and air. The tree grows on many kinds of soils but avoids hot and dry slopes or wet and poorly-drained situations, and prefers moist, loose, deep sandy loam.

Sugar pine grows most rapidly between the ages of 80 and 100 years. In the virgin forest the average size of a 100-year old tree is 18 inches in diameter, breast height, and 90 feet high. Because of the dense shade, growth in virgin forest is very slow during the first half century. The average height of a 40-year-old tree is only about 5 feet, as determined by numerous measurements made by the Forest Service. Occasionally sugar pines live to be 600 years old, but most of them do not live beyond 500 years.



SUGAR PINES (*PINUS LAMBERTIANA*) NEAR STRAWBERRY, CALIFORNIA

Two sugar pine trees growing in the Stanislaus National Forest, California. Sugar pine belongs to the white pine group, having five leaves in a cluster. In addition to its high commercial value, it is a very beautiful tree. It is gratifying that the Federal Government has declared a quarantine against shipments of white pine, currant and gooseberry nursery stock from the eastern white pine region, to prevent the introduction of the white pine blister disease into the sugar pine forests.

At intervals of 3 to 5 years, middle-aged trees produce a fairly abundant crop of seed, but owing to the large amount of seed eaten by birds, squirrels and other rodents, poor germination and injury to small seedlings by fire, drought, and strong sunlight, there is usually a lack of

native young growth of sugar pine. Planting experiments so far have not been entirely successful. Sugar pine can be grown in Europe and in the eastern United States, but its development is slower and less satisfactory than that of our eastern white pine grown under the same conditions.

### COMMERCIAL USES OF SUGAR PINE

**T**HE wood of sugar pine is very similar to that of eastern white pine and has practically the same qualities and uses. The sap wood is white or yellowish white and the heart wood light brown, in some cases tinged with red. Like eastern white pine, one of its most prominent characteristics is that it shrinks, swells and warps but little under varying moisture conditions, is easily worked with tools and is not likely to split when nailed. Smooth and rather fine in texture, it has a beauti-

of the trunks were used and thus thousands of feet of excellent saw timber were left to rot in the woods. The shake maker seldom bought the timber, but cut the sugar pines wherever he chose. At the present time shake making survives only in the remote sections where the portable shingle mill has not found its way, or where dead pines are far from the sawmills and must be utilized in this way to secure part of their value.

Close similarity of the wood to that of the eastern white pine has enabled sugar pine to enter markets which the eastern species can no longer supply. Foreign markets for this lumber have also been developed in recent years.



LOADING CREW AND MICHIGAN WHEELS IN USE IN CALIFORNIA

On land not too steep and rough, sugar pine logs are brought to the railroad by means of big wheels. This photograph shows the stiff-tongue or Michigan logging wheel, delivering a sugar pine log at the landing.



HUGE SUGAR PINE LOG ON SLIDEWAY

Five and one-half foot sugar pine log going down slideaway, Sierra National Forest, California. The log-chute is made of straight logs, 50 or 60 feet long laid in two parallel rows, about 5 inches apart. The inner surfaces are hewed off and greased. If the grade is over 30 per cent and the logs are greased, they slide of their own accord, otherwise, horses or donkey engines pull them to the mill. The chutes from the woods to the sawmill are often  $1\frac{1}{2}$  to 2 miles in length.

ful light satiny luster when finished. It is resinous and has a pleasing fragrance and does not impart a contaminating flavor to food materials brought into contact with it. It is also fairly durable in contact with the soil.

Sugar pine lumber first came into use shortly after the discovery of gold in California. At first the demand was principally for "shakes" or split shingles which were used not only for roofs but also the sides of cabins. With the need for more pretentious buildings the business of sawing sugar pine lumber developed. Shake making is still practiced in California, and, although belonging to a disappearing tribe, the shake maker is as well known and as picturesque a character as the prospector. The average size of a roof shake is 6 inches wide, 32 inches long and one-fourth inch thick. The first requisite in splitting shakes from sugar pine logs is straightness of grain. Many splendid pines, 5 feet or more in diameter, were felled and then discarded by the shake maker because the splitting properties were poor. Of the best trees, only 20 to 50 feet

On the Pacific Coast sugar pine is used in the manufacture of high grade products for which white pine has been the standard in the eastern United States. The latest and most complete information on sugar pine is contained in a recent publication of the Forest Service,\* from which the following account is quoted as furnishing the most accurate data:

"With the advent of the sawmill in California, the more accessible stands of sugar pine were eagerly sought by the lumbermen because of the superior quality of the lumber. Its durability, lightness, and softness as compared with other available woods led to its use for shakes,

\* Bulletin No. 426, United States Department of Agriculture.

flumes, sluice boxes, bridges, houses, barns, fences, and numerous other purposes. Shingle manufacture has to some extent replaced shake making. The early demand created by the fruit industry for trays and boxes was met largely by the sugar-pine mills. With increased use prices were stimulated, good grades increased in value, and the lower grades were utilized in box making. Because of its



TIMBER FALLERS AT WORK ON A BIG SUGAR PINE IN SISKIYOU COUNTY, CALIFORNIA

The beginning of the end of a sugar pine tree. The "fallers" have cut away the thick bark and undercut the trunk in the direction it is to fall, and they are ready to use the ten-foot cross-cut saw to bring the giant to earth. Additional men are needed to cut the trees into logs. Ordinarily such a crew will cut 35,000 feet to 150,000 feet B.M. of logs in a day, or enough to keep a fair-sized sawmill busy.

color, lightness, and freedom from taste and odor, sugar pine has remained a favorite with raisin packers. Some mills work a portion of their output into raisin trays, some specialize in raisin boxes, and nearly all utilize their poorer grades for box shooks or dispose of them to box makers. About 65,000,000 feet are used in California in bridge construction, sluicing, dimension stock, and general building material.

"Because of its straightness, softness, freedom from warping and shrinkage, splendid service when exposed to weather, and fine finishing qualities, sugar pine is a very important wood in the manufacture of special order sash, doors, and blinds, decks of boats, and general millwork. These same qualities make it valuable for frames and stairwork. For pattern and model making, which require woods easily worked, glued, and nailed, it is a close second to white pine. Fixture manufacturers use it for altars, beading, show cases, counters, veneer cores, shelving, and drawers. Freedom from taste and odor makes it especially valuable for druggists' drawers, for compartments for spices, coffee, tea, rice, sugar, and other provisions, and for shelving. Furniture manufacturers turn it into backing, built-in dressers, sideboards, carved work, core stock, table frames, and tops. Tanks, hot-grease vats, troughs,

and water boxes, requiring freedom from taste and permanence, are frequently made of this wood. Its lightness recommends its use for special trunks and sample cases. Its straight grain and permanence give it a place in the manufacture of piano and pipe organ keys and actions, and player pianos; and the same qualities, together with lightness, place it among the best woods for drawing boards and extension level rods.

"Large quantities are used by planing mills in the manufacture of cut siding, interior finish, and moldings. It takes readily the finest enamel finish.

"In addition to the above, sugar pine is used for drain-boards, elevator floors, brushes (brush blocks), apiary supplies, machine parts, saddles (saddle trees), shade and map rollers, wood carvings of all kinds, oars, slaek cooperage, woodenware, bakers' work boards and troughs, dresser brackets, and small turnings and feneing. A large quantity is made into matches."

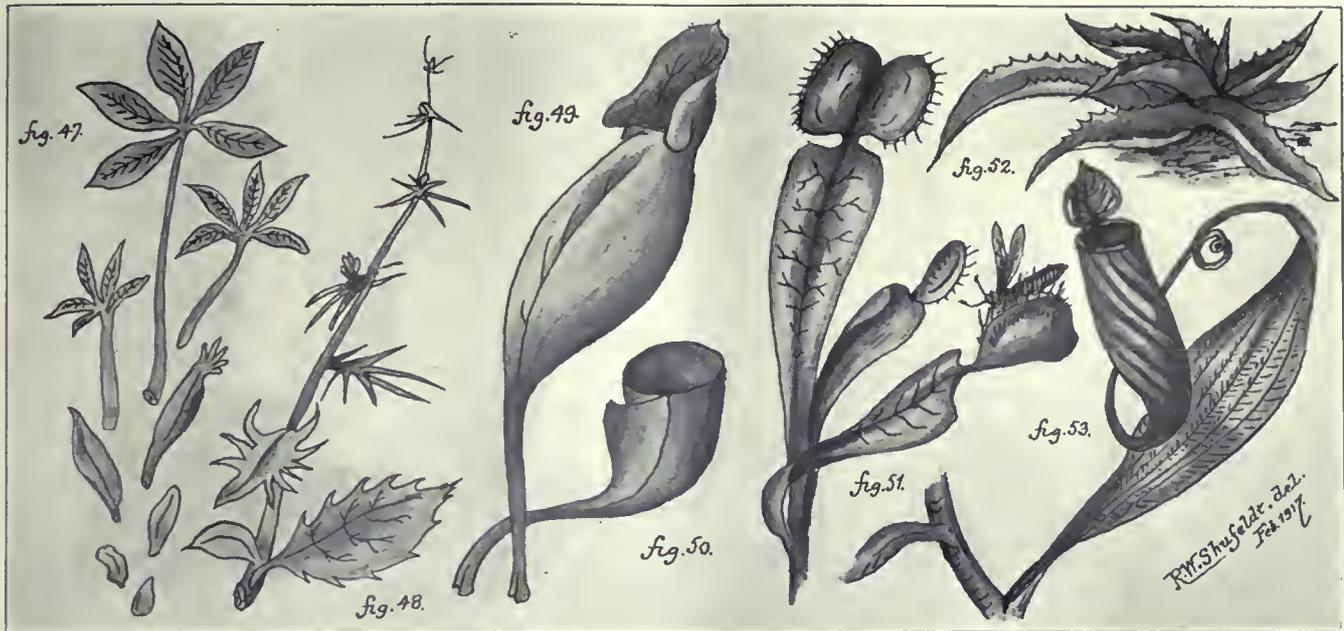
Sugar pine sells for \$1.25 to \$4 per thousand feet B. M. "on the stump," depending on the location of the timber and other factors. The average cost of cutting the logs and transporting them to the sawmill is estimated to be about \$5.50, and the cost of manufacturing amounts to about \$3.50 per thousand feet. The average price of sugar pine lumber at various California sawmills ranged from \$21 to \$24 per thousand feet in 1912.

In logging sugar pine on fairly smooth or level land, the lumbermen sometimes make use of pairs of huge wheels, 10 to 12 feet in diameter. The logs are chained to the axle of the wheels and one end raised above ground. They are then pulled by horses to the log chute, railroad or flume. The usual procedure in logging sugar pine, however, is to employ steam donkey engines or "yarders." Steel cables are run out and the logs pulled in from distances ranging up to 2000 feet. Logging railroads are used to carry the logs to the mills whenever possible and the yarders are located along the railroad.

#### FORESTRY MEETING AT PITTSBURGH

THE Chamber of Commerce of Pittsburgh, well-known as a progressive and business-like body, with a habit of initiating and carrying through to successful completion movements of value to the public, is arranging for a convention of forestry interests to be held at Pittsburgh in June commencing on Thursday, June 21st and continuing through the 23rd.

Pittsburgh will afford an excellent central meeting place for forestry organizations from the East, South, and Middle West, and cordial invitations are being sent out by the Chamber of Commerce to State Forestry Departments, and to National and State Forestry organizations, to join in the Conference. The meetings for the reading and discussion of papers will be held in the commodious assembly hall of the Chamber of Commerce, and excursions to points of interest in the vicinity are contemplated. Well ordered local arrangements are being made to minister to and promote the comfort and pleasure of those attending, and the proposed gathering is commended to all persons engaged or interested in forestry and its promotion.



THE ILLUSTRATED GLOSSARY—TRANSFORMED OR SPECIAL FORMS OF LEAVES

Figure 47. Leaves are transformed in many ways, as the scales that cover huds may, in developing, become true leaves. One of the best examples of this is the Low Sweet Buckeye of the South, shown in the figure, where the passage from mere bud-scales to a perfect, palmate leaf of five leaflets is shown; or, leaves may pass into spines, a good example of which is furnished by the summer shoot of the Barberry (Fig. 48). As already shown, tendrils are likewise transformed leaves. The Common Pitcher Plant has the leaves modified to form a curious "pitcher" (*Sarracenia*), Fig. 49,—one being seen cut across in Fig. 50. It is also called the Side-saddle Flower, or Huntsman's Cup. Most extra-

ordinary of all is the famous "Venus's Fly-Trap" (*Dionaea muscipula*) found only near Wilmington, N. C. Its leaves are modified to catch flies and other small insects and to digest them. There is a remarkable "pitcher plant" in India (Fig. 53, *Nepenthes*), wherein the leaves contract distally to become a climbing tendril, and at the farther end of this a pitcher, with a true, hinged lid, is developed. This plant is sometimes found in American conservatories. Then, finally, leaves may be so transformed as to become depositories for nourishment for the entire plant, as is the case in the Agave or Century Plant, here shown, much reduced, in Fig. 52 (*A. americana*).

## DAISIES, CORN COCKLE, BUGLOSS, AND OTHER SUMMER FLOWERS

BY DR. R. W. SHUFELDT, C. M. Z. S.

THROUGHOUT the central section of the country, even as far as the Pacific Coast region, the month of May is one of the most charming of all the year. Summer has surely come, and the woods and fields, with their thousands of denizens, are thoroughly awake. To be sure, along the Gulf tier of states, it is past or fully into what is midsummer here; while, traveling along the Canadian boundary line, one might meet with snow storms in various localities. Heavy snow storms have been known to occur in Wyoming in August: on the other hand, a member of the Association sent AMERICAN FORESTRY, during the middle of last March, a milkweed from central Florida, just about to bloom, having collected it near Haines City. The birds in that region were then raising their second brood, while in northern Dakota they were hardly ready to begin their nests for the first one. Most young birds, through the central section referred to, are, as a rule, at the stage of the elegant, little Wood Thrush seen in Figure 4; he has only been a day or so out of the nest, and the Ox-eye Daisies, in the southern part of this zone, are already coming out into blossom (Fig. 1), that is, toward the latter part of May. In New England this flower does not begin to blossom much before the first week in June, continuing to do so until the end of August, though stragglers may be seen until pretty late in the autumn.

This common white daisy of ours has been the theme for many, many pens, and its literature extends back into the days of Colonial history of the United States. It is well to know that the plant originally came from Europe, probably introduced by the early colonists. This will account for its still being confounded, in some quarters, with the English daisy—an entirely different plant, with a very different flower.

Besides being called the White Daisy, it has also received the name of Ox-eye Daisy; the White-weed; Marguerite; Love-me, love-me-not; and perhaps other names. It belongs in the genus *Chrysanthemum*, being generally known as *C. leucanthemum* of Linnæus, and there is at least one variety of it (*C. l. pinnatifidum*), a very abundant subspecies in fields and meadows throughout the north-east section of the Union, where it is most heartily detested by all farmers and agriculturists. In addition to this variety, there is the Corn Chrysanthemum (*C. segetum*) and two other species known as the Feverfew (*C. parthenium*) and the Mint Geranium or Costmary (*C. balsamita*), which latter was introduced from Asia. These last species are all garden escapes; they are spreading over the country in many places, and at a pretty rapid rate in some localities. It is hardly necessary to say that the generic term *Chrysanthemum* is from a Greek word meaning *golden flower*, referring to the yellow or orange center of the American daisy.

Mathews gives us a pretty good figure of the Feverfew just referred to, which is a tall, branching species, with small flowers; the plant does not occur south of New Jersey. This terse writer dismisses the common daisy in a few words—all of them true enough—when he says: "The commonest of all common weeds of the fields and wayside, often called Farmer's Curse, yet a prime favorite with children and artists! The flower's form is a *summum bonum* of simplicity and decorative beauty. The orange-yellow disk, depressed in the center, is formed of perfect flowers; the white rays are pistillate. The dark green leaves are ornamentally lobed. 15-25 inches high."

By all odds the best way to study daisies is to get right into a big field of them, such as is here shown in Figure 1. The first thing that will come to mind of many is the old story of Goethe's Marguerite; and, as you ramble among them, you can almost catch the words: "He loves me, he loves me not"—for so said the maiden in

"Faust," as she plucked and let fall, one by one, the snow-white rays of the flower she held in her hand. There is nothing more beautiful in all the world of wild flowers than a big meadow of these very daisies in full bloom; and if the warm sunshine of early summer is added to them, with the rollicking song of the bobolinks thrown in, what have we, among all scenes of the kind, that is more enchanting throughout nature?

If you pull up one of these plants, you will see at once that its stalk is smooth and high, and may be lengthwise grooved. Occasionally you will meet with a branched specimen, but not often. The stalk and leaves are of a rather light green color, the leaves being alternately arranged on the stalk, snugly clasping it below. Sometimes double flowers will be met with, and by flowers is meant the entire affair that caps the upper end of the stalk. This is said for the reason that the true flowers are the minute, yellow, tubular growths that form the depressed, subcircular center, around which are arrayed the white, false "petals" or rays. This central disk becomes conical as the season advances, and a full account of its structure would indeed make quite a chapter. The

cup in which this yellow disk of closely crowded florets is found is made up of a mat of green bracts, closely packed together, all being finely pointed at their free ends. One quaint writer at hand says of the foliage of the white daisy that "its leafage is interesting and individual in gesture."

The white female florets, generally about twenty-five in number, are stamenless, and, beyond their beauty, possess no utility other than to attract insects to the yellow circle of true flowers they surround. "Inside each of these tiny yellow tubes stand the stamens," says Neltje Blanchan, "literally putting their heads together. As the pistil within the ring of stamens develops and rises through their midst, two little hair-brushes on its tip sweep the pollen from their anthers, as a rounded brush would remove the soot from a lamp chimney. Now the pollen is elevated to a point where any insect crawling over the floret must remove it. The pollen gone, the pistil

now spreads its two arms that were kept tightly closed together while any danger of self-fertilization lasted. Their surfaces become sticky, in that pollen brought from another flower may adhere to them. Notice that the pistils in the white ray florets have no hair-brushes on their tips, because, no stamens being there, there is no pollen to be swept out. Because daisies are among the most conspicuous of flowers, and have facilitated dining their visitors by offering them countless cups of refreshment that may be drained with a minimum loss of time, almost every insect on wings alights on them sooner or later. In short, they run their business on the principle of a coöperative department store. Immense quantities of the most vigorous, because cross-fertilized, seed being set in every patch, small wonder that our fields are white with daisies—a long and merry life to them." What this close student of American flowers says here will apply, with great truth, to a very large number of our *Compositæ*; for, as a matter of fact, it applies to Asters, Sunflowers, and their multitudinous allies and representatives.

Passing to another group, we find an interesting one in the Pink family, which bears the scientific name of



A FIELD OF WHITE OR OX-EYE DAISIES IN MAY

Fig. 1.—Daisies belong to the *Compositæ* or Composite family, one of the largest groups of plants in this country including, as it does, a great variety of species. Among these are the familiar Golden-rods, Asters, Cockleburs, Sunflowers and their numerous allies, Thistles, and many others. The word Daisy finds its origin in "Day's Eye," the flower of Europe (*Bellis perennis*), a pink and white flower that closes in the evening and opens at daylight.

*Caryophyllaceæ*. According to Gray, this contains some fourteen genera, split into two tribes. Perhaps the best forms in it known to the nature student are the Chickweeds, Campions, and a few others. In this group there is, however, one very well-known plant, not only to those who go afield to study our wild flowers, but to farmers and to many foresters as well. Reference is made to the Corn Cockle (*Agrostemma githago*), an excellent example of which is shown in Figure 2; this is another plant introduced from Europe. The scentless flowers, which are of

flowers are single and terminal on the stems. There is a large calyx, the five linear lobes of which are longer than the five rounded petals of the corolla. There is one pistil and ten stamens, with their five styles. The hairy, pale



FLOWERS AND SEED-PODS OF CORN COCKLE (*AGROSTEMMA GITHAGO*)

FIG. 2.—This is an annual that was introduced from Europe, and it is a part of the grain fields in this country. The flowers are of a pretty magenta shade and rather showy. The plant is straight, branched, with densely hairy stems. Note the long, linear sepals extending beyond the five petals. Leaves linear. Stamens ten. Grows to be nearly a yard high. The leaves are very narrow, long, opposite, and of a pale green color. The large black fly seen resting on one of the stems is *Cuterebra cuniculi*, so named because its larvæ are bred beneath the skin of rabbits.

a bright crimson-purple color, appear late in May in the South, but not until July or August in the northern States. The example given in Figure 2 presents not only the flowers but also specimens of the seed-pods at various stages of their development. It will be noted that the



BUGLOSS, A HANDSOME WAYSIDE FLOWER (*ECHIUM VULGARE*)

FIG. 3.—We find two plants in the Borage family (*Boraginaceæ*) to which we apply the name of Bugloss; they belong to different genera. There is the Small Bugloss (*Lycopsis arvensis*), and the one shown in this figure, which is Viper's Bugloss, also called Blue-Weed and Blue-Devil (*Echium vulgare*). This is a magnificent specimen collected early in the summer near Washington, D. C., and photographed by the author. This plant is found flourishing along roadsides, railroad-tracks, and in waste meadows, being abundant in some sections of the country and rare in others. It escaped from England, and is common in some parts of Europe and Asia. Bugloss flowers of this species are pink in the bud, come out blue, then turning to a reddish purple. Their form, as well as that of the leaves and stem, is well shown in the picture.

green, linear-lanceolate leaves are opposite, while the stout and erect stem is four-angled, and will be frequently seen to branch.

Corn Cockle plants sometimes occur in many thousands in the grain fields anywhere over their range, which is pretty general; and, while detested by the farmer as noxious weeds, the sight they present to the lover of wild flowers is certainly a beautiful one. They are often met with along roadsides, and it was in such a place that I found the one I photographed for Figure 2.

When the farmer takes in his wheat or other grain, the Corn Cockle seeds often get mixed up with it, which is unfortunate, as it contains a poisonous element known

as saponin. This, when inhaled, will cause one to sneeze most violently; and as the saponin is entirely soluble in water, it has a most deleterious effect when taken into the system, producing a very unpleasant disease which may become chronic. Therefore, ground-up Corn Cackle seed will ruin all kinds of flour of which we make bread. The very mention of the name Corn Cackle will set a miller's teeth on edge, and is likely to call forth some pretty strong language. The plant may grow to be a yard or more high; it is fertilized by certain moths and

or Grass, Snake flower, and Blue-thistle. Authors also give Blue-Devil, Blue-Violet, and so on. It ranges from New England southward, being abundant in some localities, but more than scarce in others, especially as we pro-



YOUNG OF ONE OF OUR FAVORITE SONGSTERS

FIG. 4.—There are other living things to be found in the woods in May beside flowers, and those frequently in the open will be sure to meet the one when out for the other. Indeed, botanizers cannot go far afield in May, in most sections of the country, without coming across various young birds that hatch out during that month. The one here shown is the young of our favorite thrush, the Wood Thrush (*Hylocichla ustulata*), that grand songster which enlivens the woodlands with his ringing, bell-like notes as the sun nears the horizon during the entire month of May, not to say far into the summer. There are other beautiful thrushes in our avifauna related to the Wood Thrush, while the Robin, Brown Thrasher, and Catbird are near allies.

butterflies, and especially by the night-flying moth *Dianthæcia*, the larvæ of which subsist upon its unripe seeds.

In the Borage family (*Boraginaceæ*) we have another beautiful plant that was introduced from Europe several centuries ago, strictly speaking, from England, along about 1683, at a time when it was nearly exterminated there. Reference is made to the elegant "weed" generally known as Viper's Bugloss, a splendid specimen of which is here shown in Figure 3. This is the *Echium vulgare* of the botanists, and it receives its name Viper from a writer of ancient history, Dioscorides, who apparently was the first to note the resemblance to a snake's head in the side view of the flower. Since then, many vernacular names have been bestowed upon it, as Blue-Weed, Viper's Herb



FINE EXAMPLE OF A WILLOW IN BLOSSOM

FIG. 5.—The Willow family (*Salicaceæ*) is a very puzzling one to study. There are many varieties and species of them in this country, and they not infrequently hybridize. Most of them flower out quite early, as the one here shown, which exhibits the flowers of the Silky Willow (*Salix sericea*), a large shrub growing in wet places from New Brunswick southward to North Carolina, and westward to Michigan. The side view of the large American moth here shown is a specimen of a female "Spice-bush Silk-moth" (*Callosamia promethea*), which emerged from its cocoon in the writer's study early in the spring. Holland, in his *Moth Book*, says: "Every country boy who lives in the Atlantic States is familiar with the cocoons, which in winter and spring he has found hanging from the twigs of the spice-bush, the sassafras, and other trees. As they dangle in the wind they are easily detected, though they are often wrapped in the dead leaf in which the caterpillar originally spun them." (Pp. 84, 85.)

ceed southward. Late in May or early in June we may find it in bloom as far south as southern Maryland. Along railroad tracks are good places to search for it. Alice Lounsbury says: "When growing along the roadsides, its extreme hairiness attracts an immense amount of dust, and not until it has been shaken, or washed off, is the prettiness of the blossoms seen."

Bugloss buds are of a pink color, but the small, scentless flowers, when they open, are of a brilliant blue. They are thickly arranged on one side of the stem, which latter is hairy and ornamented with minute, dark-colored specks. The five-lobed corolla is of a conical form, and from it protrude the red, exerted, five unequal stamens. More-



GOLDEN-KNEE IN FLOWER

FIG. 6.—We have here a typical flower of the month of May, known as the Golden-Knee (*Chrysogonum virginianum*), a representative of the great Compositæ family (*Compositæ*). It is found only from southern Pennsylvania to Florida, and this is probably the first published photograph of it, the specimen having been collected at Great Falls, Maryland. Gray's specimen was found at "High Island at the Falls of the Potomac." It is a low-growing plant, rarely attaining a height of a foot and a half, generally less. It is a very striking flower in the woods on account of its brilliant orange, five-petalled involucre, which is silky and fluted.

over, we may note by the aid of our hand-lens that there are but two styles and one pistil, while the calyx is five parted. The lanceolate leaves are alternate, hairy, and of a rather light green. Bugloss may grow to be over two feet in height—indeed, I have seen some plants fully a yard high. Gray describes the plant as a "rough bristly biennial," the "nutlets roughened or wrinkled, fixed by a flat base." The fertilization of this plant is an interesting story, but too long to recite here; it may be said, however, that, through its evolution, Bugloss has entirely lost the power of fertilizing itself.

Coming back to the *Compositæ* for a moment, it is quite surprising how our descriptive botanists will sometimes omit a plant, which in some localities is more than abundant. A good example of this is seen in our Golden-Knee (*Chrysogonum virginianum*), which has been overlooked in all the books on flowers at hand, save in Gray's

last *Manual*. Why it should be called Golden-Knee is hard to say; and, as a matter of fact, the term is a mere translation of the two Greek words composing its generic name. In early May it is a very common flower along the Potomac river, in Virginia as well as in Maryland and in some sections of the District of Columbia. Even Gray cites it as occurring on "High Island at the Falls of the Potomac" (p. 826), but here he especially refers to a variety of it named by him *C. v. dentatum*. This variety is said to have acute leaves that are of a deltoid-ovate form, and coarsely toothed along their margins. As a rule the leaves are as we see them in Figure 6,—that is, ovate for the most part, and very rarely cordate. One cannot miss recognizing this beautiful plant when it is in flower in the woods; its brilliant yellow blossoms and hairy stems will go a long way towards this; and when we note the long peduncles to the flowers, and the long-petioled leaves—the petioles being hairy as in the case of the stems—we may be pretty certain that a Golden-Knee is the plant before us. As with so many other *Compositæ*, the true flowers, of which there are a great many, make up the center of the blossom, the five yellow rays (not petals) being pistillate and fertile. This perennial herb presents not a few other diagnostic characters; but, in view of what has just been given, it will not be necessary to enumerate them at this time. *Chrysogonum* rarely attains a height to exceed fourteen or fifteen inches, the average plant being about a foot high.

## THE FORESTRY GUY

By Arthur Chapman

A knightly figure amid the green,  
In khaki instead of mail,  
A face of bronze, eyes quick and keen—  
Swift hoofbeats on the trail;  
A home in the saddle through summer days,  
A bed 'neath the evening sky;  
Who is it that travels the silent ways?  
He's only a forestry guy.

A camp on the heights, where snowbanks gleam;  
A pack-horse that's grazing near;  
No sound save the sound of the mountain stream—  
The town sends no echo here;  
A figure bathed in the sunset's fires;  
Who dwells on these peaks so high?  
Who travels amid these granite spires?  
He's only a forestry guy.

A tendril of smoke in the valley wide,  
A flame that is fanned by the breeze;  
A break-neck dash down the mountain side  
And a fight for the living trees;  
A fight that is won, though the price is dear;  
There are scars ere the red flames die;  
Who is it that dices with death each year?  
He's only a forestry guy.

—From the April edition of "The Teepee Book."

# FORESTRY FOR BOYS AND GIRLS

BY BRISTOW ADAMS

## SOME FOREST HISTORY



THE gorge is roaring to-night, and I can hear it plainly as I sit writing, even though the windows are closed. While it is spring, there is still a chill in the air and frosts are yet common. But the days are fine so that we can all walk abroad and seek out the first spring flowers. When we were out today we could smell the scent of new earth almost as if we were following the plow; yet there was no earth turned, and we noted that the odor came from the gorge itself, as the water carried down the flood that came from the thawing ground. The spray from the falls tainted the air with the good earthy smell, but I was sorry to know that all that good earth was going to waste. The falls made a grand sight with so much water going over them, but were not lace-like and white as they are in summer. As Everett said, they looked "like a great flood of chocolate with whipped cream."

The water that trickles down the sides of the gorge, where it is too steep to have farm land, is crystal clear as it flows from the mosses, ferns, Canada yew, and other undergrowth. The hemlocks, pines, ash trees, chestnuts, oaks, maples, and hickories find a foothold wherever they can, and cling along the ledges. From a distance the gorge is a dark blue-gray in winter, and a strip of deep green in the summer, where the bordering trees stand out in the midst of the upland fields on either side. As we walked, we talked, and I made a guess that when the Indians lived here the water did not come down in such floods and did not get so muddy.

AT ONCE the boys were filled with questionings: "Did the Indians ever really live here? How could they keep the water from being muddy? What kind of Indians were they? Did they have bow'n'arrows?" And there were about twenty more, all in a breath!

"Hold on a minute," said I, "this is history you are getting into, and Gertrude hates history."

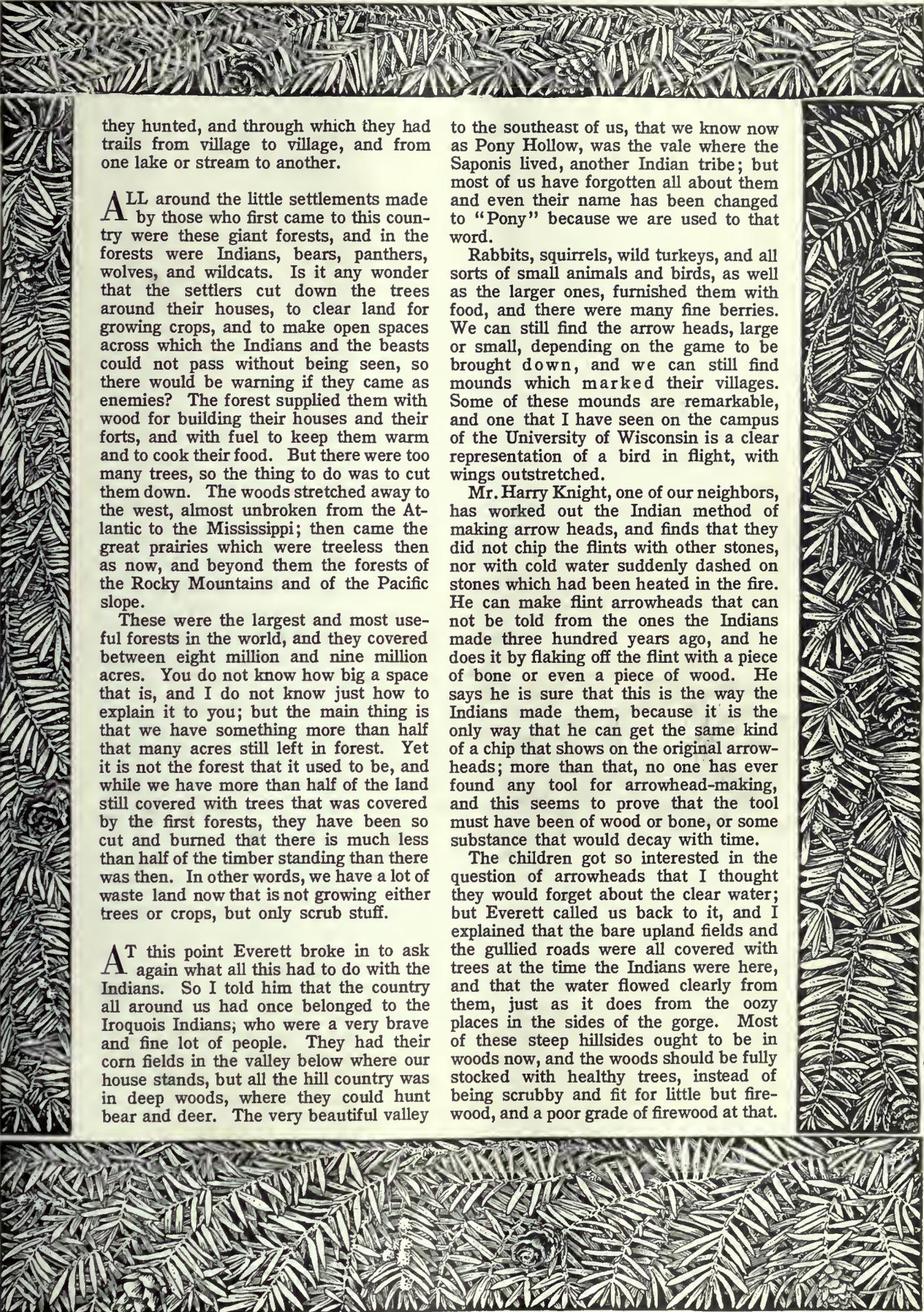
"I should say I do," replied Gertrude, "nothing but dates, and names of old-time ginks, and fights!"

Somehow, I could not quite disagree with the younger girl, because I had seen her trying to learn some of these same names and dates. As for myself, there is only one date that I am sure of in American history, and that is the landing of the Pilgrims in 1620. The reason I know that is because I had to stay in after school, when I was nine years old, and write "The Pilgrims landed in 1620" five hundred times before I could go out into just such a fine spring day as this has been. But I remember those Pilgrims and the time they landed to this very day.

Gertrude's mind was diverted from history in a moment, and she came down to present-day facts all of a sudden. "You ought not to fuss at us for getting kept in after school," said she, "because you did it your own self."

Everett came to the rescue with further questions about the Indians, and about what they had to do with the clearness of the water; so I was glad to try to satisfy his curiosity in some such way as this:

WHEN those Pilgrim Fathers landed, there were not so very many people in this country, and these were the Indians. They did not have large farms or cities as we have. They had villages, and in the level spaces, like the low land near the head of the lake, they grew some corn and tobacco, and a few other crops. All the rest was forest, where



they hunted, and through which they had trails from village to village, and from one lake or stream to another.

ALL around the little settlements made by those who first came to this country were these giant forests, and in the forests were Indians, bears, panthers, wolves, and wildcats. Is it any wonder that the settlers cut down the trees around their houses, to clear land for growing crops, and to make open spaces across which the Indians and the beasts could not pass without being seen, so there would be warning if they came as enemies? The forest supplied them with wood for building their houses and their forts, and with fuel to keep them warm and to cook their food. But there were too many trees, so the thing to do was to cut them down. The woods stretched away to the west, almost unbroken from the Atlantic to the Mississippi; then came the great prairies which were treeless then as now, and beyond them the forests of the Rocky Mountains and of the Pacific slope.

These were the largest and most useful forests in the world, and they covered between eight million and nine million acres. You do not know how big a space that is, and I do not know just how to explain it to you; but the main thing is that we have something more than half that many acres still left in forest. Yet it is not the forest that it used to be, and while we have more than half of the land still covered with trees that was covered by the first forests, they have been so cut and burned that there is much less than half of the timber standing than there was then. In other words, we have a lot of waste land now that is not growing either trees or crops, but only scrub stuff.

AT this point Everett broke in to ask again what all this had to do with the Indians. So I told him that the country all around us had once belonged to the Iroquois Indians; who were a very brave and fine lot of people. They had their corn fields in the valley below where our house stands, but all the hill country was in deep woods, where they could hunt bear and deer. The very beautiful valley

to the southeast of us, that we know now as Pony Hollow, was the vale where the Saponis lived, another Indian tribe; but most of us have forgotten all about them and even their name has been changed to "Pony" because we are used to that word.

Rabbits, squirrels, wild turkeys, and all sorts of small animals and birds, as well as the larger ones, furnished them with food, and there were many fine berries. We can still find the arrow heads, large or small, depending on the game to be brought down, and we can still find mounds which marked their villages. Some of these mounds are remarkable, and one that I have seen on the campus of the University of Wisconsin is a clear representation of a bird in flight, with wings outstretched.

Mr. Harry Knight, one of our neighbors, has worked out the Indian method of making arrow heads, and finds that they did not chip the flints with other stones, nor with cold water suddenly dashed on stones which had been heated in the fire. He can make flint arrowheads that can not be told from the ones the Indians made three hundred years ago, and he does it by flaking off the flint with a piece of bone or even a piece of wood. He says he is sure that this is the way the Indians made them, because it is the only way that he can get the same kind of a chip that shows on the original arrowheads; more than that, no one has ever found any tool for arrowhead-making, and this seems to prove that the tool must have been of wood or bone, or some substance that would decay with time.

The children got so interested in the question of arrowheads that I thought they would forget about the clear water; but Everett called us back to it, and I explained that the bare upland fields and the gullied roads were all covered with trees at the time the Indians were here, and that the water flowed clearly from them, just as it does from the oozy places in the sides of the gorge. Most of these steep hillsides ought to be in woods now, and the woods should be fully stocked with healthy trees, instead of being scrubby and fit for little but firewood, and a poor grade of firewood at that.

# COMMUNITY SPIRIT SAVED THE TREES

BY GAYNE T. K. NORTON

**A**T first glance an intimate connection between trees, subway construction, community spirit and the bettering of unpleasant conditions in everyday life does not appear; yet, because of a few elms and a bit of subway construction, the people of Brooklyn did themselves a tremendous favor. They proved the existence of community spirit in the borough—absolutely the one thing New York needs most.

They demanded a change in subway construction to save the trees and expected to pay some \$500,000 for it. After legal battles and the loss of a few trees their demands were granted, and, instead of adding a half million dollars to the construction costs, that amount was saved as a result. The economic importance of trees has long been

recognized, but in this instance every one of the elms saved is worth more than its weight in gold, for they have become living monuments, testifying to the power of community spirit. The very fact that they remain standing should furnish incentive to Brooklynites, and others, to attack and rid the community of many social problems. Here is the story of the elms and the all-important lesson they are preaching:

The present subway system is to be continued along Eastern Parkway under ground to finally become an elevated line in the neighborhood of Buffalo avenue. The original plans called for a 4-track system. Brooklyn wanted the subway badly, but when the people learned its building was to cost more than a thousand veteran



*Official Public Service Commission Photograph.*

## HOW BROOKLYN SAVED ITS NOBLE ELMS

Community spirit in the Borough of Brooklyn, New York City, saved these elms, some eight hundred in all, from destruction by subway contractors.

elms and the beauty of the Parkway, besides the millions of dollars, they objected, and determined to save the trees and beauty—and they did.

Petitions were signed, street corner meetings were held, and in other ways the people showed how they felt and what they wanted. It was a long fight; there were hearings galore, and it continued until the work began. By this time Park Commissioner Ingersoll had a new set of plans ready to submit to the Public Service Commission. The people kept pounding hard and the new plans were adopted, though the destruction continued until they went into effect.

The contracts now call for double-decked track construction. The work is being pushed from an open cut, and men from the Park department are on guard, making sure that only the trees specified are taken out. Because of the new contracts more than 800 trees are saved, as

well as a half million dollars in construction. Comparatively few have been cut, but the stations doomed a number. The contractors are required to replace all taken out. All the trees have been inspected and arranged in three classes: those that must be saved; those that should be saved, and those that must go. In some places novel engineering tactics were used in "shoring up" the roots exposed by the excavation.

At first the contractors looked askance at this idea of changing approved plans to save trees; they thought it would mean added trouble and expense, but when they felt the force of the public will, objections were no longer offered. The change proved to be an advantage and saving, and their present attitude may be judged by the action of the Intercontinental Construction Company, which was given permission to cut 145 trees and found it necessary to cut only 100.

## AN EPOCH-MAKING CONFERENCE

BY HERMAN H. CHAPMAN

ON April 11, 12 and 13, at New Orleans, Louisiana, there was held a meeting, termed the Cut-over Land Conference of the South, under the auspices of the Southern Pine Association, of New Orleans, and the Southern Settlement and Development Association of Baltimore. The sessions, which lasted for three days, were remarkable for the representative character and earnestness of the delegates in attendance and the number of notable men on the program, and the character of the papers and talks.

The addresses might be classed in three groups: patriotic, scientific, and practical. Honorable Carl Vrooman, Assistant Secretary of Agriculture, struck the keynote in his talk on "Agriculture from a National Standpoint." He vividly impressed upon his hearers the vital importance of food production in the present world crisis. On the South, in particular, rests a great responsibility. At present, over \$700,000,000 of food products are imported into this region from other states. This year the South must feed herself and in this way release an equivalent amount of food to supply our allies in the struggle. Mr. Vrooman emphasized the need for a careful classification of the cut-over lands into those suitable for agriculture, and those best fitted for the production of timber crops.

Patriotism found a silver-tongued exponent in Governor Charles S. Brough, of Arkansas. Southern oratory deserves its reputation if it even approaches the standard set by this able representative of the new South. The governor cited the Book of Revelation, in a prophecy of the great part America was to play in the future. "And a woman shall go forth into the wilderness,—and on a barren rock shall bring forth a child,—and this child shall rule the world." His interpretation of this prophecy—that on Plymouth Rock, in the New England wilderness, the child, America, was born, destined to lead the world in the establishment of free government,—was a thought worth more than passing notice.

The convention then took up the second phase,—a scientific discussion of the possibilities of cut-over lands. The fundamental question, that of the soils and their characteristics, was most ably treated by Mr. C. F. Marbut, of the Bureau of Soils, Department of Agriculture. The speaker dealt only with the so-called "coastal plains" soils, omitting the alluvial lands of the Mississippi Valley. Only the portions not already developed as farms were included—and in this part of the South—for the States of Texas, Arkansas, Louisiana, Mississippi and Alabama, the undeveloped land occupies from two to three times the area of farms under cultivation. These unimproved areas Mr. Marbut divided into four classes of soil—sandy loam, constituting the best type of land for permanent agriculture; wet and heavy land, suitable more largely for grazing; sandy land, on which truck crops and cotton can be raised, and rough or broken land, unsuitable for agriculture, on which forests should be the permanent crop. The areas in each of these classifications are roughly 25 per cent. The total cut-over area, as brought out by other speakers, is now 76,000,000 acres, and will in time amount to 250,000,000 acres. On the basis of this classification, there probably exists from 40,000,000 to 50,000,000 acres of permanent forest land in the Southern states. A great deal of attention was devoted to the livestock industry, and the grazing problem. In discussing this question, the convention had the testimony not only of such experts as Dr. C. V. Piper, Chief Agrostologist of the Bureau of Plant Industry, Mr. George M. Rommel, Chief of the Animal Husbandry Division of the Department of Agriculture, but of several experts connected with the state agricultural departments, and the testimony of a number of owners of cut-over lands who had experimented with livestock. No attempt was made to introduce any of the exaggerated advertising common to the booster and land-speculator, but the speakers talked facts, and the audience got down

to the bed rock of actual experience. It was brought out that the grazing on cut-over pine lands required from seven to ten acres to support a cow through the season, and that a feeding period of three months was necessary. Cattle turned out to rustle through the winter, after frost had killed the grasses, frequently starved to death, and at best made very slow growth. The South demands a new standard of management for success in cattle feeding and this new era will be ushered in by the use of the silo and winter forage crops. The estimates of value placed on grazing were from 15 to 25 cents per acre.

The experience talks, by owners of cut-over lands, formed the third great feature of this conference. The most typical and enlightening of these was an impromptu narrative by Mr. Alex K. Sessoms, President of the South Georgia Land Owners' Association, representing about 2,000,000 acres of land. Finding himself in possession, by inheritance, of some 70,000 acres of sandy land in South Georgia, Mr. Sessoms told how he had discovered that the neglected second-growth (Cuban or slash) pine was capable of yielding a revenue from turpentine, which, under a proper system of management, will yield a perpetual income, sufficient to pay all the expense of taxation and maintenance, and furnish a large surplus for the agricultural development of the remainder. By deep plowing and proper use of fertilizers, the portion brought under cultivation has been made very productive. As a result, not only has he demonstrated to his neighbors that land considered by them as worthless can be farmed, but he has solved the problem of carrying charges, and no longer desires to sell his land in order to get rid of a piece of unprofitable property.

In thus demonstrating on a large scale the possibility of forest crops as a source of permanent revenue, and the fundamental economic solution of the problem of carrying cut-over lands, Mr. Sessoms has done far more for the South than he realizes. The enormous possibilities of the slash pine second growth on the belt of flat, sandy soils bordering the Gulf is not yet appreciated. And in the use of the revenue from this source to develop other portions of his land for crop production, we have a wonderful example of the proper economic relation between agriculture and forestry in this region.

But by far the most hopeful and inspiring phenomenon of this truly remarkable gathering was the candor and honesty with which those southern land owners, mostly lumbermen, discussed the problem of land values and colonization. Not once or twice, but many times, in each of the three days' sessions it was clearly brought out that the settlement and subjugation of these cut-over lands was a difficult and fairly expensive process, and that the owner of these lands was morally bound to see that the purchaser and immigrant succeeded in making a living. Many speakers pointed out the great harm that had been done in every Southern state by the operations of irresponsible land speculators, or unscrupulous land owners, whose only thought was to obtain as high a price as possible for the lands, even though it left the purchaser without capital for their development. It was shown that the cost of clearing, fencing and improvements, and the poverty

and rawness of the soil, requiring two years or more to bring to a condition of profitable production, prevented the actual economic value of these raw lands from reaching a figure much in excess of \$5 per acre. The great injury done to the purchaser, and through him, to the South as a whole, was most clearly and vigorously set forth by such men as Dr. Bradford Knapp, Chief of the Office of Extension Work, States Relations Service, United States Department of Agriculture. Dr. Knapp denounced the process of selling these cut-over lands at high prices to persons unfamiliar with Southern conditions as highway robbery; and he claimed that the advertisements of certain land-selling agencies should be barred from the mails. It is significant that these statements were greeted by prolonged applause from the owners of these millions of acres of cut-over land who composed his audience.

The comparative absence from the deliberations of the convention of participation by the type of professional booster, whose extravagant and optimistic literature is so familiar to the would-be purchaser of lands, was a noticeable feature of the gathering. Representatives of land-selling and colonizing agencies were in attendance and one or two determined efforts were made to stampede the convention into some form of action which would furnish these agencies with advertising capital to be used in booming cut-over lands. But this element never at any time controlled the proceedings or swayed the convention from its purpose, which was to find out the facts, and to map out a plan of organization and policy which sought, not the temporary benefit of the land owner at the cost of misinformed purchasers, but, the permanent upbuilding of stable communities of farmers on such of these lands as have agricultural value.

This convention marks a new era in the economic thought not only of the South but of the entire country,—and in this movement the South bids fair, under the guidance of such men as attended this convention, to take the leadership. This thought was summed up by General L. C. Boyle, of Kansas City, who said: "Not a man to-day has been talking about how much money can be made from a sale of these lands, but of how to help the little fellow. This conference is giving evidence of the right spirit—the unselfish spirit of a vision—the spirit of coöperation. Government coöperation with the people is the order of the day. The men who have the vision, the understanding and the spirit, whether state or national experts, or private land owners, are bound to succeed. The highest patriotism is to make the land habitable for the poor and needy."

A permanent committee of ten men, two from each of the five states represented, was appointed, to perfect plans for permanent organization.

It is worthy of note that a paper prepared by Mr. Henry S. Graves, Chief of the National Forest Service, outlining the possibilities of utilizing much of this cut-over land for second-growth forestry, received close attention, and that the convention adopted a resolution looking to the adoption of plans by which a comprehensive scheme of reforestation may be undertaken, if found practicable.

## SOUTH AMERICAN FOREST RESOURCES

**A** COURSE in Tropical Forestry has been established at the Yale School of Forestry to train men to properly develop the forest resources of tropical countries. There are at least two very large forest regions in the tropics, the Amazon River basin in South America and the Indo-Malay region of Southeastern Asia and adjacent islands. The recent expansion of trade with these regions has focused attention on their forest resources and has shown the urgent need for their proper economic development. This will be greatly aided by the avoidance of the mistakes made in handling the forest resources of temperate regions, which can be done only by the adoption of a suitable forest policy during the early stages of exploitation. What is needed is a public appreciation of the value of the undeveloped resources and of the possibility of making them a permanent asset. This can be brought about by expert foresters, who will not only direct operations in the woods, but also arouse the public to the need of forest conservation, and assist in formulating a proper forest policy, and in the enactment and enforcement of suitable legislation. In India and in the Philippines forest schools have been established to train men for the forest service of those countries. Very little has been done along this line for tropical America, however, so the Yale school's instruction and investigative work will be focused largely on the Amazon country.

A brief review of forest conditions in South America is necessary for a proper appreciation of the problem and

possibilities. The history of every country in the process of development shows that excessive waste accompanies the exploitation of its natural resources. Primitive people of the tropics, by cutting and burning the virgin forest areas to practice a shifting system of agriculture, have been in the past the greatest enemies of tropical forests. The virgin forest areas of the countries of Central America and the West Indies have either been completely destroyed or badly damaged in that way. South America has suffered to a greater or less extent too.

