

THE EMPORIA STATE
Research Studies

GRADUATE PUBLICATION OF THE KANSAS STATE TEACHERS COLLEGE, EMPORIA



Flowering Plants of the Ross Natural History
Reservation, Lyon and Chase
Counties, Kansas

By
James S. Wilson

WHITE LIBRARY ESU EMPORIA

The Emporia State Research Studies

KANSAS STATE TEACHERS COLLEGE
EMPORIA, KANSAS

FLOWERING PLANTS OF THE ROSS
NATURAL HISTORY RESERVATION,
LYON AND CHASE COUNTIES,
KANSAS

By

James S. Wilson

VOLUME XI

JUNE 1963

NUMBER 4

THE EMPORIA STATE RESEARCH STUDIES is published in September, December, March and June of each year by the Graduate Division of the Kansas State Teachers College, 1200 Commercial St., Emporia, Kansas. Entered as second-class matter September 16, 1952, at the post office at Emporia, Kansas, under the act of August 24, 1912. Postage paid at Emporia, Kansas.

KANSAS STATE TEACHERS COLLEGE

EMPORIA · KANSAS

JOHN E. KING

President of the College



THE GRADUATE DIVISION

LAURENCE C. BOYLAN, *Dean*

EDITORIAL BOARD

TED F. ANDREWS, *Professor of Biology and Head of Department*

WILLIAM H. SEILER, *Professor of Social Sciences and Chairman of Division*

CHARLES E. WALTON, *Professor of English*

GREEN D. WYRICK, *Professor of English*

Editor of this issue: Ted F. Andrews

This publication is a continuation of *Studies in Education* published by the Graduate Division from 1930 to 1945.

Papers published in this periodical are written by faculty members of the Kansas State Teachers College of Emporia and by either undergraduate or graduate students whose studies are conducted in residence under the supervision of a faculty member of the college.

432056

DATA PROCESSING
FEB 11 1983

Flowering Plants of the Ross Natural History Reservation, Lyon and Chase Counties, Kansas

By James S. Wilson¹

The purpose of this publication is to summarize the present status of the Angiospermae on the Ross Natural History Reservation. Included are keys to families, genera and species; species description; and ecological data for each taxon. Hartman (1960) listed only a few of the species of flowering plants of the Reservation.

The Ross Natural History Reservation, consisting of approximately 1080 acres, is located in Lyon and Chase Counties, Kansas, about three miles west of Americus. It is situated on the east face of the Flint Hills and is generally of gently-rolling and undulating-hilly terrain. Limestone is common throughout the area, especially as outcroppings on the hilltops. The soils are mostly calcareous and essentially of two types: the deep, dark and friable soils below the slopes; and the shallow grayish-brown silty or gravelly soils on the slopes and summits. The rainfall usually ranges from 30-38 inches per year, most (72%) of which occurs during the growing season. Summers are usually hot, with an average July temperature of 79° F. Winters are normally moderate, the average January temperature being 31° F.

The plant families treated in this study are arranged in the order that they occur in *Gray's Manual of Botany* (Fernald, 1950) and the nomenclature is that of the same manual. All plant specimens in this study are on file in the Herbarium of the Biology Department of Kansas State Teachers College at Emporia. Frequency of occurrence and flowering periods are noted for each species of flowering plant.

1. Assistant Professor of Biology, Kansas State Teachers College, Emporia.

KEY TO FAMILIES

1. Trees, shrubs or woody vines 2
2. Vines 3
 3. Leaves pinnately compound; corolla orange
(*Campsis*) BIGNONIACEAE p. 75
 3. Leaves simple; corolla yellowish-green 4
 4. Tendrils present; leaves palmately lobed
(*Vitis*) VITACEAE p. 58
 4. Tendrils absent; leaves simple (*Celastrus*)
..... CELASTRACEAE p. 57
2. Trees or shrubs 5
 5. Trees 6
 6. Leaves opposite or whorled 7
 7. Leaves compound 8
 8. Leaflets 3 (rarely 5) (*Acer*)
..... ACERACEAE p. 58
 8. Leaflets 7 (rarely 5) or more
(*Fraxinus*) OLEACEAE p. 65
 7. Leaves simple 9
 9. Leaves entire (*Cornus*) ... CORNACEAE p. 64
 9. Leaves dentate or serrate and lobed
(*Acer*) ACERACEAE p. 58
 6. Leaves alternate 10
 10. Leaves compound 11
 11. Leaflets serrate (*Juglans*)
..... JUGLANDACEAE p. 34
 11. Leaflets entire (*Gleditsia, Robinia*)
..... LEGUMINOSAE p. 45
 10. Leaves simple 12
 12. Leaves lobed (*Morus*) ... MORACEAE p. 35
 12. Leaves not lobed 13
 13. Leaves entire 14
 14. Larger leaves 3 cm. or more
wide, about 2 times as long as
wide 15
 15. Young twigs pubescent;
sepals strongly fused, 3
mm. or more long; flowers
perfect, borne on separate
pedicels (*Diospyros*) ...
..... EBENACEAE p. 65
 15. Young twigs glabrous;
sepals less than 3 mm.

	long; flowers imperfect, the pistillate borne in dense heads (<i>Maclura</i>) MORACEAE p. 35	
14.	Leaves less than 3 cm. wide, more than 2 times as long as wide (<i>Salix</i>) SALICACEAE p. 33	
13.	Leaves serrate or dentate 16	
16.	Leaf base strongly asymmetrical, oblique; fruit a drupe or circular samara (<i>Ulmus, Celtis</i>) ULMACEAE p. 34	
16.	Leaf base symmetrical 17	
17.	Petals white, 1 cm. or more long; several small circular glands present on petiole (<i>Prunus</i>) ROSACEAE p. 44	
17.	Petals absent or less than 1 cm. long 18	
18.	Leaf blade mostly wider than long; stipules less than 2 mm. long; (<i>Populus</i>) .. SALICACEAE p. 33	
18.	Leaf blade at least 2 times as long as wide 19	
19.	Leaf blade about 2 times as long as wide (<i>Morus</i>) MORACEAE p. 35	
19.	Leaf blade 4 times as long as wide or more (<i>Salix</i>) SALI- CACEAE p. 33	
5.	Shrubs 20	
20.	Leaves opposite 21	
21.	Leaflets compound (<i>Sambucus</i>) CAPRIFOLIACEAE p. 77	
21.	Leaves simple 22	
22.	Larger leaves more than 5 cm. long and 2 cm. wide (<i>Cornus</i>) CORNACEAE p. 64	

22. Leaves less than 5 cm. long and 2 cm. wide
(*Symphoricarpos*) CAPRIFOLIACEAE p. 77
20. Leaves alternate 23
23. Leaves compound 24
24. Stems with prickles (*Rosa*) ROSACEAE p. 44
24. Stems without prickles 25
25. Leaflets serrate (*Rhus*)
..... ANACARDIACEAE p. 57
25. Leaflets entire (*Amorpha, Cassia*)
..... LEGUMINOSAE p. 45
23. Leaves simple 26
26. Leaves lobed; stems with prickles (*Ribes*)
..... SAXIFRAGACEAE p. 44
26. Leaves not lobed 27
27. Leaves serrate 28
28. Petals white, 1 cm. or more long
(*Prunus*) ROSACEAE p. 44
28. Petals white, less than 1 cm. long,
or absent 29
29. Leaves less than 4 cm. long,
rounded at the apex (*Ceanothus*)
..... RHAMNACEAE p. 58
29. Leaves more than 4 cm. long,
acute at apex (*Salix*)
..... SALICACEAE p. 33
27. Leaves entire 30
30. Leaves less than 4 cm. long, borne
in fascicles (*Lycium*)
..... SOLANACEAE p. 73
30. Leaves more than 4 cm. long, not in
fascicles (*Salix*) SALICACEAE p. 33
1. Herbs 31
31. Monocotyledons; plants mostly with parallel-veined leaf
blades and flower parts in threes 32
32. Perianth absent or of bristles or scales 33
33. Perianth composed of 6 drab sepals and petals;
fruit a many-seeded capsule (*Juncus*)
..... JUNCACEAE p. 31
33. Perianth absent or of bristles or scales; fruit
one-seeded 34
34. Stems round or two-angled 35
35. Scales of the spikelet two-ranked;
leaves two-ranked GRAMINEAE p. 14
35. Spikelet scales spirally arranged; leaves
usually three-ranked CYPERACEAE p. 26

34. Stems triangular; leaves three-ranked
 CYPERACEAE p. 26
32. Perianth present and at least the corolla colored 36
36. Sepals and petals dissimilar in color 37
37. Ovary superior 38
38. Leaves with blade and petiole; flowers
 imperfect; stamens or carpels many
 (*Alisma*) ALISMATACEAE p. 14
38. Leaves with blade only, sheath below;
 flowers perfect; stamens and carpels 6 and
 3 respectively (*Tradescantia*)
 COMMELINACEAE p. 31
37. Ovary inferior (*Limnobiium*)
 HYDROCHARITACEAE p. 14
36. Sepals and petals colored alike 39
39. Stamens 6; ovary superior LILIACEAE p. 32
39. Stamens 3; ovary inferior (*Sisyrinchium*)
 IRIDACEAE p. 33
31. Dicotyledons; leaves usually net-veined and flower parts in
 fours or fives 40
40. Ovary inferior (origin of sepals and petals above the
 ovary) 41
41. Wind-pollinated plants with greenish inconspicuous
 flowers (*Ambrosia*, *Artemisia*) ... COMPOSITAE p. 78
41. Flowers with colored petals; mostly insect
 pollinated 42
42. Stems succulent and covered with spines;
 leaves absent (*Opuntia*) CACTACEAE p. 61
42. Stems without spines; leaves present 43
43. Stamens epipetalous (fused to petals)..... 44
44. Flowers aggregated into dense heads
 which are subtended by a series of
 greenish involucre bracts
 COMPOSITAE p. 78
44. Flowers not in heads and not subtended
 by a series of involucre bracts 45
45. Stem leaves opposite or whorled
 (*Galium*, *Houstonia*)
 RUBIACEAE p. 77
45. Stem leaves alternate (*Lobelia*,
Specularia) CAMPANULACEAE p. 78
43. Stamens not fused to the petals 46
46. Flowers with one floral envelope;
 calyx pinkish (*Mirabilis*)
 NYCTAGINACEAE p. 40

46. Flowers with both sepals and petals 47
47. Petals and sepals four 48
48. Leaves opposite and sessile;
stamens 4; petals pink
(*Ammannia*) LYTHRACEAE p. 61
48. Leaves alternate, if opposite
petiolate; stamens 8 (rarely 4);
flowers pink, white or
yellow ONAGRACEAE p. 51
47. Petals and sepals normally
5; leaves alternate 49
49. Stamens and carpels many and
distinct (*Geum*, *Potentilla*)
..... ROSACEAE p. 44
49. Stamens 5-10 (rarely 1); carpels
1 or 2 50
50. Leaves with sheathing
bases; petals and stamens
5; ovary small and
strongly inferior; carpels
2 UMBELLIFERAE p. 63
50. Leaves without sheathing
bases; petals 1-5, stamens
5-10; ovary only slightly,
if at all, inferior; carpels 1
..... LEGUMINOSAE p. 45
40. Ovary superior (origin of sepals and petals beneath
the ovary) 51
51. Flowers with one floral envelope (either sepals or
petals, but not both) 52
52. Leaves in a basal rosette; petals inconspicuous
(*Plantago*) PLANTAGINACEAE p. 76
52. Leaves cauline 53
53. Leaves with sheathing bases, alternate;
sepals mostly pink, white or green; fruits
mostly trigonous POLYGONACEAE p. 35
53. Leaves without sheathing bases 54
54. Leaves opposite; calyx pink or purple
(*Mirabilis*) NYCTAGINACEAE p. 40
54. Leaves alternate 55
55. Calyx 4-lobed; flowers imperfect
(*Parietaria*) URTICACEAE p. 35
55. Calyx not 4-lobed 56
56. Ovary or fruit 2 or 3-
seeded EUPHORBIACEAE p. 53

56. Ovary or fruit 1 or many-seeded	57
57. Ovary and fruit 1-seeded	58
58. Flowers perfect; calyx 5-lobed (<i>Chenopodium</i>) CHENOPODIACEAE	p. 38
58. Flowers imperfect; sepals 0-5 (<i>Acnida</i> , <i>Amaranthus</i>) AMA-RANTHACEAE	p. 39
57. Ovary and fruit many-seeded	
PHYTOLACCACEAE	p. 40
51. Flowers with two floral envelopes	59
59. Flowers zygomorphic and sympetalous	60
60. Ovary or fruit 4-lobed	61
61. Leaves alternate (<i>Lithospermum</i>)	
..... BORAGINACEAE	p. 68
61. Leaves opposite	62
62. Flowers in elongate spikes usually less than 12 mm. in diameter; leaves serrate (<i>Verbena</i>)	
..... VERBENACEAE	p. 68
62. Flowers not in elongate spikes or, if so, spikes more than 12 mm. in diameter; stems square; plants commonly aromatic LABIATAE	p. 70
60. Ovary one, not lobed	63
63. Stamens 5	SOLANACEAE p. 73
63. Stamens 4	64
64. Leaves serrate or lobed (<i>Penstemon</i> , <i>Conobea</i>)	
..... SCROPHULARIACEAE	p. 74
64. Leaves entire (<i>Ruellia</i> , <i>Dicliptera</i>) ANCANTHACEAE	p. 75
59. Flowers not both zygomorphic and sympetalous	65
65. Stamens epipetalous; flowers sympetalous	66
66. Leaves basal	67
67. Leaves less than 5 cm. long (<i>Androsace</i>) PRIMULACEAE	p. 64
67. Leaves more than 5 cm. long (<i>Plantago</i>) PLANTAGINACEAE	p. 76
66. Leaves cauline	68

68. Leaves pinnatifid; flowers less than 1 cm. long (*Ellisia*)
 HYDROPHYLLACEAE p. 67
68. Leaves not pinnatifid 69
69. Vines with funnellform flowers 5 cm. or more long or, if herbs, stigmas 4
 CONVOLVULACEAE p. 66
69. Herbs 70
70. Ovaries 2; latex usually present 71
71. Corona (structure between petals and stamens) present; fruit about 2-4 times as long as wide (*Asclepiadora*, *Asclepias*)
 ASCLEPIADACEAE p. 65
71. Corona absent; fruit about 10 times as long as wide (*Apocynum*)
 APOCYNACEAE p. 65
70. Ovary 1; latex absent SOLANACEAE p. 73
65. Stamens not epipetalous; petals separate or sometimes weakly united at base 72
72. Flowers zygomorphic and stamens more numerous than petals 73
73. Sepals petal-like in color; petals 3 (*Polygala*) POLYGALACEAE p. 53
73. Sepals green; petals 4-5 74
74. Pistils 3-5 (*Delphinium*)
 RANUNCULACEAE p. 41
74. Pistil 1 75
75. Sepals 2; stamens 12 or more; ultimate division of leaf filiform (*Corydalis*)
 PAPAVERACEAE p. 42
75. Sepals usually more than 2; stamens 10 or less
 LEGUMINOSAE p. 45

72. Flowers not both zygomorphic and with
stamens more numerous than petals 76
76. Flowers zygomorphic; stamens
5-10 77
77. Leaves simple, mostly basal
and forming a rosette; plant
less than 15 cm. high;
stamens 5 (*Viola*)
..... VIOLACEAE p. 60
77. Leaves compound, cauline;
plants mostly more than 15 cm.
high; stamens 5-10
..... LEGUMINOSAE p. 45
76. Flowers actinomorphic 78
78. Stamens more than 10 79
79. Stamens fused into a
tube around the styles
..... MALVACEAE p. 59
79. Not as above 80
80. Leaves simple and
entire; flowers
yellow (*Hypericum*)
..... GUTTIFERAE p. 60
80. Leaves serrate, lobed,
pinnatifid or pinnate;
flowers blue, yellow or
white 81
81. Origin of
separate petals
beneath the
ovary; petals
blue, yellow or
rarely white
(*Ranunculus*,
Anemone) RANUN-
CULACEAE p. 41
81. Origin of petals
above the ovary;
petals yellow or
white (*Geum*,
Potentilla)
..... ROSACEAE p. 44
78. Stamens 10 or less 82

82. Sepals and petals 4;
stamens mostly 6
..... CRUCIFERAE p. 42
82. Not as above 83
83. Leaves opposite 84
84. Leaves simple
..... CARYO-
PHYLLACEAE p. 40
84. Leaves pinnatifid
(*Geranium*)
GERANIACEAE
..... p. 53
83. Leaves alternate 85
85. Leaves simple,
entire (*Linum*)
.... LINACEAE p. 52
85. Leaves 3-lobed
(*Oxalis*)
.... OXALIDACEAE
..... p. 52

ALISMATACEAE (Water Plantain Family)

Primarily aquatic or subaquatic herbs; leaves basal, long-petioled; plants monoecious or dioecious; flowers actinomorphic; sepals 3, green; petals 3; stamens many; carpels many; fruit an achene.

1. ALISMA L. (Water Plantain)

1. *A. subcordatum* Raf. Perennial; leaves basal, long-petioled, ovate, subcordate at base, blade up to 2.5 dm. long; scape 1-10 cm. high, glabrous, much-branched; petals 1-2 mm. long. Rare, wet areas; June-September.—*R. Neill* 14.

HYDROCHARITACEAE (Frog's-Bit Family)

Herbaceous aquatic perennials; leaves basal or cauline; flowers usually imperfect; perianth segments 6; stamens 9; carpels 3.

1. LIMNOBIUM Rich (Frog's-Bit)

1. *L. spongia* (Bosc) Steud. Leaves basal, long-petioled, blade ovate-orbicular, 3-7 cm. long; peduncles 3-10 cm. long; flowers white. Rare, introduced recently in cultivated ground; June-September.—*E. Garner* 1367.

GRAMINEAE (Grass Family)

Annual or perennial herbs; stems mostly terete, internodes usually hollow, nodes prominent; leaves alternate, linear, two-ranked, commonly possessing a ligule (small flap of tissue) at the junction of the blade and

the sheath; inflorescence a panicle, raceme or spike with 1-many spikelets; spikelets composed of glumes (usually 2), lemma(s), palea(s) and stamens and/or carpels (the lemma, palea and stamens and/or carpels are referred to as the floret); florets perfect or unisexual, without a true perianth, usually simulated by the lemmas and paleas.

1. Spikelets fusing with or closely fitting into the rachis of the inflorescence, forming a solid cylindrical or flattened spike, breaking up into joints at maturity 2
2. Spikelets awned 14. *Aegilops*
2. Spikelets awnless 33. *Tripsacum*
1. Spikelets not as above 3
3. Spikelets 3-many-flowered 4
4. Spikelets pedicellate 6
4. Spikelets sessile or nearly so 18
3. Spikelets 1 or 2-flowered 5
5. Glumes with midnerve forming a distinct keel, the outer nerves, if present, much less prominent 4
5. Glumes rounded on back, the lower one appearing keeled in some species, nerveless or with several equally prominent nerves 27
6. Spikelets 2-many-flowered 7
7. Spikelets more than 1 cm. long, usually awned; lemmas sharply pointed or awned from between 2 small teeth; sheaths closed except at summit 1. *Bromus*
7. Spikelets 1 cm. or less long, awned or awnless; sheaths open down one side, lemmas not bifid 8
8. Upper (2nd) glume acute, not broadly obtuse 9
9. Lemmas with a 3-toothed apex .. 2. *Triodia*
9. Lemmas acute, not 3-toothed 10
10. Spikelets 2-5-flowered 11
11. Back of lemmas webbed 3. *Poa*
11. Back of lemmas glabrous 7. *Koeleria*
10. Spikelets with 6 or more florets 12
12. Lemmas with 3 prominent nerves (the midrib and one on each side) 4. *Eragrostis*
12. Lemmas with 5 or more nerves 5. *Festuca*
8. Upper glume obtuse at apex 6. *Sphenopholis*
6. Spikelets 1-flowered 13

13. Leaf sheaths and margins of blades downwardly
barbed with sharp minute spines; spikelets
bristly-ciliate 8. *Leersia*
13. Not as above 14
14. Inflorescence a cylindrical spike-like panicle
5 mm. or more wide; glumes square at tip
..... 9. *Phleum*
14. Inflorescence a panicle, if spike-like, less
than 5 mm. wide 15
15. Awns 4-7 cm. long 10. *Aristida*
15. Awns less than 3 cm. long or absent 16
16. Glumes longer than the lemma
..... 11. *Agrostis*
16. Glumes shorter than the lemma 17
17. Lemmas 3-nerved
..... 12. *Muhlenbergia*
17. Lemmas 1-nerved
..... 13. *Sporobolus*
18. Culms 1-2 m. high; edge of leaf strongly serrate
..... 19. *Spartina*
18. Culms less than 1 m. high 19
19. Inflorescence a simple (unbranched) spike;
spikelets borne on opposite sides of the
flattened rachis 20
20. Spikelets solitary at each node of the
rachis 21
21. Glumes more than 2.5 mm. wide
..... 15. *Triticum*
21. Glumes less than 2.5 mm. wide
..... 16. *Agropyron*
20. Spikelets 2 or 3 at each node of the
rachis 22
22. Spikelets 1-flowered, 3 at each node,
the lateral pair sterile 17. *Hordeum*
22. Spikelet 2-6-flowered, 2 at each node of
the rachis 18. *Elymus*
19. Inflorescence branched; spikelets all borne on
the underside of the rachis 23
23. Awns present at least on upper florets 24
24. Lemmas and/or glumes notched at
summit; spikes less than 3 mm. in
diameter 20. *Chloris*
24. Lemmas and/or glumes acute, not
notched; spikes more than 3 mm.
wide 21. *Bouteloua*

- 23. Awns absent on all florets 25
 - 25. Inflorescence less than 15 mm. long; florets unisexual 22. *Buchloe*
 - 25. Inflorescence more than 20 mm. long; florets bisexual 27
 - 26. Some of the spikes arranged 2 or 3 at a node, whorled 23. *Eleusine*
 - 26. Spikes 1 at a node, alternate 24. *Schedonnardus*
- 27. Pedicels flattened, strongly ciliated along the margins 28
 - 28. Spikelets in spike-like racemes (inflorescence less than 15 cm. wide) 25. *Andropogon*
 - 28. Spikelets in much-branched panicles (inflorescence more than 15 cm. wide) 30
 - 29. Stalked spikelet staminate 26. *Sorghum*
 - 29. Stalked spikelet absent, only the hairy pedicel remaining 27. *Sorghastrum*
- 27. Pedicels, if present, glabrous or evenly pubescent on all sides 30
 - 30. Spikelets surrounded by many bristles; inflorescence spike-like, more than 5 mm. wide 28. *Setaria*
 - 30. Spikelets not surrounded by bristles; inflorescence various, if spike-like, less than 5 mm. wide 31
 - 31. Spikelet with cup or ring-like swelling at base, without an evident 1st glume; annual 29. *Eriochloa*
 - 31. Spikelet without cup or ring-like swelling; annual or perennial 32
- 32. Some or all spikelets awned 30. *Echinochloa*
- 32. Spikelets awnless 33
 - 33. Spikelets borne in 1-4 rows along the lower side of one or more slender spike-like racemes 31. *Digitaria*
 - 33. Spikelets borne in open or dense panicles 34
 - 34. 1st glume 1/10 as long as 2nd glume 32. *Leptoloma*
 - 34. 1st glume 1/4 or more as long as 2nd glume 33. *Panicum*

1. BROMUS L. (Brome-Grass)

Annuals or perennials; leaf sheath closed or nearly so; inflorescence an open or tight panicle; spikelets few to several-flowered; lemmas awned or awnless, bifid.

1. Spikelets pubescent; awns more than 12 mm. long 1. *B. tectorum*
1. Spikelets glabrous; awns less than 12 mm. long 2
 2. Awns 3 mm. long or less; 1st glume 1-nerved; rhizomatous perennial; sheaths glabrous 2. *B. inermis*
 2. Awns more than 3 mm. long; 1st glume 3-5-nerved; rhizomes absent; annual; sheaths pubescent 3
 3. Panicle rather contracted, dense; spikelets 5-8 mm. wide 3. *B. commutatus*
 3. Panicle open, loose; spikelets 3-5 mm. wide 4. *B. japonicus*

1. *B. tectorum* L. DOWNY CHESS. Annual; culms 1-8 dm. high; lower sheaths densely pubescent; panicle branches drooping; spikelets pubescent with silvery hairs. Common, disturbed areas, infrequent elsewhere; April-July.—*L. Harms* 84; *E. Hartman* 2034; *D. Vierthaler* 194.

2. *B. inermis* Leyss. SMOOTH BROME. Rhizomatous perennial; culms 4-10 dm. high (rarely more); spikelets glabrous; lemmas usually awnless. Common, prairies; April-August.—*L. Harms* 112; *E. Hartman* 2066; *R. Neill* 18; *D. Vierthaler* 75; *R. Wisdom* R2.

3. *B. commutatus* Schrad. Annual; culms 3-7 dm. high; leaf sheaths retrorsely pilose; spikelets glabrous; lemmas awned. Rare, disturbed areas; May-August.—*D. Vierthaler* 8.

4. *B. japonicus* Thunb. JAPANESE BROME. Annual; culms 1-8 dm. high; leaf sheaths densely soft-pubescent; panicle dense and usually slightly drooping; spikelets glabrous; lemmas awned. (Very similar to and difficult to separate from *B. commutatus* in our area.) Common, disturbed areas; April-August (October).—*E. Garner* 1435; *E. Hartman* 2067; *D. Vierthaler* 36.

2. ERAGROSTIS Beauv. (Love-Grass)

Annuals or perennials; inflorescence a loose or dense panicle; spikelets laterally compressed, 3-many-flowered; lemmas 3-nerved.

1. Annual; glands present on midnerve of lemma; spikelets on pedicels 2 mm. or less long; inflorescence compact, less than 5 cm. wide 1. *E. megastachya*
1. Perennial; glands absent on lemma; pedicels of spikelets over 3 mm. long; inflorescence open, over 5 cm. wide 2. *E. spectabilis*
 1. *E. megastachya* (Koel.) Link. STINKGRASS. Annual; culms 1-3 dm. high; leaves 2-8 mm. wide, glandular on the margin; inflorescence contracted; spikelets 8-40-flowered, 5-17 mm. long; lemmas about

2 mm. long, glandular on the midnerve. Infrequent, disturbed areas; June-October.—*E. Garner* 1404.

2. *E. spectabilis* (Pursh) Steud. LOVEGRASS. Perennial; culms 1-6 dm. high, glabrous except at nodes; panicle open, glabrous except in axes of the panicle; lemmas 1.5-2 mm. long. Infrequent, prairies; July-September.—*D. Goering* 26.

3. TRIODIA R. BR.

1. *Triodia flava* (L.) Smyth. PURPLETOP. Perennial; culms 8-15 dm. high; sheaths densely pubescent at summit; panicle open; spikelets 3-many-flowered, 5-8 mm. long; lemmas toothed, the nerves pubescent below and excurrent above as minute teeth. Frequent, prairies; July-September.—*E. Garner* 1409; *D. Goering* 48; *J. S. Wilson* 3655, 5459.

4. POA L. (Bluegrass)

1. *Poa pratensis* L. KENTUCKY BLUEGRASS. Perennial; culms 1-10 dm. high, glabrous; panicle dense to open; spikelets 2-5-flowered, 4-5 mm. long; lemmas copiously webbed at base, about 3 mm. long. Common, prairies; April-August.—*E. Hartman* 2025, 2055, 2088; *D. Vierthaler* 45; *R. Wisdom* R20.

5. FESTUCA L. (Fescue-Grass)

1. *F. octoflora* (Walt.) Rydb. SIX-WEEKS FESCUE. Annual; culms .5-6 dm. high; panicles dense; spikelets 5-12-flowered; lemmas acute, not toothed at apex, 4-7 mm. long. Infrequent, dry areas; April-June.—*L. Harms* 167; *D. Vierthaler* 5.

6. SPHENOPHOLIS Scribn. (Wedge-Grass)

1. *S. obtusata* (Michx.) Scribn. Perennial; culms 3-10 dm. high; panicle dense, spike-like; spikelets 1-3-flowered, 2-3 mm. long; 1st glume linear; 2nd glume obovate, broad. Frequent, prairies; May-August.—*E. Hartman* 2118; *D. Vierthaler* 175; *R. Wisdom* R57.

