

capillary bristles. — Flowers yellow. Leaves scattered, oblanceolate or linear, 1-3-nerved. A large western genus, few species approaching our limits. (Dedicated by De Candolle to Dr. Jacob Bigelow, author of the *Florula Bostoniensis*, and of the *American Medical Botany*.)

1. *B. nudata*, DC. A smooth perennial; the slender stem (1-2° high) simple or branched from the base, naked above, corymbose at the summit, bearing small heads in a flat-topped corymb. — Low pine barrens, N. J. (rare), and southward. Sept.

17. *SOLIDAGO*, L. GOLDEN-ROD.

Heads few—many-flowered, radiate; the rays 1-16, pistillate. Scales of the oblong involucre appressed, destitute of herbaceous tips (except n. 1 and 2). Receptacle small, not chaffy. Achenes many-ribbed, nearly terete; pappus simple, of equal capillary bristles. — Perennial herbs, with mostly wand-like stems and nearly sessile stem-leaves, never heart-shaped. Heads small, racemed or clustered; flowers both of the disk and ray (except n. 6) yellow. (Name from *solidus* and *ago*, to join, or make whole, in allusion to reputed vulnerary qualities.) Flowering in autumn.

Conspectus of Groups.

Heads small, sessile in flat-topped corymbs; leaves linear	41, 42
Heads all more or less pedicelled.	
Involucral scales rigid, with spreading herbaceous tips	1, 2
Involucral scales without green tips.	
Heads in a compound terminal corymb, not at all racemose	37-40
Heads small, mostly clustered in the axils of feather-veined leaves	3-7
Heads mostly large, in a terminal thyrse; leaves feather-veined.	
Western species	8, 9
Northern or mountain species	10-12
Heads mostly small or middle-sized: inflorescence paniculate (sometimes thyrsoidal).	
Leaves 3-ribbed; heads in 1-sided spreading panicled racemes.	29-32
Stem and leaves smooth and glabrous	33-36
Pubescent or scabrous	
Leaves not 3-ribbed, or only obscurely triple-nerved.	
Heads large; leaves thickish, very smooth, entire. Seashore	13
Panicle virgate or thyrsoid; leaves nearly entire	14-17
Heads very small in a short broad panicle; leaves nearly entire	18-20
Heads racemosely paniculate; leaves ample, the lower serrate	21-23

§ 1. *VIRGAÛREA*. Rays mostly fewer than the disk-flowers; heads all more or less pedicelled.

* Scales of the much imbricated and rigid involucre with abruptly spreading herbaceous tips; heads in clusters or glomerate racemes, disposed in a dense somewhat leafy and interrupted wand-like compound spike.

1. *S. squarrosa*, Muhl. Stem stout (2-5° high), hairy above; leaves large, oblong, or the lower spatulate-oval and tapering into a margined petiole, serrate, veiny; heads numerous; scales obtuse or acute; disk-flowers 16-24, the rays 12-16. — Rocky and wooded hills, Maine and W. Vt. to Penn., Ohio, and the mountains of Va.; rather rare.

2. *S. petiolaris*, Ait. Minutely hoary or downy; stem strict, simple (1-3° high); leaves small ($\frac{1}{2}$ -2' long), oval or oblong, mucronate, veiny, rough-ciliolate; the upper entire and abruptly very short-petioled, the lower often ser-

rate and tapering to the base; heads few, in a wand-like raceme or panicle, on slender bracted pedicels; rays about 10, elongated; scales of the pubescent involucre lanceolate or linear-awl-shaped, the outer loose and spreading, more or less foliaceous. — S. W. Ill. to Kan. and southward. — The name is misleading, as the leaves are hardly petioled.

* * Involucral scales without green tips and wholly appressed.

+ Heads small (3' long), clustered along the stem in the axils of the feather-veined leaves, or the upper forming a thyrse.

+ Achenes pubescent.

3. *S. cæsia*, L. Smooth; stem terete, mostly glaucous, at length much branched and diffuse; leaves lanceolate or oblong-lanceolate, serrate, pointed, sessile; heads in very short clusters, or somewhat racemose-panicled on the branches. — Rich woodlands, common; west to S. E. Minn., Ill., and Ky.

4. *S. latifolia*, L. Smooth or nearly so; stem angled, zigzag, simple or paniculate-branched (1-3° high); leaves broadly ovate or oval, very strongly and sharply serrate, conspicuously pointed at both ends (thin, 3-6' long); heads in very short axillary clusters, or the clusters somewhat prolonged at the end of the branches; rays 3-4. — Moist shaded banks; common northward, and south along the mountains.

5. *S. Curtisii*, Torr. & Gray. Smooth or nearly so; stem angled, usually branched; leaves oblong to long-lanceolate with narrowed entire base, serrate above with subulate teeth; heads in small, loose clusters; rays 4-7. — Open woods at low elevations in the mountains of Va. and southward.

+ + Achenes glabrous; inflorescence more thyrsoid.

6. *S. bicolor*, L. Hoary or grayish with soft hairs; stem mostly simple; leaves oblong or elliptical-lanceolate, acute at both ends, or the lower oval and tapering into a petiole, slightly serrate; clusters or short racemes from the axils of the upper leaves, forming an interrupted spike or crowded panicle; scales very obtuse; rays (5-14) small, cream-color or nearly white. — Var. *CONCOLOR*, Torr. & Gray, has the rays yellow. — Dry copses, west to Minn. and Mo.

7. *S. monticola*, Torr. & Gray. Nearly glabrous; stem slender, 1-2° high; leaves oblong-ovate to lanceolate, acute or tapering at both ends, the lower sparingly serrate; heads small, the scales acutish; rays 5-6. — Alleghany Mts., from Md. southward.

+ + Heads mostly large (smaller in n. 12), many-flowered, forming an erect terminal thyrse; leaves feather-veined.

+ + Leaves numerous, short, sessile, entire, uniform in size and shape; western.

8. *S. Bigelovii*, Gray. Cinereous-puberulent, 2° high; leaves oval and oblong, mostly obtuse at both ends; thyrse rather loose; involucre broad. — S. Kan. and southward. Probably running into the next.

9. *S. Lindheimeriana*, Scheele. Less puberulent; leaves lanceolate or oblong, more acute; heads narrower and more densely clustered; achenes glabrous. — S. Kan. and southward.

+ + Northern or mountain species, bright green.

10. *S. macrophylla*, Pursh. Stem stout (1-4° high), wand-like, pubescent near the summit, simple; leaves thin, ovate, irregularly and coarsely serrate

with sharp salient teeth, large (lower 3-4' long), all but the uppermost abruptly contracted into long and margined petioles; heads large (5-6" long), many-flowered, crowded in an oblong or wand-like raceme or contracted panicle (2-18' long); scales loose and thin, long, lanceolate, taper-pointed; rays 8-10, elongated; achenes smooth. (*S. thyrsoides*, *E. Mey.*) — Wooded sides of mountains, N. Maine to N. Y. (south to the Catskills), shore of L. Superior, and northward. — Very near a European form of *S. Virgaurea*.

