

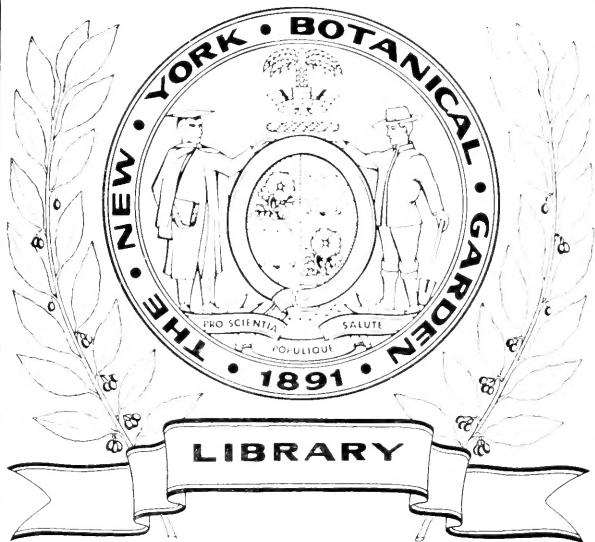
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A KEY
TO THE
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OF
Manhattan Plants,
BASED ON FRUIT CHARACTERS.

By A. S. HITCHCOCK,
*Professor of Botany in the Kansas State Agricultural College,
Manhattan, Kansas.*

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MANHATTAN, KANSAS,
MERCURY PUBLISHING HOUSE.
1894.

PREFACE.

The original intention was to publish a key to the species of flowering plants growing in the vicinity of Manhattan. With this in view full descriptions of the fruits and seeds of each species were prepared, but it was found that the cost of publication of so much matter was placed beyond what was anticipated. The work was therefore restricted to genera. In the descriptions I have endeavored to give such characters as hold true for the orders and genera as represented in the United States, exceptions being neglected. Characters which apply to our species but not necessarily to the group in general, are placed in parentheses.

The nomenclature is that used in the check list of plants of the northeastern United States.

No attempt at classification has been made here. A good working classification is that given by Caruel in Bull. Soc. Bot. France, XXXIII, 120. I find that authors differ considerably in the terminology, especially in the definition of the capsule and its modifications.

In the descriptions I have included under the term capsule, fruits such as *Cuscuta* and *Ammannia* which burst irregularly at maturity; and have grouped under the term drupaceous the true drupe with one carpel, and those forms which have more than one carpel, yet possess the essential characters of a drupe, such as *Cornus* and *Sambucus*. There are some fruits which are with difficulty placed in any classification e. g. dry, indehiscent fruits with more than one cell or seed.

The Key is prepared for the use of beginners in botany and will be used in connection with a text book.

A. S. H.

ARTIFICIAL KEY TO ORDERS OR GENERA.*

1. Fruit fleshy	2
1. Fruit dry	25
2. Drupaceous, 1 to few seeded.....	3
2. Not drupaceous	12
3. An aggregation of drupelets on an oblong receptacle.....	<i>Rubus</i> 91
3. Pome-like, with 1 to 5, 1-seeded stones.....	<i>Crataegus</i> 90
(Compare <i>Rosa</i> .)	
3. Not as above	4
4. Stone 1	5
4. Stones 2 or 3.....	9
5. Stone 2-celled.....	<i>Cornus</i> 182
5. Stone 1-celled.....	6
6. Pulp waxy, scant.....	7
6. Pulp juicy.....	8
7. Drupe black, trees	<i>Celtis</i> 36
7. Drupe white or red, shrubs or woody vines	<i>Rhus</i> 133
7. Drupe flattened, dark, submersed aquatic herbs.....	<i>Potamogeton</i> 3
8. Stone disc-shaped, with thickened margin	<i>Menispermum</i> 68
8. Stone oval or globose, somewhat 2 edged.....	<i>Prunus</i> 97
9. Stones 2	10
9. Stones 3	11
10. Fruit black, 7 mm, calyx inferior	<i>Rhamnus</i> 141
10. Fruit red, 3 to 5 mm, calyx superior.....	<i>Symphoricarpos</i> 239
11. Pulp thin and waxy, fruit orange, herbs	<i>Triosteum</i> 240
11. Pulp juicy, fruit dark purple, shrubs	<i>Sambucus</i> 238
12. Dehiscent, a fleshy capsule	13
12. Indehiscent.....	14
13. Capsules stalked, 3 to 5 on a receptacle, 2-valved... ..	<i>Xanthoxylum</i> 126
13. Capsule single, orange, 3-valved, aril scarlet.....	<i>Celastrus</i> 135
13. Capsule single, purple, 4-lobed, 4-valved, aril scarlet... ..	<i>Euonymus</i> 134
14. A pome.....	<i>Pyrus</i> 89
14. A fleshy receptacle enclosing bony akenes.....	<i>Rosa</i> 96
14. A fleshy receptacle bearing small akenes on the surface... ..	<i>Fragaria</i> 92
14. Fruit multiple, each akene enclosed in fleshy calyx	<i>Morus</i> 37
14. A 1 to many seeded berry	15
15. Many seeded, enclosed in an inflated calyx	<i>Physalis</i> 220
15. Not enclosed in inflated calyx	16

*The numbers refers to the genera or the order according as the names are in italics or small capitals.

16. Large, oblong, with several flat seeds 2 cm or more long . . . *Asimina* 60
16. Fruit and seeds smaller 17
17. Not more than 10 seeded 18
17. Seeds numerous, more than 10 23
18. Seeds 10, flat, berry dark purple surmounted by 10
styles *Phytolacca* 54
18. Seeds 1 to 6 19
19. Fruits scarlet, closely aggregated on a spadix *Arasaema* 14
19. Not as above 20
20. Berries in axillary peduncled umbels, perianth de-
ciduous *Smilax* 26
20. Berries not in umbels 21
21. Woody vines, berries in a cyme or thyrsus opposite
the leaves VITACEAE 56
21. Herbs, berries in axils of leaves or terminal clusters 22
22. Berries dark purple, 1 to several in axillary clusters. *Polygonatum* 25
22. In terminal clusters, variegated red and black *Vagnera* 24
23. Plant fleshy, spiny, seeds campylotropous, flattened. CACTACEAE 63
23. Plant not fleshy 24
24. Shrubs, remains of calyx at apex of berry *Ribes* 87
24. Herbs, calyx persistent at base of berry *Solanum* 219
25. Fruit from a compound pistil, separating at matur-
ity into its carpels, these indehiscent or more or
less 2-valved 26
25. Not as above 36
26. In dense terminal heads, calyx superior, a shrub. *Cephalanthus* 235
26. Not as above 27
27. Separating into 2 indehiscent carpels 28
27. Separating into 3 2-valved carpels *Ceanothus* 140
(Compare *Euphorbiaceae*.)
27. Separating into 4 indehiscent carpels 30
27. Carpels in a ring, separating into 5 or more indehis-
cent or 2-valved portions 32
28. Carpels forming a samara with a terminal wing, trees *Acer* 137
28. Carpels not forming samaras, herbs 29
29. In umbels or heads, carpels ribbed or winged on back,
separating from a central axis UMBELLIFERAE 67
29. In heads, calyx inferior, carpels oblong *Lippa* 200
29. Inflorescence open, calyx superior, carpels hemispherical. *Galium* 237
30. Leaves alternate, fruit deeply lobed BORRAGINACEAE 78
30. Leaves whorled, aquatic herbs *Myriophyllum* 174
30. Leaves opposite 31
31. Fruit lobed before separation, style 1, terrestrial herbs. LABIATAE 81
31. Fruit lobed, styles 2, aquatic herbs *Callitriche* 132
31. Fruit oblong, not lobed *Verbena* 199
32. Carpels numerous, indehiscent 33