7. KOELERIA Pers.

1. *K. cristata* (L.) Pers. JUNE-GRASS. Perennial; culms 3-6 dm. high; inflorescence a dense, spike-like panicle; spikelets 2-4-flowered, 3-5 mm. long; glumes and lemmas scabrous, about 2.5 mm. long. Infrequent, prairies; June-September.—*R. Neill* 5; *D. Vierthaler* 120; *R. Wisdom* R40.

8. LEERSIA Sw.

1. *L. oryzoides* (L.) Sw. CUT-GRASS. Perennial by long slender rhizomes; culms up to 15 dm. high, often lax and sprawling; leaf sheath and margins of blade strongly serrate; panicle contracted; spikelets 1.5-2 mm. wide; glumes minute or absent; lemma and palea 4-6 mm. long, copiously bristly-ciliate. Frequent, wet areas; July-October.—*E. Garner* 789, 1396; *D. Goering* 47.

9. PHLEUM L.

1. *P. pratense* L. TIMOTHY. Perennial; culms 3-10 dm. high; inflorescence a spike-like panicle, 1-20 cm. long and 6-10 mm. thick; spikelets about 5 mm. long; glumes awned from a squarish tip, ciliate. Infrequent, prairies; June-August.—*D. Vierthaler* 127.

10. ARISTIDA L.

1. *A. oligantha* Michx. NEEDLE-GRASS. Annual; culms tufted, 2-5 dm. high; leaf blades narrow, usually less than 1 mm. wide; panicles narrow, raceme-like; glumes about equal, 2-3 cm. long; lemmas about 2 cm. long, their awns 4-7 cm. long. Common, disturbed prairie; July-October.—*E. Garner* 1361, 1429; *D. Goering* 40; *D. Vierthaler* 123; *J. S. Wilson* 5322.

11. AGROSTIS L.

1. *A. hyemalis* (Walt.) BSP. TICKLE-GRASS. Perennial; culms 1.5-7.5 dm. high; leaf blades narrow, usually less than 1 mm. wide; inflorescence an open panicle; spikelets 1-2 mm. long; glumes longer than lemma; lemma .5-1 mm. long. Infrequent, moist areas in prairie; May-August.—*D. Vierthaler* 1; *R. Wisdom* R30.

12. MUHLENBERGIA Schreb. (Muhly)

Perennials; spikelets 1-flowered, articulated above the glumes; glumes equal or nearly so; fruit permanently enclosed by the lemma.

- | | |
|---|------------------------|
| 1. Leaf blades 1-2 mm. wide, involute | 1. <i>M. cuspidata</i> |
| 1. Leaf blades 2 mm. or more wide | 2 |
| 2. Glumes minute, less than 1/5 the length of the body of the lemma | 2. <i>M. schreberi</i> |
| 2. Glumes about 1/2 the length of the body of the lemma | 3. <i>M. frondosa</i> |

1. *M. cuspidata* (Torr.) Rydb. Non-rhizomatous perennial; culms stiff, erect, 2-7 dm. high; leaves inrolled, less than 2 mm. wide; panicles narrow, contracted; spikelets about 3 mm. long; lemmas glabrous at base. Infrequent, prairies; July-September.—*E. Garner* 1446.

2. *M. schreberi* Gmel. Perennial; culms, at flowering, lax, much-branched, 1-5 dm. high; leaves 2-4 mm. wide, 2-5 cm. long; panicles narrow, contracted; spikelets (excluding awns) about 2 mm. long; glumes minute, about .5 mm. long; lemmas pubescent at base. Common, wooded areas; August-October.—*E. Garner* 1430, 1454; *J. S. Wilson* 3651, 3653.

3. *M. frondosa* (Poir.) Fern. Perennial from scaly rhizomes; culms usually lax, much-branched, leafy, 4-10 dm. long; panicles narrow, contracted; spikelets about 3 mm. long; glumes about 1/2 the length of the body of the lemma; lemmas pubescent at base. Common, wooded areas; August-October.—*E. Garner* 1431; *J. S. Wilson* 3652, 3656.

13. SPOROBOLUS R. Br. (Dropseed)

Annuals or perennials; panicle open or dense; spikelets 1-flowered; lemma 1-nerved.

1. Sheaths with tufts of white hairs at their summits; spikelets about 2 mm. long 1. *S. cryptandrus*

1. Sheaths glabrous at summit; spikelets more than 3 mm. long 2. *S. asper*

1. *S. cryptandrus* (Torr.) Gray. Tufted perennial; culms 3-10 dm. high; leaf sheath densely bearded at summit; panicle partially enclosed in upper leaf sheaths; spikelets about 2 mm. long. Common, prairies; July-October.—*J. S. Wilson* 5312; *R. Wisdom* R92.

2. *S. asper* (Michx.) Kunth. Tufted perennial; culms 4-12 dm. high; leaf sheaths glabrous at summit; panicles contracted, mostly enclosed in upper leaf sheaths; spikelets 3-5 mm. long. Common, prairies; August-October.—*E. Garner* 1368, 1409; *D. Goering* 48; *J. S. Wilson* 3655, 5459.

14. AEGILOPS L.

1. *A. cylindrica* Host. GOAT-GRASS. Annual; culms much-branched from base, 4-6 dm. high; spike 5-10 dm. long; joints of rachis 6-8 mm. long; spikelet 2-5-flowered, usually awned. Frequent, dry disturbed areas; May-July.—*E. Hartman* 2063; *D. Vierthaler* 44.

15. TRITICUM L. (Wheat)

1. *T. aestivum* L. Annual; culms 4-10 dm. high; spike stiff; glumes and lemmas awned or awnless, usually less than twice as long as broad. Infrequent, escaped from cultivation, disturbed areas; May-June.—*D. Vierthaler* 174.

16. AGROPYRON Gaertn.

1. *A. smithii* Rydb. WESTERN WHEATGRASS. Rhizomatous perennial; culms 3-6 dm. high; leaves glaucous, often inrolled; spikelets one at a node, 6-13-flowered, 1-2 cm. long, 4-6 mm. wide; 2nd glume and lemmas about 10 mm. long. Common, prairies; June-August.—*E. Hartman* 2119; *D. Vierthaler* 47, 72.

17. HORDEUM L.

1. *H. pusillum* Nutt. LITTLE BARLEY. Annual; culms 1-5 dm. high; leaves 1-6 cm. long, 2-8 mm. wide; spike 2-8 cm. long, .5-1.5 cm. wide; spikelets 3 per node, 1-flowered; glumes with awn less than 2 cm. long. Common, prairies; May-September.—*D. Vierthaler* 211; *R. Wisdom* R33.

18. ELYMUS L. (Wild Rye)

1. Paleas more than 8 mm. long; awns curving at maturity, longer than body of glume 1. *E. canadensis*

1. Paleas less than 8 mm. long; awns straight at maturity, shorter than body of glume 2. *E. virginicus*
1. *E. canadensis* L. Perennial; culms 7-20 dm. high; leaves 4-15 mm. wide; spike dense, stiff or nodding, 8-25 cm. long; spikelets 2-5-flowered; glumes awned, 15-35 mm. long. Common, prairies; May-October.—*E. Garner* 1351; *E. Hartman* 2155; *D. Vierthaler* 65; *R. Wisdom* R73.
2. *E. virginicus* L. Perennial; culms 3-12 dm. high; leaves 3-13 mm. wide; spike dense, stiff, 3-15 cm. long; spikelets 2-4-flowered; glumes 1-3 cm. long, awned or awnless. Common, prairies; May-September.—*J. Hoover* 15; *R. Neill* 12; *D. Vierthaler* 73; *R. Wisdom* R72.

19. SPARTINA Schreb.

1. *S. pectinata* Link. SLOUGH-GRASS. Perennial by hard, purplish or brownish rhizomes, 4-11 mm. thick; culms 5-10 mm. thick at base, 5-20 dm. high; leaf blades saw-edged, 4-15 mm. wide; glumes acute, serrate-hispid, lemmas 7-9 mm. long, scabrous. Common, along water courses; July-September.—*D. Goering* 46; *D. Vierthaler* 121.

20. CHLORIS Sw.

1. *C. verticillata* Nutt. WINDMILL-GRASS. Tufted perennial; culms 1-4 dm. high; spikes in 1-3 whorls, 5-15 cm. long; spikelets (excluding the awns) about 2.5 mm. long, the awns about 3 mm. long; glumes acute; lemmas blunt, awned. Frequent, disturbed areas; June-September.—*E. Garner* 1357; *E. Hartman* 2160; *D. Vierthaler* 140.

21. BOUTELOUA Lag. (Grama-Grass)

Spikelets 1-2-flowered, in 2 rows on the underside of the flattened rachis.

1. Spikes 1-6, each mostly more than 20 mm. long 2
2. Leaf blades without long marginal cilia; rachis of spike extending well beyond the last spikelet 1. *B. gracilis*
2. Leaf blades with long marginal cilia; rachis not prolonged beyond last spikelet 2. *B. hirsuta*
1. Spikes 15 or more, each usually less than 15 mm. long 3. *B. curtipendula*
1. *B. gracilis* (HBK.) Lag. Tufted perennial; culms 1-5 dm. high; leaf blades without marginal cilia; spikes 1-6, 2-5 cm. long; spikelets 4-6 mm. long, pilose, with one perfect floret. Infrequent, prairies; July-September.—*E. Garner* 1334; *J. S. Wilson* 5469.
2. *B. hirsuta* Lag. Tufted perennial; culms 1.5-5 dm. high; leaf blades with long marginal cilia; spikes 1-4, 1.5-4 cm. long; rachilla projected well beyond last spikelet; spikelets 4-6 mm. long, densely pilose at least on fertile lemma. Common, rocky slopes and ridges; July-September.—*D. Goering* 49; *R. Neill* 26; *D. Vierthaler* 145.

3. *B. curtispindula* (Michx.) Torr. SIDE-OATS GRAMA. Perennial; culms 2-10 dm. high; spikes 15 or more, 6-20 mm. long; spikelets 6-10 mm. long; 1st glume about 1/2 the length of the second which exceeds the floret. Common, prairies; June-September.—*E. Garner* 1334, 1344; *D. Goering* 31; *R. Neill* 13, 75; *D. Vierthaler* 136; *J. S. Wilson* 2911.

22. BUCHLOE Engelm. (Buffalo-Grass)

1. *B. dactyloides* (Nutt.) Engelm. Creeping, stoloniferous, monoecious perennial; culms 5-30 cm. high; leaf blades short, usually less than 2 mm. wide, curling when dry; staminate spikes usually less than 4 per culm and composed of spikelets 5-20 mm. long; pistillate spikelets in subcapitate spikes usually shorter than the leaves. Common, disturbed areas; May-October.—*E. Hartman* 2051, 2098; *R. Neill* 7; *D. Viethaler* 27.

23. ELEUSINE Gaertn. (Goose-Grass)

1. *E. indica* (L.) Gaertn. Tufted annual; culms 5-50 cm. high, erect or depressed; spikes 2-9, 2.5-10 cm. long; spikelets awnless, about 5 mm. long, 3-5 flowered. Infrequent, disturbed areas; June-October. *J. S. Wilson* 5820.

24. SCHEDONNARDUS Steud.

1. *S. paniculatus* (Nutt.) Trel. TUMBLE-GRASS. Tufted perennial; culms mostly depressed and spreading, 1-4 dm. high; sheaths and blades glabrous; spikes 1.5-5 cm. long, arranged in long panicles; spikelets about 4 mm. long, appressed to rachis. Common, disturbed areas; June-September.—*D. Vierthaler* 208; *R. Wisdom* R39.

25. ANDROPOGON L. (Bluestem)

Clump-forming or rhizomatous perennials; panicle of slender spike-like racemes; sessile spikelet perfect; pedicellate spikelet staminate, sterile or reduced to a small glume.

1. Raceme one on each peduncle, usually more than 20 per culm
..... 1. *A. scoparius*

1. Racemes 2 or 3 on each peduncle, usually less than 15 per culm
..... 2. *A. gerardi*

1. *A. scoparius* Michx. LITTLE BLUESTEM. Tufted perennial; culms 5-15 dm. high; racemes 2-5 cm. long, borne on slender peduncles from the subtending leaf sheath; fertile sessile spikelets 4-10 mm. long (excluding the bent twisted awn), strongly pubescent. Common, prairies; August-October.—*E. Garner* 1362; *D. Goering* 25; *D. Vierthaler* 142.

2. *A. gerardi* Vitman. BIG BLUESTEM. Tufted perennial; culms 8-20 dm. high; racemes 2 or 3 on each peduncle, 3-10 cm. long; fertile, sessile spikelet (excluding bent twisted awn) about 7 mm. long; pedicellate spikelet similar but staminate and shorter. Common, prairies;

August-October.—*E. Garner* 1396, 1443; *D. Goering* 27; *R. Neill* 20; *D. Vierthaler* 138.

26. SORGHUM Adans.

1. *S. halepense* (L.) Pers. JOHNSON-GRASS. Coarse perennial with scaly rhizomes; culms 2-20 dm. high, rarely more; panicle open; sessile spikelet perfect, 4-6 mm. long; pedicellate spikelet staminate, awnless. Infrequent, disturbed areas; July-September.—*D. Vierthaler* 126.

27. SORGHASTRUM Nash

1. *S. nutans* (L.) Nash. INDIAN-GRASS. Perennial; culms 8-20 dm. high; leaves up to 1 cm. wide, scabrous; panicle of short, usually contracted racemes; sessile spikelet fertile, 5-8 mm. long (excluding bent awns); stalked spikelet represented by hairy pedicel only; fertile lemmas with bent twisted awn. Common, prairies; July-September.—*E. Garner* 1341, 1345; *D. Goering* 23; *J. S. Wilson* 3654.

28. SETARIA Beauv.

Annuals or perennials; inflorescence a dense paniculate spike; spikelets with an involucre of bristles.

1. Spike-like panicle, including the bristles, less than 2 cm. wide; leaves mostly less than 1 cm. wide 2
 2. Spikelet about 2 mm. long; 2nd glume nearly as long as the lemma 1. *S. viridis*
 2. Spikelet about 3 mm. long; 2nd glume about 1/2 as long as the lemma 2. *S. glauca*
1. Spike-like panicle, including the bristles, more than 2 cm. wide, lobulate 3. *S. italica*

1. *S. viridis* (L.) Beauv. GREEN FOXTAIL. Tufted annual; culms 1-10 dm. high; leaves 5-15 mm. wide; panicle spike-like, less than 2 cm. wide, 1.5-15 cm. long; spikelets 1.8-2.3 mm. long and about 1/2 as wide, subtended by 1-3 bristles 10 mm. or less in length. Common, disturbed areas; June-October.—*E. Garner* 1393, 1403; *D. Goering* 29; *L. Harms* 171; *R. Neill* 9, 11; *D. Vierthaler* 111; *J. S. Wilson* 5323; *R. Wisdom* R24.

2. *S. glauca* (L.) Beauv. YELLOW FOXTAIL. Tufted annual; culms up to 10 dm. high; spike-like panicles 1.5-12 cm. long, less than 2 cm. wide; spikelets about 3 mm. long and 1/2 as wide, subtended by 5-12 bristles 10 mm. or less in length. Common, disturbed areas; June-October.—*E. Garner* 1384, 1385; *R. Neill* 30; *D. Vierthaler* 146.

3. *S. italica* (L.) Beauv. FOXTAIL MILLET. Annual; culms commonly solitary, erect, 5-15 dm. high; spike-like panicle lobulate, 8-25 cm. long, usually more than 2 cm. wide; spikelets 2-3 mm. long, subtended by 1-3 bristles 10 mm. or more long. Rare, escaped from cultivation; July-October.—*J. S. Wilson* 5329; *R. Wisdom* 27 July 1962.

29. ERIOCHLOA HKB.

1. *E. contracta* Hitchc. CUP-GRASS. Tufted annual; culms 2-10 dm. high, erect or spreading, densely soft-pubescent; panicle of several, contracted spike-like racemes; leaf blades and sheaths soft-pubescent; spikelets pubescent, 3-5 mm. long; 1st glume absent or as a cup-like swelling at base of spikelet. Common, disturbed areas; June-September.—*E. Garner* 1386, 1406; *D. Vierthaler* 97.

30. ECHINOCHLOA Beauv.

1. *E. pungens* (Poir.) Rydb. BARNYARD-GRASS. Tufted annual; culms 1-10 dm. high; leaves 5-30 mm. wide, without a ligule; panicles open, 5-20 cm. long; spikelets, excluding awns, 3-5 mm. long and 1.5-2 mm. wide; glumes and sterile lemma often echinate. Common, disturbed and wet areas; June-October.—*E. Garner* 1387; *D. Goering* 30; *R. Neill* 1; *D. Vierthaler* 91.

31. DIGITARIA Heist. (Crab-Grass)

Weedy annuals; inflorescence of several spike-like racemes; spikelets borne in 2 rows on a flattened rachis.

1. Leaf sheaths glabrous; spikelets about 2 mm. long 1. *D. ischaemum*
1. Leaf sheaths pubescent, at least on the margins; spikelets about 3 mm. long 2. *D. sanguinalis*
1. *D. ischaemum* (Schreb.) Muhl. Erect or spreading annual; culms usually 10-40 cm. high; leaves glabrous, 2-10 cm. long, 3-6 mm. wide; racemes commonly 1-4 cm. long; spikelets about 2 mm. long; fertile lemma blackish at maturity. Infrequent, disturbed areas; July-October—*J. S. Wilson* 5448.

2. *D. sanguinalis* (L.) Scop. Annual; culms 3-10 cm. long, erect or spreading, often rooting at the nodes; leaf sheath pubescent at least on the margins, 2-10 cm. long, 3-10 mm. wide; racemes usually 3-8, 2-15 cm. long; spikelet about 3 mm. long; fertile lemma gray when ripe. Common, disturbed areas; June-October.—*E. Garner* 1433, 1438.

32. LEPTOLOMA Chase

1. *L. cognatum* (Schultes) Chase. FALL WITCHGRASS. Perennial; culms much-branched at base, 3-7 dm. high; leaf blades 4-8 cm. long, 3-6 mm. wide; panicle open, pedicels often twisted; spikelets 2-3 mm. long, minutely pubescent; 1st glume absent or minute. Common, prairies; August-October.—*E. Garner* 1346; *L. Harms* 165; *J. S. Wilson* 5458.

33. PANICUM L.

Annuals or perennials; panicles mostly open; spikelets 1-flowered; glumes herbaceous, very unequal, the 2nd nearly equaling the length of the sterile lemma.

1. Spikelets less than 1 mm. wide; culms and sheaths bristly-ciliate; annual 1. *P. capillare*
1. Spikelets 1 mm. or more wide 2
2. First glume 3 mm. long or more, over 1/2 the length of the spikelet 2. *P. virgatum*
2. First glume less than 3 mm. long, less than 1/2 the length of the spikelet 3
3. Leaf sheath glabrous; annual 3. *P. dichotomiflorum*
3. Leaf sheath pubescent; perennial 4. *P. oligoanthes*
1. *P. capillare* L. WITCH-GRASS. Tufted annual; culms 2-10 dm. high, bristly-ciliate; leaf sheaths bristly-ciliate; panicle open; spikelets up to 3.5 mm. long, less than 1 mm. wide. Common, disturbed areas; July-October.—*E. Garner* 1339; *J. Nilsen* 75; *D. Vierthaler* 141; *R. Wisdom* R31.
2. *P. virgatum* L. SWITCH-GRASS. Perennial from hard rhizomes; culms 3-20 dm. high; leaf blades usually over 2 dm. long; panicle open at maturity; spikelets about 5 mm. long; 1st glume over 1/2 the length of the spikelet, acute at apex. Common, prairies; July-October.—*E. Garner* 1340; *D. Vierthaler* 135; *R. Wisdom* R35.
3. *P. dichotomiflorum* Michx. Tufted annual; culms 2-20 dm. high; leaf sheaths glabrous; panicles open; spikelets usually 2-3.5 mm. long; 1st glume deltoid, about 1/4 as long as the spikelet. Infrequent, disturbed areas; July-October.—*E. Garner* 1388; *D. Goering* 52.
4. *P. oligoanthes* Schultes. Tufted perennial; culms mostly 2-5 dm. high; leaf sheaths, at least the lower, pubescent; blades about 5-7 times as long as wide; panicle open; spikelet mostly 3-3.5 mm. long, 1.5-1.8 mm. wide; 1st glume rounded at apex, about 1/3 the length of the spikelet. Common, prairies; spring-flowering, May-July; autumnal, July-September.—*E. Garner* 1335; *L. Harms* 157; *E. Hartman* 2099; *D. Vierthaler* 217.

34. TRIPSACUM L.

1. *T. dactyloides* L. GAMA-GRASS. Clump-forming, hard-based perennial with scaly rhizomes; culms 10-20 dm. high; leaves 2 dm. or more long, 5-30 mm. wide; spike terete; spikelets unisexual, staminate above, pistillate below, coriaceous, embedded in rachis. Infrequent, wet areas; May-June.—*L. Harms* 157; *D. Vierthaler* 217.

CYPERACEAE (Sedge Family)

Annual or perennial grass-like plants; stems usually triangular; leaves three-ranked, linear; flowers small.

1. Flowers perfect, borne free in the scales 2
2. Inflorescence a single terminal spike; leaves, blades absent 1. *Eleocharis*

- 2. Inflorescence composed of several spikelets; leaves present (rarely absent) 3
 - 3. Spikelets laterally flattened 2. *Cyperus*
 - 3. Spikelets terete or nearly so 3. *Scirpus*
- 1. Flowers imperfect, the female enclosed in a sac (perigynium) and subtended by a scale 4. *Carex*

1. ELEOCHARIS R. Br. (Spike-Rush)

Culms green, glabrous, terete, flattened or angled; leaf sheath present at base, blades absent; inflorescence a single terminal spikelet; perianth of bristles or none; achene with tubercle (swollen style base) at apex.

- 1. Stigmas 2; achenes lenticular; plants caespitose and annual or rhizomatous or stoloniferous and perennial 2
 - 2. Plant caespitose and annual; scales drab with prominent green midrib; achene whitish; tubercle as wide as high 1. *E. obtusa*
 - 2. Plant perennial by slender rhizomes usually less than 2 mm. thick; scales reddish-brown; achenes yellow; tubercle 1/2 as wide as high or less 2. *E. calva*
- 1. Stigmas 3; achenes subterete or trigonous; plants perennial by strong reddish-brown rhizomes 2-4 mm. thick 3. *E. compressa*
 - 1. *E. obtusa* (Willd.) Schultes. Annual; culms .3-7 dm. high, caespitose; achenes pale to deep brown, smooth, 1-1.5 mm. long, much over-topped by bristles. Common, wet areas; May-October.—*D. Vierthaler* 89.

2. *E. calva* Torr. Perennial by rhizomes; culms 1-6.5 dm. high; scales usually less than 3 mm. long; achenes yellowish, 1-1.4 mm. long; bristles 4, mostly longer than the achene. Common, wet areas; June-September.—*D. Vierthaler* 57; *J. S. Wilson* 2923, 4069, 4111, 4113; *R. Wisdom* R25, R55.

3. *E. compressa* Torr. Perennial from reddish-brown rhizomes 2-4 mm. thick; scales acute, commonly bifid, 3 mm. or more long; achenes yellow, strongly honey combed-reticulate; bristles usually shorter than the achene. Frequent, wet areas; April-July.—*J. S. Wilson* 2497, 4066.

2. CYPERUS L.

Spikelets numerous, strongly flattened; scales 2-ranked; flowers perfect.

- 1. Inflorescence globose (less than 3 cm. high); plant strongly tuberous at base; achenes about 2 mm. long, honeycombed-reticulate under magnification, tapering to base; scales about 3 mm. long and 2 mm. wide, greenish-white; spikelets usually less than 8-flowered 1. *C. filiculmis*
- 1. Inflorescence more than 3 cm. high, composed of several cylindrical rays; spikelets usually more than 8-flowered 2

2. Plants with strong rhizomes; scales more than 3 mm. long, reddish-brown with green midrib; anthers about 1.3 mm. long 2. *C. setigerus*
2. Plants without rhizomes; scales 2-5 mm. long; anthers .3-1 mm. long 3
3. Scales 3 mm. or more long, yellow; anthers .3 mm. long; fibrous-rooted annual 3. *C. strigosus*
3. Scales less than 3 mm. long 4
 4. Anthers about .3 mm. long; scales with 7 or fewer nerves, yellowish; achene .2 mm. wide at base 4. *C. ferruginescens*
 4. Anthers about 1 mm. long; scales with 7 or more nerves, yellowish; achene .4 mm. wide at base 5. *C. esculentus*
1. *C. filiculmis* Vahl. Perennial by clumps of corn-like rhizomes; culms .5-9 dm. high. Common, dry uplands; June-September.—*D. Vierthaler* 85, 220.
2. *C. setigerus* Torr. & Hook. Perennial by cord-like rhizomes; culms .6-1.2 m. high. Common, low marshy areas and along creek bottoms; July-September.—*K. L. Miller* 22 June 1962; *D. Vierthaler* 55.
3. *C. strigosus* L. Annual or rarely perennial; culms .5-9 dm. high. Common, low marshy areas and creek bottoms; July-September.—*J. S. Wilson* 2920.
4. *C. ferruginescens* Boeckl. Annual; culms 1-8 dm. high. Common, wet areas; July-September.—*D. Goering* 33; *R. Holman* 17; *R. Neill* 4; *D. Vierthaler* 128; *J. S. Wilson* 2921.
5. *C. esculentus* L. Annual or perennial by tubers; culms 1.5-9 dm. high. Common, wet areas; July-September.—*R. Neill* 11; *D. Vierthaler* 134.

3. SCIRPUS L. (Bulrush)

Mostly perennials; stems terete or triangular; spikelets terete, few to many-flowered, one to many in a terminal inflorescence which is often subtended by a one to several-leaved involucre (when single, the involucre often appears as a continuation of the culm); perianth of bristles.

1. Involucral bract apparently one, erect and appearing as a continuation of the stem; leaves, if present, terete; culms terete 1. *S. validus*
1. Involucral bracts 2-many, foliaceous, spreading; leaves flat; culms triangular 2
 2. Bristles smooth or with a few ascending hairs or barbs; spikelets more than 5 mm. long and with pedicels from 5-15 mm. long; non-stoloniferous plants 2. *S. lineatus*
 2. Bristles retrorsely barbed; spikelets and pedicels less than 5 mm. long; stoloniferous plants 3. *S. atrovirens*

1. *S. validus* Vahl. Perennial by stout, scaly reddish rhizomes; culms terete, up to 2.5 m. high; involucre one, erect, 1-7 cm. long; spikelets ovoid, 5-10 mm. long; achene 1.7-2.5 mm. long, whitish to light green; bristles usually 6, about equaling the achene. Infrequent, wet areas; June-August.—*L. Harms* 160; *R. Neill* 7.

2. *S. lineatus* Michx. Perennial; culms strongly clumped, 5-10 dm. high, 5-10-leaved; involucral bracts 2 or more; spikelets 5-20 mm. long; achene light brown, usually exceeded by the bristles. Common, wet areas; June-August.—*D. Goering* 20; *L. Harms* 118; *E. Hartman* 2017; *J. Hoover* 26; *R. Neill* 2; *D. Vierthaler* 12, 16; *J. S. Wilson* 2508; *R. Wisdom* R28.

3. *S. atrovirens* Willd. Perennial; culms 3-18 dm. high; involucre of 2 or more flat leaves; spikelets 2-5 mm. long; achenes about 1 mm. long, usually exceeded by the bristles. Common, wet areas; June-August.—*D. Goering* 21; *J. Hoover* 19; *R. Neill* 23; *D. Vierthaler* 35, 58, 77; *J. S. Wilson* 2930; *R. Wisdom* R27.

4. CAREX L. (Sedge)

Tufted, clump-forming or rhizomatous perennials; inflorescence of 2-many spikelets arranged in spikes, racemes or panicles; spikelets few or many-flowered; florets unisexual; perianth absent; pistil enclosed in a perigynium.