11. *S. Virgaurea*, Linn. An extremely variable and confused species in the Old World, represented in North America by

Var. *alpina*, Bigel. Dwarf (1-8' high), with few (1-12) pretty large heads (3-4" long, becoming smaller as they increase in number); leaves thickish, mostly smooth, spatulate or obovate, mostly obtuse, finely serrate or nearly entire, the uppermost lanceolate; heads few in a terminal cluster or subsolitary in the upper axils; scales lanceolate, acute or acutish; rays about 12. — Alpine summits of Maine, N. H., and N. Y., and shore of L. Superior.

12. *S. humilis*, Pursh. Low (6-12' high) and smooth, bearing several or numerous loosely thyrsoid smaller heads, which, with the peduncles, etc., are mostly somewhat glutinous; scales obtuse; rays 6-8, short; upper leaves lanceolate to linear, entire, the lower becoming spatulate and sparingly serrate. (*S. Virgaurea*, var. *humilis*, *Gray.*) — Rocky banks, W. Vt., along the Great Lakes, and northward; also on islands in the Susquehanna, near Lancaster, and at the Falls of the Potomac. — At the base of the White Mountains, on gravelly banks, occurs a form with the minutely pubescent stout stem 1-2° high, the leaves larger, broader, and coarsely toothed, and the heads very numerous in an ample compound raceme; rays occasionally almost white.

Var. *Gillmanii*, Gray. Larger (2° high), rigid, with compound ample panicle and laciniately toothed leaves. — Sand-hills of the lake-shores, N. Mich.

++ Heads small or middle-sized (large in n. 13 and 17), panicled or sometimes thyrsoidal, not in a terminal corymbiform cyme; not alpine.

++ Leaves veiny, not 3-ribbed, but sometimes obscurely triple-nerved.

= 1. Heads commonly large; leaves thickish, very smooth, entire, elongated.

13. *S. sempervirens*, L. Smooth and stout (1-8° high); leaves lanceolate, slightly clasping, or the lower ones lanceolate-oblong, obscurely triple-nerved; racemes short, in an open or contracted panicle. — Salt marshes, or rocks on the shore, Maine to Va. — Heads showy; the golden rays 7-10. Varies, in less brackish swamps, with thinner elongated linear-lanceolate leaves, tapering to each end, and more erect racemes in a narrower panicle.

= 2. Heads small; in a narrow virgate or thyrsoid panicle; scales thin, acute; leaves nearly entire.

14. *S. stricta*, Ait. Very smooth throughout; stem strict and simple, wand-like (2-4° high), slender, beset with small and entire appressed lanceolate-oblong thickish leaves, gradually reduced upward to mere bracts; the lowest oblong-spatulate; heads crowded in a very narrow compound spicate raceme; rays 5-7. (*S. virgata*, *Michx.*) — Damp pine barrens, N. J. and southward.

15. *S. pubérula*, Nutt. Stem (1-3° high, simple or branched) and panicle minutely hoary; stem-leaves lanceolate, acute, tapering to the base, smoothish; the lower wedge-lanceolate and sparingly toothed; heads very numerous and

crowded in compact short racemes forming a prolonged and dense narrow or pyramidal panicle; scales linear-awl-shaped, appressed; rays about 10. — Sandy soil, Maine to Va. and southward, mostly near the coast.

= 3. Heads middle-sized, in a thyrsoid panicle; involucre scales rather firm, obtuse; leaves entire or little serrate, smooth.

16. *S. uliginosa*, Nutt. Smooth nearly throughout; stem simple, strict (2-3° high); leaves lanceolate, pointed, the lower tapering into winged petioles, partly sheathing at the base, sparsely serrulate or entire; racemes much crowded and appressed in a dense wand-like panicle; scales linear-oblong; rays 5-6, small. (*S. stricta*, *Man.*) — Peat-bogs, Maine to Penn., Minn., and northward. Root-leaves 6-10' long. Flowers earlier than most species, beginning in July.

17. *S. speciosa*, Nutt. Stem stout (3-6° high), smooth; leaves thickish, smooth with rough margins, oval or ovate, slightly serrate, the uppermost oblong-lanceolate, the lower contracted into a margined petiole; heads somewhat crowded in numerous erect racemes, forming an ample pyramidal or thyrsiform panicle; peduncles and pedicels rough-hairy; scales of the cylindrical involucre oblong; rays about 5, large. — Var. *angustata*, Torr. & Gray, is a dwarf form, with the racemes short and clustered, forming a dense interrupted or compound spike. — Copses, Maine to Minn., and southward. — A very handsome species; the lower leaves 4-6' long and 2-4' wide in the larger forms.

= 4. Heads very small in slender spreading secund clusters forming a mostly short and broad panicle; leaves entire or nearly so.

18. *S. odora*, Ait. (SWEET GOLDEN-ROD.) Smooth or nearly so throughout; stem slender (2-3° high), often reclined; leaves linear-lanceolate, entire, shining, pellucid-dotted; racemes spreading in a small one-sided panicle; rays 3-4, rather large. — Border of thickets in dry or sandy soil, Maine and Vt. to Ky., and southward. — The crushed leaves yield a pleasant anisate odor; but an occasional form is nearly scentless.

19. *S. tortifolia*, Ell. Stem scabrous-puberulent, 2-3° high; leaves linear, short, commonly twisted, roughish-puberulent or glabrate; rays very short. — Dry soil, coast of Va. and southward.

20. *S. pilosa*, Walt. Stem stout, upright (3-7° high), clothed with spreading hairs; leaves oblong-lanceolate, roughish, hairy beneath, at least on the midrib, serrulate, the upper ovate-lanceolate or oblong and entire, closely sessile; racemes many, recurved, in a dense pyramidal panicle; rays 7-10, very short. — Low grounds, pine barrens of N. J. to Va. and southward.

= 5. Heads small or middle-sized, racemosely paniculate; leaves broad or ample, veiny, at least the lower serrate (or entire in n. 28); involucre scales obtuse.

21. *S. patula*, Muhl. Stem strongly angled, smooth (2-4° high); leaves (4-8' long) ovate, acute, serrate, pale, very smooth and veiny underneath, but the upper surface very rough, like shagreen; racemes rather short and numerous on the spreading branches; heads rather large. — Swamps; common.

22. *S. rugosa*, Mill. Rough-hairy, especially the very leafy stem (1-6° high); leaves ovate-lanceolate, elliptical or oblong, often thickish and very rugose; racemes spreading; involucre scales linear; rays 6-9; the disk-flowers 4-7. (*S. altissima*, Torr. & Gray, not *L.*) — Borders of fields and copses; very com-

mon, presenting a great variety of forms; usually one of the lowest of the common *Golden-rods*. It flowers early. Aug.-Sept.