The South American forests, which are of broad-leaved hardwoods, with the exception of two small areas, have been roughly classified under four headings: dry forests, temperate forests, swamp forests, and tropical rain forests,

according to the climatic conditions prevailing in the area occupied by each. The dry forests occur in the temperate or subtropical regions, both at high and low levels, over immense areas where the rainfall is deficient or so unevenly distributed throughout the year as to cause long periods of drouth. The tree growth, at its best, is a dense forest of comparatively few species. The trees are short-boled, usually not exceeding fifty feet in height and in many regions averaging little more than twenty-five feet. The commercial stem varies from ten to twenty feet, with diameters of twelve to twenty-four inches common. Perhaps the best known representatives of this type are the Quebracho-Algarroba forests of Northern Argen-



A "BUTTRESSED" TREE ON THE BANKS OF THE AMAZON

While it is known that the forests of Brazil are rich in valuable hardwoods, they are so vast in extent and the flora so slightly known that botanical investigation will have free scope in this practically unlimited field for many years to come.

tina. They occupy the great semi-arid plain lying between the foothills of the Andes and the Parana and Paraguay Rivers and known as the Great Chaco. Other representatives of the type are the Catinga forests of Brazil and the Coast forests of Colombia and Venezuela between Cartagena and the Island of Trinidad.

The temperate forests are found along the slopes of the Andes where elevation and moisture, combined with suitable soils, make the growth of a temperate forest possible. This type is best developed in Patagonia and comes practically to sea level in Tierra del Fuego. These forests are of Antarctic beech with a few conifers intermixed. Three species of beech would probably furnish ninety per cent of the cut. Although heavy stands are reported in the Patagonian Lake region, the forests are over-mature and so defective as to be of little commercial value. The trees reach heights of one hundred to one hundred twenty-five feet and are two to five

feet in diameter. The extension of this type along the Andes from Chili to Colombia can only be estimated. The great populations that have for thousands of years occupied this region drew on these forests for fuel and construction timber and only second-growth or scattered patches remain.

The swamp forests are made up of the typical mangrove area of tidal swamps and the forests of the fresh-water swamp and bottom lands. The mangrove areas are

limited in extent and have been partially destroyed, but the fresh-water forests occupy large areas and promise to be of commercial importance in the near future. They are irregular in age, often very open and growth is extremely rapid. The species common in this type are in the main soft-wooded, as soft or softer than our own cottonwood, basswood, or yellow poplar, and many with but little color. They reach heights of over one hundred feet in the best soils; probably sixty to seventy feet is the average, with diameters of two to three feet common. Certain of these species reach this height in ten to fifteen years and commercial diameters in much the same time. The dominant stand of any given region is generally made up of a very few species. In many cases four or five varieties will furnish seventy-five per cent or more of the commercial timber and will yield eight to ten thousand feet to the acre.

These three types of forest cover the greater part of the continent, only the northern half of Brazil with small portions of Colombia, Peru, and Bolivia being in the tropical rain forests. Although there are heavy stands of timber in these three immense areas, the supply has been partially exhausted, is too soft for commercial needs, or is overmature, with the result that the limit of consumption is visible. Most of them are in a condition similar to that of the forests of North America and Europe, although not so badly depleted by ruthless exploitation.



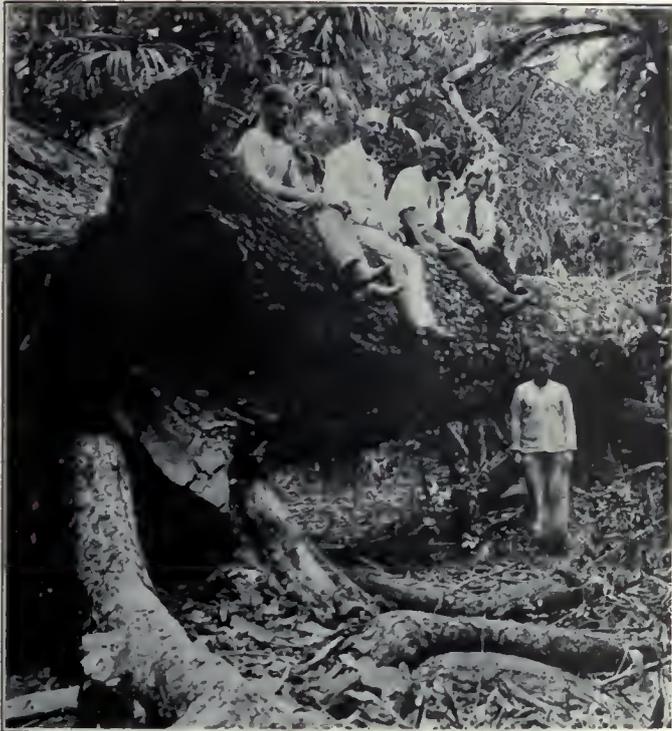
VIEW NEAR USHUAIA, ARGENTINA

The temperate forests of South America extend down into what was once generally known as Patagonia and come practically to sea level in Tierra del Fuego. Here in the far south the trees are rather stunted and deformed by the winds, but in the mountains to the north and along the shore of the Patagonian lakes they reach a splendid development and heavy stands are reported. These forests are of Antarctic beech and a few conifers.

only the northern half of Brazil with small portions of Colombia, Peru, and Bolivia being in the tropical rain forests. Although there are heavy stands of timber in these three immense areas, the supply has been partially exhausted, is too soft for commercial needs, or is overmature, with the result that the limit of consumption is visible. Most of them are in a condition similar to that of the forests of North America and Europe, although not so badly depleted by ruthless exploitation.

There are constantly growing fears that if the present methods of cutting quebracho forests are not modified and measures adopted for their regrowth, there will be little left of them in a very short time. The same is true of greenheart and mahogany, of Spanish cedar and Parana pine, and of other valuable species. Chili produces several varieties of oak of high quality, as well as valuable conifers, but the area is too small to be considered when looking for a timber supply to meet the demands of the world market.

The Amazon basin, which embraces the territory occupied by the tropical rain forests, is contrasted rather sharply with the other timbered areas of the continent, however. While their product may not be able to meet even the local demand, the tropical rain forest areas stand practically untouched by ax or other instrument of destruction. Until recent years, when medical science robbed this tropical wilderness of its most deadly weapons, man has been forced to avoid it. Now, with his newly-gained advantage, he can work his will there and the wealth



A SAMPLE OF MAHOGANY CUT AT THE SAN PABLO PLANTATION, MEXICO

There are three principal varieties of mahogany trees: the Central American, or true mahogany (*Swietenia mahogani*); the African mahogany (*Khaya senegalensis*), and the Indian mahogany (*Soyimida febrifuga*). The true mahogany grows in Cuba, Florida Keys, Dominican Republic and Haiti, various islands of the West Indies, Mexico, Central America, and to some extent in Peru and Ecuador.

stored for centuries in the most beautiful and most wonderful forests in the world becomes available for use.

Here are a few facts with regard to the forests of the Amazon basin which show how well able this vast area is to replenish the world's dwindling supply of lumber. One million six hundred thousand square miles of densely wooded land make this the largest forest area in the world. It is three times larger than the forested area of the United States and exceeds by two hundred and sixty thousand square miles that of European and Asiatic Russia combined. The stands run from ten to twenty thousand board feet to the acre and are made up of species practically like those now in use and in most cases better adapted to the uses to which they will be put than those

supplied by the forests of North America. The woods are, in the main, soft or of medium hardness, and are suitable to replace pine for construction, oak for finish and furniture, hickory for wheels and handles, and ash for agricultural implements. From the standpoint of the lum-



THE LINGUE TREE

The Lingue tree (*Persea lingue* Nees) is a species of laurel tree which grows between 32° and 41° S. latitude. It is large and its bark is extensively used in tanning hides in Valdivia and neighboring regions. Its wood is very durable, resists decay from water, is beautifully grained and varies from a light yellow to red in color. It is used in making high grade furniture and other cabinet work.

berman, these forests are ideal. The land is level and is crossed by numerous streams, making short hauls to floatable water the rule. Commercial diameters run between two and three feet and clear lengths fifty feet or more. The total height of an average tree is well over one hundred feet. The rapid growth rate of these trees makes the value of the temperate forest shrink into insignificance when compared with the producing power of an equal area of tropical forest. For every dollar of wealth produced by a temperate forest, the tropical forest should yield not less than ten. It is possible to plant and harvest not one but many forest crops in a lifetime with a higher return per acre for each than the single crop of the forester in Europe or the United States. The climate brings forestry nearer to the level of an agricultural crop than anywhere else. Firewood can be grown in from three to five years; pulpwood, posts, and piles in ten to fifteen; and merchantable timber in fifteen to twenty-five years.

It has long been the popular conception that tropical forests are only capable of producing woods chiefly valu-

able for cabinet purposes, for dyes and extracts, and for special uses requiring extreme hardness and durability. Crude and costly methods of lumbering have been responsible for the misconception. Under the existing conditions only those woods which met no competition in the market could be handled at a profit. Thorough investigations,



LOGGING IN ECUADOR

It is estimated that the forest area of Ecuador embraces about 376,050 square kilometers, of which 241,662 are of tropical hardwoods; 84,878 square kilometers of subtropical hardwoods; and 49,510 square kilometers of mahogany forests. There is practically no importation of foreign timber into Ecuador, owing to the heavy protection of the home industry. Guayaquil was once famous as a ship-building center and exporter of lumber, and efforts are being made by the Government to revive the lumber industry and to develop the splendid resources of the country's forestal wealth.

which have been made recently, conclusively show that modern methods of logging will reverse that unusual condition and woods which it has been cheaper to import from countries thousands of miles away will be replaced by native woods of superior quality and at a cheaper price.

The world needs vast quantities of wood, and no spot on the earth with abundant forest wealth is too remote to prevent a profitable harvesting of the timber crops. Quantity of the product, coupled with size and quality, are the only factors determining or limiting the degree of utilization. With the Amazon basin to draw on, South America has the wonderful opportunity of becoming the center of the world's lumber industry. If the various governments will organize forest services and train their young men as foresters, the wealth of this region will flow into their treasuries. South America's future and many of the great problems of forest administration in Europe and North America depend on how this forest is treated. If it is destroyed, as the forests of Argentina, Paraguay, and southern Brazil are being destroyed, it will mean economic ruin, probably also absolute physical ruin, to land, climate, property, and life on a great part of the southern continent. If, on the other hand, it is protected and properly utilized, South America becomes the center of the world's prosperity in the years to come. The saving of this forest also

means that Europe and North America will have time to repair their damaged forests, to perfect their organization, so as to meet the demands without destroying the capital. Only by obtaining great supplies from these virgin forests of South America can this crucial time in the great struggle for forest conservation be safely passed.

The Yale Forest School is doing the world a service in establishing courses that will make it possible for students from foreign countries to get an education in the kind of forestry they will be called upon to practice. Upon graduation such men can return to their own countries and be the leaders in the forestry movement there. They can carry on propaganda work that will aid in educating the public to the need of a strong forest conservation policy. They will be equipped to organize forestry departments to



THE JEQUITIBA TREE OF BRAZIL

This magnificent giant of the Brazilian forests, known as the jequitiba branco (*Couratari speciosa*), often attains a diameter of 5 to 7 meters and a height of over 30 meters. It is said that instances are known where the trunk of a single tree produced more than 8 metric tons of wood. The wood, which is of whitish color, is soft and very light, and is extensively used in making boxes, cases and crates, and as a substitute for pine.

carry out the policy when adopted. They will urge the establishment of forest schools in connection with the government or universities so that, as the forestry movement grows, the country will be in a position to train its own foresters. They will be trained to do investigative work. The courses in lumbering will acquaint them with the modern methods which must be applied. In short, they will be equipped to establish the forests on the ideal basis—one of permanent, maximum yield.

[EDITOR'S NOTE.—Most of the information and many complete statements in this article are taken from articles by Dr. H. N. Whitford, Assistant Professor of Tropical Forestry at Yale University, Mr. H. M. Curran, Special Lecturer on South American Forests at Yale, and Mr. Raphael Zon, Chief of Forest Investigations of the United States Forest Service, and the photographs are from the Pan American Union.

# HARMONIZING LUMBERING AND ESTHETICS

BY C. M. GRANGER

**A** GREAT many lovers of the outdoors feel that Nature's forests should be left undisturbed by the ax to furnish a constant source of delight by their very wildness. The Forest Service receives many requests to preserve from cutting National Forest timber near some mountain summer retreat or along some travelled highway. Occasionally the petition comes from some old resident who has lived with his little patch of trees so long that he actually knows the majority of them as friends and would sorely miss one single individual from the grove. Only a short time ago a request was received from the Rotary Club of Pueblo, Colorado, that the timber along a projected automobile road through the Greenhorn Mountains, which constitute Pueblo's outdoor playground, be withheld from sale and cutting to preserve the scenic attractions of the region.

On the other side of this question we naturally find the lumberman, who believes, as a general rule, that all the timber which is big enough for sawlogs should be cut. In many cases he is compelled to strip his own land because the excessive taxes and interest charges make it financially ruinous for him to delay cutting or to leave the immature trees to be cut later. As a result, countless areas have been stripped of their timber, leaving nothing but a mass of tops and branches and a few scattered trees too small or worthless for cutting. Many times fires have run through these slashings, completing the devastation; but whether fire comes or not the cut-over land presents a most unsightly appearance. The ideal condition in forest management is use without abuse, safeguarding the esthetic values while utilizing the mature timber crop, and this is common ground on which both the preservationist and the lumberman can stand.

The National Forests, including virtually all of the

mountain areas of the West, contain all manner of wonderful scenery—rock, water, and trees in every conceivable combination. Because the Government sells the ripe timber on the Forests, the fear has been entertained that the wild beauty of the forests will in time be changed through removal of the timber. Let us see what a closer view of the situation reveals.



STAND AFTER A CUTTING

One-third of the timber on this area has been cut under a National Forest timber sale, and there remains a thrifty stand all the better in health and appearance for the cutting of the mature and decadent trees.

The timber bodies on the National Forests may be divided into commercial and non-commercial stands. The former are made up of trees of value for manufacture into lumber and other wood products and so located that they may be profitably logged. The non-commercial stands, on the other hand, are those which, either by reason of the quality of the timber or its inaccessible location, are not suitable for lumbering. The timber stand or individual tree has its greatest scenic value when combined with other natural features of picturesque character—deep canyons with rocky walls, high, rocky cliffs, mountain lakes, and the like. In such locations logging is usually out of the question because of the rough, rocky ground, or because the timber is not dense enough or of proper quality to make lumbering pay. Here, then, at any rate, the forest primeval will reign undisturbed by man to create its scenic and esthetic values in Nature's own way.

There are countless areas of these non-commercial

forests in every National Forest, both mixed with the commercial timber stands and in the higher rougher portions of the mountains. Those bodies of timber just below upper timber line are the most conspicuous examples—in which many of the trees, because of exposure to severe storms and cold, become possessed of queer, twisted forms, or grow only into dwarf trees of an unusually picturesque character. Due to the location of such timber bodies at the very heads of the streams, they

have a most important function in protecting and regulating streamflow; and because of this and the fact that cutting is impracticable on account of the quality of the timber, such forests are termed "protection forests" and are held intact. Taking Colorado as an example, almost one-fifth of the timbered area in the National Forests



NO SIGN OF CUTTING HERE

When the brush is burned after a timber cutting there is little to show that there was any cutting.

lies within the protection stands at the higher altitudes; and by adding to this the areas lower down in the commercial stands which are too rough to permit logging, it is safe to say that at the very least one-fourth or one-third of the forested areas, and the most picturesque, will never be encroached upon by the axman.

Aside from the fact that most of the timber on the more scenically important parts of the National Forests is through its non-commercial character, in no danger from the lumberman, Uncle Sam is going to see that unusual scenic features and recreation possibilities may be of the highest service to their owners—the people—by being kept and developed primarily for their recreation values. For example, the city of Denver has acquired a considerable acreage of foothill timbered land west of the city, which is being rapidly developed as Denver's Mountain Park. Excellent roads are being built, camping sites with permanent fireplaces established, shelters erected, and other improvements made to bring out and make usable the recreation opportunities. Thousands of people from Denver and elsewhere motor through this park every fair Sunday and holiday. Alongside this park area is a tract of land within the Pike National Forest which has the same general characteristics and is visited and enjoyed in conjunction with the city's lands. It is the aim of the Forest Service to administer this area primarily for the development of its recreation values, since it can serve its most important use in that way. There is a working arrangement with the city officials

whereby any timber sales applied for will be considered first as to their possible effect on the scenic values of the region. If the timber is well away from the roads, where its cutting could not detract from the esthetic values, the sale will be made; but if travelled roads cross or go near the area, or if it is of special scenic importance, the timber will be preserved intact.

On such areas, so intensively used for recreation, many of the mature trees, if not deformed or defective, which would be cut in an ordinary sale, have a picturesque character which adds materially to the beauty of the region, and their retention as "scenery" is felt to be fully warranted. Similarly, along important scenic automobile highways which traverse the National Forests, the same rule would be applied to a strip of timber on either side of



TOURISTS IN THE PIKE NATIONAL FOREST, COLORADO

These tourists are in North Cheyenne Canon on a holiday trip. Note the ragged tree with dead limbs at the roadside. If this were removed the remaining forest growth would be more attractive. Timber sale cuttings would do just this.

the road, so that the forest may play its part to the fullest extent in making the route attractive. Either the natural protection, or that which is afforded by the policy of the Forest Service, will, then, take care of the great bulk of the timber part of the most important National Forest scenery. Possibly a brief discussion of the way in which the National Forest timber is cut will serve to show that little inroad is ordinarily made on the scenic feature even in the commercial stands.

Many of the forests of the Northwest have such a dense undergrowth of shrubs and vines that one may

travel only on hewed-out trails. To a somewhat lesser degree the same conditions are found in the Engelmann spruce forests of the Rocky Mountains. Here, in many places where the timber is very much over-ripe, great numbers of the overmature trees have become decayed and have fallen, mingling in a mass through which a horse cannot go at all, and where a pedestrian's progress is only a combination of crawling, squirming, and climbing.

Such forests are just as scenic as any other when viewed from a distance, for in a bird's-eye view timber is just timber; but to get the true and greatest enjoyment out of the forests one really must get into them, not only on travelled roads and trails, but along the byways where there is nothing to guide but one's inclination. To the writer there is no outdoor experience more enjoyable than rambling about through a stand of big trees under which the

forest floor is a carpet of needles clear of fallen trees and other evidences of decay. Those familiar with Western yellow pine timber know what this condition is, and the same is true, with of course far more impressiveness, of many of the stands of big trees (Sequoia) in California.

If left to itself the forest will grow up and grow old, have its youthful and old-age diseases, and become crippled and infirm, just like a human being. At the outset a young forest is made up of thrifty little trees, each striving to grow into a big tree, and each fighting for its share of light and moisture. There are usually more trees on the ground than there is soil moisture for, and they are so crowded that each one cannot get all the light it needs, so the law of the survival of the fittest comes into play, and the less sturdy members drop behind in growth, are overtopped and starved for moisture, and eventually die or become merely struggling stunted specimens. The stronger trees continue to grow into a full stand, but they are not immune from attack by disease and insects, and many of them become the victims of fungus diseases, mistletoe, and insects, which sometimes kill them, while others are merely deformed. It is when the trees reach maturity, when growth virtually stops, and become really "old," that they are the most susceptible, either through disease which has previously attacked them, or because they have not the vigor of youth to combat attacks, and large numbers of them develop spike tops or "staghead-ness," where the top dies back several feet, or the top is

broken off, or forked trees split and lose one fork, or otherwise show some prominent sign of infirmity. If attacked by insects the whole tree may die, standing for a few years, and then falling down. The usual mature forests, then, is made up of a mixture of thrifty and infirm trees. Added to the crippled green trees are dead ones, both standing and fallen.

Under the law which authorizes the sale of timber from the National Forests, the primary object of a sale must be to preserve "the living and growing timber and promote the younger growth." The men who manage the National Forests have worked out plans under which the greatest benefit will accrue to the stands of timber through judicious cuttings. Before any living tree is cut it must be designated by a Forest officer. The officers who do the marking go through the stand, selecting



SCENIC VALUE NOT TO BE DESTROYED

Around lakes visited as recreation areas no cutting would be allowed in a strip of timber around the lake and deep enough to insure no detracton from the natural beauty of the place.

for cutting those trees which are mature or overmature, and those immature ones which are in some respects defective or which need to be removed to thin crowded groups so that those left in the group may have room to grow and develop properly. All the young and middle-aged trees which are sound and thrifty are left, and they will greatly increase in size and value before the next cuttings on that area. After the cutting under these marking principles the remaining stand is free of the "spike-tops" and other cripples, and presents a thrifty appearance far more pleasing to the eye of many than the "unbarbered" stand. Furthermore—and this is a vitally important thing—the removal of the diseased overmature trees has eliminated a vast amount of fungus disease, and materially decreased the opportunity for infection of healthy trees, so that the stand has not only been put in much healthier condition, but it has much better chances of remaining healthy.

Under the marking system which has been outlined the cutting is in every sense a moderate one. For example, on a large tie sale in lodgepole pine timber on the Medicine Bow National Forest in southern Wyoming a sample area was marked to show the purchaser how the marking principles would be applied. On the area covered by the sample marking there were on the average 347 trees per acre which were six inches and more in diameter four and a half feet above the ground, and of these only fifty, or less than 15 per cent, were marked for cutting, leaving

almost two trees for every square rod. On this same area the marking took only 37 per cent of the trees 10 inches and over in diameter at breast height. At the same time all the trees which had reached a sufficient size to be mature for cutting as the trees were marked, and the lumbermen got the ripe crop, while the unripe timber was left, having both its future commercial and present esthetic values intact. When the stand is ready for cutting again, and at each succeeding cutting, the same marking principles will be applied, but the second cutting will be done when the trees now middleaged reach maturity, and before they become overmature and infirm, so that there will never again be the large number of defective trees in the stand there were in its virgin condition; and both commercial and esthetic values will always be at the maximum.

Forest Service sale contracts specify that stumps must be cut low to secure the fullest possible utilization of the tree, and that all the brush and other debris resulting from the cutting must be disposed of in a specified manner.

The limbs are trimmed off the unused portion of the trunk and wherever the fire danger is great they are piled and burned; while in localities of small fire danger the brush is frequently scattered out in a thin mat so that it will decay rapidly and disappear. Thus, with the low stumps, and after the brush has been disposed of, the ground on which cutting has been done shows little evidence of the cutting, and one going through the cut-over stand on snow deep enough to hide the stumps would ordinarily never realize that any cutting had occurred. Under the usual marking systems employed in National Forest timber sales, then, the permanency of the forest is assured.

With Unele Sam spending hundreds of thousands of dollars every year on good roads and trails to make the National Forests more accessible to the public for recreation—and they are coming to be more and more the nation's playgrounds—the people can rest secure in the knowledge that he is going to bring lumbering and esthetics together so that each shall occupy its logical place.

## PINE BLISTER DISEASE QUARANTINES

**A** QUARANTINE against the shipment of white pine seedlings west of Minnesota, Iowa, Missouri, Arkansas and Louisiana and including these states was recently ordered by the Federal Horticultural Board of the Department of Agriculture. This action followed the passage of the amendment to the quarantine law giving the Board increased power and the hearing on the quarantine proposition on April 10 at Washington. The further importation of currant and gooseberry bushes from Europe and Asia on which the white pine blister disease may be carried is also prohibited. A supplementary order of the Horticultural Board prohibits the shipment of five-leaved pines or black currant bushes from the heavily infected region comprising the New England states and New York to any point outside. This additional quarantine is made for the purpose of protecting other quarantined states as well as the remainder of the country from possible infection.

The quarantine was first made effective on June 1, but the Board later, learning there was a considerable movement under way of possibly infected white pines and to a less extent black currants from New England to states lying west and south, amended the original quarantine covering that section and made it effective May 1.

The Board explains that the quarantine was first made effective June 1 because: "the fixing of the effective date of these quarantines at June 1 was done solely in the interest of the nurserymen in recognition of their needs and of their spring contracts for delivery."

And adds: "It is hardly necessary perhaps to say that the Board will expect nurserymen, in return, to scrupulously respect state quarantines in relation to the pines, currants and gooseberries covered in these orders, and it is understood that in the meantime the voluntary agreement of a year or more ago not to ship any white

pines or currants or gooseberry plants into the Rocky Mountains or Pacific Slope states is to remain in full force and effect. The inspectors of these western states have been notified of this understanding."

These quarantines, together with the \$300,000 appropriation made by Congress for the suppression of the pine blister disease, follow the widespread public agitation of last fall and early this year, lead by the American Forestry Association, to secure national and state action against the disease which threatens to wipe out white and other five-leaved pines of this country and Canada valued at over \$500,000,000.

The various states have taken action, to date, as follows, the quarantines, unless otherwise specified, being against pines, currants and gooseberries:

California—Quarantine against all five-leaved pines and currants and gooseberries from points in the United States east of the Mississippi.

Delaware—Quarantine against all points outside the state.

Idaho—Quarantine against New Hampshire, Vermont, Massachusetts, Connecticut, New York and Pennsylvania.

Indiana—Quarantine against all points outside the state.

Kansas—Quarantine against all points outside the state.

Massachusetts—Quarantine against white pines from Europe, and an appropriation of \$50,000.

Michigan—Quarantine against all points outside the state.

Minnesota—Quarantine against all five-leaved pines in New England, New York, New Jersey, Pennsylvania, Ohio and Wisconsin and an appropriation of \$15,000.

Montana—Quarantine against New Hampshire, Vermont, Massachusetts, Connecticut, New York and Pennsylvania.

Nevada—Quarantine against territory east of the Mississippi, Minnesota and all foreign countries.

New Jersey—Quarantine against five-leaved pines from all New England, Pennsylvania, New York, Minnesota and Wisconsin.

New York—Quarantine against five-leaved pines from New England, Ohio, Indiana, Minnesota, Wisconsin, Pennsylvania, Illinois and New Jersey; and an appropriation of \$15,000 as well as \$10,000 already given for suppression. Also black currants are declared to be a public nuisance, are to be eradicated and all necessary state quarantines enforced by the state authorities.

Ohio—Quarantine against five-leaved pines from all points outside the state.

Oregon—Quarantine against territory east of the Mississippi and all foreign countries.

Pennsylvania—Quarantine against all five-leaved pines from points outside the state. The appropriation bill is still in the legislature.

South Dakota—Quarantine against all points outside the state.

West Virginia—Quarantine against all points outside the state.

Wisconsin—Quarantine against five-leaved pines from points outside the state.

Nebraska—The State Entomologist is authorized to declare a full quarantine.

Maine—Appropriation of \$5,000 for 1917, \$5,000 for 1918 and power to destroy pines, currants and gooseberries, to fix a compensation and to quarantine.

Vermont—Appropriation of \$25,000 to include campaign against gypsy moth and other plant insect and disease control work.

New Hampshire—Appropriation of \$28,000; the state forester is given power to destroy pines, currants and gooseberries except in nurseries, and the state nursery inspector has quarantine power.

Rhode Island—An appropriation of \$25,000.

Connecticut—An annual appropriation of \$7,500 and \$5,000 extra for use during the currant season.

Virginia, North Carolina, South Carolina and Maryland are now considering stricter quarantine measures to keep out the disease.

#### A NECESSARY QUARANTINE LAW

**A**GRICULTURE has long suffered unwarrantably from pests—the alfalfa weevil, the boll weevil, the grape phylloxera, for instance.

“This is especially true of that great department of agriculture, the Forest Service—a service which embraces privately-owned as well as publicly-owned forests. They have had to face the onslaught of the brown-tail moth, the chestnut blight, and now the pine blister rust, which threatens the white pines of the United States and Canada, valued at over \$350,000,000. The only way to control the disease seems to be to eradicate in the neighborhood of white pines the currant and gooseberry bushes, both wild and cultivated, on which the rust propagates and spreads to the pines, and to institute strict quarantine laws.

“The pine blister rust has not heretofore been widely prevalent in America. It now exists in the states of Maine, New Hampshire, Vermont, Massachusetts, Rhode Island, Connecticut, New York, New Jersey, Pennsylvania, Wisconsin, and Minnesota. Hence it is necessary to quarantine these states, together with portions of other states, prohibiting the movement from them to other states of five-leaved pine nursery stock and of currant and gooseberry stock. In addition, the movement of this stock from the most seriously infected states (the New England states and New York) to the less seriously infected states should also be prohibited, as should be the importation of all currant and gooseberry plants from Europe and Asia.

“It is a satisfaction to know that these three things are now being done, and that our Government can follow the examples of Germany, Austria, France, Holland, and Switzerland in enforcing quarantines. Among the measures passed by the Sixty-fourth Congress the new Quarantine Law has escaped general notice, perhaps because it was passed on Sunday, March 4, just before adjournment. It is one of two amendments to the Agricultural Appropriation Bill, added because of the urgent plea made by the American Forestry Association. The first of these amendments appropriated \$300,000 for the investigation and eradication of the pine blister rust. The second gave to the Federal Horticultural Board of the Department of Agriculture authority to declare effective quarantines against tree and plant diseases. Existing law permitted the Board to declare a quarantine only where a dangerous plant or insect infestation was known to exist. Of course such quarantine was manifestly inadequate. The Board needed the power to declare a quarantine wherever quarantine should be necessary to prevent the spread of the infestation.

“All lovers of the forest and all who are interested in forestry in any way will be relieved to know that at last our Government has the power to deal effectively with disease, and has taken three necessary measures to that end.”—From the *Outlook*, April 16.

#### YE GOUSEBERRIES

**I**F the fight which is being launched this year to save the white pine forests from destruction by the pine blister rust proves successful, gooseberry jam will be a rarity. In a curious old manuscript of the 17th century, *Recettes Medicales d'autrefois a Jersey*, we are told how our forefathers made “gooseberry custurd”:

“Take a posnet and put in a little rose water, put in gouseberryes as many as you thinke fitt, then put them into the posnet and boyle them till they be boyled to peaces, then take them up and beate to yealkes of eggs and put them in ye gouseberryes, then put it into a platten, and then put sippetts into the platten but you must first of all sweeten it very well.”

**A** WOOD specimen found in glacial drift and estimated by the Wisconsin State geologist to be approximately half a million years old has been identified by the Forest Products Laboratory of the Forest Service as spruce.

# EDITORIAL

## CUT-OVER LANDS A NATIONAL PROBLEM

NO nation, with the possible exception of Russia, in Siberia, has ever become possessed of such an enormous area of land capable of agricultural development as the United States. In the Colonial period, the energy of our mixed but largely English stock, confined by the barrier of the Appalachians, and by the ferocity of the Iroquois tribes in western New York, expended itself upon the crowded and not very fertile soils of New England and the Atlantic seacoast. The extent of this clearing greatly exceeded the limits of normal development, and visitors in New England are frequently amazed at the evidences of past cultivation of barren hillsides and rocky thin-soiled pastures.

With the bursting of the great Appalachian dam, about the time of the Revolutionary War, this flood of pent-up energy flowed westward, first clearing the fertile wooded soils of the "Northwest territory," and the more mixed and spotty areas of the South,—then, with increasing force, deluged the prairies of Illinois, Iowa, and the Great Plains, where the settler no longer had to clear his land of stumps and forest growth. The gold rush of '49 carried the wave of settlement to the Coast, while the backwash from this wave filled the interior basins.

This great westward movement took the cream of the public lands—those most easily cleared, most fertile, and best located. Then came a further great absorption, this time of public timber lands, accompanied by the building up of large units of ownership through the assembling of smaller tracts, so that the business of lumbering might be profitably and economically conducted.

About the time that lumbering, conducted on a gigantic scale in the Lake States, began to reach a stage of exhaustion, and the area of cut-over lands had mounted to large figures, the available fertile and watered public lands of the country had been almost completely absorbed. Immense areas remained, but these were too mountainous or too dry to be farmed under the Homestead Law. About this time, too, many farmers' sons in the richer sections, and others from overcrowded cities, began to seek a foothold on the soil.

This pressure created a market for cut-over lands. Up to this time, the Lake States lumbermen had abandoned large areas after removing the timber, rather than pay taxes. It was natural that they should seize the opportunity to realize something from the sale of this cut-over land,—and a second era was ushered in by the advent of the land speculator, who bought up large tracts at very low prices, often realizing several hundred per cent by selling to customers at from \$5 to \$10 per acre.

But the clearing of a farm from either timber or cut-over land is pioneer work, requiring years of hard physical toil, or else the expenditure of considerable capital to make headway in removing stumps and bringing the raw soil under the plow. Buildings must be erected, the land must

be fenced, agricultural machinery and livestock acquired, and the roughness of the soil subdued to permit proper cultivation. Studies made of clearing land show that the actual costs of removing brush and stumps and breaking the soil will reach figures that in some parts of the Pacific Northwest are prohibitive. When added to this we include the cost per acre of the fencing, building and other capital, and the cost of living during the period when the farm is being brought under cultivation, we are faced with the fact that *the true economic value of cut-over and unimproved lands is very low as compared with these same lands after this investment has been made.*

The pioneer on government land incurred no cost but his filing fees and his labor. A great item in reducing his living expenses was the plentiful supply of wild game in these new regions. Coming of rugged stock inured to hardships, with simple wants, he usually succeeded in subduing the forest and carving out a farm. The modern pioneer is confronted at the outset with an expense of purchasing his land. Too often he is city bred, ignorant of farming as a profession, unable to do without many of the modern luxuries, and soon discouraged both by the unwonted hardships encountered, and by the comparative loneliness of life on a new farm. But even if he comes of good farming stock, or from the hardy races of immigrant peasantry of Europe, he has to face the three handicaps not known to our fathers, the first cost of soil, the absence of wild game (or restrictive game laws) and the comparative poverty of the soil. For all will admit that the richer soils were the first cleared and settled. Is it any wonder that the saying is current that it takes three crops of settlers to subdue a farm in the wooded sections? The final owner builds his success upon the ruined hopes and wrecked investments of his less fortunate predecessors.

The area of cut-over lands in America is enormous, and is increasing every day. What is going to be done with these lands? Are they to remain a wilderness, scorched and blackened by repeated fires, on which not even a second growth of timber can succeed in establishing itself? Or, worse—are these lands to remain as an enormous sponge, in the hands of land speculators, who by playing upon the credulity and eagerness of land-hungry purchasers, and by charging many times the intrinsic value of the lands, deprive them of their entire store of savings and leave them a mortgage in place of the capital absolutely required for farm development? When the victim fails to meet his interest, the sponge is squeezed dry, the purchaser evicted and the land is again on the market to soak up more savings.

The time was in this country when any method of making money, not prohibited by law, was considered legitimate, and the operations of dealers in cut-over lands were regarded as beneficial to a community by bringing in

new people to spend money in the neighborhood. But of late there has been a tremendous awakening, North, South, East and even in the far West, the land of the booster and the optimist. America is tolerant of wrong, but only up to a certain point. Bitter experience has recently taught many communities—even entire states—that a defrauded purchaser and an immigrant who fails does tremendous harm to the reputation and fair name of the region. Associations of land dealers have even been forced in self-defense to abandon their methods of flamboyant advertising and employ experts to determine cold, hard facts as to the value of the lands they were endeavoring to sell,—and this because sales had become impossible, due to the bad name fastened upon the region through avarice and irresponsible speculation.

For the first time, too, the various state and governmental agencies seem to have become aroused to the need of a vigorous exposition of facts, and to have lost their fear of incurring the displeasure of entire communities acting under the leadership of these land-selling interests.

The fight for an equitable policy in the sale and settlement of raw lands, a policy which demands that the value of these lands shall be placed at its true figure instead of being inflated, is by no means won. But if many more

such conferences as the Cut-over Land Conference recently held in New Orleans are brought about, we may hope for great things in the near future. The Conference passed, among others, the following resolution: "*Be it further resolved*, that inasmuch as many acres of this area are better adapted for forest growth than for agricultural crops, the Association shall undertake to further and promote the development of approved forestry methods, looking toward reforestation of such areas, for the benefit of future generations, and where practicable to combine such reforestation methods with livestock development."

The day of the pioneer is not gone in America—we need him more than ever to help bring under cultivation the enormous areas of cut-over land suitable for agriculture. Let us do him economic justice, and give him at least as favorable an opportunity to make good as our forefathers had, and cease our efforts to deceive him into thinking that cut-over lands are worth just as much in their raw state as they will be after he has put into them all he has, his capital, and his life blood. We wish success to the high-minded and patriotic stand taken by those Southern lumbermen, owners of 76,000,000 acres of cut-over land, who have pledged themselves to the policy of fair dealing with the settler, regardless of immediate profit to themselves.

## SHALL THE NATIONAL FORESTS BE MADE SELF-SUPPORTING?

**W**HEN the National Forests were first placed under efficient administration it was the expressed hope and intention of the United States Forester to make them self-supporting within five years.

But with the development of the work, the magnitude of the task of protecting, developing and administering some 160,000,000 acres of wild and inaccessible land became better understood and the appropriations for these purposes still exceed the income by over \$2,000,000. In 1916 the income from the forests totalled \$2,800,000, which is three-fourths of the sum required to protect and administer them, the remainder being spent for permanent improvements, and for forest investigations. Receipts are constantly increasing, the income for 1916 being greater by \$340,000 than for the previous year.

Until recently, Congress was somewhat inclined to criticize the Forest Service for its apparent failure to establish the National Forests on a self-supporting basis within the stipulated five-year period. Enemies of the national policy have cited the excess of expenses over income as a proof of extravagance and failure of the whole program. But of late a distinct reversal of attitude is noticeable, and the Service has apparently justified its policy beyond further question.

The principal cause of this change of heart is the fact that the leaders of Congress have become practically convinced that the administration of the National Forests is economical and efficient. A cost of less than 2½ cents per acre per year for all purposes directly connected with protection and management is not an extravagant sum to pay for the character of service secured.

The two principal sources of income are fees charged for grazing livestock and receipts from the sale of timber. If the forests are to become self-supporting it must be mainly

from the utilization of these two resources. In either case, *the income received cannot be made the primary consideration*, yet the Government must obtain from the sale of these resources what they are actually worth on a competitive basis, otherwise an unfair commercial privilege is received by the successful applicant, which reacts injuriously on his immediate competitors and upon the public, which would lose the revenue, their only return in lieu of taxes which would be paid were these lands privately owned.

For a long time the fees charged for the grazing privileges were too low. But as soon as steps were taken to correct this injustice, those stockmen who then held the grazing privileges protested that the present income from grazing was more than sufficient to pay the cost of administration, and therefore the fees should not be increased! This was the old doctrine of self-support, but with a decidedly new application! When the grazing fees have been fully adjusted—which has not yet been accomplished—the revenue from this source alone will total over \$2,000,000.

In seeking to apply the same principle of charging the true value of the resource to the sale of timber stumpage the Forest Service has had a problem which has called forth its best efforts—not only for the fixing of the proper price of stumpage, but in deciding upon the quantity which should be sold. If the sole object of the Service had been to increase the income in order to make a showing for Congress, they could have done so by offering large bodies of timber at reduced prices (thus approaching the old policy by which four-fifths of our timber was sold or given away for a few cents a thousand feet under our land laws). But against such a policy stood the principle that timber resources must bring in the actual ap-

praised value of the stumpage—and this principle has been strictly adhered to at all times. In fact, the foresters employed by the Service have developed timber appraisals to a science which in thoroughness and accuracy exceeds anything previously attempted by private corporations.

Even with this check upon excessive sales of timber, opposition is still strong in some quarters against *any sales of national forest timber whatever*. This is especially true in regions like Washington, Oregon and Idaho, where there is an overproduction of lumber. It reaches an acute stage when the Service appraisals show stumpage values less than those desired or expected by the owners of small tracts of private timberlands acquired under the homestead, or stone and timber laws. There is much excusable ignorance of the factors which determine stumpage values on the part of such land owners. The prices paid for stumpage do not in any case determine the price of lumber,—but on the contrary, the lumber prices, less the cost of manufacture, transportation and logging, are the only ultimate basis for the value of the stumpage. Stumpage prices cannot be regulated by law. It has been pro-

posed—for the benefit of timber owners—to set a minimum price upon National Forest timber. The only effect of such a law would be to prevent the sale of such timber at all, except where it was actually worth more than the price set. It would not serve to increase values.

Whatever is the outcome of these conflicting economic factors, one thing is certain—that the income from the National Forests must be based upon other considerations than those of profit and loss on the administration. What other department of the Government is placed upon this basis? Are we to eliminate the educational activities and experimental research of the Service because it is not productive of immediate revenue? And what value shall we place upon the protection afforded to watersheds and irrigation throughout the west, or upon the recreational and scenic features of the forests, which require an expensive system of fire protection?

The National Forests may become self-supporting, and even produce a surplus income. We do not care how soon this occurs, nor should we tolerate the sacrifice of a single economic principle or public benefit to attain such a result.

## A VICTORY FOR EFFICIENCY AND ECONOMY

THE Minnesota Forest Service, since its establishment in 1911 by the employment of a trained forester, has been a model for other states. The ideals sought by this law were complete freedom from political influence, the appointment of all agents strictly on a basis of merit, and the enforcement of regulatory police powers to secure fire protection, without fear or favor, against both the rich and influential, and the man of smaller means and less responsibility.

These objects have been completely attained, by the continuance of the Minnesota State Forestry Board of nine members, with power to appoint and to protect their own executive agent, the State Forester.

But the movement for efficiency and economy, initiated in Minnesota four years ago, and gaining great headway, with practically no real opposition, suddenly developed into a sinister attack upon the integrity of this State Forest Service. The so-called Public Domain Bill, which sought to effect a great consolidation of the departments of lands, forestry, immigration, highways, fish and game, drainage, waterpower, and mines, under a single all-powerful commissioner, who should appoint subordinates over various of these departments, included a provision abolishing both the State Forestry Board and the State Forester's office. The independence and integrity of the forestry department was to be completely destroyed by creating a new department of lands, forestry and immigration, under a political subordinate, who in turn would have control of an official of third rank charged with the former duties of State Forester.

Whether this plan was deliberate, or arose from the inability of politicians as a class to grasp the essential principles of efficiency in state work, the effect of such a measure, if passed, would obviously have been to put an end to the effective enforcement of the law requiring log-

gers to burn their slash, and to throw the entire machinery of state forestry back into the morass of patronage and party politics. Against such a result the American Forestry Association lodged a vigorous protest.

Partly through the Association's efforts exerted along educational lines in calling the attention of the people of the state to this situation, and partly because of vital defects in the bill itself, which not only failed to secure economy but threatened to destroy certain essential safeguards now in force in the methods of handling public property of immense value, this imprudent and dangerous measure was finally defeated, not once, but twice—for after the first defeat in the State Senate, a duplicate bill passed the House, only to be again consigned to oblivion in the Senate.

It was freely claimed that this bill would create a vast political patronage—a part of which would have been represented by the field force of the State Forest Service, deprived of their directing head, the State Forester, and subjected to the influence of the party in power. For the present, this movement to capture the State Forestry Department has been definitely side-tracked. But the people of Minnesota may not yet realize that under the cloak of efficiency and economy, the effort to reduce all state departments to a system dependent upon influence and partisan politics, will surely be continued. There is much to be learned by our states if they ever expect to attain a really efficient and economical administration of their internal affairs—and it is time that the people as a whole came to a better understanding of the need for skilled services and merit in the management of state departments requiring technical direction. They would then be less apt to swallow the sugar-coated pill of consolidation whose apparent purpose is to improve the state machinery, but whose effect is often to tear down its most efficient units.

# A GROUP OF LOW-COST COUNTRY HOUSES

BY RAWSON WOODMAN HADDON

**I**N any consideration of the small and inexpensive country house it is well to remember at the very start that, to the architect, far less ingenuity need be brought to bear upon the work at hand in the designing of a very large and expensive building where whatever economies that are practised are the result of choice and not of necessity, or in a very cheap house, where all but the main essentials are necessarily eliminated, than is the case with the house of moderate cost in which it is desirable to embody with good design not only convenience and comfort but rigid economy as well.

And the time spent, therefore, in the designing of a low-cost house, that is, of the type costing less than five or six thousand dollars, is quite as great as the time necessary to design one costing from five to twelve or fifteen thousand dollars.

For this reason it is perhaps a natural result that small houses are seldom designed by architects of anything like national reputation, or, as a matter of fact, by any architect at all, excepting, too often, by men who attempt that impossible combination of which we so often hear, the "architect and builder."

An exception to this general rule is found in a group of houses recently built on Indian Hill, Worcester, Massachusetts, under the supervision of Mr. Grosvenor Atterbury, of New York City. Mr. Atterbury's work at Forest Hills, Long Island, and his connection with many such large town planning developments is well known.

Among the various suburban developments that have been undertaken during recent years none surpass—while few, indeed, even equal in interest—this work which was

recently undertaken by the Norton Company of Worcester, on Indian Hill, a large tract of some hundred and fifteen acres or more of undeveloped land near that city. The development was undertaken in the interest of three thousand seven hundred or so various employecs in the company's factories nearby.

While various developments of a similar kind, some larger and some smaller, have been undertaken in Europe that are very nearly perfect from the point of view of good architecture and good town-planning, it is, nevertheless, a lamentable fact that the few developments found in America until the immediately recent years have been, without exception, most noticeably lacking in any qualities of good, substantial design,

and in any suggestion, however slight, of rational landscape or town-planning.

For the reason, then, that the Indian Hill development contains within itself all these desirable characteristics, both in the houses separately and as a development as a whole, and because the actual work, while praiseworthy in design, is at the same time economical in construction, this development marks a most important period, just as Forest Hills has done, in the history of matters of this sort in the United States.

The pest of the poorly arranged and often wholly unsanitary dwelling that is too often found in large suburbs where even much more expensive houses are erected is by no means confined to any one section of the country or to any one class of dwelling, and for this reason whatever results may have been obtained in any development, large or small, are equally of interest to the individual



DEVELOPING A BUILDING SITE

General view of Indian Hill, Worcester, Massachusetts, from across the Lake, showing the first houses erected.



AN IDEAL STREET

General view showing typical street of delightful suburban settlement. Grosvenor Atterbury, architect and town-planner.

Use This Catalog  
SUGGESTIONS  
FOR  
EFFECTIVE PLANTING

AT last a book has been written which tells what plants and trees and shrubs are best adapted by Nature for each garden and landscape—and how to group them most effectively.

"Suggestions for Effective Planting" is not the usual mechanical, deadly dull nursery catalog. It is arranged in departments. To read it is like going over your problems with an experienced plantsman and having the proper materials listed for you.

Send for your copy

## Andorra Nurseries

William Warner Harper, Proprietor  
Box 200, Chestnut Hill, Phila., Pa.

## FOREST NURSERIES

PINE SPRUCE

Evergreen trees for forest planting in any quantity, from 100 trees to carload lots.

WE GROW OUR OWN TREES

Write us for catalogue

KEENE FORESTRY ASSOCIATION

KEENE, N. H.

## FORESTRY SEEDS

I OFFER AT SPECIAL PRICES

Pinus strobus  
Pseudo-tsuga Douglassi  
Pinus ponderosa  
Picea Englemanni  
Picea Pungens  
Thuja Occidentalis  
Pinus taeda

and many other varieties, all of this season's crop and of good quality. Samples upon request. Send for my catalogue containing full list of varieties.

THOMAS J. LANE

TREE SEEDSMAN

Dresher Pennsylvania

## HILL'S Seedlings and Transplants

Also Tree Seeds

FOR REFORESTING

BEST for over a half century. All leading hardy sorts, grown in immense quantities. Prices lowest. Quality highest. Forest Planter's Guide, also price lists are free. Write to-day and mention this magazine.

THE D. HILL NURSERY CO.

Evergreen Specialists

Largest Growers in America

BOX 501 DUNDEE, ILL.



Grosvenor Atterbury, Architect  
WORKINGMAN'S COTTAGE  
Indian Hill, Worcester, Massachusetts.

owner who is planning to build a single low-cost home of his own, or to those who are opening up large tracts of land upon which many suburban homes are to be built, either as industrial or everyday suburban real estate developments.

It was not so very long ago that building market conditions were in such shape that to design a house costing not more than three thousand dollars was comparatively simple. At the present time conditions are such that to duplicate a three-thousand-dollar house built not so very long ago would now cost considerably nearer five thousand. Mr. Atterbury has succeeded, in spite of this, in designing a group of buildings each of which can be sold, with land complete, for considerably less than it would cost to build less carefully and skilfully arranged houses containing the same number of rooms and the same conveniences.

While it is not often that so excellent a building site is selected for development, it also remains true that not often has the architect and town-planner so carefully and successfully selected his materials and designs to harmonize with the site and with the local traditions of the surrounding country. This has been true even when conditions of site and surroundings have been equally favorable.

The main point of interest, then, in this particular development, lies in the fact that these houses could be reproduced in other parts of the country at figures only slightly varying from their cost at Indian Hill.

None of the houses are over-large or expensive. In the matter of size, the area of the buildings has been kept down to a minimum by a skilful use of every inch of space within the walls. There are no useless and unnecessary large halls or other wasted spaces, while, on the other hand, the planning is neither

(Continued on page 312)

THORBURN'S  
SEEDS



IT pays to be extra careful of seeds intended for the growing of trees. The life of a tree extending over years is of more importance than is the growth of a product which reaches maturity in a few months.

Thorburn's Seeds are chosen with the greatest of care from selected stock. They come of good family, as it were, and the results of their planting will be thoroughly satisfactory.

Thorburn's have had a reputation for superior seeds for over a century. Now, with demand greater than ever before, that sterling reputation is jealously guarded. *The first quality always is our motto.*

Write today for the latest catalog  
Interesting and valuable

J. M. Thorburn & Co.

ESTABLISHED 1802

53 S. Barclay Street

Through to  
54 Park Place

NEW YORK



Send for  
this Book



Underground System for Gardens and Lawns



Overhead System for Gardens

## “Do your bit” to increase the Country’s food supply

by making your garden produce its maximum. Insure the success of your planting and make the most of your expenditure for seeds and fertilizer. Each foot of soil will yield its utmost; regardless of heat or protracted drouth if you install the

# Cornell

## Systems of Irrigation

An arrangement of underground piping leads the water to upright sprinklers capped with the famous Rain Cloud Nozzles which deliver a fine spray or a heavy rain, as you prefer, over every part of the garden. The volume and heaviness of the shower can be controlled perfectly, giving just the amount and character of irrigation

which you need. Cultivation is not interfered with by this installation.

