and columns III, IV and V give the data respectively, for A. & M. College, Baylor University, and "Others."

I	II	III	IV	V
Investigators	57%	14%	7%	21%
Papers	66%	12%	4%	18%

The above figures refer only to the percentages of investigators and papers *entering into the proceedings* of the Academy, and are no demonstrative index to the relative research activities of members of the various institutions during the years 1892 to 1912. Thus, Wheeler "presented" *only three* papers out of 25 published during the years 1899-1903; T. H. Montgomery presented *only three* out of 27 published during the years 1903-1908; Edmund Montgomery presented only six out of perhaps a score of papers, and three books, published between 1892 and 1907. At Texas A. & M. College many scientific papers in the biological field were published by Mally, Francis, Ness, and others in the form of bulletins, and papers in *technical* agricultural journals. Moreover, since the preponderating majority of the active membership was concentrated in the Austin region, and since the "ordinary" and "informal" meetings were held in Austin, it was but natural that the largest number of papers should come from members of the University staff.

The Vetches and Pea Vines (Vicia and Lathyrus) of Texas

Lloyd H. Shinners

In technical keys, the genus *Lathyrus* is characterized as having a squarely truncate stamen tube and styles hairy near the apex on the inner side only, while *Vicia* has an obliquely truncate stamen tube and styles hairy on the back or all around. These differences are neither well-marked nor easy to see, especially in most Texas species, which have very small flowers. For convenience the species of both genera are here treated together in a single key.

Grateful acknowledgment is made to Dr. G. L. Wittrock, New York Botanical Garden, for the loan of the types of

Vicia caroliniana var. *texana, V. Leavenworthii,* and *V. ludoviciana;* to Prof. M. L. Fernald, Gray Herbarium, Harvard University, for the loan of the type of *Vicia Reverchoni,* and representative eastern specimens of *V. caroliniana;* to Dr. F. A. Barkley and Dr. B. C. Tharp, University of Texas Herbarium, for the loan of all their material of both *Vicia* and *Lathyrus;* and to Mr. A. M. Fuller, Curator of Botany, Milwaukee Public Huseum, for the loan of various collections of both genera, particularly from Europe, and of vol. 4, part 3, of Hegi's *Illustrierte Flora von Mittel-Europa,* treating the Leguminosae. The figures of calyxes and pods were drawn by Dr. Eula Whitehouse.

1. Leaflets 3-15 (some leaves of *Lathyrus graminifolius* may have only 2; most have more); stems nearly or quite wingless throughout
   2. Leaflets 3-10 cm. long (except on youngest shoots, or shoots from browsed plants); mountains of Trans-Pecos Texas.....
      5. *Lathyrus graminifolius*
   2. Leaflets less than 3 cm. long
      3. Flowers borne in axillary peduncled racemes
         4. Calyx not gibbous at base (figs. 1, 2); pod 4.0-6.5 mm. wide (figs. 1, 2); native species, sometimes weedy
            5. Corolla less than 1.5 cm. long; stipules entire or with one prominent tooth-like lobe
               6. Racemes 1-2—flowered
                  7. Leaflets 3-7; plants of northeastern Texas; ovules 7-12 (some may be abortive; mature pods with 4-12 seeds); pods sabre-shaped, coriaceous, about 4.0-4.5 mm. wide (fig. 1).....1. *Vicia minutiflora*
                  7. Leaflets 4-16; plants of central, southern, and western Texas; ovules 3-8; pods rhombic-oblong, chartaceous, about 5.0-6.5 mm. wide (fig. 2)
                     8. Peduncle ⅛-½ as long as its subtending leaf when the flowers have opened (slightly longer in *V. Leavenworthii* var. *occidentalis* of Trans-Pecos Texas), elongating rapidly as fruit begins to form, ultimately equaling or exceeding the leaf; flowers narrow, rosy lavender to bluish lavender, rather pale and inconspicuous
                        9. Corolla 4.7-7.0 mm. long; leaflets 6-15; Blackland, Grand Prairies, East and West Cross Timbers, Edwards Plateau, rarely extending into immediately adjacent areas.....
                           2a. *Vicia Leavenworthii* var. *typica*
                        9. Corolla 6-9 mm. long; leaflets 4-11; mountains of Trans-Pecos Texas.....
                           2b. *Vicia Leavenworthii* var. *occidentalis*
                     8. Peduncle more than ½ as long as its subtending leaf when the flowers have opened, elongating slightly in fruit; flowers broad, blue-violet with pale center, rather showy; plants of the Gulf Coast and Rio Grande Plain.....
                        3b. *Vicia ludoviciana* var. *texana*