23. *S. ulmifolia*, Muhl. Stem smooth, the branches hairy; leaves thin, elliptical-ovate or oblong-lanceolate, pointed, tapering to the base, loosely veined, beset with soft hairs beneath; racemes paniced, recurved-spreading; involucre scales lanceolate-oblong; rays about 4. — Low copses; common. — Too near the last; distinguished only by its smooth stem and thin larger leaves.

24. *S. Elliottii*, Torr. & Gray. Smooth; stem stout (1-3° high), very leafy; leaves elliptical or oblong-lanceolate, acute (2-3' long), closely sessile, slightly serrate, strongly veined, thick, smooth both sides, shining above; heads in dense spreading racemes which are crowded in a close pyramidal panicle; peduncles and achenes strigose-pubescent. (*S. elliptica*, Torr. & Gray, not Ait.) — Swamps (fresh or brackish) near the coast, Mass. to N. J. and southward. — Heads showy, 3" long; the rays 8-12.

25. *S. neglecta*, Torr. & Gray. Smooth; stem stout (2-4° high), less leafy; leaves thickish, smooth both sides, opaque; the upper oblong-lanceolate, mostly acute and nearly entire; the lower ovate-lanceolate or oblong, sharply serrate, tapering into a petiole; racemes short and dense, at length spreading, disposed in an elongated or pyramidal close panicle; peduncles and achenes nearly glabrous. — Swamps, Maine to Md., Wisc., and Minn. — Heads rather large, crowded; the racemes at first erect and scarcely one-sided. Very variable, the forms approaching n. 16 and 27.

Var. *linoides*, Gray. The most slender form; radical leaves 4-8' long and 4-6" wide, the upper very small, erect; branches of panicle rather few, one-sided; rays 2-5. (*S. linoides*, Torr. & Gray.) — Mass. to N. J.

26. *S. Boottii*, Hook. Smooth, or scabrous-pubescent or below hirsute, slender, often branched, 2-5° high; leaves rather finely serrate, ovate to oblong-lanceolate, pointed; the upper small, oblong to narrowly lanceolate, often entire; heads loosely racemose; rays 1-5 or none; achenes pubescent. — Dry grounds, Va. and southward.

27. *S. arguta*, Ait. Smooth; stem angled; leaves (large and thin) ovate, and the upper elliptical-lanceolate, very sharply and strongly serrate (entire only on the branches), pointed at both ends, the lowest on margined petioles; racemes pubescent, spreading, disposed in an elongated open panicle; rays 6-7, large; achenes usually glabrous. (*S. Muhlenbergii*, Torr. & Gray.) — Copses and moist woods, N. H. to Penn., Ont., and N. E. Minn. — Racemes much shorter and looser than in the next; the involucre scales thin and more slender; the heads somewhat larger, fully 3" long.

28. *S. juncea*, Ait. Smooth throughout (1-3° high); radical and lower stem-leaves elliptical or lanceolate-oval, sharply serrate with spreading teeth, pointed, tapering into winged and ciliate petioles; the others lanceolate or narrowly oblong, slightly triple-nerved, tapering to each end, the uppermost entire; racemes dense, naked, at length elongated and recurved, forming a crowded and flat corymb-like panicle; rays 8-12, small. (*S. arguta*, Torr. & Gray.) — Var. *scabrèlla*, Gray, is somewhat roughish-pubescent (Wisc. to Ky.). — Copses and banks; common. Well distinguished by its long or drooping racemes, and the closely appressed rigid scales of the involucre, small rays, etc. Heads seldom over 2" long, the scales small and pale.

++ ++ Leaves more or less plainly 3-ribbed; heads in one-sided spreading or recurved racemes, forming an ample panicle. Not maritime.

= Smooth and glabrous, at least the stem and bright green leaves.

a. Leaves firm and rather rigid; involucre scales thickish, obtuse, quite unequal.

29. *S. Missouriensis*, Nutt. Smooth throughout (1-3° high); leaves linear-lanceolate, or the lower broadly lanceolate, tapering to both ends, with very rough margins; teeth, if any, sharp and rigid; heads and dense crowded racemes nearly as in n. 28; achenes nearly glabrous. — Dry prairies, from Wisc. and Ind. south and westward. — Heads 1½-2" long.

30. *S. Shórtii*, Torr. & Gray. Stem slender, simple (2-4° high), minutely roughish-pubescent above; leaves (the larger 2-3' long) oblong-lanceolate, acute, the lower mostly serrate with a few fine teeth; racemes mostly short in a crowded panicle; achenes silky-pubescent. — Rocks at the Falls of the Ohio; Ark. — A handsome species; heads 3" long, narrow.

b. Leaves thinner; involucre scales thin, chiefly linear, obtuse.

31. *S. serótina*, Ait. Stem stout (2-7° high), smooth, often glaucous; leaves quite smooth both sides, lanceolate, taper-pointed, very sharply serrate, except the narrowed base, rough-ciliate; the ample panicle pubescent; rays 7-14, rather long. (*S. gigantea*, of previous ed.) — Copses and fence-rows; common, and presenting many varieties. Seldom very tall.

Var. *gigantèa*, Gray. Commonly tall, 5-8° high; leaves more or less pubescent or hispidulous beneath. (*S. gigantea*, Ait.; *S. serótina* of previous ed.) — Thickets and low grounds, Can. to Tex.

32. *S. rupéstris*, Raf. Stem smooth, slender, 2-3° high; leaves linear-lanceolate, tapering both ways, entire or nearly so; panicle narrow; heads very small; rays 4-6, very short. — Rocky river-banks, W. Va. to Ky. and Ind.

= = Pubescent (at least the stem) or hispidulous-scabrous.

33. *S. Canadensis*, L. Stem rough-hairy, tall and stout (3-6° high); leaves lanceolate, pointed, sharply serrate (sometimes almost entire), more or less pubescent beneath and rough above; heads small; rays very short. — Borders of thickets and fields; very common. — Varies greatly in the roughness and hairiness of the stem and leaves, the latter oblong-lanceolate or elongated linear-lanceolate; — in var. *procera*, whitish-woolly underneath; and in var. *scabra* also very rough above, often entire, and rugose-veined.

34. *S. nemoralis*, Ait. Clothed with a minute and close grayish-hoary (soft or roughish) pubescence; stem simple or corymb at the summit (½-2½° high); leaves oblanceolate or spatulate-oblong, the lower somewhat crenate-toothed and tapering into a petiole; racemes numerous, dense, at length recurved, forming a large and crowded compound raceme or panicle which is usually turned to one side; scales of the involucre linear-oblong, appressed; rays 5-9. — Dry sterile fields; very common. Flowers very bright yellow, beginning early in Aug. — Var. *incana*, Gray, of Minn., and westward, is a dwarf form, with rigid oval or oblong leaves, rather strongly serrate or entire, and the clusters of heads in a dense oblong or conical thyse.