For your lawns use the Cornell Underground System with Rain Cloud Nozzles. Perfect irrigation over the whole area and no interference with mowing.

*Write for illustrated literature*



Portable Sprinkler for Lawns or Gardens

## W.G. CORNELL CO.

Engineers and Contractors

Plumbing, Heating, Lighting,  
Automatic Sprinklers, Water  
Supply Systems, Sewage Dis-  
posal Plants, Automatic Sewage  
Ejectors.

17th St. and Union Square, New York

Chicago	Newark
Railway Exchange	86 Park Place
Baltimore	Boston
Munsey Bldg.	334 Shawmut Ave.
Washington	Cleveland
923-12th St. N.W.	Leader-News Bldg.

Kansas City, Mo.  
Commerce Trust Bldg.



Rain Cloud Nozzles  
\$2.00 to \$3.00, f. o. b.  
N. Y.

# Tree "patching" cannot



1 A crude cement patch—ineffective and injurious.



2 Cement patch removed—showing extensive and neglected decay.

Five typical letters from  
hundreds by satisfied  
Davey clients

Mr. Geo. M. Verity, Pres.  
The American Rolling  
Mill Co., Middletown,  
Ohio.

"The work which your men did on my premises has every evidence of being first class in every respect."

Mr. T. W. Snow, Pres. T.  
W. Snow Construction  
Co., Chicago, Ill.

"The work which you did at my place six or seven years ago is so satisfactory that I have not found it necessary to do anything more. Every tree you treated, including the worst ones, have since that time made new and beautiful trees."

Mr. Edward Holbrook,  
President The Gorham  
Co., New York City.

"I wish to express the satisfaction we have had in your work. The work has been done in a thorough manner and your foreman and his assistants are entitled to great credit."

Mr. Wm. H. Grafflin, Fais-  
ton Manor, Glencoe,  
Baltimore Co., Md.

"The work done at my place has been done in a very satisfactory way and you are fortunate in having such efficient and industrious employees, a refreshing experience in these days of carelessness and shirking."

Mrs. Chas. G. Weid, Brook-  
line, Mass.

"I am very much pleased with the result of your work on my trees. . . . From their present appearance I do not see why they should not last many years longer, whereas last year we had grave doubts as to their living."

**T**HE tree is a living organism; it breathes, assimilates food, has a real circulation. Its normal condition is health, but it is subject to disease and decay just as any other living thing. As with one's body or one's teeth, the tree responds only to that treatment which is in scientific accordance with Nature's laws.

The physician, the surgeon, or the dentist requires years of patient study, plus the intuitive skill born of ripe experience, before he is equipped to obtain successful results. This is also exactly true in Tree Surgery. However, in Tree Surgery, scientific accuracy is not enough. Think of the terrific windstorm with its bending and twisting! You will then realize that Tree Surgery must be mechanically perfect to withstand it. The mechanical principles and methods of bracing employed by a real Tree Surgeon would amaze you.

Trees cannot be "patched" like barn doors. Men without long training and experience cannot save them. Tree Surgery is a science unto itself—a science demanding highly specialized knowledge and remarkable skill for its successful application.

## Facts little understood

Because the facts set forth above have not been understood, great injury has been done to thousands of trees everywhere and a vast amount of money has been wasted in disastrous tree "patching." It has been the fault of nobody in particular. Tree owners simply have not realized the degree of scientific knowledge and mechanical skill required in the permanent saving of trees. And "tree patchers"—the men who have been doing the faulty and dangerous work—are in many cases conscientious enough, but ignorant of the facts and lacking in skill.

Photograph No. 1 illustrates a typical case of tree "patching." To the untrained eye this work probably looks good, but a Davey Tree Surgeon saw at a glance that the conditions were bad. Growths of fungus disease appeared along the edges of the filling and on the bark between the large and small fillings.

Photograph No. 2 shows the filling taken out. Nearly every principle of the science of Tree Surgery had been violated—the rough decay *only* had been removed; the cavity had not been disinfected; the condition of decay behind this crude cement patch was actually appalling, and the filling had only been in two or three months; no bracing of any kind had been used; no means had been provided to exclude moisture; the large filling had been put in as a solid mass, making no allowance for the sway of the tree.

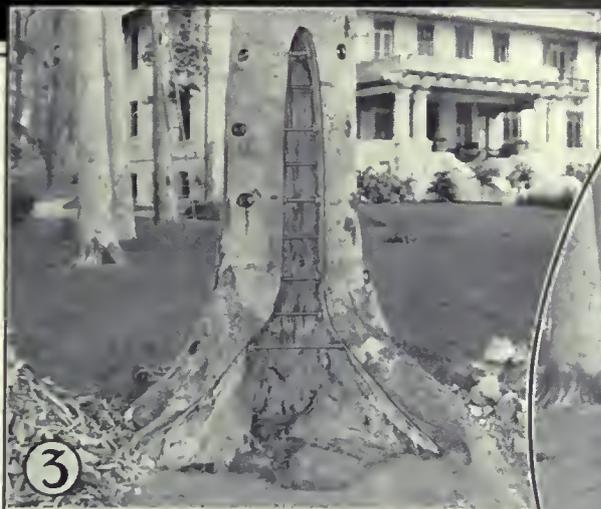
Photograph No. 3 shows all decay removed by a Davey Tree Surgeon; the cavity thoroughly disinfected and waterproofed; the mechanical bracing partly in place; the watersheds cut to exclude moisture.

Photograph No. 4 shows the Davey filling completed, put in sectionally to permit swaying without breaking the filling. This tree has since stood through many severe storms in perfect condition. New bark is now growing over the filling along the edges. The tree has been saved permanently!

# Davey Tree

Every real Davey Tree Surgeon is in the employ of the Davey Tree Expert Company and the public is cautioned against those falsely representing themselves

# save your trees!



All decay removed, cavity disinfected and waterproofed, mechanical bracing installed.



This is Davey Tree Surgery. It is scientifically accurate and mechanically perfect. The sectional filling permits swaying without crackings.

## DAVEY TREE SURGERY IS SAFE

*It is scientifically accurate and mechanically perfect.*

Your trees, many of them the product of several generations, are priceless. Once lost, they cannot be restored in your lifetime or that of your children.

To whom shall you entrust them? There can be only one answer, for there is only one *safe* place to go—to Davey Tree Surgeons.

*Safe*—because Davey Tree Surgery is time-proved; its record of successful performance for thousands of estate owners spans a generation.

*Safe*—because no Davey Tree Surgeon is allowed any responsibility until he has conclusively demonstrated his fitness. He must have served his full course of thorough, practical training and scientific study in the Davey Institute of Tree Surgery—a school, the only one of its kind in the world, which we conduct for the specific purpose of drilling our men according to Davey methods and Davey ideals.

*Safe*—because we who know values in Tree Surgery and who demand and deliver

the best, select the man to whom the treatment of your priceless trees is to be entrusted.

*Safe*—because Davey Tree Surgery has been endorsed as *best* by the United States Government after an exhaustive official investigation.

*Safe*—because Davey Tree Surgery is recommended by thousands of prominent men and women, whose endorsement you can accept with complete confidence. (Several such endorsements appear on the left.)

*Safe*—because Davey Tree Surgeons are *picked* men, thoroughly trained, conscientious, intelligent, courteous, in love with their work. "Men," writes Dr. H. D.

House, New York State Botanist and formerly professor in Biltmore Forestry School, "who would do honor to any institution of learning in America."

*Safe*—because the Davey Company is a successful and responsible house, amply able to make good in every instance, and not needing, for the sake of temporary existence, to sacrifice in the slightest degree its high standards.

Tree "patching" cannot save your trees. Only scientific, mechanically perfect treatment by men trained through years to the point of finished skill can be permanently successful. And for such treatment by such men there is only one safe place to go—to Davey Tree Surgeons.

## The Davey Tree Expert Co., Inc.

1102 Elm Street, Kent, Ohio

(Operating the Davey Institute of Tree Surgery, Kent, Ohio)

Branch Offices with telephone connections; New York, Philadelphia and Chicago

Permanent representatives located at Boston, Newport, Lenox, Hartford, Albany, Poughkeepsie, White Plains, Stamford, Jamaica, L. I., Morristown, N. J., Philadelphia, Harrisburg, Baltimore, Washington, Buffalo, Pittsburgh, Cleveland, Detroit, Cincinnati, Louisville, Chicago, Milwaukee, Minneapolis, St. Louis, Kansas City. Canadian address: 22 Victoria Square, Montreal.

# Surgeons

FOR SAFE TREE SURGERY

Write today for FREE Examination of your Trees

—and booklet, "When Your Trees Need the Tree Surgeon."

What is the real condition of your trees? Are insidious diseases and hidden decay slowly undermining their strength? Will the next severe storm claim one or more as its victim? Only the experienced Tree Surgeon can tell you fully and definitely. Without cost or obligation to you, a Davey Tree Surgeon will visit your place, and render an honest verdict regarding their condition and needs. Write today.

## Power Spraying

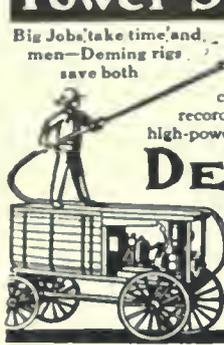
Big Jobs take time and men—Deming rigs save both

For fast, thorough spraying, covering every leaf in record time with a clinging high-powered spray, use

### DEMING POWER RIGS

Catalog showing everything from 200 gallon rigs to bucket pumps free on request.

**THE DEMING CO.**  
150 Depot St., Salem, Ohio  
Pumps for all farm uses



### Nursery Stock for Forest Planting

Seedlings	<b>TREE SEEDS</b>	Transplants
\$2.25 per 1000	Write for prices on large quantities	\$6.00 per 1000

**THE NORTH-EASTERN FORESTRY CO.**  
CHESHIRE, CONN.

## Orchids

We are specialists in Orchids; we collect, import, grow, sell and export this class of plants exclusively. Our illustrated and descriptive catalogue of Orchids may be had on application. Also special list of freshly imported unestablished Orchids.

### LAGER & HURRELL

Orchid Growers and Importers      SUMMIT, N. J.

## PARK and ESTATE FORESTRY

Logging Reports      Utilization Studies  
Timber Estimates      Forest Planting  
Etc.

*Methods and Cost of Mosquito Eradication*

### P. L. BUTTRICK

Forester and Mosquito Expert  
P. O. Box 607      New Haven, Conn.

FO 1	RE 2	ST 3	RY 4
---------	---------	---------	---------

## THE FOREST IS THREE-FOURTHS OF FORESTRY

Your opportunities are as unlimited as our forests if you study at

**WYMAN'S SCHOOL OF THE WOODS**  
*Incorporated*      Munising, Michigan

**NUT CULTURE** North, South, East, West. All phases discussed by experts. THE OFFICIAL JOURNAL. \$1.25 per year. Sample 15c.

**AMERICAN NUT JOURNAL** Rochester, N. Y.

*This is your publication. The advertising is printed for your information as a member of the Association. By mentioning your own publication in writing to the advertiser you help the editor to make a better journal.*



**SMALL SINGLE HOUSE**  
A cozy suburban home which is within the means of any thrifty fair salaried family man.

(Continued from page 308)  
cramped nor is there noticeable a lack of closet room or other arrangements.

As to cost, the typical houses containing a living-room, dining-room, kitchen, three bedrooms, a bathroom and a porch, are sold for three thousand two hundred and eighty-five dollars, with the ground upon which they stand, and the double houses, containing an additional bedroom on the second floor sell for three thousand six hundred and thirty dollars.

Naturally these are figures that should cause some amount of thought. The houses could, perhaps, have been built even more cheaply, but the materials in that case would have been inferior, and as they have been built the buyer at Indian Hill, just as every purchaser or builder of a house should be, may have absolute confidence in the fact that the materials that have gone into his house are of the best. There is, perhaps, no material so well suited for the problem as the simple frame construction that was used.

It is a notable fact, too, that frame construction was decided upon by the architect only after careful consideration of all the practical and artistic points involved. Certainly nothing more picturesque could have been found to take the place of the white texture of clapboard walls as seen in a setting such as that at Indian Hill.

While this work, with Mr. Atterbury's other work of a similar nature, marks a high period of advance in more or less paternalistic industrial activities we are not so largely interested in that phase of the question as we are in the fact that the architect has shown us how well and comfortably and economically a suburban house may be built.

In these houses we see not only examples of good design but examples of complete homes—and there is a difference in a "home" and a "house." Every detail, then, is worthy of mention. The structural framing of the houses is built of North Carolina pine, as is the interior trim. On the shingled houses cedar shingles were used.



## FISKE CLIMB PROOF CHAIN LINK FENCE

will halt the poacher, fruit thief, and thoughtless trespasser always.

Unclimbable rustproof and fireproof. All parts thoroughly galvanized by hot spelter process. The deep-set-in-concrete posts, steel wire mesh and sturdy method of construction enable it easily to outlast other fences of similar design.

We also manufacture wrought iron fencing, gates, lamp standards, gulle work, fountains, vases, tennis-court and poultry-yard enclosures, etc. Catalog on request.



### J.W. FISKE IRON WORKS

Established 1858 30  
100-102 PARK PLACE      NEW YORK

## R. MORGAN ELLIOTT & Co.

PATENT ATTORNEYS

MECHANICAL, ELECTRICAL & CHEMICAL EXPERTS

723-731 WOODWARD BUILDING  
WASHINGTON, D. C.

INVENTIONS  
PATENTING  
AND  
PROMOTING



## PATENTS

Often the slightest improvement, protected by patent, means thousands of dollars to the inventor. Our Bulletins list hundreds of inventions greatly needed, especially in farm implements, automobile accessories, household specialties and toys. Bulletins and book of advice free. Simply mail a postcard.

Lancaster & Allwine, Registered Att'ys.  
280 Ouray Bldg, Washington, D. C.



### WE CAN SAVE YOUR TREES

Don't give up hope until one of our experts has inspected your trees.

"The Bartlett Way" of bracing and bolting, cavity treating, etc., has saved thousands that were thought beyond repair. Tell us your tree troubles. Representatives go everywhere.

Send for "Tree Talk."

THE F. A. BARTLETT CO.  
544 Main Street      Stamford, Conn.

# EMERGENCY CALL FOR UNITED SERVICE

The National Agricultural Society gives you the privilege of closest possible coöperation with all federal, national, state and local agencies that are working for greater production of agricultural products and livestock.

The Big War is not wholly to blame for present conditions, nor the middlemen, speculators, etc. *Increased Population and Decreased Production* are the big causes, and normal times would have brought the same crisis which is now only harshly accentuated.

## IT IS IMPERATIVE

that all land owners appreciate the true situation and that patriotic citizens enlist together for national agricultural coöperation to remove the causes and to further intelligent concerted action to advance the agricultural industry in the United States of America.



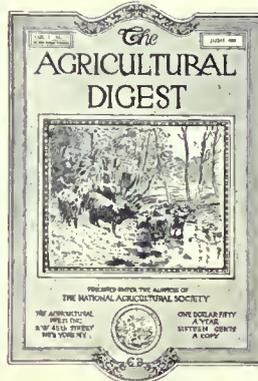
*The National Agricultural Society*

**THE HON. JAMES WILSON** of Iowa, Secretary of Agriculture in the cabinets of three Presidents, is President of The National Agricultural Society. **THEODORE N. VAIL** of New York is Vice-President. **G. HOWARD DAVISON** is Chairman of The Executive Committee.

THE NATIONAL AGRICULTURAL SOCIETY is the first national non-partisan and non-political organization of its kind, affording helpful, profitable co-operation.

Other forms of business have had the benefit of organization, the farmer's profession has drifted along with only the help of local organizations.

This society aims to help those who help themselves. It will **PAY YOU** fully and well now.



It is in no wise a competitor or antagonist of any other farm paper, but, instead, reviews them all for the common good.

*All its name implies and more.*

THE AGRICULTURAL DIGEST unquestionably fills the greatest existing need in the field of agricultural publishing today.

**BECAUSE:**

six hundred agricultural periodicals, Agricultural bulletins, and new books are analyzed and summarized monthly.

**YOU NEED IT**



*The National Agricultural Society*

Among the organizers of the National Agricultural Society were: the late **JAMES J. HILL** of St. Paul, **GOVERNOR HENRY C. STUART** of Virginia, **SENATOR JAMES W. WADSWORTH** of New York, **N. H. GENTRY** of Missouri, **PETER JANSEN** of Nebraska, **FRANK O. LOWDEN** of Illinois and **A. W. FOSTER** of California.

*A guarantee of character and service.*

The National Agricultural Society has an advisory board including deans of agricultural colleges, prominent farmers, department of agriculture men and leading editors.

MEMBERS PROFIT AND LEARN WITH THE LEADERS OF THE BEST AGRICULTURAL THOUGHT OF THIS COUNTRY.

*JOIN today in this nation-wide movement. The power rests in a representative membership.*

*Publications valued at more than \$2.*

*It is the great forward movement. The directors are farmers. You can do your part. Please cut out the blank below, now before you forget it.*

40% of the membership fee is for the subscription to THE AGRICULTURAL DIGEST, and the remainder of the fee is devoted to the cost of other publications mailed to members, and to the expenses of the Society



THE HON. JAMES WILSON



**The National Agricultural Society**  
6-6-O West 45th Street, New York

**MAIL THIS**

I herewith enclose \$2 for membership in THE NATIONAL AGRICULTURAL SOCIETY, with the understanding that I shall receive **The Agricultural Digest** for one year, and other publications issued by the Society, also one other valuable farm paper.

My name is .....

Address.....



Publications are received without further charge by members of THE NATIONAL AGRICULTURAL SOCIETY, including two high-class papers of a kind that are never sold at reduced prices, or given away. You may select one other from list sent to members

## CANADIAN DEPARTMENT

ELLWOOD WILSON, SECRETARY,  
CANADIAN SOCIETY OF  
FOREST ENGINEERS

The better protection of forests from fire is making rapid progress in Canada, and this country promises soon to outdistance its ally to the south. The Province of Manitoba has just passed a very complete act covering the whole subject of forest and prairie fires and putting into effect the permit system. The Canadian Forestry Association has been active and instrumental in the passage of this legislation and the Province is to be congratulated on coming into the ranks of those who wish to see rational and efficient protection and use of one of the most important of our natural resources. The time is coming when the people will not permit the destruction or wanton waste of property which should be conserved for our lifetime and for our children. When once it is realized that all forest and mineral wealth and also the fertility of agricultural soil is really the property of the nation and therefore of every voter, no office holders will be tolerated who do not administer such property for the common good.

The enforcement of the new Manitoba act will be carried out by Mr. Mulloy, who is proceeding to organize his fire wardens and rangers for the summer's work. He will cooperate with the Dominion Government fire rangers working on the reserves.

Mr. Robson Black, Secretary of the Canadian Forestry Association, is on a trip through the West in the interest of more general diffusion of knowledge about our forest resources and of better fire protection. He will call on all Government officials interested in such work and will lecture before Boards-of-Trade, Canadian Clubs and other public bodies.

The St. Maurice Forest Protective Association is trying to arrange for a test of an aeroplane for locating forest fires, and if this proves successful it hopes to introduce the aeroplane as a part of its mechanical equipment. There seems no reason to doubt that such a patrol would be much cheaper and more effective than the present ranger system, and if it should prove possible to land near a fire and extinguish it without calling for additional labor, the cost of fire protection would be very materially decreased.

A meeting was held recently in Montreal for the formation of a Montreal section of the Imperial Aero League and the question of the employment of these machines in commercial work of all kinds was discussed. Many aviators will be free after the war and they could be employed in carrying fast mail in forest fire protection and many other services.

The work of surveying and classifying

### Are you on the Mailing List for Catalog of

## Hicks Nurseries?



Pine and Oak Help Each Other

It will confirm your decisions on fitting your selection of trees to your soil and climate. It offers trees for dry and acid soils and moist soils in the same region. Many nurseries on alkaline soils do not specialize on oaks and pines.

Trees 20 years old can be selected now. They are guaranteed to grow satisfactorily or replaced free.

**ISAAC HICKS & SON**  
Westbury, Nassau Co., N. Y.

the Crown lands of the Province of New Brunswick has now progressed to an extent where many interesting and instructive conclusions may be drawn from the results already accomplished. To date the field parties have surveyed and examined 550,000 acres. Of this the mapping and compiling of 371,000 acres has been completed.

A letter received from one of the Staff Sergeants of the Canadian Forestry Corps says, "All the forestry battalions have been fused into a Corps, and in addition constant reinforcements are being drafted into it from the medically unfit of the infantry. The Corps is at present about five thousand strong, of whom 1500 are operating in France, and increasing every day. There are about twenty camps in England and Scotland. One Branch at Headquarters is called the Forestry Branch and this handles the technical forestry work and also all lumber returns. Captain Weir, a graduate of Ontario Agricultural College, McGill and Cornell, is in charge, and Sergeant Bricker, a student from Toronto Forest School, is his Assistant. Men in the field were given the title of Forestry Representatives and handled several camps each, sending in general forestry reports embracing silvical studies, soil studies, growth studies, etc., as well as reports on progress, accompanied by maps. Several Toronto men were on this work. Our rank was the high and lofty one of full private except Parker, who was a sergeant before this work was started. He has recently gone to France where he will be associated with the lumbering end of the work, I believe. At present we are planning some new

work at the instigation of the British Forestry authorities. A party is to be sent out to visit all our camps making volume and increment tables. We are going to use the forms which were used at Toronto University for stem analysis and volume tables. This is going to be very valuable experience for us and our time spent as soldiers will not be wasted. Since the British authorities think that this is necessary, we can assume we are 'doing our bit.' There is a very serious shortage of timber, accentuated by the submarine blockade and all production work is being speeded up. The forestry exponents are using their influence to see that the government takes up the question of reforestation as soon as possible, some even advocating that this be commenced before the end of the war."

In Prince Edward County, Ontario, where the removal of the forest exposed a sandy soil, this has drifted and people picnicking in the woods at the edge of this desert amuse themselves by tobogganing down the sandy slopes.

A new idea in fire warning signs is being used in British Columbia and Quebec. Sign posts are put up on the trails and carries giving the distances with the warning "Put Your Camp Fire Out."

The Canadian Society of Civil Engineers at a recent meeting put themselves on record as heartily in favor of proper forest protection and conservation.

The mobilization of all the resources of the country for the better carrying on of the war has given added impetus to the forestry propaganda and the National Committee on Scientific Research will include forestry research work on its program.

# BOOK REVIEWS

An Uncensored Diary, by Ernesta Drinker Bullitt, 205 pp. Price, \$1.25. Doubleday, Page & Co., New York.

Perhaps one of the most interesting accounts of life and everyday conditions in the Central Empires during the present war period is that written by Ernesta Drinker Bullitt and incorporated in book form under the title of "An Uncensored Diary," from the press of Doubleday, Page & Company. Mrs. Bullitt is the wife of William C. Bullitt, and daughter of Dr. Henry S. Drinker, president of Lehigh University. When her husband, who is a newspaper man, was ordered to the battlefields of Europe by the Philadelphia *Ledger* last year, Mrs. Bullitt insisted upon accompanying him. Floating mines or submarines held no terror for her. She was dined by many of the greatest men and women in Germany, Belgium, Austria and Hungary, and without any thought of their future publication, recorded her experiences daily. The diary is particularly unique in that it portrays a condition of affairs as written within the borders of warring nations, and was passed by the censor of the Foreign Office in Berlin.

Mrs. Bullitt frequently was a guest of General von Bissing, governor of Belgium, and also of Baroness von Bissing in Berlin. The one supreme thought of the General and his wife, Mrs. Bullitt explains, is for the safety of their eldest son, who, taken prisoner by the French, was subjected to severe treatment because of alleged ill-treatment accorded the son of Delcassé by the Germans. Von Bissing, she writes, sympathizes greatly with the Belgians.

While in Berlin Mrs. Bullitt dined on numerous occasions with Ambassador Gerard, and when her husband visited the Foreign Office to interview the Under-Secretary of State, Zimmermann, she was along. The German statesman was genial and laughingly cordial to the American woman, explained Germany's ideals and plans, and Mrs. Bullitt treats the meeting with much interest in her book.

Describing the food condition in the various cities and towns visited, the author evokes much interest by her droll humor and alternating tragic treatment of the subject. Touching on the trials and pathetically helpless position of travellers while crossing the different frontiers, she draws a sombre picture not at all conducive to cheerfulness on the part of one who may contemplate a trip abroad. And the experiences and sensations of a young German lieutenant back to "civilization" from the trenches is worthy of note, for Mrs. Bullitt has projected into the character a semblance of humanness which appeals to the individual with "nerves." This young officer, accustomed to shrieking shells and bursting bombs, obnoxious gases and wet trenches, became very nervous if riding in

an automobile, and a tramcar crossing a street at the same time was too terrifying a thing to be borne. All through the book may be found meat for thought, while in various chapters wholesome humor and delightful comedy hold the attention.

Scott Burton, Forester, by Edward G. Cheyney. D. Appleton & Company, New York. \$1.35.

A combination of a forestry education with fighting forest fires, chasing poachers, trapping bears, canoeing and all the ups and downs of college life in a big University, makes Scott Burton, Forester, mighty good reading, especially for a young fellow with a college life before him and a love of the outdoors. Scott, a tenderfoot from the East, goes West to the Forest School of the University of Minnesota to prepare for his chosen life work. He soon learns that there is a tremendous difference between the training he received in the East for his profession and that which the western boy gets, and works hard to overcome his handicap. He does well in his work and achieves great popularity among his fellows which almost turns his head. His solution of that situation is interesting. The book contains a wealth of authentic forestry information, in addition to being a mighty readable story, which gives it a double value.

The Bird Study Book, by T. Gilbert Pearson. Doubleday, Page & Co., New York. Price, \$1.25.

Mr. Pearson, as secretary of the National Association of Audubon Societies, is nationally known as an authority on birds. In this book he aims to present information for the consideration of that steadily growing number of Americans who wish to acquire greater familiarity with the habits and activities of wild birds. The book is intended for the beginner in bird studies. It is plentifully illustrated and will be found of great value to those desiring a knowledge of bird life in this country.

Forest Working Plans, second edition, by A. B. Recknagel. John Wiley & Sons, New York. Price, \$2.00.

The welcome accorded the first edition and the steady demand for it has encouraged the author to compile a revised and enlarged second edition. The book presents that which is best in European forest organization which is adaptable to the present methods of American forestry. The book is of particular value not only to the student but also to the practical forester.

Essentials of American Timber Law, by J. P. Kinney. John Wiley & Sons, New York. Price, \$3.00.

The book is devoted to a presentation of the existing law governing trees and their products as property, with such observations and references to historical development as are considered necessary to an understanding of the reasons for existing law.



*Every Forester and Lumberman  
Should Have this Book*

## HANDBOOK FOR RANGERS AND WOODSMEN

By JAY L. B. TAYLOR, Forest Ranger,  
U. S. Forest Service

This handbook will be a helpful guide to all engaged in woodwork and those whose recreation takes them into rough and unsettled regions. Have this book sent for free examination. Sign and mail the coupon—today.

429 pages, 4¼x6¾, 236 figures.

**Flexible Binding, \$2.50 net**

A NEW EDITION JUST PUBLISHED  
2nd EDITION THOROUGHLY REVISED

## THE THEORY AND PRACTICE OF WORKING PLANS

By PROF. A. B. RECKNAGEL, B.A.,  
M.F., Cornell University

This new edition contains important changes which will interest the forester. 279 pages, 6x9, illustrated.

**Cloth, \$2.00 net**

### USE THIS COUPON

JOHN WILEY & SONS, Inc.  
432 Fourth Avenue, New York City.  
GENTLEMEN: Kindly send me for ten days' free examination the books indicated below.

**Taylor Handbook for Rangers and Woodsmen  
Recknagel Working Plans**

It is understood that I am to remit their price, or return them, postpaid, within ten days after their receipt.

Name.....

Address.....

Member of .....  
[Indicate name of Society]

Position Reference.....  
[Not required of Society Members]

A. F. 5-17

## CURRENT LITERATURE

### MONTHLY LIST FOR APRIL, 1917

(Books and periodicals indexed in the library of the United States Forest Service.)

#### Forestry as a Whole

Hutchins, D. E. A discussion of Australian forestry, with special reference to forestry in Western Australia, the necessity of an Australian forest policy, and notices of organized forestry in other parts of the world; together with appendices relating to forestry in New Zealand, forestry in South Africa, and control of the rabbit pest. 434 p. pl., maps. Perth, West Australia, 1916.

#### Bibliographics

New York state college of forestry, Syracuse university. List of publications of the New York state college of forestry. 10 p. il. Syracuse, N. Y., 1917. (Circular 16.)

*Proceedings and reports of associations, forest officers, etc.*

Canada—Department of the interior. Report of the director of forestry for the year 1916. 95 p. il. Ottawa, 1917.

Indiana—State board of forestry. Sixteenth annual report, 1916. 217 p. il. Indianapolis, Ind., 1917.

New Hampshire—Forestry commission. Biennial report for the years 1915–16. 177 p. pl., maps. Manchester, 1916.

Pennsylvania—Dept. of forestry. Report for the years 1914–1915. 248 p. pl. Harrisburg, Pa., 1916.

#### Forest Aesthetics

Stone, George E. Shade trees, characteristics, adaptation, diseases and care. 264 p. il. Amherst, Mass., 1916. (Mass.-Agricultural experiment station. Bulletin 170.)

#### Forest Education

##### Forest schools

New York state college of forestry, Syracuse university. Announcement of the course in city forestry. 31 p. Syracuse, N. Y., 1917. (Circular 15.)

New York state college of forestry, Syracuse university. The New York state ranger school on college forest at Wanakona, N. Y. 28 p. il., map. Syracuse, N. Y., 1917. (Circular 14.)

Yale forest school. Tropical forestry. 93 p. New Haven, Conn., 1916.

##### Exhibitions

Pennsylvania—Dept. of forestry. A guide to the exhibit of the Pennsylvania Department of forestry and information about the work of the department. 21 p. pl. Harrisburg, Pa., 1916. (Bulletin 14.)

#### Forest Botany

##### Trees: classification and description

Wilson, Ernest Henry. The conifers and taxads of Japan. 91 p. pl. Cambridge, Mass., 1916. (Arnold arboretum. Publication no. 8.)

#### Forest Influences

Bates, Carlos G. The windbreak as a farm asset. 16 p. il. Wash., D. C., 1917. (U. S.—Dept. of agriculture. Farmers' bulletin 788.)

## Our Trees

### HOW TO KNOW THEM

Photographs from Nature  
By ARTHUR I. EMERSON

WITH A GUIDE TO THEIR RECOGNITION AT ANY SEASON OF THE YEAR AND NOTES ON THEIR CHARACTERISTICS, DISTRIBUTION AND CULTURE

By CLARENCE M. WEED, D.Sc.  
*Teacher of Nature Study in the Massachusetts State Normal School at Lowell*

One hundred and forty illustrations  
Size of book, 7½ inches by 10 inches

Cloth, \$3.00 net

Postage extra

ALL nature-lovers will hail this book with delight. Its purpose is to afford an opportunity for a more intelligent acquaintance with American trees, native and naturalized. The pictures upon the plates have in all cases been photographed direct from nature, and have been brought together in such a way that the non-botanical reader can recognize at a glance either the whole tree or the leaves, flowers, fruits, or winter twigs, and thus be able to identify with ease and certainty any unknown tree to which his attention may be called. In the discussion of the text especial attention has been given to the distinguishing character of the various species, as well as to the more interesting phases of the yearly cycle of each, and the special values of each for ornamental planting.

Publishers

J. B. LIPPINCOTT COMPANY  
Philadelphia



#### Forest Protection

##### Insects

Clement, G. E., and Munro, Willis. Control of the gipsy moth by forest management. 54 p. maps. Wash., D. C., 1917. (U. S.—Dept. of agriculture. Bulletin 484.)

##### Fire

Vermont—Forest service. Instructions to forest fire wardens of Vermont. 1916. 30 p. Burlington, Vt., 1916. (Publication no. 22.)

#### Forest Legislation

Kinney, Jay P. The essentials of American timber law. 279 p. New York, J. Wiley & sons, 1917.



**SUPERIOR  
ENGRAVINGS**

FOR ALL PURPOSES  
DESIGNERS AND  
ILLUSTRATORS

HALF-TONES · LINE CUTS  
3 COLOR PROCESS WORK  
ELECTROTYPES

**NATIONAL ENGRAVING CO.**  
506-14th Street, N.W.  
WASHINGTON, D. C.

Phone Main 8274

### Use Press Clippings

IT will more than pay you to secure our extensive service, covering all subjects, such as Polo, Golf, Tennis, trade and personal, and receive the benefit of the best and most systematic reading of all papers and periodicals, here and abroad, at minimum cost. Why miss taking advantage for obtaining the best possible service in your line?

Our service is taken by all progressive business men, publishers, authors, collectors, etc., and is the card index for securing what you want and need, as every article of interest is at your daily command. Write for terms; or send your order for 100 clippings at \$5, or 1,000 clippings at \$35. Special rates quoted on Large Orders.

**The Manhattan Press Clipping Bureau**  
ARTHUR CASSOT, Proprietor Established 1888  
6 East 41st Street, NEW YORK  
Send for Our Desk Calendar

**Do Business by Mail**

It's profitable, with accurate lists of prospects. Our catalogue contains vital information on Mail Advertising. Also prices and quantity on 6,000 national mailing lists, 99% guaranteed. Such as:

War Material Mfrs.	Wealthy Men
Cheese Box Mfrs.	Axle Grease Mfrs.
Shoe Retailers	Auto Owners
Contractors	Tin Can Mfrs.
Druggists	Farmers, Etc.

Write for this valuable reference book; also prices and samples of fac-simile letters.  
Have us write or revise your Sales Letters.  
Ross-Gould, 1009C Olive St.

**Ross-Gould**  
Mailing Lists St. Louis

Your co-operation with your own magazine will boost American Forestry to an exalted position among advertising media. One way to co-operate is to patronize our advertisers, or ask for suggestions and advice.

New York—Conservation commission. The conservation law as amended to the close of the regular session of 1916. 409 p. Albany, N. Y., 1916.

#### Forest Administration

India—Central provinces—Forest dept. The Central provinces forest manual. 3d ed. 331 p. Nagpur, 1915.  
United States—Dept. of agriculture—Forest service. Pisgah national game preserve regulations. 14 p. Wash., D. C., 1917.

#### Forest Engineering

Merrill, O. C. Opening up the national forests by road building. 9 p. pl. Washington, D. C., 1917. (U. S.—Dept. of agriculture. Separate from yearbook, 1916, no. 696.)

#### Forest Utilization

Hawes, Austin F. Marketing study of woodlots to be made by the Vermont forestry department. 12 p. Burlington, Vt., 1916. (Vermont—Forest service. Publication no. 21.)

#### Lumber industry

Downman, R. H. The National lumber manufacturers' association. 4 p. Chicago, Ill., 1916. (National lumber manufacturers' association. News letter no. 4.)

United States—Interstate commerce commission. Docket no. 8131, in the matter of rates on and classification of lumber and lumber products; statement of the descriptions of lumber and lumber products at present used in carriers' tariffs and of descriptions proposed for uniform adoption. 28 p. Wash., D. C., 1916.

United States—Interstate commerce commission. Docket no. 8131, in the matter of rates on and classification of lumber and lumber products; analysis of testimony and exhibits; Fred Esch, examiner. 147 p. tables. Wash., D. C., 1916.

#### Wood-using industries

Brown, Nelson C. The hardwood distillation industry in New York. 66 p. il. Syracuse, N. Y., 1917. (New York state college of forestry, Syracuse university. Technical publication no. 5.)

United States—Federal trade commission. News-print paper industry. 12 p. Wash., D. C., 1917. (U. S.—65th congress—Special session. Senate document no. 3.)

White, F. M. Dairy and general purpose barns. 40 p. il. Chicago, Ill., 1917. (National lumber manufacturers' association—Trade extension dept. Farm bulletin no. 7.)

#### Wood Technology

Lee, H. N. Canadian woods for structural timbers. 44 p. il. Ottawa, 1917. (Canada—Department of the interior—Forestry branch. Bulletin 59.)

Webster, Angus D. British-grown timber and timber trees. 164 p. pl. London, Wm. Rider & son, 1916.

Zimmerman, C. W. Tests of western yellow pine car sills, joists and small clear pieces. 16 p. il. pl. Wash., D. C., 1917. (U. S.—Dept. of agriculture. Bulletin 497.)

Barton, J. E. The use of treated timber, especially as relating to the use of treated timbers on the farm. 3 p. Frankfort, Ky., 1917. (Kentucky—State forester. Circular no. 5.)

#### Auxiliary Subjects

##### Political economy

Hine, Charles DeLano. Modern organization, an exposition of the unit system. 110 p. N. Y., Engineering magazine co., 1916.

Jones, Edward D. The business administrator; his models in war, statecraft, and science. 275 p. N. Y., Engineering magazine co., 1914.

##### Parks

Connecticut—State park commission. Report for the two fiscal years ended Sept. 30, 1916. 32 p. Hartford, Conn., 1916.

##### Clearing of land

Thompson, M. J. Investigations in cost and methods of clearing land. 32 p. il. St. Paul, Minn., 1916. (Minnesota—Agricultural experiment station. Bulletin 163.)

##### Erosion

Ramser, C. E. Prevention of the erosion of farm lands by terracing. 40 p. il. pl. Wash., D. C., 1917. (U. S.—Dept. of agriculture. Bulletin 512.)

#### Periodical Articles

##### Miscellaneous periodicals

Angora journal, March 1917.—Survey and report on goat grazing opportunities in northwest needful to convince owners, p. 3-4.

Arizona, March 1917.—Coconino national forest; its officials receive annual fire prize, p. 10, 16.

Biltmorean, March 1917.—The blister rust of white pine, by L. E. Newman, p. 1-9.

Breeder's gazette, April 5, 1917.—Sugar camp days, by Earle W. Gage, p. 726-7.

Bulletin of the Pan American union, March 1917.—Where pine and tropical hardwood meet, by Miles Haman, p. 330-1.

Bulletin of the Torrey botanical club, March 1917.—An annotated list of the forest trees of the Hawaiian archipelago, by Vaughan MacCaughy, p. 145-57; Some factors influencing the prevalence of Endothia gyrosa, by Neil E. Stevens, p. 127-44.

Conservation, April 1917.—Forest and prairie fires; Saskatchewan takes action to overcome these scourges, by Clyde Leavitt, p. 15. Ontario's forest protection, by Clyde Leavitt, p. 16.

Country gentleman, March 10, 1917.—Pine straw as a fertilizer, by J. T. R., p. 18.

Country gentleman, March 31, 1917.—Mr. Schoen and I sell a woodlot, by P. S. Lovejoy, p. 3-4, 35-6.

Country gentleman, April 7, 1917.—Keeping the farm at home; concrete and other walls to prevent soil-washing, by George S. Howe, p. 13.

Country life in America, March 1917.—The hardness of wood, by E. L. D. S., p. 120.

Country life in America, April 1917.—Some American hardwoods, by Ladd Plumley, p. 132-8.

Forest and stream, May 1917.—The newest national forest, by Donald Gillis, p. 208-9.

Gardeners' chronicle, March 3, 1917.—Cupressus glabra, by A. Bruce Jackson, p. 95-6.

In the open, March 1917.—Protection of our forests, by George H. Wirt, p. 32-7.



### Become a Game Farmer

Write for these two books which tell all about this interesting and profitable work. "Game Farming for Profit and Pleasure," is sent free on request. It treats of the subject as a whole; describes the many game birds, tells of their food and habits, etc. "American Pheasant Breeding and Shooting," is sent on receipt of 10c in stamps. It is a complete manual on the subject.

**HERCULES POWDER CO.**  
1047 Market Street

Wilmington

Delaware



WE MAKE THE

## ENGRAVINGS

FOR THE

AMERICAN FORESTRY  
MAGAZINE

OUR SPECIALTY

IS THE "BETTER GRADE FINISH OF

### DÉSIGNS & ENGRAVINGS

IN ONE OR MORE COLORS  
FOR MAGAZINES CATALOGUES  
ADVERTISEMENTS ETC

HALF TONES

LINE PLATES

DULLO-TONES

COMBINATION LINE

COLOR PROCESS

AND HALF TONES

MULTI-COLORS

—ESTABLISHED 1889—

## GATCHEL & MANNING

SIXTH AND CHESTNUT STREETS  
OPPOSITE OLDE INDEPENDENCE HALL

PHILADELPHIA

## The Watch that Times the Fast Trains

Thousands of engineers and conductors carry Hamilton Watches. They know they can rely on them absolutely for correct time. Make up your mind now that when you get your watch, it will be a Hamilton—the kind the railroad men carry.



The lowest-priced Hamilton is a movement alone for \$12.25 (\$13.00 in Canada). The highest-priced Hamilton is our Masterpiece at \$150.00 in 18k heavy gold case. Other Hamiltons at \$15.00, \$25.00, etc. Your jeweler can fit a Hamilton movement to your present watch case.

### Send for Hamilton Watch Book "The Timekeeper"

It tells you the story of the Hamilton and a lot of facts about watch making. You will learn much about good watches from this book. It's free. Send for it to-day.

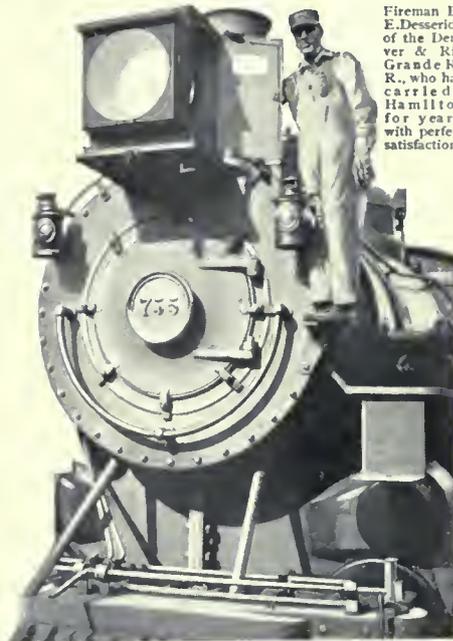
**Hamilton Watch Company**

Dept. 39

Lancaster, Pennsylvania

# Hamilton Watch

"The Watch of Railroad Accuracy"



Fireman E. E. Desserich of the Denver & Rio Grande R., who has carried a Hamilton for years with perfect satisfaction.

- International review of agricultural economics, Jan. 1917.—The question of forestry in the Kingdom of Serbia, p. 114-22.
- Munsey's magazine, April 1917.—Forest tragedy; the rise and fall of a lumber town, by Samuel T. Dana, p. 353-63.
- Outing, Feb. 1917.—A tenderfoot in the Sierras, by Don Carlos Ellis, p. 582-8.
- Phytopathology, April 1917.—Contributions to our knowledge of the white pine blister rust, by W. A. McCubbin, p. 95-100; Recent cultures of forest trees rusts, by James R. Weir and Ernest E. Hubert, p. 106-9; Pycnial stages of important forest tree rusts, by James R. Weir and Ernest E. Hubert, p. 135-9.
- Popular science monthly, April 1917.—War time uses of wood, by Arlie W. Schorger, p. 590-2.
- Reclamation record, April 1917.—The stabilizing influence of the national forests, p. 196.
- Recreation, April 1917.—The ten-million-dollar leak in our meat supply, by Will C. Barnes, p. 157-8.
- Sierra club bulletin, Jan. 1917.—The war zone forest of the Kern, by Walter Mulford, p. 155-8.
- Southern homeseeker and investors guide, March 1917.—The eastern national forests as public recreation grounds, by John L. Cobbs, Jr., p. 18-19.
- Torreya, Dec. 1916.—Snow injury to trees, by George B. Rigg, p. 257-60.
- Torreya, Feb. 1917.—Self-pruning in the American elm, by Jean Broadhurst, p. 21-4.
- United States—Department of agriculture. Weekly news letter, March 28,

- 1917.—The paper outlook; national pulp resources; importance of conserving forests; utilizing waste wood, by David F. Houston, p. 1-4.
- Wood preserving, Jan.-March 1917.—Creosoted wood-block pavement, by F. P. Hamilton, p. 11; Boston elevated railway treating plant, by E. W. Bright, p. 12-14; Transmission of air pressure in timber, and its bearing on plant operation, by George M. Hunt, p. 14.
- Trade journals and consular reports*
- American lumberman, March 17, 1917.—The relation of pulp wood supply to forest waste, p. 24; Sawdust wanted for propagating work, p. 25; Hardwood logging in the Adirondack forests, by A. B. Recknagel, p. 34-5.
- American lumberman, March 24, 1917.—Use of salt in seasoning lumber, p. 29; Graphic diagram of National hardwood rules, p. 29; Famous wooden bridge has served more than a century, p. 34; Creosoted timber and maintenance, by B. L. Grondal, p. 38; Hemlock bark again demanded by tanners, p. 43; Conference marks progress of fire fighters, p. 44; Cutting mahogany, by Frances Forrester-Brown, p. 50-1.
- American lumberman, March 31, 1917.—Creosoted fir stove pipe gains popularity, p. 29; Work of Madison laboratory proved practical, p. 29; Cutting hardwoods with a view to economy, by W. J. Blackmur, p. 30.
- American lumberman, April 7, 1917.—War will greatly stimulate wooden ship building, p. 32; Germans devastate forests of Russia, p. 38; The possibilities of potash as a by-product, by George A. Schwabland, p. 43; Some facts about the industry,

- particularly on the Pacific coast, by Lewis Schwager, p. 58; Laboratory has new director, p. 59; American woods for tea boxes, by K. Krishnamurti Nayudu, p. 59; Managing a national forest, by Herman Work, p. 60-1; Logging with motor trucks on the Pacific Coast, p. 66.
- Barrel and box, March 1917.—The life of a barrel, p. 21; Lumber footage in barrel heads, by N. G. Near, p. 22.
- Canada lumberman, April 1, 1917.—The timber import trade of Australia, by H. R. McMillan, p. 26-9; Conveyors' part in lumber production, p. 42-4.
- Electric railway journal, Dec. 16, 1916.—Timber preservation by pressure and open tank processes, by C. H. Teesdale, p. 1254.
- Engineering record, March 31, 1917.—New stump burner for logged-off lands requires no blower, by Le Roy W. Allison, p. 495-6.
- Gulf Coast lumberman, March 15, 1917.—New uses for wood, p. 28.
- Hardwood record, March 25, 1917.—Colored woods of the United States, by Hu Maxwell, p. 15-17.
- Hardwood record, April 10, 1917.—Growth-ring wood figures, by Hu Maxwell, p. 13-15.
- Lumber trade journal, March 15, 1917.—Recent work of the Forest products laboratory at Madison is thoroughly reviewed, p. 22-3.
- Lumber trade journal, April 1, 1917.—Louisiana lumber taxation, p. 15-16.
- Lumber word review, March 25, 1917.—Motor trucks in high favor among lumbermen, p. 23-5.
- Paper, March 14, 1917.—Pitch in sulphite pulp, by R. E. Cooper, p. 13-14; Paper resources of the United States, by Carl Vrooman, p. 15.
- Paper, March 21, 1917.—Utilization of bark for felts, p. 15; Uses of wood-pulp, by S. F. Acree, p. 17.
- Paper, March 28, 1917.—Paper conditions in foreign countries, by G. F. Steele, p. 22-24.
- Paper, April 4, 1917.—Cellulose and chemical industry, by Charles F. Cross, p. 17-19; Pulpwood possibilities in the south, by Job Taylor, p. 19-20.
- Paper mill, March 3, 1917.—Forced circulation in cooking sulphite pulp, by Sydney E. Lunak, p. 17, 32.
- Pioneer western lumberman, March 15, 1917.—Creosoted wood blocks advocated for building permanent roads in Oregon, by O. P. M. Goss, p. 22.
- Pioneer western lumberman, April 1, 1917.—Cost of logging in the Pacific northwest, p. 15; The Yosemite valley, p. 20-21.
- Power, Jan. 30, 1917.—Utilization of lumber mill waste, by R. L. Watts, p. 136.
- Pulp and paper magazine, March 1, 1917.—The sedimentation test of ground wood pulp, p. 217-19; Forestry and forest protection matters, by Ellwood Wilson, p. 226-8.
- Railway review, March 31, 1917.—Fire protection, inspection and signaling in the Southern Pacific snowshed district, p. 450-3.
- St. Louis lumberman, March 15, 1917.—An awakened Russia, p. 13; Selling what the logger leaves, by Arthur Koehler, p. 47-8; Modern methods of land clearing by Carl Livingston, p. 48-9; Transportation in modern business, by F. M. Ducker, p. 57-8; Drying car material, p. 58.
- St. Louis lumberman, April 1, 1917.—Secretary Kellogg anent shipbuilding, by R. S. Kellogg, p. 17; The big willows of the lower valley, p. 18.

Southern industrial and lumber review, March, 1917.—A modern lumber mill, p. 16-19.

Southern lumberman March 17, 1917.—Valuable pointers on best methods for clearing stumps from cut-over lands, p. 25-6.

Timber trades journal, March 3, 1917.—Reviving a neglected industry, p. 325-6.

Timberman, March 1917.—An interesting presentment of the inland empire rate structure, p. 33-5; Willamette valley manufacturers seek opening of Portland gateway, p. 36-8.

United States daily consular report, March 15, 1917.—Increased lumber output of British Columbia, by George N. West, p. 980.

United States daily consular report, March 16, 1917.—Austrians make paper twine, yarn, and belting, by Jas. B. Young, p. 1000-2.

United States daily consular report, March 20, 1917.—Possible lumber production in Fiji Islands, by Alfred A. Winslow, p. 1043; American market for knocked-down rattan furniture, by George E. Anderson, p. 1045.

United States daily consular report, March 26, 1917.—Norwegian wood pulp and paper industries, by E. Haldeman Dennison, p. 1125-7.

United States daily consular report, March 27, 1917.—South African market for sawed and planed woods, p. 1142-4.