6. Racemes 3-many—flowered
10. Lower calyx teeth slender, attenuate, equaling or exceeding the tube (fig. 2); mature pods about 2.0-2.5 cm. long, abruptly narrowed at each end; plants annual or winter annual
11. Peduncle ⅛-½ as long as its subtending leaf when all the flowers have opened, elongating rapidly fruit begins to form, ultimately equaling or rarely slightly exceeding the leaf, 0.5-3.5 cm. long in flower, 2.0-8.5 cm. long in fruit, 1-5—flowered (most commonly 3-4—flowered); flowers narrow, rosy lavender to bluish lavender, rather pale and inconspicuous, 4.8-7-0 mm. long (see also lead 12 for var. *occidentalis* of Trans-Pecos Texas, with larger flowers and longer peduncles)
2a. *Vicia Leavenworthii* var. *typica*

11. Peduncle more than ½ as long as its subtending leaf when all the flowers have opened, elongating slightly in fruit (but the terminal flowers often abortive and the tip of the raceme shrivelling), (1.0) 3.0-8.5 cm. long in flower (as little as 1.0 cm. only in dwarf plants less than 20 cm. high, especially of var. *texana* of the Gulf Coast and Rio Grande Plain), about the same or slightly longer in fruit, 1-13—flowered; flowers from pale bluish lavender to deep blue-violet with white center, relatively large and showy, 5.0-8.2 mm. long (the three varieties of *V. ludoviciana* do not fit well into a dichotomous key; parallel descriptions of the distinctive characteristics of each follow:)

12a. Flowers 6-8 mm. long, 2.5-4.0 mm. wide (vertical measure of evenly pressed flowers); racemes rather compact and dense, 5-10—flowered; plant sparingly pubescent to nearly glabrous; sandy oak and pine land, East Cross Timbers and southeastern Texas, southwest to the central Gulf Coast.....
3a. *Vicia ludoviciana* var. *typica*

12b. Flowers 5-6 mm. long, 1.8-2.3 mm. wide (vertical measure of evenly pressed flowers); racemes rather compact and dense, 1-6—flowered; plants sparingly pubescent or nearly glabrous; Gulf Coast and Rio Grande Plain
3b. *Vicia ludoviciana* var. *texana*

12c. Flowers 5.2-8.2 mm. long, 1.5-2.5 mm. wide (vertical measure of evenly pressed flowers); racemes loose, 3-13—flowered, the flowers rather widely spaced even in early flower; plants sparingly to rather densely gray-pubescent; limestone soil, Grand Prairie and Edwards Plateau.....
3c. *Vicia ludoviciana* var. *laxiflora*

10. Lower calyx teeth triangular, broad, shorter than the tube; pods about 2.5-3.5 cm. long, tapered to both ends; perennial.....4. *Vicia caroliniana*

5. Corolla more than 1.5 cm. long; stipules irregularly toothed; Panhandle.....5. *Vicia linearis*

4. Calyx strongly gibbous at base, the pedicel apparently attached toward one side (fig. 3); pods 8-10 mm. wide (fig. 3); cultivated species, sometimes found wild along roadsides or in pastured land

13. Stems glabrous or sparsely pubescent with appressed hairs.....6. *Vicia dasycarpa*
13. Stems densely pubescent with widely spreading hairs.....7. *Vicia villosa*