35. *S. radula*, Nutt. Stem and oblong or obovate-spatulate leaves rigid and very rough, not hoary, the upper sessile; scales oblong, rigid; rays 3-6; otherwise nearly as in n. 34. — Dry hills, W. Ill., Minn., Kan., and southward.

36. *S. Drummóndii*, Torr. & Gray. Stem (1-3° high) and lower surface of the broadly ovate or oval somewhat triple-ribbed leaves minutely velvety-pubescent, some of the leaves almost entire; racemes panicle, short; scales of the involucre oblong, obtuse; rays 4 or 5. — S. W. Ill., Mo., and southward.

+++ Heads in a compound corymb terminating the simple stem, not at all racemose; leaves mostly with a strong midrib.

++ Leaves flat, not 3-nerved.

37. *S. rígida*, L. Rough and somewhat hoary with a minute pubescence; stem stout (2-5° high), very leafy; corymb dense; leaves oval or oblong, copiously feather-veined, thick and rigid; the upper closely sessile by a broad base, slightly serrate, the uppermost entire; heads large, over 30-flowered; the rays 7-10. — Dry soil, N. Eng. to Minn., and southward.

38. *S. Ohioënsis*, Riddell. Very smooth throughout; stem wand-like, slender, leafy (2-3° high); stem-leaves oblong-lanceolate, flat, entire, obscurely feather-veined, closely sessile; the lower and radical ones elongated, slightly serrate toward the apex, tapering into long margined petioles; heads numerous, on smooth pedicels, small, 16-20-flowered; the rays 6 or 7. — Moist meadows or prairies, W. New York to Ind. and Wisc. — Root-leaves 1° long; the upper reduced to 1-2', with rough margins, like the rest.

++ Leaves somewhat folded, entire, the lower slightly 3-nerved.

39. *S. Riddellii*, Frank. Smooth and stout (2-4° high), very leafy, the branches of the dense corymb and pedicels rough-pubescent; leaves linear-lanceolate, elongated (4-6' long), acute, partly clasping or sheathing, mostly recurved, the lowest elongated-lanceolate and tapering into a long keeled petiole; heads very numerous, clustered, 20-30-flowered; the rays 7-9. — Wet grassy prairies, Ohio to Minn. and Mo.; Ft. Monroe, Va. — Heads larger than in the last, 2-3" long. Stem-leaves upright and partly sheathing at the base, then gradually recurved-spreading.

40. *S. Houghtonii*, Torr. & Gray. Smooth; stem rather low and slender (1-2° high); leaves scattered, linear-lanceolate, acutish, tapering into a narrow slightly clasping base, or the lower into margined petioles; heads few or several, 20-30-flowered; the rays 7-9. — Swamps, north shore of Lake Michigan; Genesee Co., N. Y. July, Aug. — Leaves rough-margined, 2-5' long, 2-4" wide, 1-nerved, or the lower obscurely 3-nerved above; veins obscure. Heads large, nearly ½' long. Scales of the involucre obtuse.

§ 2. *EUTHAMIA*. Corymbosely much branched; heads small, sessile, in little clusters crowded in flat-topped corymbs; the closely appressed involucre scales somewhat glutinous; receptacle fimbriate; rays 6-20, short, more numerous than the disk-flowers; leaves narrow, entire, sessile.

41. *S. lanceolata*, L. Leaves lanceolate-linear, 3-5-nerved; the nerves, margins, and angles of the branches minutely rough-pubescent; heads obovoid-cylindrical, in dense corymbous clusters; rays 15-20. — River-banks, etc., in moist soil; common. — Stem 2-3° high; leaves 3-5' long.

42. *S. tenuifolia*, Pursh. Smooth, slender; leaves very narrowly linear, mostly 1-nerved, dotted; heads obovoid-club-shaped, in numerous clusters of 2 or 3, disposed in a loose corymb; rays 6-12. — Sandy fields, Mass. to Ill., and southward; common near the coast.

18. BRACHYCHÆTA, Torr. & Gray. FALSE GOLDEN-ROD.

Heads and flowers nearly as in *Solidago*, except the pappus, which is a row of minute rather scale-like bristles, shorter than the achene. — A perennial herb, with rounded or ovate serrate leaves, all the lower ones heart-shaped; the small yellow heads in sessile clusters racemed or spiked on the branches. (Name composed of *βραχύς*, short, and *χαίτη*, bristle, from the pappus.)

1. *B. cordata*, Torr. & Gray. Wooded hills, S. Ind. and E. Ky. to N. Ga. Oct. — Plant 2-4° high, slender, more or less pubescent.

19. BÉLLIS, Tourn. DAISY.

Heads many-flowered, radiate; the rays numerous, pistillate. Scales of the involucre herbaceous, equal, in about 2 rows. Receptacle conical, naked. Achenes obovate, flattened, wingless, and without any pappus. — Low herbs (all but our single species natives of the Old World), either stemless, like the true *Daisy*, *B. PERENNIS* (which is found as an occasional escape from cultivation), or leafy-stemmed, as is the following. (The Latin name, from *bellus*, pretty.)

1. *B. integrifolia*, Michx. (WESTERN DAISY.) Annual or biennial, diffusely branched (4'-1° high), smoothish; leaves lanceolate or oblong, the lower spatulate-obovate; heads on slender peduncles; rays pale violet-purple. — Prairies and banks, Ky. and southwestward. March-June.

20. APHANÓSTEPHUS, DC.

Involucral scales in few series, broadly lanceolate, the outer shorter. Achenes prismatic, the broad truncate apex bearing a short coroniform pappus. Otherwise as *Bellis*. — Southwestern leafy-stemmed and branching pubescent herbs, with solitary terminal daisy-like heads. (*Ἀφανής*, inconspicuous, and *στέφος*, crown; in allusion to the pappus.)

1. *A. Arkansasus*, Gray. Diffuse, 1° high; leaves oblong-spatulate to broadly lanceolate, the lower often toothed or lobed; rays white to purple, ½' long; pappus mostly 4-5-lobed. — Plains of Kan. and southward.

21. CHÆTOPÁPPA, DC.

Heads several-flowered, radiate; disk-flowers often sterile. Involucral bracts imbricated in 2 or more rows, the outer shorter. Receptacle flat, naked. Achenes fusiform or compressed; pappus of 5 or fewer thin nerveless paleæ, alternating with rough bristly awns, or these wanting. — Low southwestern branching annuals, with narrow entire leaves and solitary terminal heads; ray white or purple. (*Χαίτη*, a bristle, and *πάππος*, pappus.)

1. *C. asteroides*, DC. Slender, 2-10' high, pubescent; involucre narrow, 2" long; rays 5-12; achenes pubescent. — Dry grounds, Vernon Co., Mo., and southward.