United States daily consular report, March 29, 1917.—Philippine lumber supplanting Oregon pine, by George E. Anderson, p. 1159; Paper-making materials in the Netherlands, by J. H. Krogh, p. 1181-3.

United States daily consular report, April 5, 1917.—Prevention of forest fires in Canada, p. 54-5.

United States daily consular report, April 9, 1917.—To study European methods for American lumber, p. 99; Market in the Netherlands for southern pitch pine, by G. H. Krough, p. 101; New Brunswick lumber produces large revenue, by Edward A. Dow, p. 110.

United States daily consular report, April 11, 1917.—British Columbia timber royalties, by George N. West, p. 142-3.

West Coast lumberman, March 15, 1917.—Specifications of lumber required to build a typical wooden vessel, p. 38-9; Master car builders' association revised rules for loading open cars, p. 40; A comparison of the cruising systems employed in the Pacific northwest, by Harold G. Foran, p. 54-5, 58, 81; Redwood ties and timbers counted on to give dependable service for twelve to twenty years without use of preservative, by Edwin E. Myers, p. 56-7; Douglas fir saw mill waste can be used in a well built gas producer, by George S. Wilson, p. 66-7; West Coast lumberman's 1917 revised directory of Pacific Coast mills, p. 83-96; Pencil making, p. 110; Logging engineering, by C. V. Wilson, p. 112.

West Coast lumberman, April 1, 1917.—World's most modern mill refuse utilization plant installed at Tacoma, p. 36-8.

Wood turning, April 1917.—The big six and the house that Jack built, by John H. Van Deventer, p. 5-11.

Wood-worker, March 1917.—Testing kiln-dried lumber, by E. U. Kettle, p. 36-7.

*Forest journals*

American forestry, April 1917.—Planting one million food gardens, p. 197-204; Forestry and the paper industry, by D. F. Houston, p. 205-12; Nebraska's forestation commission, by Woodruff Ball, p. 212; The independence of American nurseries, by David Fairchild, p. 213-16; The dogwood, by R. W. Shufeldt, p. 217-20; The warblers, by A. A. Allen, p. 221-5; Mining "claims" in the Grand Canyon, by H. H. Chapman, p. 225-7; Food-producing trees, by J. Russell Smith, p. 228-33; Eastern forest lands bought, p. 233; The new spirit of public service, by C. J. Stahl, p. 234-5; Spraying work of this season, by J. J. Levison, p. 236-7; Aeolian erosion in Hawaii, by C. S. Judd, p. 239-40; Tour of the national forests and parks, p. 240; Lake Sunapee; a poem, by Richard B. Glaenzer, p. 240; Pine blister quarantine hearing, p. 241; The summer campaign against the white pine blister, p. 242; National park legislation, p. 242; Primary education in forestry, p. 242-3; The public domain and the stock-raising homestead law, p. 243; Building bungalows, by Rawson Woodman Haddon, p. 244-6.

Arborea, Feb. 1917.—Don'ts for tree wardens and city foresters, p. 199-203; The European white birch, p. 205-6; Frost cracks, p. 206-7; Street planting in cities, p. 207-9.

Canadian forestry journal, March 1917.—In the maple sugar season, by Maud Going, p. 992-4; The motor car in timber guarding, by George P. Melrose, p. 995-7; Slash disposal as a commercial proposition, by B. W. Lakin, p. 1003-4; How to plant the prairies, by Norman M. Ross, p. 1007-8; Forestry keystone of wood industries, by Ellwood Wilson, p. 1017-20; Canada's work in forest research; the working programme of the Forest products laboratories of Canada, by W. B. Campbell, p. 1021-2; The nurseries and the white pine menace, by H. T. Gussow, p. 1023-5; Great forest development for Russia, by Samuel McRoberts, p. 1034-6.

Forest leaves, April 1917.—What forest fires do in Pennsylvania, p. 19-20; Forestry in the lake states, by Filibert Roth, p. 20-3; Respectfully addressed to our Pennsylvania legislature, by J. T. Rothrock, p. 24-5; Proposed forest fire protection in the anthracite coal region, p. 25-6.

Journal of forestry, Feb. 1917.—The correlation of American forest research, by Earle H. Clapp, p. 163-75; The rôle of the microscope in the identification of the "timbers of commerce," by Irving W. Bailey, p. 176-91; A practical method of preventing the damping off of coniferous seedlings, by Charles A. Scott, p. 192-6; Mannan content of the gymnosperms, by A. W. Schorger, p. 197-202; Forest biology, by P. S. Lovejoy, p. 203-14; Basic problems in forest pathology, by E. P. Meinecke, p. 215-24; Some problems in light as a factor of forest growth, by Raphael Zon, p. 225-32; The role of light in natural and artificial reforestation, by Carlos G. Bates, p. 233-9.

New York forestry, April 1917.—Effects of forests on climate, stream flow, and soils, p. 5-9; The story of the New York state canals, by Frank M. Williams, p. 11-16; Forests and water in New York, by Hugh P. Baker, p. 18-23; The forest preserve

## 70,000,000 Feet National Forest Timber For Sale

**Location and Amount** All the merchantable dead timber standing or down and all the live timber marked or designated for cutting on an area embracing about 1580 acres in Township 5 N., R. 7 E., W. M. unsurveyed, Wind River watershed, Columbia National Forest, Washington, estimated to be 70,000,000 feet B.M., more or less, of Douglas fir, western hemlock, western red cedar, western white pine, amabilis fir, grand fir, and other species, approximately 64 per cent Douglas fir.

**Stumpage Prices** Lowest rates considered, \$1.40 per M for Douglas fir and western red cedar, \$3.00 per M for western white pine, and 50 cents per M for western hemlock, amabilis fir, grand fir, and other species.

**Deposit** With bid \$5000, to apply on purchase price if bid is accepted, or refunded if rejected. Ten per cent may be retained as forfeit if the contract and bond are not executed within the required time.

**Final Date For Bids** Sealed bids will be received by the District Forester, Portland, Oregon, up to and including May 14, 1917.

The right to reject any and all bids is reserved.

Before bids are submitted full information concerning the character of the timber, conditions of sale, deposits, and the submission of bids should be obtained from the

DISTRICT FORESTER  
or the  
FOREST SUPERVISOR  
PORTLAND, OREGON

- for water gathering grounds, by A. H. Perkins, p. 25-7.
- Ohio forester, Jan. 1917.—Surveying the state forests, by A. E. Taylor, p. 4-7; Thinning a ten-year-old catalpa grove, by H. C. Rogers, p. 7-9; Natural vs. formal ideas in forestry work, by J. J. Crumley, p. 10-12.
- Schweizerische zeitschrift für forstwesen, Feb. 1917.—Ueber forstraserven, by Philipp Flury, p. 37-54; Die witterung des jahres 1916 in der Schweiz, by R. Billwiller, p. 55-9.
- Skogen, Jan. 1917.—Om det inflytande, som vara skogsvardsatgärder kunna utöva på skogsmarkens alstringsförmåga (On the effect which our protective measures can exercise on the productivity of forest soils), by Henrik Hesselman, p. 1-12; Om Norrlands träkolproduktion (On Norrland's charcoal production), by Birger Arvas, p. 13-21; Några Skanska jättekärl (Some giant beeches from Skane), by Nils Sylvén, p. 22-6; Rikt förgrenad gran (A many-branched spruce), by Sven Hedström, p. 27; Vara vanligaste barkborrar och deras gangsystem (Our most common bark borers and their galleries), by Ivar Trägårdh, p. 37-53; Några råd vid skogsförsäljningar (Some advice in regard to forest sales), by Ake Joachimsson, p. 54-8; Ormgranar (Serpent-like spruces), by Uno Danielsson, p. 59; Trävarumarknaden 1916; en översikt (A review of the timber market for 1916), p. 61-4.
- Skogsvårdsföreningens tidskrift, Jan. 1917.—Rätten till skogsavkastningen a biskoparnas sätesgardar och löningshemman (The right to returns from the forest at bishop's country seats and farms), by Hugo Tigerschiöld, p. 1-21; Om tallens och granens bark (Concerning pine and spruce bark), by J. E. Wretling, p. 22-60; Impediment och Norrlandsindelning (Unreclaimable land and the classification of Norrland), by Sven Petrini, p. 61-7; Dispositionen över till statsverket indragna boställen inom Jämtlands län (Disposal of crown farms withdrawn for the state treasury in Jämtland), by E. F. Groth, p. 67-8; Förslag till lagbestämmelser om förebyggande av fara för skogseld (Proposal for a law to prevent danger of forest fires from railroads), p. 69-76; Förslag till en riksinventering av Norges skogar (Proposal for a national inventory of Norway's forests), p. 77-9.
- Skogsvårdsföreningens tidskrift, Feb. 1917.—Redogörelse för verksamheten vid statens skogsförsöksanstalt under år 1916 (Report of the state's forest experiment station for the year 1916), by Gunnar Schotte and others, p. 129-40; Om eftergroning hos tallfrö (Concerning delayed germination of pine seed), by Edvard Wibeck, p. 141-74; Om Skogsjordsanalyser (Concerning analyses of forest soils), by Olof Tamm, p. 175-200; Formklasstudier i fullslutna tallbestånd (Form class studies in fully stocked pine stands), by L. Mattsson, p. 201-36.
- Tidsskrift for skogbruk, Feb. 1917.—Pileplantningen på Svanholm, Stokkevandet, by Em. Simonsen, p. 27-8; Efter en liten Vestlandsvisit (After a little visit to the west coast), by Myhrwold, p. 28-38; Om beskatning av skog (Concerning forest taxes), by R. M. Aubert, p. 38-45; Av skogsbudgettende 1917-18 (From the forest budgets for 1917-18), p. 45-52.

“QUALITY”

LONG AND SHORT LEAF  
YELLOW PINE

QUALITY

SERVICE

MISSOURI  
LUMBER & LAND  
EXCHANGE COMPANY

CAPACITY

R. A. Long Building

Kansas City, Mo.

THE SAME

“TODAY AND TOMORROW”

# American Forestry



FACULTY OF FORESTRY  
JUN 10 1918  
UNIVERSITY OF TORONTO

An Illustrated Magazine about Forestry and Kindred Subjects Published Each Month by the American Forestry Association Washington, D. C.

# CREOSOTED FENCE-POSTS ARE ECONOMICAL



These posts were treated with Creosote in 1905, and were photographed in 1914. They were completely undecayed. Experts believe they will last 15 to 20 years longer.—Photos courtesy Iowa State College of Agriculture.

**R**AILWAYS and other large industrials use thousands of fence-posts annually, but few are protected from decay, with the result that replacements are continual. An enormous saving in labor and materials can be effected if creosoted posts are used.

The Iowa State College of Agriculture have made a comprehensive study of this subject and the results are published in Bulletin No. 158, from which the following data and quotations have been taken.



Untreated. These cedar posts were set in 1905 and taken up for examination in October 1914. In each case the post was entirely gone; in post No. 1 about one-third of the bottom rotted away; in post No. 2 one-half of the bottom decayed, while in post No. 3 more than one-half of the bottom decayed.

## ESTIMATED AVERAGE LIFE IN YEARS

Species of Wood	Untreated	Creosoted
Ash	6 years	25 years
Cottonwood	3 years	25 years
Red Oak	6 years	20 years
White Cedar	14 years	30 years
Willow	4 years	25 years

Further interesting facts are quoted from Bulletin mentioned above:

*First*—"By effective creosote treatment it is probable that woods commonly used for posts may be doubled in life (white cedar, oak, etc.)."

*Second*—"By treatment many species at present almost valueless can be made to last twenty-five years or more, with only a small addition in cost for treatment (willow, soft maple, cottonwood, elm, etc.)."

*Third*—"Figuring the investment at 6% simple interest, creosoting reduced the annual cost of the less durable fence-posts by about one-half."

*Fourth*—"In selecting posts for treatment take the native soft-wooded trees and save the oak, hickory, black walnut, etc., for other purposes."

*Fifth*—"In creosoting select small posts, those 4½ inches in diameter, if of sufficient strength. They are cheaper and when creosoted will last as long, or longer, than seven-inch posts."



*Sixth*—"See that the posts are thoroughly peeled of the inner as well as the outer bark."

*Seventh*—"The posts should be thoroughly seasoned before treatment is attempted, or a poor penetration of creosote oil will be secured."

*The Best Creosote for all practical purposes is Barrett's Carbosota—Grade-One Liquid Creosote Oil.*

It comes ready for use in convenient-sized packages and requires no apparatus or skilled labor for its application. Any one can use it properly at any time.

It has been especially developed to meet the needs of the average consumer. Green lumber or timbers cannot be effectively creosoted by non-pressure processes. They should be air-dry.

Barrett's Carbosota is the "Standard" wood preservative for use in the Brush and Open-Tank methods of treatment. It is economical, effective and convenient.

Further information free on request to nearest office.

## The Barrett Company

New York Chicago Philadelphia Boston St. Louis Cleveland Cincinnati Pittsburgh  
 Detroit Birmingham Kansas City Minneapolis Nashville Salt Lake City Seattle Peoria  
 THE PATERSON MANUFACTURING COMPANY, Limited: Montreal Toronto Winnipeg Vancouver  
 St. John, N. B. Halifax, N. S. Sydney, N. S.

# AMERICAN FORESTRY

THE MAGAZINE OF THE AMERICAN FORESTRY ASSOCIATION

PERCIVAL SHELDON RIDSDALE, Editor

## EDITORIAL ADVISORY BOARD

HERMAN H. CHAPMAN  
ERNEST A. STERLING

S. T. DANA  
FREDERICK S. UNDERHILL

JOHN E. RHODES  
S. N. SPRING

JUNE 1917 VOL. 23

## CONTENTS

No. 282

A Forestry Regiment in Action . . . . .	325	Wisconsin's Forest Playgrounds . . . . .	353
With one illustration.		Redwood Trees—Four illustrations . . . . .	354
Sawmill Units for England's Need . . . . .	327	"Private Property—No Camping"—By Smith Riley . . . . .	358
War, Forests and Lumber . . . . .	328	With six illustrations.	
Santa Cruz Natural Bridge—An illustration . . . . .	330	Cactus Lakes—By Frank Coyne . . . . .	361
Lignum Vitæ in Curaçao—By Miles Haman . . . . .	331	With three illustrations.	
With two illustrations.		Pine Blister in Michigan . . . . .	362
War-Time Uses of the Woodlot—By Austin F. Hawes . . . . .	332	School Forests Established . . . . .	362
With three illustrations.		New York State College of Forestry Building . . . . .	363
Enlisting Soldiers of the Soil . . . . .	334	With one illustration.	
With nine illustrations.		Forestry for Boys and Girls—The Trees and War—By Bristow Adams . . . . .	364
Flowers That Bloom in June—By R. W. Shufeldt . . . . .	340	Altoona's Watershed Forested . . . . .	366
With six illustrations.		With one illustration.	
Forest Flowers—By Bessie L. Putnam . . . . .	343	Hawaii's Effective Laws . . . . .	366
With seven illustrations.		Editorial . . . . .	367
"Witch's Broom" on Japanese Cherries—By C. W. H. Douglass . . . . .	346	The Food Garden as a Character Builder.	
With three illustrations.		Procrastination in Indiana.	
Foresters in War Work . . . . .	348	The Need of Smith-Lever Extension Work in Forestry.	
The Florida Magnolia Tree—By Jennie Lynne Kyle . . . . .	349	A Great Forward Step by Minnesota.	
With three illustrations.		A Backward Step in Vermont.	
The Knot Over Washington's Tomb—By Gayne T. K. Norton . . . . .	351	Stock Losses Affect Food Supply.	
With one illustration.		Book Reviews . . . . .	374
Some Historically Interesting Trees . . . . .	352	Canadian Department—By Ellwood Wilson . . . . .	377
With two illustrations.		Current Literature . . . . .	378
Russia's Lumber Industry . . . . .	353		

## SPECIAL OFFER TO MEMBERS ONLY

One of the following described books will be presented free of charge to any member of the American Forestry Association who secures ONE NEW subscribing member:

- No. 1—Field Book of American Trees and Shrubs, 465 pages, 275 illustrations of trees, leaves, blossoms, fruits, seeds, area of growth, etc.
- No. 2—Field Book of Wild Birds and Their Music, 262 pages, 38 colored and 15 other full-page illustrations.
- No. 3—Field Book of American Wild Flowers, 587 pages, 24 colored plates and 215 full-page illustrations.

### FILL OUT THIS BLANK

I present for Subscribing Membership in the American Forestry Association, including American Forestry Magazine, and enclose \$3.00 for the 1917 fee—

Name . . . . . Address . . . . . City . . . . .

Send Book No.  to Name . . . . . Address . . . . . City . . . . .

\$2.00 of above fee is for American Forestry for One Year.

AMERICAN FORESTRY is published monthly by the American Forestry Association.

Subscription price without membership, three dollars per year; single copies, twenty-five cents.

Entered as second-class mail matter December 24, 1909, at the Post-office at Washington, under the Act of March 3, 1879

Copyright, 1917, by the American Forestry Association

# REAL ESTATE

## SOUTH CAROLINA TIMBER



RED OAK

Timber on a South Carolina plantation or entire plantation, on the Great Pee Dee River in Marlboro County. Now occupied and under cultivation. Dwelling house occupied by owner. Several new small houses rented to colored help, barn, small saw mill. 1,140 acres cleared. 3,200 acres timbered; 1,250 acres fine large old growth timber, 700 acres large second growth timber over 50 years old; balance mostly thrifty, large second growth timber. Growth of Gum Pine, etc., very rapid. Many very large White and Red Oaks, Yellow Pine, Cypress, Sycamore, Cottonwood, Holly, etc., as shown in accompanying photograph.

A careful estimate shows the following:

BOARDFEET	VARIETY
6,770,000	Sweet Gum
3,520,000	Yellow Pine
1,680,000	Red Oak
1,560,000	White Oak
1,000,000	White Ash
790,000	Hickory
680,000	Sycamore
670,000	Maple
560,000	Elm
460,000	Cottonwood
390,000	Black Gum
390,000	Cypress
100,000	Holly
60,000	Birch
30,000	Willow
250,000	Other species
18,910,000	Total

DESCRIPTION OF THIS AND MANY OTHER TIMBER PROPERTIES FOR SALE MAY BE OBTAINED ON APPLICATION TO

**DONALD E. LAUDERBURN**

154 FIFTH AVENUE

NEW YORK CITY

## 70,000,000 Feet National Forest Timber For Sale

**Location and Amount** All the merchantable dead timber standing or down and all the live timber marked or designated for cutting on an area embracing about 1580 acres in Township 5 N., R. 7 E., W. M. unsurveyed, Wind River watershed, Columbia National Forest, Washington, estimated to be 70,000,000 feet B.M., more or less, of Douglas fir, western hemlock, western red cedar, western white pine, amabilis fir, grand fir, and other species, approximately 64 per cent Douglas fir.

**Stumpage Prices** Lowest rates considered, \$1.40 per M for Douglas fir and western red cedar, \$3.00 per M for western white pine, and 50 cents per M for western hemlock, amabilis fir, grand fir, and other species.

**Deposit** With bid \$5000, to apply on purchase price if bid is accepted, or refunded if rejected. Ten per cent may be retained as forfeit if the contract and bond are not executed within the required time.

**Final Date For Bids** Sealed bids will be received by the District Forester, Portland, Oregon, up to and including May 14, 1917.

The right to reject any and all bids is reserved.

Before bids are submitted full information concerning the character of the timber, conditions of sale, deposits, and the submission of bids should be obtained from the

DISTRICT FORESTER  
or the  
FOREST SUPERVISOR  
PORTLAND, OREGON

## NURSERY

A very profitable going nursery property in Eastern Massachusetts for sale. Gross sales \$25,000 to \$30,000. Can be purchased on very favorable terms.

**WALTER CHANNING, JR.**

50 Congress Street  
Boston, Mass.

## IN THE HEART OF CRAWFORD NOTCH, WHITE MOUNTAINS, NEW HAMPSHIRE

500 acres of Woodland in the centre of Federal and State owned land. Forest Rangers protect from fire loss. Government Conservation guarantees scenic value of the surrounding timberland.

Game and FISH greatly increasing. Ideal for a GENTLEMAN'S ESTATE for it offers the rare COMBINATION of unequalled opportunity for SCIENTIFIC FORESTRY DEVELOPMENT and ACCESSIBILITY to the best SUMMER RESORTS. Bretton Woods only 10 miles away.

The fine scenery includes views of the entire Presidential Range—many trout streams—pure springs—arca well wooded—many old growth trees.

For full particulars apply

**CHAS. H. MOREY**

BOX 27

BEMIS, N. H.

## TIMBER CRUISING BOOKLETS

Biltmore Timber Tables. Including solution of problems in forest finance. Southern Timber Tables. How to estimate Southern Pine, Southern White Cedar, and Southern Appalachian Timber—Spruce pulpwood, Hemlock bark, Chestnut oak bark, Chestnut tannic acid wood.

Postpaid, 25 cents each

**HOWARD R. KRINBILL**

Forest Engineer

Newbern, N. C.

## CANADIAN TIMBER

Timber is one of the resources of Canada which will produce great wealth. We have large and small propositions for sale, which will interest practical Timber men.

For information, write:

**LOUGHEED & TAYLOR, LTD.**  
CALGARY CANADA

## PHILIP T. COOLIDGE FORESTER

Stetson Bldg., 31 Central Street, Bangor, Me.  
Management and Protection of Woodlands  
Improvement Cuttings, Planting, Timber  
Estimates and Maps. Surveying

## CORN CATTLE HOGS

Three-crop Corn Land  
Virgin Soil  
No Crop Failures

**JOHN L. ROPER LUMBER CO.**  
Norfolk, Va.

## BRITISH COLUMBIA TIMBER

Our knowledge of the timber resources of the Coast is based on 20 years' experience in the woods of British Columbia. We have never lost a dollar for a client on an investment. We will be pleased to hear from you if you are interested in British Columbia stumpage.

**W. L. KEATE**  
441 SEYMOUR ST. VANCOUVER, B. C.

# REAL ESTATE

FORESTS : ESTATES : TIMBERLANDS  
PRESERVES : FARMS : CAMPS : ETC.

## IN THE VICINITY OF

## LAKE TARLETON CLUB



Do you know that in the State of New Hampshire there are 635 lakes and ponds and over 10,000 miles of rivers? In addition there are thousands of miles of trout streams. The average visitor to the so-called "White Mountain Region" sees but a fraction of these lakes and streams. They compose the real beauty of New Hampshire scenery and they lie but a short distance from the main travelled boulevards of the State, most of them south of the Presidential Range.

The picture at the top of this page is a glimpse of one end of Lake Tarleton, in the Lake Tarleton Club preserve of 5000 acres. There are five lakes and over three thousand acres of forest in this preserve. Within a radius of fifteen miles from Lake Tarleton Club House are forty lakes and ponds and over ninety streams. All this delightful wilderness of lake and forest is absolutely secluded and yet within twenty minutes' automobile drive of express trains from New York and Boston. *It is four hours nearer New York City than the chief resorts of the Adirondacks.*

In several hill farms within a few miles of this delightful resort which command unsurpassed views of lake and mountain and are ideally situated for summer homes, for fish and game preserves, or for practical self-supporting

farms. Most of them are well-timbered and were purchased because of scenic and timber values. Several of them have trout brooks and lake area within their boundaries and sufficient timber growth to repay the purchase price if properly handled. I will sell these at favorable prices and terms to parties wishing to establish summer homes or to follow practical forestry methods in protecting the timber growth. Larger timbered areas can be procured in the neighborhood of several of them if desired.

I own several timber tracts in New Hampshire and Vermont, without farms, varying in size from 100 to 2500 acres, well covered with spruce, pine, and hardwood growths suitable either for saw mill or pulp operations.

I also have for sale a 5000-acre tract of second growth yellow pine in Jefferson and Grant Counties, Arkansas, about ten miles west of the City of Pine Bluff. There are estimated to be twenty-five million feet of yellow pine and several million feet of oak and red gum on this tract.

Prices and fuller information furnished on request to parties seriously interested.

E. BERTRAM PIKE,  
PIKE, NEW HAMPSHIRE.



### SALE OF TIMBER FLATHEAD INDIAN RESERVATION

**SEALED BIDS MARKED OUTSIDE "BILL Flathead Timber, Ronan Unit"** and addressed to Superintendent of the Flathead Indian School, Dixon, Montana, will be received until twelve o'clock noon, Mountain time, Tuesday, September 11, 1917, for the purchase of the merchantable timber upon tribal and allotted lands situated within Sections 4 and 5 T. 19 N., R. 19 W.; Sections 5, 6, 7, 8, 9, 10, 15, 16, 17, 18, 19, 20, 21, 22, 27, 28, 29, 32, 33, and 34 T. 20 N., R. 19 W.; Section 21, 22, 27, 32, 33, and 34, T. 21 N., R. 19 W.; Section 1 and Section 12 T. 20 N., R. 20 W., M. P. M. containing approximately 57,000,000 feet of timber, over 80 per cent Western Yellow Pine. Each bid shall state the amount per thousand feet B. M. offered for Yellow Pine (including "hull pine") and the amount per thousand feet offered for Fir, Larch and other species. Each bid must be submitted in triplicate and be accompanied by a certified check on a solvent national bank, drawn in favor of the Superintendent of the Flathead Indian School, in the amount of \$2500. The deposit will be returned if the bid is rejected, and retained as a forfeit if the bid is accepted and the bond and agreements required by the regulations are not furnished within 60 days from the date when the bid is accepted. No bid of less than \$3 per thousand feet for Yellow Pine and \$1.25 per thousand feet for Douglas Fir, Larch and other species will be accepted. The right to reject any and all bids is reserved. Copies of regulations and other information regarding the proposed sale including specific description of the sale area may be obtained from the Superintendent of the Flathead Indian School, Dixon, Montana.

Washington, D. C., May 4, 1917. CATO SELLS, Commissioner of Indian Affairs.

### IF YOU WANT TO BUY

Timberlands, Preserves, Estates, Farms, Camps, etc., then we can assist in getting exactly what you want, provided such properties exist.

REAL ESTATE DEPARTMENT  
2 West 45th St. New York City

### PENNSYLVANIA TIMBER TRACT

FOR SALE—3500 acres in Bedford and Huntingdon Counties, in fee reserving mineral rights, average haul to railroad. 2 miles or less, all down hill, 20 million feet Oak, Chestnut, Pine, Locust, Poplar, Maple, 15 miles from market for mine props and ties

DONALD E. LAUDERBURN  
154 FIFTH AVE. NEW YORK

### CALIFORNIA Lands or GOVERNMENT Lands

The fact that you are taking this paper is evidence that you are interested in Timber. Would you like to get a piece of land of your own that has part timber and that may be used for home all of the time or part of the time or when you may need it? For information and particulars about how to take 40 to 160 acres of timberland without residence, direct from officials, write JOSEPH CLARK, Searcher of Records, Sacramento, California.

### BUSINESS FOR SALE

AN OPPORTUNITY for some rich man's son, in a profitable out of doors occupation. I will give three months of my time to teach the purchaser—renovating old orchards, tree surgery, spraying and moving large trees. Lots of orders on hand. Present owner is classed as one of the most expert in Massachusetts. Situated near 300,000 people. Included in the sale will be automobiles and sprayers, tools and a great many hooks on forestry, etc. For further information address Box 400, care of AMERICAN FORESTRY.

### TIMBER TRACTS AND PRESERVES

Many tracts are suitable for timber investments; others are admirably adapted for game preserves. Some are suited for both. This department provides a market-place for both commercial and sporting properties of value. All information, etc., from

ADVERTISING DEPARTMENT  
2 WEST 45th STREET NEW YORK  
Tel. 4275 Vanderbilt



*We Can Put a Tract of Timber  
on Your Directors' Room Table*

*in such complete form as to show the size, location, species, quality of the trees; the height, slope and contour of the ground; with a running commentary from the pen of experienced men on all interesting conditions—in short, a virtual miniature of the tract. This is a FULL LACEY REPORT.*

*By means of it you can make a purchase, a sale, a loan or intelligently consider a logging operation without setting your foot outside the door.*

*37 years devoted to all that pertains to timberland matters have made a LACEY REPORT equivalent to a guarantee.*

*We have an interesting booklet for you. Please write.*

*James D. Lacey & Co.*  
INTERNATIONAL TIMBERLAND FACTORS  
EST. IN 1880

CHICAGO  
1750 McCormick Bldg.

SEATTLE  
626 Henry Bldg.

NEW ORLEANS  
1213 Whitney-Central Bldg.

# AMERICAN FORESTRY

VOL. XXIII

JUNE 1917

NO. 282

## A FORESTRY REGIMENT IN ACTION

"SOMEWHERE in France," a full regiment of trained American woodsmen will soon be at work aiding the cause of the Allies. The United States Forest Service, at the request of the War Department, prepared plans for the organization and is recruiting the men. These men form a part of the Engineers' Reserve Corps, organized for special duty behind the battle lines on the Western front and the units of which are going into service as fast as they can be equipped. The speed and efficiency which have characterized the formation of this regiment give evidence of the whole-hearted and thorough way the American people are "coming across," now that they have been drawn into the titanic struggle against the enemies of democracy. Swift and sure American business methods can be counted on to do the will of the people with dispatch.

A few days after President Wilson's proclamation that a state of war existed between the United States and Germany, a census of the trained foresters and woodsmen of the country was begun by the United States Forest Service in conjunction with state forestry boards and forest protective associations all over the country. The purpose was double, it being considered as necessary to furnish adequate protection for the forests of the country as to furnish men to serve the nation's need in military organizations. The men were urged to refrain from rushing into military organizations without giving consideration to the question as to what they were best fitted to do. As a result the special abilities of these men were not lost through random enlistment and are now available to fill the urgent need which our Allies, through Mr. Balfour, of the British Commission, inform us exists and ask us to meet.

The regiment is organized in units capable of handling all kinds of woods work, and includes a number of portable sawmill outfits and complete equipment for every phase of a lumbering operation. It will be officered by trained foresters and expert lumbermen who are thoroughly familiar with producing and delivering lumber. The Forest Service is exercising great care in selecting the men, striving to get the most skilful workers in the several specialized lines of woods and mill work, and it is stated

that this will be the finest body of experts that it is possible to gather. The classes of men in the ranks comprise axemen, teamsters, skidders, loaders, scalers, tie-hewers, millwrights, saw-filers, sawyers, engineers, portable sawmill men, blacksmiths, lumberjacks, and carpenters, as well as motorcycle and motor truck operators. In addition, there are a number of cooks, commissary experts, clerks, etc., for maintaining the large camps necessary in connection with the woods operations.

Although the regiment is organized by the Forest Service and officered by forestry experts who have received their training in Government or State service, the supreme command is in the hands of an army officer appointed by the War Department and the entire regiment is organized on the military plan and is under military law.

The men are furnished with the regular army uniforms, a necessity in the war zone in order to insure their treatment as prisoners

of war in case of capture by the enemy. Every man has enlisted in the regiment for four years, but active service will be required for only such part of that period as may be necessary. The rules for enlistment require that a man be between the ages of eighteen and forty-five, be a citizen of the United States or have declared his intention to become such, be physically sound and pass the regular military physical examination.

Pay of enlisted men, as well as officers, begins at date of enlistment, and traveling expenses from the place of enlistment to the training camp are met by the Government. The salaries of officers are the same as those received by officers of corresponding rank in other branches of the military service, while those of enlisted men are as shown in table on following page.

The regiment is made up of six companies of 164 men each, with twenty-six men on the battalion and regimental staffs and a driver for each vehicle, in addition to the commissioned officers. The enlisted men will include: six first sergeants, 18 sergeants, first-class, 1 sergeant bugler, 50 sergeants, 6 stable sergeants, 6 supply sergeants, 6 mess sergeants, 2 color sergeants, 19 cooks, 6 horse-shoers, 108 corporals, 6 saddlers, 27 wagoners, 186 pri-



FOREST REGIMENT FLAG

The proposed flag for the regiment of United States expert woodsmen, which will soon be seen in France.

vates, first-class, 568 privates, second class, 12 buglers. It is being mobilized in six companies, three being trained at the engineering training camp at Fort Leavenworth, Kansas, and the other three at American University, Washington, D. C.

#### SALARIES OF ENLISTED MEN

Grade	Monthly pay in U. S.	Monthly pay Foreign service
Master engineer, senior grade . . . . .	\$81.00	\$97.20
Master engineer, junior grade . . . . .	71.00	85.20
Regimental sergeant major . . . . .	51.00	61.20
Regimental supply sergeant . . . . .	51.00	61.20
Battalion sergeant major . . . . .	51.00	61.20
Battalion supply sergeant . . . . .	51.00	61.20
Sergeant, first-class . . . . .	51.00	61.20
Sergeant bugler . . . . .	48.00	57.60
Sergeant . . . . .	44.00	52.80
Stable sergeant . . . . .	44.00	52.80
Supply sergeant . . . . .	44.00	52.80
Mess sergeant . . . . .	44.00	52.80
Color sergeant . . . . .	44.00	52.80
Cook . . . . .	38.00	45.60
Horseshoer . . . . .	38.00	45.60
Corporal . . . . .	36.00	43.20
Saddler . . . . .	36.00	43.20
Wagoner . . . . .	36.00	43.20
Private, first-class . . . . .	33.00	39.60
Private, second-class . . . . .	30.00	36.00

Listing of applicants for service in the regiment is in the hands of the following forest officers. This listing does not insure final acceptance of the applicant, as it may be necessary to reject some of the men listed for physical defects or for other reasons:

F. H. Colby, Forest Commissioner, Augusta, Maine; J. S. Benedict, United States Forest Service, Gorham, New Hampshire; E. C. Hirst, State Forester, Concord, New Hampshire; Harris A. Reynolds, 4 Joy Street, Boston, Massachusetts; W. O. Filley, State Forester, New Haven, Connecticut; C. R. Pettis, superintendent of State forests, Albany, New York; J. S. Illick, Pennsylvania Department of Forestry, State Forest Academy, Mont Alto, Pennsylvania; F. W. Besley, State Forester, Johns Hopkins University, Baltimore, Maryland; H. L. Johnson, United States Forest Service, Elkins, West Virginia; S. H. Marsh, United States Forest Service, Harrisonburg, Virginia; Verne Rhoades, United States Forest Service, Asheville, North Carolina; H. G. Spahr, United States Forest Service, Blue Ridge, Georgia; E. P. Bushnell, United States Forest Service, Johnson City, Tennessee; Edmund Secrest, State Forester, Wooster, Ohio; T. B. Wyman, Munising, Michigan; W. T. Cox, State Forester, St. Paul, Minnesota; G. E. Marshall, United States Forest Service, Cass Lake, Minnesota; F. B. Moody, Conservation Commissioner, Madison, Wisconsin; J. H. Foster, State Forester, College Station, Texas; The Forester, United States Forest Service, Washington, D. C.; District Forester, United States Forest Service, Federal Building, Missoula, Montana; District Forester, United States Forest Service, New Federal Building, Denver,

Colorado; District Forester, United States Forest Service, Gas and Electric Building, Albuquerque, New Mexico; District Forester, United States Forest Service, Forest Service Building, Ogden, Utah; District Forester, United States Forest Service, 114 Sansome Street, San Francisco, California; District Forester, United States Forest Service, Beck Building, Portland, Oregon.

The duty of this regiment will be the cutting of timber and its manufacture into the forms needed for military use. Railroad ties will be produced in large quantities for repairing the French railroads. Military use, coupled with a lack of men available for railroad work, has resulted in rapid deterioration of the railroads leading up to the front. A good deal of the timber cut will be used for bridge construction and large quantities must also be produced for trench timbers. The arts of peace must be pushed, too, in order to make successful prosecution of the war possible, so a good deal of lumber will be produced for building operations as well as for mine props and cordwood.

The location of the field of operations is not made known for military reasons. The work will be done, however, in the French forests of oak, beech, hornbeam and other hardwoods, with occasional stands of pine. The timber in these areas is small in comparison with that of most American forests, much of it being only eight to twelve inches in diameter. In character these lands are much like the woodlots of Southern New England, and on the whole the operations will be similar to portable sawmill logging in Massachusetts, Connecticut, Maryland, and Virginia.

France has managed her forests scientifically for a great many years, using them on the permanent, sustained yield basis. Although the exigencies of the war put the timber needs far above the yield, every possible means will be used to reduce waste to the absolute minimum and thus preserve as much of the forest as possible for future production. The American regiment will therefore be called upon not only to turn out the lumber at high speed, but to do it with high efficiency as well. The condition of the forests after the selective cutting operation has been completed will tell more plainly than words how well the American woodsmen know their business. The personnel of the regiment allows no doubt that the work will be done thoroughly and with speed, as well as on correct scientific principles.

As the magazine goes to press, the Forest Service announces that it is prepared to organize one or more additional regiments if they are needed. Indications are that more will be needed, and in that case the men will be recruited as soon as the organization of the first regiment is completed. Since the first announcement of the organization of this body of expert woodsmen was made, the offices of the Forest Service and the American Forestry Association have been flooded with inquiries and applications from every section of the country. The eagerness of the men to serve makes it certain that as many regiments as are needed will be recruited without delay.

So a considerable part of America's part in the war will be an intensive application of the principles of civilization, conservation and construction.

## SAWMILL UNITS FOR ENGLAND'S NEED

**A**LMOST immediately after the entry of the United States into the European war an opportunity was afforded for American forestry and lumber interests to give practical example of American enterprise and efficiency in extending substantial aid to our allies overseas.

In no individual instance, perhaps, will the helpful activity of this country be better illustrated than in the extension of assistance to the British Government in the solution of serious problems involving timber supply for its forces in France. The response to the English need was given with a swiftness and efficiency characteristic of the American forester and lumberman. No time was wasted and there was no lost motion in achieving tangible results. The whole thing was worked out within 24 hours and the machinery placed in action to make the contribution immediately effective.

The British need was for skilled lumbermen and equipment. Because of a lack of these factors the forces in France were seriously handicapped. Knowledge of this condition came to the Massachusetts Committee on Public Safety and it was immediately realized that the only way in which effective assistance could be given was through sending men and equipment direct to England. Inadequate shipping facilities made it impossible to send the lumber itself. For this reason it was proposed that New England raise ten portable sawmill and logging units and turn them over to the British authorities.

The proposal was at once cabled to London. Through the British Embassy at Washington a cablegram was received from the War Office indicating pleased acceptance of the offer and stating that transport facilities would be provided by the British Government. The project received the unofficial approval of Secretary of War Baker and the enthusiastic and active coöperation of the Governors of all the New England states.

To work out the details of the undertaking and to make its operation effective the Massachusetts Committee on Public Safety appointed a committee of which the chairman was W. R. Brown, of Berlin, New Hampshire, a director of the American Forestry Association and a member of the Lumber Committee of the Council of National Defense. Mr. Brown is also president of the New Hampshire Timberland Owners' Association. The other members of the committee were:

James J. Phelan, Vice-Chairman, Massachusetts Committee on Public Safety; Harold G. Philbrook, Treasurer, Vice-President, Connecticut Valley Lumber Company; F. W. Rane, Secretary, State Forester of Massachusetts; George S. Lewis, Treasurer, Connecticut Valley Lumber Company; Philip T. Dodge, International Paper Company; H. W. Blanchard, H. W. Blanchard Lumber Company; Garrett Schenck, Great Northern Paper Company; Hon. Herbert B. Moulton, Parker and Young Company; I. B. Hosford, St. Croix Paper Company; Martin A. Brown, Woodstock Lumber Company; George E. Henry, J. E. Henry and Sons; Samuel H. Boardman, President Eastern

Shook and Wooden Box Association; J. M. Parker, St. John Lumber Company; Marshall T. Wood, Lande Manufacturing Company; H. B. Stebbins, H. B. Stebbins Lumber Company; Chester C. Whitney, Perry Whitney Lumber Company; J. H. Hustis, Receiver, Boston and Maine Railroad; L. S. Tainter, Conway Lumber Company; E. C. Hirst, New Hampshire State Forester; Forest H. Colby, Maine State Forester; W. O. Filley, Connecticut State Forester; J. B. Mowry, Rhode Island State Forester.

It is significant of the scope and influence of the American Forestry Association that of the 23 members of this committee twelve are members of the Association. This representation includes, in addition to Chairman Brown, Messrs Philbrook, Rane, Dodge, Blanchard, Martin A. Brown, Henry, Tainter, Hirst, Colby, Filley and Mowry. On subcommittees appointed for handling details the American Forestry Association was represented by Blaine Viles and W. J. Lannigan.

An idea of the speed and effectiveness of the committee's work is given in the statement that the first meeting was held on May 17 and that within less than a week formal announcement was made of complete readiness. The men and equipment were sent to England very soon afterwards. In this promptness of action and in the perfection of organization the undertaking has shown our allies that American coöperation in the European war is to be fully depended upon to meet emergencies as they may arise.

To send ten units for sawmill and logging operations in England involved the raising of a fund of \$120,000. The cost of each unit is placed at \$12,000. This money was provided overnight. Through its Governor and its committee on public safety each of the New England states subscribed the sum required for a single unit. With six units thus provided for, there was no difficulty in raising funds for the four remaining units by private subscription among the paper manufacturers, lumbermen and timberland owners of New England. Because of these contributions, as well as because of the fact that almost the entire membership of the committee is made up of timber owners and foresters, the sawmill and logging units are identified as the gift of the New England timber interests to the British Government.

The thoroughness with which the committee worked out the details of the enterprise is indicative of the spirit with which the whole matter was undertaken. In submitting the plans Chairman Brown presented six closely typed pages showing the exact requirements of each unit. These needs included everything that would be wanted in a sawmill and logging camp, from a portable 50 or 60 horsepower engine and boiler, a rotary sawmill which can saw up to 20-foot lengths, four saws, 2000 extra teeth, to an exact specified number of each of the hundreds of spare parts, mill supplies and tools and articles needed for felling equipment, hauling equipment, construction and repair equipment and camp equipment. This exactness extended even

to three dozen lamp wicks for each camp, 1½ dozen lamp chimneys, two six-quart bean pots, a couple of can openers, half a dozen salt shakers and the almost countless domestic articles that a camp must have. These things are mentioned as indicating the careful attention given the details by some of the busiest men in New England.

The man-power of the ten units amounts to close to 400. For general supervision there is a general manager, a bookkeeper, an engineer and millwright, a storekeeper and purchasing agent and a secretary and stenographer, and for each camp a timekeeper and bookkeeper. For the logging

crew each unit has 25 men and for the mill crew nine men. Horses to the number of 120 were taken, with harness and stable equipment.

Through the British Embassy arrangements were made that the men should work as civilians, under contract for one year, that their wages should be paid from the time of sailing, that they are to be provided with board, lodging and medical attendance, and transportation to and from England, that they are to be employed only in the United Kingdom and that they are to do logging and millwork exclusively.

---

## WAR, FORESTS AND LUMBER

**T**HE national importance of America's forest resources and the technical skill of her forestry experts have never been so emphasized as by the emergency brought about through this country's participation in the European war. Every phase of the situation is in some way closely interwoven with and dependent on our lumber supply. Without this natural wealth of our forests and the ability to make it quickly available there would be paralysis of our best effort.

Whether it be the need for ships for the transportation of foodstuffs and munitions, the need for the construction of vast camps for the training and concentration of the army or any one of the many activities looking toward armed, industrial and economic preparedness, American lumber is one of the foundations of American participation in the war. Hand in hand with this is the need for the active assistance of men trained in forestry and lumber operations for swiftly, surely and wisely handling the vast supply of lumber that must be utilized. In the present situation this human resource is as vital as the lumber itself.

Through the cooperation of the Federal Shipping Commission and the Lumber Committee of the Council of National Defense the grave problems involving the Government's lumber supply for war-time needs are being reduced to their simplest terms. That the solution will prove adequate there appears to be no room for doubt. The work already accomplished and the program prepared make it clear to those familiar with the situation that the country has been placed in position to meet the emergency in the quickest and most efficient manner.

The Lumber Committee is made up of men representative of the best spirit of the American lumber industry. They are men of vast private interests, who have dropped their own work and submerged their own affairs into an earnest effort to be of service to the nation. Efficiency is the committee's central thought. As to business capacity, thoroughness and expert knowledge, as well as to patriotism, this committee affords exemplification of the extent to which the Government is receiving constructive assistance at the hands of the public-spirited business men of America. In no branch of its work is the Council of Defense being given help that is more vital or more valuable than in connection with forestry and lumber.

**T**HE essence of this country's present helpfulness toward its European Allies in the great war is in the matter of food supply. We have the foodstuffs and we are providing Europe with funds with which to pay for them. To make this combination of merchandise and buying power of definite value the fundamental need is shipping facilities. Through the activities of enemy submarines the available supply of ships has been greatly diminished, and as this destruction proceeds the need for added tonnage becomes greatly emphasized. It is in the effort to help supply this need as swiftly as possible and at the same time provide for the adequate care of the internal needs of our own Government and private enterprise that the Lumber Committee is doing a big work and doing it well.

Lumber is needed by the Government in tremendous quantities. The building of a thousand wooden vessels now being undertaken by the Federal Shipping Commission will require more than 1,000,000,000 feet. Construction of barracks and other building operations of the army and navy will greatly increase the volume needed for public use. In the aggregate the official requirements are creating a sudden and unusual demand for lumber to the extent of approximately 2,000,000,000 feet. In the handling of this tremendous order the expert counsel and planning of Forestry experts and trained lumbermen are essential.

Without this cooperation the Government problem would be intensified and the lumber trade would suffer demoralization. To make such demand for material on an industry normally unorganized, broken up into thousands of unrelated units and widely scattered geographically, would bring about a condition that would seriously hamper the Government in its efforts to meet the emergency. It is to overcome this lack of organization and to bring about coordination that the Lumber Committee has concentrated its efforts.

One of the fundamentals in handling the situation and solving the problem was the application of expert knowledge of forestry. First-hand knowledge of the country's available supply of timber and its accessibility was the thing upon which all the work of the committee must be based. Obviously this intimate information could be furnished by none others than men trained along technical

forestry lines. For this reason it was inevitable that the man-power of the American Forestry Association should be generously drafted into the work of the Council of Defense through its Lumber Committee. This draft has given the Council the benefit of the skill and experience of such individual members of the Association as R. H. Downman, of New Orleans, who was made chairman of the committee; Henry S. Graves, chief forester of the United States and vice-president of the Association, and E. T. Allen, of Portland, Oregon, and W. R. Brown, of Berlin, New Hampshire, directors of the Association. These experts are all members of the committee, as are the following named members of the Association: G. S. Long, of Tacoma, Washington; Charles S. Keith, of Kansas City; C. H. Worcester, of Chicago, and W. H. Sullivan, of Bogalusa, Louisiana. In his work as a member of the committee Forester Graves has the active assistance of William B. Greeley, assistant Forester of the United States, who is a director of the American Forestry Association. On the Federal Shipping Commission the directorate of the Association is represented by Capt. J. B. White, of Kansas City, a recognized authority on Lumber Conservation and utilization. This list indicates the importance of the American Forestry Association's contribution to the national work.

An important result already achieved by the Lumber Committee is in the matter of purchases of lumber for building the big new army cantonments. Through the work of the committee the Government has been placed in position to save from \$3 to \$5 a thousand as against the prevailing market prices in the several sections from which the lumber will be taken. The basis is not one of arbitrary price fixing, but of informal agreements assuring a maximum price varying according to cost of production in different parts of the country and the grades of lumber involved. As the building contractors will be paid a fixed percentage of the cost of construction the Government will reap another direct advantage of the lower lumber cost, making possible a vast saving in addition to that involved in the purchases themselves. The arrangement between the Lumber Committee and the lumbermen is so elastic that it will leave the Government entire freedom of choice in placing orders, while contractors purchasing direct on emergency requirements will have the names of dealers with whom they can deal at Government prices.

**T**HE committee has also concentrated on arranging a proper apportionment of the lumber in the individual cantonment districts so as to avoid waste in transportation. Through improved specifications, a carefully worked out disposition of supply sources and railroad facilities it has been conservatively estimated, according to a bulletin of the Government Committee on Public Information, that the Lumber Committee has already saved the Government at least \$5,000,000 in addition to the saving through price agreements.

It is not only through their forestry knowledge and training but through their familiarity with lumber manufacture and transportation problems as well that these men are giving the Council of National Defense and the Shipping Commission a measure of helpfulness that cannot be computed in dollars and cents. The real gauge of

this assistance will be in the efficiency which it will make possible in prompt meeting of the requirements for lumber and simplification of the problems of distribution, no less than in the money that may be saved to the Government through centralized purchasing and voluntary coöperation on the part of the lumber interests of the country.

One of the primary needs of the situation, as pointed out by the Lumber Committee, is that the Government should adapt its requirements, as far as possible, to existing lumber stocks and manufacturing conditions, to the end that delays may be prevented, cost minimized and the best possible output achieved. Another basic need is the prevention of extreme inflation in prices, which would normally follow such a sudden increase in demand. It is figured that this inflation might readily increase the cost of the lumber needed for public use to the extent of \$5,000,000 or more and at the same time work a hardship on private consumers.

**C**AREFUL handling of transportation is another vital point in the situation. The Committee recognizes the importance of eliminating cross-shipments of lumber, doing away with unnecessary long hauls and in every way holding transportation cost to a minimum. It is pointed out that transportation charges might easily be increased 25 per cent or more by the haphazard placing of orders, and that this increased expenditure would be incidental to the general loss involved in a failure to achieve the maximum use of the country's transportation facilities.

Correlation of the requirements of the various Departments and the needs for different classes of lumber is another point to which the Committee has given careful attention. This calls for systematic planning as far in advance of deliveries as may be possible. In order that available stocks may be best utilized and lumber manufacture best adapted to the products to be needed by the Government it is deemed necessary that all requisitions be brought together and orders placed, as far as practicable, with regard to the whole list rather than individual items. One example of the application of this method is to be found in the plan that the large volume of small dimension lumber and boards necessarily produced in manufacturing ship timbers for the emergency fleet should be used as far as possible in the construction of cantonments and other purposes for which they may be suited. It is foreseen that unless all public needs for lumber be thus tied together there is certain to be serious delay in supplying some of these needs and a greater or less disruption of normal manufacturing conditions, with resultant decrease of output and increase of cost.