- 1. Styles 2; achenes lenticular 2
- 2. Male flowers borne above female flowers 3
 - 3. Perigynia 3.3 mm. or more long; anthers about 2 mm. long 4
 - 4. Leaves more than 4 mm. wide; sheaths loose, modelled green and white on back 1. *C. gravida*
 - 4. Leaves less than 4 mm. wide; sheaths tight, green on back 2. *C. austrina*
 - 3. Perigynia less than 3.3 mm. long; anthers about 1 mm. long 5
 - 5. Leaves overtopping flowering culms 3. *C. vulpinoidea*
 - 5. Leaves shorter than flowering culms 4. *C. annectens*
 - 2. Male flowers borne beneath female flowers 5. *C. brevior*
- 1. Styles 3; achenes trigonous 6
- 6. Perigynia pubescent 6. *C. lanuginosa*
- 6. Perigynia glabrous 7
- 7. Perigynia 5-6 mm. long, strongly beaked; anthers about 2 mm. long 7. *C. hystricina*
- 7. Perigynia less than 4 mm. long, scarcely, if at all, beaked; anthers 3-4 mm. long 8
- 8. Plants solitary, connected by underground rhizomes; some leaves 2 mm. or more wide; female scales about

5 mm. long, rounded at apex, translucent-margined;
anthers 3-4 mm. long 8. *C. meadii*

8. Plants tufted; leaves less than 2 mm. wide; female
scales about 4.5 mm. long, acute, reddish-
brown-margined; anthers about 3 mm. long

..... 9. *C. pennsylvanica*

1. *C. gravida* Bailey. Cespitose perennial; culms 3-10 dm. high; leaf sheaths loose, green and white modelled, nodulose-septate; leaves 4-8 mm. wide; pistillate scales about 4 mm. long and 2 mm. wide, acute to aristate, equaling perigynia; perigynia spongy-thickened at base; achenes about 2.5 mm. long; anthers 2-3.3 mm. long. Common, wet and dry areas; April-July.—*D. Goering* 49; *D. Vierthaler* 48, 180, 200; *J. S. Wilson* 2502, 4064.

2. *C. austrina* (Small) Mackenz. Cespitose perennial; culms 2-8 dm. high; leaf sheaths tight, not prominently reticulate or septate on back; leaves 2-4 mm. wide; pistillate scales about 3.8 mm. long and 2 mm. wide; perigynia about 4 mm. long and 2 mm. wide; achenes about 2 mm. long and 1.3 mm. wide; anthers about 2.1 mm. long. Common, wet and dry areas; April-July.—*L. Harms* 82, 83, 109; *D. Vierthaler* 40, 155; *J. S. Wilson* 2069, 5166; *R. Wisdom* R4, R34, R35.

3. *C. vulpinoidea* Michx. Cespitose perennial; culms 2-10 dm. high; leaves overtopping flowering culms; pistillate scales about 2.8 mm. long and 1 mm. wide, awned; perigynia about 2.2-2.6 mm. long and 1.3-1.6 mm. wide; anthers .8-1.2 mm. long. Common, wet areas; April-July.—*E. Hartman* 2082; *D. Vierthaler* 61; *R. Wisdom* R24, R54.

4. *C. annectens* Bickn. Cespitose perennial; culms 2-10 dm. high; leaves shorter than flowering culms; pistillate scales about 3 mm. long and 1 mm. wide, awned; perigynia about 2.0 mm. long and 1.4-1.8 mm. wide; anthers about 1 mm. long. Common, wet areas; May-July.—*D. Vierthaler* 68, 70, 170.

5. *C. brevior* (Dew.) Mackenz. Cespitose perennial; culms 3-10 dm. high; pistillate scales about 3.2 mm. long; perigynia 3.4-4.1 mm. long and 2.3-2.8 mm. wide, nerveless on inner face and several-nerved on outer face; anthers about 1.9 mm. long. Common, wet and dry areas; April-July.—*D. Goering* 26; *J. S. Wilson* 4114; *R. Wisdom* R36.

6. *C. lanuginosa* Michx. Tufted perennial from rhizomes and stolons; culms 3-10 dm high; leaves 2-5 mm. wide; pistillate scales equaling perigynia; perigynia pubescent, about 3 mm. long and 2 mm. wide; anthers about 1.9 mm. long. Common, moist depressions in prairies; April-August.—*D. Vierthaler* 183, 222; *J. S. Wilson* 4116.

7. *C. hystericina* Muhl. Cespitose perennial; culms 2-8 dm. high; leaves 3-10 mm. broad; staminate spike 3-4 cm. long, terminal; pistillate spike about 4 cm. long, the lower peduncled and drooping; pistillate scales 4.5-5 mm. long; perigynia strongly ribbed, mostly at right angles to the rachis, 5-6 mm. long and 1.5-2 mm. wide; anthers about 2.2 mm. long.

Common, wet areas; April-July.—*L. Harms* 121, 172; *K. Miller* 22 June 1962; *D. Vierthaler* 30, 190, 196; *R. Wisdom* R29.

8. *C. meadii* Dew. Tufted perennial with filiform rhizomes; culms 2.5-6 dm. high; leaves grayish-green, stiff, 2.5-5 mm. wide; staminate spike terminal, about 2 cm. long and 8 mm. wide; pistillate spike about 2 cm. long; staminate scales with rusty-brown margins and green midrib, obtuse at apex, about 4.2 mm. long and 1.5 mm. wide; pistillate scales with reddish-brown margins and green midrib, 4-5 mm. long and about 2 mm. wide; perigynia about 4 mm. long and 2 mm. wide; anthers mostly 3.1-4.5 mm. long. Common, prairies; late March-June.—*D. Goering* 5; *L. Harms* 20; *E. Hartman* 2070; *D. Vierthaler* 16; *J. S. Wilson* 2015 4065.

9. *C. pensylvanica* Lam. Strongly tufted perennial; culms 1-3 cm. high; leaves 1-1.8 mm. wide; staminate spikes about 1 cm. long and 3 mm. wide; pistillate spikes about 7 mm. long; staminate scales acute, about 5 mm. long and 1.6 mm. wide; pistillate scales similar to those of the male; perigynia about 3 mm. long; anthers 2-3 mm. long. Common, prairies; March-June.—*L. Harms* 8.

COMMELINACEAE (Spiderwort Family)

Herbs; leaves parallel-veined, sheathing at base; flowers perfect, actinomorphic or zygomorphic, trimerous, 3-carpellate; stamens 3 or 6; ovary superior; fruit a capsule.

1. TRADESCANTIA L. (Spiderwort)

Perennial herbs; leaves linear or linear-lanceolate; sepals 3, green; petals 3, blue, pink or white; stamens 6; capsule 3-locular.

- 1. Sepals glabrous 1. *T. ohioensis*
- 1. Sepals glandular-pubescent 2. *T. bracteata*

1. *T. ohioensis* Raf. Stems erect, glabrous, 4-10 dm. high; leaves linear-lanceolate, glabrous, up to 4 dm. long; sepals glabrous; corolla bluish-purple. Rare, prairies; May-June.—*J. S. Wilson* 2453.

2. *T. bracteata* Small. Stems erect, glabrous, 1-4 dm. high; leaves linear-lanceolate, glabrous, up to 3 dm. long; sepals glandular-pubescent, 8-15 mm. long; petals purplish, about 15-30 mm. long. Common, prairies; May-July.—*E. Hartman* 2095, 2096, 2097; *R. Neill* 44; *J. S. Wilson* 2448, 2460.

JUNCACEAE (Rush Family)

Annual or perennial herbs; leaves grass-like or absent; flowers perfect, actinomorphic, trimerous, 3-carpellate; perianth small, green or brown; stamens 6 or 3; capsule 3-many-seeded.

1. JUNCUS L. (Rush)

Annuals or perennial; stems and leaves glabrous; capsule many-seeded.

1. Inflorescence of several globose heads; perianth members bristle-tipped 1. *J. torreyi*
1. Inflorescence cymose, at least some of the flowers on pedicels 2 mm. or more long; perianth members acute, not bristle-tipped 2
 2. Auricles of the leaf sheath membranaceous, pale brown; perianth 3-4 mm. long 2. *J. interior*
 2. Auricles of the leaf sheath coriaceous, yellowish; perianth 4-6 mm. long 3. *J. dudleyi*
 1. *J. torreyi* Cov. Perennial; stems erect, 4-12 dm. high; leaves linear, 1-3 mm. wide, septate, the auricle of the leaf sheath membranaceous, about 2-3 mm. long; flowers borne in dense globular heads, 1-2 cm. wide; perianth members linear-lanceolate, bristle-tipped, mostly 4-6 mm. long; capsule about 5 mm. long. Common, wet areas; June-August.—R. Neill 3, 15; D. Vierthaler 9, 87; J. S. Wilson 2924.
 2. *J. interior* Wieg. Cespitose perennial; stems erect, 3-8 dm. high; leaves mostly involute, linear; auricles membranaceous, pale brown; inflorescence cymose, the individual flowers or some of them on pedicels 2 mm. or more long; perianth members lanceolate, acuminate, about 3-4 mm. long, about equaling the ovate capsule. Common, prairies and disturbed areas; May-July. In our area, very similar to and hardly separable from *C. dudleyi*.—E. Garner 1442; E. Hartman 2120; D. Vierthaler 80; J. S. Wilson 2509; R. Wisdom R58.
 3. *J. dudleyi* Wieg. Cespitose perennial; stems erect, 3-8 dm. high; leaves commonly involute, linear; auricles coriaceous, yellowish; inflorescence cymose; perianth members lanceolate, acuminate, about 4-6 mm. long, exceeding the ovoid capsule. Common, prairies; May-August. Questionably distinct from no. 2; other than the highly variable characters of the auricle texture and color and the perianth length, it is nearly identical to *C. interior* in our area.—L. Harms 119, 10 May 1960; J. S. Wilson 4115.

LILIACEAE (Lily Family)

Mostly herbaceous perennials by bulbs, corms, tubers or rhizomes; flowers usually perfect, trimerous; calyx and corolla colored alike, often fused; stamens 6; carpels 3, fused; ovary superior; fruit a capsule or berry.

1. Flowers 1 and leaves 2 per plant; sepals and petals (tepals) over 2 cm. long 1. *Erythronium*
1. Flowers 2 or more; tepals less than 2 cm. long 2
 2. Flowers 10 or more per umbel; plants onion-scented 2. *Allium*
 2. Flowers 10 or less per umbel; plants odorless 3. *Nothoscordum*

1. ERYTHRONIUM L. (Trout Lily)

1. *E. albidum* Nutt. Perennial from deep corm; leaves 2, lanceolate, entire, usually over 8 cm. long and 1 cm. wide; flower 1, borne on a scape 1-2 dm. high; tepals over 2 cm. long, whitish, reflexed with age; capsule oblong, about 2 cm. long, loculicidal. Abundant, prairies; March-April.—*M. Hopkins* 16.

2. ALLIUM L.

1. *A. mutabile* Michx. WILD ONION. Bulb ovoid, 1-3 cm. long, covered with a fibrous reticulate coat; flowering stem 2-5 dm. high; leaves 3 or more, linear, usually over 2 dm. long and up to 5 mm. wide; flowers borne in an umbel; tepals white or pink, about 5 mm. long; capsule ovoid, about 4 mm. long. Infrequent, rocky slopes; May-June.—*E. Hartman* 2049; *J. S. Wilson* 2448, 4112.

3. NOTHOSCORDUM Kunth.

1. *N. bivalve* (L.) Britt. FALSE GARLIC. Bulb with membranaceous coats, ovoid, about 2 cm. long; flowering stems up to 3 dm. high; leaves linear, 1-3 dm. long, up to 4 mm. wide; flowers 10 or less, borne in umbels; tepals cream-colored, about 1 cm. long; capsule subglobose, about 5 mm. long. Abundant, prairies; April-May.—*W. Barker* 3; *F. Busey* 17; *D. Goering* 7; *E. Hartman* 2022; *M. Hopkins* 24; *J. S. Wilson* 2011.

IRIDACEAE (Iris Family)

Perennial herbs from bulbs, rhizomes, corms or fibrous roots; leaves mostly basal and equitant; flowers borne from a spathe, perfect, commonly slightly zygomorphic, trimerous, 3-carpellate; calyx and corolla colored; stamens 3; ovary inferior; fruit a capsule.

1. SISYRINCHIUM L. (Blue-Eyed Grass)

1. *S. campestre* Bickn. Perennial, grass-like herbs; stems glabrous, flattened, 1-4 dm. high; leaves mostly basal, linear; spathe often purpletinged, the inner bract over 1.5 cm. long; perianth white or light blue, 8-10 mm. long; capsule about 3 mm. long. Common, prairies; April-May.—*L. Harms* 47, 52; *E. Hartman* 2021, 2024; *J. S. Wilson* 2001, 4074.

SALICACEAE (Willow Family)

Trees or shrubs; plants dioecious; leaves simple, alternate, stipulate; flowers in catkins, without a perianth, the pistillate 1-carpellate; fruit a many-seeded capsule.

1. Leaves about as wide as long 1. *Populus*
 1. Leaves usually several times as long as wide 2. *Salix*

1. POPULUS L.

1. *P. deltoides* Marsh. COTTONWOOD. Tree up to 30 m. high; bark whitish-gray; leaves deltoid, dentate or serrate, about as wide as long; capsules ovoid, 6-10 mm. long. Common, drainage areas; April-May.—*R. Neill* 5; *J. S. Wilson* 2004, 4067.

2. SALIX L. (Willow)

Trees or shrubs; leaves mostly linear to linear-lanceolate; capsule 2-locular.

1. Leaves greenish beneath 1. *S. nigra*

1. Leaves glaucous beneath 2. *S. caroliniana*

1. *S. nigra* L. Shrub or small tree up to 20 m. high; stipules minute; leaves linear-lanceolate, minutely serrate, pale green beneath; pistillate flowers with long-pubescent yellow scales; capsule about 4 mm. long. Infrequent, wet areas; April-May.—*L. Harms* 79; *J. S. Wilson* 2003.

2. *S. caroliniana* Michx. Shrub or tree up to 10 m. high; stipules large, reniform; leaves commonly lanceolate, minutely serrulate, glaucous beneath; pistillate scales pubescent, yellow; capsules about 4 mm. long. Infrequent, wet areas; April-May.—*E. Hartman* 2103.

JUGLANDACEAE (Walnut Family)

Trees or shrubs; leaves alternate, pinnate; plants monoecious; staminate flowers in catkins; pistillate flowers at tips of young branches; ovary inferior; fruit a nut.

1. JUGLANS L. (Walnut)

1. *J. nigra* L. BLACK WALNUT. Large trees up to 50 m. high; bark grayish-black; young twigs pubescent; leaves odd-pinnate, the leaflets serrate, pubescent; fruit 5-8 cm. in diameter. Infrequent, wooded areas; April-May.—*D. Goering* 71; *E. Hartman* 2120.

ULMACEAE (Elm Family)

Trees or shrubs; leaves alternate, simple, serrate; flowers perfect or unisexual; fruit a samara or drupe.

1. Flowers perfect; leaves with many prominent lateral veins; fruit a samara 1. *Ulmus*

1. Flowers (at least some of them) unisexual; leaves usually with 3 prominent veins from the base; fruit a drupe 2. *Celtis*

1. ULMUS L. (Elm)

1. *U. americana* L. AMERICAN ELM. Tree up to 40 m. high; leaves often doubly serrate (the large teeth often toothed), oblique at base; flowers perfect; samara about 1 cm. in diameter, ciliate. Common, wooded areas; March-April.—*J. S. Wilson* 5783.

2. CELTIS L.

1. *C. occidentalis* L. HACKBERRY. Tree up to 30 m. high; leaves serrate, prominently 3-nerved at base; flowers (or some of them) unisexual; drupe globose, black, about 7-10 mm. in diameter (rarely more). Common, wooded areas; March-April.—*L. Harms* 5.

MORACEAE (Mulberry Family)

Trees or shrubs; leaves alternate, simple; flowers unisexual, commonly in heads or aments; fruit an achene or drupe.

1. Leaves serrate; fruit purplish, less than 5 cm. in diameter 1. *Morus*
 1. Leave entire; fruit spherical, more than 5 cm. in diameter 2. *Machura*

1. MORUS L. (Mulberry)

1. *M. alba* L. Large or small tree, often shrub-like, up to 15 m. high; leaves serrate, often lobed, glabrous or essentially so; fruits fleshy, mostly purplish. Common, wooded areas; April-May.—*L. Harms* 25; *E. Hartman* 2038; *R. Holman* 31.

2. MACLURA Nutt. (Osage Orange)

1. *M. pomifera* (Raf.) Schneid. Tree up to 20 m. high; stems with thorns 1-2 cm. long; leaves simple, entire, ovate-lanceolate, acuminate, mostly 5-20 cm. long; fruit 6-12 cm. in diameter. Common, fence rows; May-June.—*E. Hartman* 2039; *J. S. Wilson* 5327.

URTICACEAE (Nettle Family)

Herbs, shrubs or trees; leaves usually serrate, stipulate; plants usually monoecious or dioecious; petals absent; ovary from a single carpel, superior, 1-seeded.

1. PARIETARIA L. (Pellitory)

1. *P. pensylvanica* Muhl. Pubescent annual; stems ascending, usually much-branched, 1-4 dm. high; leaves lanceolate to elliptic, petiolate, entire; flowers axillary, greenish, subtended by linear bracts about 5 mm. in length; achene shining, about 1 mm. long. Infrequent, disturbed areas; June-October.—*E. Garner* 1422, 1426; *J. Ramsey* 9 Aug 1960.

POLYGONACEAE (Smartweed Family)

Herbs, shrubs, trees or vines; leaves simple, usually alternate and entire, with sheathing stipules (ocrea); flowers actinomorphic, mostly perfect, without petals; ovary superior, 2-3 (rarely 4) carpellate; fruit an achene.

1. Achene with 3 broad wings; sepals and stamens 6; larger flower pedicels 3 mm. or more long 1. *Rumex*
1. Achene without wings; sepals 4-6; stamens 3-8; pedicels less than 3 mm. long 2
 2. Flowers axillary, not in spike-like racemes 2. *Polygonum*
 2. Flowers in terminal spike-like racemes 3. *Persicaria*

1. RUMEX L.

Annual or perennial herbs; leaves alternate, with large stipules (ocrea); flowers with 6 sepals and stamens; fruit with 3 distinct wings.

1. Leaf margins crenulate-cripsed, irregular; pedicels of mature flowers and fruits 5-10 mm. long; grains (small swollen structure between the wings in the fruit) ovoid, 3, about 1/2 the length of the wings 1. *R. crispus*
1. Leaf margins even, entire; pedicels of mature flowers and fruit 3-5 mm. long; grains lanceolate, usually 1, about 1/2 to 2/3 the length of the wings 2. *R. altissimus*

1. *R. crispus* L. CURLY DOCK. Perennial; stems erect, glabrous, 4-15 dm. high; leaves with margins crisped or curled, mostly lanceolate; inflorescence paniculate, the flowers on pedicels 5-10 mm. long; calyx strongly winged and about 5 mm. long in fruit; grains ovoid, mostly 3, about 1/2 the length of the wings. Abundant, disturbed areas; May-August.—*E. Hartman* 2073; *R. Wisdom* R41.

2. *R. altissimus* Wood. Perennial; stems erect, glabrous, 5-15 dm. high; leaves with entire margins (at least above), lanceolate; inflorescence paniculate, the flowers on pedicels less than 5 mm. long; calyx winged; grains lanceolate, usually 1, 1/2 to 2/3 the length of the wing. Common, disturbed areas; May-August.—*L. Harms* 81; *E. Hartman* 2035, 2061; *J. S. Wilson* 2416; *R. Wisdom* R3.

2. POLYGONUM L. (Knotweed)

Annual herbs; leaves alternate, mostly entire, with sheathing stipules (ocrea); petioles jointed; flowers axillary, perfect, actinomorphic, without a corolla; sepals mostly greenish; achene trigonous.

1. *P. aviculare* L. KNOTWEED. Annual; stems much-branched, prostrate or ascending; leaves mostly elliptic, glabrous, usually less than 3 cm. long and 1 cm. wide, with jointed petioles; flowers axillary; sepals 2-3 mm. long, green with white or pink margins; achene dull brown, trigonous, about 2 mm. long. Common, disturbed areas; May-October.—*E. Garner* 1408, 1421.

3. PERSICARIA Mill (Smartweed)

Annual or perennial herbs; leaves alternate, mostly entire, with stipular sheaths (ocrea) and non-jointed petioles; flowers in terminal

racemes, perfect, actinomorphic, without petals; sepals 4-6, often petaloid; stamens 3-9; achenes lenticular or trigonous.

1. Ocrea fringed with long cilia 2
 2. Calyx glandular-punctate; flowers and fruits (or some of them) not overlapping the ones above and below in the raceme 1. *P. punctata*
 2. Calyx non-glandular; flowers and fruits overlapping 3
 3. Achenes mostly trigonous; ocreolae (sheathing structures in the raceme) reaching at most to the base of the one above; raceme slender 2. *P. hydropiperoides*
 3. Achenes mostly lenticular; flowers and fruits overlapping, congested; raceme thick 3. *P. persicaria*

1. Ocrea without marginal cilia 4
 4. Racemes nodding; achene less than 2 mm. wide; peduncle without gland-tipped hairs 4. *P. lapathifolia*
 4. Racemes erect; achene more than 2 mm. wide; peduncle with gland-tipped hairs 5. *P. pensylvanica*

1. *P. punctata* (Ell.) Small. Annual or perennial herb; stems erect, often much-branched, 1-10 dm. high; leaves usually elliptic, entire, mostly 4-8 cm. long and 1-2 cm. wide; ocrea marginally ciliate; flowers borne loosely, some of them not overlapping with the ones above and below in racemes; calyx mostly white to green, glandular-punctate, about 2 mm. long; achenes trigonous, smooth and shining, mostly 2.5-3 mm. long. Infrequent, wet areas; June-October.—*R. Wisdom* R88.

2. *P. hydropiperoides* (Michx.) Small. Annual or perennial herb; stems ascending, 2-12 dm. high; leaves mostly lance-elliptic, entire, the larger blades usually over 6 cm. long and 1 cm. wide; ocrea marginally ciliate; spike-like racemes usually less than 6 mm. thick; calyx white, green or pink; achenes trigonous, smooth and shining, black, about 2 mm. long. Infrequent, wet areas; July-October.—*J. S. Wilson* 5467.

3. *P. persicaria* (L.) Small. Annual herb; stems mostly ascending, commonly much-branched; leaves commonly lanceolate, the larger blades mostly over 5 cm. long and 15 mm. wide; ocrea marginally ciliate; racemes mostly over 6 mm. wide, the flowers and fruits congested; calyx white to pink; about 2 mm. long; achenes mostly lenticular, black, smooth and shining, about 2 mm. long. Infrequent, disturbed areas; June-October.—*J. S. Wilson* 5821.

4. *P. lapathifolia* (L.) Small. Annual; stems erect, often much-branched, 2-20 dm. high; leaves commonly elliptic, high variable in size; nodes often swollen; ocrea strongly ribbed; racemes numerous, nodding; peduncles without gland-tipped hairs; calyx white, pink or green, about 2-3 mm. long; achene lenticular, brownish-black, less than 2 mm. wide. Infrequent, wet areas; June-October.—*J. S. Wilson* 5468.

5. *P. pensylvanica* (L.) Small. Annual; stems erect, often much-branched; leaves mostly elliptic, highly variable in size; racemes many,

erect; peduncles copiously covered with glandular-tipped hairs; calyx white or pink, about 3-4 mm. long; achene lenticular, shining, brownish-black, about 2-3 mm. wide. Common, wet areas; June-October.—*E. Garner* 1395; 1448; *D. Goering* 38; *J. S. Wilson* 5471.

CHENOPODIACEAE (Goosefoot Family)

Annual or perennial herbs or shrubs; leaves alternate, simple; flowers axillary or in spikes, without a corolla, perfect or unisexual; ovary 1, superior; fruit a 1-seeded utricle often enclosed in the calyx.

1. CHENOPODIUM L. (Pigweed)

Annual or perennial herbs; flowers perfect; styles 2 or 3; seeds commonly black and shining.

1. Larger leaves 12 mm. or more wide; seeds 1.2 mm. or more wide 2
2. Leaves green on both sides 3
3. Large blades 3 cm. or more wide, with 1-4 large teeth on each margin; seeds 1.8-2.5 mm. wide 1. *C. hybridum*
3. Leaves less than 3 cm. wide; seeds less than 1.6 mm. wide 4
4. Panicles many-flowered, congested; seeds black, dull (not lustrous), about 1.4 mm. wide 2. *C. paganum*
4. Panicles few-flowered, not congested; seeds black, lustrous, about 1.2 mm. wide 3. *C. boschianum*
2. Leaves (or some of them) whitened beneath; seeds black, lustrous, about 1.4 mm. wide 4. *C. album*
1. Leaves less than 12 mm. wide, lanceolate; seeds less than 1.3 mm. wide 5. *C. lanceolatum*

1. *C. hybridum* L. Annual; stems erect, glabrous, up to 15 dm. high; leaves ovate, long-petioled, with 1-4 large teeth on each margin, the larger 3 cm. or more wide; inflorescence paniculate; calyx green; seeds black, 1.8-2.5 mm. wide. Infrequent, disturbed areas; July-October.—*J. S. Wilson* 3659.

2. *C. paganum* Reichenb. Annual; stems erect, much-branched, up to 2 m. high; leaves lanceolate, remotely-toothed, cuneate at base, less than 3 cm. wide; flowers congested in panicles; calyx partially covered with small whitish scales; seeds black, about 1.4 mm. wide. Common, disturbed areas; July-October.—*R. Neill* 17; *J. S. Wilson* 5465.

3. *C. boschianum* Moq. Annual; stems erect, with slender branches, up to 10 dm. high; larger leaves long-petioled, lance-ovate and irregularly toothed, the smaller and upper lanceolate leaves entire; panicle loose, the flowers not congested; seeds black, about 1.3 mm. wide. Infrequent, disturbed areas; July-October.—*J. S. Wilson* 3496.

4. *C. album* L. PIGWEED, LAMBSQUARTERS. Annual; stems erect, often much-branched, 2-20 dm. high; leaves commonly lance-ovate, the larger commonly toothed; sepals covered with white scales; seeds black, 1.3-1.5 mm. wide. Infrequent, disturbed areas; June-October.—*J. S. Wilson* 3748.

5. *C. lanceolatum* Muhl. Annual; stems erect, much-branched, glabrous, up to 15 dm. high; leaves mostly lanceolate, entire, usually less than 1 cm. wide; seeds black, about 1 mm. wide. Infrequent, disturbed areas; July-October.—*E. Garner* 1383, 1419.

AMARANTHACEAE (Amaranth Family)

Mostly herbaceous annuals or perennials; leaves commonly simple; flowers small, usually imperfect; corolla absent; ovary superior; fruit a utricle.

1. Plants dioecious; calyx 2.5-3.5 mm. long in staminate flowers, absent in pistillate flowers; leaves mucronate from a broadly rounded or slightly convex apex 1. *Acnida*
1. Plants monoecious or dioecious; calyx present in female flowers; leaves not as above 2. *Amaranthus*

1. ACNIDA L. (Water Hemp)

1. *A. tamariscina* (Nutt.) Wood. Annual; stems erect, much-branched, glabrous, 3-15 dm. high; leaves commonly lanceolate, entire, alternate, usually less than 1 cm. wide; flowers in axillary or terminal spikes; sepals 2.5-3.5 mm. long; utricle circumscissile; seeds about 1 mm. wide. Common, disturbed areas; July-October.—*E. Garner* 1411, 1412; *J. S. Wilson* 3680, 5314, 5318; *R. Wisdom* R91.

2. AMARANTHUS (Amaranth)

Annual herbs; leaves alternate, simple, usually entire; flowers small; sepals 1-5; fruit a 1-seeded utricle.

1. Flowers in long terminal and axillary spikes; sepals about 2.5 mm. long; larger leaves usually over 2 cm. wide 1. *A. retroflexus*
1. Flowers in axillary clusters; sepals about 1 mm. long; leaves less than 2 cm. wide 2. *A. albus*

1. *A. retroflexus* L. PIGWEED. Annual; stems erect, mostly branched, pubescent, 3-15 dm. high; leaves commonly ovate, long-petioled, the larger over 2 cm. wide; spikes thick, the flowers congested; bracts about 4-6 mm. long; sepals rounded at apex, mucronate, 2.5-4 mm. long in pistillate flowers; seeds brownish-black, lustrous, about 1 mm. wide. Common, disturbed areas; July-October.—*E. Garner* 1420; *L. Long* 21; *J. S. Wilson* 3679, 4545, 5319.

2. *A. albus* L. TUMBLEWEED. Annual; stems erect, much-branched from base, glabrous, 1-10 dm. high; leaves commonly spatulate, long-petioled, usually less than 2 cm. wide; flowers in axillary clusters; sepals

of pistillate flowers up to 2 mm. long; seeds black, lustrous, about 1 mm. or less wide. Infrequent, disturbed areas; July-October.—*J. S. Wilson* 5320.