22. BOLTÒNIA, L'Her.

Heads many-flowered, radiate; the rays numerous, pistillate. Scales of the hemispherical involucre imbricated somewhat in 2 rows, appressed, with narrow membranaceous margins. Receptacle conical or hemispherical, naked. Achenes very flat, obovate or inversely heart-shaped, margined with a callous

wing, or in the ray 3-winged, crowned with a pappus of several minute bristles and usually 2-4 longer awns. — Perennial and bushy-branched smooth herbs, pale green, with the aspect of Aster; the thickish leaves chiefly entire, often turned edgewise. Flowers autumnal; disk yellow; rays white or purplish. (Dedicated to *James Bolton*, an English botanist of the last century.)

* Heads middle-sized, loosely corymbd.

1. *B. asteroides*, L'Her. Stems 2-8° high; leaves lanceolate; involucre scales acuminate; pappus of few or many minute bristles and 2 awns or none. (*B. glastifolia*, L'Her., the awned form.) — Moist places along streams; Penn. to Ill., and southward to Fla. Sept., Oct. — Var. *DECURRENS*, Engelm., a large form with the leaves alate-decurrent upon the stem and branches. Mo. (*Eggert*).

2. *B. latisquama*, Gray. Heads rather larger; involucre scales oblong to ovate, obtuse or mucronate-apiculate; pappus-awns conspicuous. — W. Mo. and Kan.

* * Heads small, paniced on the slender branches.

3. *B. diffusa*, L'Her. Stem diffusely branched; leaves lance-linear, those on the branchlets very small and awl-shaped; rays short, mostly white; pappus of several very short bristles and 2 short awns. — Prairies of S. Ill. (*Vasey*), and southwestward. Aug. — Oct.

23. TOWNSENDIA, Hook.

Heads many-flowered, the numerous ray-flowers (violet to white) in a single series, fertile. Involucre broad, the lanceolate scariously margined scales imbricated in several series. Receptacle flat, naked. Achenes obovate or oblong, flattened, with thickish margins and beset with forked-capitellate hairs; pappus a single row of long awns or coarse rigid bristles, or reduced in the ray to chaffy scales. — Low scarcely caulescent herbs, with linear to spatulate entire leaves and large heads. (Named for *David Townsend*, botanical associate of Dr. Darlington of Penn.)

1. *T. sericea*, Hook. Acaulescent silky-pubescent perennial; heads sessile, solitary or few, $\frac{1}{2}$ -1' high; ray-pappus mostly bristly. — Dry plains, central Neb., north and westward. April, May.

24. SERICOCARPUS, Nees. WHITE-TOPPED ASTER.

Heads 12-20-flowered, radiate; the rays about 5, fertile (white). Involucre somewhat cylindrical or club-shaped; the scales closely imbricated in several rows, cartilaginous and whitish, appressed, with short and abrupt often spreading green tips. Receptacle alveolate-toothed. Achenes short, inversely pyramidal, very silky; pappus simple, of numerous capillary bristles. — Perennial tufted herbs (1-2° high), with sessile somewhat 3-nerved leaves, and small heads mostly in little clusters, disposed in a flat corymb. Disk-flowers pale yellow. (Name from *σπικρός*, *silky*, and *καρπός*, *fruit*.)

* Pappus rusty; leaves sparingly serrate, veiny, rather thin.

1. *S. conyzoides*, Nees. Somewhat pubescent; leaves oblong-lanceolate or the lower spatulate, ciliate; heads rather loosely corymbd, obconical (4-6" long). — Dry ground; Maine to Ohio, and southward. July.

* * Pappus white; leaves entire, obscurely veined, firmer and smaller.

2. *S. solidagineus*, Nees. Smooth, slender; leaves linear, rigid, obtuse, with rough margins, tapering to the base; heads narrow (3" long), in close clusters, few-flowered. — Thickets, S. New Eng. to Tenn., and southward. July.

3. *S. tortifolius*, Nees. Hoary-pubescent; leaves obovate or oblong-spatulate, short ($\frac{1}{2}$ -1' long), vertical, both sides alike; heads rather loosely corymbd, obovoid (4-5" long). — Pine woods, Va. and southward. Aug.

25. ÁSTER, L. STARWORT. ASTER.

Heads many-flowered, radiate; the ray-flowers in a single series, fertile. Scales of the involucre more or less imbricated, usually with herbaceous or leaf-like tips. Receptacle flat, alveolate. Achenes more or less flattened; pappus simple, of capillary bristles (double in §§ 4 and 5). — Perennial herbs (annual only in §§ 7 and 8), with corymbd, paniced, or racemose heads; flowering in autumn. Rays white, purple, or blue; the disk yellow, often changing to purple. (Name *ἀστήρ*, *a star*, from the radiate heads of flowers.)

Conspectus of Groups.

Annuals, with copious fine soft pappus	53, 54
Pappus double	46-48
Scales closely imbricated, not green-tipped, often scarious-edged	49-52
Scales closely imbricated, scarcely at all herbaceous; leaves cordate, serrate	2, 3
Scales nearly equal, rigid, more or less foliaceous; pappus-bristles rigid, some thickened at top	1
Scales with herbaceous tips or the outer wholly foliaceous. ÁSTER proper.	
Pappus rigid; stem-leaves sessile, none cordate or clasping; heads few, large	4-8
Leaves silvery-silky both sides, sessile, entire	14, 15
Lower leaves more or less cordate, petiolate	17-24
Leaves entire, lower not cordate, cauline sessile with cordate-clasping base	16
Involucre (and branchlets) viscid or glandular; leaves not cordate, mostly entire, the cauline all sessile or clasping	9-13
Lower leaves all acute at base; not glandular nor viscid nor silky-canescens.	
Smooth and glabrous, usually glaucous; scales coriaceous at base; leaves firm, usually entire	25-30
Hoary-pubescent or hirsute; scales squarrose; stem-leaves small, linear, entire	31, 32
Scales closely imbricated, not coriaceous at base; branches divaricate; heads many, small	33-35
Remaining species; branches erect or ascending.	
Stem-leaves auriculate-clasping or with winged-petiole-like base; involucre lax	42-45
Stem-leaves sessile, but rarely cordate or auriculate at base	36-41

§ 1. *HELIÁSTRUM*. Pappus simple, coarse and rigid, the stronger bristles somewhat clavate; scales rigid, more or less foliaceous, nearly equal.

1. *A. paludösus*, Ait. Stems 1° high; glabrous or nearly so; heads $\frac{1}{2}$ ' high, rather few, racemose or spicate; outer scales lax, foliaceous; rays purple; leaves linear, entire. — Kan. to Tex., thence to Car. and Ga.

§ 2. *BIÖTIA*. Involucre obovoid-bell-shaped; the scales regularly imbricated in several rows, appressed, nearly destitute of herbaceous tips; rays 6-18 (white or nearly so); achenes slender; pappus slightly rigid, simple; lower leaves large, heart-shaped, petioled, coarsely serrate; heads in open corymb.