To overcome the various difficulties necessitates coöperation of Government, lumber manufacturers and lumber trade organizations to insure the production of the necessary grades and quantities, stabilize prices and provide for the most direct deliveries. To make this coöperation effective requires that the lumber needs of the Government be brought together at one central point.

In order to accomplish these important objects the Lumber Committee has suggested that it serve as a clear-

ing-house on the lumber requirements of all Government Departments, with a view to centralizing orders and purchases as far as may be practicable. Representing every large lumber producing region of the country, together with the organization and facilities of the United States Forest Service, the committee believes that its services can be best utilized and the Government's lumber requirements most effectively met under a program carefully planned through its deliberations.

The first step in this program calls for submission to the committee by each Department or Bureau, as far in advance of necessary deliveries as possible, of all anticipated lumber requirements of material quantities. These references should include data on proposed use, specifications and time and place of delivery. After consideration of the specifications the Lumber Committee will promptly advise with the Department or Bureau, with a view to adjusting the needs to fit current lumber stocks or manufacturing conditions. Suggestion will be made as to specific commercial grades, based upon the current rules of lumber manufacturers' associations, which will meet the specifications at a minimum cost.

As another step the committee will stand ready to advise the Department or Bureau as to the best manner of making its purchases, either from designated manufacturers or associations known to be in the best position to furnish the materials promptly and at a minimum trans-

portation cost, or from local distributing yards in the case of smaller and emergency orders.

ONE of the most important functions of the committee, as planned, is in the matter of prices. With intimate knowledge of trade conditions and all sources of supply, the committee will be in position to give advice as to the prices at which materials can be procured or as to the maximum prices which it is equitable for the Government to pay. Methods of procedure that will insure the most favorable prices and deliveries at the lowest cost within the time limits necessary will be suggested in each specific instance. Further suggestions will be made, when desirable, regarding methods of inspection and other details that will fully protect the interests of the Government.

The results achieved by the committee will be shown in reports of all its activities, with specific lists of lumber orders placed, and with full information as to prices and terms, filed periodically with the Advisory Commission to the Council of National Defense through the committee on raw materials of which the Lumber Committee is a part.

This outline of the work proposed for itself by the Lumber Committee makes obvious the intent to develop the centralized purchase of lumber required by the various branches of the Government and to avoid the losses and delays which are considered inevitable under decentralized and unsystematic handling of this large volume of business.



Guy E. Mitchell

SANTA CRUZ NATURAL BRIDGE (BEFORE THE DAWN OF LIFE)

One of the most perfect of natural bridges, appearing almost like an artificial tunnel, is found in Santa Cruz County, California. The top of the bridge is used as a driveway, as is shown in the picture. The exposure of the rock made by the natural undercutting of this bridge by the ocean waves heating on the shore discloses to the trained eye an interesting phase of the formation of this part of the country. The lower or darker portion of the rock forming the bridge is shale, young geologically, but of great age as computed in years or centuries. The upper fifteen feet, which, as shown in the photograph, is of lighter shade, was deposited in the age immediately preceding the one in which we live. This surface material was deposited by the rushing streams fed from the great glaciers which lay in the mountains of the Sierra to the east.

# LIGNUM VITÆ IN CURAÇAO

BY MILES HAMAN

PRACTICALLY every American who is at all familiar with the common commercial woods has seen and handled Lignum Vitæ, or, as it is commonly called from Havana to Buenos Aires, guayacan. To those who are unfamiliar with this wood and its uses, it would be of interest to look closely at the next bowling-ball, pulley-block, or wooden bed easter and one will be pretty sure to find a close-grained, heavy, green wood with an oily surface which bears, in English-speaking countries, the name of Lignum Vitæ. Though the wood is thus in common use and well known, but few have ever seen the tree in its native surroundings.

There are a number of species, but perhaps the most common are *Guayacum sanctum* and *Guayacum officinale*, of the West Indian Islands. Closely related genera of the same family are found in the Argentine Chaco, where it is a much prized fire-wood of the Indians. Many a soldier and ex-

somewhat moderated by the trade winds, and the island is out of the Caribbean region most affected by hurricanes.

The region is one of extreme drought. The average rainfall is less than ten inches and records of no precipitation at all for an entire year are not uncommon.

Huge tree cacti, *Cereus*, *Opuntia* and *Melocactus*, thorny shrubs and such plants as are common to the Arizona-Cal-



LIGNUM VITÆ, OR GUAYACUM, IN ITS NATIVE SURROUNDINGS  
The heat is very great but modified by trade winds and the region is one of extreme drought, the average rainfall being less than ten inches, and records of no precipitation at all for a whole year are not uncommon. The huge cacti and thorny shrubs thriving nearby testify to these conditions.

plorer of this region has cooked his meal with knots and splinters of guayacan, or used it as a torch. In Spanish-speaking countries the true Lignum Vitæ is much confused with the group of very hard woods belonging to the Leguminosæ—closely related to our black locust. These woods bear the same name of guayacan, and are widely used, but lack the peculiar qualities which are characteristic of the true guayacan.

On the Island of Curaçao, Dutch West Indies, just off the Venezuelian coast, and far down on the point where the work of forest destruction has progressed the least, one may see Lignum Vitæ in its native home.

The island is one of gently rolling topography with but three points, St. Christopher, the Castle Mountains and the Three Brothers, rising well above the general level, and it is at medium elevations that guayacan is most commonly found. The heat here is great, though



SHOWING DETAIL OF THE PECULIAR BARK OF THE LIGNUM VITÆ  
The wood is close-grained, heavy and very hard, and the tree, with its richly colored dark green leaves, its blue flowers and orange-red fruits, is in striking contrast to its arid surroundings.

ifornia desert region are the common associates of guayacan. It grows in places as unlikely for tree growth as one can find.

Not only is guayacan important commercially, but it has proved its worth as an ornamental tree. Not to be outdone by mahogany, which has been planted as a shade tree, guayacan is also used in landscape work, and several groups have been planted around the Governor's palace, just inside the harbor.

# WAR-TIME USES OF THE WOODLOT

BY AUSTIN F. HAWES

EXTENSION SPECIALIST IN FORESTRY

**W**HAT has the farmer's woodlot to do with the war? In this time of emergency when the farmer is being appealed to for more wheat and corn; more pork and beans; more potatoes and eggs, and every acre is to be pushed for its maximum production, little attention has been given to the woodlot. That unkept portion of the farm where the cows seek shelter from the summer's heat, where the older people once played at Indians, and the younger ones are now hunting Germans, has never been considered of any serious importance in the farm or national economy.

But at this time of national emergency, when every resource is being scrutinized, and many readjustments are taking place, it is well to consider the woodlot, which in the aggregate forms such a large portion of the American farm. The Geological Survey says in a recently published bulletin:<sup>1</sup> "Nothing is more certain than that the country will, next winter, witness a shortage of coal perhaps more serious than in the winter just passed unless unusual efforts are made between now and next fall to prevent it." When the published statements of the foreign Commissioners, that France and Italy are in serious need of coal, are taken into account it will be realized that the fuel situation is of vital importance to our allies as well as ourselves.

The coal shortage is due largely to the tremendous growth of war industries dependent on coal, and the consequent congestion of freight. Orders have already been placed with our manufacturers which will keep them fully employed for over a year, and therefore a shortening of the war would offer no immediate solution of the fuel problem. It must be realized that there is plenty of coal in the mines, and that the difficulty comes from the inability of the railroads to move it in the winter when there is such a great demand for it. On October 1, 1916, there was a total shortage of 100,000 cars in this country, of which 25,000 were coal cars. The advice of the Geological Survey is that the

consumer should buy and store coal against the needs of next winter, and thereby personally save trouble and expense. When it is realized that every ear of coal unloaded this summer for use next winter will release a car for other important and, perhaps, imperative needs at a

time when the need is greatest, there will be no question of the wisdom of this call.

What has all this to do with the woodlot? Simply this: where coal is scarce, wood can be substituted to a certain extent, and should be this winter. Obviously the manufacturers cannot substitute wood; neither can city people, because this would result in even greater railroad congestion. For the same reason the farmers of Ohio and Illinois, who



A LOT OF WOOD FROM A WOODLOT

This shows what a woodlot can be made to do in the way of reducing the high cost of fuel and making a farmer independent, to a large extent, of the coal producer and the overtaxed railroads in the present nation-wide congestion of freight. The cut timber represents a considerable supply of fuel, and the possibilities of the woodlot are by no means exhausted.

can obtain coal on their own farms, might just as well continue to do so. Wherever team-hauled wood can be substituted for railroad-hauled coal this should be done, and may be considered a part of the program laid down by President Wilson. Farmers owning woodlots, and villages which can purchase wood from nearby farmers, can all help, and though it is not expected that many will substitute wood as their chief fuel, they can supplement their use of coal with wood much more than usual. In the seventeen states, including Minnesota, Iowa and Missouri and those to the east, including New England, there is a rural population of about 20,000,000 people, and it is estimated that they use annually about 18,000,000 tons of coal. If by substituting wood one-quarter of the coal burned by farmers and one-tenth of the coal burned in villages could be saved, there would be a total saving of 2,700,000 tons or 67,000 earloads. In fact, it seems reasonable to assume that by an active campaign between two and three million tons of coal can be saved, which is an appreciable factor.

Considering two cords of wood as the equivalent of one ton of coal, this substitution would call for the cutting of about five million cords of wood more than usual. The total amount of wood used in these seventeen states last year was estimated by the Forest Service at 26,571,000 cords.

<sup>1</sup>U. S. Geological Survey Bulletin 666-M, by C. E. Leshar.

At the close of the harvesting season, there will be a large surplus of labor if the present campaign for farm labor is successful. Some of this can be profitably employed in wood cutting and hauling, and in this way can be kept on the farms over winter. In fact, this winter work might be an important factor in a permanent "back-to-the-farm" movement. The wood cut in the fall could be burned in the latter part of the winter, and enough could be cut in the winter to relieve the shortage in the following winter.

Undoubtedly economic pressure would of itself result in a partial substitution of wood for coal, but since the Government has thought best to stimulate the raising of food in a period of abnormal prices, it should stimulate a

estry work, may serve as an example. Through the Extension Service of the Agricultural Colleges and the various county agents an educational campaign will be started immediately after haying to convince the farmers of the desirability of cutting more wood and cutting it in a proper way. Farmers have confidence in the county agents, for they have found their advice is practical, and they are more intimately acquainted with them than they can be with the State Forester or the Professor of Forestry at the College. Both of these men, with their various assistants,



FUEL F. O. B. THE FARMHOUSE

Here is a woodlot at the owner's very door. On this small area in Stafford County, New Hampshire, is a stand of pine timber that is ready to do its share toward solving the fuel problem. By cutting even a slight portion of this timber the owner will be contributing to the national supply of fuel, and he will be doing his woodlot no harm. In the aggregate such contributions will be of vast value.



WHAT TREES ARE THESE?

This is a woodlot which combines use and beauty, to say nothing of its interest to the student of the trees. It is a stand of mixed hardwoods on a farm in Ohio. In the foreground stands a young tulip 12 inches in diameter and 75 feet high. On the other side is a beech, while near the man are two chestnuts. The younger growth is mostly beech and maple. The woodpile is of beech, for some use.

form of production and saving which is less obvious. Even if the high price of fuel were in itself sufficient to bring about this increased wood cutting, it is evident that widespread, promiscuous cutting of woodlots will do more damage than good. By proper organization, this opportunity can be turned to a certain extent to the improvement of the woodlot and hence of the farm.

The plan to be followed in this fuel emergency campaign illustrates so nicely the coöperative work of the States Relations and Forest Services of the Department of Agriculture that it may be of general interest. Under the so-called "Smith-Lever" law the States Relations Service has been developing, in coöperation with the various Agricultural Colleges, a great system of agricultural education and will eventually have a county agent in every county in the country. The Forest Service for about twenty years has been offering information along forestry lines, and in many states has coöperated with the State Foresters in getting this information to the public. It is now proposed to combine all these forces in a more effective campaign. New Hampshire, which is one of the leading states in for-

will furnish the technical information necessary to have the work conducted properly. The County Agents will select certain woodlots, well located in reference to main highways, to serve as demonstrations, and a forester will mark the trees which should be cut. Later the agents will arrange conferences of neighboring farmers in these woodlots, and the forester will explain why he marked certain trees for cutting. So far as possible the forester will visit other woodlots and give the owners instructions to guide them in their work. There is such a complete force of foresters in New Hampshire that it is believed that the whole campaign can be handled very beneficially for the woodlots and their owners. The Professor of Forestry at the College will be responsible for the direction of the work in the two or three counties near the College; and the State Forester with his several assistants will be responsible for this work in the remainder of the State. Other states should follow New Hampshire's example in this emergency.

## ENLISTING SOLDIERS OF THE SOIL

**I**n the present national crisis the members of the American Forestry Association can make no contribution more helpful than their coöperation in the campaign to stimulate Food Production and Food Thrift. The enthusiasm with which they have entered into this work is manifested in letters received by the editor of American Forestry from members throughout the country, endorsing the efforts of the Association and the Magazine to assist and supplement the plans of the National Emergency Food Garden Commission. Mr. Charles Lathrop Pack was the originator of this commission and is its president, which facts give the Association particular pride and interest in the success with which the work is meeting. The movement is already proving of tremendous value in increasing the nation's food supply through the planting of a million or more food gardens. By thus utilizing land that has been unproductive the country is now creating a source of food supply of immense worth in this time of war emergency. The American Forestry Association is doing much by the contribution of its headquarters and organization to the work of the Commission. President Pack feels that the individual members can increase this contribution by doing whatever they can to stimulate Food Production and Food Thrift in their own communities.—THE EDITOR.

**A**s a clearing-house through which potential food gardeners are brought into intimate touch with expert knowledge on which they can base intelligent work for food production, the National Emergency Food Garden Commission exercises one of its most important functions.

In this way the Commission is developing a new generation of gardeners of all ages and guiding them into successful cultivation of vacant land near their homes, to the personal gain of the workers and to the needed increase of the nation's food supply. Authorities agree that the propaganda of the Commission will prove a vital factor in helping America solve one of its most serious present problems, that of supplying ourselves and our European Allies with enough to eat during the period of the war.

The raw material for this movement was at hand. The land was waiting, in the form of back yards, vacant lots and unused tracts of various sizes, in or near every city, town and village of the country. The gardeners were ready in the school children and their elders in every community. That the one thing needed was a national commission to arouse interest in the national need and to supply expert guidance has been shown by the immediate success of the work which the Commission has undertaken. The response has

astonished everybody concerned. That the results will be of vast importance is obvious.

The movement affords a rare example of Thrift wedded to Abundance. It is a case of producing for the purpose of immediate use as well as for saving for the future. The

food garden will enable families in the most moderate circumstances to enjoy the hitherto unknown luxury of vegetables fresh from the garden, and to those who have been denied this privilege the work involved will pay dividends far in excess of the money saved in the purchase of food-stuffs. Anyone interested in statistics may take as his basis the \$250,000,000 of expected output in the Emergency gardens, multiply it by the proper factor of individual satisfaction on the part of the consumers and find, to his own profit, at any rate, the aggregate worth of the dividends to be gleaned by the shareholders in this important war movement.

Thrift is the essence of the undertaking. The nation's shortage in foodstuffs is one of the most serious phases of the unprecedented situation which confronts the American people. It is no exaggeration to say that the country is today in the midst of a food panic. Efforts to place the blame for some of the trouble are interesting and impor-



A SOLDIER OF THE SOIL

Women are taking as important a place as men in War Gardening. Throughout the United States they are shouldering the rake and hoe and adding to the nation's food supply. The costume is a type of uniform being worn by the women and girls engaged in raising food for soldiers.

tant, but as a fundamental it must be recognized that the shortage actually exists. That there may have been manipulation and an exploitation of the country's needs may be determined by those in authority, but regardless of this phase of the matter the one thing clearly indicated as a

tuted, the methods of cultivation were not intensive and the money value of the product was small. Training of the children in the school work showed how this value could be increased and the Commission has data to show that the average school child of reasonable age can produce



"SOW AND YE SHALL REAP"

Mrs. J. Chester Pyles and Mrs. M. E. Rafters, troop captains of the Girl Scouts of Washington, planting the first handful of seeds on the girl scouts' one-acre farm. The seeds for the farmlet were donated by the National Emergency Food Garden Commission. If a million other American women would follow the example set by these women, the production of food in this country would be increased to such an extent that not only would food prices be much lower but we would be able to supply our Allies with all the food they need.

national duty is to produce more food and do it as quickly as nature makes possible. This is Thrift of vital worth and meaning. It will give the people more food, better food and at a distinct saving in financial outlay. It will release for other uses a vast number of freight cars that would be required to carry to market the foodstuffs which will thus be at hand without transportation, or "F. O. B. the kitchen door," as President Charles Lathrop Pack aptly phrases it. These cars will be available for the transportation of other merchandise, the tremendous movement of which helps create a deficiency in food supplies. In case of military necessity for the use of the railway facilities of the country this phase of helpfulness will be increased several fold.

The development of school gardens in various cities throughout the country has given the Commission a basis for actual figures as to what may be accomplished. About thirty per cent of the families outside of the large cities have home gardens, but, until the school garden work was insti-

Commission the technical difficulties are removed and a nation of amateur gardeners immediately becomes a nation of experts.

If there is demand for Thrift in connection with the

from \$50 to \$100 worth of vegetables on a picce of ground 50 x 100 feet in size—equivalent to about an eighth of an acre. Let this be done on a considerable scale in every community and it will be readily seen to what extent this will simplify the country's food problem and its transportation problems in the bringing of food to each city or town by railroad freights.

While the school children are the nucleus of the nation's potential army of food gardeners, the work appeals to grown people with similar force. To the man or woman who works eight hours a day in store, shop or office, the making and care of a garden can be made to afford recreation that is not only healthful and financially remunerative but of distinct pleasure as well. Without expert guidance this would not be easily achieved, for gardening is a work that must be conducted along lines of exact science. With the instruction and helpfulness of the



DOING A MAN-SIZED JOB

Hard work is play for these girl scouts when the cultivation of their farmlet, on the D. A. R. grounds, Washington, is at stake. These young huskies work like Trojans to grow food to help feed Uncle Sam's fighting men. They are aiding the National Emergency Food Garden Commission in its campaign for a greater food production.

production of foodstuffs, President Paek feels that there is no less imperative need for Thrift in the utilization of the country's supply. American kitchens waste enough food each year to feed the whole British army in France and several divisions of the French army. The estimate of this waste is \$700,000,000 annually, and this is believed to be conservative. For the elimination of this reckless extravagance it is important that the people of America

of left-over cereals with meats, fruits or vegetables. Even a spoonful of cereal is worth saving as a thickener for soup or gravy. No housekeeper should throw away stale bread, sour milk, scraps of meat or fish, trimmed fats or suet. Even the water which has been used for cooking rice and many vegetables should be saved. Stale bread can be used in many ways, sour milk can be used in baking, meat and fish scraps add flavor and nourishment to



WHAT BOYS CAN DO IN HOME GARDENING

There could be no better evidence of success of the Home Gardening campaign of the National Emergency Food Garden Commission than this picture showing a piece of ground cultivated by a Boys' Club. The young gardeners followed instructions and worked together to increase the nation's food supply. The abundant yield is an eloquent tribute to their success, and an inspiration to others, grown-ups as well as young people.

should consider themselves mobilized into an army of food-savers. This does not mean deprivation. It simply means the exercise of care.

That this care is essential is shown by the insistence of our own military leaders and those of our Allies that the outcome of the war is a matter of food. Every saving, no matter how trivial and small it may seem in itself, adds to the aggregate of the food supply that can make victory possible and certain, just as every new food garden, however small, contributes to the vast total of this new source of food. Without Food Thrift at home the struggle on the battlefields may be to no purpose. Famine may be the great victor, and it is easily conceivable that the war may end in a surrender forced by starvation.

The chief food loss in America is in the private homes. Good food is improperly handled and stored, carelessly cooked, wastefully prepared, or over-generously provided. Extravagant cooks must learn how to use left-overs. Appetizing side dishes may be prepared by the combination

made-over dishes; fat can be used as a substitute for butter and lard in cooking, and cooking water will help to flavor soups and sauces.

The economical preparation of food is an important step in the program of Thrift. Carelessness in peeling will waste 20 per cent of potatoes, turnips and apples. In the average family too much food is habitually served. Simplicity should be the keynote of war-time menus. Too many dishes mean that much food is thrown away. Saving rather than spending should be the motto of the patriotic American home.

In the raising of foodstuffs in emergency gardens the community spirit is an important factor. Efforts of any kind are more successful where the individual feels that his neighbor is working with him. Many persons who have had little or no experience in gardening, but who are ready to learn and to work, are attracted by the idea of community gardens. So many inquiries have come to the National Emergency Food Garden Commission as to the practical

working of such enterprises that a special bulletin of advice has been issued on the subject. This bulletin says in part:

"The advantages of community gardening are several. Considerable back-breaking labor can be saved by hiring the plowing and harrowing of the garden tract. The pro-rata expense for this work will be light and well worth paying to escape the toil of spading by hand. Moreover, in the cultivation of an extended garden tract it is possible to use other labor-saving tools, like the wheel hoe, which are not practical in small back-yard gardens.

"Money also can be saved by the individual members, comparing the cost of community gardens with that of the same tract if tilled in individual plots, in the purchase of garden tools—hoes, rakes, wheelbarrows, sprinkling cans, and the like—because several workers in the garden at different times can use the same tools. In the same way money can be saved in purchasing fertilizer, seeds, and spraying chemicals for insects and plant diseases, and a further advantage is that the community garden is likely to have the benefits of artificial fertilization and spraying which are often dispensed with by the individual who cultivates a small garden.

"The greatest advantage of all which can come to the

#### A WAR-TIME MOTTO

**"PRACTICE Economy, but not Parsimony; cut out Waste—particularly all Food-Waste—but maintain the American standard of Comfort. That is good economics and good business."**—CHARLES LATHROP PACK.

workers in a community garden is the possibility of their obtaining expert instruction. For a small cost some expert gardener—perhaps a market gardener on the outskirts of the city—can be hired to visit the community garden at intervals and tell the novice workers about their mistakes. Once a week would be often enough for such practical instruction. Such first-hand advice for a new gardener often means the difference between a heavy crop and a complete crop failure.

"In general those who engage in such an enterprise should be as far as possible persons of the same interests and tastes, and also of about the same habits in life. Their leisure time should be about the same. Shunt off the chronic kickers, and those who are constitutionally convinced that others are always trying to get the best of them. Every one who goes into such an arrangement should understand exactly what the coöperation proposes to do. It ought all to be down in black and white before anything is started or any money spent. While each member is enlisting to share in the produce, he is also pledging his pro-rata amount of labor. The points of trouble in any community garden undertaking are likely to come in these two places.

"It is important that the volunteer manager be a man



ONE YOUNG CANNER'S VERSATILITY

This "Girl from Utah" has established a reputation that may well bestir the envy of the experienced housewife. With a view to doing her bit in the matter of Food Thrift, she started at the top of the vegetable and fruit list and worked through it. The result is here pictured. In each of the five rows may be counted eleven jars. No two of them are duplicates as to contents. This means that the young lady canned fifty-five varieties of vegetables and fruits in a single season. What will she do when she is twice as old?

in whom all the members have confidence as to his fairness and ability. Once he is selected, he should be given rather a free rein in the management."

With local organizations thus perfected the Emergency Food Garden movement has been making rapid headway throughout the nation. The readiness of communities to organize for the production of food has been remarkable, and the Commission finds itself flooded with requests for information and coöperation, all of which are given prompt and cordial attention. For the instruction and guidance of these organizations and individual gardeners the Commission is furnishing daily planting lessons to newspapers all over America. Nearly 2000 newspapers throughout the country are now using these lessons, which are supervised by agricultural experts. They tell what, when and how to plant and how to insure a full crop. Due regard is given to climatic conditions in various sections of the country, and these lessons have been instrumental in bringing about the creation of thousands and thousands of flourishing gardens all over the land.

Not the least important phase of the individual's duty in connection with the food supply of the nation is in the matter of canning, the season for which is now here. Too much emphasis, says President Pack, cannot be placed on the necessity for preserving fruits and vegetables during the season of their abundance for use when winter shall have arrived. This



CANNING BY COMMUNITIES

A high measure of efficiency in canning is reached by application of the Community Spirit. Inasmuch as canning is one of the fundamentals of Food Thrift, Community Canning should be encouraged. It reduces cost and labor and induces food conservation on a larger scale than individual effort.



FAIR CANNERS AT THE FAIR

Canning operations may be made as interesting as an afternoon tea. In this picture is conveyed a suggestion of the allurements of community work in preparing vegetables and fruits for winter use. These charming housewives—or future housewives—are club members who are busily engaged in the conduct of a demonstration in canning at a county fair. Incidentally the picture is a good matrimonial recommendation—which is quite another story.

is real conservation of food. The importance of it is accentuated by the success of the Emergency Food Garden movement. The planting and cultivation of a million food gardens will make it possible for families not heretofore canners of food to become such on generous scale. By doing this they will contribute vastly, in the aggregate, to the available supply of food for the winter season.

Economists are giving a great deal of attention to this point. As a part of a campaign for enlisting women in gardening, farming and Food Thrift, the National American Woman Suffrage Association has inaugurated a comprehensive program for this important work. In addition to its bureau of farm occupations and its plan of pledging women as individuals to do farm and garden

work wherever possible, the Association is urging the establishment of canning centers in each suffrage league throughout the states or in coöperation with other women's societies in communities. Farm and garden clubs of local leagues are being urged to plan at once to open canning centers with the ripening of the asparagus, spinach and rhubarb crops and to follow this up throughout the season. Provision for a supply of cans is characterized as of first importance, as a shortage exists and prices are rising. A volunteer or paid expert for supervision and instruction is deemed essential, to the end that the greatest degree of efficiency may be attained.

A number of the most prominent women on Long

Island have organized the Long Island Food Reserve Battalion to interest the women of that section in organizing clubs for canning, preserving and storing surplus vegetables and other food supplies. The scale on which the work is being conducted is shown by the action of the Long Island Railroad in sending a special instruction train over its lines for a week during the latter part of May. The train ran on a schedule announced in advance, allowing stops of an hour each at stations throughout Long Island. At each stop lectures were given by Mrs. H. B. Fullerton, Mrs. A. Louise Andrea and other experts, and an opportunity given

to inspect the exhibits, which included complete outfits of canning implements, jars and crocks. Reports indicate that the train was instrumental in arousing intense interest and enthusiasm among Long Island women.

In no field has there been greater progress than in the home canning of fruits and vegetables. The old-fashioned method of canning, used a generation ago, involved cooking foodstuffs in an open kettle



READY FOR THE SHELF

This cauliflower has been through the routine by which it is prepared for the winter. Notice the firmness of the product and the perfect retention of form made possible by the cold pack method of canning vegetables and fruits.

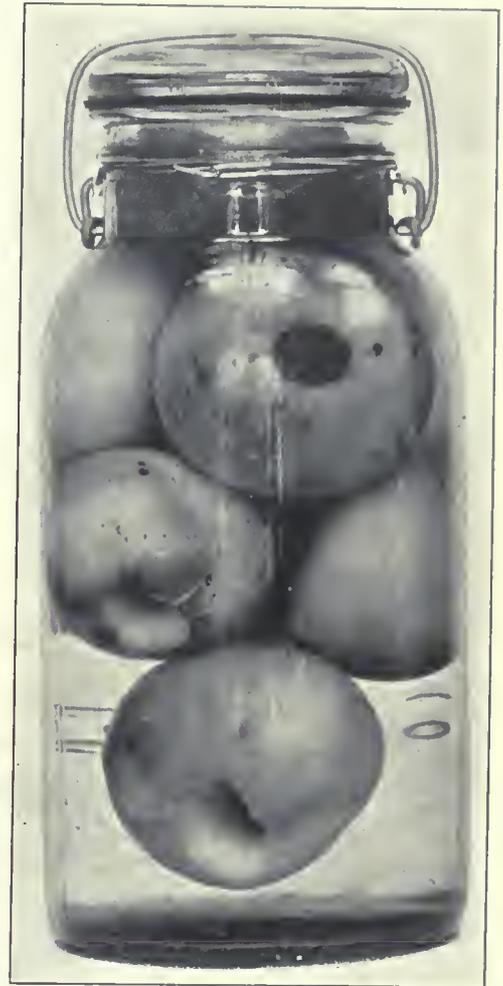
over a hot fire and then putting them into sealed cans. This was laborious and expensive, and it was actually cheaper to buy canned goods from the grocer than to put them up at home.

The modern method is by means of sterilization. Science has proved that the decay of food is caused by yeast ferment and other forms of bacteria and germ life. Fruits and vegetables cooked in the old open kettle were of course sterilized by the hours of boiling. Too frequently, though, the food products thus prepared would not keep, for the reason that they were placed in cans which had not been sterilized. The loss thus brought about was no inconsiderable item.

Sterilization, under the modern process, does away with

this loss. The foodstuffs are placed in cans and sealed before being subjected to heat. The cans are then placed in boiling water or in live steam and kept there until the heat has destroyed all germ life within holders or contents. This may or may not cook the contents of the cans. Whether it cooks them or not does not matter. Partially cooked fruits or vegetables prepared by this process will keep as well as those thoroughly cooked.

This method saves time, labor and expense. The foods are placed in the cans when cold and can therefore be handled quickly and easily. The sterilization period is frequently short, and with this saving of time is combined the economy made possible by dispensing with thick syrups and preservative spices. Fruits can be preserved in thin syrup, and vegetables require only water and salt as a flavoring solution. A distinct advantage is the ease with which the



APPLES CANNED WHOLE

If all housewives realized what may be done with apples there would be none of the prodigious waste of this fruit that takes place every year. Why let apples decay in the orchards when they may be canned like this, during the season of abundance, and saved for the lean months of winter?

process can be applied, making it practicable to put up small quantities to as good advantage as larger quantities. The thrifty housewife can thus preserve a single can of surplus foodstuff. This makes possible true household efficiency, as it enables her to save for the winter any small surplus of a garden crop, or an excess left over from her grocer's order. Recognizing the importance of food-canning, the National Emergency Food Garden Commission has issued a special bulletin of instructions which will make it possible for every housewife to preserve food products of the highest standard at slight cost of money, time and labor. Copies of this bulletin may be had without cost on application to the office of the Commission at 1410 H street, N. W., Washington, D. C.



## FLOWERS THAT BLOOM IN JUNE

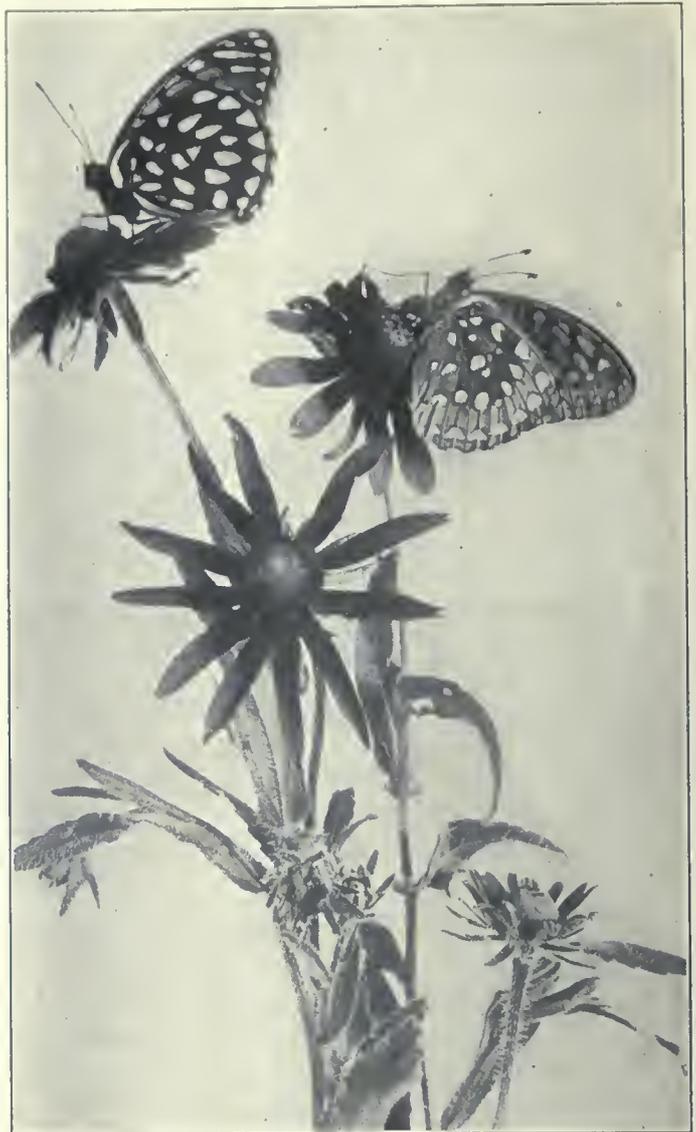
BY DR. R. W. SHUFELDT, C. M. Z. S.

ALL through the northeastern section of the United States, the month of June marks the long-looked-for season by the student of wild flowers, when field and forest, marsh and meadow are actually aglow with hundreds of different flowers that were not in evidence earlier in the year. One meets with them upon every hand, just so soon as one passes beyond the environs of the city; or, if one lives in the country, almost before there is a chance to



THE FLOWER OF OUR HILLSIDES AND ROCKY CRAGS

FIG. 1.—This is a fine specimen of the Wild Columbine (*Aquilegia canadensis*) which belongs to the Crowfoot family along with such plants as Larkspur, Hellebore, Buttercup, and many others (*Ranunculaceae*). There are several species and varieties of the Wild Columbine, as well as a Garden Columbine (*A. vulgaris*), in which the flowers are blue, purple, pink, or even pure white. This wild one, however, has scarlet flowers that are yellow inside; it nods upon its slender stem, which causes its hollow spurs to point upwards; though when the flower drops off the fruit points the same way. The Columbine is a perennial, having 2-3-ternately compound leaves with lobed leaflets. The five hollow spurs are backward projections of the petals, which latter are all alike. The five regular sepals have the same color. Pistils likewise are five, with slender styles. The erect pods contain many small seeds. Range: general; blooming from the latter part of April to the middle of June.



BLACK-EYED SUSAN, A FAVORITE FLOWER OF EARLY SUMMER

FIG. 2.—Nearly every one who goes afield is so well acquainted with this conspicuous "Yellow Daisy" that it hardly requires a description. It is the *Rudbeckia hirta* of the botanics, and belongs among the *Compositae* or great Composite family. It also bears the name of Cone-flower and Nigger-head—the latter being particularly inappropriate from any viewpoint. There is no trouble in finding it on its range anywhere, during the months of June to September, for it grows in the dry soil of meadows, brakes, and roadsides, from western New York to Manitoba and southward. Originally it came from the West mixed with clover seed. In various localities it presents certain variations in its flowers and leaves, and it may be either an annual or a biennial. There is a pair of Aphrodite butterflies (*Argynnis aphrodite*) on the upper flowers, a very beautiful and abundant species of the eastern part of the United States; it is a near relative of *A. cybele*.

pass out of the front gate. Their name is legion; and, to mention some of them here, with a view of giving an idea of their abundance, colors, or marvellous beauty, is to do a rank injustice to the host of others left off the list. Only a few can be considered at a time, with the hope of continually making records of others as the months pass.

First, we may choose the Columbine (Figure 1). That superb plant, with its beautiful flowers, is known to nearly every one that at all frequents the open; moreover, its unique structure and form is no stranger in many country or even city gardens, where we meet with the Garden Columbine, a species with hooked spurs, originally introduced from Europe. In northern New York the Wild Columbine is sometimes seen to grow most luxuriantly out on hilly meadows; but this is by no means the case elsewhere, for it is, perhaps, above all other flowers, the one that adorns our hillsides, where masses of loose stones occur, or, even

more frequently, wherever patches of soil are to be found among the granite cliffs and on the sides of rocky ravines. There its lovely red and yellow flowers bob away in the breeze, often in such inaccessible nooks as to be quite beyond the reach of the ordinary climber. Many a venturesome swain has had his tumble, in his endeavor to gratify the wish of his sweetheart—standing far below him—for a bunch to take home for a vase on her mantel.

Mrs. William Starr Dana has written very feelingly about this. She says of the Columbine that "it contrives to secure a foothold in the most precipitous and uncertain of nooks, its jewel-like flowers gleaming from their lofty perches with a graceful *insouciance*, which awakens our sportsmanlike instincts, and fires us with the ambition to equal it in daring and make its loveliness our own. Perhaps it is as well if our greediness be foiled and we get a tumble for our pains, for no flower loses more with its surroundings than the Columbine. Indeed, these destructive tendencies, which are

strong within most of us, generally defeat themselves by decreasing our pleasure in a blossom the moment we have ruthlessly and without purpose snatched it from



NEW JERSEY TEA, A CONSPICUOUS FLOWER OF THE WOODLANDS

FIG. 4.—This tall, shrubby plant, with its pretty clusters of white flowers, received its name, *New Jersey Tea*, from the fact that, during the War of the American Revolution, its leaves were quite extensively used to take the place of tea leaves for the making of tea; it belongs to the Small Buckthorn family (*Rhamnaceæ*). It also occurs on gravelly shores, ranging from central Maine to western Ontario and southward. In the neighborhood of Washington, D. C., it is quite abundant in open and dry woods, and early in July is abundantly visited by a black beetle of no great size, three specimens of which are shown in the picture. *New Jersey Tea* is the *Ceanothus americanus* of the botanics, and there appears to be but one other species of it described for our flora, *C. ovatus*, which is of rare occurrence in the eastern districts.



THE COMMON TREE FROG, A WELL-KNOWN DENIZEN OF THE FORESTS IN JUNE

FIG. 3.—Le Conte named this remarkable little imp of the woods *Hyla versicolor* for very excellent reasons; and Mary C. Dickerson, in her splendid volume "The Frog Book," says of it, on page 117: "Probably more familiar than any other member of the batrachian group, if we except the common toad, is this entertaining little acrobat of the frog world. Some June morning, when we are admiring the blue flowers of the clematis that climbs the porch, we see what looks like a yellowish white oval of putty plastered against the white pillar shaded by the vine. It is our Common Tree Frog (or Tree Toad, as it is called) sound asleep." This author gives no fewer than 18 colored and plain figures of this species from life in her book, as well as a beautiful plate of a piece of woods or forest where they are to be found; its history is an extremely interesting one.

its environment. If we honestly wish to study its structure, or to bring into our homes for preservation a bit of the woods' loveliness, its interest and beauty are sure to repay us. But how many pluck every striking flower they see, only to toss it carelessly aside when they reach their destination, if they have not already dropped it by the way!"

There is great variance of opinion as to how the Columbine got its vernacular and scientific names. The dove, the eagle, and other forms enter into the discussion, but the story is too long to print here.

Fertilization is performed principally by a number of species of bees, though the humming birds play no mean part in this rôle. The honey is held in the five backward-extending spurs which are called the nectaries, and the five sepals are red like the petals.

But on this long and sultry day toward the very last week in June, let us pass out of the cool ravine where the Columbines grow, into the blazing sun, as it mercilessly heats the air, and the fields, and everything growing in them for acres around. Near at hand is a sluggish, muddy stream, with a great mass of bramble skirting a part of its bank. But all this, and all this scorching temperature, is precisely what the flower about to be noticed fully enjoys. This is the Black-eyed Susan, and there are hundreds of these gorgeous, orange fellows in sight, standing up boldly against the heat everywhere. It would make a salamander

blush to think of it; and every year that passes, this royal representative of the *Compositae* seems to be more and more abundant in that same locality. There is a reason for this,



THE CURIOUS LEATHER-FLOWER OF THE RICH LOWLANDS OF THE SOUTH

FIG. 5.—Here is another representative of the Crowfoot family (*Ranunculaceae*) which has been called the Leather-flower (*Clematis viorna*) on account of the thick, leathery sepals, four of which, with their recurved tips, are joined at their margins as shown in the cut. F. Schuyler Mathews, in his useful "Field Book of American Wild Flowers," says, on page 130, that it is "a southern species with solitary, thick, leathery, bell-shaped, dull purple flowers without petals, the purple sepals about one inch long. The three or more leaflets with unbroken edges or lobed. In early autumn the hoary plume is brownish." Southern Pennsylvania, south to Georgia and Tennessee and west to Ohio." The specimen here shown is a Maryland one, collected on the Georgetown Canal, and the vine was growing in rich, marshy soil, amid a mass of other vegetation.

just as was found to be the case with respect to the White Daisies in last month's AMERICAN FORESTRY: they are rich in pollen, and the bees, butterflies, and beetles do the rest. Neltje Blanchan truly says: "Anyone who has

had a jar of these yellow daisies standing on a polished table indoors, and tried to keep its surface free from a ring of golden dust around the flowers, knows how abundant their pollen is."

The New Jersey Tea, here shown in Figure 4, is also called Wild Snowball, as well as Red Root, from the deep reddish tint of that part of the plant. A tan-colored dye



A PRETTY MIDSUMMER DAISY

FIG. 6.—This is the Common Daisy Fleabane (*Erigeron ramosus*) of the *Compositae* and it belongs in a genus in which occur some ten or more species, with as many varieties; so it is not always an easy task to distinguish them. Indeed, common as this plant is from June to October, east of the Mississippi, in fields and along roadsides, it has been incorrectly identified by not a few authors on flowers. Note that the stem is slightly hairy, and that it is pinnate—corymbose at the summit; that the lanceolate leaves are *entire* or occasionally one-notched, and scattered. Flowers white, sometimes tinged with lilac. This is the *Erigeron strigosus* of Muhlenberg and of Mathews. The central disks are bright yellow, and constitute the true flowers; the white rays correspond to all daisy rays. Robin's Plantain, Sweet Scabious, and Horse-weed or Butter-weed all belong in this genus, and are close relatives of the Asters.

is made from these roots which possesses some economic importance. As one passes through the silent woods in June, a group of these conspicuous, shrubby plants appears to stand out boldly and apart from the surrounding vegetation, and the sight is by no means an unattractive one.

There is hardly any danger of mistaking the curious Leather-flower (Figure 5), nor the long, straggling vine upon which it is found, for any other flower, although some botanists touch upon the possibility of this in their works.

However, such slips are occasionally made, and it will be as well to correct one here, which appeared in the last issue of AMERICAN FORESTRY, when *Plantago lanceolata* was incorrectly described and figured as *Plantago major*; the first-named is the English plantain, Rib Grass or Ripple Grass, whereas the latter is the Common plantain.

There would seem to be no doubt but that the beautiful little white daisy shown in Figure 6 is the Common Daisy Fleabane, or Sweet Scabious of some writers, though this flower is often confused with the Daisy Fleabane. In

the last edition of Gray's *Manual*, we find the Daisy Fleabane or Sweet Scabious called *Erigeron annurus*, and the Daisy Fleabane, *E. ramosus*, the very next species to it; Mathews seems to confuse the two. In any event, the White Daisy Fleabane is one of our most abundant plants, and in some sections it may be found along the roadsides, everywhere. These plants got their curious name from the fact that some people believe that when burned some insects would shun them; and so we often see bunches of them so treated hanging in country cottages.

## FOREST FLOWERS

BY BESSIE L. PUTNAM

WE are apt to look for our flowers in a class quite apart from trees, and to value the latter, from the aesthetic point of view, merely for their verdure and shade. And yet some of them are quite as much entitled to floral recognition as some of the garden flowers grown merely as flowers.

Almost before the pussy willows have burst their furry

catkins, the flower clusters of the red maple have burst their buds, accentuating the brightness of color which the twigs have been for weeks gathering, and which, to the close observer, render the tree little less interesting in spring than after the bright autumn colors are donned. Less showy but far more graceful are the greenish blossoms of the sugar or hard maple, which appear a little later than



Photo by American Museum of Natural History

### THE WILD CRAB

Blossoms most beautiful and fragrant, and in May time, when the flowers are at their best, attracting the bees and other winged creatures by the hundreds.



Photo by American Museum of Natural History

### THE DOGWOOD

The showy flowers of the dogwood—the banner of spring. One of the most conspicuous of all the flowering trees, making the hillsides in May truly beautiful.



FLOWER OF THE TULIP OR  
YELLOW POPLAR

The flowers of the yellow poplar closely resemble tulips in form and size and even in coloring. Of a pale green—almost cream—with markings of orange, they are very beautiful.

the leaves, and which, with their long, slender pedicels, envelop the tree in a fairy-like fringe which sways with the gentlest breeze.

In May the hillsides glow with the glistening white of the dogwood, perhaps the most showy of all our forest blossoms. And yet the flowers are not white after all, but are a greenish yellow, clustered in groups of twenty or more, each surrounded by the four-leaved involucre which is known in common parlance as the flower. These floral envelopes vary much in size and purity of color, this depending partly upon the individual tree, and partly upon the season; and it is a common saying among farmers that when the dogwood blossoms are small the fruit crop will be correspondingly small; in other words, Jack Frost is quite as partial to nipping the dogwood as the apple blossoms. When the dogwood is in bloom, as well as "when the oak leaves are as large as squirrel's ears," is the accepted time for planting corn.

About the same time the pink buds of the wild crab are burst-



FLOWER OF THE SUGAR MAPLE

The graceful blossoms of the hard maple, coming just after the leaves and which with their long, slender pedicels envelop the tree in a fairy-like fringe, swaying with every breeze.



A SPRAY OF BASSWOOD (LINDEN) BLOSSOMS

These creamy flowers are prime favorites of the bees, which fact alone should commend the planting and care of the trees for their commercial value as honey getters.

ing, filling the air with a fragrance which calls bees and other winged creatures by the hundreds. Talk about the beauty of apple blossoms; they are not to be compared with those of the wild crab! The Japanese may revel among their cherry blossoms, but with *Pyrus coronaria*, which is usually at its best in middle latitudes at Decoration time, we may well be satisfied.

Most interesting are the flowers of the tulip tree, *Liriodendron tulipifera*, resembling the tulip in form and size, and quite as strangely marked as some of the parrot tulips, with their blending of pale green with orange crescents. In autumn the winged seed-pods expand, almost like glistening straw-colored flowers. Scarcely less interesting are the leaves, each abruptly notched at the end into a shape so distinctively its own that there is no possibility of mistaking the foliage of the tulip or whitewood for that of any other tree. In geological times there were several species, but now we have but a lone species, now largely grown in many parts of Europe as a shade tree,



THE CHESTNUT

This photograph speaks for itself—it is unnecessary to enlarge on the beauty and grace of the flower of the chestnut—a feathery, creamy mass of bloom in late June or July.

and well deserving a place among our own ornamental trees of park and lawn. In its forest home it grows to a height of more than a hundred feet, but when planted in the open it is more compact in form, and as symmetrical with its low growing branches and lower stature as when its limbless trunk stretches up among the forest trees.

The cucumber tree, *Magnolia acuminata*, is a handsome tree with large flowers resembling in shape those of the famed magnolia of the South, though smaller and sadly lacking in their greenish color the waxy beauty of their subtropical cousins. The fruit, which resembles a small cucumber, eventually splits open at every seed, allowing the bright scarlet seeds to be suspended by their slender, thread-like attachment for some days before they finally become detached.

The basswood, with clusters of creamy blossoms, each bearing a curious leafy bract, furnishes an abundance of most excellent bee pasturage. This feature alone should insure to the tree liberal planting. Valuable for its wood, it pays its way after the very first years in the abundance of amber honey which it produces.

In our own opinion, there are few more attractive trees when in bloom than the chestnut, now surely doomed unless its persistent enemy can be routed. Though the beautiful trees near New York have all been sacrificed and the chestnut tree blight is surely passing westward, there are still many beautiful specimens, laden in July with a feathery

mass of creamy catkins. True, the pistillate flowers are rarely noticed by the uninitiated, but it does not require a botanist's eye to appreciate the showy staminate tassels.

The last of all trees or of all flowering plants to bloom is the witch hazel, in some localities scarcely attaining to more than shrub-like dimensions. When its neighboring trees are casting their autumn leaves, this strange species expands its small, strap-shaped honey yellow blossoms, the fruit of which does not mature until the following mid-summer. The plant has a highly specialized method of seed sowing, as unique as are its flowering plans. When ripe and dry the capsules burst elastically, propelling the seeds, according to William Hamilton Gibson, forty-five feet by actual measurement. If one wishes to test these sharpshooters, a simple method is to gather some of the branches in mid-

summer, when the fruit has nearly reached maturity, and place them in the living-room. As the pods become dry the capsules split and the bony seeds are thrown quite across the room.

And yet this seeming anomaly in reversing nature's rules for flowering is only anticipating its companions in the process, for while the other trees simply perfect their flowering buds for the coming season, this joker expands them. That is all the difference! And so between the pussy willow and the witch hazel there is an almost constant procession of forest flowers, each worthy of our attention.



FLOWERS OF THE CUCUMBER TREE (*MAGNOLIA ACUMINATA*)

This is a handsome tree with large flowers not unlike those of the famous Southern magnolia, though they are greenish in color and lack the waxy beauty of the true magnolia.

**I**F the 25,000,000 trees planted in the Pennsylvania state forests were set four feet apart, as they actually are in the woods, and planted in a straight line, they would cover almost 19,000 miles. Planted twenty feet apart, they would provide shade trees on both sides of 40,000 miles of highway.

**S**TATE Forests with a total of over 3,600,000 acres have been established in thirteen states. Of these New York has the largest forests, which comprise 1,826,000 acres; Pennsylvania is second with 1,008,000 acres, and Wisconsin third with 400,000 acres.

**A** SINGLE issue of a New York Sunday paper is said to consume the timber from fifteen acres of forest. If Pennsylvania's state forests were fully stocked, they could furnish enough pulpwood to keep forty Sunday papers going indefinitely.

**T**HE latest advice is not to char the ends of fence posts before setting them in the ground. The charcoal is said to hold water and thereby hasten rotting of the post.

**A**BSORBENT cotton, vests, hose, and handkerchiefs are now being made from wood in Germany.

## “WITCH’S BROOM” ON JAPANESE CHERRIES

BY C. W. H. DOUGLASS

“WITCH’S Broom,” a peculiar form of tree growth which is caused by the attacks of a parasitic fungus, has been recently discovered on Japanese cherry trees presented to the United States by the Japanese Government during President Taft’s administration. These trees were imported in a shipment containing many varieties of Japanese flowering shrubs which are used for ornamental purposes in Japan and were considered suitable to our climate, and were set out in Potomac Park, part of the beautiful park system of Washington, D. C. Despite the facts that a previous shipment was destroyed because of possible danger of introduction of diseases and insect pests and that this second one was carefully examined both before leaving Japan and after arriving here, the disease came in undetected. What the result will be no one can tell. It may spread to our native cherry trees and do an enormous amount of damage and it may do little or no harm.