32. Carpels 2-valved.....	34
33. Carpels beaked	<i>Callirrhoe</i> 148
33. Carpels beakless	<i>Malva</i> 147
34. Carpels 5	35
34. Carpels 12 to 15	<i>Abutilon</i> 146
35. Involucre none, valves beaked	<i>Sida</i> 150
35. Involucre 3-leaved, valves not beaked.....	<i>Malvastrum</i> 149
36. Fruit from a single pistil, separating transversely into 1-seeded joints	<i>Meibomia</i> 98
36. Not separating transversely	37
37. Fruit a legume, 1-celled with 1 parietal placenta. .	LEGUMINOSAE 41
37. Fruit not a legume	38
38. An utricle, 1-celled, 1-seeded, with papery pericarp.....	39
38. Not an utricle	40
39. Utricles imbricated with scarious bracts.....	AMARANTACEAE 25
39. No scarious bracts	CHENOPODIACEAE 24
40. Fruit large, 1-celled, 1-seeded, with a deeply 4-lobed embryo, surrounded by a bony nut-shell and a woody or spongy shuck	JUGLANDACEAE 15
40. Not as above.....	41
41. Fruit indehiscent	42
41. Fruit dehiscent by valves or bursting irregularly.....	60
42. Large (6 to 8 cm), many seeded, with a woody peri- carp	<i>Cucurbita</i> 243
42. Obpyramidal, angled, closely packed in spherical heads, but not surrounded by an involucre, peri- carp woody, 1-2 celled, 1-2 seeded.....	<i>Sparganium</i> 2
42. Three-seeded, surrounded by a scant flesh	<i>Triosteum</i> 240
42. Two-celled, 2-seeded, not in heads	43
42. One-seeded	44
43. A samara, winged all around (sometimes 1-seeded).....	<i>Ptelea</i>
43. Not winged	<i>Circaea</i> 173
44. A samara.....	45
44. An acorn.....	<i>Quercus</i> 34
44. Fruit in dense peduncled heads, capillary bristles at base of each, trees	<i>Platanus</i> 88
44. Fruits minute on long-bristled stalks, closely aggre- gated in long brown spikes; marsh plants.....	<i>Typha</i> 1
44. Fruits few in a membranous, reticulated, 5-lobed in- volucre, each 5-ribbed.....	<i>Allionia</i> 55
44. An akene, several or many in a head surrounded by an involucre.....	COMPOSITAE 92
44. Akenes 2, enclosed in an indurated bur-like invo- lucre	46
44. Akenes several from one flower.....	47
44. Fruit single in a flower, an akene or 1-seeded nutlet.....	53
45. Wing terminal	<i>Fraxinus</i> 186

45. Wing all around *Ulmus* 35
46. Involucre top-shaped, hooks in a circle around the upper part..... *Agrimonia* 95
46. Involucre ovoid, hooks all over..... *Xanthium* 268
47. Akene bearing a slender hook, heads globular..... *Geum* 94
47. Akene with a long villous or plumose tail (style)..... *Clematis* 64
47. Akenes more or less beaked, but not tailed..... 48
48. Sepals 3, stem endogenous **ALISMACEAE** 4
48. Sepals 5 or more, or deciduous..... 49
49. Sepals 5, with 5 alternating bractlets *Potentilla* 93
49. No bractlets..... 50
50. Sepals deciduous, akenes scarcely flattened, glabrous, strongly ribbed *Thalictrum* 67
50. Sepals persistent, not ribbed..... 51
51. Receptacle much elongated, akenes glabrous..... *Myosurus* 65
51. Receptacle convex or oblong..... 52
52. Akenes glabrous, beak oblique *Ranunculus* 66
52. Akenes pubescent or woolly, beak straight..... *Anemone* 63
53. Pericarp covered with slender, easily detached, downwardly barbed bristles *Sicyos* 242
53. Fruit drupaceous, flesh, very scant..... *Rhus* 133
53. A globose nut with woody, felty-pubescent pericarp, peduncle of cluster attached to a leaf-like bract, trees *Tilia* 145
53. In terminal clusters, globular, bearing the superior, 5-lobed, persistent calyx lobes, herbs..... *Comandra* 45
53. Pericarp thin, fruit enclosed in 5-lobed indurated calyx, deflexed on axis *Phryma* 201
53. Sessile in spikes, 4 to 8 angled or ribbed 54
53. Not as above, an akene..... 55
54. Nutlets 4-angled *Gaura* 171
54. Nutlets 8-ribbed or winged..... *Stenosiphon* 172
55. Endogenous grass or rush-like herbs 56
55. Exogenous plants 57
56. Fruit in the axis of a scale, no scale above fruit... **CYPERACEAE** 6
56. Fruit with a scale above and below, leaves 2-ranked **GRAMINEAE** 5
57. Akene enclosed in an inflated sac, in oblong catkins..... 58
57. Akene not thus enclosed 59
58. Trees, akene oblong, smooth, nerved..... *Ostrya* 33
58. Herbaceous vine, akene orbicular, besprinkled with reddish atoms..... *Humulus* 38
59. Sepal 1, folded around the 2-edged akene..... *Cannabis* 39
59. Sepals 3 or 4, or calyx tubular or 4-lobed above..... **URTICACEAE** 21
59. Sepals 5 or 6, akene lenticular or 3-angled..... **POLYGONACEAE** 23
- (Compare *Ambrosia* 269.)

60. Capsule dehiscing by holes in the side CAMPANULACEAE 91
60. Capsule many seeded enclosed in a spathe, aquatic
endogens *Heteranthera* 17
60. Capsule bursting irregularly, or opening by a hole
or irregularly at top 61
60. Capsule dehiscing regularly 65
61. Capsule 1-celled 62
61. Capsule 2 celled, 1-3 seeded, vines 63
61. Capsule 4-celled, many seeded 64
62. Globose, placenta central, calyx inferior *Utricularia* 231
62. Oblong, placentae parietal, calyx superior *Mentzelia* 157
63. Globose, smooth; parasitic, vines *Cuscuta* 192
63. Ovoid, prickly; not parasitic *Echinocystis* 241
64. Enclosed in 4-angled calyx *Ammannia* 160 and *Rotula* 161
64. Capsule 4-angled, calyx lobes 4, superior *Ludwigia* 164
65. Dehiscence by a circumcissile line 66
65. Dehiscence not circumcissile 68
66. Capsule 2-celled, few seeded *Plantago* 235
66. Capsule 1-celled, many seeded 67
67. Sepals 2, broad and enclosing the sessile capsule *Portulaca* 57
67. Sepals 5, narrow, erect, pedicels slender *Anagallis* 185
68. Capsule 1-celled, 1 2-seeded, 2-valved somewhat
fleshy *Xanthoxylum* 126
68. Capsule 1-celled, placenta central, seeds four or more 69
68. Capsule 1 celled with parietal placentae or 2-3 celled 78
68. Capsule 4-celled, calyx superior, seeds numerous 71
68. Capsule 5 or more celled 72
69. 3-valved at summit 70
(Compare *Solanum rostratum* 219.)
69. 5-valved at summit, in umbels *Androsace* 183
69. 6-valved at summit *Silene* 58
70. Capsule enclosed in wing-angled calyx, seeds globose,
about 4 *Saponaria* 59
70. Not enclosed in calyx, seeds several, angled *Stevronema* 184
71. Seeds comose *Epilobium* 165
71. Seeds not comose *Onagra, etc.*, 166
72. Calyx superior, capsule 10 ribbed, tapering at base *Jussiaea* 163
72. Calyx adherent to lower part of 5 horned capsule *Penthorum* 86
72. Calyx inferior 73
73. Capsule more than 5-celled 74
73. Capsule 5-celled 75
74. Imperfectly 10 celled, 10 seeded *Linum* 125
74. 12-15 celled, seeds about 3 in each cell *Abutilon* 146
75. Seeds 1 in each cell, capsule elastically 5 valved from
below *Geranium* 123
75. Seeds more than 1 in each cell 76

76. Dehiscence explosive, calyx not enlarged 77
76. Dehiscence not explosive, calyx enlarged, veiny..... *Hibiscus* 151
77. Valves elastically coiling..... *Impatiens* 139
77. Valves pinching out the seeds and collapsing on the axis..... *Oxalis* 124
78. Seeds numerous, comose, fruit 1-celled 79
78. Seeds not comose..... 81
79. Fruit a follicle, 2 to each flower, herbs 80
79. Placentae 2-4, trees or shrubs **SALICACEAE** 16
80. Follicles long and slender *Apocynum* 188
80. Follicles ovate or fusiform..... **ASCLEPIADACEAE** 73
81. Fruit a follicle..... 85
81. Not a follicle..... 83
82. Follicles 3 to each flower..... *Delphinium* 62
82. Follicles 4 or 5 *Aquilegia* 61
83. Capsule 3 celled, or 1 celled with 3 parietal placentae..... 84
83. Capsule 1-celled with 2 parietal placentae 95
83. Capsule 1 with 4 or 5 parietal placentae..... 98
83. Capsule 2-celled..... 99
84. Seeds 1 in each cell, capsule not inflated..... 82
84. Seeds 2 or more in each cell 87
85. 1 of the 3 cells indehiscent..... *Commelyna* 15
85. All of the cells dehiscent..... 86
86. Calyx 5 lobed, supporting the smooth globose capsule..... *Phlox* 193
86. Sepals 3, endogenous herb *Tradescantia* 16
86. Capsule large, leathery, prickly, seeds about 2 cm *Aesculus* 138
86. Capsule 3 lobed, calyx absent or if present, the pericarp pubescent **EUPHORBIACEAE** 47
87. Pericarp bladdery-inflated, capsule 3-celled, 3-lobed at summit *Staphylea* 136
87. Pericarp not much inflated 88
88. Sepals inferior, 6, narrow and glumaceous, endogens *Juncus* 18
88. Sepals if present not glumaceous..... 89
89. Capsule 3-celled 90
89. Capsule 1-celled with 3 parietal placentae 92
90. Calyx superior, capsules umbellately clustered from a 2-leaved spathe, leaves equitant and stem flat... *Sisyrinchium* 27
90. Calyx inferior 91
91. Sepals 6, stem endogenous **LILIACEAE** 11
91. Sepals 5, seeds several *Mollugo* 56
91. Sepals 5, seeds 6, velvety, 5 mm..... *Ipomoea* 189
91. Sepals 5, petals 3, withering persistent, seeds 6, very small *Lechea* 154
92. Capsule dehiscent explosively, the valves widely spreading **VIOLACEAE** 61