NYCTAGINACEAE (Four-O'clock Family)

Mostly annual or perennial herbs; leaves usually opposite and entire; flowers usually perfect, actinomorphic, without a corolla, 1-carpellate; calyx often petaloid; ovary superior or partially inferior; fruit 1-seeded.

1. MIRABILIS L. (Four-O'clock)

Perennial herbs; leaves opposite, entire; flowers 1-5 in a 5-lobed involucre; calyx usually pinkish; stigma capitate.

1. Leaves petiolate, over 2 cm. wide 1. *M. nyctaginea*
 1. Leaves without an evident petiole, less than 2 cm. wide

..... 2. *M. albida*

1. *M. nyctaginea* (Michx.) MacM. Stems erect, glabrous, up to 1 m. high; leaves commonly obovate, entire, petiolate, over 2 cm. wide; flowers in terminal clusters, partially enclosed in a ciliate-pubescent involucre; calyx pink, about 10 mm. long; fruit about 4 mm. long. Common, disturbed areas; May-October.—*E. Garner* 1400, 1436; *R. Wisdom* R15.

2. *M. albida* (Walt.) Heimerl. Stems erect, branched, whitish, 2-10 dm. high; leaves linear, entire, sessile, usually less than 15 mm. wide; involucre pubescent; calyx pink, 7-10 mm. long; fruit about 5 mm. long. Common, dry areas; July-October.—*J. S. Wilson* 3510, 4452; *R. Wisdom* R38.

PHYTOLACCACEAE (Pokeweed Family)

Herbs, shrubs or trees; leaves alternate, entire; flowers perfect, actinomorphic, without a corolla; ovary superior.

1. PHYTOLACCA L. (Pokeweed)

1. *P. americana* L. Large perennial herb; stems up to 3 m. high, often branched; leaves commonly ovate, glabrous, the larger blades over 10 cm. long and 5 cm. wide; flowers borne in axillary racemes; sepals 5, greenish-white or pinkish, about 2-3 mm. long; stamens 10; berry purplish-black, about 7-10 mm. wide. Infrequent, disturbed areas; July-October.—*J. S. Wilson* 5326.

CARYOPHYLLACEAE (Pink Family)

Annual or perennial herbs; leaves usually opposite, entire; flowers perfect, actinomorphic, mostly pentamerous; ovary superior; fruit a capsule or utricle.

1. Corolla 2 cm. or more long; larger leaves 1 cm. or more wide 1. *Saponaria*
 1. Corolla less than 1 cm. long; leaves less than 1 cm. wide 2

- 2. Upper leaves linear, at least 7 times as long as wide; stems with glutinous patches 2. *Silene*
- 2. Leaves lanceolate or wider, less than 6 times as long as wide 3. *Cerastium*

1. SAPONARIA L. (Bouncing Bet)

1. *S. officinalis* L. Perennial herb from horizontal rhizomes; stems ascending, glabrous, 3-8 dm. high; leaves commonly elliptic, glabrous, the larger over 1 cm. wide; sepals glabrous, 15-25 mm. long; petals whitish-pink, slightly longer than the sepals; capsule elliptic, many-seeded. Infrequent, disturbed areas; July-September.—*J. Nilsen* 100; *J.S. Wilson* 4450.

2. SILENE L. (Campion)

1. *S. antirrhina* L. Annual; stems erect, much-branched from base, glutinous just beneath upper nodes, 2-8 dm. high; leaves linear to linear-lanceolate, rarely over 5 mm. wide; calyx about 10 mm. long; corolla white or pink, often inconspicuous; capsule ovoid, about 6 mm. long. Infrequent, disturbed areas and prairies; May-July.—*J. S. Wilson* 2445; *R. Wisdom* R19.

3. CERASTIUM L. (Mouse-Ear Chickweed)

1. *C. viscosum* L. Annual; stems spreading or ascending, pubescent, 1-3 dm. long; leaves sessile, commonly spatulate, rarely over 2.5 cm. long; sepals about 4 mm. long; corolla white; capsule lanceolate. Infrequent, disturbed areas; April-June.—*J. S. Wilson* 4076.

RANUNCULACEAE (Crowfoot Family)

Mostly herbs; leaves usually alternate or basal, often dissected; flowers actinomorphic, rarely zygomorphic, usually perfect; stamens and carpels commonly numerous; ovary superior; fruit an achene, follicle or berry.

- 1. Basal leaves rounded; petals yellow 1. *Ranunculus*
- 1. Basal leaves dissected; flowers blue, pink or white 2
 - 2. Petals more than 10, blue or white; flowers actinomorphic, the larger ones more than 3 cm wide 2. *Anemone*
 - 2. Petals less than 10, white, spurred at base; flowers zygomorphic, less than 2 cm. wide 3. *Delphinium*

1. RANUNCULUS L. (Buttercup)

1. *R. abortivus* L. SMALL-FLOWERED BUTTERCUP. Perennial herb; stems erect, branched, glabrous, 2-5 dm. high; leaves minutely serrate, the basal long-petioled, orbicular, cordate at base, the cauline nearly sessile, divided into 3-5 linear-lanceolate divisions; sepals slightly longer than petals; petals yellow, 2-3 mm. long; stamens many; achenes

about 1.5 mm. long, borne in a short head. Infrequent, wet areas; April-June.—*L. Harms* 40.

2. ANEMONE L. (Anemone)

1. *A. caroliniana* Walt. Perennial from tuber-like rhizomes; stems erect, 1-4 dm. high; leaves all basal, orbicular in outline, usually with 3 variously divided leaflets; sepals many, petal-like; blue or white, 10-20 mm. long; petals none; stamens and carpels many; achenes borne in an ovoid head. Infrequent, prairies; April-May.—*J. S. Wilson* 4062.

3. DELPHINIUM L. (Larkspur)

1. *D. virescens* Nutt. Perennial from a tuberous base; stems erect, 3-7 dm. high; leaves, both basal and cauline, dissected into linear divisions; flowers white, the spur about 10-15 mm. long; follicles 10-20 mm. long. Common, prairies; May-July.—*E. Hartman* 2104, 2147; *J. S. Wilson* 2431.

PAPAVERACEAE (Poppy Family)

Herbs; leaves commonly dissected; flowers perfect, actinomorphic or zygomorphic; sepals 2-4; petals 4-12; ovary superior; fruit a capsule.

1. CORYDALIS Medic. (Corydalis)

1. *C. micrantha* (Engelm.) Gray. Herbaceous annual; stems ascending, glabrous, much-branched from the base, 1-4 dm. high; leaves dissected, the ultimate segments filiform; corolla yellow, spurred at base, about 1 cm. long; capsule ascending, 1-2 cm. long. Infrequent, disturbed areas and prairies; April-June.—*F. Busey* 18; *M. Hopkins* 22; *J. S. Wilson* 2016.

CRUCIFERAE (Mustard Family)

Annual, biennial or perennial herbs; leaves alternate, commonly dissected; flowers usually perfect, actinomorphic, tetramerous, 2-carpellate; sepals 4; petals 4; stamens usually 6 (4 long and 2 short); ovary superior; fruit a capsule (silique or silicle).

- | | |
|--|-----------------------|
| 1. Petals yellow; fruit linear, at least 4 times as long as wide (silique) | 2 |
| 2. Leaves simple, dentate | 1. <i>Erysimum</i> |
| 2. Leaves pinnate, the segments less than 1 mm. wide | 2. <i>Descurainia</i> |
| 1. Petals white; fruit less than 4 times as long as broad (silicle) or linear (silique) | 3 |
| 3. Leaves obovate, minutely toothed at apex, less than 3 cm. long, pubescent; plants usually less than 10 cm. high | 3. <i>Draba</i> |
| 3. Leaves lanceolate or dissected and longer | 4 |

4. Aquatic; fruit more than 4 times as long as wide
 4. *Nasturtium*
4. Terrestrial; fruit less than 4 times as long as wide 5
5. Leaves toothed; fruit orbicular 5. *Thlaspi*
5. Leaves dissected; fruit triangular 6. *Capsella*

1. ERYSIMUM L.

1. *E. repandum* L. Annual; stems erect, often branched above, 1-10 dm. high; leaves lanceolate, remotely toothed, usually less than 1 cm. wide; sepals about 5-7 mm. long; petals yellow, 6-10 mm. long; fruit linear, 5-10 cm. long. Common, disturbed areas; April-June.—*D. Goering* 2; *L. Harms* 1; *E. Hartman* 2005, 2036, 2057; *J. S. Wilson* 2020.

2. DESCURAINIA Webb & Berth. (Tansy Mustard)

1. *D. pinnata* (Walt.) Britt. Annual; stems erect, commonly branched, 1-7 dm. high; leaves pinnate or bipinnate, the segments mostly filiform and less than 1 mm. wide; flowers small, borne in a glandular raceme; petals yellow, less than 4 mm. long; fruit linear-clavate, 1-2 mm. thick, about 5-8 mm. long. Common, disturbed areas; April-June.—*L. Harms* 54; *E. Hartman* 2045; *M. Hopkins* 23; *J. S. Wilson* 4079.

3. DRABA L.

1. *D. cuneifolia* Nutt. Annual; stems erect, often branched from base, pubescent, 5-30 cm. high; leaves mostly obovate, pubescent, toothed, usually all basal except for 1 or 2 pairs just above the rosette; raceme pubescent; petals white; fruit 6-11 mm. long, 1-2 mm. wide. Common, prairies; March-May.—*F. Busey* 15; *L. Harms* 15; *J. S. Wilson* 4071.

4. NASTURTIIUM R. Br. (Watercress)

1. *N. officinale* R. Br. Aquatic perennial herb; stems submersed, floating in water or prostrate in mud, glabrous; leaves pinnate, the leaflets commonly ovate; corolla white, about 4 mm. long; fruit slender, about 2-3 mm. wide and 10-20 mm. long. Common, springs; April-June.—*F. Busey* 24; *E. Eisenbise* 16; *E. Garner* 87; *L. Harms* 17, 115; *J. S. Wilson* 2430, 4075; *R. Wisdom* R26.

5. THLASPI L. (Penny Cress)

1. *T. arvense* L. Annual; stems erect, often branched, glabrous, 1-8 dm. high; leaves mostly linear-lanceolate, glabrous, remotely toothed; petals white, about 3 mm. long; fruits orbicular, notched at apex, winged, 10-14 mm. long and about 2/3 as wide. Common, disturbed areas; April-June. —*W. Barker* 6; *E. Garner* 1413; *D. Goering* 1; *L. Harms* 2; *E. Hartman* 2037, 2058; *J. S. Wilson* 2006, 2019.

6. CAPSELLA Medic. (Shepherd's Purse)

1. *C. bursa-pastoris* (L.) Medic. Annual; stems erect, 1-6 dm. high; leaves mostly basal, deeply pinnatifid; corolla white, about 2 mm. long; fruit triangular, slightly notched at apex, 5-7 mm. long. Common, disturbed areas; March-June.—*L. Harms* 12; *E. Hartman* 2056; *J. S. Wilson* 2021, 2080.

SAXIFRAGACEAE (Saxifrage Family)

Herbs, woody vines, shrubs or trees; leaves various; flowers usually perfect, actinomorphic, pentamerous; ovary inferior; fruit a follicle, capsule or berry.

1. RIBES L.

1. *R. missouriense* Nutt. WILD GOOSEBERRY. Shrub; stems arching, up to 3 m. long, possessing nodal spines; leaves 3-lobed, dentate, circular in outline; flowers commonly 2 from axillary peduncles, each on a pedicel shorter than the peduncle; sepals 5-7 mm. long; petals yellowish, 2.5-3.5 mm. long; stamens exert, 10-12 mm. long; fruit globose. Common, wooded areas; April-May.—*W. Barker* 2; *D. Goering* 9; *J. S. Wilson* 2008.

ROSACEAE (Rose Family)

Herbs, shrubs or trees; leaves alternate, stipulate; flowers perfect, actinomorphic, usually pentamerous; sepals, petals and stamens inserted on floral tube; ovary inferior or superior.

- | | |
|--|----------------------|
| 1. Small trees, shrubs or woody vines | 2 |
| 2. Stems with prickles; leaves pinnate | 1. <i>Rosa</i> |
| 2. Stems without prickles; leaves simple | 2. <i>Prunus</i> |
| 1. Herbs | 3 |
| 3. Petals yellow; cauline leaves with 5 leaflets, all less than
1.5 cm. wide | 3. <i>Potentilla</i> |
| 3. Petals white; cauline leaves with 3 leaflets, the larger more
more than 2 cm. wide | 4. <i>Geum</i> |

1. ROSA L. (Rose)

Shrubs or woody vines with thorns; leaves pinnate; petals large and showy; stamens and carpels many; achenes numerous in the fleshy hypanthium (floral tube).

- | | |
|--|-------------------------|
| 1. Stipules fimbriate; styles united into a column nearly as long as
the stamens | 1. <i>R. multiflora</i> |
| 1. Stipules mostly entire; styles separate, mostly included in the
floral tube (shorter than the stamens) | 2. <i>R. carolina</i> |
| 1. <i>R. multiflora</i> Thunb. Stems climbing or sprawling; leaves pin-
nate, mostly with 7 serrate glabrous leaflets and glandular-pubescent
petioles; stipules fimbriate; flowers borne in a terminal raceme; sepals at- | |

tenuate, pubescent, about 5-8 mm. long; petals mostly 1-2 cm. long, white. Common, fence-rows; May-June.—*E. Hartman* 2116.

2. *R. carolina* L. Stems up to 1 m. long; leaves usually pinnate, the leaflets mostly 7, ovate, serrate, pubescent beneath; flowers usually 1 at a node; sepals pubescent, acute or occasionally foliaceous-tipped; petals pink, about 2-3 cm. long. Common, prairies; May-June.—*E. Hartman* 2068; *R. Wisdom* R23, R59.

2. PRUNUS L.

Trees or shrubs; leaves alternate, simple, serrate; flowers in axillary clusters or racemes; sepals 5, petals 5; fruit a 1-seeded drupe.

1. Flowers in racemes of 15 or more 1. *P. virginiana*

1. Flowers in axillary clusters of 5 or less 2. *P. americana*

1. *P. virginiana* L. CHOKe CHERRY. Shrub or small tree up to 10 m. high; leaves mostly ovate, serrate, with 1 or 2 glands on petiole near the blade; flowers borne in racemes of 15 or more, produced after the leaves; sepals triangular, 1-1.5 mm. long and about as wide, conspicuously glandular-margined; petals white, about 4 mm. long; fruit reddish, about 8-10 mm. in diameter. Infrequent, wooded areas; April-May.—*J. Wertzberger* 11; *J. M. Fulghum* 11 May 1961.

2. *P. americana* Marsh. WILD PLUM. Small shrub up to 4 m. high; leaves ovate-lanceolate, serrate, produced after the flowers; flowers in axillary clusters of 2-4; sepals acute, about 3 mm. long; petals white, about 7-10 mm. long; drupe red, about 2 cm. in diameter. Common, prairies; April-May.—*D. Goering* 8; *L. Harms* 18.

3. POTENTILLA L. (Cinquefoil)

1. *P. recta* L. Herbaceous perennial; stems several from a hardened base, erect, pubescent, 1-5 dm. high; leaves palmately compound, mostly with 5-6 pubescent, serrate, linear-lanceolate leaflets; flowers in terminal cymes; sepals pubescent; petals yellow, about 1 cm. long. Infrequent, prairies; May-July.—*J. Hoover* 21; *J. Woodhead* 28 June 1960.

4. GEUM L. (Avens)

1. *G. canadense* Jacq. Perennial herb; stems erect, minutely pubescent, 3-10 dm. high; leaves pinnately compound, the basal commonly with 5-7 ovate pinnate leaflets, the cauline with 1-3; sepals lance-acute, about 6 mm. long; petals white, as long as the sepals; fruit globose, bristly at maturity. Infrequent, wooded areas; May-July.—*E. Garner* 1452; *J. S. Wilson* 2462.

LEGUMINOSAE (Pea Family)

Annual or perennial herbs, vines, shrubs or trees; leaves alternate, stipulate, usually compound; flowers regular or more commonly zygo-

morphic; sepals and petals commonly 5; stamens 5-10 (rarely 1), commonly diadelphous; carpel 1; fruit a legume.

1. Leaves with 3-5 leaflets 2
 2. Leaflets serrate 1. *Melilotus*
 2. Leaflets entire 3
 3. Flowers more than 20 mm. long and 10 mm. wide; leaves sessile 2. *Baptisia*
 3. Flowers much less than 20 mm. long and 10 mm. wide 4
 4. Corolla yellow or cream-colored; flowers aggregated into dense heads 3. *Lespedeza*
 4. Corolla blue, purple, pink or white 5
 5. Stems trailing or twining; plants vining; fruit pod-like, about 20 mm. long and 5 mm. wide 4. *Strophostyles*
 5. Stems erect, ascending, spreading or prostrate 6
 6. Foliage glandular-punctate 5. *Psoralea*
 6. Foliage not glandular-punctate 7
 7. Petioles more than 5 mm. long (at least on lower leaves); fruits strongly constricted into joints (chain-like) and more than 10 mm. long at maturity; plants usually 5 dm. or more high 6. *Desmodium*
 7. Petioles less than 5 mm. long; fruits not constricted, less than 10 mm. long at maturity; plants usually less than 3 dm. high 3. *Lespedeza*
1. Leaves with 7 or more leaflets 8
8. Leaves bipinnately compound 9
 9. Herbs or shrubs 10
 10. Corolla pink; stems with short, hooked thorns about 3 mm. long 7. *Schrankia*
 10. Corolla white; stems without thorns 8. *Desmanthus*
 9. Trees with greenish-yellow flowers; thorns, if present, straight or branched and more than 10 mm. long 9. *Gleditsia*
8. Leaves pinnately compound 11
11. Trees 12
 12. Leaves even-pinnate (terminal leaflet absent); thorns, if present, simple 10. *Robinia*
 12. Leaves odd-pinnate; thorns mostly branched 9. *Gleditsia*
11. Shrubs or herbs 13

- 13. Corolla yellow; stamens poricidal 11. *Cassia*
- 13. Corolla blue, purple, pink, white or cream-colored 14
- 14. Vines with tendrils; corolla bluish-purple 12. *Vicia*
- 14. Herbs or small shrubs 15
- 15. Petals 1 16
- 16. Stamens 10; corolla blue 13. *Amorpha*
- 16. Stamens 5; corolla white or purple 14. *Petalostemum*
- 15. Petals several; corolla zygomorphic 17
- 17. Leaves glandular-dotted or punctuate 18
- 18. Corolla cream-colored, 12-15 mm. long 15. *Glycyrrhiza*
- 18. Corolla purple, pink or white, less than 8 mm. long 14. *Petalostemum*
- 17. Leaves not glandular-punctuate 16. *Astragalus*

1. MELILOTUS Mill. (Sweet Clover)

Annual or biennial herbs; leaves 3-foliolate, serrulate; flowers zygomorphic; stamens 10, diadelphous.

- 1. Corolla white 1. *M. alba*
- 1. Corolla yellow 2. *M. officinalis*

1. *M. alba* Desr. Flowering stems 5-15 dm. high; leaves with setaceous stipules, 3-foliolate, the leaflets mostly ovate, the middle one stalked; calyx lobes acute; corolla white. Common, disturbed areas; May-October.—*R. Neill* 34; *J. S. Wilson* 2427; *R. Wisdom* R71.

2. *M. officinalis* (L.) Lam. Flowering stems 5-15 dm. high; leaves with setaceous stipules, 3-foliolate, the leaflets mostly ovate to ovate-lanceolate, the middle one stalked; calyx lobes acute; corolla yellow. Common, disturbed areas; May-October.—*E. Garner* 1439; *E. Hartman* 2077; *R. Neill* 6; *R. Wisdom* R7.

2. BAPTISIA Vent. (False Indigo)

Perennial herbs from thick rhizomes; leaves with 3-5 leaflets; flowers zygomorphic; stamens 10, distinct.

- 1. Corolla cream-colored; leaves pubescent 1. *B. leucophaea*
- 1. Corolla blue; leaves glabrous 2. *B. minor*

1. *B. leucophaea* T. & G. Flowering stems densely pubescent, 3-10 dm. high; leaves pubescent, the leaflets entire, oblanceolate; stipules ovate, longer than petioles; calyx pubescent, the lobes acute, longer than wide; corolla cream-colored, about 2 cm. long; fruit ovoid, about 3-5 cm. long; turning black at maturity. Common, prairies; April-June.—*W. Barker* 5; *E. Harms* 45; *E. Hartman* 2028, 2059; *J. S. Wilson* 2002.

2. *B. minor* Lehm. Flowering stems 3-10 dm. high, glabrous; leaves glabrous, the leaflets entire, lanceolate; stipules mostly ovate, longer than the petioles; calyx glabrous, the lobes about as wide as high, acute; corolla blue; fruit ovoid, about 3-6 cm. long. Common, prairies; April-June.—*D. Goering* 67, 68; *D. Greiner* 22; *E. Hartman* 2092, 2093, 2100, 2115; *J. Hoover* 30; *R. Koehn* 33.

3. LESPEDEZA Michx. (Bush Clover)

Mostly annual or perennial herbs; leaves 3-foliolate, the leaflets mostly entire; corolla zygomorphic; fruit 1-seeded.

1. Erect plants; corolla yellowish; stipules setaceous, about 1 mm. wide; flowers borne in head-like clusters 1. *L. capitata*

1. Prostrate or ascending plants; corolla pinkish; stipules ovate, 2 mm. or more wide; flowers 1-5 at a node 2. *L. stipulacea*

1. *L. capitata* Michx. Perennial herbs; flowering stems erect, densely pubescent, 4-12 dm. high; leaves pubescent, the leaflets elliptic, entire; sepals pubescent, about 7 mm. long; corolla cream-colored. Common, prairies; July-September.—*J. Davis* 37; *E. Garner* 1444; *D. Goering* 17.

2. *L. stipulacea* Maxim. KOREAN LESPEDEZA. Much-branched prostrate annual; flowering stems pubescent with long ascending hairs, 1-6 dm. long; leaves minutely strigose, the leaflets mostly obovate; calyx about 2 mm. long; corolla pinkish. Introduced by seeding in disturbed areas; July-October.—*E. Garner* 1440; *J. S. Wilson* 3462.

4. STROPHOSTYLES Ell. (Wild Bean)

1. *S. leiosperma* (T. & G.) Piper. Annual vine-like herb; flowering stems pubescent; leaves 3-foliolate, the leaflets slightly pubescent, elliptic, entire; stipules setaceous, about 1 mm. wide; calyx pubescent, the lobes acute; corolla zygomorphic, bluish-purple; fruit pubescent, 2-4 cm. long. Infrequent, prairies; July-October.—*E. Garner* 1338.

5. PSORALEA L. (Scurf-Pea)

Perennial rhizomatous herbs; leaves glandular-punctate, pinnate; flowers zygomorphic; fruit 1-seeded.

1. Calyx lobes (at least the longest) more than 6 mm. long. 1. *P. esculentus*

1. Calyx lobes less than 6 mm. long 2

2. Calyx lobes less than 2 mm. long 2. *P. tenuiflora*

2. Calyx lobes (at least the longest) more than 3 mm. long 3. *P. argophylla*

1. *P. esculentus* Pursh. PRAIRIE TURNIP. Perennial from subglobose root; flowering stems pubescent, 1-4 dm. high; leaves pubescent, the leaflets mostly oblanceolate, entire, sessile; calyx strigose, about 13 mm. long, lobes unequal, the longest about 7 mm.; corolla bluish-purple,

about 13 mm. long; fruit pubescent. Infrequent, prairies; April-July.—*D. Greiner* 34; *E. Hartman* 2046; *R. Wisdom* R50.

2. *P. tenuiflora* Pursh. Much-branched perennial from thickened tubers; flowering stems 2-10 dm. high, pubescent; leaves pubescent, the leaflets 3-5, entire; calyx about 3 mm. long, pubescent; corolla purplish. Common, prairies; April-July.—*D. Goering* 28; *E. Hartman* 2054, 2078, 2139; *R. Wisdom* R22.

3. *P. argophylla* Pursh. Perennial from elongate rhizomes; flowering stems white-pubescent, much-branched, 2-7 dm. high; leaves whitish on both surfaces, the leaflets white-pubescent; corolla bluish-purple. Common, prairies; April-July.—*D. Greiner* 29; *E. Hartman* 2138; *J. Hoover* 16; *J. S. Wilson* 2470.

6. DESMIDIUM Desv. (Tick Trefoil)

1. *D. illinoense* Gray. Perennial herb; flowering stems 6-15 dm. high, pubescent; leaves 3-foliolate, the leaflets lanceolate, entire, pubescent beneath, stalked; corolla zygomorphic, purplish, about 9 mm. long; fruit constricted into 3-6 pubescent joints. Infrequent, prairies; June-September.—*J. S. Wilson* 3511.

7. SCHRANKIA Willd. (Sensitive Brier)

1. *S. nuttallii* (DC.) Standl. Shrubby herbaceous perennial; flowering stems covered with prickles, arching, up to 1 m. long; leaves bipinnate, the leaflets (ultimate) small, rarely more than 5 mm. long; flowers actinomorphic, pink, borne in capitulate clusters; stamens 10-12; fruit linear, terete, thorny, 4-12 cm. long. Infrequent, prairies; May-September.—*J. Hoover* 4; *R. Wisdom* R46.

8. DESMANTHUS Willd.

1. *D. illinoensis* (Michx.) MacMill. Perennial herb; flowering stems glabrous, up to 1 m. high, channelled; leaves bipinnate, the ultimate leaflets small, mostly less than 1 cm. wide and 1 cm. long, glabrous; flowers borne in head-like clusters, actinomorphic, white; stamens 5; fruits strongly curved, 1-2.5 cm. long. Infrequent, prairies; May-June.—*R. Neill* 14; *J. S. Wilson* 3509; *R. Wisdom* R61.

9. GLEDITSIA L. (Honey-Locust)

1. *G. triacanthos* L. Large, mostly thorny, trees up to 20 m. (rarely more) high; leaves pinnate or bipinnate, the leaflets mostly lanceolate, entire, glabrous, usually less than 1 cm. wide; flowers less than 1 cm. long, often imperfect; fruit large, 1-4 dm. long, 2-4 cm. wide. Infrequent, old homesteads; April-June.—*J. S. Wilson* 5315.

10. ROBINIA L. (Locust)

1. *R. pseudoacacia* L. BLACK LOCUST. Tree up to 25 m. high; branches mostly with short stipular thorns; leaves pinnate, the leaflets

mostly ovate to elliptic, pubescent; flowers about 15-25 mm. long, cream-colored; fruit 5-10 cm. long. Infrequent, wooded areas; May-June.—*D. Goering* 69; *E. Hartman* 2062.

11. CASSIA L. (Senna)

Herbs or shrubs; leaves pinnate; petals 5, mostly yellow, slightly unequal in length; stamens 5-10, the anthers opening by pores; fruit a many-seeded legume.

1. Leaflets over 7 mm. wide and usually over 20 mm. long
 1. *C. marilandica*
1. Leaflets less than 7 mm. wide and usually less than 20 mm.
 long 2. *C. fasciculata*

1. *C. marilandica* L. Shrub; stems up to 2 m. high; leaves pinnate, the leaflets lanceolate, entire, over 20 mm. long and 7 mm. wide; petals 10-15 mm. long; fruit 6-10 cm. long. Infrequent, drainage areas; May-July.—*T. Crawford* 9 August 1960.

2. *C. fasciculata* Michx. PARTRIDGE PEA. Herbaceous annual; flowering stems erect, 2-8 dm. high; leaves pinnate, the leaflets linear, less than 15 mm. long and 5 mm. wide; petals 1-2 cm. long; fruit 4-7 cm. long. Common, prairies; July-September.—*E. Garner* 1449; *J. S. Wilson* 3514.

12. VICIA L. (Vetch)

1. *V. americana* Muhl. Trailing herbaceous perennial vine; stems up to 1 m. long, glabrous; leaves pinnate, the leaflets mostly linear, the terminal one usually a tendril; calyx about 5 mm. long, the lobes acute; corolla zygomorphic, purplish, about 20 mm. long; fruit 2.5-3.5 cm. long. Infrequent, prairies; April-July.—*E. Garner* 86; *M. Hopkins* 28.

13. AMORPHA L.

Shrubs; leaves pinnately compound, the leaflets entire; inflorescence a spike-like raceme; flowers with a single bluish-purple petal; stamens 10, fused only at base; pod 1-2-seeded.