Importation of trees and plants is often fraught with great danger. A plant that may not be harmful in its na-

tive haunts may become a danger in new surroundings; a disease that may have lived for centuries on plants without attracting attention because of the mildness of its activities on the native hosts, may run like wildfire and do great damage if allowed to spread and attack a new host. In both cases the reason for the sudden activity is that the forces which nature developed to prevent the dominance of any one individual at the expense of others are lacking in the new surroundings.

It is recognized that plants gradually develop a resistance to disease which may amount almost to immunity. Thus down through the years the disease may be attacking and the plant defending, with the result a deadlock. But allow the disease to spread to another species of the plant, one that has never been attacked and has therefore had no occasion to develop resistance, and the results are likely to be very destructive. Two widely-known examples can be found in the chestnut and white pine forests of the Eastern United States. Dead chestnuts and pines bear mute testi-



GOVERNMENT CHERRY TREE DISEASED

On the left is a Japanese flowering cherry tree, one of those presented to President Taft by the Japanese Government and planted in Potomac Park, Washington, D. C. This tree was removed as soon as it was found to be diseased. Out of a shipment of several thousand cherry trees about twenty were subsequently found to be infected with a parasitic fungus which caused a short, dense growth generally known as “witch’s broom.” This particular tree was probably attacked while a small seedling, as it is entirely “broomed.” The normal tree on the right shows the contrast.

mony to the destructive power of the chestnut blight and the white pine blister, both diseases imported from abroad on nursery stock from which they spread to our native species.

In like fashion many other diseases of trees and shrubs, as well as dangerous insects and diseases of animals and human beings, have been transplanted from one part of the world to another with enormous losses resulting from their unbridled, destructive activities. "An ounce of prevention is worth a pound of cure," and it is with that idea in mind, rather than any definite knowledge of grave danger, that

try wherever the climate is favorable to their growth and development. This wide distribution gives the problem a serious aspect, for the eradication of the disease is thus made very difficult.

Following the discovery of the disease on the Japanese trees in the District of Columbia, specimens of European cherry in other places were also found to be affected similarly, but whether the disease is the same has not been determined. Although the life history of the disease has not been worked out, some general information regarding it is available. Investigation has shown that the infection



EFFECT OF "WITCH'S BROOM" ON JAPANESE CHERRY

This is another of the trees presented to President Taft by the Japanese Government. In this case the right-hand branch is free from infection, while the left one has several brooms on it. After a branch is attacked it will continue to grow, but will rarely, if ever, develop either flowers or fruit.

a warning is issued against imported ornamental cherry trees which may be infected by the recently discovered or a similar disease.

The flowering cherry trees of Japan have attained world-wide fame because of their beauty and decorative value and have naturally been imported into this country in considerable numbers for ornamental purposes. Owners of many large estates have purchased them for this purpose and they can be found here and there throughout the coun-



INFECTED LEAVES OF JAPANESE CHERRY

This close-up view of an infected tree shows how the spore-bearing bodies on the under side of the leaves cause them to crinkle. These spores ripen just after the blossoms are out and are blown from one tree to another when the leaves are small and tender. Normal leaves can be seen among the crinkled ones, and this comparison is the best way to ascertain whether or not leaves are infected, as the spore-bearing bodies are apparent only as a faint white bloom almost invisible to any but the practiced eye.

is caused by a parasitic fungus—one that lives on the tree, drawing its nourishment from the living tissues but at the same time allowing the tree to live. The life activity of the tree is so changed by the parasite, however, that while producing for a time an extra dense foliage growth, it does not produce flowers or fruit, as all the flower buds become leaf buds. The dense aborted growth is the result of the tree's response to the stimulus of the attacking disease.

The illustrations show the characteristic appearance of infected trees. In the first a normal tree is shown at the right in order to bring out the contrast with the diseased specimen. The diseased tree shown was evidently infected

in the nursery before it left Japan as every branch is diseased, making a "Witch's Broom" of the whole tree. The fungus grew as the tree grew, sending its thread-like bodies through the living tissues of the tree and stimulating the peculiar form of growth. Both the density and the shortness of the infected tree are clearly shown in this illustration. The second view shows a tree that was evidently attacked after it had attained considerable size. The main branch on the right is free from infection, as is shown by the normal growth, but the broomy growths occurring in several places on the left branch each show the presence of an infection. It is probable that this tree was infected through the leaves.

In the third illustration are shown the infected leaves. The fungus develops the spore-bearing bodies on the under side of the leaves, causing them to curve downward around the edges to give the spores the advantage of a sheltered place to grow and ripen. The crinkled effect identifies these leaves, which are quite easily distinguishable from the normal leaves around them. It is quite difficult to detect the spore-bearing body on the under side of the leaf even by close examination, as it is very inconspicuous. A faint white bloom is the only visible sign of its presence. After the spores have ripened and have been released into the air, to be carried about by the wind, the leaves on which they developed blacken and die. This will ordinarily happen a few weeks after the leaves first appear.

In spreading from tree to tree it is probable that the leaf is first attacked. The infected tree develops the spores on the leaves and releases them about one week after the tree blossoms, so that they are free to attack other trees when the leaves are only about half-grown and are still tender and easily penetrable by the thread-like growths of the fungus.

It is not known whether any of our native cherries have yet been attacked by this foreign parasite. But they may

be eventually, and the fact that they have had no opportunity to develop resistance might mean a serious spread of the disease if it once gains a foothold. The disease would have an immediate effect on trees used for fruit production, inasmuch as the diseased parts of a tree produce no fruit. The effect on the lumber-producing cherry trees would be felt only in the far future. It would be impossible to use for lumber a tree that was made up of thick, broomy branches. In fact, it is very doubtful if a tree attacked early would ever reach merchantable size. The money value of the fruit and lumber-producing cherries makes care in preventing the spread of such a disease very much worth while.

Since blossoming time has passed and this year's crop of spores has long since ripened and started on the hunt for prey, there is little possibility for action that will accomplish immediate results in preventing the spread of the disease. All cherries should be carefully examined, however, for evidence of infection. If trees or parts of trees bear few or no blossoms, have a dense, broomy growth, show curled leaves which blacken at the edge and fall early, the assumption is that they are diseased. They should be removed as soon as detected, in order to prevent any possible spread.

Although several species of Japanese cherry are commonly infected, the Yoshiro variety (*Prunus serrulata*, but more commonly called *Prunus Yedoensis*) was the most commonly attacked in the Washington Park and it is therefore especially to be suspected. The Asagi or green-flowered variety will also bear watching.

In addition to this "Witch's Broom," these same Japanese cherry trees are affected by the injurious Asiatic twig borer described in a recent number of AMERICAN FORESTRY. That two such destructive pests could enter the United States on a shipment as carefully watched as this second one was, is conclusive evidence that importation of living plants from abroad, even if inspection shows them apparently clean, is unsafe.

## FORESTERS IN WAR WORK

THE following interesting letter has been received from one of the foresters with the Forestry Battalion, Canadian Expeditionary Force, stationed in England:

"We are now getting so close to the end of our timber at Windsor Park that I have been kept pretty busy looking over new areas. It is easy to find timber but difficult to find areas suitable for an operation like ours. Most of the timber I saw was small Scots pine averaging about fifteen thousand feet B. M. per acre. My last trip was to Whitley Camp. I am glad to say that we have given over our old system of leaving slash. Our men now burn as they cut. At the same time pit props (mine timbers) are cut and the fuel wood is piled. We find that this system takes but little time and has obvious advantages."

From a forester in France: "Over here in France our world is centred of course on the Western front and I have not heard very much of the doings in the forestry world in Canada. Occasionally I meet the local French National Forest officials and I can assure you that we have many interesting professional talks together. Our present log-

ging operation, of which I am in charge, is on a French National Forest of mixed hardwood and softwood. It reminds me very much of the lectures given by our Dean. The forest authorities exercise full control over the private holdings such as we are cutting upon. For instance, we must clean the surface entirely of all wood and debris, not leaving even a twig. Luckily the local French peasants are about and they eagerly take all the refuse. This is appreciated when I tell you that this winter was a very severe one in France and coal was very dear and high, \$50.00 per ton. Interesting details of our operation I will reserve for your interest when I return to Canada. It is impossible to put them on paper."

The Forestry Battalion being recruited by Major Lyons has sent over a company and another will be ready in a few weeks.

**B**ALSA wood, found in Central America, is said to be the lightest known wood. It is lighter than cork and has an average specific gravity of only 0.104.

# THE FLORIDA MAGNOLIA TREE

BY JENNIE LYNNE KYLE

**T**HE Magnolia is one of the typical trees of Florida. In no state in the Union does it attain such magnitude of growth and beauty. It inhabits the low, rich lands along the rivers and swamps, but many fine specimens are found at varying distances from the river line.

Its form is majestic and stately. While the great Live Oaks and Water Oaks may be called the Kings of the Florida forests, the Magnolia tree towers to as great heights, and its wide-spreading branches are almost as powerful as those of the great oaks. Its downward spreading branches tend to give it an oval shape and when given space in which all sides are exposed to the sun and air, its symmetry of form gives it rank as the most beautiful of Southern trees.

The Magnolia tree of Florida grows to a height of one hundred to one hundred and twenty-five feet, the largest known measuring eighteen feet in circumference at the base. The diameter is usually uniform up to one-half the height of the tree, where it gradually diminishes in circumference to a small diameter at the top of the tree.

Its roots are powerful and strong. The largest ones run outward, very near to the top of the ground, to a distance equal to the length of the greatest limbs of the tree. These underground roots are to some degree an imitation of the tree above ground—a provision Nature makes for its stability and protection.

The leaves measure from ten to thirteen inches in length by three to four inches in breadth. They are oval at the end—thick and heavy—of a rich dark green color at maturity, which is most beneficial to the sense of sight in this land of bright sunshine and

heat. In summer and winter the tree is clothed in this heavy mantle.

In winter the leaves are a great protection to the tree from cold and assist Nature in her work of beauty. When all other trees are bare, except the Live Oak, whose leaves are dull and brown in

color, the Magnolia trees are richly clothed in their leaves of green.

The winter months are only a preparation for the bursting forth, in May, of the most gorgeous and wonderful flowers. The buds begin to form about the first of April and many are open to greet the May-day festivities.

During May and June the tree presents a wonderful picture of many hundreds of these noble flowers. Each new shoot on every limb bears a flower. Just before the bud matures to a perfect flower its white form is a beautiful oval figure, resembling a half-opened rosebud, and is at this time in its most perfect form. In a few hours eight large petals unfold themselves into a flower so large, so rich in its creamy whiteness, yet so pure and delicate, that one touch of the finger, or the breath from one's body, will taint its loveliness and in a few moments the wound will cause a dark brown spot to appear. No impurities dare come in contact with its soft, delicate texture, though while on the tree in a pure atmosphere and sun it lasts for many days. No bloom of any tree or flower is so large, so fragrant, yet so delicate, pure and beautiful.

In the centre of this flower is a small cone of delicate green shade—a wonderfully made thing of beauty—a model of the finest and most delicate workmanship which



A MAGNIFICENT FLORIDA MAGNOLIA

This majestic magnolia is typical of the species. It is well located and so has developed its wide-spreading branches in almost perfect symmetry. The heavy mantle of leaves—a rich, dark green in color at maturity—protects the magnolia in summer and winter, too, when all the others, except the Live Oak, are bare.

only the hand of Nature can mould. At its base and extending upward about half an inch, the cone is a purple shade, in which are stuck many little creamy narrow stems about an inch long. Just where they are attached to this



A YOUNG MAGNOLIA

This tree has attained to height and stateliness, though it is still quite young. Note particularly the heavy growth of symmetrical limbs, reaching nearly to the ground.

purple cone each stem is also purple. Above these, arranged in regularity all over the remaining part of the cone, are from forty to fifty small, round, curling, transparent stems which are to form pockets for the seeds which are to develop later. The Magnolia bloom measures from ten to twelve inches in diameter.

The many large leaves surrounding the bloom are of a bright, tenderest green color—curved and grouped in Nature's most graceful lines.

By July Fourth the last of these magnificent flowers has gone and the cone begins to develop. Each of these pockets is now closed and contains one or two seeds.

The seeds are of the shape and size of a bean, and when full grown are of a bright red color. By September the cones have matured and they begin to fall to the ground. The pockets burst and the seeds fall out. They may be gathered and sold for sixty cents per pound to a perfume manufacturer. A rare perfume is made from them, which possesses the same sweet, delicate scent as the flower, and a soothing calmness pervades one while inhaling it.

It is an old but unfounded belief that the southern Spanish moss is a parasitic plant—that it feeds upon the magnolia in a most appalling manner, absorbing the juices of the tree, and retarding its growth. It hangs in long, graceful streamers from the limbs—very beautiful to the observer, and not fatal to the tree.

But the glory and magnificence of these wonderful trees



A STately MAGNOLIA BEAUTIFULLY PESTOONED WITH SPANISH MOSS

This splendid tree is fifteen feet in circumference at its base. The Spanish moss with which it is so heavily hung may, as some claim, retard the growth of the limbs and leaves, but it surely adds greatly to the picturesque appearance of the tree.

are more fully brought out on moonlight nights. When the atmosphere is clear and with a full moon in the background look up at their mighty statures! They stand in silence, and the graceful contour of trunk and limbs stands out more boldly. Their very greatness seems a protection to one, their beauty a pleasure to one, and a study of them calls one closer to Nature.

**T**HE Pennsylvania Department of Forestry refuses to be scared by the white pine blister rust. Almost 50 per cent of the 3,750,000 trees planted on the State Forests this spring were white pine.

# THE KNOT OVER WASHINGTON'S TOMB

BY GAYNE T. K. NORTON

"YES sir, dat ole black walnut am two hundred years ole, an I done cry when she die las spring," repeated the aged and wrinkled black man who stands guard over the tomb of George Washington, at Mount Vernon, Virginia. A quarter wormed more of the tree's history from him, but a refusal the day before of \$2,800 for his house could not be driven from his mind and speech, talk of it he would, toying my quarter the while. Still, what I saw, gathered and heard, not of the colored gentleman's realty, but of the black walnut, was most interesting.

Certainly the old veteran was an aristocrat of tree-land, and its "knot" many traveled far to see. As it is a growth of extreme rarity on a famous tree, soon to be no more in its present condition, and as it has never been "written up," a description should prove interesting. By the time these lines travel the long road to print the tree will have been cut, and the knot transported to the National Museum as an exhibit.

The tree was planted by John Augustine Washington, father of George, on the 2,500-acre farm granted him by Lord Culpepper, in 1674. Until the fall of 1915 it grew as only a black walnut can grow, bearing fruit, giving shade, and lending dignity and beauty to the historic and picturesque home on the banks of the Potomac.

As it stood in the fall of 1916 it had a diameter of more than three feet and a height of ninety. Hanging like a huge nut from the under side of a heavy limb, 25 feet from the ground and 12 from the trunk, was the strange growth, an organic disease, tumor, or cancer, that perhaps caused death, and which certainly made the tree famous.

When viewed from a distance the "knot" has somewhat the appearance of a walnut grown to immense proportions; when silhouetted against the sky from below it gives the impression of a jagged relief map of a strange

continent. Accurate measurements are impossible, but it is well over four feet high and more than five feet through; the weight cannot even be guessed, for the condition of the interior is not known. When viewed from directly beneath, the bulk does not hang evenly, rather it

bulges far to one side, as if North America—the "knot"—was suspended from a straight rod—the limb—which touched Newfoundland, and California at Los Angeles.

About two-thirds of the surface is covered with very rough bark. On the portion nearest the ground is a whorl, almost a cork-like. The bark runs around and up and down, is very thick and distinctly that of a black walnut. The portion not covered by bark is deeply lined, weather-beaten, discolored wood, pried with innumerable holes, yet sound. It appeared like a flesh wound healed without attention, a bit of living dead-wood. The lines run up and down, are deep and uneven. Around the edge the bark is smooth, humped and rounded. This portion of the knot faces southeast. On the upper portion is a depression into which many of the lines curve, like a miniature whirlpool.

The "knot" began to grow more than 100 years ago, when the supporting limb was a slender branch, so the colored guard affirmed, though he was hardly there

at the time. But he was there 86 years ago and has watched the steady development.

After watching the barkless portion insect activity was discovered, and the sunlight glistened upon the wings of hundreds of Chinese honey bees. The swarm took possession 25 years ago and is still using the "knot" as a hive. Some lay the death of the tree to the bees, reasoning that so much honey has been stored within that the flow of sap has been prevented. None have been allowed to mar or even examine the tree, which accounts for the lack of



Photograph by G. T. K. Norton

## THE "KNOT" ON THE BLACK WALNUT THAT SHADES GENERAL WASHINGTON'S TOMB

The cancer or tumor, a large and rare growth on a famous tree. Offers of hundreds of dollars are made for the "knot," but it is destined to go to the National Museum as an exhibit. A swarm of honey bees have been the occupants for twenty-five years, and some claim the honey stored by them has caused the death of the tree by stopping the flow of sap.

accurate figures about the "knot." The bees and birds have been the only investigators.

Almost daily offers for the "knot" are made by curio hunters and other nature-loving visitors; one man was even then, at the time of my visit, trying to purchase it for \$500 and this offer was called "mean and low compared to some" by the guide.

On the beautiful Washington estate are many other grand old trees, each with a story. Three neighbors to the black walnut are interesting: they commemorate the first of a chain of events that all but wrecked the Union. General Washington did not believe in slavery and accordingly set his own free. These first free slaves, free in name only, for they could not have been driven from General Washington, planted the trees about the spot he had set apart for his tomb. After 118 years the trees still live. The two red cedars are rotting, hollow and bent, but time has not been so hard on the sycamore.

The first thing one with an eye for the beautiful in nature will notice at Mount Vernon, particularly if he arrives by the boat, is the number and grandeur of the trees; there are dozens of fine veterans of many species, all perfectly cared for and in fine condition. Comparisons with at-home conditions are involuntary; we regret that our streets and yards are not so beautifully ornamented. Only in one other place have we seen such trees—Washington.

Possibly we all know of specimens, or even localities, that compare well, though it is doubtful if any city can as a whole equal Washington in point of trees. It is they that give it more than half its charm; their powerful influence is quickly appreciated. If possible, they are even more beautiful than the trees of Mount Vernon.

Without them the city would be as all others: great stone piles of modern efficiency. The trees can be thanked for the "human-ness" of Washington, and they show in luxuriance the care given them.

## SOME HISTORICALLY INTERESTING TREES

THE following interesting notes, about historic or unusual trees, were sent by Mr. Henry B. Abbott, of Philadelphia, who writes: "I am sending a picture of the Old Oak in the Friends' graveyard at Salem, New Jersey. It is considered the finest specimen of white oak in the State, and its picture has been adopted for use on the New Jersey State forestry crest, or emblem. It is about 85 feet high and symmetrical. Tradition says the British cut out the top during the war of the Revolution. It is supposed to be about 300 years old. Some years ago a currant bush was found growing and thriving in one of the crotches of the old oak, the seed having presumably been carried by a bird, but of course it did not live and has long since disappeared.

"On a trip to Orlando, Florida, some few years ago, I saw an old live oak, to which the Indians came and held their councils. I understand it was the meeting place of the Florida Indians generally, and its situation seems to bear this out. Except for a few

trees in a small segment, there was a large open circle, maybe a hundred feet in radius, without trees. So far as I know, the place or tree has not been photographed. It was only a trunk with a few limbs when I saw it, and I fear it has now disappeared."

Another very interesting tree Mr. Abbott describes as traditionally known to be "the tree where Columbus tied his ships." This is located on the river Osamece at Santo Domingo, and is an old landmark, regarded with veneration and love by the people of the locality.

While we do not vouch for the correctness of its claim to historic value, the appearance of the old monarch inclines us to place some faith in the traditions which surround it. It does not seem impossible of belief that Columbus landed and made fast his ships at this point, when he settled the small colony at Santo Domingo—lovingly named by him "Hispaniola," and where later his remains were temporarily interred. Mr. Abbott continues:

"There are, a mile or two west of Had-



WHERE COLUMBUS TIED HIS SHIPS

A veteran tree at Santo Domingo, marking the spot—so local tradition has it—where his ships were made fast when, on his second voyage of discovery, Columbus founded Hispaniola.

donfield, Camden county, New Jersey, two yew trees, which I think are about 200 years old. Elizabeth Haddon was the settler of Haddonfield. There is an interesting account of her in a book called 'Social Hours with Friends.' After she had been over here two years she went back to England to see her parents, and then returned, bringing these two little trees in two little pots. They are now in rather



THE OLD OAK AT SALEM, NEW JERSEY

This beautiful and symmetrical old tree is located in the Friends' Graveyard, at Salem, New Jersey, and its history dates back to the days of the Revolution. It is about 85 feet in height and, despite its age, is considered to be the finest specimen of white oak in the State.

a dying condition. Like the English yew, they are bush-like, with several trunks. A five-cent trolley fare from Camden takes you past the farm.

"Did I mention the old cypress tree here in Bartram's Garden? John Bartram was the botanist of the country at and before the time of the American Revolutionary war. He received many gifts from across the ocean and this young tree was one of them."

#### RUSSIA'S LUMBER INDUSTRY

**T**HE importance of the lumber industry in Russia is figuring largely in the plans for Russia's export trade after the close of the war. The demand for building materials will be unprecedented and the vast resources of Russia's forest wealth have scarcely been more than touched. Furthermore, hundreds of square miles of forest in the crown lands now confiscated are available for exploitation. With the marvelous increase in the harbor facilities of Archangel and Vladivostock and the extension of railroads in the forested districts, this industry has a big future. In 1913, the last year of normal export, lumber worth 165,000,000 rubles was exported. By the closing of the Baltic ports this export has been reduced to a valuation of 27,200,000 rubles. Vast stores of timber have accumulated, and in Archangel alone 65,000,000 rubles' worth of timber is ready for shipment. In 1916, when an increase in exports is noticed, little big timber was shipped, the exports being mainly pine for matches and spruce for paper pulp. Domestic consumption of timber has been large, a considerable quantity being required for military purposes. The demand for railroad ties has been great and the erection of factories all over the country at a time when unusually heavy demands were made upon railroad facilities has caused many of these factories to burn wood instead of coal. As, however, the Ministry of Agriculture possesses a modern and progressive Forestry Bureau, this use of timber for fuel is being managed in such a way as to increase rather than deplete the great forests of Russia.

#### WISCONSIN'S FOREST PLAYGROUNDS

**T**HE Wisconsin Conservation Commission has completed plans for the utilization of the state forest lands, and has worked out a general plan to make the northern Wisconsin region, the land of lakes, a playground for the entire Middle West, by throwing open state lands for campers and summer visitors. The State plans to carry this work of developing the pleasure resources of the forest to the greatest extent, and has devised a general system by which long-time leases will be given for a few dollars a year to those who wish to build summer cottages. The State also will build some cottages for rent in the state parks and in the forest reserve, and is providing portable cottages for other locations. For those who do not want any of these, the Commission is arranging to lease tent sites. Meanwhile, the Commission is planning a campaign to prevent forest fires with the assistance of the lumber manufacturers who own forest land, on a plan for coöperative work in maintenance of a force of forest rangers and fire wardens. This is already being done in upper Michigan, and Commissioner Frank B. Moody at the last meeting of the Northern Hemlock and Hardwood Manufacturers' Association started a formal movement for such a coöperative campaign. The State is going ahead with its plans to make its forest reserve region, including Vilas county, which alone has 1,200 lakes, as though the war were to end immediately, so that the summer resort life may be carried on despite the war, and is offering special opportunities for the wives and families of those who may be busy on the business of the war.



*Photograph by W. A. Fishbaugh*

**ONE REDWOOD TREE AS A SOURCE OF BUILDING MATERIAL**

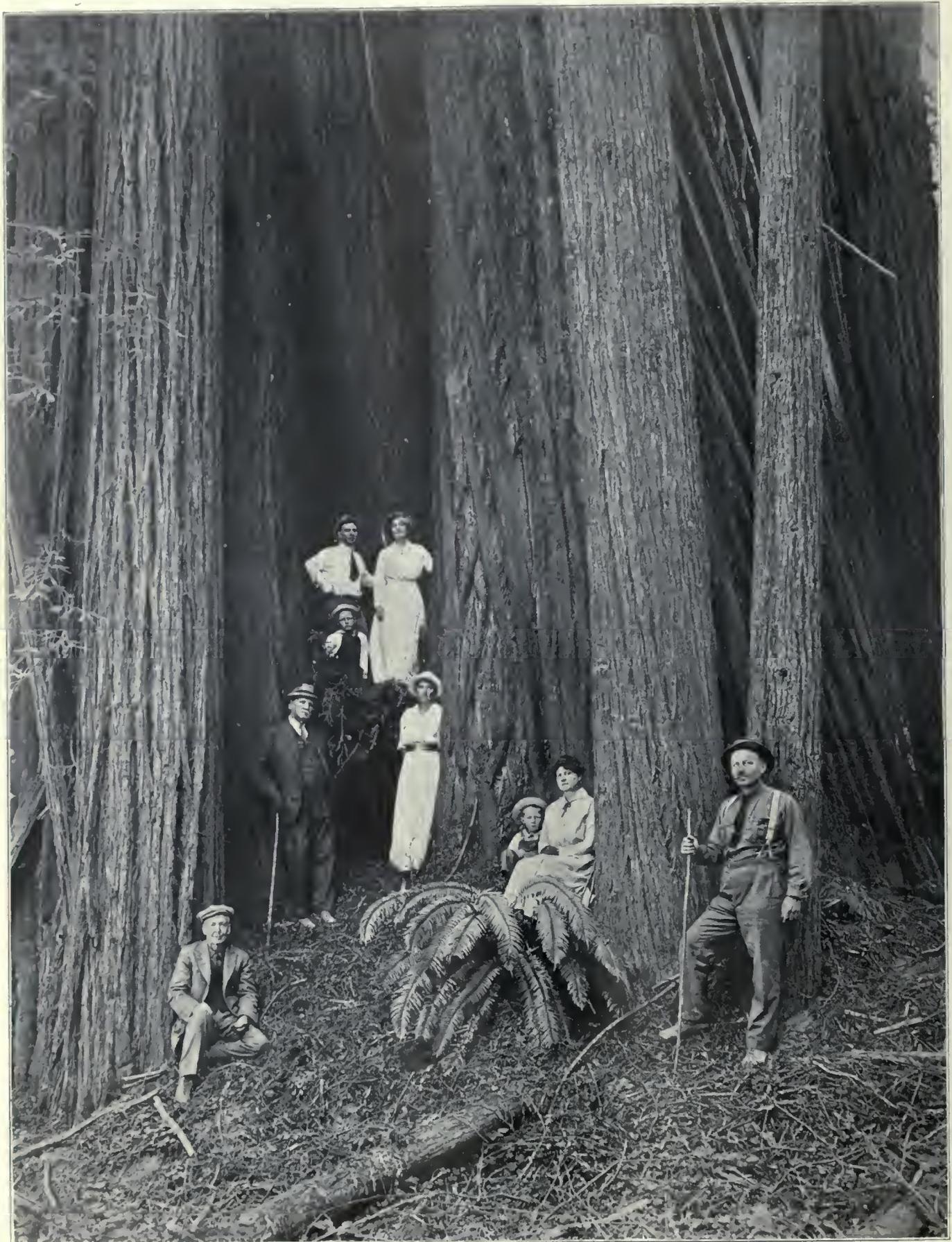
An order for 100,000 feet of lumber is not to be disregarded by the lumber dealer, for 700,000 feet is a good deal of merchandise in his line. To a giant redwood, however, it is nothing at all. In this picture may be seen Luther Burbank leaning against one of the patriarchs of the Ah Pah tract. This particular tree is eighteen feet in diameter and would easily yield 100,000 feet of merchantable lumber. The Ah Pah tract in Northern California, owned by Charles Willis Ward, contains many of these giants, and it is unlikely that heavier stands of timber can be found in the Redwood belt than those in this neighborhood. Among these trees there are veterans which were well grown at the beginning of the Christian Era. Some of them are 3000 years old.



*Photograph by W. A. Fishbaugh*

#### MORNING FOG AMONG THE REDWOODS

Fog and the Redwood seem to go together. Wherever you find the giant trees at their best you can count with confidence on a daily bath of fog. The clouded streaks in this picture are not an indication of defective photography. They are accurate portraiture of the morning sunbeams breaking through the fog as they prepare to drive it away. This occurs between nine and ten o'clock each day during the summer season and those familiar with the California forests agree that it is one of the most interesting manifestations of nature's routine program. The spectacle is an unfailing source of interest to visitors to whom it is new. Some idea of the size of the trees may be had by noting the relative insignificance of mere man as shown in the foreground.



Photograph by W. A. Fishbaugh

#### THE BEAR'S NEST IN THE REDWOODS

This picture shows a camping party at the foot of the group of Redwood trees known as the Bear's Nest. Luther Burbank is to be seen at the left. His expression indicates his admiration for the skill displayed by Nature in the grafting operation which welded these trees together at the top. The Bear's Nest, which is in Northern California, is easily accessible to visitors and camping parties, for Charles Willis Ward, owner of the land on which the trees have stood for centuries, has connected the various remarkable clumps of giant Redwoods by pleasant trails communicating with the central campground of his Ah Pah tract. Last August Mr. Ward and some of his friends spent their annual vacation at Ah Pah Ranch, as he has named his camping grounds. "We never open a tin can at the camp," is the owner's boast, "as our garden provides a hountiful supply of vegetahles and fruits." Is it any wonder that the place is popular with campers?



*Photograph by W. A. Fishbaugh*

**PROPINQUITY MAKES AFFINITIES EVEN OF TREES**

These Redwood trees have grown together at the top, and this photograph, which was taken from the ground with the camera pointed directly skyward, is proof that Nature is a grafter when opportunity offers, as the joining of this group of great trees could not have been more skilfully wrought even by an expert hand. The trees are known as the Bear's Nest, a group of giant Redwoods which grew so closely to each other that their amalgamation was inevitable. They are on the Ah Pah tract, a great timbered park in Northern California, owned by Mr. Charles Willis Ward. Surrounding them are innumerable Redwoods of immense size that would yield nearly half a million feet of lumber to the acre. Another view of the Bear's Nest group, showing how it looks nearer earth, appears on the opposite page.

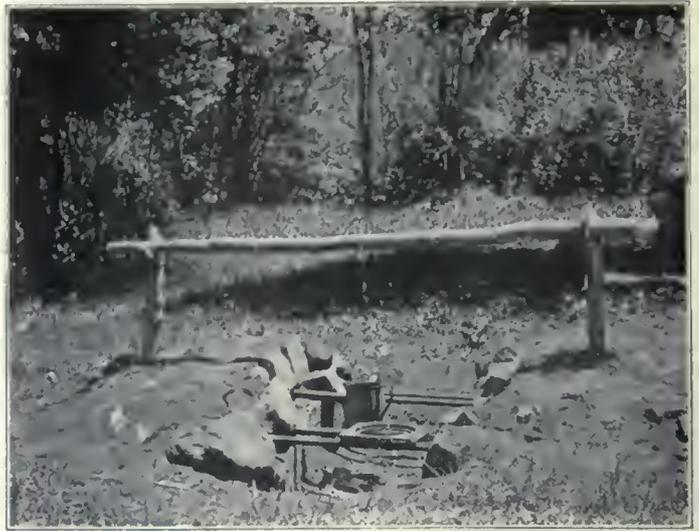
# "PRIVATE PROPERTY - NO CAMPING"

BY SMITH RILEY

DISTRICT FORESTER, DENVER, COLORADO

"WELL, of all the messes I ever saw this is the worst. Why can't travelers show a little more consideration for other people's property and for other travelers who follow them?"

The speaker was an owner of land, along a popular fishing stream, traversed by a state road noted for its scenic features, and his remarks were called forth by the sight of a particularly attractive corner of his property strewn with



WHERE CAMPERS ARE ENCOURAGED

The United States Government is contributing generously to the comfort of campers, rich and poor alike. In National Forests tourists will find camp sites laid out for their use and forage preserved for their benefit. In this picture is shown a typical fire-place built by forest officers in recognition of the needs of campers. Maps are provided and the Forest Service is doing much to stimulate the recreational use of the parks.



FREE CAMP GROUND IN DENVER PARK

Enterprising cities in Colorado have taken steps to meet the public need and demand for places in which camps may be made. Denver has converted a part of one of its largest parks into camp sites which may be occupied free of charge by motorists and others who come with camp equipment, with the assurance that no signs will be found warning against trespass.

papers, lunch boxes, and broken beer bottles. The smooth bark of a nearby aspen tree had been completely disfigured by numberless initials of those who, after enjoying the beauties of the spot, thoughtlessly abused the privilege accorded them of camping there. As the owner saw the matter, nothing remained for him to do but to place a strong wire fence between his land and the road, and on it to display a "No Trespass" sign. Such signs have blossomed along public highways in all thickly settled portions of these United States.

I recall an incident: a family started out one Sunday by automobile for a day in the open. When lunch time came the car was passing through a river bottom bordered with large trees and green banks. Wire fences lined the road closely, so that this party left their machine beside the road, crawled through a somewhat dilapidated wire fence, and proceeded with joy and large appetites to eat

their lunch amid the attractive surroundings. Soon a party of horsemen appeared upon the road. Reaching a meadow on the far side of the river, they entered through a gate, pulled off the saddles and turned their mounts loose to graze, roll, and trample the tall grass. After lunch this second party produced guns and proceeded to disfigure the bole of a large tree by shooting at a mark. The report of the guns disturbed stock in a nearby pasture, and at the same time caused their own horses to trample a great amount of grass. Soon an irate owner came upon the



AN ATLAS OF THE ROADSIDE

As a part of its policy to encourage the recreational use of the National Forests the Forest Service posts map-signs at strategic places along the roadside in the public domain. In the foreground, near the left margin of this picture, is shown a signboard on which is posted a map of the neighboring road system in this forest. On the tree in the center is a sign giving additional information.

**GOING FISHING?**

THE FINEST TROUT STREAMS, THE BEST HUNTING GROUNDS AND THE MOST BEAUTIFUL CAMPING PLACES IN AMERICA ARE TO BE FOUND WITHIN THE NATIONAL FORESTS.

**90,000,000 PEOPLE**

ARE JOINT OWNERS OF THE NATIONAL FORESTS

**YOU**

ARE ONE OF THIS NUMBER

**HELP PREVENT FOREST FIRES**

LIGHTED MATCHES, CIGARS and CIGARETTES are DANGEROUS. PUT OUT YOUR CAMP FIRES BEFORE LEAVING. DON'T BUILD BONFIRES.

**KEEP THE FORESTS GREEN.**

*U. S. Department of Agriculture. Forest Service.*

**INVITING YOURSELF TO FISH**

The National Forest Service goes on the theory that the 90,000,000 people of the United States are the real owners of the National Forests. Evidence of this is afforded by signs like the one pictured above, in which citizens are made to invite themselves to fish, hunt and camp on their own property. Prospective tourists will do well to note the injunction as to preventing forest fires on their own property.

scene to drive off the party of riders. This done, he approached the automobile party and in very abusive language ordered them out. They were responsible for all the trouble, he explained, because the riders would never have entered the meadow had they not observed the automobile party inside the fence across the river. The owner went on to say that he did not object to visitors who did not injure his property, but that in this case real damage had been done, and therefore the party must leave at once. It is due to such incidents as this that the number of "No Trespass" signs steadily increases.



**NOW BEAUTIFUL AND INVITING**

But, disfigure the trees and strew the ground with empty pickle bottles and papers, and then—can we blame the owner for posting "No Trespass" signs?



**HOW OWNERS PROTECT THEMSELVES**

Those who have seen the damage wrought by some campers do not consider it strange that owners of land should steadily increase the number of "No Trespass" signs. If all campers would show the proper attitude toward the rights of property owners these signs would be unnecessary. Because of the custom of strewing papers, lunch-boxes and empty bottles over temporary resting places, and the actual damage sometimes caused, the owners display the signs in self-defense.

A long step in this direction, and almost the first of its kind, has been taken in the case of the National Forests. No finer recreation grounds exist anywhere, and each year a greater number of people come to the Forests for the pleasures of outdoor life. The Forests belong to the public, and are being developed for its benefit. Here is an example: the east entrance to the Yellowstone Park is through the Shoshone National Forest. Thousands of wagons and pack and saddle horse parties pass over this road in a season. Imagine the inconvenienc to the traveler if this road were lined with fences and "No Trespass" signs. But it isn't. On the contrary, the Forest Service has set aside a strip of country upon each side of the road where visitors to the Park may graze their horses. Certain places have also been reserved as camp locations, and signs are posted along the way for the visitor's guidance. In short, upon this much-used thoroughfare the visitor's needs are considered first; nothing is permitted to interfere with his enjoyment.

It is the same in other places in the National

Forests visited by pleasure seekers. Camp sites are laid out and forage reserved for the traveler's benefit. Signs posted in conspicuous places ask him to use care with fire and to leave his camp site in a sanitary condition. Garbage pits are provided in which he may burn litter and waste-paper. In this way it is hoped to educate the visitor in ways different from those which arouse the ire of private land-owners. The signs tell the camper, for one thing, that he is part owner of the National Forests, and that injury to them means injury to his own property. Other than the rules regarding fire and proper camp sanitation, there are no restrictions upon those who come to the National Forests for recreation. Maps of the Forests, showing the location of attractive camp sites, fishing streams, postoffices, telephones and ranger stations, are distributed by the various supervisors. The recreational resources are being developed in the same way as the other resources, like timber, water, and forage. They are open to everybody on equal terms, and are meant for the enjoyment of the man with the slim pocketbook as much as for the man with the fat one.

In marked contrast with conditions in the National Forests are those on most privately owned tracts. Here, for example, is a lake famous for its fishing, used by many people as a recreation ground. The lake is situated so as to make it possible to impound a supply of water for electrical power. A power company obtains a deed to the land surrounding the lake and builds a dam. This enlarges the lake, making it of even greater value for recreational purposes, but as soon as the power company gains control of the land it sticks up signs warning the public to keep off—the land is private property.

Recreational use of the borders of the lake would not in any way interfere with the impounding of the water. Had the title to the lake shores, which were once the property of the Federal Government, been retained under public control and an easement given the power company to impound water, the company would have had all that was needed for the development of power, while the public would have had the opportunity to enjoy the lake. As it is, the opportunities for recreation which the lake affords are wholly wasted.

I know of a National Park that is approached along the valley of a river where there is much patented land not cultivated or cropped. In days gone by the owners of

these lands did not protest against the public using them, for in those days few people came to the region. Nowadays, however, travel over this road has increased two or three hundred per cent, and "No Camping" signs have blossomed forth everywhere, while long stretches of the road have been fenced. One owner of a considerable amount of land in the vicinity has announced his intention of developing water upon his property and allowing visitors to camp there. It should be explained, however, that for the use of this camp location a charge is to be made of \$1 per day per person.

Several cities in Colorado have already taken steps to meet the need for public camping grounds. Denver has set aside in its largest park an area which may be occupied free of charge by those who motor with camp equipment. Colorado City and Colorado Springs also have free camping areas where motor visitors are welcome.

To come back to the National Forests, I should like to quote from an article published in a Denver newspaper:

"The Government, by its well-worded, cordial invitations and the magnificent roads it creates and maintains, will eventually draw the public to sections where liberty instead of restraint is in the air. Perhaps the most striking illustration just now is the boulevard from Steamboat Springs to the top of the Rabbit Ear Range. Here are twenty-five miles of perfect road, thoroughly signed and posted, through a fern and flower country of such magnificence that a visit only can tell its glories. The movement is young, but one who runs can read that the day of barbed wire and selfish restraints on the tourist is doomed."

The road referred to was built by the Forest Service, in cooperation with the counties concerned, through the Routt National Forest. It is one of a great system of good roads which the Forest Service is building in the National Forests as a means of opening them up to the public. The sum of \$10,000,000, to be spent a million dollars a year for ten years, was appropriated by Congress in 1916 for National Forest roads. A sum equivalent to 10 per cent of the gross receipts of the Forests is also available annually for road building purposes. In time the full recreational possibilities of the National Forests will be made available for the enjoyment of the American people. In the promotion of public health and public happiness the Forests promise to be a tremendously valuable national asset.

**F**OREST fires in the United States have caused an average annual loss of seventy human lives and twenty-five to fifty million dollars' worth of timber. The indirect losses run close to half a billion a year.

**T**HE California State Forestry Department has thrown open to the entire state, and those from other states, the state forests as a national pleasure ground, in the theory that by thus treating the national forests the future of the forests is best assured.

**S**AVE coal by burning wood which can't be used for anything else. The fuel value of two pounds of wood is roughly equivalent to that of one pound of coal.

**W**HEN cutting firewood, remove the poorer species first from your woods. Defective chestnut might as well be cut, for the blight will surely get it. Soft maple, gum, sassafras, catalpa, aspen, and hackberry are not often valuable for other uses.

**O**VER 40,000 forest fires burned 5,900,000 acres of forest in the United States in 1915. About 1,100 of them burned 380,000 acres in Pennsylvania.

**N**O wonder newsprint is scarce. There are 2,580 daily newspapers in the United States. Over 800 have gone out of business since the rise in paper prices began.

## CACTUS LAKES

BY FRANK COYNE

**C**ACTUS growing in standing water! Cactus, the one plant above all others associated by the layman with the desert. Yet here are vast expanses of forests of cactus growing in standing water, with here and there little islands appearing but slightly above the general level. Certainly, a remarkable phenomenon to one familiar with the cactus in its normal habitat. Through our great dry West great areas of desert land, whether in the Mojave desert in the California-Arizona section, or in the Great-Basin and Western Colorado Plateau country of Nevada and Utah, one will find cactus growing in its typical zero-phytic habitat, on the driest of soils, together with its frequent associate greasewood and sagebrush.

Down in the Dutch West Indies on the island of Curaçao, just off the Venezuelan coast, is the site of these pictures. To the blacks living here in their little thatched huts and content to earn a living on a few acres of maize, cactus is perhaps the most common plant, and quite a factor in their lives. It furnishes practically all the material for their fences or hedges; the housewife in the morning throws the washing at the windward side of the cactus fence to dry (and more than one indignant traveler and tourist has pondered over the sight of holes in his palm-beach suit or shirt); and perhaps at "medio-dia" she cuts a few of the tender tips from her fence and washline for soup! I've actually seen goats grazing on the species shown in the pictures, whose spines are anywhere from one to five inches long. And let it be remembered that the species eaten by the goats is not the "spineless Burbank cactus."

Five species of cactus are found here on the island, and to botanists the names of *Cereus*, *Opuntia*, and *Melocactus* will be familiar. *Cereus*, the species seen in the picture, and called by the natives "Dattoe," in their "Papia-

mento" language (which is a patois of French, English, Spanish, Dutch and Portuguese), is the most common and is to the thatched-hut dwellers here, in its diversity of uses, what blubber is to the Esquimau in his igloo.

In Curaçao this species grows on all soil formations and at all elevations, from the beach lapped by the Caribbean to the top of the highest peak, St. Christoffelberg. On the



THE FOREST OF CACTI

General appearance of cactus forest on the Hato Plains after heavy tropical shower; Curaçao, Dutch West Indies.

hill-tops one finds it associated with Brazil-wood and *Lignum Vitæ*, where lazy iguanas lie in the branches of the trees and where tiny chameleons run along the branches and trunk of the *Wajaaka*.

But what a strange anomaly! In Utah the *Sego lily*, a desert flower, and the cactus grow side by side, while here in Curaçao on some of the driest sites are found orchids growing in profusion on cactus, and in other localities cactus, in standing water, where one might naturally expect waving cocoanut palms in the place of the defiant spiny cactus, which in many places attains the height of twenty feet and extends in unbroken stretches along the north coast for many miles.



A CACTUS LAKE

This unique photograph shows part of the forest of cactus growing in standing water in the Dutch West Indies—a most remarkable thing to see when one has been accustomed to associating this plant with driest of desert surroundings, but we must admit that it is only a temporary condition.



THE CACTUS SWAMP

Swampy expanse of cactus, Curaçao, Dutch West Indies. The region is naturally one of extreme aridity and this apparent phenomenon is explained by the fact that the photograph was taken after a heavy and rare tropical shower.

The explanation, however, for this in this locality is simple, though I venture to say that the same phenomenon in other desert countries is extremely unlikely. Curaçao, an island in the tropics, is one of drought and scanty rainfall. These dry conditions account for the presence of the cactus, but what about the lakes? The pictures were taken during the wet season. Recently, while walking along the north coast of the island from Jofje Aban to Santa Maria, I was caught in a heavy tropical shower. The soil there was very thin and barely covered the coral-limestone rock. The thin covering of soil is just sufficient

for the growth of the cactus, and the coral-limestone rock being practically impervious to water held the precipitation for quite a while, forming in many places small streams and in others large temporary lakes. For three hours after the rain had ceased I had the unique experience of walking through a forest of this giant tree-cactus which underfoot had the appearance of a swamp. The next day all signs of the lakes had disappeared and the desert was as before, with nothing but the braying of an occasional burro or the hawking and screaming of a few parrots to disturb its silence.

#### PINE BLISTER IN MICHIGAN

**C**LOSE on the heels of the Department of Agriculture's quarantine against the shipment of white pine seedlings from areas, where the white pine blister disease is doing its destructive work, to other sections of the country, comes the discovery of the disease in a nursery near Detroit, Michigan. Prior to this time the disease had been widespread throughout the New England states, but has rarely been found much further west.

Federal agents employed by the Bureau of Plant Industry of the Department of Agriculture made the discovery, learning at the same time that the nurseryman had known of its presence for the past six years in a certain lot of imported pine and that a dozen or more diseased specimens had been destroyed during that period. Shipments have been made regularly from this stock, but fortunately the business is largely local, so that the disease has probably not spread greatly through this channel. A complete survey is being made in Michigan to discover and stamp out the disease.

#### SCHOOL FORESTS ESTABLISHED

**A**RBOR DAY has been widely celebrated throughout New York State this year by the establishment of school forests. Among the villages which have taken up reforestation work on reservoir sites, undeveloped park lands and worn-out pastures are Fort Edward, where 15,000 red pines were planted on April 12th and 26th; Port Jervis, where the forest started last year in the Elks' Park was extended by the planting of 1,000 Norway spruces on April 19th; Ballston Spa, where the school children put out 1,000 red pines; Randolph, where 2,000 evergreens of various kinds were planted by the pupils of the high school on park land; Newburgh, where, through the cooperation of the public schools and the Chamber of Commerce, 2,000 Norway spruces were added to the forests started last spring on the reservoir lands of the city; Wellsville, where the new waterworks was dedicated on May 11th by the planting of 1,000 forest trees on the reservoir slope, and Ellenville, where 1,000 trees have been planted on land owned by the village.



THE FORESTRY BUILDING AT SYRACUSE

New home of The New York State College of Forestry at Syracuse University, built by the people of the State of New York at a cost of \$250,000, and occupied early last spring.

## NEW YORK STATE COLLEGE OF FORESTRY BUILDING

**N**EW YORK State has taken her place among the foremost states in forestry education by the erection of a beautiful building on the campus of Syracuse University to house the New York State College of Forestry. Under Dean Hugh P. Baker, the college has made rapid growth since its organization in 1911 and has been in urgent need of this new building. Built at a cost of \$250,000, with \$35,000 additional for furnishings, it is said to be the largest and best-equipped structure in the country used exclusively for forestry educational purposes.

It was announced in November, 1914, that the Eastern Forest Products Laboratory would be located in the new building. As soon as the \$20,000 worth of machinery and apparatus can be installed, the college will be in a position to carry on investigative as well as educational work. Wood working, wood distillation, timber testing, timber preservation, and pulp and paper making laboratories will be fitted up and practical courses in these several lines established to train young men as experts.

In point of beauty this building is worthy of some note. Situated on an elevation overlooking the city of Syracuse and occupying an isolated section of the campus of the University, it makes an imposing sight. It is constructed in the Renaissance style of architecture and has three stories and basement. Indiana limestone and tapestry brick are used with very pleasing contrast. A retaining wall of limestone rises fifteen feet above the concrete base and the brick construction is used for the upper portions. The dimensions are 280 feet by 66 feet.

The main entrance is exceptionally spacious and the broad, ornamental granite approach is flanked on either side by huge blocks of dressed limestone, each weighing

nearly two tons. Four Corinthian pillars, of limestone also, are built into the front of the building and support a broad band of the same material in which is carved, "The New York State College of Forestry." Centered above this inscription is a large seal of the State of New York carved in limestone. The window ledges and cornices are also of limestone, carrying out the effect of the contrast between the gray of the limestone and the warm red of the tapestry brick to the fullest extent.

The interior is arranged to secure the greatest convenience possible. A rotunda occupies the center of the building and the corridors run from it lengthwise. The offices of the dean and the business offices radiate from the rotunda, while the departmental heads have offices on the corridors. The lecture rooms and laboratories of each department are grouped nearby. A unique feature of the building is the decorative scheme used in the rotunda. It is finished in marble with massive pillars and into the walls are set specimens of 118 different species of woods, each highly polished to show the grain, and labelled. Stairways have thin marble steps with balustrades of ornamental iron and oak. Floors in all the rooms are of maple.

Everything conceivable in the way of equipment is incorporated in the structure. A big mailing room to handle press bulletins and other publications issued by the college occupies a section of the basement, and lavatories, locker rooms, and shower baths are also located there. A large library with a well-lighted reading room and ample stack space makes study pleasant and convenient. The Forestry Club of the college will also have rooms in the building. An assembly hall with a seating capacity of 300 serves for lectures and for various gatherings.

# Forestry for Boys and Girls

by Bristow Adams

## THE TREES AND WAR



WITH all the talk of war, and all the need of doing our best to win that war, we can not help thinking of the place that the trees have

held, and will hold, in man's strife with other men. It seems too bad that the great, patient trees should have a part in anything so bad as war is. If they have souls, they must be as surely against the crime of warfare as all right-thinking men are against it. I speak of war in this case as I would speak of slavery or of any other crime against humanity that ought to be done away with.