2. *A. corymbösus*, Ait. Stem slender, somewhat zigzag; leaves thin, smoothish, coarsely and unequally serrate with sharp spreading teeth, taper-pointed,

ovate or ovate-lanceolate, all but the uppermost heart-shaped at the base and on slender naked petioles; rays 6-9. — Woodlands; common; especially northward. July, Aug. — Plant 1-2° high, with smaller heads, looser corymbs, rounder and less rigid exterior involucre scales, and thinner leaves than the next; not rough, but sometimes pubescent.

3. *A. macrophyllus*, L. Stem stout and rigid (2-3° high); leaves thickish, rough, closely serrate, abruptly pointed; the lower heart-shaped (4-10' long, 3-6' wide), long-petioled; the upper ovate or oblong, sessile or on margined petioles; heads in ample rigid corymbs; rays 10-15 (white or bluish). — Moist woods; common northward, and southward along the mountains. Aug., Sept. — Involucre $\frac{1}{2}$ broad; the outer scales rigid, oblong or ovate-oblong, the innermost much larger and thinner.

§ 3. ASTER proper. Scales imbricated in various degrees, with herbaceous or leaf-like summits, or the outer entirely foliaceous; rays numerous; pappus simple, soft and nearly uniform (coarser and more rigid in the first group); achenes flattened. (All flowering late in summer or in autumn.)

* 1. Scales well imbricated, coriaceous, with short herbaceous mostly obtuse spreading tips; pappus of rigid bristles; stem-leaves all sessile, none heart-shaped or clasping; heads few, or when several corymbose, large and showy.

+ Lowest leaves ovate or ovate-oblong, some rounded or subcordate at base.

4. *A. Hervéyi*, Gray. Slightly scabrous, 1-2° high, the summit and peduncles glandular-puberulent; leaves roughish, obscurely serrate, the lower ovate on nearly naked petioles, the upper lanceolate; heads loosely corymbose, $\frac{1}{2}$ high; involucre nearly hemispherical, the scales obscurely glandular, all erect, with very short or indistinct green tips; rays violet, $\frac{1}{2}$ long. — Borders of oak woods, in rather moist soil, E. Mass. and R. I.; Mt. Desert. An ambiguous species, approaching the last.

+ + Radical leaves all tapering into margined petioles; involucre squarrose (hardly so in n. 8); rootstocks slender.

5. *A. spectabilis*, Ait. Stems 1-2° high, roughish and glandular-puberulent above; leaves oblong-lanceolate, or the lower spatulate-oblong, obscurely serrate or the upper entire; heads few, hemispherical, $\frac{1}{2}$ high; scales glandular-puberulent and viscid; mostly with the upper half herbaceous and spreading; rays about 20, bright violet, nearly 1' long. — Sandy soil, Mass. to Del., near the coast, and perhaps southward. Sept. — Nov. One of the handsomest species of the genus.

6. *A. surculosus*, Michx. Stems 1° high or less, from long filiform rootstocks; leaves entire or nearly so, rigid, lanceolate or the upper linear; heads few or solitary, as in the last but generally smaller, the scales hardly glandular. — Moist ground, coast of N. J., and southward.

7. *A. gracilis*, Nutt. Rootstocks occasionally tuberous-thickened; stems slender, 1° high; leaves oblong-lanceolate, entire or nearly so, small (1-2' long); heads few or several; involucre top-shaped, 3-4" long, glabrous, not glandular nor viscid, the coriaceous whitish scales with very short deltoid or ovate tips; rays 9-12, 3-6" long. — Pine barrens, N. J. to N. C., E. Ky. and Tenn.

8. *A. radula*, Ait. Stem simple or corymbose at the summit, smooth or sparsely hairy, many-leaved (1-3° high); leaves oblong-lanceolate, pointed,

sharply serrate in the middle, very rough both sides and rugose-veined, closely sessile (2-3' long), nearly equal; scales of the bell-shaped involucre oblong, appressed, with very short and slightly spreading herbaceous tips; achenes smooth. — Bogs and low grounds, Del. to Maine and northward, near the coast; also Pocono Mountain, Penn. A dwarf form (var. *strictus*, Gray) has oblong-to linear-lanceolate nearly entire leaves, and usually solitary heads; White Mountains, N. H., to Lab. Aug. — Rays light violet. Involucre nearly smooth, except the ciliate margins.

* 2. Involucre and usually the branchlets viscidly or pruinose-glandular, well imbricated or loose; pubescence not silky; leaves entire (or the lower with few teeth), the cauline all sessile or clasping; rays showy, violet to purple.

+ Heads small; involucre not squarrose. Extreme western.

9. *A. Fendleri*, Gray. Rigid, 1° high or less; leaves firm, linear, 1-nerved, hispid-ciliate, 1' long or mostly much less; heads scattered, 3" high; scales linear-oblong, obtuse, or the inner acute. — Central Kan. (Ellis, Dr. L. Watson) and southwestward.

+ + Heads larger; involucre scales spreading, in few or many ranks.

10. *A. grandiflorus*, L. Rough with minute hispid hairs; stems slender, loosely much branched (1-3° high); leaves very small ($\frac{1}{4}$ -1' long), oblong-linear, obtuse, rigid, the uppermost passing into scales of the hemispherical squarrose many-ranked involucre; rays bright violet (1' long); achenes hairy. — Dry open places, Va. and southward. — Heads large and very showy.

11. *A. oblongifolius*, Nutt. Minutely glandular-puberulent, much branched above, rigid, paniculate-corymbose (1-2° high); leaves narrowly oblong or lanceolate, mucronate-pointed, partly clasping, thickish (1-2' long by 2-5" wide); involucre scales nearly equal, broadly linear, appressed at the base; rays violet-purple; achenes canescent. — Banks of rivers, from Penn. and Va. to Minn. and Kan. — Heads middle-sized or smaller.

Var. *rigidulus*, Gray. Low, with more rigid and hispidulous scabrous leaves. — In drier places, Ill., Wisc., and southwestward.

12. *A. Novæ-Angliæ*, L. Stem stout, hairy (3-8° high), corymbed at the summit; leaves very numerous, lanceolate, entire, acute, auriculate-clasping, clothed with minute pubescence, 2-5' long; scales nearly equal, linear-awl-shaped, loose, glandular-viscid, as well as the branchlets; rays violet-purple (in var. *roseus* rose-purple), very numerous; achenes hairy. — Moist grounds; common. — Heads large. A peculiar and handsome species.

13. *A. modestus*, Lindl. Pubescent or glabrate; stem slender, simple, with few large heads terminating slender branchlets; leaves lanceolate, very acute, narrowed to a sessile base, sparingly serrate or serrulate; scales linear-attenuate, equal, mostly herbaceous; rays blue. — N. Dak. and westward.

* 3. Leaves whitened, silvery-silky both sides, all sessile and entire, mucronate; involucre imbricated in 3 to several rows; rays showy, purple-violet.