1. Sepals triangular, wider than high; larger leaflets 7 mm. or
 more wide 1. *A. fruticosa*
1. Sepals lanceolate, about 2 times as long as wide; larger leaflets
 rarely over 5 mm. wide 2. *A. canescens*

1. *A. fruticosa* L. Flowering stems usually over 1 m. high, rarely up to 5 m. high; large leaves commonly with 20 or fewer densely tomentose leaflets, these usually over 5 mm. wide; calyx about 2-3 mm. long. Common, drainage areas; May-June.—*L. Harms* 111, 168; *E. Hartman* 2053, 2080; *R. Wisdom* R32.

2. *A. canescens* Pursh. LEAD PLANT. Small shrub about 5-10 dm. high; stems gray-pubescent; leaves pubescent, the leaflets usually more than 20; calyx 3-4 mm. long, gray-pubescent. Common, prairies; May-July.—*E. Hartman* 2140; *R. Wisdom* R63.

14. PETALOSTEMUM Michx. (Prairie Clover)

Perennial herbs; leaves odd-pinnate, glandular-punctate beneath; inflorescence a many-flowered spike; corolla with 1 white or pink petal; fruit a short 2-seeded pod enclosed in the persistent calyx.

1. Corolla white; calyx glabrous or slightly pubescent 2
 2. Spike less than 1.5 cm. long; larger leaflets usually less than 2 mm. wide 1. *P. multiflorum*
 2. Spike more than 2 cm. long; larger leaflets usually more than 3 mm. wide 2. *P. candidum*
 1. Corolla pinkish-purple; calyx densely gray-pubescent

..... 3. *P. purpureum*
 1. *P. multiflorum* Nutt. Flowering stems 3-6 dm. high, much-branched, glabrous; leaves with 3-9 glandular-punctate, linear-oblong leaflets; spikes many, subglobose, less than 1.5 cm. long; calyx glabrous; corolla white. Infrequent, prairies; July-August.—*J. S. Wilson* 5330.

2. *P. candidum* (Willd.) Michx. Flowering stems 3-7 dm. high, glabrous; leaves with 5-9 linear-lanceolate, glandular-punctate leaflets; flowering spike 2-7 cm. long, usually 1 per culm; calyx glabrous or minutely pubescent; corolla white. Common, prairies; June-July.—*E. Hartman* 2158; *R. Wisdom* R87.

3. *P. purpureum* (Vent.) Rybd. Flowering stems 4-8 dm. high, glabrous; leaves with 3-7 often slightly pubescent linear leaflets; spikes often many, about 2 cm. long; calyx copiously gray-pubescent; corolla pinkish-purple. Common, prairies; June-July.—*E. Hartman* 2137, 2149; *R. Neill* 79.

15. GLYCYRRHIZA L. (Licorice)

1. *G. lepidota* Pursh. Flowering stems 3-10 dm. high; leaves with 11-19 oblanceolate leaflets; inflorescence a many-flowered, spike-like raceme; calyx pubescent, about 5 mm. long, the lobes about 1/2 the length; corolla whitish-yellow, 9-15 mm. long. Common, prairies; May-July.—*D. Greiner* 31; *E. Hartman* 2153; *J. Hoover* 7; *J. S. Wilson* 2477, 2912; *R. Wisdom* R31.

16. ASTRAGALUS L. (Milk Vetch)

Perennial herbs; leaves pinnately compound; corolla white, yellow or purple.

1. Calyx tube about 4-5 mm. long, white-pubescent; calyx teeth about equal in length to the tube 1. *A. striatus*
 1. Calyx tube about 6-8 mm. long, commonly with some blackish pubescence; calyx teeth about 1/2 as long as the tube

..... 2. *A. caryocarpus*
 1. *A. striatus* Nutt. Flowering stems cespitose, 1-4 dm. high, white-pubescent; leaves odd-pinnate, pubescent, the leaflets mostly elliptic; inflorescence mostly a subglobose spike-like raceme about 10-20

mm. wide; calyx white-pubescent, the calyx tube 4-5 mm. long, equal to or slightly longer than the teeth; corolla purplish; fruit mostly 7-10 mm. long. Common, prairies; April-May.—*D. Coering* 31; *J. S. Wilson* 5164.

2. *A. caryocarpus* Ker. Flowering stems cespitose, pubescent, 2-4 dm. high; leaves with 11-25, mostly elliptic leaflets; spike-like racemes usually over 2 cm. and often over 3 cm. wide; calyx commonly with blackish hairs, the tube about 7 mm. long, about twice as long as the teeth; corolla purplish, usually over 10 mm. long; fruit inflated and usually more than 2 cm. long. Common, rocky areas; April-May.—*D. Coering* 4, 30; *L. Harms* 7, 19; *E. Hartman* 2029, 2049.

LINACEAE (Flax Family)

Herbs or rarely shrubs; leaves simple, entire; flowers perfect, actinomorphic, 4-6-merous; ovary superior; fruit a many-seeded capsule.

1. LINUM L. (Flax)

1. *L. sulcatum* Riddell. Annual; stems erect, glabrous, 2-8 dm. high; leaves mostly linear, alternate, 1-3 cm. long, rarely over 3 mm. wide; sepals glandular-ciliate on the margins, acute, about 5 mm. long, persistent in fruit; petals yellow, 8-12 mm. long; capsule globose, about 3 mm. long. Infrequent, prairies; June-September.—*J. S. Wilson* 2489, 2916.

OXALIDACEAE (Wood Sorrel Family)

Mostly herbs; leaves alternate or basal, compound; flowers perfect, actinomorphic, pentamerous; ovary superior; fruit a capsule or berry.

1. OXALIS L. (Wood Sorrel)

Mostly annual or perennial herbs; leaves 3-foliolate; flowers white, yellow or pink; fruit a capsule.

1. Corolla yellow; cauline leaves present 1. *O. stricta*
 1. Corolla pinkish; leaves all basal 2. *O. violacea*

1. *O. stricta* L. Annual; stems ascending, often much-branched, pubescent, up to 5 dm. high; leaves long-petioled, the 3 leaflets each heart-shaped; sepals acute, pubescent, about 4 mm. long; petals yellow, 5-10 mm. long; capsule cylindrical, pubescent, 1-3 cm. long, many-seeded. Infrequent, disturbed areas; May-October.—*E. Garner* 1425.

2. *O. violacea* L. Perennial from scaly bulbous base; leaves all basal, long-petioled, the 3 leaflets each heart-shaped; scapes several-flowered, surpassing the leaves; sepals about 5 mm. long, tipped with an orangish callous; petals pinkish-purple, 10-18 mm. long. Abundant, prairies; April-May.—*F. Busey* 16; *L. Gordon* 9; *L. Harms* 41, 44; *E. Hartman* 2023.

GERANIACEAE (Geranium Family)

Herbs or shrubs; leaves mostly opposite and palmately veined; flowers perfect, usually actinomorphic, pentamerous, usually 5-carpellate; ovary superior and beaked in fruit by projection of the styles and receptacle (torus).

1. GERANIUM L. (Geranium)

1. *G. carolinianum* L. Annual; stems ascending, usually much-branched from base, pubescent, .5-6 dm. high; leaves palmately lobed, the larger blades 2-7 cm. wide; sepals awn-tipped, pubescent, about 3 mm. wide; petals pink, about 10 mm. long; fruit pubescent, its length including the styles about 15 mm. Infrequent, disturbed areas; May-July.—*J. S. Wilson* 2442.

POLYGALACEAE (Milkwort Family)

Herbs, shrubs, trees or vines; leaves various; flowers perfect, zygomorphic, sympetalous; stamens 3-8, slightly connate and often fused to the corolla; ovary superior.

1. POLYGALA L. (Milkwort)

1. *P. verticillata* L. Annual; stems 5-40 cm. high; leaves linear, entire, whorled (at least the lower), up to 3 mm. wide; corolla white, greenish or pinkish; wings 1/2 to 2/3 as long as the capsule; capsule about 2 mm. long. Infrequent, prairies; August-October.—*W. Barker* 4 Oct., 1962.

EUPHORBIACEAE (Spurge Family)

Herbs, shrubs, or trees or leafless succulents; plants monoecious or dioecious; flowers regular; calyx commonly present; corolla usually absent; ovary superior, usually 3-carpellate.

- | | |
|---|---------------------|
| 1. Juice milky; female flowers stipitate from a cup-like involucre (cyathium) which also bears staminate flowers | 1. <i>Euphorbia</i> |
| 1. Juice clear, not milky; female flowers not stipitate | 2 |
| 2. Plants with scattered simple pubescence; leaves commonly dentate or serrate; axillary flowers partially enclosed in palmately-cleft bracts | 2. <i>Acalypha</i> |
| 2. Plants with copious stellate pubescence; leaves mostly entire; axillary flowers not enclosed in palmately-cleft bracts | 3. <i>Croton</i> |

1. EUPHORBIA L. (Spurge)

Herbs, shrubs or trees; leaves various; plants monoecious; involucre (cyathium) cup-like and often resembling a flower; pistil 3-carpellate, arising on a stipe from the cyathium; male flower reduced to a single stamen; fruit a 3-lobed capsule.

1. Leaves entire, the upper petaloid, green with white margins, the lower and larger over 15 mm. wide 1. *E. marginata*
 1. Leaves serrate, if entire usually less than 10 mm. wide, the upper green 2
 2. Leaves opposite 3
 3. Larger leaves over 15 mm. wide, dentate; mature capsule about 4 mm. wide; some petioles over 10 mm. long 2. *E. dentata*
 3. Leaves less than 14 mm. wide; capsule 3 mm. or less wide; petioles less than 9 mm. long 4
 4. Plant glabrous 5
 5. Leaves serrate 6
 6. Leaves with short petioles; capsules glabrous 4. *E. maculata*
 6. Leaves sessile; capsules covered with small scales 9. *E. dictyosperma*
 5. Leaves entire 7
 7. Larger leaves 1 cm. or more long, concave at apex 5. *E. missurica*
 7. Leaves less than 6 mm. long, rounded at apex 6. *E. serpens*
 4. Plants pubescent 8
 8. Larger leaves over 2 cm. long 4. *E. maculata*
 8. Leaves less than 1.5 cm. long 9
 9. Styles bifid nearly to base, about .2 mm. long; capsules pubescent along the angles 7. *E. chamaesyce*
 9. Styles bifid about 1/3 to 1/2 their length, about .5 mm. long; capsule evenly pubescent 8. *E. supina*
 2. Lower leaves alternate, entire 10
 10. Petaloid appendages of the cyathium large, white; the larger pedicels of the cyathium 7-25 mm. long 10. *E. corollata*
 10. Petaloid appendages absent; pedicels of the cyathium less than 6 mm. long 3. *E. heterophylla*
1. *E. marginata* Pursh. SNOW-ON-THE-MOUNTAIN. Annual; stems erect, often branched and pubescent upwardly, 3-10 dm. high; leaves (at least the lower) mostly ovate, entire, alternate, sessile, the larger over 15 mm. wide, the upper petaloid (at flowering) green with white margins; cymes congested with many pubescent cyathia, each possessing 5 white petaloid appendages; ovary and capsule 3-lobed, the latter about 6 mm. wide at maturity; seeds about 4 mm. long. Common,

disturbed areas; July-October.—*E. Garner* 1359; *M. Moeder* 5a; *R. Neill* 26; *J. S. Wilson* 3513; *R. Wisdom* R14.

2. *E. dentata* Michx. Annual; stems erect, often branched and pubescent above, 2-6 dm. high; leaves mostly ovate, dentate, petiolate, pubescent beneath; cyathia congested in the upper axes of the leaves; capsules 3-lobed, about 5 mm. wide; seeds about 2.5 mm. long. Common, disturbed areas; June-October.—*E. Garner* 1397; *D. Goering* 8; *J. S. Wilson* 2918, 3666.

3. *E. heterophylla* L. Annual; stems erect, commonly branched glabrous, mostly 2-7 dm. high; leaves variable, linear to ovate, entire to serrate, glabrous or essentially so, short-petioled; cyathia glabrous, without petaloid appendages, congested in upper, often red-blotched leaves; capsule glabrous, about 6 mm. wide; seeds about 3 mm. long. Infrequent, disturbed areas; August-October.—*D. Goering* 8a.

4. *E. maculata* L. Annual; stems ascending, often branched, 1-10 dm. high; leaves commonly oblanceolate, serrulate, opposite, short-petioled; cyathia in axillary and terminal clusters; capsule glabrous, about 2 mm. wide; seeds mostly 1-1.5 mm. long. Common, disturbed areas; July-October.—*E. Garner* 1343; *D. Goering* 3; *C. Koehn* 32; *R. Neill* 15, 32.

5. *E. missurica* Raf. Annual; stems erect, much-branched, glabrous, 1-6 dm. high; leaves linear to elliptic, entire, rounded at apex, petioled, the larger blades rarely over 5 mm. wide; cyathia with conspicuous white petaloid appendages, pedunculate; capsules about 2 mm. wide; seeds about 1.7 mm. long. Infrequent, prairies; June-September.—*J. S. Wilson* 5785.

6. *E. serpens* HBK. Annual; stems prostrate, much-branched, rooting at nodes, glabrous; leaves mostly ovate, glabrous, entire, less than 10 mm. long and 5 mm. wide; cyathia mostly in axillary clusters; capsules glabrous, about 1-1.5 mm. wide; seeds about 1 mm. long. Common, disturbed areas; July-October.—*D. Carson* 24; *E. Garner* 1365, 1428; *J. S. Wilson* 3516, 3658, 5308.

7. *E. chamaesyce* L. Annual; stems prostrate or ascending, much-branched, pubescent, 1-5 dm. long; leaves mostly ovate, the upper half of the blade serrulate, usually less than 10 mm. long and 5 mm. wide; cyathia pubescent, borne in axillary clusters; capsules pubescent, especially along the edges, about 1.5 mm. wide; styles bifid nearly to base, about .2 mm. long; seeds about 1 mm. long. Common, disturbed areas; July-October.—*E. Garner* 1333; *J. S. Wilson* 5306, 5307.

8. *E. supina* Raf. Annual; stems mostly prostrate, rarely ascending, much-branched, pubescent, 1-4 dm. long; leaves mostly ovate-lanceolate, pubescent, the blade serrulate its entire length and usually less than 10 mm. long and 5 mm. wide; cyathia pubescent, in axillary clusters; capsules evenly pubescent, about 1.5 mm. long; seeds about

1 mm. long. Common, disturbed areas; July-October.—*J. Davis* 31; *E. Garner* 1380, 1405; *J. S. Wilson* 5309, 5470.

9. *E. dictyosperma* Fisch & May. Annual; stems erect, much-branched, glabrous, 2-6 dm. high; leaves mostly oblong-spatulate, sessile, glabrous, the blade usually more than 15 mm. long and 8 mm. wide; cyathia axillary, glabrous; capsules about 2.5 mm. wide, covered with scales; seeds about 1.5 mm. long. Infrequent, disturbed areas; May-July.—*J. S. Wilson* 2449, 2488.

10. *E. corollata* L. Perennial; stems erect, branched upwardly, 3-10 dm. high; leaves alternate, sessile, mostly elliptic, the larger over 2 cm. long and 5 mm. wide; cyathia with 5 white petaloid appendages, glabrous, borne in cymes from peduncles 7-25 mm. long; capsule about 6 mm. wide; seeds about 4 mm. long. Infrequent, prairies; July-September.—*J. S. Wilson* 5786.

2. ACALYPHA L. (Three-Seeded Mercury)

Herbs, shrubs or trees; leaves alternate, usually serrate; plants monoecious; flowers without a corolla; sepals 3-5; ovary superior, 3-carpellate; capsule 3-seeded.

1. Larger leaves over 3 cm. wide and with 20 or more fine teeth per margin 1. *A. ostryaefolia*
1. Leaves less than 2 cm. wide and with 15 or fewer teeth per margin 2. *A. virginica*

1. *A. ostryaefolia* Riddell. Annual; stems erect, pubescent, 2-8 dm. high; leaves ovate, rounded at base, serrate with 20 or more teeth per margin; pistillate flowers in terminal spikes subtended by a many-cleft bract, the clefts 1 mm. or less wide; male flowers in shorter axillary spikes; capsules with numerous short scale-like projections. Infrequent, disturbed areas; July-October.—*J. S. Wilson* 3465, 3492.

2. *A. virginica* L. Annual; stems erect, commonly branched, 2-6 dm. high; leaves elliptic, cuneate at base, the margins serrate with several shallow teeth; pistillate and staminate flowers borne in axillary clusters, these subtended by palmately cleft bracts, the clefts pubescent and often over 1 mm. wide; capsules pubescent, without scale-like projections. Common, disturbed areas; July-October.—*E. Garner* 1398, 1453; *J. S. Wilson* 3508.

3. CROTON L.

Herbs, shrubs or trees with stellate pubescence; leaves mostly simple; plants monoecious or dioecious; flowers usually congested in head-like racemes; capsule usually pubescent, 1-3 locular.

1. Styles 3, each 2 or 3 parted; flowers aggregated into terminal, densely cobwebby-pubescent clusters usually over 15 mm. wide; capsule about 8 mm. wide 1. *C. capitatus*
1. Styles 2, each bifid to base; flower clusters usually less than

12 mm. wide, pubescent but not cobwebby-pubescent; capsule about 4 mm. wide 2. *C. monanthogynous*

1. *C. capitatus* Michx. Annual; stems erect, copiously stellate-pubescent, 2-10 dm. high; leaves mostly elliptic to ovate, long-petioled, the larger blades usually over 3 cm. long; inflorescence congested, copiously cobwebby-pubescent; styles 3, each 2 or 3-parted; capsule 3-seeded, about 8 mm. wide. Common, disturbed areas; June-October. —*M. Moeder* 8; *R. Neill* 3; *J. Nilsen* 81; *J. S. Wilson* 5313.

2. *C. monanthogynous* Michx. Annual; stems erect, stellate-pubescent, often branched above, 2-7 dm. high; leaves mostly elliptic, long-petioled, the blades rarely over 3 cm. long; inflorescence congested, pubescent with stellate hairs; styles 2, each bifid to base; capsule 1-seeded, about 4 mm. wide. Common, disturbed areas; June-October. —*E. Garner* 1378, 1394, 1416; *L. Long* 22; *J. S. Wilson* 2928, 3487.

ANACARDIACEAE (Cashew Family)

Trees or shrubs; leaves alternate, usually compound; flowers various, but commonly pentamerous; fruit a drupe.

1. RHUS L.

1. Leaflets 3 2

2. Leaflets lobed; fruit red; much-branched shrub 1. *R. aromatica*

2. Leaflets toothed or serrate, not lobed; fruit white; stems sprawling or climbing 2. *R. radicans*

1. Leaflets 10 or more, serrate 3. *R. glabra*

1. *R. aromatica* Ait. FRAGRANT SUMAC. Cespitose shrub up to 2 m. high; leaves with 3, commonly lobed, leaflets; flowers yellow, borne in spike-like clusters; drupes red, densely pubescent. Common, hillsides; April-May. —*W. Barker* 1; *L. Harms* 14, 24; *E. Hartman* 2052; *M. Moeder* 76; *J. S. Wilson* 2013.

2. *R. radicans* L. POISON IVY. Sprawling or climbing woody shrub or vine; leaves 3-foliolate, the leaflets mostly ovate, serrate or dentate; flowers in axillary panicles; fruit whitish-gray. Common, wooded areas; May-June. —*J. S. Wilson* 5782.

3. *R. glabra* L. SMOOTH SUMAC. Shrub or small tree mostly less than 3 m. high; leaves with serrate lanceolate leaflets; flowers greenish-yellow, borne in panicles; fruit red, densely pubescent. Common, hillsides; June-July. —*E. Garner* 1392; *E. Hartman* 2079.

CELASTRACEAE (Staff-Tree Family)

Woody vines or shrubs; leaves simple; flowers mostly perfect, actinomorphic, usually 4-5-merous; ovary partially inferior; fruit a capsule.

1. CELASTRUS L. (Bittersweet)

1. *C. scandens* L. Woody vine; leaves alternate, commonly ovate, simple, minutely serrate, the larger blades usually more than 2.5 cm. wide; flowers pentamerous; stamens 5; fruit orange to yellow-orange, splitting at maturity and exposing the red seeds. Infrequent; disturbed areas; May-June.—*J. S. Wilson* 4451.

ACERACEAE (Maple Family)

Trees or shrubs; leaves opposite, simple or compound; flowers commonly perfect, actinomorphic, pentamerous; ovary superior, 2-locular; fruit a samara.

1. ACER L. (Maple)

1. Leaves with 3 (rarely 5) leaflets 1. *A. negundo*

1. Leaves simple, palmately lobed 2. *A. saccharinum*

1. *A. negundo* L. BOX ELDER. Tree up to 20 m. high; leaves with 3-5 ovate dentate leaflets; plant dioecious; flowers greenish, occurring before the leaves; samaras 2.5-3.5 cm. long. Common, wooded areas; March-May.—*E. Garner* 88, 89; *J. S. Wilson* 4068.

2. *A. saccharinum* L. SILVER MAPLE. Tree up to 40 m. high; bark silvery-gray above, darker gray below; leaves whitened beneath, palmately lobed into deeply dissected, dentate, acute, segments; plant monoecious; flowers greenish, occurring before the leaves; samaras 3.5-6 cm. long. Infrequent, wooded areas; March-April.—*J. S. Wilson* 2012.

RHAMNACEAE (Buckthorn Family)

Small trees or shrubs; leaves simple, mostly alternate; flowers small, usually perfect; fruit a drupe or capsule.

1. CEANOTHUS L.

1. *C. ovatus* Desf. Cespitose shrub up to 1 m. high; new branches pubescent; leaves alternate, elliptic, serrate, pubescent beneath, about 1 cm. wide and 2-3 cm. long; flowers cream-colored, small, usually less than 3 mm. wide, pentamerous, borne in panicles; drupe blackish, about 5 mm. in diameter. Common, prairies; April-July (rarely later).—*E. Garner* 1447; *E. Hartman* 2047.

VITACEAE (Grape Family)

Woody vines with tendrils; leaves alternate, palmately-veined or compound; flowers perfect or unisexual, actinomorphic, 4 or 5-merous; fruit a 2-4-seeded berry.

1. VITIS L. (Grape)

1. *V. riparia* Michx. Vines; stems climbing, glabrous, often 15 m. high; leaves palmately veined, commonly 3-lobed, dentate; flowers small,

borne in panicles; berries blackish, 6-12 mm. in diameter. Common, wooded areas. May-June.—*E. Hartman* 2091.

36. MALVACEAE (Mallow Family)

Herbs, shrubs or trees; leaves alternate, simple, usually palmately-veined, stipulate; flowers actinomorphic, perfect, pentamerous, 5 to many-carpellate; stamens many, fused together around the styles; ovary superior.

1. Petals orange to yellow-orange; blades about as wide as long, cordate at base, velvety-pubescent 1. *Abutilon*
1. Petals yellow, pink or white; leaves longer than wide 2
 2. Leaves lobed 3
 3. Petals pink or white; perennial from thickened verticle root; petiole of basal leaves 3 cm. or more long 2. *Callirhoe*
 3. Petals cream-colored with a reddish blotch at base; annual from taproot; petioles less than 3 cm. long 3. *Hibiscus*
 2. Leaves not lobed 4
 4. Setaceous bracts present at base of calyx (care); leaves usually with 8 or fewer teeth on a margin 4. *Sphaeralcea*
 4. Bracts absent at base of calyx; leaves usually with 10 or more teeth on a margin 5. *Sida*

1. ABUTILON Mill.

1. *A. theophrasti* Medic. VELVET LEAF. Herbaceous annual; stems erect, often branched, pubescent, 2-15 dm. high; leaves cordate, velvety-pubescent, long-petioled, usually over 5 cm. wide and 5 cm. long; sepals copiously pubescent; petals yellow-orange; fruit pubescent, usually over 2 cm. wide. Infrequent, disturbed areas; July-October. —*J. Davis* 39.

2. CALLIRHOE Nutt. (Poppy Mallow)

1. *C. alcaeoides* (Michx.) Gray. Perennial herb from vertically thickened root; stems ascending, pubescent, up to 4 dm. high; leaves palmately and deeply 5-lobed, the lower on the long petioles; calyx lobes acute, pubescent, about 5 mm. long; petals pink or white, usually over 2 cm. long; fruit pubescent. Common, prairies; April-June.—*D. Greiner* 30; *L. Harms* 70; *E. Hartman* 2026, 2048, 2075; *R. Wisdom* R10.

3. HIBISCUS L.

1. *H. trionum* L. FLOWER-OF-THE-HOUR. Annual; stems erect, branched from the base, pubescent, 1-5 dm. high; leaves palmately lobed, mostly with 3 divisions, the petioles usually less than 3 cm. long;

calyx conspicuously veined, subtended by 10-12 filiform bracteoles; petals cream-colored, red blotched at base; fruit enclosed in strongly inflated calyx. Common, disturbed areas; June-October.—*J. S. Wilson* 5787.

4. SPHAERALCEA St. Hil.

1. *S. angustatum* (Gray) Fern. Annual; stems erect, much-branched, pubescent, 2-4 dm. high; leaves mostly lanceolate, pubescent, the larger usually less than 1 cm. wide and with 8 or fewer teeth on a margin; setaceous bracts present at base of calyx; calyx pubescent, the lobes triangular; petals yellow, about as long as the calyx; fruit 5-6-carpellate. Infrequent, disturbed areas; July-October.—*E. Garner* 1437; *J. S. Wilson* 5455.

5. SIDA L.

1. *S. spinosa* L. Annual; stems erect, often branched, finely pubescent, 1-6 dm. high; leaves mostly oblanceolate, finely pubescent, the larger blades over 1 cm. wide and with 10 or more teeth on a margin; calyx lobes triangular, finely pubescent; petals yellow, 4-6 mm. long; fruit 5-carpellate. Common, disturbed areas; June-October.—*E. Garner* 1418, 1450.

GUTTIFERAE (St. John's-Wort Family)

Herbs or shrubs; leaves opposite, entire, with translucent glands; flowers usually yellow, perfect, actinomorphic, 2-5-carpellate; stamens usually many; ovary superior; fruit a capsule.

1. HYPERICUM L. (St. John's-Wort)

1. *H. sphaerocarpum*. Michx. Perennial; stems erect, branched from a woody base; leaves linear-elliptic, about 4 times as long as wide (rarely over 1 cm. wide); flowers borne in cymes; petals yellow, about 5-9 mm. long; styles persistent as a beak fruit; capsule globose, 4-7 mm. long. Common, prairies; June-August.—*J. Hoover* 20; *J. S. Wilson* 2411, 2486, 2917, 3464, 4454; *R. Wisdom* R76.

VIOLACEAE (Violet Family)

Mostly herbs; leaves commonly basal; flowers perfect, zygomorphic, pentamerous; petals 5, the lower usually spurred; fruit usually a many-seeded capsule.

VIOLA L. (Violet)

- | | |
|--|----------------------------|
| 1. Leaves all basal | 2 |
| 2. Leaves deeply lobed | 1. <i>V. pedatifida</i> |
| 2. Leaves not lobed, mostly cordate | 2. <i>V. missouriensis</i> |
| 1. Leaves (or some of them) cauline | 3. <i>V. kitaibelliana</i> |
| 1. <i>V. pedatifida</i> G. Don. PRAIRIE VIOLET. Perennial herb from vertically-thickened rhizome; plant rarely over 1 dm. high; leaves | |

3-parted, each segment cut into linear lobes; corolla violet, 2-4 cm. wide; seeds light brown. Infrequent, prairies; April-May.—*J. S. Wilson* 4063.

2. *V. missouriensis* Greene. Perennial from stout rhizome; plant rarely over 15 cm. high; leaves cordate, crenulate-margined, about as long as broad; sepals white-margined; corolla color highly variable, commonly violet; capsule ellipsoid, about 1 cm. long; seeds cream-colored. Common, prairies and wooded areas; April-June.—*E. Garner* 1417; *D. Goering* 10; *L. Harms* 16, 32, 33, 34, 36; *J. S. Wilson* 2009, 2010, 4061.

3. *V. kitaibelliana* R. & S. Annual; stems leafy, rarely over 1 dm. high; stipules palmately-lobed; leaves minutely dentate, the lower commonly orbicular, the upper lance-ovate to oblanceolate; flowers lavender, about 1 cm. wide; capsules about 5 mm. long. Infrequent, prairies and disturbed areas; April-May.—*L. Harms* 11; *J. S. Wilson* 4078.

CACTACEAE (Cactus Family)

Perennial fleshy herbs, shrubs or trees; leaves usually absent; stems flattened or terete, often armed with long spines and short prickles (glochidia) arising from an areole; flowers perfect, actinomorphic, polypetalous; ovary inferior, 1-celled; fruit a berry.

