OKLAHOMA SPIDERS

I INTRODUCTION*

R. D. BIRD

A. THE IDENTIFICATION OF ARACHNIDA

It was at first intended in this bulletin to publish a key to the families and genera of Arachnida but this had to be abandoned because of (1) lack of space, (2) lack of recent keys. Comstock's "The Spider Book," 1913, Doubleday, Page and Co., will probably be available to anyone interested in the groups. Although it is becoming out of date and does not include all the Oklahoma species, it is the best procurable at the present time. Nathan Banks' key to the "Families and Genera of Arachnida," American Naturalist, 1905, 34:293-323, is easy to work but in need of revision. An up to date manual of North American spiders is badly needed. A key to Oklahoma species cannot be gotten out until considerable more data has been accumulated. It is hoped that this bulletin may serve to encourage other residents of the state to work on spiders.

In using Comstock to identify Oklahoma spiders in connection with this list, one will find certain species which have been described at a later date and hence have not been included. Among the genera, *Grammonota, Diplocephalus,* and *Trochosa* are also not included. There is also a certain amount of synonymy: our *Tutelina=Icius; Eugnatha=Tetragnatha; Schizogyna=Schizocosa; Acrosoma=Micrathena;* and *Geolycosa=Lycosa* in Comstock. Our *Pelopatis* can be separated from *Thanatidius* in Comstock as follows:

First and third eye rows of equal length ----------*Thanatidius*
First eye row much broader than third ----------*Pelopatis*

Other works on spiders which will be found useful are: *Petrunkevitch, Alex.* Synonymic index-catalogue of Spiders of the Americas and adjacent islands. Bull. American Museum. Vol. 29. 1911. *Savory, T. H.* The Biology of Spiders. Sedgwick and Jackson, Ltd. 1928. *Emerton, J. H.* Common Spiders. Ginn and Co. 1902.

B. ARACHNIDS AND THEIR RELATIVES

The Arthropoda, of which the Arachnida form a class, is the greatest phylum of the animal kingdom and is characterized as follows:

1. Chitinous exoskeleton (chitin is a complex chemical substance closely allied to that found in nails and horns) forming a protective armor to which the muscles are attached. It is made up of a number of hard plates or sclerites separated by an elastic membrane giving freedom

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of movement. Sometimes the chitin is strengthened by an impregnation of calcium carbonate. No knight of old was more perfectly armored than are the arthropods.

2. Segmented body.
3. Bilateral symmetry.
4. Ventral nervous system.
5. Paired jointed appendages.

The principal classes of the Arthropoda are:

1. The *Crustacea,* to which belong the crabs, crayfish, lobsters, etc.
2. The *Diplopoda,* or millipeds, long, cylindrical animals characterized by the apparent possession of two pairs of legs to a segment, giving the common name of thousand legged worms.
3. The *Chilopoda,* or centipedes, long flattened animals characterized by one pair of legs to a segment and a large pair of chelae, or poison jaws.
4. The *Insecta,* characterized by three body regions, three pairs of legs, one pair of antennae and compound eyes in addition to simple.
5. The *Arachnida,* characterized by the apparent absence of antennae (the second antennae of the crustacea are modified to form the chelicerae). Arachnids are the only air breathing arthropods which have the head and thorax fused into a cephalothorax. They possess both booklungs and tracheae. The reproductive openings are ventral and at the base of the abdomen. There are from 2-12 pairs of simple eyes. Of the 6 pairs of appendages borne by the cephalothorax, the first pair or *chelicerae* are in front of the mouth. The second pair are termed the *pedipalps* and are more or less leg-like in form; usually the basal parts bear masticatory ridges for crushing the prey. The last segment may bear claws or pincher-like organs by the prolongation of the inner side of the second last segment so that it is opposite to the last, forming a definite chela or pincher as in the scorpions. Sometimes the last segment may fold back on the second last as the blades of a pocket knife on the handle. The remaining four pairs of appendages usually function as legs but may be more or less feeler like.

THE ORDERS OF THE ARACHNIDA

The common orders of the Arachnida found in Oklahoma may be separated as follows:

A. Abdomen distinctly segmented.
  B. Abdomen with a tail-like projection.
    The tail stout and armed with a sting. (Scorpions) *Scorpionida.*
  BB. Abdomen without a tail-like projection.
    C. Palpi with long pincher-like claws. (Fake Scorpions) *Pseudoscorpionida.*
    CC. Palpi without long pincher-like claws.
      D. Legs usually very long and slender; thorax not distinctly divided into three segments. (Harvestmen or Daddy-long-legs) *Phalangida.*
      DD. Legs moderately long; head distinct from thorax; thorax distinctly divided into three segments. *Solpugida.*
AA. Abdomen unsegmented.
  B. Abdomen joined to the cephalothorax by a short, narrow stalk. (Spiders). *Araneida.*
  BB. Abdomen fused with the cephalothorax. (Mites and ticks). *Acarina.*