92. Dehiscence not explosive, valves erect. 93
93. Seeds exceedingly small and numerous, calyx superior. *Gyrostachys* 28
93. Seeds rather few, sepals 5, inferior 94
94. Sepals about equal, leaves all opposite *Hypericum* 152
94. Sepals unequal, 2 much smaller, leaves mostly alternate. *Helianthemum* 153
95. Seeds 4, calyx enlarged, 5 lobed *Macrocalyx* 194
95. Seeds more than 4. 96
96. Seeds borne all over the inside of the valves. *Gentiana* 187
96. Seeds borne only along the suture. 97
97. Seeds crested, oblong *Bicuculla* 70 and *Capnoides* 71
97. Seeds not crested, kidney-shaped. CAPPARIDACEAE 36
98. Capsule 2-valved, smooth herb. *Orobanche* 232
98. Capsule 4 or 5 valved, prickly herb *Argemone* 69
99. Placentae parietal. 100
99. Placentae axile. 101
100. Placenta 1, fruit 1 carpelled. *Astragalus* 114
100. Placentae 2, connected by a false partition. CRUCIFERAE 35
101. Calyx superior 102
101. Calyx inferior 103
102. Calyx 5 cleft, 10-angled, seeds numerous *Lobelia* 244
102. Calyx 4-cleft, 4-ribbed, seeds few *Houstonia* 236
103. Seeds few (1 to 8). 104
103. Seeds numerous 105
104. Seeds 2, crested. *Polygala* 127
104. Seeds 4 to 8, lenticular, supported by curved stalks ACANTHACEAE 86
104. Seeds 2 to 6, angular, no long stalks. CONVOLVULACEAE 747
105. Capsule thorny, imperfectly 4-celled *Datura* 221
105. Capsule membranous, enclosed in the 10-14 ribbed calyx tube. *Lythrum* 162
105. Not as above, calyx usually persistent, inferior SCROPHULARIACEAE 83

DESCRIPTIONS OF GENERA.

MONOCOTYLEDONEÆ (Stem Endogenous).

ORDER 1. TYPHACEAE.

1. *Typha*. 1-seeded, closely aggregated on an elongated axis, very small, on long stalks which bear numerous hair-like bristles. Marsh herb.

ORDER 2. SPARGANIACEAE.

2. *Sparganium*. Nut-like, 1 or 2 celled, 1 or 2 seeded, obpyramidal, closely aggregated in globular heads with interspersed scales. Marsh herbs.

ORDER 3. NAIADACEAE.

3. *Potamogeton*. Drupaceous, 4 or less to each flower, flesh scant. Aquatic herbs (entirely submersed).

ORDER 4. ALISMACEAE.

Akenes, several from 1 flower, the 3 outer perianth divisions persistent. Marsh herbs.

4. *Alisma*. Akenes in a circle, flattened. Heads numerous, pangled.

5. *Echinodorus*. Akenes in a head, turgid, ribbed. Heads several.

6. *Lophotocarpus*. Akenes in a head, flattened, ribbed, enclosed by the sepals. Heads few.

7. *Sagittaria*. Akenes in a head, flattened. Sepals reflexed, heads few.

ORDER 5. GRAMINEAE.

Usually a caryopsis; (sometimes the seed is free from the pericarp), enclosed within 2 scales, the upper scale, next to the axis, is 2-keeled on the back, while the lower is 1-nerved or keeled in the middle of the back, or convex. The flowers or fruits are usually in 2-ranked clusters, with a pair of empty scales at the base of the cluster. Herbs with 2-ranked leaves. A large order with numerous genera and species.

ORDER 6. CYPERACEAE.

An Akene in the axis of a bract, often surrounded by bristles or a sac, but no bract between the fruit and the axis. Fruits usually gathered in spikes or heads. Herbs with 3-ranked leaves.

8. *Cyperus*. Scales 2-ranked, strongly keeled. Akene flat or triangular, naked, spikelets in spikes or heads.

9. *Eiophorum*. Scales in this and the following genera, several ranked. Akene triangular, surrounded by several long bristles.

10. *Scirpus*. Bristles around akene few and short or none.

11. *Eleocharis*. Spike single terminating the naked stem. Akene surrounded by bristles and tipped with a tubercle.

12. *Carex*. Akene enclosed in a sac.

13. *Fuirena*. Scales with an awn on the back below the tip.

ORDER 7. ARACEAE.

14. *Arasacma*. Berries crowded on a fleshy axis, usually surrounded or supported by a more or less rolled up leaf (spathe). (Berries scarlet, 1-celled, 1 to few seeded. Herbs).

ORDER 8. COMMELINACEAE.

Capsule 2-3-celled, seeds 3 or more, dehiscence loculicidal. Herbs.

15. *Commelina*. Capsule 3-celled (3-seeded, 1 cell indehiscent. Fruit enclosed in spathe.)

16. *Tradescantia*. Capsule 3-celled, all dehiscent. (Seeds about 3, elliptical, flattish, on one side a pit with radiating ridges, on the other a longitudinal ridge with transverse wrinkles on each side.)

ORDER 9. PONTEDERIACEAE.

17. *Heteranthera*. Capsule more or less completely 3-celled by the intrusion of the placenta, seeds numerous. Aquatic herbs. (Capsule enclosed in the spathe.)

ORDER 10. JUNCACEAE.

18. *Juncus*. Capsule 3-celled or 1-celled with 3 parietal placenta, loculicidally 3-valved. Divisions of perianth 6, scale-like, persistent. Seeds small and numerous. Grass-like herbs.

ORDER 11. LILIACEAE.

Fruit 3-celled, a berry or capsule. Perianth inferior. Herbs.

19. *Zygadenus*. Capsule 3-lobed. (Septicidally 3-valved at summit. Seeds about 6, angled, oblong.)

20. *Allium*. Capsules in umbels on naked stems, supported by a 1 to 3-valved spathe, loculicidally dehiscent. Seeds 3-6, usually angular. Plant with the odor of onions.

21. *Nothoscordum*. As in *Allium* but no odor of onions.

22. *Erythronium*. Capsule loculicidal, solitary, nodding. Low plants with 2 leaves and a scape.

23. *Yucca*. Capsules several (large and woody, imperfectly 6-celled, by a false partition from the back of each cell, 6-valved at summit. Seeds

numerous, flat, black, closely crowded crosswise in the 6 cavities. Leaves long and sharp pointed).

24. *Vagnera*. Berries nearly globular, in clusters terminating the stem. Seeds 1-2. Perianth withering, persistent.

25. *Polygonatum*. Berries globular, from the axils of the leaves. Seeds usually not more than six.

ORDER 12. SMILACEAE.

26. *Smilax*. Berry 3-celled, globular, seeds 6 or less. Herbs or woody vines provided with a pair of tendrils near the base of the petiole.

ORDER 13. IRIDACEAE.

27. *Sisyrinchium*. Capsules 3-celled, somewhat 3-angled, loculicidally dehiscent. Flowers from a spathe. Grass-like herbs with equitant leaves and a 2-edged stem.

ORDER 14. ORCHIDACEAE.

28. *Gyrostachys*. Capsule 1-celled, 3-valved, with 3 parietal placentae and innumerable minute seeds. Herbs.

DICOTYLEDONEÆ (Stem Exogenous).

ORDER 15. JUGLANDACEAE.

Fruit 1-seeded, but more or less 2-4-celled by partitions between the lobes of the embryo. The pericarp consists of an inner bony indehiscent portion and an outer more spongy or leathery covering. Trees.

29. *Juglans*. Outer covering, spongy, indehiscent.

30. *Hicoria*. Outer covering leathery or woody, splitting from the top more or less completely into four valves.

ORDER 16. SALICACEAE.

Capsule, 1-celled, 2-4 valved; placentae parietal or basal. Seeds numerous, provided with a silky coma. Trees or shrubs.

31. *Populus*. A cup-shaped disk at base of capsule. (Capsules ovate, 10-12 mm, 2-4 valved, in long, loose racemes. Placentae parietal).

32. *Salix*. No cup-shaped disk. (Capsules tapering above into a beak, 2-valved, in close racemes. Placenta basal).

ORDER 17. BETULACEAE.

33. *Ostrya*. Akene smooth, enclosed in the inflated sac-like involucre, the latter gathered in a short catkin. Tree.

ORDER 18. FAGACEAE.