As for the present war, we are in it now, and the only way out is forward. We have got to see it through, and I find, each day, that I feel more strongly than the day before that I should like to be at the front, in the thick of it, that I might help in that way or in any way to make war less likely in the future. Our Congress has stated that we are to take our part for the good of the people of the world, and our President has approved of that course. All of us support our Government in this idea. Our duty is to make it more easy for the everyday folks to say how they shall run their affairs, instead of having these affairs run selfishly by kings, and dukes, and uniforms, and gold-braid, and pride-of-birth, and lust-of-power.

Peace is no less blessed than it ever was, and war is no less cruel. But the first thing right now is to help bring about, even through war itself, a world-wide belief in the rights of the many to make their own rules for the greatest good of the greatest number, as against the wicked selfishness of the few. If all the great nations—and the German people

form a great nation—will come to a belief in what Abraham Lincoln called "a government of the people, by the people, and for the people," then we can be pretty sure that war will cease. And we are fighting now to safeguard that form of government,—Democracy,—in Europe as well as in America.

MY two boys are too little to realize what war means. They would be much pleased to see their father in a uniform, and to have him carry a flag, or shoot a gun, and march away to fight the enemy. The older one is very proud of the soldier grandfather who fought against slavery, and they would be just as proud to have their own father fight against the equally wrong use of power in the present day.

With the girls it is different. They are older, and they know what it might mean if the other fellow shot first and shot straighter, or if a ship were blown up and all those on board were drowned. I overheard one of them a few nights ago, and got about what the eavesdropper is said always to get.

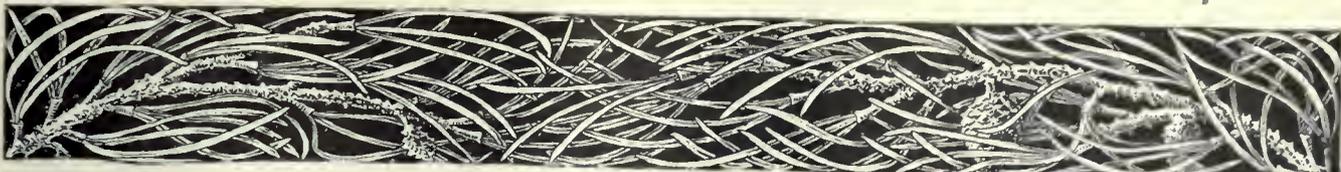
She was saying her prayers, and, as I remember, a part of the prayer was about like this:

"Dear Lord, even if father is right mean to us sometimes when we don't really intend to be bad, please don't let him go away to the war and get killed."

I tiptoed away with some very mixed thoughts.

WE are all trying to do our bit, as they say in England. Early in the morning, and after the day's work is over, so long as there is light, we are gardening to help raise the food that we will need this summer. Even the little boys have staked out tiny plots, and have bordered them with the rough stones that they spaded up. One of the girls was inclined





to find fault with her brother because he was planting flowers, but he said that the flowers were just as nice now as they were before the war began, and I think he is right. I am planting trees and shrubs as well as vegetables. The hedge-row flowers of England bloom untrampled today because some little girls' fathers and brothers are in the blood and mire at the front.

**I**NDEED, it seems to me that the war should not make those at home do any less the things that they always should do; and I am almost sorry that it took a war to make us see that every one should do his part to help serve the world with food and clothing, and other products of the soil. There is nothing that we are doing now in the great gardening campaign that we ought not to have been doing for the past ten years, and that we ought not to keep on doing, with improvements, for the next ten years and more to come.

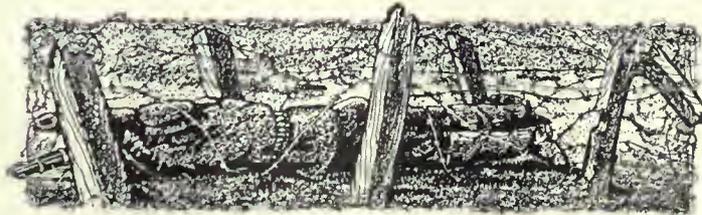
For example, there is more reason why we should plant and care for trees, and protect them from all sorts of harm, than there ever was. We have seen the pictures of the forests of Europe burned and shattered by shell-fire, cut away to make room for cannon, destroyed to go into trenches and stockades, and roadways and bridges, built into barbed-wire entanglements, even supporting that real ring of steel, the barbed fence charged with a death-dealing electric current, that surrounds poor Belgium. If there were truly "tongues in trees," as Shakespeare says, they would be crying out in horror at being put to such inhuman uses.

**O**UR own trees will have to help make up for those which have been so badly used. Maybe some of ours will be put to the same kinds of purposes. Trees are more important in war than they ever

have been before, even counting the time when the spongy palmetto logs of Fort Moultrie formed such a sure defense against the cannon of the British vessels.

In former times, when the eyes of an army were formed by cavalry, which scouted ahead and brought back word as to where the enemy might be, it was possible to hide whole regiments in deep valleys or ravines, or behind hills and thick woods. Nowadays, with airplanes taking the place of cavalry, all these hiding places can be easily seen from above, except those which have a screen of trees over them. On the battlefields of France today the great batteries are hidden from the scouts of the air by being placed in groves or forests, and where no trees are growing great branches are set up to cloak the batteries.

This is a serious time. It is no time for being nervous and panic-stricken; it is no time for ill-considered action, or for starting new and untried activities or new ways to do things. The great conservation movement, which started with forestry, was never so important as it is now; and if we had seriously heeded its call eight years ago we would now be about eight times as well off as we are today. Its program is as good now as it was then, and its program ever looks to the future, as we must all look to the future. The home gardening of today should not be for this year, but for all years to come, and little that we can do will bring quick results now. Next year there will be even more need for thrift, more need for planting and planning. Let us each do our part as we see it to do, with all our hearts and with all our strength. We must win the fight. Then our forests will be put to good and peaceful uses, and then no little girls should ever have to pray that even a cross father might not have to go away to be killed.





PRACTICAL ENTHUSIASTS WHO DID THE PLANTING NEAR ALTOONA, PENNSYLVANIA

A group of the planters—mostly Boy Scouts—who made such a good record in putting out the little trees on Kittanning Point, part of Altoona's watershed, under the personal supervision of District Forester Ludwig, of the Pennsylvania Forest Service.

## ALTOONA'S WATERSHED FORESTED

**T**ROOPS are guarding the water supply reservoirs of most of our cities to prevent poisoning of the water by alien enemies. Fortunate is the city that has taken the necessary measures to insure a pure, even flow of water to the homes in its environs the year around, in times of peace as well as war. The protection from denudation of those lands adjacent to reservoirs or other sources of supply is the essential thing. The ground cover must be retained for its cleansing ability in removing impurities from the water and for its absorptive powers, which equalize the flow. Planting of trees on such lands is the only satisfactory and permanent method of accomplishing the desired end.

Altoona, Pennsylvania, has adopted a broad policy in this connection. In April and May of last year, 30,000 one- and two-year-old seedlings were planted on Kittanning Point, part of the watershed of the city's reservoirs, and

an appropriation has been made to carry on the work from year to year. Twenty thousand seedlings started in plantation last year will be set out this spring. White Pine, European Larch, Scotch Pine, White Ash, and Pitch Pine are being used and the first year's planting shows that ninety to ninety-five per cent are thriving.

The Blair County Game, Fish, and Forestry Association was the first to realize the need of this work and to call it to the attention of the city officials. The Commissioner of Parks and Watersheds immediately cooperated with the organization and the aid of the Boy Scouts in the section was secured. Most of the actual work of planting was done by the boys and they made a good record for themselves by setting out 18,000 trees in one seven-hour day. The trees were furnished by the State of Pennsylvania and the work was superintended by District Forester Ludwig of the Pennsylvania Forest Service.

## HAWAII'S EFFECTIVE LAWS

**H**AWAII has now had her 798,344 acres of forest preserves under the control of a Division of Forestry for a year and the rules in force have worked out very well. The law, passed in April, 1916, provides penalties not to exceed five hundred dollars in amount for violations of its provisions, which are based largely on the regulations in force in the National Forests administered by the United States Forest Service.

The cutting, killing, removal, or injuring in any way any tree, the grazing of any animals or the hunting of any wild animals on forest land under the control of the Division of Forestry, is prohibited except as authorized by permit from the Superintendent of Forests. The wilful dis-

turbance or defacement of signs, survey monuments, or marks of any kind, the destruction of property of any kind, the leaving of refuse which will render the forest unsightly or pollute the waters of the forest, and "squatting" on government land or erecting any sort of construction except as otherwise allowed by law are all punishable by fine.

More than 250,000 acres of the 798,344 under the control of the Forestry Division are privately owned. C. S. Judd, Superintendent of Forestry for the Territory of Hawaii, and five Forest Rangers appointed by him, make up the organization which is effectually caring for the Hawaiian forests.

# EDITORIAL

## THE FOOD GARDEN AS A CHARACTER BUILDER

**T**HE main business of life is to learn how to live. How few of us choose wisely in what we strive for! Experience and results are the only sure tests of value. Yet our standards must be fixed, and our ideals formed largely before we are fifteen, when the wisdom of our elders too often seems dry as dust and overcharged with caution. To the typical young American pleasure and amusement appear not as relaxation from duty, but too often as the chief aim in life. And too often, also, overindulgent parents seek only their children's happiness, and themselves forget that contentment can come only from a normal balance between work and play.

The American boy, especially the boy who lives in the city or small town, either has far more time for play than is good for him, or else he is employed at routine labor in which he has no interest, and which robs him of his youth and initiative. Every child should be encouraged to undertake some constructive task in which he can reap the fruit of his own exertions.

A vegetable garden is a golden opportunity for the development of character. The youth should be given his own plot of ground, and, if possible, he should buy his own seed, make his own choice of crops, guided by a word or two of advice—and, above all, he should receive market prices for the products which he raises, paid in cash by his parents or neighbors, on delivery. Many farmers' sons forsake the home place for poorly paid positions in the city, not because of the drudgery of the farm, but for the sole reason that they are given no tangible return or personal interest in the product of their labor. Most city boys grow up in the densest ignorance of that partnership between man and nature, the cultivation of the soil, upon which rests the prosperity of any nation. The planting, tending and harvesting of a crop of vegetables, and the final real-

ization of a money income from its sale, teach the young proprietor perseverance, responsibility, and initiative and the greatest lesson of all—the fact that success in actual business undertakings is attained only by continuous attention and industry. Such an undertaking will help to overcome the desire to make money by trickery and without exertion—an idea so often absorbed by young people to their ultimate undoing. The boy who will forego his pleasures when the garden needs weeding and who will carry through his enterprise can be trusted to make good in other fields of endeavor which have nothing to do with agriculture. His outlook, too, is permanently broadened and his interest in life increased. But a child must have incentive for what he does. Patriotism has a strong appeal to the young and the thought that in this way he is actually helping our nation to win the war for human liberty will be a powerful motive for the undertaking. But boys from eight to twelve years old cannot be expected to grasp the abstract idea of service for the sake of principle, when the effort is shorn of all tangible rewards and mother simply appropriates the results for the family dinner table. Parents will do well to remember that the few dollars which they may be called upon to pay to the boy, when he proudly offers them the products of his own garden, are worth many times their value in character building.

The greatest good is accomplished with youths under twelve to fourteen. These little fellows cannot very well prepare the soil as thoroughly as it should be done; the initial spading should be done for them by some older person. A plot of ground as small as 10 by 50 feet will yield produce worth as much as \$20.00, and a boy can easily care for this much ground. Has this aspect of the food garden ever received from American parents the attention it deserves?

---

## PROCRASTINATION IN INDIANA

**D**URING the fall of 1916 the American Forestry Association endeavored to point out to the people of Indiana the reason for the almost complete failure of the state forestry law to secure efficient results. This law has been in operation for twelve years. In its general plan of organization it followed the pattern of those states which have been successful in forestry—in that a State Forestry Board was created, composed of five men chosen for professional or personal interest in the subject.

But there was one fatal defect—this board was not given control over its own agent. The secretary, who was intended as the executive and forester, and who should have been appointed by the board and been under its direct oversight, was instead made a member, of equal authority with the others, and was appointed by the Governor.

It would have been possible for the Governors of the state to have appointed to this position men of the proper professional training in forestry, without which progress and initiative are practically impossible. The law even required that the secretary should have forestry training. But out of three appointees, each holding for four years, only one had even a rudimentary knowledge of trees from a botanical standpoint, and the last appointee, whose term expires July 1st, was frankly ignorant of the entire subject.

A vigorous effort was made in the legislature this last winter to remedy this defect by giving the board the control of its own affairs, but the bill failed of passage, thus permitting the old and discredited plan to remain in force for another term. The Governor has appointed as secretary a public-spirited citizen, who has no professional knowledge

of forestry, and who has recognized the fact by appointing as his deputy a former secretary, the only one whose work was worthy of commendation. It is probable that under this management the Forestry Department in Indiana will make a reasonably good showing in the next four years.

But the real question is not settled. The state is no further ahead than it was in 1908 when this same acting secretary was appointed—only to be replaced in 1912 for purely political reasons.

Only one plan has ever stood the test of time and ex-

perience, in state forest organization, during the 20 years or more since the movement started—and that is the creation of an independent forestry board entrusted with the direction of state forestry affairs, *empowered to appoint the state forester*, and required by law to secure a trained man. Until Indiana comes to recognize this principle the state may look forward to future setbacks and upheavals and to an indefinite postponement of the solution of several great economic questions in forestry whose urgency will become more evident with every year.

## THE NEED OF SMITH-LEVER EXTENSION WORK IN FORESTRY

THE American Forestry Association has already called attention to the opportunity given to the various states, under the terms of the Smith-Lever law, to provide extension work in forestry among the owners of farm woodlots. So far this field has been almost entirely neglected. The states are rapidly building up their agricultural field forces, consisting of county agents, and are expending sums ranging around \$50,000, which are duplicated by the Smith-Lever law from the national treasury—yet, with one or two exceptions, not one cent of this fund is being used to instruct the farmers in the proper care and development of the woodlot. This cannot be due to the lack of recognition of the value of the woodlot, windbreak and shelter belt on the farm—for as far back as 1876 Minnesota founded a state forestry association to encourage the planting of trees on prairie farms. Its only adequate explanation is the lack of proper organization or aggressiveness on the part of the state educational forces which are responsible for the spread of forestry information. Where no forest

school exists, the agricultural leaders, following the lines of greatest interest or least resistance, simply develop their own work and forestry goes by the board. Where forestry is taught, especially at the state agricultural colleges, it should be possible to arouse the interest of those who must pass upon the expediency of providing extension work in this line. Yet in many instances this has not been done.

There is only one method which promises any degree of success, and that is the employment of a specialist, a forester, to devote his time to the state woodlot problem. County agricultural agents may be relied on to speak a good word for forestry as occasion permits—but never to give it the attention and skilled guidance which it demands.

Every state should without further delay make suitable provision for the employment under the Smith-Lever law of a specialist on woodlots. Considering the urgency of the need for this work, and the wonderful opportunity presented by this law, it is simply astonishing that this has not already been done.

## A GREAT FORWARD STEP BY MINNESOTA

THE state of Minnesota has set aside for state forests an area of over 300,000 acres of state lands. This tract is composed of scattered sections and "forties" of land, a part of a much greater area of similar character lying in northeastern Minnesota. The National Government had previously set aside over a million acres in this region as a National Forest.

Northeastern Minnesota, in the northern half of Lake and Cook Counties, is a granitic area of outcropping rock ledges, shallow soils and innumerable lakes and water courses. It is the southern extension of a similar great area in Canada. This region is filled with moose and deer, which thrive under the dual protection afforded by the lack of wagon roads or railroads in the hunting season and the establishment of a game preserve or refuge by the state. Fire has caused great havoc, but there still remains much beautiful pine, spruce and cedar along the lake shores. If the region can be protected from fires and the lake shores preserved in their natural state, this portion of northern Minnesota is destined, within a few years, to become the greatest public playground in the middle West, rivalling Maine in attractiveness, climate, and accessibility.

In setting aside these state lands to be administered as state forests, Minnesota has insured the fullest protection and development of the recreational features of the region, and has rendered an inestimable public service to the entire country, but especially to the Mississippi Valley. This legislation is the first result of the constitutional amendment passed in 1914, by popular vote, which gave the state legislature the power to classify state-owned lands as agricultural or forest land. This victory for sound economics, a wonderful demonstration of the progress of popular education in forestry, was deeply resented by the speculators in cheap lands, to whom all lands have a possible sale value, whether they are in reality agricultural or not. Opposition arose in the legislature, the first fruits of which were the crippling of the State Forest Service by reducing its appropriation. Then followed the attempt in the legislature of 1916-'17 to destroy the independence and integrity of the State Forest Service altogether, under color of fusing it with lands and immigration in the proposed Public Domain bill.

Not only was this entire bill defeated, largely as a result of this attack upon a department which was unselfishly working for the preservation of Minnesota's great

timber resources—but the people's confidence in this department was further manifested by entrusting it for the first time with an adequate area of state forest land.

The time is rapidly passing in our various states when state property in land, timber and other natural resources can be neglected or mismanaged with impunity by officials imbued with the ideas of partisan politics—and the era when such property can be stolen outright belongs to the recent past. But the public has yet to learn that the management of such property is a business which requires stability of policy, the retention of expert managers, and the elimination of the "spoils system," even though the latter

be euphemistically termed "responsibility to the people." State forest property must be kept in the hands of trained state foresters and managed on the merit system. Minnesota has had this system since 1911, and when the people of Minnesota realize that the proper development and protection of their 300,000-acre playground depends upon continuing the efficient and non-political organization of the State Forest Service, under the State Board of Forestry, there will be less chance in the future than there was this year that they will permit legislation jeopardizing their heritage of forest and lake front, that is destined to become the most prized possession of generations yet to come.

### A BACKWARD STEP IN VERMONT

VERMONT has abolished her State Forestry Board and subordinated her State Forestry Department to the Commissioner of Agriculture. Incidental to this change, both the state forester and the assistant state forester, comprising the technical force of this department, have resigned.

This upheaval in Vermont presents vividly the struggle between the old and the new ideals in state government in this country. We have stated repeatedly in these pages that state forestry cannot be efficient as a part of the partisan political game as it is usually played. An attempt to do any effective work in fire protection, the rational management of forest lands, especially if state owned, and public education in forestry if entrusted to politicians without professional training is worse than a waste of time, for it will bring forestry into disrepute among the unthinking public.

Vermont made a good beginning in state policy ten years ago, when the State Board of Forestry was established and empowered to appoint a trained forester. They secured and retained until the present year one of the most capable and experienced foresters in the country—a man whose reputation amongst the profession is above reproach. Under this forester the work in Vermont forged rapidly ahead. A state-wide system of fire protection was organized, planting increased rapidly and a policy of purchasing state forests was begun, which promised in time to yield great results as demonstrations of forestry practice.

But close students of state organization have realized that forestry in Vermont was all this time resting upon an unstable foundation, and was after all at the mercy of the strong political machine which for generations has controlled the destinies of this rock-ribbed New England community. The board which had the appointive power was composed of four men, only one of whom was a scientist. Of the other three, the Governor was one, and the Governor appointed the remaining two.

Forestry was originally taken up by a number of men prominent in political life in Vermont, with the sincere purpose of benefiting the state. Under their encouragement the department was launched and was given the needed support. But this was autocracy. Sooner or later the will of these rulers was bound to clash with the interests of the

public—and that is just what happened. A prominent citizen bestowed a tract of land upon the state to be managed as a state forest. Another prominent citizen suggested the name of a retainer for custodian. The retainer was appointed. It shortly developed that the state forest was being run, not according to the ideals of practical and economic forest management, but for the dual purpose of carrying out the personal ideas of the donor and of providing a permanent job for the henchman. To the student of the spoils system in American politics it will not appear surprising that these overlords of an American commonwealth decided that a technical expert who refused to consent to the retention of an incompetent assistant should therefore be gotten rid of, even if in the process it were necessary to tear down the entire department.

Efficiency and party politics are absolutely incompatible. The two cardinal principles of efficient organization are, first, that the man directly responsible for the job shall be qualified to perform the duties required of him, and, second, that he be given the power to select and remove and to oversee and control the subordinates required in carrying out this work. The latter principle was grossly violated, and as a result the state forester resigned and the department itself was reorganized out of existence as a penalty for this insubordination.

The new law provides that the commissioner of agriculture shall act as state forester, in addition to serving as state nursery inspector, director of the agricultural schools of the state, cattle commissioner, and state ornithologist. An amendment, not contemplated by the original law, but secured by the friends of forestry, reads that he must appoint a deputy who shall be a professionally trained forester. The commissioner has the power of apportioning the funds to be spent for forestry, and makes all appointments. The deputy of forestry, therefore, has no real authority, but is a subordinate, from this time forth, who can be expected to give no further trouble. The custodian whose retention precipitated this issue between personal government and business efficiency still holds his job.

AMERICAN FORESTRY calls attention to this situation because of the deep significance of the events described. There are many who claim that state governments in this country do not possess the elements of stability necessary

for success in establishing, and maintaining a state forest policy, and that efforts in this direction are a waste of time. This is not the attitude taken by the Association. We believe that it is possible to establish firm and lasting state forest policies, provided the people of our state commonwealths will recognize the absolute necessity of divorcing forestry from politics, and the means by which it can be

done. We hope that the results of the ten years of constructive work in Vermont will not be lost, and that at some future time the independence and stability of the department will again be established on a much surer foundation of popular enlightenment, rather than the fickle favor of a few powerful men who still worship ancient ideals of government.

### STOCK LOSSES AFFECT FOOD SUPPLY

**A**T this critical time when the world is approaching a period of short food supply, reports from the West show that the severity of the past winter caused serious losses among the cattle and sheep on the ranges. Stockmen throughout the West say the winter was unquestionably the worst they have experienced in twenty-five years. On the Pacific Coast its equal has not been suffered for fifty years. Where the snow generally does not cover the range until the first of February and is gone by April, the middle of last December saw the ranges buried so deep that the animals could not get the forage, and storm after storm followed, with no opening up until the middle of May. For the average six weeks or two months period when the range is deeply covered by snow, the stockman feels safe if he has a ton and a half of hay for each animal. With that period stretched into five months, practically tripled, the usual ton and a half of feed was absolutely inadequate and many animals died of starvation.

In the Southwest the winter was unusually open, which will be about as bad for that section as the heavy snows were for the other sections of the West. While the heavy snows cover forage, their melting gives much-needed moisture to the soil and an abundant grass crop is the result. In the Southwest the absence of snow means absence of forage and starvation for thousands of animals.

Even with the plains now open and an abundant forage crop assured over the greater part of the grazing area, the losses are by no means over, because the season is so late. The plains forage is counted upon to keep the animals in feed until the summer ranges in the mountains are ready, but the fact that these feeding grounds will be six weeks late in bearing a crop of forage grasses means that there will be another feedless period between with resultant losses.

The United States Forest Service, which controls most of the summer feeding grounds in the mountains, as they are located in National Forests, is doing everything in its power to relieve the situation. As soon as the gravity of

the situation was appreciated, telegrams were sent from the headquarters at Washington, D. C., to all District Foresters and Supervisors ordering them to let all the stock that could be fed on to the summer ranges and to do it as soon as the forage was in condition. This may result in some overcrowding of the range and a shortage later, but the need is so great that the chance must be taken.

An idea of the total shortage in the meat supply which will result from the losses can be gained from the following figures: There are normally a few less than fifty million cattle on the western ranges. Of these ten or twelve million are beef cattle. In the average year 500,000 calves are grazed on the National Forests, but figures show that this number will be reduced probably twenty per cent. A reduction this year of one-fifth of the total beef supply will be the result, and next year and the following it will be even more marked, because the steers pulled through the bad year while the cows died off, and the future as well as the present calf crop will be thereby cut down. The sheep losses are much greater than those among the cattle; but, being fast breeders, they will more quickly reach normal numbers again. About six million lambs are grazed in the National Forests on an average, but this year it is estimated that the total will be nearer four million. Only thirty-five or forty per cent of the ewes will have lambs, about half as many as usual, and the result will be a reduction of about one-third in the mutton supply.

Averaging the losses, it is evident that the beef and mutton output will be reduced approximately twenty-five per cent this year, with several lean years ahead, especially in the beef supply. Two years ago Australia lost twenty million sheep, and conditions are as bad or worse in the other grazing regions of the world, so the United States cannot depend on a foreign meat supply and must work out its own salvation. The agitation for economy and conservation in handling food needs no stronger argument than this to prove its case.

**A**LARGE number of schools in New York State have taken advantage of the offer put out by the New York State College of Forestry to furnish plans free and shrubbery at cost for the improvement of school grounds. Among the villages which have celebrated Arbor Day by putting through landscape improvement plans are Camden, Canastota, Peterboro, Fulton, Clayton, Remsen and Belmont. Plans are under way for several other villages.

**T**HE President has issued a proclamation eliminating 40,160 acres of mineral land from the Crook National Forest in Arizona. A large part of the area is covered by mining locations and there is practically no forest cover. The land has no value for watershed protection. By the same proclamation some thirty-four thousand acres of rough mountain land of no agricultural value are added to the forest.

# SAVE THE FRUIT CROP

We said this **LAST YEAR**—  
We say it again

This is a year for thrift and service. We must feed not only our own people, but also millions in Europe. The frightful waste of fruit is a national reproach. Help stop this unpardonable extravagance. The fruit we waste would feed Belgium.

**T**HE United States Government urges preserving as a home duty. Preserved fruits are energizing and nourishing. They vary your menus. They reduce the cost of your table.

America's canning and preserving industries are models for the world. Their products are pure, appetizing and wholesome. Support them.

If you preserve at home, put up more fruit than ever before. Get jars and glasses, bottles and crocks ready to save the fruit crop. Put away dried vegetables. The American housewife who practices thrift places herself in the ranks of those who serve their country.

You can show your thrift in no more convincing way than by combating the national tendency to squander this country's wonderful fruit crop. Whether you buy preserved fruits from your grocer or preserve at home you perform a service to your own family and to the Nation.

## American Sugar Refining Company



*"Sweeten it with Domino"*

Granulated, Tablet, Powdered, Confectioners, Brown

Domino Granulated Sugar is sold in convenient-sized bags and cartons

The increased cost of preserving because of the higher price of sugar is less than the increased cost of most other foods

### Coal Companies Protect Forests

Organization of the Forest Protective Association for the hard coal region of Pennsylvania has been completed, and application made to Chief Forest Fire Warden Wirt for a form of charter. The following officers have been elected:

President, H. C. Mason, of the Lehigh and Wilkes-Barre Coal Company; Vice-President, A. C. Neumiller, forester for the Lehigh Coal and Navigation Company; Secretary and Treasurer, H. C. Wiener, forester for the Lehigh Valley Coal Company. Directors: H. B. Fell, of the Wyoming Valley Water Company; L. W. Conrad, of the P. and R. Coal and Iron Company; H. A. Christian, of the New Jersey Zinc Company; E. A. Pettibone, of the D. and H. Coal Company; Col. James Archbald, Superintendent Girard Estate; P. W. Lance, of the Spring Brook Water Company; and R. C. Coombe, of Tamaqua.

The charter will be modelled after the one under which a similar association is now operating in the Poconos. The association will operate over about 500,000 acres of forest land, covering practically all of the anthracite region between the Susquehanna and the Schuylkill.

### Under Forestry Management

The Empire State Forest Products Association, made up of prominent New York lumbermen and paper manufacturers who control a total area of one million two hundred thousand acres of timberland in that state, has decided to establish a rational and constructive system of forestry for handling these lands. The first step taken was the securing of Professor A. B. Recknagel, of the Forestry Department at Cornell University, as forester. He has been given a year's leave from his duties at Cornell and will establish headquarters for the association at Albany, starting the work at once. In taking up this work, Professor Recknagel will have the benefit of years of practical training and experience in similar work for the government in the United States Forest Service, coupled with four years' experience in teaching forestry at Cornell University. He has specialized in forest management and is the author of a book on "The Theory and Practice of Working Plans," the second edition of which has recently appeared from the press of John Wiley and Sons, of New York. He is a graduate of Yale University in the class of 1904 and of Yale Forest School two years later. Subsequently he spent a year in study and travel abroad.

### Levison Resigns

J. J. Levison, B.A., A.F., has resigned his position as Forester of the City of New York to give all his time to his private practice as consulting landscape

forester and arboriculturist. Mr. Levison has been associated with the park department of Greater New York for the past eleven years and has been instrumental in improving tree conditions there. During the past few years he has written a good many interesting articles on tree conditions for AMERICAN FORESTRY.

### State Game Protection

"New Mexico Game Protective Association wins fight for a 100 per cent game warden," is the terse way Robert E. Dietz, Secretary of that Association, sums up the results of the campaign of New Mexico sportsmen to save the fast dwindling game supply through honest, competent handling. The campaign lasted over six months and resolved itself into a running fight between the sportsmen and hostile political influences. Public opinion was so thoroughly stirred up and the Association's position was so irrefutably sound, however, that the appointment of a competent warden, "skilled in matters pertaining to fish and game" as the state law requires, was secured despite the opposition.

"Heretofore we have had more law-breakers than game," says Mr. Dietz. "Now we hope for sudden failure of the crop of game hogs and a chance for the game to come back."

### A Forest Play

A picturesque and appealing little play for children is "The Spirit of the Forest," by Miss Margaret Dadmun. It not only furnishes fun and entertainment for a cast of from forty to fifty little ones, but carries a real lesson in conservation which, presented in this way, is bound to be effective and to make its indelible impression, not only on the audience but on the players as well. It is written around Gerta, a little peasant girl of ten, and Wilfred, her brother, a little older, and their experience in an ancient grove of trees suddenly enchanted by the Spirit of the Forest—a fairy and her attendant train, who gives to each tree a voice to speak and tell of his love and special service for mankind—a service repaid by neglect and cruel destruction, as the lines go on to say, until the eyes of man are opened by the lack of rain and the drooping and death of the trees, since the Raindrops come no more. Their King—the mighty oak—is slain and felled by man, and the Trees have given up hope when the Spirit of the Forest returns, bringing the Raindrops and Sunbeams, Fairies and Elves with her—and new life to the forest through the Little Oaks which spring up from the freshly moistened earth to carry on the work of serving man. The costuming and grouping of the children in the various parts is very effective and is made more so by the interpolation of appropriate musical selections to carry along the spirit of the play.

We like "The Spirit of the Forest" and wish to congratulate Miss Dadmun on her work. We shall be glad to refer inquiries regarding it to her, and hope that it will be widely read and used.

### Liberty Trees of Andorra

That the graceful wistaria which adorns so many of the lovely homes in Germantown, Chestnut Hill, and Mount Airy, Philadelphia, traces its origin, together with quaint Wistar Street, to Richard Wistar, founder of the large Andorra estate, is probably unknown to many of the residents of this charming suburban section, and it is also probably a little known fact that clustered around the name Andorra are some of the quaintest legends of the Pyrenees. Particularly interesting to patriotic Americans is the story that the natives of Andorra plant in their public squares, not flag-poles surmounted by flags, but trees which they call "Liberty Trees." In these days of conservation in every department of animal, horticultural, and agricultural activity, too much emphasis cannot be placed on the importance of tree planting. "Arbor Day" comes only once a year, and too little publicity is given this subject. Trees, ornamental and comforting as they are, are most valuable as conservers of soil moisture. Potato planting in these days of national crisis is undoubtedly a patriotic act, but a closely related task is that of tree planting, and it would not be a bad idea to supplement the popular liberty loan with the planting of liberty trees.

### Foresters Enlist

At the present time the New York State College of Forestry is represented in the different branches of the Army and Navy to the following extent: Six men have enlisted in the Naval Reserve Corps; ten have seen Border Service and are still with the Cavalry, Infantry, or Artillery Service; seven have enlisted in the above branches since the outbreak of the war, and between 40 and 50 will attend the Officers' Training Camp at Madison Barracks, New York.

The College also maintains a company in the Syracuse University Regiment. Professor H. B. Waha is captain of the company, and the other commissioned officers are Professor R. P. Prichard and Professor H. H. Tryon.

### A Course in Lumbering

A short course in lumbering, designed to meet the demand for a brief and practical training with special emphasis on the engineering aspect of the subject, has been inaugurated at the Georgia State College of Agriculture at Athens, Georgia. It prepares men for such positions as cruiser or surveyor, yard boss, scaler, or woods foreman with lumber companies, or for the position of Forest Ranger in the Government service.



## THE BEAUTIFUL TRANSFORMATION OF AN UGLY SKYLINE EFFECT

The principal flaw in the top photograph is the unsightly effect produced by dead branches. Edged against the sky is a ragged, monotonous outline in which there is a minimum of grace, symmetry and beauty.

Now note the lower photograph—observe what a wonderful transformation has been effected by Davey Tree Surgeons!

All ugly, dead branches have been removed, and artistic grouping has been achieved by the elimination of certain unimportant trees and bushes. What refreshing variety of outline is now presented; what charm lies in its perfect simplicity!

Possibly your estate offers similar opportunities for enhanced beauty—perhaps a little judicious artistry can bring out “hidden wonders” of which you are now unconscious.

**BUT**—be careful to whom you entrust this important work. Trimming and cutting, *incorrectly* done, are dangerous. Thousands of trees are lost every year because their owners do not realize the degree of highly expert knowledge and experience this work requires. More than half the decay in trees is directly traceable to improper trimming.

### Take the safe course—

—and put your trees in the hands of Davey Tree Surgeons. Tree Surgery, as they practice it, is

**The Davey Tree Expert Co., Inc., Elm Street, Kent, Ohio**

*(Operating the Davey Institute of Tree Surgery)*

Branch Offices with telephone connections: 225 Fifth Avenue, New York  
2016 Land Title Bldg., Philadelphia 450 McCormick Bldg., Chicago

Permanent representatives located at Boston, Newport, Leox, Hartford, Stamford, Albany, Poughkeepsie, White Plains, Jamaica, L. I., Morristown, N. J., Philadelphia, Harrisburg, Baltimore, Washington, Buffalo, Pittsburg, Cleveland, Detroit, Cincinnati, Louisville, Chicago, Milwaukee, Minneapolis, St. Louis, Kansas City. Canadian Address: 22 Victoria St., Montreal.

# DAVEY TREE SURGEONS

## FOR SAFE TREE SURGERY

Every real Davey Tree Surgeon is in the employ of the Davey Tree Expert Company and the public is cautioned against those falsely representing themselves

scientifically accurate and mechanically perfect—the result of the life study of John Davey, “The Father of Tree Surgery,” augmented and refined by the massed experience of the greatest body of expert tree men the world has ever known.

Davey Tree Surgeons are the only Tree Surgeons officially endorsed by the United States Government. They have treated and saved the priceless trees at the National Capitol, White House, Naval Observatory, Fort Meyer, Charleston (S. C.) Navy Yard, Annapolis Naval Academy, West Point Military Academy, etc.

They are the only tree surgeons endorsed by thousands of estate owners—prominent men and women whose recommendations you can accept with complete confidence. And they are the only Tree Surgeons who are backed by a successful and responsible house, amply able to make good in every instance, and not needing, for the sake of temporary existence, to sacrifice in the slightest degree its high standards.

### Write today for free examination of your trees—

and booklet, “When Your Trees Need the Tree Surgeon.” What is the real condition of your trees? Only the experienced tree surgeon can tell you fully and definitely. Without cost or obligation to you, a Davey Tree Surgeon will visit your place, and render an honest verdict regarding their condition and needs. Write today.

*From Mr. Lisle R. Beardslee,  
Wilmington, Delaware.*

“The work done by your company upon an old tree in my yard is very satisfactory and a remarkable demonstration of what can be accomplished by the scientific methods followed by your concern.”

*From Mr. Arthur Heurley,  
The Northern Trust Company,  
Chicago, Ill.*

“The work done on my trees by your foreman and his associates has been very satisfactory, so much so that we have been at considerable pains to canvass the neighborhood so as to give the boys some extra work while in the vicinity.”

*From Mr. Wm. R. Kenan, Jr.,  
Lockport, N. Y.*

“Some twelve or fourteen years ago while visiting at my sister’s summer home at Mamaroneck, N. Y., I saw your father with a very large corps doing tree surgery on that place. It impressed me so forcibly and, in later years, the results were so convincing that, upon the purchase of this place, I concluded to have your company do such work as was necessary here. The work has been entirely satisfactory.”



JOHN DAVEY  
“Father of Tree Surgery”

## BOOK REVIEWS

The Way to Study Birds, by John Dryden Kuser. G. P. Putnam's Sons, New York and London. Price, \$1.25.

The dominant thought of the reader of this book is that it was written by one in whom the love of birds is inherent. Mr. Kuser treats the birds as his intimates, with a familiarity born of close association and sense of comradeship. He knows their ways, their haunts, their individuality and their music. He knows when, where, and how to find them, and his book shows that he knows how to make them his friends when found. In short, the volume may well be accounted an important addition to bird literature.

Fundamentally, the author has sought to make bird identification a simple matter for the non-expert. He recognizes that information on this subject has not been easily available to the beginner in bird-study. His aim has been to supply this information in simple terms and to make it unnecessary for the student to wade ignorantly through a complicated mass of terms or descriptions or to go bird-hunting without the remotest idea of what he may expect to find or how to know when he has found it. With this book as a guide the beginner may attain acquaintanceship with a number of the bird species and acquire a good store of knowledge as to their habits. While intended more as a course of study than a book of reference, the volume is valuable along both lines.

Of the birds found in the neighborhood of New York the book describes 50 species and gives suggestions and information that will make possible identification of others. The data include haunts, description, field-marks, size and shape, song, seasonal abundance and comprehensive remarks as to individual characteristics. It is in these "Remarks" that Mr. Kuser gives the impress of his own bird-loving, and no student of our feathered neighbors can afford to miss the liberal education afforded by the ownership and study of the book.

"The Origin of the Lumber Industry," by William Compton, Ph.D. American Lumberman, Chicago.

Mr. Compton is a member of the Federal Trade Commission. The book contains a vast fund of information, presents a balanced view, ethically speaking, of the lumber industry, and it develops much that has been poorly understood in the economics of that industry. No publication comes to mind in which so many significant facts relating to timber and the lumber industry are brought into so small a compass. The census figures for

production of lumber from 1850 to date, the figures on sawmills, their number, capacity, and capitalization, the history of production by regions, a summary of the timber resources of the country, an insight into the degree to which timber ownership is now concentrated, and the figures on stumpage, past and present, are all connected in a logical fabric embracing the most timely and important problems and tendencies in the field. The big feature of the work is his development of the relations of price. Under his handling that appears as the crucial point of the whole matter. Quantity and quality granted, the desire or necessity of the people is expressed in price, which varies with the economic demand and other factors. Local exhaustion of timber supplies, separation of producing from consuming centers, and increased freight charges are a few of the factors affecting price. The lumber trust bogey is put to rout through a picture of the competition within the industry and a broad study of the history of lumber prices, which, although showing apparent increases, involve a slight relative loss from 1907 to 1913. Compton concludes that "natural influences furnish adequate explanation of lumber prices." The book is professedly an economic one strictly and as such can be read with much profit by the lumberman, the forester, and the conservationist.

"Evergreens, How to Grow Them," by C. S. Harrison, President of the Nebraska Park and Forestry Association. 95 pages, 19 illustrations. Webb Publishing Company, St. Paul, Minn.

This work is written chiefly to aid the farmers of the prairie States in the selection and care of evergreens which will produce lumber, prevent erosion, and beautify the treeless landscape. Brief descriptions of adaptable trees, facts on how to raise them from seed, transplant them, pack them, ship them, etc., make the book practical. At the same time, the numerous illustrations and the well-worded descriptions of scenery, through which the author sprinkles paragraphs which show a broad vision and idealism, add a touch of æsthetic interest.

"Georgia Forest Trees" has been chosen as the title for the annual publication of the Forest Club of the Georgia State Forest School, Athens, Georgia. It lists seventy-six trees native to Georgia, giving a short description in each case, covering the distribution, form and other characteristics, nature of the wood, and its uses. Being dedicated to the school children of Georgia, it should prove useful in advancing the cause

of conservation of Georgia's forests by "instilling in them a deep and lasting affection for nature."

The Book of the Peony, by Mrs. Edward Harding, published by J. B. Lippincott Company, Philadelphia and London. Price, \$6.00 net.

This is the only book on this well-known and greatly loved flower, and being such it is complete, practical and beautiful. As a printer's production it is a work of art. It has twenty illustrations in full colors and twenty-two in doubletone. The history and the development of the peony are presented by Mrs. Harding in a delightful manner. She deals specifically with each variety, and gives so much practical information and instruction that the lover and the grower of peonies will find the book unusually profitable.

Forest Fancies, by Lucy C. Kellerhouse. Duffield & Co., New York. Price, \$1.50.

Here are seven charming stories of the life and trees of the forest told delightfully by one who knows and loves the trees and woods. The stories are illustrated with twenty-four full-page prints excellently done. The book is one which should appeal to every lover of the forests.

The *Forestry Annual*, issued by the Forestry Club of the Michigan Agricultural College, East Lansing, Michigan, has just made its appearance for the second time. Attractive in form and makeup and filled with varied and valuable information, it makes a strong bid for the "attention and interest of the student body, alumni, and friends of M. A. C. to the continually widening field of forestry." The large number of forest schools that are issuing annuals of this nature, and the work being done by the students themselves, gives an indication of the keen interest with which young men are entering the forestry field. The future of forestry in his country is safe in the hands of such men.

The third annual number of the *Empire Forester*, published by the Forestry Club of the New York State College of Forestry at Syracuse, N. Y., is a fine piece of work. The policy of its board to largely confine the material in it to student articles on popular phases of forestry, or written in a popular way if technical, gives it an appeal that is not limited to men in the technical field. The selection of a cover design of real artistic value, the use of high-grade cameo paper and duotone ink, the numerous and well-selected illustrations and the evidences of careful editing show expenditure of both money and brains. The editors are to be congratulated.

# STOP Those Leaks!

**N**OT only the little leaks—like the leak in the grain bag or in your water tank. Stop the big ones too. Stop the leaks that cut down the profits from your farm. Learn how successful farmers have found out how to make their land pay more. Learn what government agricultural experts have discovered. Let them tell you how to cut out the waste that eats up profits. You will find it all in this great farm library—now sent on a remarkable offer. (See below.)

Also read how you get absolutely free a great book by America's most famous agriculturist, Hon. F. D. Coburn. Don't miss this opportunity. Send the coupon.

## The Farmer's Cyclopedia

(Authentic Records, U. S. Dep't Agriculture)

7 big, thick volumes, 6¼ in. x 9 in. 5,000 pages, 3,000,000 words. Hundreds of pictures and diagrams. Facts given here that cost the government \$4,000,000.00 to obtain. The best of all the practical information in the U. S. Dep't of Agriculture—selected and classified by a board of farming experts. Information on every branch of farming. Every statement verified by experts—no theories to wade through—just bedrock facts. Whether you have only an acre or 100 acres or a big ranch, you need them. They will help you to make more money. Send now, while this offer holds good. See the books. Then decide. Let them speak for themselves.

### OUR "10 DAYS READING" OFFER

Send the coupon with \$1 and we will ship the 7 big books—also the Coburn Manual. Pay net transportation charges when they arrive. Read them 10 days. If you keep them send \$3.00 a month until \$29.50 is paid. Otherwise send them back and we will return your \$1. See how this great library makes every farming puzzle clear. See how it shows the easiest, best ways to get money-making results. It tells you the best ways to increase your grain and hay crops. It explains the most approved methods of breeding cattle, horses, sheep and hogs. It goes right to the bottom of dairy farming. It tells how to detect, prevent and cure animal diseases and how to get rid of orchard parasites. It has an answer to practically every farming question. The price is nothing compared with what they may make or save for you. See for yourself. We can't do justice to these books here. Send for them. Mail the coupon now.

### EXTRA!

A manual by Hon. F. D. Coburn written to help you study farming. This book not sold separately—but free to you if you subscribe for the Cyclopedia.

### SPECIAL:

### COUNTRY LIFE IN AMERICA

For only one payment extra you get Country Life in America for a year. Less than the regular price. This beautiful magazine breathes the very spirit of country life. The special color section just added is extremely valuable. Every number contains useful information for the farmer.

#### Partial List of Contents

- Feed and Care of Dairy Cows  
(This alone worth the price)
- Feed and Feeding for Beef  
(A wonderful work)
- Diseases and Insect Pests  
(How to protect cattle and crops against them)
- Profitable Hog Raising  
(A complete library on the hog)
- Success with Sheep  
(Every question answered)
- Poultry Problems Solved  
(No other books on poultry ever need be read)
- Fruit  
(How to get larger yield. How to avoid insect pests)
- Latest Facts and Investigation on every Farm Product  
(Insures bigger, better crops with less labor)
- Every Phase of Farm Management  
(From government experiments and researches)
- Soils and Fertilization  
(Make your land yield more)
- Farm Buildings  
(How to plan and build on the farm)
- Farm Machinery  
(How to run it. All about it)
- Domestic Science  
(Comfortable, economical farm housekeeping. Lightens the work of the housekeeper)
- And thousands of other subjects of vital interest and value.

## Send Coupon NOW!

If you are a farmer or if you are a city man who expects to have a farm—you ought at least to see these books. Get them while the offer is good. Have the 10 days reading even if you do not buy. We want you to see them. We want you to know what an amazing amount of practical farming information they contain. Send today.

DOUBLEDAY, PAGE & CO.

Dept. 4791, Garden City, New York

Send me the complete set of Farmer's "Cyclopedia (Authentic Records of U. S. Dep't of Agriculture) in 7 big, thick volumes. If not satisfactory I will return the books in 10 days; otherwise I will send you \$3.00 monthly, until \$29.50 is paid. I am to have the Coburn Manual free if I keep the books. I enclose \$1.00 to be returned if I send the books back.

Name \_\_\_\_\_

Address \_\_\_\_\_

DOUBLEDAY, PAGE & CO. Dept. 4791, GARDEN CITY New York

If you want Country Life in America also, write Yes here \_\_\_\_\_

A-F-6.

# Our Trees

## HOW TO KNOW THEM

Photographs from Nature  
By ARTHUR I. EMERSON

WITH A GUIDE TO THEIR RECOGNITION AT ANY SEASON OF THE YEAR AND NOTES ON THEIR CHARACTERISTICS, DISTRIBUTION AND CULTURE

By CLARENCE M. WEED, D.Sc.  
*Teacher of Nature Study in the Massachusetts State Normal School at Lowell*

One hundred and forty illustrations  
Size of book, 7½ inches by 10 inches

Cloth, \$3.00 net Postage extra

ALL nature-lovers will hail this book with delight. Its purpose is to afford an opportunity for a more intelligent acquaintance with American trees, native and naturalized. The pictures upon the plates here in all cases been photographed direct from nature, and have been brought together in such a way that the non-botanical reader can recognize at a glance either the whole tree or the leaves, flowers, fruits, or winter twigs, and thus be able to identify with ease and certainty any unknown tree to which his attention may be called. In the discussion of the text especial attention has been given to the distinguishing character of the various species, as well as to the more interesting phases of the yearly cycle of each, and the special values of each for ornamental planting.

Publishers

J. B. LIPPINCOTT COMPANY  
Philadelphia

### North Carolina's Losses

North Carolina suffered a loss of over three and one-half millions from forest fires in 1916, according to advices from the Forestry Division of the State Geological and Economic Survey. For the seven preceding years the damage had averaged about \$620,000 per year, making the 1916 losses about six times greater than the average. The area burned over reached a total of 977,000 acres with the consequent destruction of about 248,000,000 feet of timber. The greatest portion of the financial loss was in the destruction of the by-products of the forest, as North Carolina produces large quantities of turpentine and naval stores.

"In spite of figures of such magnitude," the report continues, "the Legislature adjourned without making any appropriation whatever to prevent fires." Measures which would gradually but surely reduce the annual waste have been recommended to each successive General Assembly, but so far no definite, constructive action has been taken. The forest fire law, recommended and endorsed by the Survey, the North Carolina Forestry Association, and the United States Forest Service, was passed two years ago, but no funds were appropriated to put it into effect, which failure effectually ties the hands of the conservationists.

The protection of young growth as a remedy for the high cost of pulp and paper is being agitated, but so far as reports show there is no real progress toward a constructive method of handling these rich and important resources of the State.

*Your interest in the advertising pages can best be expressed by responsiveness. You should give the advertising department credit of selecting only those with whom it is a wholesome pleasure to do business.*

## W. & T. SMITH CO.

*Geneva Nursery*

### NURSERY STOCK AT WHOLESALE

SEND FOR CATALOG  
AND PRICE LIST



GENEVA, N. Y.

JUST PUBLISHED

## Handbook of Clearing and Grubbing, Methods and Cost

by HALBERT P. GILLETTE

Chapters: Glossary of Terms; Cost of Estimating and Appraising; Specifications; Clearing; Grubbing by Hand; Burning and Char-pitting; Blasting; Hand, Horse and Power Stump Pullers; Heavy Plows.

250 pages, illustrated

Handbook size \$2.50 net, postpaid

N. B.—You have the privilege of returning the book at the end of 30 days, if not perfectly satisfactory, and your money will be refunded at once.

CLARK BOOK CO., Inc.

27 William St.,

New York, N. Y.



WE MAKE THE

## ENGRAVINGS

FOR THE  
AMERICAN FORESTRY  
MAGAZINE

OUR SPECIALTY

IS THE "BETTER GRADE FINISH OF

### DESIGNS & ENGRAVINGS

IN ONE OR MORE COLORS  
FOR MAGAZINES CATALOGUES  
ADVERTISEMENTS ETC

HALF TONES

LINE PLATES

DULLO-TONES

COMBINATION LINE  
AND HALF TONES

COLOR PROCESS

MULTI-COLORS

—ESTABLISHED 1889—

## GATCHEL & MANNING

SIXTH AND CHESTNUT STREETS  
OPPOSITE OLDE INDEPENDENCE HALL

PHILADELPHIA

**NUT CULTURE** North, South, East, West. All phases discussed by experts. THE OFFICIAL JOURNAL. \$1.25 per year. Sample 15c.