3. Flowers sessile in the upper leaf axils
14. Flowers less than 1.5 cm. long; pods glabrous
15. Leaflet tips acute.....8a. *Vicia angustifolia* var. *typica*
15. Leaflet tips truncate..8b. *Vicia angustifolia* var. *segetalis*
14. Flowers more than 1.5 cm. long; pods densely hairy.....9. *Vicia sativa*

1. Leaflets 2 (large stipules may imitate a second pair of leaflets); stems plainly winged in the upper part
16. Corolla less than 1.5 cm. long; stems narrowly winged, the wings 1.5 mm. or less wide; leaflets more than 5 times as long as wide (except on late axillary shoots or seedlings), usually less than 12 mm. wide
17. Calyx more than half as long as the corolla; corolla 6-9 mm. long, pale or light violet-blue, inconspicuous; pods glabrous.....1. *Lathyrus pusillus*
17. Calyx less than half as long as the corolla; corolla 10-12 mm. long, blue-violet with white eye, large and showy; pod densely pubescent with spreading hairs from swollen bases.....2. *Lathyrus hirsutus*
16. Corolla 1.5-3.0 cm. or more long; stems broadly winged, the wings 2-5 mm. wide; leaflets not more than 5 times as long as wide, usually more than 12 mm. wide
18. Flowers sweet-scented; racemes with 1-5 flowers; annual.....3. *Lathyrus odoratus*
18. Flowers scentless; racemes with 3-10 or more flowers; perennial.....4. *Lathyrus latifolius*

VICIA

1. V. MINUTIFLORA Dietr., Syn. Pl. 4: 1107. 1847. *V. micrantha* Nutt. ex T. & G., Fl. N. A. 1: 271. 1838. Not *V. micrantha* Hook. & Arn., Bot. Misc. 4: 197. 1833. Sandy pine land or oak woods, northeastern Texas, west and south to Tarrant, Brazos, and Chambers Counties. Winter annual, perhaps becoming perennial in the southern part of its range. The earliest species to flower, beginning in north central Texas as early as mid March, about two weeks earlier than *V. Leavenworthii*. The leaflets usually are narrowly linear and few in number (3-7), but late axillary or basal shoots may have oblong leaflets, and occasionally an entire plant may have broad leaflets. *V. minutiflora* f. **Reverchoni** (S. Wats.) Shinners, comb. nov. *(V. Reverchoni* S. Wats., Proc. Amer. Acad. 14: 291, 1879), is an unusual form with broad leaflets and pubescent instead of glabrous pods. The calyx, corolla, and shape and texture of the pods are those of typical *V. minutiflora*. The only specimen of this form seen is the type, from "sandy prairies, Dallas," *J.*

Reverchon, April, 1879 (in Gray Herb.) No similar plants have been found since.

2a. V. LEAVENWORTHII T. & G. **var. typica** Shinners, var. nov. *V. Leavenworthii* T. & G., Fl. N. A. 1: 271. 1838. The commonest and weediest species of central Texas, from the Blackland Prairies westward to the Pecos and north to the base of the Panhandle, in both limestone soils and the sandy soils of the Cross Timbers; a single collection seen from Terrell Co., in the Trans-Pecos, and one from Gonzales Co., near the inner edge of the sandy Coastal Plain. Winter annual, flowering in north central Texas from early April until June, drying up and disappearing with the onset of summer drought and heat. New seedlings can be seen in late October or November in north central Texas, after the onset of fall rains. According to Mr. V. L. Cory (personal communication), it is abundant on the Edwards Plateau in shallow depressions where there are temporary lakes, but it is much sought after by livestock, and soon becomes exterminated by grazing. The type, from "Arkansas, *Dr. Leavenworth!*" was probably collected in what is now the state of Oklahoma, in the neighborhood of Ft. Towson in May, 1834, or from Ft. Towson to the Cross Timbers and mouth of the False Washita (see account of Leavenworth's travels by McVaugh, 1947, pp. 61-65). Whole plant moderately to very densely gray-pubescent. Variable in stature, and in form and size of leaflets. The latter in well-developed plants are lanceolate-oblong and rather numerous (6-15, most commonly 8-12). Forms with narrowly linear leaflets have generally passed as *V. texana* (T. & G.) Small, a plant of the Coastal Plain, better considered a variety of *V. ludoviciana* (see 3b). The statement in the original description of *V. Leavenworthii* that all the calyx teeth are longer than the tube is only exceptionally true; more commonly the upper teeth are slightly shorter.