34. *Quercus*. Fruit an acorn. The 1-celled, 1-seeded nut, supported by an involucre (cup) of numerous scales. Trees or shrubs.

ORDER 19. ULMACEAE.

Fruit 1-celled, 1-seeded, indehiscent, dry or fleshy. Trees.

35. *Ulmus*. Membranaceous samara, winged all around.
 36. *Celtis*. Drupe globular, axillary, solitary or few. Calyx persistent at base. Stone globular (ridged, 5 mm).

ORDER 20. MORACEAE.

Fruit an akene. Calyx inferior.

37. *Morus*. Calyx fleshy. Fruit multiple, resembling a blackberry. Trees.
 38. *Humulus*. Akene enclosed in the sac-like calyx; sacs in an oblong head; bracts foliaceous. Herbaceous vine.
 39. *Cannabis*. Calyx of 1 sepal folded around the 2-edged akene, sharp pointed; bracts narrow. Herb.

ORDER 21. URTICACEAE.

Fruit an akene. Sepals inferior, usually persistent. Herbs.

40. *Urtica*. Sepals 4, the two outer short and narrow, the inner large and enclosing the flat, ovate akene.
 41. *Urticastrum*. Flowers in loose, terminal cymes. Sepals 4 (only 2 noticeable in fruit). Akene flat and very oblique, reflexed on the broadly-winged pedicel.
 42. *Adicea*. Sepals 3. (Three rudimentary stamens curved under the ovate flattened akene, which they discharge at maturity by their elasticity).
 43. *Boehmeria*. Akene enclosed in the calyx. (Calyx continued above the ovoid flattened akene as a thick wing. Fruit in dense spikes).
 44. *Parietaria*. Ovoid akene enclosed in the tubular, 4-lobed, nerved calyx. In axillary-bracted clusters.

ORDER 22. SANTALACEAE.

45. *Comandra*. Fruit 1-celled, 1-seeded, indehiscent, drupaceous (but dry). Calyx lobes 5, superior, persistent. Herb.

ORDER 23. POLYGONACEAE.

Akene lenticular or angled. Calyx inferior, persistent. Herbs with sheathing stipules.

46. *Rumex*. Akene 3-angled, 3 outer sepals reflexed, 3 inner erect, enclosing the akene, often considerably enlarged
 47. *Polygonum*. Akene lenticular or 3-angled, usually enclosed by the 5-6 parted calyx. Sepals all erect.

ORDER 24. CHENOPODIACEAE.

Fruit a 1-seeded utricle, usually enclosed by the inferior, persistent calyx. No scarious bracts. Herbs.

48. *Chenopodium*. Calyx 5-parted. Seed lenticular (horizontal.) Utricle indehiscent, but sometimes easily breaking away.

49. *Cycloloma*. Calyx 5-parted, partially enclosing the horizontal fruit, the lobes furnished with a continuous, scarious, horizontal wing.

50. *Monolepis*. Sepal 1. Seed vertical, lenticular.

51. *Salsola*. Calyx 5-parted, each division with a broad, scarious wing on back. Seed horizontal, lenticular.

ORDER 25. AMARANTACEAE.

Fruit much as in *Chenopodiaceae*, but imbricated with scarious bracts. Herbs.

51a. *Amaranthus*. Bracts 3, sepals 3-5 (utricle dehiscent by a circumcissile line, 2-3 beaked. Seed horizontal).

52. *Acnida*. No calyx. Utricle circumcissily dehiscent. Seed vertical.

53. *Froelichia*. Bracts 3. Calyx tube 5-cleft, 2-winged and woolly with long hairs, enclosing the indehiscent utricle.

ORDER 26. PHYTOLACCACEAE.

54. *Phytolacca*. Berry 10-celled, 10-seeded, dark purple, the 5 sepals persistent at base and the 10 styles at summit. Seeds vertical. Herb.

ORDER 27. NYCTAGINACEAE.

55. *Allionia*. Fruit nut-like, 1-celled, 1-seeded, indehiscent, tightly enclosed in the persistent base of the calyx tube, 3 to 5 together in a 5-lobed membranous involucre, ribbed or angled. Herbs.

ORDER 28. AIZOACEAE.

56. *Mollugo*. Capsule 3-celled, loculicidally 3-valved, partitions separating from the axis, sepals 5, inferior, persistent. Seeds several. Herb.

ORDER 29. PORTULACACEAE.

57. *Portulaca*. Capsule 1-celled, circumcissily dehiscent, through the pericarp and the two enclosing sepals. Placenta basal, seeds numerous, attached by slender stalks. Herbs.

ORDER 30. CARYOPHYLLACEAE.

Capsule 1-celled (enclosed in the calyx tube). Placenta central or basal. Seeds usually many. Herbs.

58. *Silene*. Capsule sometimes 3-celled at base (6-valved at summit). Seeds several.

59. *Saponaria*. Capsule 4-valved at summit (seeds about 4).

ORDER 31. ANONACEAE.

60. *Asimina*. Fruit an oblong berry, with several large, flat, horizontal seeds (solitary or 2-3 on a receptacle, yellowish-green about 1 dm long): Small tree.

ORDER 32. RANUNCULACEAE.

Fruit a single carpel. (An akene or follicle, more than 1 to each flower.) Herbs.

61. *Aquilegia*. Follicles 5 (or 4) erect. Seeds numerous (smooth).

62. *Delphinium*. Follicles erect (3). Seeds numerous (deeply reticulated).

63. *Anemone*. Akenes numerous, flattened, pointed, but not plumose tailed, from slightly pubescent to densely woolly. (Style not much longer than the body.)

64. *Clematis*. Akenes numerous, long-tailed, margined. Vines.

65. *Myosurus*. Akenes numerous on a much elongated receptacle (flat, quadrangular, with a ridge on back extending up into a beak).

66. *Ranunculus*. Akenes numerous in a globose or oblong head (glabrous, lenticular, more or less obliquely beaked)

67. *Thalictrum*. Akenes few, ribbed, scarcely flattened.

ORDER 33. MENISPERMACEAE.

68. *Menispermum*. Drupe globular, 1-seeded, stigma scar near base. Stone disc-shaped, thicker at the edges than in the middle. Woody vine.

ORDER 34. PAPAVERACEAE

Fruit dry, 1-celled ; placentae parietal, (dehiscent ; seeds numerous.) Herbs.

69. *Argemone*. Capsule prickly (4-5 valved from the top along the sutures, placentae extending upward and persistent with the stigma after the separation of the valves. Seeds globose).

70. *Bicuculla*. Placentae 2, capsule dehiscent along the sutures. Seeds crested (black, shining, slightly pitted).

71. *Capnoides*. (Differs from *Bicuculla* in having the capsule more slender, 1 cm long, 1½ mm wide, and torulose).

ORDER 35. CRUCIFERAE.

Fruit a 2-carpelled capsule, 2-celled by a false partition extending between the 2 parietal placentae, dehiscing by the separation of the 2 valves from the partition. Herbs.

KEY TO OUR GENERA.

- | | | |
|----|--|-------------------|
| 1. | Capsule more or less elongated, flattened parallel to partition..... | 2 |
| 1. | Capsule elongated, terete or 4-angled..... | 5 |
| 1. | Capsule short, flattened contrary to partition..... | 6 |
| 2. | Valves nerveless..... | 3 |
| 2. | Valves 1-nerved, flat, linear, sometimes curved, seeds
(in 1 row) flat, margined or winged..... | <i>Arabis.</i> 72 |
| 3. | Capsule oval-oblong, ends rounded, seeds in 2 rows,
(flat, minutely pitted)..... | <i>Draba.</i> 73 |

3. Capsule elongated, seeds in 1 row.....	4
4. Capsule linear, flat, raceme elongated... ..	<i>Cardamine.</i> 74
4. Capsule tapering upward, raceme short.....	<i>Dentaria.</i> 75
5. Valves nerveless, convex. Seeds small and numer- ous, globular (capsule oblong).....	<i>Roripa.</i> 76
5. Capsule strongly beaked; 1-seeded or empty. Seeds globose in 1 row.....	<i>Brassica.</i> 77
5. Capsule cylindrical, not strongly beaked (closely ap- pressed to stem).....	<i>Sisymbrium.</i> 78
5. As above but capsules erect on spreading pedicels....	<i>Descurainia.</i> 79
6. Elliptical, turgid, style prominent.....	<i>Camelina.</i> 80
6. Triangular-obcordate; seeds numerous.....	<i>Bursa.</i> 81
6. Lenticular, 2 seeded.....	<i>Lepidium.</i> 82
6. Orbicular, with a wide wing; seeds few.....	<i>Thlaspi.</i> 83

ORDER 36. CAPPARIDACEAE.

Capsule 1-celled with 2 parietal placentae. Seeds kidney-shaped.
Herbs.

84. *Polanisia*. Capsule sessile in the calyx, (glandular pubescent, flattish. Dehiscent at apex where valves separate from placentae).