14. *A. sericeus*, Vent. Stems slender, branched; leaves silver-white, lanceolate or oblong; heads mostly solitary, terminating the short branchlets; scales of the globular involucre similar to the leaves, spreading, except the short coriaceous base; achenes smooth, many-ribbed. — Prairies and dry banks, Wisc. and Minn. to Ky., and southward. — Heads large; rays 20-30.

15. **A. cóncolor**, L. Stems wand-like, nearly simple; leaves crowded, oblong or lanceolate, appressed, the upper reduced to little bracts; heads in a simple or compound wand-like raceme; scales of the obovoid involucre closely imbricated in several rows, appressed, rather rigid, silky, lanceolate; achenes silky. — Dry sandy soil near the coast, R. I., N. J., and southward. — Plant 1–3° high, with the short leaves 1' or less in length, grayish-silky both sides.

* 4. Leaves entire, the lower not heart-shaped, the cauline all with sessile and cordate-clasping base, the auricles generally meeting around the stem.

16. **A. pátens**, Ait. Rough-pubescent; stem loosely panicle above (1–3° high), with widely spreading branches, the heads mostly solitary, terminating slender branchlets; leaves oblong-lanceolate or ovate-oblong, often contracted below the middle, rough, especially above and on the margins; scales of the minutely roughish involucre with spreading pointed tips; achenes silky. — Var. **PHLOGIFOLIUS**, Nees, is a form of shady moist places, with larger and elongated thin scarcely rough leaves, downy underneath, sometimes a little toothed above, mostly much contracted below the middle. — Dry ground; common, Mass. to Minn., and southward. Heads $\frac{1}{2}$ ' broad, with showy deep blue-purple rays.

* 5. Lower leaves heart-shaped and petioled; no glandular or viscid pubescence; heads with short and appressed green-tipped scales (except in n. 17 and 24), mostly small and numerous, racemose or panicle.

— Heads middle-sized, with many rays, and squarrose foliaceous involucre.

17. **A. anómalus**, Engelm. Somewhat pubescent and scabrous; stems slender (2–4° high), simple or racemose-branched above; leaves ovate or ovate-lanceolate, pointed, entire, the upper small and almost sessile; scales of the hemispherical involucre imbricated in several rows, appressed, with linear spreading leafy tips; achenes smooth. — Limestone cliffs, W. Ill. and Mo. to Ark. — Rays violet-purple.

— Rays 10–20; involucre scales appressed or erect.

— Leaves entire or slightly serrate; heads middle-sized; rays bright-blue.

18. **A. azúreus**, Lindl. Stem rather rough, erect, racemose-compound at the summit, the branches slender and rigid; leaves rough, the lower ovate-lanceolate or oblong, heart-shaped, on long often hairy petioles; the others lanceolate or linear, sessile, on the branches awl-shaped; involucre inversely conical. — Copses and prairies, western N. Y., and Ohio to Minn., and southwestward. Involucre much as in *A. lævis*, but smaller and slightly pubescent.

19. **A. Shórtii**, Hook. Stem slender, spreading, nearly smooth, bearing very numerous heads in racemose panicles; leaves smooth above, minutely pubescent underneath, lanceolate or ovate-lanceolate, elongated, tapering gradually to a sharp point, all but the uppermost more or less heart-shaped at base, and on naked petioles, none clasping; involucre bell-shaped. — Cliffs and banks, Ohio to Ill., and southward. — A pretty species, 2–4° high; leaves 3–5' long.

20. **A. undulátus**, L. Pale or somewhat hoary with close pubescence; stem spreading, bearing numerous heads in racemose panicles; leaves ovate or ovate-lanceolate, with wavy or slightly toothed margins, roughish above, downy underneath, the lowest heart-shaped on margined petioles, the others abruptly contracted into short broadly winged petioles which are dilated and clasping at the

base, or directly sessile by a heart-shaped base; involucre obovoid, the scales less rigid. — Dry copses; common.

— Leaves conspicuously serrate; heads small; rays pale blue or nearly white.

21. **A. cordifolius**, L. Stem much branched above, the spreading or diverging branches bearing very numerous panicle heads; lower leaves all heart-shaped, on slender and mostly naked ciliate petioles; scales of the inversely conical involucre all appressed and tipped with very short green points, obtuse or acutish. — Woodlands; very common. — Heads profuse, but quite small. Varies with the stem and leaves either smooth, roughish, or sometimes hairy, also with the leaves all narrower. Apparent hybrids with n. 35 also occur.

22. **A. sagittifolius**, Willd. Stem rigid, erect, with ascending branches bearing numerous racemose heads; leaves ovate-lanceolate, pointed; the lower heart-shaped at base, on margined petioles; the upper lanceolate or linear, pointed at both ends; scales of the oblong involucre linear, tapering into awl-shaped slender and loose tips. — Dry ground, N. Y. and Penn. to Ky., and northward. — Green, but usually more or less hairy or downy; the heads rather larger than in the last, almost sessile.

23. **A. Drummóndii**, Lindl. Pale with fine gray pubescence; leaves cordate to cordate-lanceolate, mostly on margined petioles, the uppermost lanceolate and sessile; scales acute or acutish. — Passing into the last. Open ground, etc., Ill. to Minn. and Kan.

24. **A. Lindleyanus**, Torr. & Gray. Rather stout, 1–2° high, sparsely pubescent or nearly glabrous; radical and lowest leaves ovate, moderately or obscurely cordate, the uppermost sessile and pointed at both ends; heads larger, rather few in a loose thyrse or panicle, the linear-attenuate scales looser and less imbricated; rays pale violet. — Lab. to L. Superior; Lisbon, N. H. (*C. E. Faxon*), and Mt. Desert (*Rand*).

* 6. Without heart-shaped petioled leaves, the radical and lower all acute or attenuate at base; not glandular nor viscid, nor silky-canescens.

— Smooth and glabrous throughout (or nearly so, except forms of n. 30), and usually pale and glaucous; involucre scales closely imbricated, firm and whitish-coriaceous below, green-tipped; leaves firm, usually entire.

— Rays violet or blue; scales rather abruptly green-tipped; leaves on the branchlets reduced to rigid subulate bracts.

25. **A. turbinéllus**, Lindl. Stem slender, 3° high, paniculately branched; leaves oblong to narrowly lanceolate, tapering to each end, with rough margins; involucre elongated-obconical or almost club-shaped ($\frac{1}{2}$ ' long); the scales linear, with very short and blunt green tips; rays violet-blue; achenes nearly smooth. — Dry hills, etc., Ill., Mo., and southwestward. — Well-marked and handsome.

26. **A. lævis**, L. Stout, 2–4° high; heads in a close panicle; leaves thickish, lanceolate or ovate-lanceolate, chiefly entire, the upper more or less clasping by an auricled or heart-shaped base; scales of the short-obovoid or hemispherical involucre with short abrupt green tips; rays sky-blue; achenes smooth. — Borders of woodlands; common. A variable and elegant species.

27. **A. virgátus**, Ell. Slender, strict and simple, with few or several racemose or terminal heads, like those of the last; leaves lanceolate or linear, the lower usually long and narrow. — S. W. Va., and southward.