2b. V. LEAVENWORTHII **var. occidentalis** Shinners, var. nov. A specie differt pedunculis paulo longioribus uni- vel bifloris (rarissime plurifloris), corollis majoribus (6-9 mm. longis), foliolis plerumque paucioribus (4-11). Type: Boot Spring, Chisos Mts., Brewster Co., Texas, *C. H. Muller,* July 29, 1932 (in Herb. Southern Methodist University).

Replacing the species in the mountains of Trans-Pecos Texas, and found westward to Arizona. This plant has generally passed as *V. exigua* Nutt. (ex T. & G., Fl. N. A. 1: 272, 1838), originally described from the "plains of Oregon and upper California." *V. exigua,* according to Abrams' *Illustrated Flora of the Pacific States* (1944), has a corolla about 5 mm. long, and is found in "Upper Sonoran and Transition Zones, southern Oregon southward through the Coast Ranges to northern Lower California." These statements would exclude *V. exigua* from the flora of Texas, and the plant erroneously so called seems better treated as a variety of *V. Leavenworthii,* which it closely resembles.

3a. V. LUDOVICIANA Nutt. var. **typica** Shinners, var. nov. *V. ludoviciana* Nutt. ex T. & G., Fl. N. A. 1: 271. 1838. (As to Leavenworth specimen described and cited first; possibly not as to Nuttall's specimens, which may have belonged to another species.) The commonest and most widespread species of sandy pine and oak lands in southeastern Texas, north and west to Gregg, Johnson, Robertson, Gonzales, and Refugio Counties. Winter annual, with rather showy, deep-colored flowers; banner broad and spreading, abruptly contracted to a claw-like (though wide) base. Leaflets 6-10 (most commonly 7-9), usually oblong-oval, broader than in *V. Leavenworthii,* but varying to oblong-linear. The type was collected near Natchitoches, Louisiana, by Leavenworth. It is a robust plant with stout stem and large leaflets, resembling well-developed specimens of *V. Leavenworthii* more than common forms of *V. ludoviciana.* The specimen is in fruit, and has only 2-4 pods per peduncle, but there is a single late immature but elongated peduncle with six flower buds. As noted in the key, it is not uncommon for the terminal flowers to be abortive in this species, so that old fruiting plants are exceedingly difficult to distinguish from equivalent plants of *V. Leavenworthii.* The latter species, however, has fewer than six flowers per peduncle, the peduncle is very short in early flower, and the species itself does not occur nearer than 200 miles west of Natchitoches.

3b. V. LUDOVICIANA var. **texana** (T. & G.) Shinners, comb. nov. *V. caroliniana* var. *texana* T. & G., Fl. N. A. 1: 271. 1838. *V. texana* (T. & G.) Small, Fl. s.e. U.S. 656 and 1332.

1 2 3

1. *Vicia minutiflora.* Pod ×2; flowering calyx ×7. 2. *V. Leavenworthii.* Pod. ×2; flowering calyx ×7. 3. *V. dasycarpa.* Pod ×2; flowering calyx ×7.