ORDER SCORPIONIDA

Scorpions are at once recognized by their tail-like post abdomen ending in a sting and by the enormous development of the pedipalps which bear large chelae. They are common animals of the more arid portion of the southwest and extend northward in this type of country to southern Alberta. As they are nocturnal in their habits, they are seldom seen unless one turns over the stones under which they are accustomed to hide. They appear to prefer flat slabs of sandstone along the banks of treeless water courses. Frequently four or more individuals of different ages may be found under a single stone. Scorpions do not lay eggs but give birth to living young hatched from eggs within the uterus of the mother. They do not leave her at once but cling to all portions of her body by means of their pinchers. It has been estimated that it takes them five years to attain their maturity.

The sting is used for poisoning insects which are caught and held by the pinchers. This sting, although much feared, is painful but not serious to man. Some of the larger species of the tropics may produce severe wounds or even death. Household ammonia is supposed to be the best remedy.

The common scorpion of central Oklahoma is *Centrurus carolinianus* Pal. Beauv. Other species may occur here but have not yet been recorded.

ORDER SOLPUGIDA

This is a rare arachnid group of which only a few specimens of one species, *Eremobates pallipes* Say., have been taken in central and western Oklahoma. Although very different from scorpions in their structure, they resemble them in being nocturnal and hiding under stones.

Solpugids are strange looking arachnids, yellowish in color and about three quarters of an inch in length. The most striking characteristic is an enormous pair of two-segmented chelicerae with the second segment articulated to the ventral side of the first in such a way that they work dorso-ventrally and lie close to the sides of the head. The mouth is borne at the end of a beak; the thorax is distinctly segmented; the palps are long and leg-like but without claws and highly sensory; the first pair of legs is palp-like, so that these arachnids appear to have two pair of palps and only three pairs of legs. Peculiar racquet-like sense organs are borne on the last pair of legs. The respiratory organs are tracheae. Eggs are laid in burrows excavated by the mother.

Solpugids are carnivorous and very active in search of their prey. They carefully stalk such insects as flies and pounce on them with great rapidity. Sometimes they enter houses in search of insects. One specimen in our collection was taken in such a situation. When camped by the salt plains near Edith, Oklahoma, a six year old daughter of one of the farmers came running up to me with one carefully wrapped in a piece of paper. She excitedly explained that she had caught it in her bed and it was not the first they had found in their house. An urgent request was made for others but no more were taken in the house, although one was found under a board over a hundred yards out on the salt plain.

Solpugids are not poisonous.

ORDER PSEUDOSCORPIONIDA

The false scorpions are tiny arachnids which resemble true scorpions without a tail and sting. Their chelicerae are very large and complicated and possess good specific characters. The moveable last joint, or finger, bears a prominence on which silk glands open. Silk is used to spin a cocoon into which the animal retreats to moult or spend the winter. The female glues the eggs to her abdomen. When the young hatch they feed by means of a long sucking beak on a sack exuded from the reproductive opening. The male has a pair of very long organs (called ram's-horn organs) which may be extended to a length greater than the body. Their function is unknown.

Pseudoscorpions live under sticks, stones, bark, in the nests of social insects and quite frequently they enter houses. They are predacious on small insects. Over fifty species have been recorded from the United States.

ORDER PHALANGIDA

Harvestmen or daddy-long-legs are at once recognized by the fused cephalothorax and abdomen and by the enormously long legs. The legs are not held straight but with the knees high so that the body is swung between them. In a few species the legs are comparatively short. Adults of a few species hibernate, but most of them die off in the fall, the winter being passed in the egg state. About Norman, Oklahoma, great numbers of spherical white eggs about 1 mm. in diameter were observed under stones on the prairie. They were at first thought to be those of Lepidoptera, but on being kept on some moist earth in a warm place they hatched into baby phalangids.

Phalangids have been found to feed upon both dead and living insects and upon soft plants. They have no silk glands and make no shelter.

ORDER ACARINA

This order may be recognized by the abdomen being broadly fused to the cephalothorax. The chelicerae may be two-segmented and chelate or long and slender and fitted for piercing. The pedipalps vary greatly in different species. The chelicerae and pedipalps may form a distinct beak which in some forms is retractile. It is by means of this structure that ticks pierce the skin. Great care should be taken in removing an attached tick or the beak will break loose and remain in the wound. Ticks should be gradually worked loose and given liberal applications of alcohol, turpentine or gasoline to force them to loosen their hold.

Adult Acarina have the typical four pairs of legs but immature ones frequently have only three pairs, as in the insects.

One or many pairs of eyes may be present.

Normally the genital aperture is on the ventral segment of the abdomen near the base but in the ticks it is pushed forward between the legs so as to be near the mouth.