28. *A. concinnus*, Willd. Not glaucous, slender, 1-3° high; leaves lanceolate, mostly somewhat serrate, the lowest spatulate-lanceolate on winged petioles; heads smaller than in the preceding, numerous, panicle; rays violet. — Rare; Penn. and southward.

++ Rays white or turning purplish; scales narrow, subulately green-tipped; leaves mostly narrow, narrowed at base, on the branchlets lax and attenuate.

29. *A. polyphyllus*, Willd. Often tall (4 or 5° high), with virgate branches; cauline leaves narrowly lanceolate or linear, 4 or 5' long; heads paniculate; scales lanceolate-subulate, the outermost much shorter; rays 4" long. — N. Vt. to Wisc., and southward. Heads larger and flowering earlier than the next.

30. *A. ericoides*, L. Smooth or sparingly hairy (1-3° high); the simple branchlets or peduncles racemose along the upper side of the wand-like spreading branches; lowest leaves oblong-spatulate, sometimes toothed; the others linear-lanceolate or linear-awl-shaped; heads 3" high or less; involucre scales often nearly equal, with attenuate or awl-shaped green tips. — Dry open places, S. New Eng. to Minn., and southward. — Var. *VILLÖSUS*, Torr. & Gray, is a hairy form, often with broader leaves; chiefly in the Western States. — Var. *PUSILLUS*, Gray, is a dwarf slender and glabrous form of the barrens of Lancaster, Penn. (Porter), with very narrow or filiform leaves and very small few-flowered heads. — Var. *PRINGLEI*, Gray, a low strict form, with few erect branches and rather small heads. About Lake Champlain.

++ Hoary-pubescent or hirsute; herbaceous tips of the involucre scales squarrose or spreading; cauline leaves small, linear, entire, scarcely narrowed at the sessile or partly clasping base; heads numerous, small, racemose.

31. *A. amethystinus*, Nutt. Tall (2-5° high), upright, much branched, puberulent or somewhat hirsute; leaves not rigid; heads 3" high, the tips of the scales merely spreading; rays light clear blue. — Moist grounds, E. Mass. to Ill. and Iowa. With the habit of n. 11.

32. *A. multiflorus*, Ait. Pale or hoary with minute close pubescence (1° high), much branched and bushy; the heads much crowded on the spreading racemose branches; leaves rigid, crowded, spreading, with rough or ciliate margins, the uppermost passing into the spatulate obtuse scales; heads 2-3" long; rays white or rarely bluish, 10-20. — Dry sandy soil; common.

++ Scales glabrous, closely imbricated (the outer regularly shorter), not coriaceous, with short appressed green tips; branches slender, divaricate or divergent; leaves lanceolate to subulate; heads small (2-3" high) and numerous.

++ Heads scattered, terminating minutely foliose slender branchlets.

33. *A. dumosus*, L. Smooth or nearly so, 1-3° high; leaves linear or the upper oblong, crowded, entire, with rough margins; scales linear-spatulate, obtuse, in 4-6 rows. — Thickets; common. — A variable species, loosely branched, with small leaves, especially the upper, and an obconical or bell-shaped involucre, with more abrupt green tips than any of the succeeding. Rays pale purple or blue, larger than in n. 34. Runs into several peculiar forms.

++ Heads racemosely unilateral upon very short minutely leafy branchlets.

34. *A. vimineus*, Lam. Smooth or smoothish, 2-5° high, bushy; leaves linear or narrowly lanceolate, elongated, the larger ones remotely serrate in

the middle with fine sharp teeth; scales of the involucre narrowly linear, acute or acutish, in 3 or 4 rows. (*A. Tradescanti*, of previous ed.) — Var. *FOLIOLÖSUS*, Gray, has linear entire leaves, the ascending branches with more scattered paniculate heads. — Moist banks; very common. — Heads very numerous, and usually crowded, smaller than in the last. Rays white or nearly so.

35. *A. diffusus*, Ait. More or less pubescent, much branched; leaves lanceolate or oblong-lanceolate, tapering or pointed at each end, sharply serrate in the middle; scales of the involucre linear, acute or rather obtuse, imbricated in 3 or 4 rows. (*A. miser*, of previous ed.) — Thickets, fields, etc.; very common, and extensively variable. Leaves larger than in either of the preceding (2-5'); the involucre intermediate between them, as to the form of the scales. Rays mostly short, white or pale bluish-purple. — Var. *THYRSÖFÖRUS*, Gray, with ovate-oblong to lanceolate leaves, the branches ascending and often short, and the thyrsoid or spicate-glomerate heads less secund. N. Y. to Ill. — Var. *HIRSUTICÄULIS*, Gray, the slender stem and the midveins of the long narrow leaves very hirsute. N. Y. and Ky. — Var. *BIFRONS*, Gray, a luxuriant form with large thin leaves and rather larger heads loosely disposed on the spreading branches. Ky. to Ill.

++ ++ Involucre various, the heads when numerous densely or loosely paniculate on erect or ascending branches.

++ Culine leaves sessile, but the base not cordate nor auriculate (except in forms of n. 41), nor winged-petiole-like; glabrous or nearly so.

= Heads small or middle-sized; scales narrow, in several lengths, the erect green tips not dilated.

36. *A. Tradescanti*, L. Stem much branched (2-4° high); the numerous heads (2-3" high) somewhat panicle or racemed; leaves lanceolate to linear, tapering to a long slender point (2-6' long), the lower somewhat serrate in the middle; involucre scales linear, acutish, partly green down the back. (*A. tenuifolius*, previous ed.) — Low grounds, Mass. to Minn., and south to Va. and Ill. Rays short and narrow, white or purplish. Some forms approach n. 32-34, others differ from *A. paniculatus* only in the smaller heads and shorter ray.

37. *A. paniculatus*, Lam. Stem (2-8° high) much branched; the branches and scattered heads (about 4" high) loosely paniculate; leaves long-oblong to narrowly lanceolate, pointed, the lower serrate; scales narrowly linear, with attenuate green tips or the outermost wholly green. (*A. simplex*, previous ed.) — Shady moist banks; common. Rays white or purplish, 3-4" long. Approaches in its different forms the preceding and the two following. A slender form with linear leaves, in northern bogs, resembles n. 40.

38. *A. salicifolius*, Ait. Like the last; the leaves commonly shorter, firmer, often scabrous, less serrate or entire; involucre more imbricated, the firmer linear scales with shorter acute or obtusish green tips; heads as large, disposed to be thyrsoid or racemose-clustered; rays rarely white. (*A. carneus*, previous ed.) — Low grounds, N. Eng. to Minn., and southward; most abundant westward. — Var. *SUBÄSPER*, Gray, a rigid scabrous form, with contracted leafy inflorescence, the broad heads usually leafy-bracteate and the broader scales often obtuse. Ill. to Tex.