1903. Confined to the Gulf Coast and Rio Grande Plain, extending as for northwest as Frio and Gonzales Counties. Not always readily separable from var. *typica*. Smaller and more delicate in all parts; peduncles very slender, fewer-flowered, the flowers smaller, but similar in shape and color; leaflets lanceolate-oblong to linear. The type was collected by Leavenworth at an undesignated locality in Texas. It consists of a single slender erect stem with few leaves; most of the leaflets and flowers are missing. The peduncles are nearly as long as the leaves and 1- or 2-flowered. The plant resembles specimens of *V. minutiflora* much more than it does most collections of *V. ludoviciana* var. *texana*. The only deciding feature to be seen lies in the ovary, which has only 5 ovules, placing it with either *V. ludoviciana* or *V. Leavenworthii*. The elongate peduncles indicate *V. ludoviciana*, which is represented along the Gulf Coast by a race with few-flowered peduncles. There is some doubt as to the type locality, for Leavenworth is not known to have collected along the Gulf Coast in Texas. If it is assumed that the variety extends farther inland than Chambers County, the northernmost from which specimens have been seen (not an unreasonable supposition, for the flora of deep east Texas has been very inadequately collected, and small early-spring herbs like *Vicia* are easily overlooked), it may then be conjectured that Leavenworth collected the type on one of his trips from Louisiana into Texas, in April, 1834, or in May 1837 (cf. McVaugh, 1947, p. 67). The condition of the type specimen (without even immature fruit) suggests the former and earlier date. The assignment of var. *texana* to *V. caroliniana* by Torrey and Gray is difficult to understand. It does not have numerous flowers in the raceme, they are not large, the calyx teeth are not short and broad, and the plant is not perennial, as is true of *V. caroliniana;* while in all these features it greatly resembles *V. minutiflora, V. Leavenworthii,* and *V. ludoviciana.*

3c. V. LUDOVICIANA var. **laxiflora** Shinners, var. nov. A specie differt corollis angustioribus plerumque pallidis, racemis laxis floribus cito distantibus, caulibus foliisque pubentioribus. Sola calcarea incolit; ad *V. Leavenworthii* distrahenter spectat. Type: about 3 miles south of Bridgeport on Highway 24, Wise Co., Texas, *Eula Whitehouse* 15275, April

13, 1946 (in Herb. Southern Methodist University); found in moist ground near creek, in Grand Prairie area. Replacing the species in the limestone areas of the Grand Prairie and eastern part of the Edwards Plateau, central Texas. Flowers narrower and paler than in var. *typica*, resembling large flowers of *V. Leavenworthii*. Whole plant usually pubescent, sometimes rather densely so. More variable than var. *typica*, from which some specimens are difficult to separate. Other specimens, especially of dwarfed plants, or fruiting plants with few pods, are almost impossible to distinguish from *V. Leavenworthii*.

4. V. CAROLINIANA Walt. Rare; only two Texas collections have been seen, both in Herb. University of Texas: New Braunfels, Comal Co., *F. Lindheimer exs. 788c*, March, 1850. Henderson, Rusk Co., *Marguerite Riedel 44-17*, Feb. 9, 1944. The former record is far out of the expectable range of the species. *V. caroliniana* and *V. linearis* are the only native Texas members of the genus which are regularly perennial, contrary to the statements in the keys and descriptions in Small's *Flora of the Southeastern United States* (1903).

5. V. LINEARIS (Nutt.) Greene. The Texas plant has been called *V. trifida Dietr.* (based on *tridentata* Schwein.), but the type of that species came from Minnesota, and the name is properly a synonym of *V. americana* Muhl., a close relative of *V. linearis* not found in Texas. *V. linearis* is confined to the Panhandle; it has been collected in Hutchinson, Randall, and Wheeler Counties, in flower in May and June. There is a specimen in the Herbarium of the University of Texas marked as from Burnet, in central Texas, but this is surely an error in labelling.

6. V. DASYCARPA Ten. Found as an escape in Brazos, Denton, Hood, Navarro, and possibly Fayette and Washington Counties (no statement on label of last two as to whether wild or cultivated). Apparently more common than *V. villosa*. It is probable that many plantings of hairy or winter vetch are actually of this species.

7. V. VILLOSA Roth. Found self-sown in Dallas and Hunt Counties; also collected in Fayette, Lamar, and Tarrant

Counties (no information as to whether wild or cultivated). Seed is sold under the names of winter vetch and hairy vetch, but as noted under the preceding species, probably much of what is grown for *V. villosa* is *V. dasycarpa.*

8a. V. ANGUSTIFOLIA L. Var. TYPICA Rouy. Probably cultivated, though the only Texas specimen of this species seen belongs to the following variety.