Mites and ticks are of great economic importance. Mites are serious pests of many fruits and vegetables and ticks transmit deadly diseases of

man and domestic animals. Rocky Mountain spotted fever of man (which was originally confined to Montana and Idaho but has now spread to the Atlantic coast) and anaplasmosis of cattle may be cited as striking examples. The subject is a vast one and cannot be treated here. Over 450 species of Acarina are found in the United States.

ORDER ARANEIDA

Spiders, like other Arthropods, have a cephalothorax and abdomen. They differ from them in that both the cephalothorax and abdomen are unsegmented and the abdomen is joined to the thorax by a narrow waist.

The anterior part of the cephalothorax is called the head. It usually bears eight pair of eyes but sometimes less. The mouth parts consist of a pair of poison jaws or chelicerae and a pair of pedipalpi. The pedipalpi are composed of a palpus, used as a copulatory appendage in the male, and a basal portion or maxilla, used as jaws to chew the food. Between and behind the maxillae is a lower lip or labium, not homologous to that of insects. A large sternum lies between the four pairs of walking legs.

On the ventral side near the anterior end of the abdomen is the genital opening protected by a plate called the epigynum. On either side of the epigynum is a slit-like opening into the book lungs. There are in addition in a few cases tracheae which open near the posterior end of the abdomen. The anus is at the posterior end and just back of it are three pair of spinnerets.

II. AN ANNOTATED LIST OF OKLAHOMA SPIDERS*

NATHAN BANKS, N. M. NEWPORT AND R. D. BIRD

The following list of spiders consists chiefly of species collected by parties of the University of Oklahoma Biological Survey during the summers of 1928, 1929, 1930, 1931. The parties were in charge of Dr. A. I. Ortenburger and Dr. R. D. Bird. Collections were made throughout the eastern part of Oklahoma, in western Oklahoma and the neighborhood of the salt plains of Alfalfa and Woods Counties, and in the Wichita Mountains.

The identifications have, in the great majority of cases, been made by Nathan Banks of the Museum of Comparative Zoology, Harvard College. A few have been determined by J. H. Emerton and by N. M. Newport.

Some one hundred and sixty species of Araneida, eight of Phalangida and one each of Scorpionida and Solpugida are included in this list.

There are two new species described by Dr. Banks: *Menemerus fraternus* (Attidae) and *Philodromus washita* (Thomisidae. A new generic name, *Allepeira* (Tetragnathidae), is proposed for *Hentzia.*

The collection data is given in the following order: county, day (in arabic numerals), month (in roman numerals), year, initials of collector and locality. Complete data has been given when available.

Notes after species are by N. M. Newport except when otherwise indicated; those after families are quotations from Emerton "Common Spiders," 1902, Ginn and Co.

COLLECTIONS

The following people have contributed to the records of Oklahoma spiders. The initials of the collectors are given in brackets after the record.

M. J. B.—Mary Jane Brown made incidental collections of spiders in connection with an ecological study east of Norman in 1928.

L. B.—Lois Gould Bird collected mainly in Cleveland Co. during fall of 1927.

R. D. B.—Ralph Durham Bird made general collections over the state, 1929-1932.

W. F.—Wilton M. Fisher collected in Latimer County during the summer of 1931.

N. M. N.—N. M. Newport collected in the Wichita Mountains, Comanche Co., in 1928. In 1929 he collected throughout eastern Oklahoma and about Norman. 1929-30 work was about Yukon, Canadian Co.

P. N.—Phyllis Draper Newport was responsible for collections made by her high school students at Bowlegs, Seminole Co., in 1930 and 1931.

A. I. O.—A. I. Ortenburger was responsible for the collections made by members of the Oklahoma Biological Survey party, summer of 1927, in the eastern part of the state.

A. E. R.—Anna Elizabeth Rennie collected for the Biological Survey mainly in Comanche and Harmon Counties, summer of 1926.

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*Contribution from the Zoological Laboratory of the University of Oklahoma. (New Series No. 111).

O. S.—O'Reilly N. Sandoz collected in December, 1931, at Devil's Canyon, Caddo County.

A. O. W.—A. O. Weese collected in Comanche County, summer of 1928, in connection with an ecological study.

The following students collected mainly in Cleveland County, in connection with class work.

G. A.—George Adamson; W. N. C.—W. N. Clark; G. D.—Grace Dennis; N. G.—Nell Guthrie; H. M. H.—Harold M. Hefley, Jr.; R. V. J.—R. V. James; T. L.—Thelma Levering; J. S. M.—J S. Matt; B. S.—Babette Shumacker; D. S.—Dale Swart; M. W.—M. Wheat; Z.—Paul Zeigler.