85. *Cleome*. Capsule raised on a (2 cm) stipe, (glabrous, terete but somewhat knotty. Valves completely separating from placentae).

ORDER 37. CRASSULACEAE.

86. *Penthorum*. Capsules 5 (4-6) celled, the cells extending upwards into a beak. Calyx partially adnate to ovary. Dehiscence by the beaks and sides falling away from the center and partitions. Seeds small and very numerous.

ORDER 38. SAXIFRAGACEAE.

87. *Ribes*. Berry globose, 1-celled, many seeded; placentae, parietal; calyx superior. Shrubs.

ORDER 39. PLATANACEAE.

88. *Platanus*. Fruit 1-celled, 1-seeded, indehiscent, coriaceous, club-shaped, sessile in dense, peduncled heads, furnished with a copious cluster of tawny hairs at base. Trees.

ORDER 40. ROSACEAE.

Pistils 1 to many in each flower, simple. Fruit various, drupe, follicle, akene, or aggregation of drupelets. Herbs, shrubs, or trees.

89. *Pyrus*. Fruit a pome, the 2-5 carpels sunk in the receptacle which completely encloses them, and more or less united with each other. Receptacle fleshy, pericarp cartilaginous (the core), each carpel 2-seeded (pome greenish, 2 cm or more). Trees.

90. *Crataegus*. Fruit a small pome (scarlet), but the pericarp or a portion of it, becoming crustaceous, forming 1 to 5, 1-seeded nutlets. Trees.

91. *Rubus*. Fruit an aggregation of numerous little drupelets on an oblong receptacle. Calyx 5 parted, persistent. Shrubs.

92. *Fragaria*. Fruit formed of the enlarged and pulpy, scarlet receptacle, with the numerous akenes upon its surface. Calyx 10-cleft, persistent. Herbs.

93. *Potentilla*. Akenes several in a head (receptacle pubescent). Calyx 10-cleft, persistent. Herbs.

94. *Geum*. Akenes numerous in a head; long style persistent (hooked at extremity). Herbs.

95. *Agrimonia*. Akenes 2, enclosed in the top-shaped "calyx tube," the upper part of which is beset with numerous hooked bristles. Herbs.

96. *Rosa*. Akenes or nutlets several, bony and hairy, enclosed by the urn-shaped fleshy receptacle. Calyx lobes 5, more or less persistent. Shrubs.

97. *Prunus*. Drupe with a large more or less 2 edged stone. (Globose or ovoid, scarlet or yellowish, or dark red.) Trees or shrubs.

ORDER 41. LEGUMINOSAE.

Fruit a legume. A single carpel with a parietal placenta. Dehiscence along both sutures, or indehiscent. Sometimes 2-celled by a false partition between the sutures or jointed by transverse partitions between the seeds. Herbs, shrubs, or trees.

KEY TO OUR GENERA.

- | | | |
|---|----------------------|-----|
| 1. Fruit separating into 1-seeded indehiscent joints,
flat, beset with minute barbed hairs. Herbs..... | <i>Meibomia</i> . | 98 |
| 1. Not separating into joints..... | | 2 |
| 2. Legume prickly..... | | 3 |
| 2. Legume unarmed..... | | 4 |
| 3. Prickles hooked, legume slightly dehiscent, oblong,
few seeded. Herbs..... | <i>Glycyrrhiza</i> . | 99 |
| 3. Prickles straight, legume 4-valved by the separation
of the sides from the two thickened margins.
Seeds several, scurfy. Prickly herbs.... | <i>Morongia</i> . | 100 |
| 4. Elongated, usually dehiscent, several seeded, not
inflated..... | | 5 |
| 4. Not elongated, indehiscent or tardily dehiscent..... | | 15 |
| 5. Large, woody, scarcely dehiscent..... | | 6 |
| 5. Smaller, not woody, dehiscent..... | | 7 |
| 6. Oblong, seeds orbicular, flattish, large (1½ to 2 cm).
surrounded by pulp. Trees..... | <i>Gymnocladus</i> . | 101 |

- 6 Elongated, usually twisted; seeds oblong 5x13 mm.
 Thorny trees *Gleditschia*. 102
7. Coiled spirally, several seeded. Herbs..... *Medicago*. 103
7. Not coiled 8
8. Ventral suture, wing margined, legume thin and flat..... 9
8. Not winged 10
9. Legume rounded above. Trees..... *Robinia*. 104
9. Legume acute at both ends. Trees..... *Cercis*. 105
10. Seeds separated by transverse partitions 11
10. No transverse partitions 12
11. Legumes in racemes, several seeded... .. *Cassia*. 106
11. Legumes in heads, few seeded..... *Acuan*. 107
12. Legume and seeds flat. Vines 13
12. Legume terete or somewhat flattened 14
13. Ciliate margined, 3 to 4 cm long..... *Falcata*. 108
13. Glabrous, margin thickened, 10 cm long..... *Apios*. 109
14. Seeds globular, valves glabrous, not conspicuously
 coiled in dehiscence..... 23
14. Seeds oblong or angular, valves pubescent, tightly
 coiled in dehiscence. Vines..... *Phaseolus*. 110
15. Legume enclosed in the persistent calyx and corolla;
 in heads; small and thin, few seeded *Trifolium*. 111
15. Corolla deciduous 16
16. Legume several seeded, usually inflated 17
16. Legume 1-2-seeded 19
17. Strongly beaked and stipitate, tardily dehiscent,
 seeds numerous; calyx persistent... .. *Baptisia*. 112
17. Not conspicuously beaked or stipitate..... 18
18. One-celled, inflated, dehiscent, seeds rattling in the
 pod..... *Crotalaria*. 113
18. Two-celled and inflated, or 1-celled and turgid,
 slightly or tardily dehiscent, oblong or ovoid *Astragalus*. 114
19. Flat, orbicular, reticulated, 1-seeded, included in
 the calyx..... *Lespedeza*. 115
19. Not as above 20
20. In dense spikes, included in calyx, not flattened... *Kuhnistera*. 116
20. Terete, oblong, not included in calyx..... 21
20. Flattened or globose, or if oblong, enclosed in calyx .. 22
21. Canescent or glandular. Shrubs *Amorpha*. 117
21. Glabrous. Herbs..... *Melilotus*. 118
22. Calyx teeth long, persistent, very villose..... *Parosela*. 119
22. Calyx teeth, not villose; legume indehiscent..... *Psoralea*. 120
23. Five to six cm long, 1 cm wide *Lathyrus*. 121
23. Two to three cm long, one-half cm wide *Vicia*. 122

ORDER 42. GERANIACEAE.

123. *Geranium*. Capsule 5-celled, 5-valved, 5-lobed, the receptacle extending up between the cells as a long 5-sided beak; cells 1-seeded. Valves dehiscing elastically upward from the base along the beak.

ORDER 43. OXALIDACEAE.

124. *Oxalis*. Capsule 5-celled, (5-sided) oblong, loculicidally dehiscent. Seeds few or numerous, forcibly pinched out during dehiscence, the valves then collapsing. Herbs.

ORDER 44. LINACEAE.

125. *Linum*. Capsule 5-carpelled, 5-celled, or 10-celled by false partitions from the back of each carpel (10-valved from the top, false partitions extending about half way to axis). Seeds flat, smooth, developing mucilage on wetting. Herbs.

ORDER 45. RUTACEAE.

126. *Xanthoxylum*. Carpels 3-5, raised on a short stalk. Pericarp thick and fleshy (red, turning brown), 2-valved, exposing the 1 or 2 globose, shining, black, crustaceous seeds. Prickly shrub.

ORDER 46. POLYGALACEAE.

127. *Polygala*. Capsule 2-celled, 2-seeded, loculicidally 2-valved. Seeds carunculate (caruncle 2 lobed or 2-winged). Herbs.

ORDER 47. EUPHORBIACEAE.

Capsule (except *croton monanthogynus*) 3-lobed, 3-celled, 3-seeded, 6-valved, valves separating from the persistent centre. Herbs.

128. *Croton*. Capsule sessile in the calyx (stellate pubescent). *C. monanthogynus* has the capsule 1 or 2 celled and 1 or 2 seeded.

129. *Acalypha*. Capsules supported by a leaf-like involucre. Calyx present. Seeds caruncled.

130. *Tragia*. Calyx present. Seeds not caruncled (globose) capsule bristly.

131. *Euphorbia*. Capsule stalked in a cup-shaped involucre. Calyx none.

ORDER 48. CALLITRICHACEAE.

132. *Callitriche*. Fruit solitary and sessile, or nearly so, in the axils of the leaves, 4-lobed, compressed, 4-celled, separating at maturity into 4 indehiscent nutlets. Low marsh or aquatic herbs.

ORDER 49. ANACARDIACEAE.

133. *Rhus*. Fruit drupaceous, 1-seeded; stone surrounded by thin, waxy pulp. Sepals inferior (persistent). Shrubs.

ORDER 50. CELASTRACEAE.