1. OPUNTIA Mill. (Prickly Pear)

1. *O. macrorhiza* Engelm. Stems prostrate, rarely over 2 dm. high, commonly orbicular or diamond-shaped, arising from a thick tuberous root; petals yellow, often fading to orange; fruit brick-red, fleshy, cylindrical, many-seeded. Common, prairies; May-June.—*J. S. Wilson* 5443.

LYTHRACEAE (Loosestrife Family)

Herbs or shrubs; leaves mostly opposite, entire; flowers perfect, usually actinomorphic, 4-6-merous; ovary inferior.

1. AMMANNIA L.

1. *A. coccinea* Rothb. Annual; stems erect, much-branched, glabrous, 2-5 dm. high; leaves clasping at base, linear-oblong; flowers in axillary clusters, nearly sessile; petals pink; capsule globose, about 4-5 mm. in diameter. Infrequent, wet areas; July-October.—*D. Goering* 57.

ONAGRACEAE (Evening Primrose Family)

Mostly herbs; flowers perfect, actinomorphic, mostly 4-5-merous; ovary inferior; fruit usually a capsule or berry.

1. Petals absent; leaves glabrous, spatulate; flowers borne in the axes of the cauline leaves 1. *Ludwigia*

1. Petals present; leaves pubescent; flowers usually borne terminally 2
2. Petals 1 cm. or more long; fruit more than 1 cm. long 2. *Oenothera*
2. Petals less than 1 cm. long; fruit less than 1 cm. long 3. *Gaura*

1. LUDWIGIA L.

1. *L. palustris* (L.) Ell. Herbaceous perennial; stems weak, often floating in water; leaves opposite, ovate to lanceolate, glabrous; flowers axillary, without a corolla, with 4 sepals and 4 stamens; ovary inferior; fruit a 4-locular, many-seeded capsule, about 3-4 mm. long. Infrequent, creeks; June-September.—*J. S. Wilson* 2925.

2. OENOTHERA L. (Evening Primrose)

Annual, biennial or perennial herbs; flowers perfect, actinomorphic, tetramerous; stamens 8; ovary terete or 4-angled; fruit a many-seeded capsule.

1. Corolla yellow; leaves entire 2
2. Petals 4 cm. or more long; plants low-growing, usually less than 2 dm. high 1. *O. missouriensis*
2. Petals less than 3 cm. long; plants erect, mostly 3-12 dm. high 2. *O. biennis*
1. Corolla white; leaves dentate 3. *O. speciosa*

1. *O. missouriensis* Sims. Perennial; stems often prostrate or slightly ascending, 2-5 dm. long; leaves alternate, entire, velvety-pubescent, the larger blades usually more than 5 cm. long; flowers large; petals bright yellow, mostly 3-6 cm. long; floral tube 8-10 cm. long; capsule 4-8 cm. long, strongly winged. Infrequent, rocky areas; May-June.—*E. Hartman* 2043, 2087; *R. Wisdom* R52.

2. *O. biennis* L. EVENING PRIMROSE. Biennial; stems erect, pubescent, 2-15 dm. high; leaves alternate, sessile, commonly elliptic, pubescent, entire or weakly toothed, the larger more than 4 cm. long and 1 cm. wide; flowers short-pedicelled, borne in terminal spike-like racemes; petals yellow, mostly 15-25 mm. long; capsule pubescent, about 1-3.5 cm. long. Common, disturbed areas; June-October.—*E. Garner* 1350; *D. Goering* 5.

3. *O. speciosa* Nutt. Perennial; stems ascending, 3-6 dm. long; leaves alternate, elliptic, dentate or incised, the larger blades usually over 4 cm. long and 5 mm. wide; corolla white, fading pink, 2-4 cm. long; capsule pubescent, 12-18 mm. long. Common, prairies and disturbed areas; May-August.—*D. Greiner* 27; *L. Harms* 158; *E. Hartman* 2102, 2143; *J. Hoover* 6; *R. Neill* 2; *J. S. Wilson* 2405.

3. GAURA L.

1. *G. parviflora* Dougl. Biennial herb; stems erect, pubescent, 5-20 dm. high; leaves alternate, lanceolate, entire; flowers in terminal spikes; sepals about 2 mm. long; petals about 2 mm. long, pink; stamens 8; ovary inferior; capsule ellipsoid, mostly 5-8 mm. long. Common, prairies and disturbed areas; June-September.—*J. S. Wilson* 2927; *R. Wisdom* 21.

UMBELLIFERAE (Parsley Family)

Herbs; leaves usually compound, with a sheathing petiolar base; flowers small, actinomorphic, usually perfect, pentamerous, 2-carpellate; ovary inferior; fruit a 2-seeded schizocarp (capsule).

- | | |
|--|-----------------------|
| 1. Ultimate leaf segments filiform, 1 mm. or less wide | 2 |
| 2. Corolla yellow; leaves all basal | 1. <i>Lomatium</i> |
| 2. Corolla white; leaves cauline | 2. <i>Spermolepis</i> |
| 1. Ultimate leaf segments lanceolate or broader | 3 |
| 3. Leaves pinnate; umbel large, usually over 3 cm. wide | 3. <i>Polytaenia</i> |
| 3. Leaves with 3-5 leaflets; umbel head-like, rarely over 2 cm. wide | 4. <i>Sanicula</i> |

1. LOMATIUM Raf.

1. *L. foeniculaceum* (Nutt.) C. & R. Perennial herb from thick verticle root; leaves all basal, bipinnate, the ultimate segments filiform, less than 1 mm. wide; umbel usually 1; petals yellow; fruit 6-9 mm. long. Abundant, prairies; April-May.—*W. Barker* 4; *E. Garner* 85; *D. Goering* 3; *L. Harms* 6; *E. Hartman* 2033; *M. Hopkins* 17; *J. S. Wilson* 2017, 4070.

2. SPERMOLEPIS Raf.

1. *S. inermis* (Nutt.) Math. & Const. Annual; stems erect, much-branched above, glabrous, 2-6 dm. high; leaves pinnately compound, all the divisions filiform; umbels many, usually less than 2 cm. high; petals white; fruit tuberculate, about 2 mm. long. Infrequent, prairies; May-June.—*J. S. Wilson* 2426.

3. POLYTAENIA DC.

1. *P. nuttallii* DC. Perennial from thickened root; stems erect, glabrous, 4-10 dm. high; leaves pinnate, the ultimate segments toothed; umbels several, the larger over 4 cm. wide; petals yellow; fruits about 6-8 mm. long. Infrequent, prairies; May-June.—*E. Hartman* 2032; *J. S. Wilson* 2491; *R. Wisdom* R53.

4. SANICULA L. (Black Snakeroot)

1. *S. canadensis* L. Perennial; stems erect, branched, glabrous, 3-7 dm. high; leaves with 3-5 lance-ovate, glabrous, serrate leaflets;

umbels small, subtended by reduced stem-like leaves; fruits 3-5 mm. long, covered with hooked bristles. Infrequent, wet shaded areas; June-July.—*L. Harms* 159.

CORNACEAE (Dogwood Family)

Trees, shrubs, rarely herbs; leaves mostly opposite, entire; flowers usually perfect, actinomorphic, 4 or 5-merous, 2-carpellate; ovary inferior; fruit a drupe.

1. CORNUS L. (Dogwood)

Mostly shrubs; flowers borne in cymes or heads, perfect, tetramerous; drupe white, blue or red.

1. Leaves scabrous to touch; fruit white; stone smooth; older stems brownish-gray 1. *C. drummondii*

1. Leaves smooth to touch; fruit dark blue; stone grooved; older stems reddish 2. *C. amomum*

1. *C. drummondii* Meyer. Shrub or small tree, 1-6 m. high; twigs of the present year short-pubescent, usually tan or pinkish-brown; older stems grayish; pith white or brown; leaves commonly ovate or ovate-lanceolate, scabrous on both surfaces, cuneate or broadly rounded at base; petals 4, cream-colored, about 3-4 mm. long; drupe white, about 4-6 mm. in diameter; stone smooth. Common, prairies; May-July.—*E. Garner* 1391; *D. Goering* 19; *J. S. Wilson* 2409, 2473, 3463; *R. Wisdom* R60.

2. *C. amomum* Mill. Shrub, usually much-branched from base, up to 5 m. high; twigs of present year gray-pubescent; older stems reddish; pith brown; leaves commonly lanceolate, cuneate at base, pubescent beneath; petals cream-colored, about 4-5 mm. long; fruit dark blue with cream-colored blotches, about 5 mm. in diameter; stone grooved. (Including *C. obliqua* Raf., our taxon.) Infrequent, along creeks; May-July.—*J. S. Wilson* 5782.

PRIMULACEAE (Primrose Family)

Herbs; leaves simple, commonly basal; flowers regular, perfect, sympetalous, usually pentamerous; stamens borne opposite and usually attached at the base of the petals; ovary superior; capsule many-seeded.

1. ANDROSACE L.

1. *A. occidentalis* Pursh. Annual; flowering scape rarely over 5 cm. tall; leaves basal, mostly oblanceolate, entire, usually less than 15 mm. long; flowers small, less than 3 mm. wide; calyx lobes about 2 mm. long, equaling tube; corolla minute, soon deciduous; capsule about 3 mm. long. Common, rocky slopes; March-April.—*L. Harms* 9; *J. S. Wilson* 4072.

EBENACEAE (Ebony Family)

Trees or shrubs; leaves alternate, entire; flowers perfect or unisexual, actinomorphic; ovary superior; fruit a berry.

1. DIOSPYROS L. (Persimmon)

1. *D. virginiana* L. Tree up to 15 m. high; leaves thick, ovate, entire; flowers axillary, usually 1 or 2 at a node, greenish-yellow, the pistillate about 1.5 cm. long, the staminate about 1 cm. long and with 16 stamens; berry partially enveloped by the calyx, 2-4 cm. in diameter. Infrequent, old homesteads; May-June.—*J. S. Wilson* 5781.

OLEACEAE (Olive Family)

Trees or shrubs; leaves opposite; flowers perfect or unisexual; corolla, if present, sympetalous; stamens 2 or 4, epipetalous; ovary superior, 2-locular; fruit a drupe, capsule or samara.

1. FRAXINUS L. (Ash)

1. *F. americana* L. WHITE ASH. Tree up to 40 m. high; young twigs glabrous; leaves pinnate, the 5-9 leaflets minutely serrate to entire, ovate-lanceolate; samara linear-oblong, 3-5 cm. long, the free portion of the wing longer than the body of the fruit. Common, wooded areas and old homesites.—*J. Beckner* 116; *E. Hartman* 2040; *J. S. Wilson* 4117.

APOCYNACEAE (Dogbane Family)

Mostly herbs or vines; leaves opposite or alternate; flowers perfect, actinomorphic, pentamerous, symsepalous, sympetalous, 2-carpellate; stamens epipetalous; ovary superior; fruit commonly a follicle.

1. APOCYNUM L. (Dogbane)

1. *A. sibiricum* Jacq. Perennial herb; stems erect, usually branched above, glabrous at least below, 3-13 dm. high; leaves commonly ovate to elliptic, entire, glabrous, sessile or nearly so, the larger over 2.5 cm. wide; flowers in terminal cymes; corolla white, about 2-3 mm. long; follicle linear, mostly 3-13 cm. long. Infrequent, prairies; June-August.—*R. Neill* 6.

ASCLEPIADACEAE (Milkweed Family)

Herbs, shrubs or vines, usually with milky juice; leaves mostly entire; flowers perfect, actinomorphic, slightly sympetalous, pentamerous, 2-carpellate; ovary superior, 2-lobed; fruit a follicle.

1. Petals 4-6 mm. wide; larger leaves usually over 3.5 cm. wide
 1. *Asclepiadora*
1. Petals less than 4 mm. wide; leaves less than 3.5 cm. wide
 2. *Asclepias*

1. ASCLEPIADORA Gray

1. *A. viridis* (Walt.) Gray. GREENHORN MILDWEED. Perennial from rhizomatous base; stems decumbent or ascending, usually glabrous, 2-6 dm. long; leaves commonly ovate, the larger over 3.5 cm. wide; petals yellowish-green, 4 mm. or more wide; corona purplish; follicle usually over 8 cm. long and 1/4 as wide. Common, disturbed areas; May-June.—*E. Garner* 1347; *E. Hartman* 2074; *J. Hoover* 18.

2. ASCLEPIAS L. (Milkweed)

Perennial herbs; leaves entire, alternate, opposite or whorled; flowers borne in umbels; fruit a follicle.

1. Leaves linear (less than 4 mm. wide), at least 10 times as long as wide; corolla cream-colored 1. *A. verticillata*
1. Leaves broader (more than 4 mm. wide), less than 6 times as long as wide 2
 2. Corolla orange (rarely yellow); umbels terminal; milky juice absent 2. *A. tuberosa*
 2. Corolla greenish-yellow; umbels mostly lateral; milky juice present 3. *A. viridiflora*

1. *A. verticillata* L. Perennial; stems erect, 2-8 dm. high; leaves whorled, linear, glabrous; umbels borne laterally; petals cream-colored, about 4 mm. long; follicle erect, slender, 4-5 cm. long. Common, disturbed areas; June-August.—*E. Hartman* 2159; *R. Neill* 17; *J. S. Wilson* 2908, 4449, 5316; *R. Wisdom* R85.

2. *A. tuberosa* L. BUTTERFLY-WEED. Perennial from thickened verticle root; stems erect, pubescent, without milky juice, 3-7 dm. high; leaves alternate, commonly linear-lanceolate, pubescent; umbels mostly terminal; corolla orange (rarely yellow), about 7 mm. long; corona orange, about 6 mm. long; follicles erect, about 8-12 cm. long. Common, disturbed areas; June-July.—*D. Greiner* 26; *E. Hartman* 2135; *R. Wisdom* R62.

3. *A. viridiflora* Raf. Perennial; stems erect, minutely pubescent, 3-8 dm. high; leaves commonly ovate-lanceolate, mostly opposite, the larger blades usually over 1.5 cm. wide and 6 cm. long; umbels lateral; corolla greenish-yellow, about 6 mm. long; follicles lanceolate, 8-11 cm. long. Infrequent, prairies; June-August.—*J. S. Wilson* 2909.

CONVOLVULACEAE (Morning-Glory Family)

Mostly herbs; leaves alternate, simple; flowers perfect, actinomorphic, pentamerous, symsepalous, sympetalous, 2-3-carpellate; stamens epipetalous; ovary superior; fruit a capsule.

1. Plants twining; stigmas 1 or 2 2
 2. Stigmas capitate 1. *Ipomea*
 2. Stigmas linear 2. *Convolvulus*
1. Plants not twining; stigmas 4 3. *Evolvulus*

1. IPOMEA L. (Morning-Glory)

1. *I. hederacea* (L.) Jacq. Annual; stems vining, long-pubescent, 3-20 dm. long; leaves 3-lobed, pubescent; sepals lanceolate, pubescent, 10-25 mm. long; corolla purplish, 3-5 cm. long; ovary and capsule 3-locular. Infrequent, disturbed areas; July-October.—*R. Neill* 35; *J. S. Wilson* 5456.

2. CONVULVULUS L. (Bindweed)

Twining perennial herbs; corolla large, funnellform; ovary 2-4-celled; capsule globose.

1. Bracts foliaceous, ovate, borne immediately beneath the sepals and concealing them 1. *C. sepium*

1. Bracts linear, borne on peduncle 5 mm. or more below the sepals 2. *C. arvensis*

1. *C. sepium* L. Herbaceous vine; stems trailing or twining, pubescent, up to 3 m. long; leaves commonly triangular, pubescent, long-petioled, the larger blades usually over 3 cm. wide at base; sepals about 1 cm. long, concealed by the foliaceous bracts; corolla white or pink, 3.5-7 cm. long. Common, disturbed areas; May-September.—*R. Wisdom* R5, R83.

2. *C. arvensis* L. Herbaceous vine; stems trailing or twining, up to 1 m. long; leaves often triangular, commonly cordate at base, the larger blades 3 cm. or more wide at base; sepals about 1 cm. long; corolla white or rarely pinkish, 15-20 mm. long. Common, disturbed areas; May-October.—*E. Garner* 1441.

3. Evolvulus L.

1. *E. nuttallianus* R. & S. Perennial herb; stems erect, several from a woody base, densely silky-pubescent, 1-2 dm. high; leaves lanceolate, silky-pubescent, crowded, rarely over 5 mm. wide and 20 mm. long; calyx about 5 mm. long, silky-pubescent; corolla purplish, about 1 cm. long; fruit usually 4-seeded. Infrequent, prairies; May-July.—*E. Hartman* 2085.

HYDROPHYLLACEAE (Waterleaf Family)

Annual, biennial or perennial herbs; leaves commonly pubescent, usually pinnatifid or compound; flowers perfect, actinomorphic, pentamerous, symsepalous, sympetalous, 2-carpellate, borne in a scorpioid cyme; corolla usually blue, pink or white; stamens epipetalous; ovary superior; fruit a capsule.

1. ELLISIA L.

1. *E. nyctalea* L. Annual; stems weak, ascending, commonly branched from base, 1-4 dm. long; leaves deeply pinnatifid, the larger

blades over 6 cm. long; corolla white, about 6 mm. long; capsule globose. Infrequent, wooded areas; April-June.—*R. Hodges* 34.

BORAGINACEAE (Borage Family)

Commonly herbs; leaves alternate, simple; flowers borne in cymes, perfect, mostly actinomorphic, pentamerous, symsepalous, sympetalous, 2-carpellate (each carpel is 2-lobed); stamens epipetalous; ovary superior; fruit of 4 long nutlets.

1. Style exert from corolla; flowers borne in elongate terminal scorpioid cymes 1. *Onosmodium*
1. Style not exert from corolla; flowers axillary or clustered at the apex 2. *Lithospermum*

1. ONOSMODIUM Michx.

1. *O. occidentale* Mackenz. Perennial herb; stems erect, much-branched from base, densely hispid-pubescent, 4-10 dm. high; leaves oblanceolate, hispid, parallel-veined, the larger over 5 cm. long and 1 cm. wide; calyx hispid, about 10 mm. long; corolla white; style exert; nutlets white, lustrous, about 4 mm. long. Infrequent, prairies; May-July.—*J. S. Wilson* 2474.

2. LITHOSPERMUM L.

Annual or perennial herbs; leaves pubescent, usually entire; flowers in axillary or terminal clusters.

1. Corolla yellow, the lobes fimbriate (toothed); perennial 1. *L. incisum*
1. Corolla white, the lobes entire; annual 2. *L. arvense*
 1. *L. incisum* Lehm. Perennial; stems erect, commonly several from thickened root, pubescent, 1-4 dm. high; leaves mostly linear, pubescent, usually less than 5 mm. wide; flowers borne in terminal clusters; corolla yellow, about 2.5-4 cm. long; nutlets white, lustrous. Common, prairies; April-June.—*W. Barker* 6; *D. Goering* 12; *L. Harms* 23; 46; *E. Hartman* 2020; *M. Hopkins* 25; *J. S. Wilson* 2007, 4047.

2. *L. arvense* L. Annual; stems ascending, much-branched from base, pubescent, 1-6 dm. high; leaves commonly oblanceolate, pubescent, usually less than 5 mm. wide; flowers borne in axillary and terminal clusters; corolla white, about 5-7 mm. long; nutlets tan, about 3 mm. long. Common, disturbed areas; March-June.—*F. Busey* 5; *L. Harms* 1022.

VERBENACEAE (Vervain Family)

Herbs or shrubs; leaves mostly opposite; flowers slightly zygomorphic, perfect, pentamerous, symsepalous, sympetalous; stamens epipetalous; ovary superior, 2-carpellate; fruit mostly of 2-4 bony nutlets.

1. VERBENA L (Vervain)

Annual or perennial herbs; leaves opposite, mostly serrate or incised; flowers slightly zygomorphic.

- 1. Fruiting calyx 3 mm. or less long; spikes panicled at apex 2
 - 2. Spikes loose, the fruits or flowers not overlapping; corolla white 1. *V. urticifolia*
 - 2. Spikes dense, the fruits and flowers congested, overlapping; corolla usually purple 2. *V. hastata*
- 1. Fruiting calyx more than 3 mm. long; spikes 1-3 at the apex of the stems 2
 - 3. Stems glabrous or nearly so; leaves usually glabrous, linear-lanceolate, commonly with 9 or fewer teeth per margin; corolla usually white 3. *V. simplex*
 - 3. Stems pubescent; leaves pubescent, lanceolate or wider, commonly with 10 or more teeth per margin; corolla usually blue or purple 4
 - 4. Spike 7-10 mm. thick during anthesis; larger leaves usually 2 cm. or more wide 4. *V. stricta*
 - 4. Spike 5-6 mm. thick during anthesis; larger leaves usually less than 15 mm. wide 5. *V. moechina*

1. *V. urticifolia* L. Perennial; stems erect, square above, 5-15 dm. high; leaves mostly lanceolate, serrate, the petioles over 5 mm. long, the larger blades more than 8 cm. long and 2 cm. wide; flowers borne loosely (not overlapping the ones above and below) in a much-branched panicle of spikes; calyx in fruit about 2 mm. long; corolla white, about 4 mm. long. Infrequent, edge of streams and wooded areas; July-October.—*E. Garner* 1382; *J. S. Wilson* 3501, 5317.

2. *V. hastata* L. Perennial; stems erect, squarish above, 5-15 dm. high; leaves serrate, mostly lanceolate, rarely hastate (in this area), some petioles over 5 mm. long, the larger blades more than 5 cm. long and 15 mm. wide; flowers and fruits imbricate in the panicle of spikes; calyx in fruit about 2 mm. long; corolla usually purple. Infrequent, wet areas; July-October.—*J. S. Wilson* 3556, 3586.

3. *V. simplex* Lehm. Perennial; stems erect, often much-branched, usually glabrous or only sparsely pubescent, 2-6 dm. high; leaves mostly linear-lanceolate, serrate, glabrous or nearly so, rarely over 1 cm. wide; spikes terminal, usually 1-3 per stem, the flowers congested, slightly imbricate; calyx about 4 mm. long in fruit; corolla white, lavender or light blue. Common, prairies; May-September.—*D. Carson* 30; *E. Hartman* 2105; *J. S. Wilson* 2467; *R. Wisdom* R1, R86.

4. *V. stricta* Vent. Perennial; stems erect, densely gray-pubescent, 3-12 dm. high; leaves short-petioled, usually about 2 mm. long, mostly ovate to obovate, deeply serrate, copiously pubescent beneath, the larger blades usually over 2 cm. wide and 4 cm. long; spikes 1-5 at the stem

apices, the flowers strongly congested; calyx copiously pubescent about 4-6 mm. long in fruit; corolla blue, purple or white. Common, prairies; June-September.—*E. Hartman* 2136; *J. Hoover* 8; *R. Neill* 4; *J. S. Wilson* 2466.

5. *V. moechina* Moldenke. A common hybrid, intermediate in many characters, between *V. simplex* and *V. stricta*. Perennial; stems erect, pubescent; leaves lanceolate, serrate, pubescent beneath, usually less than 15 mm. wide; spikes dense; calyx pubescent, about 5 mm. long in fruit; corolla purple, blue or white; seed-set often poor. Common, prairies; June-August.—*E. Bailey* 28 June 1960; *D. Dwelle* 28 June 1960; *E. Hartman* 2152.

LABIATAE (Mint Family)

Mostly herbs; stems square; leaves opposite, simple; flowers perfect, zygomorphic, pentamerous, symsepalous, sympetalous; stamens epipetalous; ovary superior, formed from 2 2-lobed carpels; fruit usually consisting of 4 bony nutlets.

1. Flowers borne in terminal or long axillary spikes or spike-like racemes usually more than 2 cm. long 2
 2. Stamens 2; corolla blue or white 1. *Salvia*
 2. Stamens 4; corolla pink, cream-colored or yellowish-green 3
 3. Leaves with 14 or fewer teeth on a margin, rounded or cordate at the base of the blade; corolla yellowish-green or cream-colored 4
 4. Calyx lobes triangular, as wide as high; corolla yellowish-green 2. *Agastache*
 4. Calyx lobes lanceolate, bristle-tipped, at least 2 times as long as wide; corolla cream-colored 3. *Nepeta*
 3. Leaves with 15 or more teeth on a margin, cuneate at base; corolla pinkish-white 4. *Teucrium*
1. Flowers borne sessily or on short petioles from the axes of regular cauline leaves or borne in heads 5
 5. Stamens 2 6
 6. Corolla blue or purple; leaves entire, linear, at least 6 times as long as wide 5. *Hedeoma*
 6. Corolla pink or white; leaves serrate or dentate, broader, less than 4 times as long as wide 7
 7. Corolla pink; calyx tube over 7 mm. long 6. *Monarda*
 7. Corolla white; calyx tube less than 3 mm. long 7. *Lycopus*
 5. Stamens 4 8
 8. Corolla pink or cream-colored; tubers absent; flowers in clusters of 3 or more 9
 9. Corolla pink; upper leaves sessile, green beneath 8. *Lamium*

9. Corolla cream-colored; upper leaves short-petioled, whitened beneath by copious pubescence 9. *Marrubium*
8. Corolla blue; thickened tubers present at ends of rhizomes; flowers 1 or 2 from axes of cauline leaves 10. *Scutellaria*

1. SALVIA L. (Sage)

Mostly annual or perennial herbs; corolla deeply 2-lipped; stamens 2.

1. Annual; corolla 6-10 mm. long; calyx minutely pubescent along the nerves; flowers 1-3 at each node 1. *S. reflexa*
1. Perennial; corolla 15 mm. or more long; calyx copiously white-pubescent; flowers 4 or more at each node 2. *S. azurea*

1. *S. reflexa* Hornem. Erect much-branched annual; stems mostly 2-6 dm. high; leaves petiolate, mostly lanceolate, 2-6 cm. long, 3-10 mm. wide, minutely pubescent beneath; racemes erect, usually 1-2-flowered at a node; calyx minutely pubescent along the nerves; corolla blue, 6-10 mm. long. Infrequent, disturbed areas; June-October.—*E. Garner* 1434; *C. Koehn* 33; *R. Wisdom* R33.

2. *S. azurea* Lam. Erect perennial; stems 5-10 dm. high; leaves short-petioled or sessile, serrate or entire, linear to lanceolate, 3-12 cm. long; racemes erect, usually many-flowered at each node; calyx copiously pubescent; corolla blue or white, 15-25 mm. long. Common, prairies; July-October.—*E. Garner* 1332; *D. Goering* 10; *J. S. Wilson* 3503

2. AGASTACHE Clayt. (Giant Hessop)

1. *A. nepetoides* (L.) Ktze. Perennial herb; stems erect, 5-15 dm. high; leaves ovate, serrate, long-petioled, the larger blades over 3 cm. wide and 6 cm. long; spike dense, mostly 1-1.5 cm. thick and 5-15 cm. long; calyx lobes ovate; corolla greenish-yellow. Infrequent, wooded areas; August-September.—*D. Goering* 35.

3. NEPETA L.

1. *N. cataria* L. CATNIP. Erect perennial; stems copiously short-pubescent, up to 1 m. tall; leaves mostly deltoid-ovate, dentate, white pubescent beneath, the blades usually 2-5 cm. long; racemes both terminal and lateral; calyx copiously pubescent, the lobes setaceous; corolla cream-colored, about 8-12 mm. long. Infrequent, wooded areas; June-October.—*E. Garner* 1377; *J. S. Wilson* 5325; *R. Wisdom* R 68.

4. TEUCRIUM L. (Germander)

1. *T. occidentale* Gray. Erect perennial; stems 3-9 dm. high; copiously short-pubescent; leaves mostly ovate-lanceolate, serrate with 15 or more teeth per margin, pubescent beneath with white hairs; spike-like raceme about 2 cm. wide and 5 cm. or more long; calyx lobes acute, minutely pubescent; corolla pink, deeply dissected, 8-13 mm. long.

Common, stream margins; June-August.—*E. Hartman* 2154; *R. Neill* 9; *J. S. Wilson* 2910; *R. Wisdom* R74.

5. HEDEOMA Pers. (Pennyroyal)

1. *H. hispida* Pursh. Annual; stems much-branched, pubescent, 5-20 cm. high; leaves linear, entire, 1-2 cm. long; flowers numerous in the axes of the leaves; calyx bristly-pubescent, the lobes bristle-tipped; corolla blue or purple, about 6 mm. long, barely exceeding the calyx. Common, disturbed prairies; April-July.—*E. Hartman* 2117; *J. S. Wilson* 2408; *R. Wisdom* R8.