8b. V. ANGUSTIFOLIA var. SEGETALIS (Thuill.) Koch. Cultivated, and to be expected as an escape. The only Texas specimen seen is from the Denton Agricultural Experiment Station. Pods similar in shape and texture to those of *V. minutiflora* (fig. 1), but slightly longer, and black at maturity instead of brown.

9. V. SATIVA L. Specimens have been sent from Fayette and Lamar Counties, without indication of whether they were cultivated or wild; and cultivated specimens from Dallas County. Seed is sold under the name of common vetch, and the plant is to be expected as an escape.

LATHYRUS

1. L. PUSILLUS Ell. In sandy soil, pine land or oak woods, eastern Texas, west and south to Cooke, Bexar, Wharton, and Galveston Counties. Rather common; often associated with *Vicia minutiflora.*

2. L. HIRSUTUS L. Becoming frequent in cultivation, and to be expected as an escape. It was thought to be a native species by officials of the Denton Experiment Station, where self-sown plants appeared in 1947 in a plot planted to it the preceding year. According to Small (1933) it has become established in waste places, fields, and roasides in Mississippi. The fall and winter, 1947, catalogue of Reuter Seed Co., New Orleans, advertised "Singletary Pea, the wonder crop for the south," stated to be a wild winter pea discovered by B. H. Singletary of the College of Agriculture, Louisiana State University. Seeds of this pea planted in the greenhouse had not reached flowering size at the time of writing. The seedlings have the stipules and single pair of leaflets with conspicuously mucronate tips characteristic of *Lathyrus hirsutus,* but the leaflets are oblong-oval, much shorter and broader than is usual in that species. It is quite common,

however, for leaflets to be short and broad on late axillary shoots of many species of *Vicia* and *Lathyrus*. Similar juvenile leaf forms might be found in seedlings also, although in seedlings of *Vicia Leavenworthii* the leaflets are generally extremely narrow. It seems possible if not probable that Singletary Pea is actually *Lathyrus hirsutus* of southern Europe, and not a native species.

3. L. ODORATUS L. Sweet pea is commonly cultivated in central and northern Texas. Planted in fall or winter, it flowers in spring and early summer, but suffers from heat and drought during summer and fall.

4. L. LATIFOLIUS L. Everlasting pea or perennial sweet pea is frequently cultivated in central and northern Texas, but like common sweet pea, it makes a poor showing after the onset of hot dry summer weather.

5. L. GRAMINIFOLIUS (S. Wats.) White. Davis Mts., Jeff Davis Co., and Black Mt., Brewster Co. Collections made in April, June, August, and September, with flowers or both flowers and fruit; one stated to be from "along rocky banks of small mountain creek, alt. 2200 m."; another from Limpia Canyon.

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The Species of Dictyna (Arachnida) in the Exline Collection

Sarah E. Jones

Mrs. Harriet Exline Frizzell has very kindly loaned me her specimens of *Dictyna* Sundevall, 1833, mostly from the western United States. Examination has produced the records given below. All holotypes and allotypes have been deposited in the Museum of Comparative Zoology, Harvard University, and all other specimens have been returned to the Exline collection.

Dictyna arundinaceoides Keyserling, 1883

Wash.: Deep Creek, May 30, 1937 (M. H. Hatch); Seattle, May 6, 1932 (Henry), May 26, 1934, May 27, 1935, May 19, 1935, Sept. 24, 1935 (all M. H. Hatch); Tacoma, May 5, 1945 (Forsell); Renton, May 13, 1936; Kirkland, July 17, 1938; Lenore Lake, May 8, 1938; Medical Lake, May 30, 1937; Cedar Mt., May 19, 1938; Maloney's Grove, May 26, 1934; Lake Forest Park, Seattle, Jan. 29, 1934; Newman's Lake, May 29, 1937; *Ore.*: Lake Albert, June 16, 1938; *Mont.*: Bozeman, June 23, 1936 (all M. H. Hatch).