(Capsule somewhat fleshy, lobed, loculicidally dehiscent. Seeds 1 or 2 in each cell, enveloped in a conspicuous scarlet aril. Shrubs.)

134. *Euonymus*. (Capsule 4-celled, purple. Upright shrub.)

135. *Celastrus*. Capsule orange, 3-celled. Woody vine.

ORDER 51. STAPHYLEACEAE.

136. *Staphylea*. Capsule 3-celled, 3-lobed, thin, much inflated (3-5 cm long), tardily dehiscent along ventral sutures at the top. Seeds few in each cell, bony. Shrub.

ORDER 52. ACERACEAE.

137. *Acer*. Fruit deeply 2-lobed, dry, the lobes separating at maturity, each portion forming a 1-seeded samara. Wing unsymmetrical, terminal and extending down the inner side. Trees.

ORDER 53. HIPPOCASTANACEAE.

138. *Aesculus*. Capsule 3-celled, loculicidally 3-valved, leathery (more or less prickly) 1-3 seeded. Seeds large (2 cm or more) with a thick, shining (brown) seedcoat and a large pale scar. Shrubs or trees.

ORDER 54. BALSAMINACEAE.

139. *Impatiens*. Capsules 5-celled, 5-valved, dehiscent violently and throwing out the few seeds in each cell. Valves coiling after dehiscence. Herbs.

ORDER 55. RHAMNACEAE.

140. *Ceanothus*. Capsules 3-lobed, 3-celled, supported by the cup-shaped disk. Carpels separating from each other and also dehiscent part way down the dorsal suture. Low shrubs.

141. *Rhamnus*. Drupe black, globose and berry-like, stones 2, ovate, flattish, a groove on back and a line along the face, cartilaginous, finally opening along the suture and letting out the smooth, hard, dark-brown seed. Tall shrub.

ORDER 56. VITACEAE.

Berry 2-celled, mostly 4-seeded. Seeds bony (with a prominent dorsal raphe and a deep groove on one side, triangular obovate. Tendril bearing woody vines).

142. *Vitis*. (Berry nearly black, edible. Leaves simple).

143. *Parthenocissus*. Berry nearly black, inedible. Leaves palmately compound.

144. *Ampelopsis*. (Berry blue. Leaves simple.)

ORDER 57. TILIACEAE.

145. *Tilia*. Nut globular, 1-celled, (1-seeded, 7 mm broad, 5-angled at base, surface felty-pubescent). In pedicelled clusters, the peduncle attached to a leaf-like bract, which is deciduous with the cluster. Trees.

ORDER 58. MALVACEAE.

Carpels 5 to many, united in a ring and separating at maturity, or forming a several-celled capsule. Pedicels jointed. Seeds kidney-shaped. Herbs.

146. *Abutilon*. Carpels several (12-16), separating from the central axis and from each other, dehiscent at apex, (pubescent, beaked, seeds about 3 in each carpel).

147. *Malva*. Carpels several, indehiscent, beakless, 1-seeded, calyx lobes 5 with a 3-leaved involucrel.

148. *Callirhoe*. Carpels as in *Malva*, but beaked on inner angle, and the beak separated by a partition (indehiscent). Involucrel 3-leaved or more.

149. *Malvastrum*. (Carpels 5, 1-seeded, kidney-shaped, softly hairy. Calyx with a 3-leaved involucrel. Seeds smooth.)

150. *Sida*. No involucrel, (carpels 5, 1-seeded, dehiscent at apex, enclosed in inflated calyx, beaked, tardily separating).

151. *Hibiscus*. Carpels united into a 5-celled, loculicidal capsule. Involucrel several leaved. (Calyx inflated, hairy, veiny. Seeds black, slightly tuberculate.)

ORDER 59. HYPERICACEAE.

152. *Hypericum*. (Capsule 1-celled, septically 3-valved, with numerous seeds on 3 parietal placentae. Sepals 5, inferior, persistent. Herbs.)

ORDER 60. CISTACEAE.

Capsule 1-celled, with (3) parietal placentae, loculicidally (3) valved. Herbs.

153. *Helianthemum*. (Capsules of the earlier flowers with valves widely spreading, 5 mm long, several seeded; of the later flowers considerably smaller, and the valves spreading only slightly, few seeded.)

154. *Lechea*. Capsule (1½ mm long) imperfectly 3-celled by the intrusion of the placentae. Seeds 2 on each placenta.

ORDER 61. VIOLACEAE.

Capsule 1-celled, loculicidally 3-valved, placentae 3, parietal, on the middle of the valves. (Capsule obtusely 3-angled, dehiscing violently, the valves becoming boat-shaped and widely spreading.) Sepals persistent, inferior. Herbs.

155. *Viola*. Sepals auricled. Seeds numerous (ovate, smooth, hard, with a round scar at base and a linear scar at apex. Capsule ½-1 cm long).

156. *Calceolaria*. Sepals not auricled. (Capsule 6 mm long, 5 mm wide, about 6-seeded. Seeds globose, slightly flattened, nearly black, 2 mm wide.)

ORDER 62. LOASACEAE

157. *Mentzelia*. Capsule inferior, 1-celled, with 3 parietal placentae,

oblong or club-shaped, pubescent with barbed hairs, breaking away at summit. Seed few or several. Herbs.

ORDER 63. CACTACEAE.

Berry inferior, 1-celled, seeds few or numerous on several parietal placentae. (Fleshy, prickly herbs with scale-like leaves.)

158. *Cactus*. Plant globose, covered with spine bearing tubercles. (Berry ovoid, scarlet; seeds few, black, pitted.)

159. *Opuntia*. Plant consisting of joints, (flat, oval. Berry oblong, pink. Seeds numerous, enclosed in a tough aril.)

ORDER 64. LYTHRACEAE.

Capsule thin and membranous, tightly enclosed in the calyx tube. Seeds numerous. Placentae axil. Herbs.

160. *Ammannia*. Calyx 4-ribbed. Capsule 2-4 celled, but at maturity the partitions break away more or less, leaving the placentae in the axis. Dehiscence an irregular bursting. (Capsules clustered in the axils of the sessile leaves.)

161. *Rotala*. Differs from *Ammannia* in having the capsule minutely and densely striate.

162. *Lythrum*. Capsule oblong, 2-celled (dehiscent along partitions at top. Calyx 10-14 ribbed, 5-7 toothed with as many short appendages in the sinuses. Almost sessile in loose racemes.)

ORDER. 65. ONAGRACEAE.

Fruit inferior, dry, dehiscent or indehiscent, 1-5 celled. Herbs.

163. *Jussiaea*. Capsule oblong (arcuate, tapering at base, 5-celled, 10-ribbed, seeds numerous in 1 row, angled). "Opening between the ribs."

164. *Ludwigia*. Capsule short, many seeded (4-angled, 4-celled, dehiscent by a hole in the top or breaking away irregularly. Calyx lobes 4, persistent).

165. *Epilobium*. Capsule linear, many-seeded, 4-celled, loculicidally 4-valved. Seeds numerous, provided with a tuft of fine, soft hair at one end.

166. *Anagra*. Capsule 4-celled, loculicidally 4 valved. Seeds numerous, naked. (Capsule in terminal spikes, 4 sided, ribbed, sessile.)

167. *Oenothera*. As above (but capsules cylindrical, axillary, sessile).

168. *Xylopleurum*. As above (but capsules shortly pedicelled, clavate-fusiform, in a loose spike with 4 narrow wings and ribbed between).

169. *Megapterium*. As above (but capsules axillary, with 4 broad wings, 3 cm wide).

170. *Meriolyx*. As above (but capsules axillary, sessile, 4-sided, usually arcuate, linear, canescent).

171. *Gaura*. Fruit indehiscent, 1 celled, 4-angled or winged (1-seeded).

172. *Stenosiphon*. Fruit as in *Gaura*, but 8-ribbed, 2 or 3 of the ribs winged, transversely wrinkled, villous.

173. *Circaea*. Fruit indehiscent, beset with hooked hairs (2-celled, 2-seeded, rounded, tapering below into the pedicel).

ORDER 66. HALORRHAGIDACEAE.

174. *Myriophyllum*. Fruit 4-celled, 4-lobed, 4-seeded, indehiscent sessile in the axils of the leaves. Aquatic herbs.

ORDER 67. UMBELLIFERAE.

Fruit 2-carpelled, dry. At maturity the 2 carpels separate from the central axis, forming 1-seeded, indehiscent akene-like bodies. Calyx superior. The back of each carpel is provided with 5 primary ribs or wings, and often with 4 intermediate or secondary ribs. Fruit in umbels or heads.

175. *Polytaenia*. Carpels much flattened dorsally, oval, 3 ribs on back fine, 2 lateral corky-thickened.

176. *Peucedanum*. As above, but lateral ribs thin-winged.

177. *Sanicula*. Carpels nearly globose, beset with hooked prickles.