**AMERICAN NUT JOURNAL** Rochester, N. Y.

### Do Business by Mail

It's profitable, with accurate lists of prospects. Our catalogue contains vital information on Mail Advertising. Also prices and quantity on 6,000 national mailing lists, 99% guaranteed. Such as:

War Material Mfrs.	Wealthy Men
Cheese Box Mfrs.	Auto Grease Mfrs.
Shoe Retailers	Auto Owners
Contractors	Tin Can Mfrs.
Druggists	Farmers, Etc.

Write for this valuable reference book; also prices and samples of fac-simile letters. Have us write or revise your Sales Letters.

Ross-Gould, 1009C Olive St.

## Ross-Gould

Mailing Lists St. Louis

### PATENTS

Often the slightest improvement, protected by patent, means thousands of dollars to the inventor. Our Bulletins list hundreds of inventions greatly needed, especially in farm implements, automobile accessories, household specialties and toys. Bulletins and book of advice free. Simply mail a postcard.

Laocaster & Allwins, Registered Att'ys.  
286 Oursy Bldg., Washington, D. C.

# A UNIQUE METHOD OF BIRD STUDY!

*Do You Want to KNOW Our Birds?*

## THE WAY TO STUDY BIRDS

By John Dryden Kuser

16mo. 9 Illustrations in Color. \$1.25

A manual of information regarding some fifty of the more common birds—their haunts, description, field marks, size and shape, song and seasonal abundance. To facilitate the identification of species and also by way of throwing light on the duration of their visitations, the birds are classified under those of spring, summer, fall and winter. Illustrations by the well-known bird artist, Louis Agassiz Fuertes.

**G. P. PUTNAM'S SONS**

New York

2 West 45th Street

London

## CANADIAN DEPARTMENT

ELLWOOD WILSON

SECRETARY, CANADIAN SOCIETY OF FOREST ENGINEERS

During the past month the last important section of Forest land in the Province of Quebec was organized into a coöperative fire protective association. The timberland owners of the section lying north of the St. Lawrence River, from the St. Maurice River east to the River Laval and north of Lake St. John, formed a coöperative association, to be known as the Laurentian Forest Protective Association, and chose for their Manager Mr. R. L. Seaborne, who was for several years a district inspector for the St. Maurice Forest Protective Association. This association will protect about 20,000 square miles, covering some of the most valuable timberlands in the Province and owned by some of the most important paper and lumber companies. Among these Price Bros. Co. are the largest limit holders in Quebec. Hon. William Turner is the President and Mr. Kernan, of the Donnacona Pulp and Paper Co., is the Vice-President and Mr. Paul G. Owen, the Secretary-Treasurer. There are now four of these coöperative associations which practically cover the most important timbered areas under license from the Government, the Ottawa, the St. Maurice, the Laurentian and the Southern St. Lawrence, and these

have all joined themselves into a federation, called the Quebec Forest Protective Association, which will have charge of all matters of general interest and will handle the necessary literature and propaganda work and also matters with the Provincial and Federal Government Departments.

The Laurentide Company, Limited, in its planting operations this summer will plant about one million trees.

The Riordon Paper Company, Limited will plant about two hundred and fifty thousand trees in the neighborhood of St. Jovite.

Robson Black, Secretary of the Canadian Forestry Association, has just completed a very successful lecture trip through the Prairie Provinces and British Columbia, where he has succeeded in interesting the Government Departments concerned in fire protection in introducing legislation requiring permits for the setting of clearing fires at any time during the summer months. Now that the Prairie Provinces have taken this action only New Brunswick and Nova Scotia need to come into line. If all goes well Canada will soon have adequate protection against forest fires from coast to coast, which will be the most important step in the conservation of our natural resources.

The forest survey of the Province of New Brunswick is making satisfactory progress and is being carried on economically and thoroughly. The outstanding fact demonstrated by this survey is the great fire loss in the past and the necessity for a rational and efficient fire protection service for the future.

The Quebec Forestry School students are about to go into their spring quarters for their field work at Burrill's Siding, where they have a thousand acres of land on which they can practice surveying and get experience in silviculture and different methods of lumbering.

The Research Council of Canada has decided to set aside one hundred square miles in the Petawawa Military District in Ontario. A sufficient grant will be made to carry out a thorough survey of this area next summer, the work to be done by the Dominion Forest Branch. Beyond the survey a program has not yet been prepared. The Research Council for Scientific and Industrial Work in Canada has been formed for the purpose of ascertaining and tabulating the various agencies which are now carrying on research work in universities and colleges, in Government laboratories, business organizations and industries, scientific associations or by private persons; also to ascertain the lines of work being done and the facilities and equipment and especially the man-power available for such

# BOOKS ON FORESTRY

AMERICAN FORESTRY will publish each month, for the benefit of those who wish books on forestry, a list of titles, authors, and prices of such books. These may be ordered through the American Forestry Association, Washington, D. C. Prices are by mail or express prepaid.\*

FOREST VALUATION—Filibert Roth.....	\$1.50
FOREST REGULATION—Filibert Roth.....	2.00
PRACTICAL TREE REPAIR—By Elbert Peets.....	2.00
THE LUMBER INDUSTRY—By R. S. Kellogg.....	1.10
LUMBER MANUFACTURING ACCOUNTS—By Arthur F. Jones.....	2.10
FOREST VALUATION—By H. H. Chapman.....	2.00
CHINESE FOREST TREES AND TIMBER SUPPLY—By Norman Shaw.....	2.50
TREES, SHRUBS, VINES AND HERBACEOUS PERENNIALS—By John Kirkegaard.....	1.50
TREES AND SHRUBS—By Charles Sprague Sargent—Vols. I and II, 4 Parts to a Volume—per Part.....	5.00
THE TRAINING OF A FORESTER—Gifford Pinchot.....	1.35
LUMBER AND ITS USES—R. S. Kellogg.....	1.15
THE CARE OF TREES IN LAWN, STREET AND PARK—B. E. Fernow.....	2.17
NORTH AMERICAN TREES—N. L. Britton.....	7.30
KEY TO THE TREES—Collins and Preston.....	1.50
THE FARM WOODLOT—E. G. Cheney and J. P. Wentling.....	1.70
IDENTIFICATION OF THE ECONOMIC WOODS OF THE UNITED STATES—Samuel J. Record.....	1.25
PLANE SURVEYING—John C. Tracy.....	3.00
FOREST MENSURATION—Henry Solon Graves.....	4.00
THE ECONOMICS OF FORESTRY—B. E. Fernow.....	1.61
FIRST BOOK OF FORESTRY—Filibert Roth.....	1.10
PRACTICAL FORESTRY—A. S. Fuller.....	1.50
PRINCIPLES OF AMERICAN FORESTRY—Samuel B. Green.....	1.50
MANUAL OF THE TREES OF NORTH AMERICA (exclusive of Mexico)—Charles Sprague Sargent.....	6.00
AMERICAN WOODS—Romeyn B. Hough, 13 Volumes, per Volume.....	5.00
HANDBOOK OF THE TREES OF THE NORTHERN U. S. AND CANADA, EAST OF THE ROCKY MOUNTAINS—Romeyn B. Hough.....	6.00
GETTING ACQUAINTED WITH THE TREES—J. Horace McFarland.....	1.75
PRINCIPAL SPECIES OF WOOD: THEIR CHARACTERISTIC PROPERTIES—Charles Henry Snow.....	3.50
HANDBOOK OF TIMBER PRESERVATION—Samuel M. Rowe.....	4.00
TREES OF NEW ENGLAND—L. L. Dame and Henry Brooks.....	1.50
TREES, SHRUBS AND VINES OF THE NORTHEASTERN UNITED STATES—H. E. Parkhurst.....	1.50
TREES—H. Marshall Ward.....	1.50
OUR NATIONAL PARKS—John Muir.....	1.91
LOGGING—Ralph C. Bryant.....	3.50
THE IMPORTANT TIMBER TREES OF THE UNITED STATES—S. B. Elliott.....	2.50
FORESTRY IN NEW ENGLAND—Ralph C. Hawley and Austin F. Hawes.....	3.50
THE PRINCIPLES OF HANDLING WOODLANDS—Henry Solon Graves.....	1.50
SHADE TREES IN TOWNS AND CITIES—William Solotaroff.....	3.00
THE TREE GUIDE—By Julia Ellen Rogers.....	1.00
MANUAL FOR NORTHERN WOODSMEN—Austin Cary.....	2.12
FARM FORESTRY—Alfred Akerman.....	.57
THE THEORY AND PRACTICE OF WORKING PLANS (in forest organization)—A. B. Recknagel.....	2.10
ELEMENTS OF FORESTRY—F. F. Moon and N. C. Brown.....	2.20
MECHANICAL PROPERTIES OF WOOD—Samuel J. Record.....	1.75
STUDIES OF TREES—J. J. Levison.....	1.75
TREE PRUNING—A. Des Cars.....	.65
THE PRESERVATION OF STRUCTURAL TIMBER—Howard F. Weiss.....	3.00
THE PRACTICAL LUMBERMAN—By Bernard Brereton (third edition).....	1.50
SEEDING AND PLANTING IN THE PRACTICE OF FORESTRY—By James W. Toumey, M.S., M.A.....	3.50
FUTURE FOREST TREES—By Dr. Harold Unwin.....	2.25
FIELD BOOK OF AMERICAN TREES AND SHRUBS—F. Schuyler Mathews.. (In full leather).....	2.00
FARM FORESTRY—By John Arden Ferguson.....	2.50
LUTHER BURBANK—HIS METHODS AND DISCOVERIES AND THEIR PRACTICAL APPLICATION.....	1.30
(In twelve volumes, beautifully illustrated in color)	48.00
THE BOOK OF FORESTRY—By Frederick F. Moon.....	2.10
OUR FIELD AND FOREST TREES—By Maud Going.....	1.50
HANDBOOK FOR RANGERS AND WOODSMEN—By Jay L. B. Taylor.....	2.50
THE STORY OF THE FOREST—By J. Gordon Dorrance.....	.65
THE LAND WE LIVE IN—By Overton Price.....	1.70
WOOD AND FOREST—By William Noyes.....	3.00
THE ESSENTIALS OF AMERICAN TIMBER LAW—By J. P. Kinney.....	3.00

\* This, of course, is not a complete list, but we shall be glad to add to it any books on forestry or related subjects upon request.—EDITOR.

work; to coordinate all agencies, to induce cooperation and prevent overlapping, and to bring about a community of knowledge; to study the problems which confront our industries and to link up the resources of science with labor and capital so as to bring about the best possible economic results; to make a study of our unused resources, wastes and by-products with a view to their utilization in new or subsidiary processes of manufacturing; to develop ways and means by which the present small force of competent and trained research men can be augmented.

This work is being rapidly organized and the following organizations have volunteered to help in it: The Canadian Society of Civil Engineers, Canadian Mining Institute, Canadian Manufacturers' Association, Society of Chemical Industry and the Canadian Society of Forest Engineers. The country will be divided up into districts and volunteer field-workers will cover these districts and gather all available information.

There is a considerable shortage of labor this spring, many of the companies having difficulty in getting sufficient men for their drives. The spring has been late and dry and there is therefore not as much water as is needed for driving operations.

The Quebec Government is taking an interest in the reforestation of its burnt-over lands and is considering arrangements by which the limit holders will undertake this work.

## CURRENT LITERATURE

### MONTHLY LIST FOR MAY, 1917

(Books and periodicals indexed in the library of the United States Forest Service.)

#### Forestry as a Whole

- Proceedings and reports of associations, forest officers, etc.*
- Hawaii—Board of agriculture and forestry—Division of forestry. Report for the biennial period ending December 31, 1916. 62 p. pl. Honolulu, 1917.
- India—Baluchistan—Forest department. Progress report of forest administration for 1915-16. 32 p. Calcutta, 1916.
- India—Jammu and Kashmir—Forest department. Progress report of forest administration for the year 1915-1916. 81 p. Lahore, 1916.
- India—Northwest frontier province—Forest department. Progress report on forest administration for the year 1915-16. 48 p. Peshawar, 1916.
- Massachusetts—State forester. Thirteenth annual report, 1916. 124 p. pl. Boston, Mass., 1917.
- Ontario—Department of lands, forests, and mines. Report for the year ending 31st of October, 1916. 151 p. il., pl. Toronto, 1917.

**Forest Aesthetics**

Castle, M. A. Street and park trees for Wisconsin communities. 54 p. il. Madison, Wis., 1916. (Wisconsin—Conservation commission. Bulletin 2.)

**Forest Education**

Baker, Hugh P. What forestry means at Syracuse. 10 p. Syracuse, N. Y., 1916.  
 Georgia state forest school. Lumberman's short course. 4 p. il. Athens, Ga., 1917.  
 Kellerhouse, Lucy Charlton. Forest fancies. 164 p. N. Y., Duffield & Co., 1917.

**Forest Botany**

Sponsler, O. L. A bud and twig key to the more important broadleaf deciduous trees in the United States. 26 p. il. Ann Arbor, Mich., George Wahr, 1916.

**Silviculture**

*Planting*

Berry, James B. Growing tree seedlings. 8 p. il. Athens, Ga., 1916. (University of Georgia—State college of agriculture—Extension division. Circular 34.)  
 MacDonald, G. B. Evergreen trees for Iowa. 59 p. il. Ames, Ia., 1917. (Iowa Agricultural experiment station. Bulletin 170.)

**Forest Protection**

*Disease*

United States—Laws, statutes, etc. The plant quarantine act, Aug. 20, 1912, as amended March 4, 1913, and March 4, 1917. 4 p. Wash., D. C. 1917.

**Forest Management**

Berry, James B. Improving the woodlot. 8 p. il. Athens, Ga., 1916. (University of Georgia—State college of agriculture—Extension Division. Circular 31.)  
 Frothingham, Earl H. The status and value of farm woodlots in the eastern United States. 44 p. il., maps, Wash., D. C., 1917. (U. S.—Dept. of agriculture. Bulletin 481.)  
 Hickel, Robert. Mesures a prendre pour assurer nos besoins en bois après la guerre. 9 p. Paris, P. Renouard, 1916.

**Forest Economics**

Sweden—Kongliga socialstyrelsen. Skogsarbetarnas levnads- och arbetsförhållanden i Värmland, Dalarna och Norrland (Living and working conditions of forest workers in Vermland, Dalarna and Norrland). 399 p. il., map. Stockholm, 1916.

**Forest Administration**

United States—Department of agriculture—Forest service. April field program, 1917. 28 p. Wash., D. C., 1917.

**Forest Utilization**

*Lumber industry*

American saw mill machinery co. Making money off the woodlot. 20 p. il. Hackettstown, N. J., 1916.  
 MacMillan, H. R. Report on the timber import trade of Australia. 76 p. il. Ottawa, Dept. of trade and commerce, 1917.

**Are you on the Mailing List for Catalog of**

**Hicks Nurseries?**

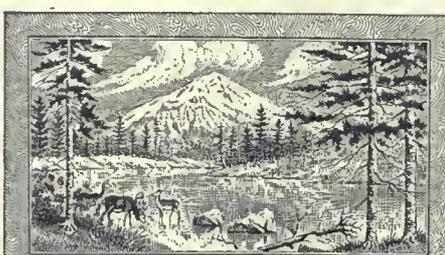


**Pine and Oak Help Each Other**

It will confirm your decisions on fitting your selection of trees to your soil and climate. It offers trees for dry and acid soils and moist soils in the same region. Many nurseries on alkaline soils do not specialize on oaks and pines.

Trees 20 years old can be selected now. They are guaranteed to grow satisfactorily or replaced free.

**ISAAC HICKS & SON**  
 Westbury, Nassau Co., N. Y.



**SUPERIOR ENGRAVINGS**

**FOR ALL PURPOSES DESIGNERS AND ILLUSTRATORS**

**HALFTONES · LINE CUTS  
 3 COLOR PROCESS WORK  
 ELECTROTYPES**

**NATIONAL ENGRAVING CO.**

506-14th. Street, N.W.  
 WASHINGTON, D. C.

... Phone Main 8274 ...



**TREE HEALTH**

We not only cure trees, but we keep them healthy. Experts in fertilizing, mulching, spraying and pruning, as well as cavity treating, bracing, bolting, etc.

"THE BARTLETT WAY" is safe and sure. Representatives everywhere. Send for "Tree Talk," the tree lovers' manual

THE F. A. BARTLETT COMPANY  
 544 Main Street Stamford Conn.

**Nursery Stock for Forest Planting**

Seedlings	<b>TREE SEEDS</b>	Transplants
\$2.25	Write for prices on	\$6.00
per 1000	large quantities	per 1000

**THE NORTH-EASTERN FORESTRY CO.**  
 CHESHIRE, CONN.

**Orchids**

We are specialists in Orchids; we collect, import, grow, sell and export this class of plants exclusively. Our illustrated and descriptive catalogue of Orchids may be had on application. Also special list of freshly imported unestablished Orchids.

**LAGER & HURRELL**

Orchid Growers and Importers SUMMIT, N. J.

**PARK and ESTATE FORESTRY**

Logging Reports Utilization Studies  
 Timber Estimates Forest Planting  
 Etc.

*Methods and Cost of Mosquito Eradication*

**P. L. BUTTRICK**

Forester and Mosquito Expert  
 P. O. Box 607 New Haven, Conn.

*American Forestry is your magazine. It will increase in value and influence when the advertising revenue is larger. You can help by patronizing our carefully selected advertisers.*

**M**ODERN WAR is destruction on a scale beyond precedent; great trees are cut down and the work which nature has spent years in building is blasted. After the war the dead trees must be replaced. It is well for America to start now the planting for the orchards which will bear fruit for the generations that are to come.

*Thorburn's*

## Tree Seeds

are seeds with a splendid lineage. They are carefully selected so that the growth from them may be of high quality.

Whether you are planting trees for fruit and food, or for shade, beauty and comfort, you can choose Thorburn's knowing that for over a century these seeds have been famous for their excellence.

You should have the 1917 catalogue containing a wealth of information. Write for your copy today.

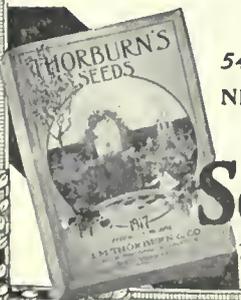
Sent free on request.

**J. M. Thorburn & Co.**

ESTABLISHED 1802

53 S. Barclay Street

Through to  
54 Park Place  
NEW YORK



Send for  
this Book

Nellis, J. C. Production of lumber, lath, and shingles, in 1915, and lumber in 1914. 45 p. Wash., D. C., 1917. (U. S.—Dept. of agriculture. Bulletin 506.)

North Carolina pine association. North Carolina pine; its beauty for panelled walls, beamed ceilings and polished floors. 16 p. il. Norfolk, Va., 1917.

### Auxiliary Subjects

#### Wood-using industries

McCreight, Arthur M. Cross-ties purchased and treated in 1915. 8 p. Wash., D. C., 1917. (U. S.—Dept. of agriculture. Bulletin 549.)

National lumber manufacturers' association—Trade extension dept. Working drawings and photographs showing the construction of farm buildings for use in manual training schools. 15 p. il. Chicago, Ill., 1917. (Educational series no. 3.)

White, F. M., & Griffith, C. I. Ice houses and ice supply. 23 p. il. Chicago, Ill., 1916. (National lumber manufacturers' association—Trade extension dept. Farm bulletin no. 6.)

#### Forest by-products

Champion fibre company. The story of chestnut extract. 24 p. il. Canton, N. C., 1917.

### Periodical Articles

#### Botany

Robbins, Wilfred W. Native vegetation and climate of Colorado in their relation to agriculture. 56 p. il., maps. Fort Collins, Colo., 1917. (Colorado—Agricultural experiment station. Bulletin 224.)

Trelease, Sam F., and Livingston, Burton E. The daily march of transpiring power as indicated by the porometer and by standardized hygrometric paper. 14 p. Cambridge, University press, 1916.

#### Hydrography

California—State water commission. Report, 1915-16. 183 p. pl., map. Sacramento, Cal., 1917.

Hall, Benjamin M., and Hall, Maxcy R. Second report on the water powers of Alabama. 448 p. pl., maps. University, Ala., 1916. (Alabama—Geological survey. Bulletin 17.)

#### Public lands

Michigan—Public domain commission. Proceedings, vol. 7, 1915-16. 747 p. Lansing, Mich., 1916.

#### Miscellaneous periodicals

American architect, April 11, 1917.—Southern yellow pine for structural purposes, by Samuel J. Record, p. 223-8.

Asia, March, 1917.—New homes for China's millions, by Gertrude Emerson and Elsie F. Weil, p. 25-9.

California fish and game, April, 1917.—Trinity national forest game refuge, by E. V. Jotter, p. 65-8.

Conservation, May, 1917.—Pine blister in Canada, by Clyde Leavitt, p. 18; Railway fire protection work, p. 20.

Country life, March 10, 1917.—The beauty and uses of British timbers, by A. D. Webster, p. 237-8.

Country life in America, May, 1917.—Growing trees on farm and forest, by Walter D. Ludwig, p. 104-6; a modern log cabin, by Irving Lee Palmer, p. 148-50.

### American-Grown Trees and Evergreens

Our ability to supply plants of the highest quality is not curtailed by the stoppage of foreign shipments. Buy nursery stock grown at Andorra.

#### Andorra Nurseries

Wm. Warner Harper, Prop.  
"Suggestions for Effective Planting" on request

Box 200,  
Chestnut Hill  
Phila., Penna.

## Power Spraying

Big Jobs take time and men—Deming rigs save both



For fast, thorough spraying, covering every leaf in record time with a clinging high-powered spray, use

## DEMING POWER RIGS

Catalog showing everything from 200 gallon rigs to bucket pumps free on request.  
THE DEMING CO.  
150 Depot St., Salem, Ohio  
Pumps for all farm uses

## FORESTRY SEEDS

### I OFFER AT SPECIAL PRICES

Pinus strobus Picea Englemanni  
Pseudo-tsuga Douglasii Picea pungens  
Pinus ponderosa Thuja occidentalis  
Pinus taeda

and many other varieties, all of this season's crop and of good quality. Samples upon request. Send for my catalogue containing full list of varieties.

### THOMAS J. LANE

TREE SEEDSMAN

Dresher Pennsylvania

## HILL'S

### Seedlings and Transplants

Also Tree Seeds

### FOR REFORESTING

BEST for over a half century. All leading hardy sorts, grown in immense quantities. Prices lowest. Quality highest. Forest Planter's Guide, also price lists are free. Write to-day and mention this magazine.

### THE D. HILL NURSERY CO.

Evergreen Specialists

Largest Growers in America

BOX 501

DUNDEE, ILL.

## FOREST NURSERIES

PINE

SPRUCE

Evergreen trees for forest planting in any quantity, from 100 trees to carload lots.

WE GROW OUR OWN TREES

Write us for catalogue

### KEENE FORESTRY ASSOCIATION

KEENE, N. H.

- Countryside, Feb., 1917.—Which wood, by D. Irving Sewall, p. 70; Oak furniture, by Harold D. Eberlein and Abbot McClure, p. 78-9, 91-3; Tree education: A talk on pruning, by Frank A. Waugh, p. 81-2.
- Countryside, March, 1917.—Making trees over by tree surgery, by Henry R. Francis, p. 124-5, 163; Why not use the other woods, by Harold D. Eberlein and Abbot McClure, p. 130, 164-6.
- Gardeners' chronicle, April 7, 1917.—Spring in the woodland, by A. D. Webster, p. 140.
- In the open, April, 1917.—Save the last of the white pines, p. 20-4.
- Journal of the New York botanical garden, Feb., 1917.—The Paulownia tree at the Mansion, by W. A. Murrill, p. 31-5.
- Munsey's Magazine, May, 1917.—The accident that gave us wood-pulp paper, by Parke F. Hanley, p. 688-90.
- National wool grower, April, 1917.—Turning poison into mutton, by Smith Riley, p. 19-21.
- Ottawa naturalist, March, 1917.—Are our forests vanishing, by R. H. Campbell, p. 158-60.
- Philippine journal of science, Sec. D, Nov., 1916.—A collection of termites from the Philippine Islands, by Masamitsu Oshima, p. 351-7.
- Plant world, March, 1917.—Seeding habits of spruce as a factor in the competition of spruce with its associates, by Louis S. Murphy, p. 87-90.
- Proceedings of the American society of civil engineers, April, 1917.—Modern practice in wood stave pipe design and suggestions for standard specifications, by J. F. Partridge, p. 559-94.
- Proceedings of the Engineers' club of Dayton, Ohio, Jan., 1917.—Our national forests, by Don Carlos Ellis, p. 5-27.
- Scientific American, April 21, 1917.—What shall we do to prevent our enormous forest-fire losses, by Ralph S. Hosmer, p. 405, 408.
- Scientific monthly, April, 1917.—A California arboretum, by Douglas Houghton Campbell, p. 289-300.
- Torrey, March, 1917.—Pinus caribaea; an extension of range in Louisiana, by W. R. Mattoon, p. 49-52.
- Washington Sunday Star, April 22, 1917.—Plant a tree and perform an act of patriotism, by Mrs. Lydia Adams-Williams, p. 3.
- Trade journals and consular reports*
- American lumberman, April 14, 1917.—Development of the chicken silo offers a new market for wood, p. 24; Possibilities of wood for phonograph needles, p. 33; Shipbuilding conditions, p. 34; How poultry experts regard the chicken silo, p. 37; Rushing plans for wooden ship construction, p. 41; May delay blister rust appropriation in Massachusetts, p. 48; Problems of piano manufacturing are discussed, p. 48; Philippine lumbering operations growing, p. 52.
- American lumberman, April 28, 1917.—Manufacturers to boost yellow poplar, p. 28-9; Building of wooden ships is urged in France, p. 29.
- American lumberman, May 5, 1917.—British Columbia's forest output increased, p. 36; Preventing decay of wood in textile plants, by Clyde H. Teesdale and others, p. 42.
- Barrel and box, April, 1917.—Standard specifications for canned foods cases, by National association of box manufacturers, p. 33-4; Recommended uniform containers for fruits and vegetables, by Association of Transportation lines, p. 34; Electrically equipped box plant, p. 36.

# Hamilton Watch

"The Watch of Railroad Accuracy"

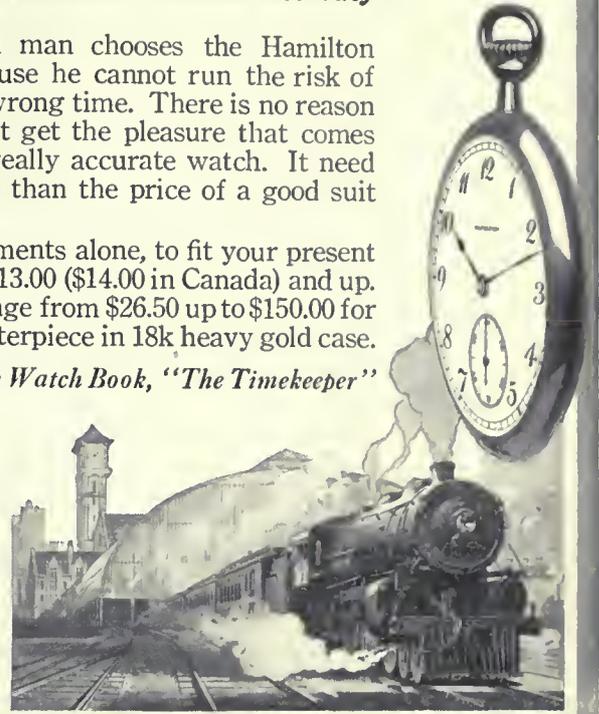
THE railroad man chooses the Hamilton Watch because he cannot run the risk of having the wrong time. There is no reason why you shouldn't get the pleasure that comes from carrying a really accurate watch. It need not cost you more than the price of a good suit of clothes.

Hamilton movements alone, to fit your present watch case, cost \$13.00 (\$14.00 in Canada) and up. Cased watches range from \$26.50 up to \$150.00 for the Hamilton Masterpiece in 18k heavy gold case.

Write for Hamilton Watch Book, "The Timekeeper"

A reading of this book gives you a new perspective on watches and watch buying. In it are pictured and described all of the Hamilton models.

HAMILTON WATCH  
COMPANY, Dept. 39  
Lancaster, Pennsylvania





Your Fruit Won't Spoil If You Use

## GOOD LUCK

RED RUBBERS

*They Fit All Standard Jars*

Specially recommended for cold pack canning. Send 2c stamp for new book on preserving or 10c in stamps for one dozen rings if you cannot get them at your dealer's. Address Department 51 BOSTON WOVEN HOSE & RUBBER CO. Cambridge, Mass.

## Use Press Clippings

IT will more than pay you to secure our extensive service, covering all subjects, such as Polo, Golf, Tennis, trade and personal, and receive the benefit of the best and most systematic reading of all papers and periodicals, here and abroad, at minimum cost. Why miss taking advantage for obtaining the best possible service in your line?

Our service is taken by all progressive business men, publishers, authors, collectors, etc., and is the card index for securing what you want and need, as every article of interest is at your daily command.

Write for terms; or send your order for 100 clippings at \$5, or 1,000 clippings at \$35. Special rates quoted on Large Orders.

**The Manhattan Press Clipping Bureau**

ARTHUR CASSOT, Proprietor Established 1888

6 East 41st Street, NEW YORK

Send for Our Desk Calendar

You probably have a business that might be advertised to advantage in American Forestry. The advertising department solicits only logical advertising and if given the opportunity will explain the possibilities and reasonabilities of this magazine for the business in whose growth you are most interested.

# FREE

Best Expert  
Instruction on

## CANNING AND DRYING OF VEGETABLES AND FRUITS

ALSO ON

## FOOD GARDEN PLANTING

WRITE TO

**Conservation Department  
American Forestry Association**

WASHINGTON, D. C.

# The Rally Call

## Still Time to Have Good Gardens by starting with sturdy plants

This is a Message of Good Cheer for late comers to the ranks of garden makers. You may gather vegetables as early as the early starters if you set out plants during June—July. Our plants are grown in soil thoroughly sterilized with live steam. The plants have been sprayed as a protection against blight and fungous diseases.

**"Double-Rooted"  
Transplanted**

# PLANTS

**\$1.00 Per 100  
Postpaid**

Though worth double the price of plants as ordinarily grown, we can sell them so reasonably because of immense quantities provided. *Guaranteed to reach destination in good condition after a week's journey.* Do not ask us to send less than 100 of one kind. Rather combine order with neighbors, thus taking advantage of the greatest bargain plant offer ever made by us. All plants are grown from selected strains secured from leading seed specialists.

**Cabbage**—for Winter use: Succession; Surehead; Danish Ballhead; for Summer use, Copenhagen Market and Burpee's All Head, Ey.

**Cauliflower**—Snowball; Dry Weather.

**Egg Plant**—New York Improved Purple.

**Peppers**—Ruby King, Chinese Giant.

**Tomatoes**—Stucky plants, 8 inches high, with extra fine root system, started under glass and repeatedly transplanted. Varieties: Earliana, Bonny Bcst, Red Rock, Stone.

I also offer for Fall Planting: Big Boston Lettuce, Egyptian Onions, and Kale Seed—Strawberry, Blackberry, Currant, Gooseberry, and Raspberry plants, also Asparagus, Rhubarb, and Cultivated French Dandelion roots. Ready for delivery during October—November and again March—April. Write for variety names, leaflets, describing my methods of growing, etc. Order NOW!

**The following at 50c per 100**

We also offer, postpaid:—

**Beet**—Crosby's Egyptian.

**Celery**—Golden Self Blanching; New Easy Blanching; Winter Queen.

**Lettuce**—Grand Rapids; Big Boston.

**Onion**—Prizetaker; Southport, Red and Yellow Globe.

**Sweet Potatoes**—Red and Yellow Jersey; Gold Standard and Southern Queen.



## W. J. RITTERSKAMP

PLANT SPECIALIST  
Lotus Gardens

## Princeton, Ind.

Electrical world, April 14, 1917.—Saw-mill waste for generating electricity, by J. B. Woods, p. 697-8.

Engineering news, March 15, 1917.—Trees planted by new machine replace railway snow fences, by Hugh Smith, p. 432-3.

Engineering news-record, May 3, 1917.—Wood-stave pipe will deliver Everett's new water supply, by R. E. Koon, p. 246-7.

Gulf Coast lumberman, May 1, 1917.—The renaissance of wood, by Robert Henry Downman, p. 40.

Hardwood record, April 25, 1917.—Figures by quarter-sawing, by Hu Maxwell, p. 16-17; Seeking boxwood substitutes, p. 19; Japanese wooden toys, p. 33.

Journal of industrial and engineering chemistry, May 1, 1917.—The chemical composition of the higher fractions of maplewood creosote, by Ernest J. Pieper and others, p. 462-5.

Lumber trade journal, April 15, 1917.—Shavings and sawdust and their uses as shown by Forest service tests, by Rolf Thelen, p. 19-20; Important conference of cut-over land interests held in New Orleans, p. 24-33.

Lumber trade journal, May 1, 1917.—Many uses for turpentine and rosin listed by the government as a result of navy inquiries, p. 39.

Lumber world review, April 25, 1917.—Opportunities for marketing American lumber abroad, by Nelson C. Brown, p. 21-3.

Lumber world review, May 10, 1917.—"Forest products exposition" at Anderson, Ind., p. 25-8.

National coopers' journal, May, 1917.—The proper drying of cooperage stock, by Thomas Robertson, p. 7.

New York lumber trade journal, April 15,

1917.—Some basic facts and invaluable suggestions concerning the lumber industry and its future possibilities in foreign trade, by J. Rogers Flannery, p. 19.

Packages, April, 1917.—Canning case specifications, p. 14; History of the laboratory, by Howard F. Weiss, p. 19.

Pioneer western lumberman, May 1, 1917.—Mountain mahogany sought by pipe manufacturers, p. 5.

Pulp and paper magazine, March 15, 1917.—The barking drum; its history and development, by Herbert Guettler, p. 261-6.

Pulp and paper magazine, April 5, 1917.—Wood as a raw material in papermaking, by Bjarne Johnson, p. 333-6; Slash disposal as a commercial proposition, by B. W. Lakin, p. 339-40.

Railway review, Jan. 27, 1917.—Grouping of ties for treatment, by C. P. Winslow, p. 128-9.

Railway review, Feb. 17, 1917.—Timber treating processes used in the United States, p. 242-3.

Railway review, April 21, 1917.—The status of the timber supply, by Logan G. McPherson, p. 571-2.

St. Louis lumberman, April 15, 1917.—Keeping tabs on Arkansas tree growth, by John B. Woods, p. 39; Report on changes in yellow pine grades, p. 54-5; Modern merchandising methods make money, by E. P. Hunter, p. 55-6.

St. Louis lumberman, May 1, 1917.—Logging along the highways, by J. B. Woods, p. 44-5; Uniform classification of forest products, p. 52.

Southern lumber journal, May 1, 1917.—Yellow pine for shipbuilding purposes has no equal anywhere, by A. C. Powers, p. 27.

Southern lumberman, April 14, 1917.—Practical afforestation, by Henry S. Graves, p. 19.

Southern lumberman, April 21, 1917.—Wooden shipbuilding campaign starts under direction of Gen. G. W. Goethals, p. 26-7.

Timber trades journal, March 24, 1917.—Empire timbers and their utilization, p. 513-26; The Swedish trade in 1916, p. 541-2; The Russian timber trade in 1916, p. 543; Russia and our future supply of building wood and wood pulp, p. 544; Review of the timber trade of 1916, p. 561-643; Engineering section, p. 645-60.

Timber trades journal, April 14, 1917.—The weights of British timber, p. 761-2.

Timberman, April, 1917.—Lumbering in Russia, by W. Toritch, p. 35; Lumbering on Alaska coast, by W. G. Weigle, p. 36; Government plans the building of 1,000 wooden vessels, 37-9; Commercial importance of sugar pine, by Louis T. Larsen, p. 42-3; Uniform lumber list submitted by west coast lumbermen, p. 48 B; Kiln drying white pines, by V. G. Gilbreath, p. 48 C; Suggestions for logging engineers, p. 48 F; Plans for wooden bridges, by O. P. M. Goss, p. 48 G.

United States daily consular report, April 17, 1917.—Lumbering operations in eastern Canada, by E. Verne Richardson, p. 212-13.

United States daily consular report, April 21, 1917.—Siam's teak trade, by Carl C. Hansen, p. 275; Lumber trade of Kiangsi province, by John R. Arnold, p. 282.

United States daily consular report, April 25, 1917.—Canada's timber resources and production, p. 330-1.

- United States daily consular report, May 4, 1917.—Timber situation in United Kingdom, by J. F. Butler, p. 459-63.
- United States daily consular report, May 7, 1917.—Mahogany production in Guatemala, by Samuel C. Reat, p. 483-4.
- United States daily consular report, May 11, 1917.—Paper-making materials in Sweden, by Per Torsten Berg, p. 546-7.
- Wood-turning, May, 1917.—Value in baseball bats, p. 16.
- Wood-worker, April, 1917.—An up-to-date casket factory, by W. H. Rohr, p. 23-4; Correct methods of drying lumber, by E. U. Kettle, p. 26-7.
- Wooden and willow-ware trade review, April 26, 1917.—Willow culture profitable, p. 25-6.

#### Forest journals

- American forestry, May, 1917.—War, lumber, and ships, p. 261-2; A million and more food gardens, p. 263-8; Foresters for national defense, p. 268-9; The fruit trees of Picardy; a poem, by Alice G. Field, p. 269; Timber cruising in the Pacific northwest, by Herman H. Chapman, p. 270-1; The vireos, by A. A. Allen, p. 272-5; A forest ranger course for the southern Appalachians, p. 275; The Oahu rain forest, by Vaughan MacCaughey, p. 276-8; Cascade Pass, Washington, p. 279; The sugar pine; identification and characteristics, by Samuel B. Detwiler, p. 280-3; Commercial uses of sugar pine, p. 283-4; Daisies, corn, cockle, bugloss, and other summer flowers, by R. W. Shufeldt, p. 285-9; The forestry guy; a poem by Arthur Chapman, p. 289; Some forest history, by Bristow Adams, p. 290-1; Community spirit saved the trees, by Gayne T. K. Norton, p. 292-3; An epoch-making conference, by Herman H. Chapman, p. 293-4; South American forest resources, p. 295-8; Harmonizing lumbering and esthetics, by C. M. Granger, p. 299-302; Pine blister disease quarantines, p. 302-3; Cut-over lands a national problem, p. 304-5; Shall the national forests be made self-supporting, p. 305-6; A victory for efficiency and economy, p. 306; A group of low-cost country houses, by Rawson Woodman Haddon, p. 307-8, 312.
- Canadian forestry journal, April, 1917.—The great forests of Russia, p. 1044-5; Odd uses of wood in war time, by A. W. Schorger, p. 1058-61; Ridding "slash" from western lands, by R. H. Campbell, p. 1063-4; The dawn of forestry in China, by Joseph Bailie, p. 1065-6; How forest reserves help the settler, p. 1067-8; Hitching up with public sentiment, by E. Allen, p. 1071-4.
- Indian forest records, 1917.—The life-history of *Diapus furtivus*, Sampson, by C. F. C. Beeson, p. 1-29.
- Indian forester, Feb., 1917.—The distribution of the sal in the Ramnagar forest division, by S. H. Howard, p. 55-70; The issue of timber licenses in Burma, by H. C. Walker, p. 70-5; Some impressions of the Kulu forests, by H. L. Wright, p. 75-80; Forestry in Mesopotamia, by M. R. K. Jerram, p. 85-8; A new species of *Acacia*, by H. H. Haines, p. 88-90; The Burma industrial exhibition, p. 91-3; International trade in matches, p. 101-5; Destruction of trees by poison, p. 106-9.
- Indian forester, March, 1917.—Commercial vs. quasi-commercial departmental teak extraction in Burma, by Htao Hai, p. 111-16; The formation of teak taungya plantations in Burma, by J. D. Clifford, p. 117-21. A note on sal timber operations in Singhbhum, Bihar, and Orissa,

"QUALITY"

LONG AND SHORT LEAF  
YELLOW PINE

QUALITY

SERVICE

MISSOURI  
LUMBER & LAND  
EXCHANGE COMPANY

CAPACITY

R. A. Long Building

Kansas City, Mo.

THE SAME

"TODAY AND TOMORROW"



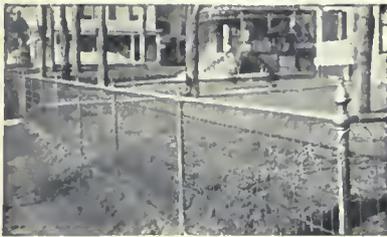
## FISKE WOVEN LAWN FENCE

will keep them out.

This sensible, reasonably priced fencing will protect your lawns and flower beds and is decorative as well.

The open wire mesh does not obstruct the view of your property and the nice construction of iron top rail and sturdy supporting posts will certainly add to the neatness and appearance of your lawn.

Made in various heights—all parts heavily galvanized by hot spelter process and rust-proof—posts deep-set-in-concrete assure permanent alignment. Write for catalog.



J. W. FISKE IRON WORKS 100-102 PARK PLACE  
NEW YORK

## Yale University Forest School

NEW HAVEN, CONN., U. S. A.

YALE University Forest School is a graduate department of Yale University. It is the oldest existing forest school in the United States and exceeds any other in the number of its alumni. A general two-year course leading to the degree of Master of Forestry is offered to graduates of universities, colleges and scientific institutions of high standing and, under exceptional conditions, to men who have had three years of collegiate training, including certain prescribed subjects. Men who are not candidates for the degree may enter the School as special students, for work in any of the subjects offered in the regular course, by submitting evidence that will warrant their taking the work to their own advantage and that of the School. Those who have completed a general course in forestry are admitted for research and advanced work in Dendrology, Silviculture, Forest Management, Forest Technology, and Lumbering. The regular two-year course begins the first week in July at the School camp near Milford, Pennsylvania.

For further information  
address

JAMES W. TOUMEY, Director  
NEW HAVEN CONNECTICUT

by O. A. Dodsworth, p. 122-7; Progress of the Casuarina plantations in western division, Kanara, by G. E. Majoribanks, p. 128-32; Wood flour and the manufacture of dynamite and linoleum, p. 158-9; Teak in Trinidad, by C. S. Rogers, p. 161-2.

Journal of forestry, March, 1917.—How lumbermen in following their own interests have served the public, by Austin Cary, p. 271-89; Laissez faire vs. foresight in forest management, by Burt P. Kirkland, p. 289-306; Timber estimating in the southern Appalachians, by R. C. Hall, p. 310-21; Some problems in Appalachian timber appraisal, by W. W. Ashe, p. 322-34; Logarithmic cross-section paper in forest mensuration, by Donald Bruce, p. 335-42; Ecology and silviculture in the southern Appalachians; old cuttings as a guide to future practice, by E. H. Frothingham, p. 343-9; Comments on terminology, p. 350-3; Juniperus cedrus, by G. B. Sudworth, p. 362-3.

Ohio forester, April, 1917.—The woodlot on Mt. Tom farm, by Eugene F. Cranz, p. 15-16; Landscape planting on rural school grounds, by R. B. Cruickshank, p. 17-18; The roots of trees and erosion, by J. J. Crumley, p. 20; Some phases of forestry work in Ohio, by J. J. Crumley, p. 21-4.

Revue des eaux et forêts, January 1, 1917. Estimation rapide de la valeur d'un chêne de taillis sous futaie, by Marcel Raux, p. 2-7; Chronique suisse, by A. Barbey, p. 8-11; Enseignements forestiers de la guerre, by L. Pardé, p. 12-15; L'école forestière en Argonne, by V. de Larminat, p. 16-19; Les bois d'aéroplanes, p. 20-4.

Schweizerische zeitschrift für forstwesen, March 1917.—Ueber das auftreten des grauen lärchenwicklers, by J. Coaz, p. 73-82.

Skogen, March, 1917.—Om det inflytande som vara skogsvarldsatsgärder kunna utöva på skogsmarkens alstringsförmåga (On the influence which our forest protective measures can exert on the productivity of the forest soil), by Henrik Hesselman, p. 73-82; Skogssällskapet (The forestry association of southwestern Sweden; its formation, object, activities, and organization), by E. L., p. 93-4; Skogsarbetarnas levnads- och arbetsförhållanden (Living and working conditions of forest workers in Norrland), by Gösta Mellström, p. 95-101.

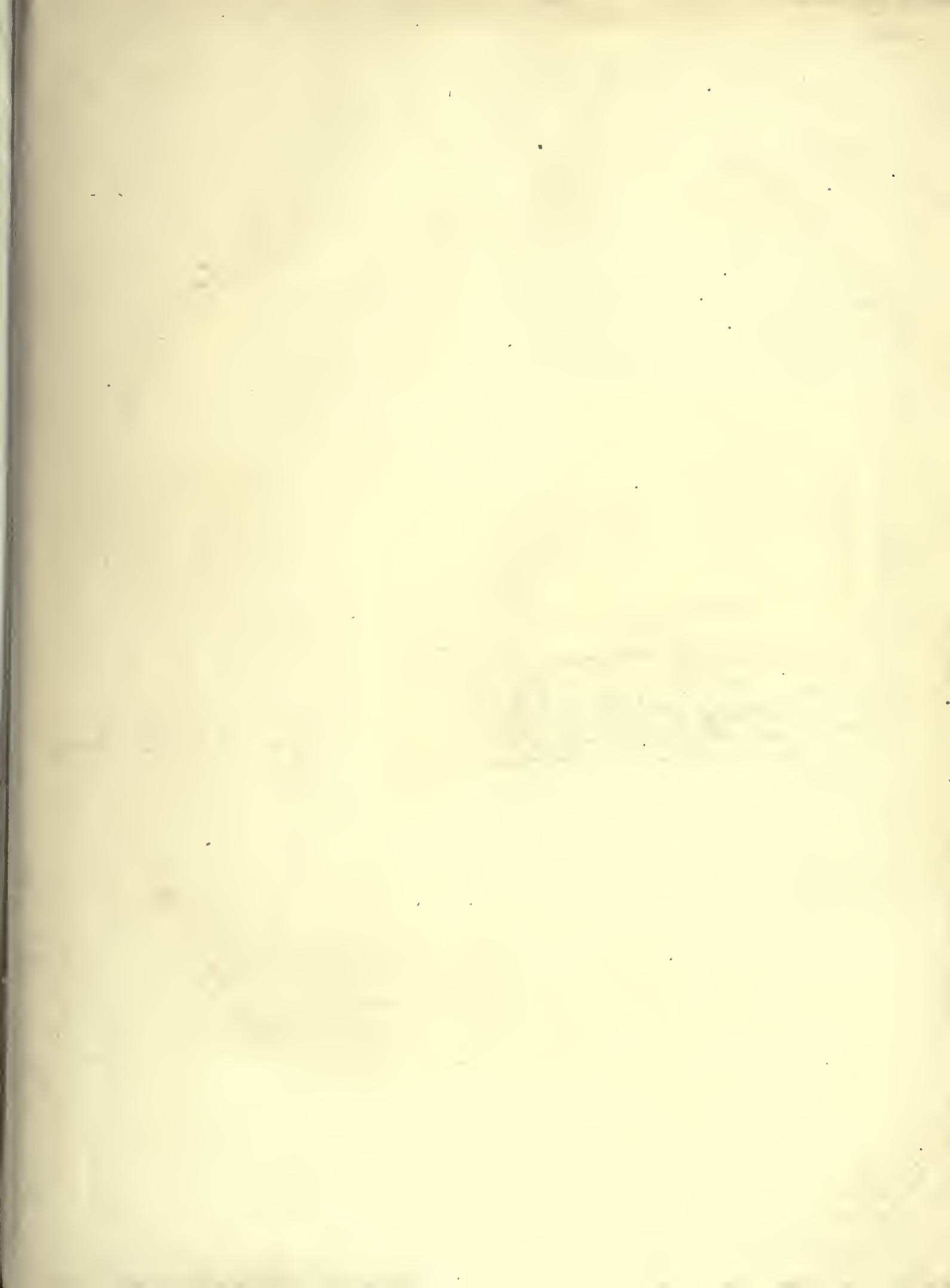
Skogsvarldsföreningens tidskrift, March 1917. Skall staten driva sagverksrörelse (Shall the state carry on a sawmill business?), by Otto Hellström, p. 269-73; Om samarbete mellan skogsvarldsnämnderna i Nor- och Västerbottens län och de år 1916 tillsatta skogsingenjörerna inom samma läns kustland (Concerning coöperation between the forest protective boards in the Norrbotten and Västerbotten district and the forest engineers added in 1916 in the whole district's coast), by Vilh. Alund, p. 273-6; Bidrag till fragan om skogsbrukets organisation (Contribution to the problem of the organization of forestry), by R. Wikander, p. 276-7.

Tree talk, March-May, 1917.—Insect enemies of trees, p. 72-4; White pine blister rust, by W. H. Rankin, p. 77-8; Modern tree surgery, p. 80-3.

## 750,000,000 Feet National Forest Timber To Be Offered For Sale

The Forest Service is now examining and will offer for sale as a pulpwood proposition the merchantable live and dead timber marked or designated for cutting on an area located in approximately Township 30 N., Ranges 8 and 9 E., W. M., on the watershed of the Stillaguamish River, Snoqualmie National Forest, Washington, estimated to be 750,000,000 feet B.M., more or less, of western hemlock, silver fir, mountain hemlock, Sitka spruce, Douglas fir, and western red cedar timber, approximately 70 per cent western hemlock, silver fir, mountain hemlock and Sitka spruce suitable for pulpwood. Formal advertisement of this timber will begin and sample contract will be prepared not later than September 1, 1917. Those interested may obtain further information from the

FOREST SUPERVISOR  
SEATTLE, WASHINGTON  
or the  
DISTRICT FORESTER  
PORTLAND, OREGON





SD American forests  
1  
A55

American forests	SD
AUTHOR	1
TITLE	A55
	v.23
	pt.1
DATE	ISSUED TO

**PLEASE DO NOT REMOVE  
SLIPS FROM THIS POCKET**

**UNIVERSITY OF TORONTO  
LIBRARY**