6. MONARDA L. (Monarda)

1. *M. fistulosa* L. Erect perennial; stems often branched, 5-15 dm. high, minutely pubescent above; leaves mostly deltoid-lanceolate, serrate, the larger blades usually more than 4 cm. long and 1.5 cm. wide; heads large, up to 5 cm. in diameter; calyx glandular-pubescent, the tube about 1 cm. long, the lobes minute; corolla pink, about 2-2.5 cm. long. Common, rocky slopes; June-July.—*E. Hartman* 2150; *R. Wisdom* R80.

7. LYCOPUS L. (Water Horehound)

1. *L. americanus* Muhl. Erect much-branched perennial; stems 1-9 dm. high; leaves lanceolate, serrate, deeply incised, glabrous, the larger blades mostly 1-2 cm. wide and 5 cm. or more long; flowers numerous, sessile in the axes of the cauline leaves; calyx short, less than 3 mm. long; corolla white, barely exceeding the calyx. Common, stream margins; June-September.—*D. Goering* 56; *M. Moeder* 77, 81; *J. S. Wilson* 3494, 4455, *R. Wisdom* R20.

8. LAMIUM L.

1. *L. amplexicaule* L. HENBIT. Winter annual; stems branched from base, up to 4 dm. high; leaves long-petioled at base, sessile above, mostly suborbicular, dentate or lobed; flowers numerous in the axes of the upper leaves; calyx pubescent, about 5 mm. long, the lobes bristle-tipped and about 2.5 mm. long; corolla pink, 12-15 mm. long. Infrequent, disturbed areas; March-May.—*L. Harms* 12.

9. MARRUBIUM L. (Horehound)

1. *M. vulgare* L. Perennial; stems erect, often branched, whitened by copious pubescence, 1.5-6 dm. high; leaves whitened by pubescence, mostly ovate, serrate, the lower long-petioled; flowers numerous from the axes of the upper short-petioled leaves; calyx densely pubescent, about 6 mm. long, the lobes spine-tipped; corolla white, about 6-8 mm. long. Common, wooded areas; May-October.—*R. Holman* 25; *M. Moeder* 28a; *J. S. Wilson* 2446; *R. Wisdom* R18.

10 SCUTELLARIA L. (Scullcap)

1. *S. parvula* Michx. Rhizomatous tuber-forming perennial; stems much-branched from base, 5-20 cm. high, pubescent; leaves mostly obovate, entire or with a few teeth, glandular-pubescent, about 1 cm. wide and 1.5 cm. long; flowers borne 1 or 2 in the axes of the upper leaves; calyx glandular-pubescent, about 3 mm. long at anthesis; corolla blue, about 1 cm. long. Infrequent, prairies; May-July.—*E. Hartman* 2042.

SOLANACEAE (Nightshade Family)

Herbs or shrubs; leaves alternate; flowers perfect, mostly regular, symsepalous, sympetalous, pentamerous; stamens epipetalous; fruit a 2-3 or rarely 5-locular capsule or berry.

- | | |
|---|--------------------|
| 1. Shrubs; leaves borne in fascicles | 1. <i>Lycium</i> |
| 1. Herbs; leaves not in fascicles | 2 |
| 2. Anthers poricidal, opening by apical pores; corolla yellow, white, pale blue or lavender | 2. <i>Solanum</i> |
| 2. Anthers opening by longitudinal slits; flowers mostly cream-colored to yellow | 3. <i>Physalis</i> |

1. LYCIUM L. (Matrimony Vine)

1. *L. halimifolium* Mill. Shrub, usually less than 2 m. high, branches often recurving; leaves mostly lance-spatulate, entire, up to 5 cm. long; flowers in small axillary clusters; corolla pink; berry red. Infrequent, disturbed areas; July-September.—*J. S. Wilson* 3515, 3664.

2. SOLANUM L. (Nightshade)

Herbs or shrubs; flowers mostly regular; stamens 5, opening by apical pores; berry usually 2-locular.

- | | |
|--|--------------------------|
| 1. Spines or prickles present on stems or leaves | 2 |
| 2. Corolla yellow | 1. <i>S. rostratum</i> |
| 2. Corolla white, blue or lavender | 2. <i>S. carolinense</i> |
| 1. Spines lacking | 3. <i>S. americanum</i> |

1. *S. rostratum* Dunal. BUFFALO-BUR. Annual; stems much-branched, usually less than 6 dm. high, copiously covered with yellowish prickles; leaves alternate, prickly, deeply pinnatifid, the lobes mostly rounded; flowers slightly zygomorphic; calyx about 7 mm. long; corolla yellow; berries enclosed in the spiny calyx. Common, disturbed areas; July-October.—*E. Hartman* 2146; *R. Neill* 10, 64.

2. *S. carolinense* L. HORSE NETTLE. Rhizomatous perennial; stems prickly, mostly less than 6 dm. high; leaves lobulate, prickly on the veins; calyx mostly 6-8 mm. long, pubescent; corolla white, lavender or pale blue; berries yellow, about 1-1.5 cm. in diameter. Common, disturbed areas; May-October.—*E. Hartman* 2145; *J. S. Wilson* 2429; *R. Wisdom* R17, R38, R70.

3. *S. americanum* Mill. Annual; stems much-branched, usually less than 6 dm. high; leaves mostly ovate-lanceolate, often with sinuate margins; flowers borne in few-flowered umbels; calyx less than 3 mm. long; corolla white, less than 1 cm. long; berry black, many-seeded, 5-9 mm. in diameter. Infrequent, disturbed areas; June-October.—*E. Garner* 1414; *J. S. Wilson* 3665.

3. PHYSALIS L. (Ground Cherry)

Annual or perennial herbs; leaves alternate, entire, sinuate or dentate; flowers few at the nodes; calyx strongly inflated in fruit; corolla mostly rotate or campanulate; anthers opening by longitudinal slits; fruit a 2-carpellate berry.

1. Stems pubescent with erect hairs

2. Pubescence of branched or stellate hairs; flowering calyx more than 6 mm. long 1. *P. pumila*

2. Pubescence of simple hairs; flowering calyx less than 6 mm. long 2. *P. missouriensis*

1. Stems glabrous or, if slightly pubescent, hairs appressed 3

3. Flowering pedicel more than 2 cm. long 3. *P. pendula*

3. Flowering pedicel less than 2 cm. long 4. *P. longifolia*

1. *P. pumila* Nutt. Perennial; stems pubescent, up to 5 dm. high, with stellate or branched hairs; leaves pubescent on both surfaces, long-petioled, ovate-lanceolate, the larger blades over 2 cm. wide and 4 cm. long; calyx pubescent, about 8-10 mm. long during flowering, about 3-4 times as long in fruit; corolla yellow, about 13 mm. long. Common, disturbed areas; May-October.—*J. S. Wilson* 2345; *R. Wisdom* R9.

2. *P. missouriensis* Mackenz. & Bush. Annual; stems pubescent, much-branched, up to 7 dm. high; leaves ovate to ovate-lanceolate, usually glabrous above; calyx about 4-5 mm. long at anthesis, in fruit about 1.3-2 cm. long; corolla yellow, about 7 mm. long. Infrequent, disturbed areas; May-October.—*J. S. Wilson* 3515, 3664.

3. *P. pendula* Rydb. Annual; stems 2-6 dm. high, glabrous; leaves glabrous, thin, ovate-lanceolate, sinuate-dentate, the larger blades more than 3 cm. wide; calyx at anthesis up to 5 mm. long, the lobes about as long as wide; corolla yellowish, about 6 mm. long. Infrequent, disturbed areas; July-October.—*C. Bartak* 31; *E. Garner* 1415.

4. *P. longifolia* Nutt. Perennial; stems erect, 3-8 dm. high, glabrous; leaves ovate-lanceolate, sinuate-dentate; calyx about 6-8 mm. long at anthesis, 3-4 cm. long in fruit; corolla yellowish, about 15 mm. long. Infrequent, disturbed areas; July-October.—*D. Carson* 12.

SCROPHULARIACEAE (Figwort Family)

Mostly herbs; leaves opposite, alternate or whorled; flowers zygomorphic, pentamerous, symsepalous, sympetalous, 2-carpellate; stamens epipetalous; ovary superior; fruit a capsule.

- 1. Leaves pinnatifid, less than 5 cm. long; flowers less than 2 cm. long 1. *Conohea*
- 1. Leaves not pinnatifid, more than 5 cm. long; flowers more than 2 cm. long 2. *Penstemon*

1. CONOBEA Aubl.

1. *C. multifida* Aubl. Annual herb; flowering stem much-branched, up to 3 dm. high; leaves opposite, deeply pinnatifid, the segments mostly linear; corolla greenish-white, about as long as the calyx; capsule obovate, mostly 3-4 mm. long. Common, wet disturbed areas; July-October.—*D. Goering* 32; *J. S. Wilson* 3485, 4446.

2. PENSTEMON Mitchell (Beard-Tongue)

1. *P. cobbiae* Nutt. Rhizomatous perennial; flowering stems pubescent, mostly less than 6 dm. high; leaves opposite, obovate to oblanceolate, serrate, the lower cauline over 2 cm. wide, pubescent; corolla white, mostly 3-4 cm. long; fertile stamens 4, the fifth without an anther, bearded; capsule about as long as the sepals. Infrequent, prairies; May-June.—*R. Wisdom* R48.

BIGNONIACEAE (Trumpet Creeper Family)

Trees, shrubs or woody vines; leaves opposite or whorled; flowers perfect, zygomorphic, pentamerous, symsepalous, sympetalous, 2-carpelate; stamens 2 or 4, epipetalous; ovary superior; fruit a capsule.

1. CAMPSIS Lour. (Trumpet Creeper)

1. *C. radicans* (L.) Seem. Woody vine; stems up to 10 m. long; leaves pinnate, the 5-13 leaflets ovate, serrate, 3-8 cm. long; calyx about 20 mm. long, orange; corolla orange, about 5 cm. long; capsule linear, 15-20 cm. long. Infrequent, fence rows, June-September.—*E. Garner* 1402; *R. Neill* 10.

ACANTHACEAE (Acanthus Family)

Herbs or shrubs; leaves simple, opposite, usually entire, flowers perfect, zygomorphic, pentamerous, symsepalous, sympetalous, 2-carpelate; stamens 2 or 4, epipetalous; ovary superior; fruit a capsule.

- 1. Stamens 4; calyx lobes 10 mm. or more long 1. *Ruellia*
- 1. Stamens 2; calyx lobes about 3 mm. long 2. *Dicliptera*

1. RUELLIA L.

Mostly perennial herbs; corolla large, funnellform, blue or white; capsule many-seeded.

- 1. Calyx lobes 2 mm. or more wide, linear-lanceolate 1. *R. strepens*
- 1. Calyx lobes less than 2 mm. wide, linear 2. *R. humilis*

1. *R. strepens* L. Perennial; stems ascending, commonly branched, 3-10 dm. high; leaves lance-ovate, entire, opposite, the larger 3 cm. or more wide; flowers axillary; calyx about 2 cm. long, the lobes linear-lanceolate, ciliate on the margins, 2-4 mm. wide; corolla light blue or pale violet. Infrequent, wooded areas; June-July.—*J. S. Wilson* 2468.

2. *R. humilis* Nutt. Perennial; stems often weakly ascending, copiously ciliate-pubescent, much-branched, 2-6 dm. high; leaves lance-ovate, ciliate-pubescent, rarely over 2 cm. wide; flowers axillary; calyx about 2-3 cm. long, the lobes ciliate, linear or setaceous, rarely over 1 mm. wide; corolla pale violet. Common, prairies; June-October.—*E. Garner* 1451; *E. Hartman* 2141; *J. S. Wilson* 2428; *R. Wisdom* R22.

2. DICLIPTERA Juss.

1. *D. brachiata* (Pursh) Spreng. Perennial herb; stems erect, often branched, 3-7 dm. high; leaves lance-ovate, entire, 3-10 cm. long and about 1/3 as wide; flowers subtended by obovate bracts 6-10 mm. long and about 1/2 as wide; calyx lobes short, about 3 mm. long; corolla pink or purplish, 12-18 mm. long; capsule 2-4 seeded. Infrequent, wooded areas; August-October.—*J. Nilsen* 146.

PLANTAGINACEAE (Plantain Family)

Mostly herbs; leaves usually basal; flowers regular, tetramerous; sympetalous; stamens epipetalous; carpels 2, fused; ovary superior.

1. PLANTAGO L. (Plantain)

Annual or perennial herbs; leaves basal (rarely cauline); fruit a 2-many-seeded capsule.

- | | |
|--|------------------------|
| 1. Leaves glabrous, the larger commonly more than 5 cm. wide; sepals glabrous | 1. <i>P. rugelii</i> |
| 1. Leaves pubescent, usually less than 3 cm. wide; sepals pubescent | 2 |
| 2. Leaves linear, densely pubescent, less than 1 cm. wide; corolla transparent in drying | 2. <i>P. purshii</i> |
| 2. Leaves ovate-lanceolate, pubescent, more than 1 cm. wide; corolla drying opaque, tan in color | 3. <i>P. virginica</i> |
1. *P. rugelii* Dcne. Leaves all basal, ovate, long-petioled, glabrous, mostly more than 3 cm. wide; flowering scape 1-4 dm. high; sepals glabrous, acute, about 3 mm. long; corolla whitish; capsule ellipsoid, about 5 mm. long, 4-9 seeded. Common, disturbed areas; May-October.—*J. S. Wilson* 3489; *R. Wisdom* R67.

2. *P. purshii* R. & S. Annual; leaves basal, linear to linear-lanceolate, pubescent, less than 1 cm. wide; flowering scape 5-25 cm. long, gray-pubescent; sepals densely pubescent, about 2-3 mm. long; corolla lobes ovate, transparent and reflexed in age; capsule about 2 mm. long, 2-seeded. Infrequent, disturbed areas; May-August.—*J. S. Wilson* 2406.

3. *P. virginica* L. Annual; leaves all basal, ovate-lanceolate, pubescent, the larger more than 1 cm. wide; flowering scape up to 25 cm. high; sepals pubescent, about 2 mm. long; corolla lobes lanceolate, acute, becoming tan-colored and remaining erect in age; capsule about 2 mm. long, 2-seeded. Common, disturbed areas; May-June.—*E. Hartman* 2106; *J. S. Wilson* 2407, 2490.

RUBIACEAE (Madder Family)

Herbs, shrubs or trees; leaves opposite or whorled, simple, stipulate; flowers perfect, tetramerous, mostly actinomorphic, symsepalous, sympetalous, usually 2-carpellate; stamens epipetalous; ovary inferior; fruit a capsule, berry or drupe.

1. Leaves (and leaf-like stipules) 4, 6 or 8 at a node; stems scabrous, harsh to touch 1. *Galium*
 1. Leaves 2 at a node; stems smooth to touch 2. *Houstonia*

1. GALIUM L. (Bedstraw)

1. *G. aparine* L. Annual; stems weak, sprawling over other plants, scabrous; leaves linear-oblongate, the stipules leaf-like and similar to the leaves; flowers borne from axillary peduncles; corolla white; fruit 2-lobed, 2-seeded, hispid, 2-4 mm. long. Infrequent, wooded areas; March-May.—*R. Wisdom* R47.

2. HOUSTONIA L.

1. *H. nigricans* (Lam.) Fern. Perennial; stems erect, glabrous, often several from the woody base, 2-6 dm. high; leaves opposite, linear; flowers numerous, sessile or short-pedicelled in cymose panicles; corolla purple, pale blue or white, about 6 mm. long; capsule about 3 mm. long. Infrequent, prairies; June-July.—*E. Hartman* 2151; *R. Wisdom* R84.

CAPRIFOLIACEAE (Honeysuckle Family)

Herbs, shrubs or vines; leaves opposite; flowers actinomorphic or zygomorphic, perfect, sympetalous; stamens epipetalous; fruit a capsule or drupe.

1. Leaves simple 1. *Symphoricarpos*
 1. Leaves pinnately compound 2. *Sambucus*

1. SYMPHORICARPOS Duham.

1. *S. orbiculatus* Moench. BUCKBRUSH. Small shrub; stems erect, much-branched, pubescent above, up to 15 dm. high; leaf ovate, entire, pubescent, rarely over 2 cm. long; flowers in axillary clusters; corolla white; drupe reddish-purple, about 6 mm. long. Common, prairies; June-August.—*E. Garner* 1337; *J. S. Wilson* 3454.

2. SAMBUCUS L. (Elder)

1. *S. canadensis* L. Shrub; stems erect, much-branched, glabrous, up to 3 m. high; leaves pinnate, glabrous, leaflets 5-11, ovate, serrate, the larger more than 5 cm. long; cyme many-flowered, flat-topped; corolla white, 3-5 mm. wide; berries purplish-black, about 5 mm. wide. Common, wet areas; June-July.—*J. S. Wilson* 2410, 2476, 2919, 3458.

CAMPANULACEAE (Bluebell Family)

Herbs; leaves alternate; flowers perfect, actinomorphic or zygomorphic, pentamerous, sympetalous, commonly 2-5 carpellate; stamens epipetalous, often connate by their anthers; ovary inferior; capsule many-seeded.

1. Corolla zygomorphic; anthers connate; larger leaves 15 mm. or more wide 1. *Lobelia*
 1. Corolla actinomorphic; anthers separate; leaves less than 15 mm. wide 2. *Specularia*

1. LOBELIA L. (Lobelia)

1. *L. siphilitica* L. Perennial herb; stems erect, glabrous, 5-15 dm. high; leaves commonly lanceolate, minutely dentate, up to 12 cm. long; racemes often many-flowered, elongate; calyx about 1 cm. long; corolla blue, about 2 cm. long; capsule subglobose. Common, wet areas; August-October.—*E. Garner* 1330; *D. Goering* 13; *J. Nilsen* 54; *J. S. Wilson* 3460, 3495.

2. SPECULARIA Fabr. (Venus' Looking-Glass)

Annual herbs; flowers actinomorphic, blue, 3-carpellate; capsules linear.

1. Leaves linear, entire 1. *S. leptocarpa*
 1. Leaves ovate, clasping the stem, dentate 2. *S. perfoliata*

1. *S. leptocarpa* (Nutt.) Gray. Annual; stems erect, often solitary, glabrous, 2-8 dm. high; leaves linear to linear-lanceolate, minutely pubescent, 1-4 cm. long; flowers axillary, the lower with 3 sepals, the upper with 4 or 5; corolla blue; capsule linear, 9-15 mm. long. Common, prairies; May-July.—*D. Greiner* 25; *E. Hartman* 2144; *J. Hoover* 17; *J. S. Wilson* 2412.

2. *S. perfoliata* (L.) A.DC. Annual; stems erect, pubescent, 1-10 cm. high; leaves obicular, clasping at the base, toothed, pubescent, mostly less than 1 cm. long; flowers axillary; sepals lance-attenuate, about 5 mm. long; corolla bluish-purple; capsule 5-8 mm. long. Common, prairies; May-July.—*D. Greiner* 24; *J. Hoover* 5; *J. S. Wilson* 2433, 2464.

COMPOSITAE (Daisy Family)

Mostly annual or perennial herbs; leaves basal, alternate, opposite or whorled, simple or compound, entire, toothed or lobed; inflorescence a

single capitulum (head) or an aggregation of capitula; capitula subtended by a series of involucrel bracts; flowers commonly with hairs, scales or teeth in place of a calyx; corolla of two types, ray (flattened, strap-shaped) and disk (central and tubular); five fused petals; stamens 0-5, epipetalous, ovary inferior.

1. Heads without white or yellow flowers (mostly pink, purple or blue flowers) 2
 2. Leaves prickly 1. *Cirsium*
 2. Leaves not prickly 3
 3. Ray flowers pink and over 2 cm. long 2. *Echinacea*
 3. Ray flowers absent 4
 4. Inner involucrel bracts resinous; pappus double, the inner of long bristles, the outer of very short bristles; leaves serrate 3. *Vernonia*
 4. Inner involucrel bracts not glutinous; pappus bristles essentially equal in length; leaves entire 4. *Liatris*
1. Heads with white, yellow or greenish flowers 5
 5. Ray flowers yellow 6
 6. Ray flowers only; sap white 7
 7. Leaves basal and dissected 5. *Taraxacum*
 7. Leaves entire or some of them cauline and dissected 8
 8. Leaves entire and linear; heads more than 2 cm. high 6. *Tragopogon*
 8. Leaves dissected or dentate; heads usually less than 2 cm. high 7. *Lactuca*
 6. Both ray and disk flowers present; sap clear 9
 9. Disk flowers sterile, not forming achenes 8. *Silphium*
 9. Disk flowers fertile, forming achenes 10
 10. Leaves opposite 11
 11. Disk flowers yellow 12
 12. Heads less than 1 cm. wide 9. *Dyssodia*
 12. Heads larger 13
 13. Pappus of teeth with retrorsely barbed hairs 10. *Bidens*
 13. Pappus, if toothed, not retrorsely barbed 14
 14. Involucrel bracts in a single series, not imbricate 11. *Heliopsis*
 14. Involucrel bracts imbricate, in 3 or 4 series 12. *Helianthus*
 11. Disk flowers red or brown 12. *Helianthus*
 10. Leaves alternate 15

- 15. Leaves pinnate or pinnatifid 16
 - 16. Receptacle higher than wide; disk
flowers gray or brownish 13. *Ratibida*
 - 16. Receptacle wider than high; disk
flowers yellow 14. *Senecio*
- 15. Leaves simple 17
 - 17. Both ray and disk flowers yellow 18
 - 18. Pappus of a few scales or awns,
never bristly; leaves linear, up to
6 cm. long and 3 mm. wide
..... 15. *Gutierrezia*
 - 18. Pappus of many capillary bristles;
leaves larger 16. *Solidago*
 - 17. Disk flowers brown 17. *Rudbeckia*
- 5. Ray flowers white, pink, blue, violet or absent 19
 - 19. Ray flowers white, pink, blue or violet 20
 - 20. Ray flowers more than 40 18. *Erigeron*
 - 20. Ray flowers less than 40 21
 - 21. Leaves pinnate, ultimate segments filiform
..... 19. *Achillea*
 - 21. Leaves simple 22
 - 22. Heads 8 mm. or more wide; ray flowers
evident 20. *Aster*
 - 22. Heads less than 8 mm. wide; rays not
evident 18. *Erigeron*
 - 19. Ray flowers absent 23
 - 23. Leaves pinnate, pinnatifid, or three-lobed 24
 - 24. Receptacle bristly or chaffy; bony female flowers
borne in axil of leaves; male flowers borne in
terminal racemes 21. *Ambrosia*
 - 24. Receptacle naked; flowers perfect 22. *Artemisia*
 - 23. Leaves simple 25
 - 25. Petioles ciliate; lower leaves opposite 23. *Iva*
 - 25. Petioles eciliate; leaves alternate or opposite 26
 - 26. Involucral of pistillate flowers with hooked
barbs; leaves alternate 24. *Xanthium*
 - 26. Involucral not barbed; leaves opposite or
alternate 27
 - 27. Leaves opposite 25. *Eupatorium*
 - 27. Leaves alternate 28
 - 28. Cauline leaves serrate 26. *Kuhnia*
 - 28. Cauline leaves entire 29
 - 29. Basal leaves glabrous and more
than 10 cm. long 27. *Cacalia*

29. Basal leaves densely white-tomentose, less than 10 cm. long 28. *Antennaria*

1. CIRSIIUM Mill. (Thistle)

Biennial or perennial herbs (rarely annuals); leaves alternate, usually pinnatifid, often with prickles; heads usually large, purplish, subtended by several series of spine-tipped involucre bracts; flowers all tubular, usually perfect.

1. Stems white-tomentose 1. *C. undulatum*
 1. Stems greenish, essentially glabrous 2. *C. altissimum*

1. *C. undulatum* (Nutt.) Spreng. Biennial; first year's rosette with white-tomentose pinnatifid leaves; flowering stems white-tomentose, 2-7 dm. high; leaves commonly white-tomentose on both surfaces, deeply pinnatifid, spine-tipped; involucre 2.5-3.5 cm. high; corolla purple. Common, disturbed areas; June-September.—*R. Wisdom* R67.

2. *C. altissimum* (L.) Spreng. Biennial; first year's rosette green, glabrous above; flowering stems 10-20 dm. high; leaves toothed or slightly pinnatifid, spine-tipped; involucre 2-3.5 cm. high; corolla pink-purple. Common, disturbed areas; July-October.—*D. Goering* 37; *J. S. Wilson* 5444.

2. ECHINACEA Moench. (Purple Coneflower)

1. *E. angustifolia* DC. Perennial; flowering stems up to 5 dm. high; leaves alternate, entire, 3-nerved, hispid, the basal long-petiolate; peduncles long, terminated by a single head; involucre bracts about 1 cm. long, ciliate; ray flowers pink-purple; disk flowers brownish-red, stiff. Common, dry upland prairies; May-August.—*D. Goering* 32; *E. Hartman* 2133; *J. Hoover* 31; *R. Koehn* 34; *J. S. Wilson* 2417; *R. Wisdom* R65.

3. VERNONIA Schreb. (Ironweed)

1. *V. baldwini* Torr. Perennial; flowering stems up to 1 m. high, rarely more; leaves alternate, simple, ovate-lanceolate, serrate, slightly hispid beneath; involucre purplish-tinged, about 5 mm. high, the bracts imbricate; ray flowers absent; disk flowers purplish. Common, disturbed areas; July-September.—*J. S. Wilson* 5331.

4. LIATRIS Schreb. (Blazing Star)

Perennial herbs; leaves alternate, simple, entire, linear or lanceolate; inflorescence racemose or spicate; ray flowers absent; disk flowers usually purple; pappus of 1 or 2 rows of conspicuous barbellate or plumose bristles.

1. Pappus barbellate; heads spherical, about as wide as high 1. *L. aspera*

1. Pappus plumose; heads cylindrical, about 2 times as long as wide 2. *L. mucronata*

1. *L. aspera* Michx. Perennial; flowering stems 3-10 dm. high, gray-tomentose; leaves mostly lanceolate, minutely pubescent beneath, the basal rarely over 2 cm. wide; involucre usually less than 2 cm. in diameter, its bracts mostly rounded at the apex and eciliate; tube flowers purple, the corolla tube about 7 mm. long; pappus barbellate, about 7 mm. long. Common, rocky areas; August-October.—*E. Garner* 1442; *D. Goering* 2; *L. Harms* 36; *M. Moeder* 106.

2. *L. mucronata* DC. Perennial; flowering stems leafy above, 2-8 dm. high; leaves mostly linear, the upper usually less than 5 mm. wide; involucre about 10 mm. high, its bracts abruptly pointed, ciliate on the margin; heads about 2 times as long as wide; tube flowers 4-8 per head, purple; pappus plumose, about 7 mm. long. Common, rocky areas; August-October.—*E. Garner* 1355; *D. Goering* 1; *L. E. Gordon* 25; *L. Long* 34; *M. Moeder* 108.

5. TARAXACUM Zinn (Dandelion)

1. *T. officinale* Weber. Perennial herbs with white latex; leaves all basal, lanceolate, pinnatifid; peduncles terminated by a single head; involucre of an inner and outer series of bracts; ray flowers yellow; tube flowers absent; pappus of conspicuous soft hairs; achenes 2-4 mm. long. Common, disturbed areas; March-December.—*D. Goering* 11.

6. TRAGOPOGON L. (Goat's Beard)

1. *T. major* Jacq. Lactiferous perennials from taproots; flowering stems leafy, up to 8 dm. high; leaves linear, clasping, entire; peduncle terminated by single head; involucre of bracts green, linear, about 4.5 cm. long; ray flowers yellow; disk flowers absent; pappus bristles long, conspicuous. Infrequent, disturbed areas; May-July.—*W. James* 1; *J. S. Wilson* 2415, 2922.

7. LACTUCA L. (Lettuce)

Lactiferous annuals, biennials or perennials; leaves usually serrate, dissected or lobed, rarely entire; inflorescence commonly paniculate; ray flowers usually 30 or less; tube flowers absent; pappus bristles long and conspicuous.

1. Involucre less than 8 mm. high 1. *L. canadensis*
 1. Involucre more than 8 mm. high 2
 2. Midrib of leaf with prickles 2. *L. scariola*
 2. Midrib of leaf without prickles 3. *L. saligna*
 1. *L. canadensis* L. var. *latifolia* Ktze. Biennial herb from taproot; flowering stems 5-20 dm. high; leaves large, deeply pinnatifid, short-spined on the midrib; involucre less than 8 mm. high; ray flowers yellow; pappus 5-7 mm. long. Infrequent, disturbed areas; July-September.—*J. S. Wilson* 2914.