178. *Osmorrhiza*. Carpels linear, attenuate downward into a tail, somewhat bristly (2-3 cm long).

179. *Cicuta*. Carpels slightly compressed laterally, ribbed (3-4 mm).

180. *Deringa*. Carpels linear, glabrous, ribbed (5-7 mm). Umbels irregular.

181. *Spermolepis*. Carpels small (1½ mm), ovate, papillose, ribbed.

ORDER 68. CORNACEAE.

182. *Cornus*. Drupe with a 2-celled, 2-seeded stone. Calyx superior. (In cymes, blue or white. Stone longitudinally ridged. Shrubs.)

ORDER 69. PRIMULACEAE.

Capsule 1-celled, placenta central, seeds several. Herbs.

183. *Androsace*. Capsule 5-valved at apex (ovoid, 4 mm.)

184. *Steironema*. Capsule 4-valved at apex (globose, 5-6 mm).

185. *Anagallis*. Capsule dehiscent by a circumscissile line about the middle.

ORDER 70. OLEACEAE.

186. *Fraxinus*. Samara symmetrically winged from apex. Trees. (Calyx inferior, minute, persistent. Wing somewhat decurrent along the sides. Samara 1-celled, 1-seeded.)

ORDER 71. GENTIANACEAE.

187. *Gentiana*. "Capsula oblong, 2-valved, 1-celled, dehiscent through the 2 ventral sutures. Seeds very numerous, borne over the whole inner surface of the capsule."

ORDER 72. APOCYNACEAE.

188. *Apocynum*. Fruit 2 long and slender follicles. Seed numerous, provided with a coma at apex. (Follicles pendent, glabrous, 10 cm.) Herbs.

ORDER 73. ASCLEPIADACEAE.

Follicles 2, (fusiform). Seeds numerous (comose). Herbs.

ORDER 74. CONVOLVULACEAE.

Capsule mostly 2-celled and 4-seeded or less, (3-celled and 6-seeded in *Ipomoea hederacea*). Twining, trailing or erect herbs.

189. *Ipomoea*. Calyx not bracteate at base. Capsule globose, 2-4-valved. (1 cm or more long.)

190. *Convolvulus*. As in *Ipomoea* but calyx with 2 large bracts at base.

191. *Evolvulus*. (Capsule 3-4 mm long, 2-4-valved. Erect herb.)

ORDER 75. CUSCUTACEAE.

192. *Cuscuta*. Parasitic, orange-colored, twining herbs. (Capsule very thin and papery, indehiscent, breaking away irregularly, 2-3 mm high.)

ORDER 76. POLEMONIACEAE.

193. *Phlox*. Capsule 3-celled, loculicidally 3-valved, 3-seeded (calyx lobes long-acuminate, persistent. Capsule globular, smooth, 5 mm long). Herbs.

ORDER 77. HYDROPHYLLACEAE.

194. *Macrocalyx*. Capsule 1-celled, 2-valved, with 2 much enlarged parietal placentae, 4-seeded. Calyx enlarged, 5-angled. Herbs.

ORDER 78. BORRAGINACEAE.

Fruit (in ours) deeply 4-lobed, separating into 4 indehiscent, 1-seeded nutlets. Leaves alternate. Herbs.

195. *Cynoglossum*. Nutlets armed all over the back with barbed prickles.

196. *Lappula*. Nutlets armed (along the margin with 1 row of barbed prickles.)

197. *Lithospermum*. Nutlets bony (smooth and glossy, sometimes wrinkled, acutish), often less than 4 maturing, scar basal.

198. *Onosmodium*. Nutlets much as in *Lithospermum*. (Plant bristly-hairy, $\frac{1}{2}$ to $1\frac{1}{2}$ M high. Leaves oblong. Nutlets pearly white.)

ORDER 79. VERBENACEAE.

(Fruit dry, not lobed, separating into 2-4 indehiscent, 1-seeded nutlets. Herbs with opposite leaves.)

199. *Verbena*. Fruits in terminal spikes, enclosed in the 5-toothed calyx, separating into 4 nutlets. (Nutlets oblong, 4-sided, 2 sides occupied by the scar.)

200. *Lippia*. Fruits in short, long-peduncled axillary spikes. (Calyx 2-lipped, 2-edged.)

ORDER 80. PHRYMEAE.

201. *Phryma*. Fruits in a long, loose, slender spike, almost sessile, reflexed and closely appressed to axis, enclosed in the calyx. Calyx teeth 5, the 3 upper, now outer, coriaceous and extending into spine-like projections, 2 lower triangular. Adapted for catching hairs in the 2 "boot jack" sinuses of the upper calyx teeth. Fruit 1-celled, 1-seeded, with thin pericarp. Herbs.

ORDER 81. LABIATAE.

Fruit 4-lobed, separating into 4, 1-seeded nutlets. Herbs with opposite leaves.

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- | | |
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| 1. Nutlets rugose-reticulated | 2 |
| 1. Not reticulated..... | 3 |
| 2. In a terminal spike, leaves serrate..... | <i>Teucrium</i> . 202 |
| 2. Axillary; leaves narrow, nearly entire..... | <i>Isanthus</i> . 203 |
| 3. Fruit in terminal heads, supported by leaf-like bracts..... | 4 |
| 3. In closely approximate clusters forming a terminal spike..... | 5 |
| 3. Solitary or clustered in the axils..... | 9 |
| 4. Calyx hairy in throat, leaves ovate to lanceolate..... | <i>Monarda</i> . 204 |
| 4. Calyx naked in throat, leaves linear lanceolate | <i>Koellia</i> . 205 |
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| 5. Calyx about equally 5-toothed | 7 |
| 6. Lobes entire, spike elongated..... | <i>Salvia</i> . 206 |
| 6. Upper lip 3-toothed, lower 2-toothed, spike oblong,
with conspicuous, reniform ciliate bracts..... | <i>Prunella</i> . 207 |
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| 7. Spike more or less interrupted, calyx teeth acuminate..... | 8 |
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| 8. Stem downy, calyx-teeth spinose..... | <i>Nepeta</i> . 211 |
| 9. Calyx strongly 2-lipped, closed; upper lip helmet-
shaped..... | <i>Scutellaria</i> . 212 |
| 9. Calyx about equally toothed, sometimes oblique..... | 10 |
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| 10. Clusters dense..... | 11 |
| 11. Calyx gibbous at base, 3 upper teeth recurved | <i>Hedeoma</i> . 214 |
| 11. Calyx not gibbous..... | 12 |
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| 12. Teeth not spinescent | 14 |
| 13. Teeth 5, calyx smooth | <i>Leonurus</i> . 215 |
| 13. Teeth 10, calyx woolly..... | <i>Marrubium</i> . 216 |
| 14. Plant downy, odor of mint strong..... | <i>Mentha</i> . 217 |
| 14. Smooth; not strongly aromatic..... | <i>Lycopus</i> . 218 |

ORDER 82. SOLANACEAE.

Fruit 2-celled, many seeded, a capsule or berry. Calyx inferior. Herbs.

219. *Solanum*. (Berry globose, black or yellow; seeds flat. Calyx persistent at base of berry or in *S. rostratum* enlarged and prickly, enclosing the berry which becomes dry at maturity.)

220. *Physalis*. Berry globose, enclosed in the enlarged and inflated, 5-angled, papery calyx. Seeds flat.

221. *Datura*. Capsule ovoid, beset with stout prickles, 4-valved. Placentae 2 lobed, protruding from center of partition. A false partition extends from the center of each placenta, making the capsule 4-celled except near the top. Seeds flat, (kidney-shaped, pitted).

ORDER 83. SCROPHULARIACEAE.

Capsule 2-celled, many seeded (2-4-valved). Calyx inferior. Herbs.

222. *Verbascum*. Capsules in spikes or racemes, globose, septicidally dehiscent, 2-valved, valves 2-cleft, separating from partitions. Seeds numerous, wrinkled.

223. *Scrophularia*. Capsules (5-6 mm) in a terminal thyrsus, septicidally dehiscent, valves beaked, a narrow portion of partition remaining at axis. (Seeds papillate in longitudinal rows.)

224. *Pentstemon*. Capsule (1-1½ cm) in a terminal thyrsus, septicidally dehiscent, valves inclined to split. (Seeds very angular.)

225. *Mimulus*. Capsules (5-10 mm) axillary, enclosed in the (angular) calyx, loculicidally 2-valved, valves sometimes 2-cleft. (Seeds plump, sometimes winged, one-fifth to two-fifths mm).

226. *Conochea*. Capsules 1 to few on capillary pedicels in the axils, (4-valved, separating from axis. Placentae large. Seeds one-fifth mm longitudinally grooved).

227. *Bacopa*. Capsules 1 to few in the axils, on thick pedicels. (Dehiscence as in *Conochea*. Seeds two-fifths mm, striate.)

228. *Ilysanthes*. Capsules (5 mm) single in the axils, pedicels capillary.

229. *Veronica*. Capsules racemed or axillary (flattened contrary to partition, notched at apex. Dehiscence loculicidal or also septicidal. Seeds concavo-convex or ovoid). Calyx lobes 4.

230. *Gerardia*. Capsules axillary, globose (4-valved, enclosed in hemispherical calyx tube). "Seeds angulate."

ORDER 84. LENTIBULARIACEAE.

231. *Utricularia*. Capsule globose, 1-celled, many-seeded, placenta central, "bursting irregularly" (Pedicels recurved, calyx 2-lipped, persistent, inferior. Seeds oblong, ½ mm). Aquatic herbs.

ORDER 85. OROBANCHACEAE

232. *Orobanche* & *Aphyllon*. Capsule 1-celled, 2-valved. Seeds very small and

numerous. (Each valve carrying 2 parietal placentae $\frac{1}{2}$ the way from the edge. Capsule solitary on a scape about 1 dm high, enclosed more or less in the withered 5 lobed calyx. Seeds one-fifth mm, oblong, coat loose, reticulated,) chlorophyllless herbs.

ORDER 86. ACANTHACEAE.

Capsule 2-celled, loculicidally dehiscent, few seeded; valves separating elastically. Herbs. (Seeds lenticular, supported by curved stalks.)

233. *Ruellia*. (Capsules nearly sessile in axillary clusters, oblanceolate, $1\frac{1}{2}$ to 2 cm. Seeds 4 to 8, minutely hairy.)

234. *Dianthera*. (Clusters of capsules long peduncled. Capsules 1 cm. Seeds 4, glabrous.)

ORDER 87. PLANTAGINACEAE.

235. *Plantago*. Capsules in dense spikes, 2 celled, few-seeded, circumscissily dehiscent, partition remaining or falling away with lid. Herbs with ribbed leaves, all radical.

ORDER 88. RUBIACEAE.

Calyx superior. (Fruit dry, 2-4-celled, 1 to few seeded.) Herbs or shrubs.

236. *Cephalanthus*. Fruit (5-8 mm long) in dense globose heads, "at length splitting from base upwards into 2-4, 1-seeded portions." Shrubs.

237. *Houstonia*. Capsules in cymes, upper portion free, loculicidally dehiscent across the free portion, 2-celled (2-3 mm, 4-ribbed below. Seeds few, black, oblong, pitted.) Herbs.

238. *Galium*. Fruit 2-celled (dry), splitting into 2 (globose, bristly) indehiscent, 1-seeded portions. Herbs with whorled leaves.

ORDER 89. CAPRIFOLIACEAE.

Fruit drupeous (in ours). Calyx superior. Herbs or shrubs.

239. *Sambucus*. (Fruits in broad cymes. Stones 3. Fruit dark purple, globose, 5 mm. Stones flattened, 2-edged, roughened). Shrubs.

240. *Symphoricarpos*. Fruits in axillary clusters. Stones 2. (Fruit red, 3 to 5 mm, globose. Stones plano-convex, smooth, bony.) Shrubs.

241. *Triosteum*. Fruits sessile in axillary clusters, flesh becoming dry. Stones 3. (Fruit yellow or orange, canescent, globular, 1 cm. Stones ribbed). Herbs.

ORDER 90. CUCURBITACEAE.

Calyx superior. Seeds large and flat. Climbing or trailing herbaceous vines.

242. *Echinocystis*. Capsule inflated, weakly prickly, 2-celled, 4-seeded, bursting at apex, inner portion fibrous-reticulated, (the 2 seeds in each cell partially separated by a partition.)

243. *Sicyos*. Fruit ovate, flat, indehiscent, 1-celled, 1-seeded, prickly with slender, easily detached, downwardly barbed bristles.

244. *Cucurbita*. Fruit indehiscent, 1-celled, covered with a smooth, hard rind. Seeds numerous on several parietal placentae. (Rind thin, seeds contained in the dry and fibrous contents. Fruit ovoid or globose, light yellow, 6-8 cm long.)

ORDER 91. CAMPANULACEAE.

Capsule many seeded, adherent to calyx tube. Herbs.

245. *Lobelia*. Capsule 2-celled, dehiscing loculicidally across the upper free portion. (Seeds $\frac{1}{2}$ mm, oblong, papillose.)

246. *Campanula*. (Capsules clustered in wand-like spikes, 3-celled, dehiscing by a circular hole near the top, opposite each partition.)

247. *Legouzia*. (Capsules axillary, 1-celled with 1 parietal placenta, or 2 or 3 celled with axil placentae. Sometimes tending to split from the top.)

ORDER 92. COMPOSITAE.

Akenes sessile in heads surrounded by a many-bracted involucre, usually crowned by bristles, chaff or other appendages (the pappus), and often with interspersed scales on the receptacle. Herbs

KEY TO OUR GENERA.

1. Pappus of fine capillary bristles	2
1. Pappus not of capillary bristles	20
1. Pappus supported upon a narrow beak	3
2. Akenes not narrow beaked	5
3. Akenes very flat	<i>Lactuca</i> 248
3. Akenes not flat, ribbed	4
4. Oblong, ribs spinulose above, pappus white	<i>Taraxacum</i> 249
4. Fusiform, ribs not spinulose, pappus tawny	<i>Pyrrhopappus</i> 250
5. Involucral bracts spiny tipped, akenes flattish, smooth	<i>Carduus</i> 251
5. Not spiny pointed	6
6. Akenes flat or flattish	7
6. Akenes not flattened	10
7. Involucral bracts in several rows	8
7. Involucral bracts in 1 or 2 rows	9
8. Tapering, squarrose; pappus of few deciduous bristles	<i>Grindelia</i> 252
8. Erect or spreading; pappus of numerous bristles	<i>Aster</i> 253
9. In 1 row	<i>Erigeron</i> 254
9. In 2 rows, inner equal, outer short and unequal	<i>Prenanthes</i> 255
10. Bracts thin and scarious	11
10. Bracts not scarious	12
11. Woolly	<i>Antennaria</i> 256
11. Smooth	<i>Anaphalis</i> 257

12. Leaves, at least lower, opposite; akenes 5-angled.....*Eupatorium* 258
12. Leaves alternate..... 13
13. Bracts in 1 row, sometimes with a few short outer ones..... 14
13. Bracts in several rows..... 17
14. Heads corymbose-clustered at summit, bracts in 1 row..... 15
14. Heads solitary on a scape.....*Troximon* 259
14. Heads sessile along the rush like branches of the stem; leaves scale-like..... *Lygodesmia* 260
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15. Involucre 5-bracted, 5-flowered.....*Cuculia* 261
15. Involucre several bracted, several flowered.....*Senecio* 262
16. Involucre and peduncle glandular.....*Hieracium* 263
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17. Bracts appressed, yellowish, heads 3-8 mm high; pappus white.....*Solidago* 265
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18. Heads in wand-like spikes.....*Laciniaria* 266
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19. Pappus white, very plumose; akenes 5 mm.....*Kuhnia* 267
19. Pappus brown or red, not plumose; akenes 2-3 mm.....*Vernonia* 268
20. Involucre beset with hooks forming a bur..... 21
20. Involucre not bur-like..... 22
21. Bur of numerous separate bracts; akenes several.....*Arctium* 269
21. Bur indurated enclosing the 2 akenes.....*Xanthium* 270
22. Akenes single, enclosed in a top-shaped, indurated involucre.....*Ambrosia* 271
22. Akenes several or numerous in each involucre..... 23
23. Heads in close terminal spikes; pappus none.....*Iva* 272
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24. Very small, 2-4 mm high, panicled.....*Artemisia* 273
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26. Bracts in about 1 row, or with some short outer ones..... 28
27. Pappus none; akenes terete, ribbed; heads 1½ cm wide.....*Chrysanthemum* 274
27. Pappus of 2 long bristles and several shorter ones; akenes flat; heads 7-10 mm wide.....*Boltonia* 275
28. Pappus of scales dissected into bristles; plant resinous dotted.....*Dysodia* 276
28. Pappus of several obovate, obtuse, scarious scales; plant woolly.....*Hymenopappus* 277
29. Akenes strongly flattened and wing-margined..... 30

29. Akenes not wing flattened..... 31
30. Flattened radially; bracts few, nearly equal, re-
flexed.....*Actinomeris* 277
30. Flattened tangentially, bracts numerous, in several
rows.....*Silphium* 279
31. Receptacle conical or columnar..... 32
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32. Columnar; akenes flattened.....*Lepachys* 280
32. Conical or short oblong; akenes 4-sided..... 33
33. Chaff spiny-pointed, rigid, brown; pappus toothed.....*Echinacea* 281
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34. Leaves opposite; inner bracts coriaceous, appressed.....*Heliopsis* 282
34. Leaves alternate; bracts all spreading.....*Rudbeckia* 283
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36. Pappus none or of short teeth.....*Coreopsis* 285
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