2. *L. scariola* L. Biennial or annual herb; flowering stems 2-15 dm. high; leaves dentate, rarely dissected; involucre 8 mm. or more high; ray flowers pale yellow; pappus about 10 mm. long; beak of achene about equaling the body in length. Common, disturbed areas; July-October.—*E. Garner* 1427.

3. *L. saligna* L. Annual or biennial herb; flowering stems 3-10 dm. high; leaves pinnatifid, remotely dentate; involucre in fruit 12-15 mm. high; ray flowers yellow; beak of achene about 2 times length of the body. Common, disturbed areas; July-October.—*J. S. Wilson* 4456.

8. SILPHIUM L. (Rosinweed)

Rhizomatous perennials; flowering stems erect, up to 2 m. high; leaves opposite or alternate, serrate or deeply pinnatifid; involucre bracts ovate to ovate-lanceolate, the outer usually 5 mm. or more wide; ray flowers yellow, pistillate and fertile; disk flowers yellowish, apparently perfect but not producing achenes.

1. Leaves alternate, pinnatifid, usually 15 cm. or more long
 1. *S. laciniatum*

1. Leaves opposite, serrate, usually less than 15 cm. long
 2. *S. integrifolium*

1. *S. laciniatum* L. Tall perennial; flowering stems 10-30 dm. high; leaves alternate, pinnatifid, the lower usually more than 15 cm. long; involucre bracts about 2 cm. long; ray flowers 2-5 cm. long. Common, prairies; July-September.—*J. S. Wilson* 5783.

2. *S. integrifolium* Michx. Tall perennial; flowering stems 5-15 dm. high; leaves opposite, serrate, usually less than 15 cm. long; involucre bracts ovate, about 15 mm. long; ray flowers 15-35 mm. long. Common, prairies; July-September.—*R. Neill* 8, 12, 28; *J. S. Wilson* 2929, 3512, 4453.

9. DYSSODIA Cav.

1. *D. papposa* (Vent.) Hitchc. Strong-scented annual herb; flowering stems 1-4 dm. high; leaves opposite, pinnately dissected; involucre bracts about 7 mm. long, copiously glandular; ray flowers scarcely exceeding the involucre, yellow; pappus scales upwardly dissected into bristles. Common, eroded areas; July-October.—*D. Goering* 53.

10. BIDENS L. (Bur-Marigold)

Annual or perennial herbs; leaves opposite, simple or compound; disk and/or ray flowers usually yellow; pappus of 2-6 teeth.

1. Leaves simple and serrate 1. *B. cernua*

1. Leaves compound or pinnatifid 2

2. Outer involucre bracts 10 or less, longer than and exceeding top of head (not the teeth of the achenes, however)
 2. *B. frondosa*

2. Outer involucre bracts 10 or more, not exceeding the tube flowers, strongly ciliate on the margins 3. *B. polylepis*
1. *B. cernua* L. Annual; flowering stems 1-10 dm. high; leaves sessile, simple, serrate; outer involucre bracts 5-8, large and leafy, often exceeding the disk; ray flowers yellow, 6-8 or absent; tube flowers yellow; achenes (excluding teeth) about 4-6 mm. long. Infrequent, wet areas; August-September.—*D. Goering* 9, 42; *J. S. Wilson* 5464.
2. *B. frondosa* L. Annual; flowering stems up to 10 dm. high; leaves compound with 3-5 lanceolate serrate leaflets; outer involucre bracts green, less than 10, often exceeding the disk; ray flowers yellow, mostly absent; disk flowers orange; achenes about 5 mm. long, brownish-black at maturity, mostly 2-awned. Infrequent, wet areas; August-October.—*J. S. Wilson* 3657.
3. *B. polylepis* Blake. Annual; flowering stems up to 12 dm. high; leaves pinnatifid or compound with 3-5 serrate leaflets; outer involucre bracts 10 or more, strongly ciliate; ray flowers yellow; disk flowers yellow. Infrequent, wet areas; August-October.—*D. Goering* 42.

11. HELIOPSIS Pers.

1. *H. helianthoides* (L.) Sweet. Perennial; flowering stems 3-12 dm. high; leaves simple, opposite, serrate, scabrous; outer involucre bracts 3-5 mm. wide, scabrous, strongly nerved at base; ray flowers yellow, about 5 mm. wide; tube flowers yellowish; achene about 4 mm. long. Infrequent, wooded areas; August-October.—*L. Harms* 35.

12. HELIANTHUS L. (Sunflower)

Annual or perennial herbs; ray flowers usually yellow; disk flowers yellow, red or brown; chaff of the receptacle foliaceous and embracing the achene; pappus of 2 chaffy scales.

1. Annual; disk reddish-brown; large outer involucre bracts more than 5 mm. wide at base 1. *H. annuus*
1. Perennial; disk yellow or brown; outer involucre bracts usually less than 5 mm. wide at base 2
2. Leaves opposite; outer involucre bracts less than 1 cm. long 2. *H. laetiflorus*
2. Upper leaves alternate; outer involucre bracts more than 1 cm. long 3
3. Outer involucre bracts 3-4 mm. wide at base 3. *H. tuberosus*
3. Outer involucre bracts less than 3 mm. wide at base 4. *H. maximiliana*
1. *H. annuus* L. Annual; flowering stems 2-20 dm. high; leaves simple, alternate, scabrous, petiolate, 2-30 cm. wide; involucre bracts marginally ciliate, more than 5 mm. wide at base; ray flowers yellow; disk flowers brown; receptacle nearly flat. Common, disturbed areas;

July-October.—*E. Garner* 1354; *D. Goering* 36; *J. S. Wilson* 4447; *R. Wisdom* R16.

2. *H. laetiflorus* Pers. Perennial; flowering stems 2-15 dm. high; leaves simple, entire, usually opposite; outer involucre bracts usually less than 7 mm. long; ray flowers yellow; disk flowers with reddish-brown lobes; receptacle convex. Infrequent, prairies; July-September.—*J. S. Wilson* 3483.

3. *H. tuberosus* L. Perennial; flowering stems up to 15 dm. high, rarely higher; leaves simple, alternate above, scabrous, petiolate, rather large, up to 15 cm. wide; outer involucre bracts 3-4 mm. wide at base; ray flowers yellow; disk flowers with yellow lobes; receptacle convex. Infrequent, wet areas; August-October.—*D. Goering* 55.

4. *H. maximiliana* Schrad. Perennial; flowering stems 5-20 dm. high, rarely higher; leaves simple, alternate above, lanceolate, scabrous, usually less than 3 cm. wide; outer involucre bracts rather narrow, usually less than 3 mm. wide; ray flowers yellow; disk flowers yellow. Common, prairies; July-October.—*E. Garner* 1370, 1371, 1375; *D. Goering* 54, 63; *J. S. Wilson* 3672, 3674.

13. RATIBIDA Raf. (Prairie-Coneflower)

1. *R. columnifera* (Nutt.) Wooton & Standl. Perennial; flowering stems 2-7 dm. high; leaves alternate, compound, with 5-9 entire linear leaflets; involucre bracts linear, about 5 mm. long; receptacle columnar; ray flowers yellow or maroon; disk flowers grayish. Common, prairies; May-July.—*E. Hartman* 2156, 2157.

14. SENECIO L. (Golden Ragwort)

1. *S. plattensis* Nutt. Perennial; flowering stems 1-4 dm. high, lanate at base; basal leaves tufted, serrate but unlobed; cauline leaves mostly pinnatifid; involucre bracts about 5 mm. long and .5 mm. wide, uniseriate; ray and disk flowers yellow; pappus of many fine silky hairs. Common, prairies; April-June.—*L. Harms* 110, *E. Hartman* 2030; *J. S. Wilson* 4077; *R. Wisdom* R43.

15. GUTIERREZIA Lag. (Broomweed)

1. *G. dracunculoides* (DC.) Blake. Annual from taproot; flowering stems much-branched, 1-8 dm. high; leaves alternate, simple, entire, usually less than 1 mm. wide; involucre about 3 mm. high; ray and disk flowers yellow; pappus of 5-8 bristle-like scales. Common, disturbed areas; August-October.—*E. Garner* 1366; *D. Goering* 20; *I. Ronnback* 4; *J. S. Wilson* 3455, 3507, 3682.

16. SOLIDAGO L. (Goldenrod)

Perennial herbs; leaves alternate, simple and mostly sessile; flowers yellow, mostly radiate; pappus of capillare bristles.

1. Involucral bracts pubescent 2
 2. Larger leaves mostly less than 10 mm. wide; involucral bracts acute at apex, less than 1 mm. wide 1. *S. petiolaris*
 2. Larger leaves usually over 15 mm. wide; involucral bracts obtuse, more than 1 mm. wide 2. *S. rigida*
1. Involucral bracts glabrous 3
 3. Leaves entire, linear, rarely more than 6 mm. wide 3. *S. gymnospermoides*
 3. Leaves lanceolate, at least the lower serrate, the larger usually 6 mm. or more wide 4
 4. Leaves usually at least 5 times as long as wide 5
 5. Stems pubescent 4. *S. altissima*
 5. Stems glabrous 5. *S. missouriensis*
 4. Leaves 2-3 times as long as wide 2. *S. rigida*

1. *S. petiolaris* Ait. Perennial from elongate rhizome; flowering stems 5-15 dm. high, minutely pubescent above; leaves mostly lanceolate, entire, minutely pubescent below; inflorescence spike-like, rarely more than 4 cm. wide; involucre about 6 mm. long, the bracts pubescent. Infrequent, prairies; August-October.—*D. Goering* 21, 22; *J. S. Wilson* 3669.

2. *S. rigida* L. Perennial; flowering stems 2-12 dm. high, pubescent; leaves mostly ovate, sub-entire, thick and rigid, pubescent, the larger usually over 15 mm. wide; inflorescence corymbiform, densely congested; involucre about 5-10 mm. high, its bracts glabrous or pubescent, obtuse at apex. Common, rocky soils; August-October.—*J. Beckner* 114; *E. Garner* 1358; *M. Moeder* 31d; *J. S. Wilson* 3663, 3671.

3. *S. gymnospermoides* (Greene) Fern. Rhizomatous perennial; flowering stems 4-10 dm. high; leaves linear, entire, rarely over 6 mm. wide; involucre glistening-glutinous, about 4-5 mm. high; disk flowers 3-8. Infrequent, prairies; August-October.—*D. Goering* 41.

4. *S. altissima* L. Rhizomatous perennial; flowering stems gray-pubescent, usually 5-15 dm. high; leaves thick, triple-nerved, pubescent beneath (at least on the nerves), mostly lanceolate, the larger over 10 mm. wide and slightly serrate; involucre 3-5 mm. high, its bracts scarious-margined. Common, moist areas; August-October.—*E. Garner* 1352; *D. Goering* 21, 45; *I. Ronnback* 3; *J. S. Wilson* 3668, 3670, 3673, 3675.

5. *S. missouriensis* Nutt. Perennial from cord-like rhizome; flowering stems glabrous, 1-8 dm. high; leaves lanceolate, glabrous, the larger serrate, and usually less than 10 mm. wide; involucre about 3-4 mm. high. Common, prairies; August-October.—*J. J. Ramsey* 8 Sept 1960; *J. S. Wilson* 5310; *R. Wisdom* R89.

17. RUDBECKIA L.

1. *R. hirta* L. Perennial (often annual); flowering stems pubescent, mostly 3-8 dm. high; leaves alternate, simple, mostly ovate, hispid;

outer involucral bracts about 12 mm. long, green; ray flowers yellow; disk flowers brown; pales bristly-ciliate at apex; receptacle concial. Infrequent, prairies; May-July.—*J. Ransom* 28 June 1960.

18. ERIGERON L. (Fleabane)

Annual, biennial or perennial herbs; leaves alternate; heads many-flowered, the rays usually white or lavender, the disk yellow; involucral bracts narrow, about equal in length.

1. Ray flowers less than 4 mm. long 1. *E. canadensis*
1. Ray flowers more than 4 mm. long 2
 2. Basal and lower cauline leaves coarsely dentate, the larger usually over 15 mm. wide, sessile and clasping the stem; disk corollas 2.5-4 mm. long 2. *E. philadelphicus*
 2. Basal leaves entire or nearly so, often absent at flowering, the lower cauline usually peliotate, commonly less than 15 mm. wide; disk corollas 1.5-2.5 mm. long 3
 3. Involucre covered with glistening multicellular hairs some of which are more than 1 mm. long 3. *E. annuus*
 3. Involucre covered with whitish hairs usually less than .5 mm. long 4. *E. strigosus*

1. *E. canadensis* L. HORSE-WEED. Annual; flowering stems erect, 1-20 dm. high; leaves simple, mostly entire, marginally ciliate, linear to linear-lanceolate, usually less than 5 mm. wide; the many heads arranged in a much-branched paniculate inflorescence; involucre 5 mm. or less wide; ray flowers white, up to 4 mm. long; disk flowers yellow. Common, disturbed areas; July-October.—*E. Garner* 1379; *D. Goering* 11; *J. S. Wilson* 5457.

2. *E. philadelphicus* L. Perennial; flowering stems 1-10 dm. high, villose; leaves usually dentate, sessile and clasping, strigose beneath, the larger commonly more than 15 mm. wide; involucre about 10 mm. wide; ray flowers white, lavender or pink, about 8 mm. long; disk flowers yellow. Common, wet areas; April-July.—*E. Hartman* 2031, 2050; *R. Wisdom* R56.

3. *E. annuus* (L.) Pers. Annual or biennial; flowering stems 2-12 dm. high, pubescent with spreading hairs; leaves mostly lanceolate to oblanceolate; involucre about 8 mm. wide, densely covered with glistening multicellular hairs some of which are more than 1 mm. long; ray flowers white, about 7 mm. long; disk flowers yellow. Common, disturbed areas; May-October.—*R. Neill* 12, 34; *J. S. Wilson* 2413, 2425, 2926, 5462; *R. Wisdom* R 17.

4. *E. strigosus* Muhl. var. *strigosus* Annual or weak perennial; flowering stems 2-10 dm. high, covered with a short pubescence; leaves entire or nearly so, usually lanceolate; involucre about 8 mm. wide, the bracts covered with short white hairs mostly less than .5 mm. long; ray

flowers white, about 7 mm. long; disk flowers yellow. Common, prairies; April-October.—*E. Garner* 1423; *E. Hartman* 2084, 2142; *R. Wisdom* R12, R16.

19. ACHILLEA L. (Yarrow)

1. *A. millefolium* L. Perennial; flowering stems 3-8 dm. high, cobwebby white-pubescent; leaves bipinnate, the segments filiform; heads arranged in a flat-topped corymb; involucre about 4 mm. high, cylindrical; ray flowers white, about 2 mm. long; disk flowers yellow. Common, disturbed areas; *D. Goering* 33; *E. Hartman* 2060, 2089; *J. S. Wilson* 2479; *R. Wisdom* R6.

20. ASTER L. (Aster)

Perennial herbs; leaves alternate and simple; heads many, each usually many-flowered; involucre bracts usually imbricate; receptacle flat; ray flowers various; disk flowers yellow; pappus of capillare bristles.

1. Involucre bracts glandular; ray flowers blue; leaves entire or with ciliated margin 1. *A. oblongifolius*
1. Involucre bracts without glands; ray flowers white or blue 2
2. Ray flowers blue, about 8 mm. long; larger leaves 2-3 times as long as wide, ovate-lanceolate 2. *A. sagittifolius*
2. Ray flowers white; larger leaves at least 4 times as long as wide, lanceolate 3
3. Involucre bracts up to 5 mm. long, larger leaves 6-20 mm. wide 3. *A. simplex*
3. Involucre bracts 3 mm. or less long; leaves up to 5 mm. wide 4. *A. ericoides*

1. *A. oblongifolius* Nutt. Perennial herb; flowering stems branched, 1.5-7.5 dm. high; leaves lanceolate, simple, minutely ciliate on the margin; involucre about 5 mm. high, the bracts glandular; ray flowers blue. Infrequent, prairies; August-October.—*E. Garner* 1336, 1363; *D. Goering* 15; *J. S. Wilson* 3677.

2. *A. sagittifolius* Wedemeyer var. *drummondii* (Lindl.) Shinn. Perennial; flowering stems branched above, 4-12 dm. high; leaves ovate-lanceolate, simple, serrate, pubescent beneath, the lower commonly with winged petioles; involucre about 5 mm. high, the bracts about 5 mm. long; ray flowers blue, about 1-2 mm. wide. Infrequent, wooded areas; August-October.—*E. Garner* 1374.

3. *A. simplex* Willd. var. *ramosissimus* (T. & G.) Cronq. Perennial; flowering stems branched, glabrous, 4-15 dm. high; leaves mostly lanceolate, glabrous, rarely over 1 cm. wide; involucre about 5 mm. high, the bracts .5 mm. wide; ray flowers white, about 8 mm. long. Infrequent, prairies; August-October.—*D. Goering* 43, 44.

4. *A. ericoides* L. Perennial; flowering stems 2-10 dm. high, pubescent, covered with small leaves above; leaves linear, mostly less

than 3 mm. wide and 20 mm. long; involucre about 3 mm. high, the bracts about 2 mm. long; ray flowers white, usually less than 6 mm. long. Common, prairies; August-October.—*E. Garner* 1364, 1424; *D. Goering* 24; *J. S. Wilson* 3678.

21. AMBROSIA L. (Ragweed)

Annual or perennial herbs; plants monoecious, the male flowers borne in terminal spike-like racemes, the female in axes of the leaves.

1. Some of the leaves palmately divided into 3-5 lobes 1. *A. trifida*
 1. Leaves pinnately divided 2. *A. artemisiifolia*

1. *A. trifida* L. GIANT RAGWEED. Annual; flowering stems 3-30 dm. or more high; leaves large, mostly 3-lobed, scabrous above; racemes of male flowers often 15 cm. or more long; fruit 6-12 mm. long, tuberculate. Common, disturbed areas; July-October.—*J. S. Wilson* 3497.

2. *A. artemisiifolia* L. Annual; flowering stems 1-10 dm. high; leaves pinnate, scabrous above; staminate racemes usually less than 10 cm. long; fruits about 4 mm. long, bluntly tuberculate. Common, disturbed areas; July-October.—*E. Garner* 1348, 1349; *R. Neill* 34; *J. S. Wilson* 3459, 3466.

22. ARTEMISIA L.

1. *A. ludoviciana* Nutt. WHITE SAGE. Perennial from cord-like rhizomes; flowering stems white-pubescent, 2-8 dm. high; leaves pinatifid to entire, white-pubescent below; involucre small, about 2 mm. high and 3 mm. wide; ray flowers absent; the outer disk flowers pistillate, about 2 mm. long. Common, prairies; August-October.—*J. Beckner* 136; *E. Garner* 1331, 1445; *D. Goering* 18; *J. S. Wilson* 3457, 3500, 3681, 3749.

23. IVA L.

1. *I. ciliata* Willd. Annual; flowering stems usually simple, 3-12 dm. high; leaves mostly ovate-lanceolate, scabrous above, at least the lower opposite; involucre about 2-3 mm. high; pistillate and staminate flowers in the same head; ray flowers absent. Infrequent, disturbed areas; August-October.—*J. S. Wilson* 5784.

24. XANTHIUM L. (Cockleburr)

1. *X. pensylvanicum* Wallr. Annual; flowering stems 2-9 dm. high; leaves alternate, usually cordate-ovate to lobulate; pistillate involucre barbed, the projections usually 2-3 mm. long; staminate flowers terminal. Infrequent, disturbed areas; August-October.—*L. Gordon* 6.

25. EUPATORIUM L.

Perennial herbs; heads without ray flowers, discoid; pappus of capillare bristles.

1. Leaves entire or with a few teeth, usually at least 6 times as long as broad 1. *E. altissimum*

1. Leaves serrate, usually less than 4 times as long as broad 2. *E. rugosum*

1. *E. altissimum* L. Perennial; flowering stems 6-20 dm. high; leaves opposite, lanceolate, entire, or if serrate, near the apex only; involucre about 5 mm. high; tube flowers white, 5 in each head; corolla about 5 mm. long. Common, prairies; August-October.—*E. Garner* 1376; *D. Goering* 4, 34; *J. S. Wilson* 3676.

2. *E. rugosum* Houtt. WHITE SNAKEROOT. Perennial; flowering stems 2-10 dm. high; leaves ovate, opposite, serrate, long-petioled; involucre about 5 mm. high; tube flowers white, 12 or more in each head; corolla about 4 mm. long. Common, disturbed areas; July-October.—*E. Garner* 1399; *M. Moeder* 79.

26. KUHNIA L.

1. *K. eupatorioides* L. Perennial; flowering stems 2-10 dm. high; leaves alternate, lanceolate to elliptic, glandular beneath; involucre 7-14 mm. high, its bracts in several series; flowers all tubular; corolla white; pappus of numerous plumose bristles. Common, prairies; August-October.—*E. Garner* 1356; *D. Goering* 7, 51; *J. S. Wilson* 3667, 3683, 5321.

27. CACALIA L. (Indian Plantain)

1. *C. tuberosa* Nutt. Perennial from tuberous root; flowering stems glabrous, erect, 5-15 dm. high; leaves alternate, glabrous, entire, ovate, long-petioled, parallel-veined; involucre about 6-8 mm. long; flowers tubular; corolla white; pappus of numerous capillare bristles. Common, prairies; May-July.—*E. Hartman* 2076, 2134; *J. Hoover* 29; *R. Wisdom* R77.

28. ANTENNARIA Gaertn. (Pussy-Toes)

1. *A. neglecta* Greene. Dioecious perennial by rosette-forming stolons; flowering stems 5-25 cm. high; leaves alternate, densely white-pubescent beneath, spatulate; pistillate involucre about 7 mm. high; flowers all tubular; corolla white, about 5 mm. long. Common, prairie slopes; April-June.—*F. Busey* 26; *D. Goering* 14; *M. Hopkins* 21; *J. S. Wilson* 2000.

LITERATURE

- Fernald, M. L. 1950. Gray's manual of botany, 8th ed. American Book Co., New York.
- Gleason, H. A. 1952. The new Britton and Brown illustrated flora of northeastern United States and adjacent Canada. Lancaster Press, Inc., Lancaster, Pennsylvania.
- Hartman, E. L. 1960. The F. B. and Rena G. Ross Natural History Reservation. The Emporia State Research Studies. VIII (4):1-39.

The Emporia State Research Studies

- Vol. I, No. 1, 1952: Willis Ratzlaff, *The Limnology of Some Roadside Ditches in Chase and Lyon Counties, Kansas*. No. 2,* 1952: C. Stewart Boertman, *Apportionment in the Kansas House of Representatives*. No. 3,* 1953: John Breukelman and Ted F. Andrews, *Offerings and Enrollments in Secondary School Sciences in Kansas in 1951-52*. No. 4, 1953: George S. Blair, *The Office of County Coroner in Kansas*.
- Vol. II, No. 1, 1953: Green D. Wyrick, *The World of Ernest Hemingway*. No. 2,* 1953: Ira Everett Welch, *The Comparison of Column Method Versus the Contest Method in the Teaching of Spelling*. No. 3, 1954: Jerry P. Leibman, *Press Freedom and Libel as Defined by Kansas Case Law*. No. 4, 1954: Harold Crimmins, *A History of The Kansas Central Railway, 1871-1935*.
- Vol. III, No. I, 1954: Fred W. Grabhorn, *Status of Teachers of Business Subjects in the Secondary Schools of Kansas, 1953-1954*; Billy Lee Fowler, *Turnover of Business Teachers in the Secondary Schools in Kansas, 1952-1953*; Eleanor Patrick Evans, *List of Free Teaching Aids for Typewriting, Bookkeeping, and Shorthand*. No. 2, 1954: Garrett R. Carpenter, *Silkville: A Kansas Attempt in the History of Fourierist Utopias, 1869-1892*. No. 3 1955: John C. Scafe, *Foreign Language Teaching in Kansas High Schools, 1953-1954*. No. 4, 1955: Richard A. Valyer, *A Proposed Course of Study for Driver Education*.
- Vol. IV, No. 1 1955: Jessie Louise Losey, *A Selected, Annotated List of One-Act Plays for Festival Use*. No. 2, 1955: George E. Thornton, *The Social and Moral Philosophy of Thomas Dekker*. No. 3, 1956: John Breukelman and Ted F. Andrews, *Offerings and Enrollments in Secondary School Sciences in Kansas in 1954-1955*. No. 4, 1956: S. Hull Sisson and Harry Walthall, *An Annotated Bibliography of Theses Accepted for the Master of Science Degree, Kansas State Teachers College, Emporia, 1945 Through 1954*.
- Vol. V, 1,* 1956: Walt Butcher, *Presidential Election Returns for Kansas, 1864-1952*. No. 2,* 1956: Alex A. Daughtry, *A Report on the Post-Graduation Activities of the 1955 Kansas High School Graduates*. No. 3, 1957: Carl W. Prophet, *Seasonal Variations and Abundance of Cladocera and Copepoda and Some Physical-Chemical Conditions of the Fall and Verdigris Rivers in Wilson and Montgomery Counties, Kansas*; Claire L. Schelske, *An Ecological Study of the Fishes of the Fall and Verdigris Rivers in Wilson and Montgomery Counties, Kansas*. No. 4, 1957: William C. Tremmel, *The Social Concepts of George Herbert Mead*.
- Vol. VI, No. 1,* 1957: John M. Matthews, *Sang De Boeuf: Its Chinese Historical References and Local Reduction Experiments in Electric Firing Kilns*. No. 2, 1957: Weldon N. Baker and Merle E. Brooks, *Background and Academic Preparation of the Teachers of Science in the High Schools of Kansas 1955-1956*. No. 3,* 1958: Harold V. Sare, *Nehru and the Rise of the Modern State of India*. No. 4,* 1958: Robert M. Taylor, *Acoustics for the Singer*.
- Vol. VII, No. 1, 1958: Robert F. Clarke, *An Ecological Study of Reptiles and Amphibians in Osage County, Kansas*. No. 2, 1958: Harold V. Sare and Wallace Browning, *Background and Academic Preparation of the Social Science Teachers in the High Schools of Kansas 1956-1957*. No. 3, 1959: John M. Burger, *Background and Academic Preparation of the Mathematics Teachers in the Public High Schools of Kansas 1957-1958*. No. 4, 1959: Johnny L. Kloefkorn, *A Critical Study of the Work of H. L. Mencken as Literary Editor and Critic on the American Mercury*.
- Vol. VIII, No. 1, 1959: Herman H. Harris, Jr., *The History and Calculation of Pi*. No. 2, 1959: Willard O. Stibal, *The Historical Development of Student Personnel Records in Colleges and Universities*. No. 3, 1960: Donald E. Zimmerman, *The Nature of Mans John Donne's Songs and Holy Sonnets*. No. 4, 1960: Emily L. Hartman, *The F. B. and Rena G. Ross Natural History Reservation*.
- Vol. IX, No. 1, 1960: Charles E. Walton, *To Maske in Mythe: Spenser's Theatrical Practices in The Faerie Queene*. No. 2, 1960: Paul G. Jantzen, *The Ecology of a Boggy Marsh in Stafford County, Kansas*. No. 3,* 1961: R. Alton Lee, *Pasquale Paoli: Fighter for Freedom*. No. 4, 1961: Eugene Donald Decker, *A Selected Annotated Bibliography of Sources in the Kansas State Historical Society Pertaining to Kansas in the Civil War*.
- Vol. X, No. 1, 1961: John Breukelman and Ralph P. Frazier, *Offerings and Enrollments in the Secondary School Sciences in Kansas in 1960-1961*. No. 2, 1961, Marvin Ewy, *Charles Curtis of Kansas: Vice President of the United States, 1929-1933*. No. 3, 1962, J. J. Weigand, *A Comparison of the Effectiveness of Two Methods of Teaching General Music in the Junior High School*. No. 4, 1962, Roma Ball and Others, *Four Studies in Elizabethan Drama*.
- Vol. XI, No. 1, 1962: Robert L. Dorsch and Dorothy D. Greer, *Faulkner—Three Studies, Part I*. No. 2, 1962: Sherland N. Dirksen, *Faulkner—Three Studies, Part II*. No. 3, 1963, George M. Rundell and Minnie M. Miller, *Foreign Languages in Kansas Secondary Schools, 1961-1962*. No. 4, 1963, James S. Wilson, *Flowering Plants of the Ross Natural History Reservation, Lyon and Chase Counties, Kansas*.

* This issue is no longer available.