DISTRIBUTIONAL RELATIONSHIPS

Oklahoma is so situated that its fauna contains elements of western, eastern, southern, and northern groups. Spiders well illustrate this phenomenon. The most unexpected are a series of species which are more characteristic of the west, particularly the Sonoran or Southwest. These include *Diguetia canites, Filistata hibernalis, Loxosceles rufescens, Phidippus howardi, Phidippus rauterbergi, Lithyphantes pulcher, Allepeira basilica, Epeira nigrifoliata, Epeira oaxacensis, Pellenes limatus, Pardosa sternalis, and Philodromus inquisitor. Diguetia canites* is the most notable; it is a very remarkable spider belonging to a group of primitive forms widely separated on the earth. It was first known from Southern California, and later from Baja California, Northern Mexico, and Western Texas.

The prairie element is represented by *Philodromoides prataríae, Singa schefferi, Phidippus pius, Phidippus texanus, Xysticus auctificus, Lycosa permunda, Lycosa antelucana, Pardosa mercurialis, Pirata wacondana,* and *Sassacus popenhoei.*

The southern element is shown in *Singa nigripes, Larinia directa, Thiodina puerpera, Phidippus variegatus, Pelopatis undulata, Thanatidius dubius,* and *Cynorta sayii,* but also by the abundance of certain species which are especially common in the South, as *Oxyopes salticus, Lathrodectus mactans, Epeira domiciliorum, Tibellus duttoni.*

But the larger share of the species belong to the area of the middle part of the Carolinas, Georgia, Alabama, Mississippi, Louisiana, and thence bending up toward Oklahoma. Outside of the species listed as southwestern, southern and prairie, practically all of the spiders are common in this Carolinian zone. The *Pachylomerus* and the *Geolycosa* are particularly characteristic of this area. A number of these species go up into New England, but are there more uncommon. The common New England *Misumena vatia* is wanting, the *Epeira displicata* with but one record, and the most common New England grassland spider *Epeira trivittata* is largely replaced by *Epeira domiciliorum.* Nor is there a record of *Epeira trifolium,* and the few *Epeira gigas* show that is rare compared to many localities in the East.

NATHAN BANKS.

FAMILY THERAPHOSIDAE

THE TARANTULAS

1. *Eurypelma hentzi* Girard. The Common Tarantula.

Cleveland Co. 21. VI. 29. Norman City Park.
Comanche Co. 12, 22. VI. 28. (N. M. N.). Immature specimens.
*Comanche Co. 20, 21, 27, 30. VI. Adult males.
Garvin Co. VIII. 26.
Latimer Co. 9, 14, 15, 16, 17, 18, 20, 27, 29. VI. 31. (Members of Okla. Biological Survey party.) Camp on Cunneo Tubby Creek north of Wilburton.
Murray Co. VI. 24. (H. M. H.) Arbuckle Mountains. Common June, 1930 (N. M. N.).
*Pawnee Co. IV. 28. (Perry) Quay, Okla.
Seminole Co. IX. 30 to V. 31. (P. N.) Bowlegs. Very common in May.

Abundant in mountainous and rocky areas of the state, particularly in the Arbuckle Mountains. Found occasionally in prairie areas, commonly known as the Tarantula.

2. *Pachylomerus carabivorus* Atk. Trap-door spider.

*Cleveland Co.; no date; Norman; very young specimens.
Latimer Co. 11. VII. 31. (W. F.).
*LeFlore Co. 24. VI. 27. (A. I. O.) Kiamichi River.

FILISTATIDAE

3. *Filistata hibernalis* Htz.

Cleveland Co. 27. XI. 28. (N. M. N.).
Comanche Co 16, 28. VI; 3, VII. 28. (N. M. N.).

Under dry cow dung. Cracks of outbuildings. Hackled web.

SCYTODIDAE

4. *Diguetia canites* McCook.

Comanche Co. *8, 25. VI. 28 (N. M. N.).

Irregular net sheet webs. Suspended near rock ledges. Hammock retreat in center of web.

5. *Loxosceles rufescens* Dufour.

Canadian Co. 2. X. 30. (N. M. N.) Yukon.
Cleveland Co. 19, 28. IX. 27; 9, 10. X. 27; 14. I. 28. (L. B.) Norman.
Cleveland Co. 4. VII. 29. (N. M. N.) Norman.
Comanche Co. *20, 29. VI. 28. (N. M. N.).
Murray Co. 10, IV. 29. (N. M. N.) Arbuckles.

Irregular webs, outbuildings, hollow stumps and trees, dark places.

DYSDERIDAE

6. *Ariadne bicolor* Htz.

Comanche Co. 29. VI. 28; 5. VII. 28. (N. M. N.).

Under bark and in crevices of dead trees and stumps, small sac-like web.

PHOLCIDAE

7. *Pholcus phalangioides* Fuessl.

Canadian Co. 2. IV. 31. (N. M. N.) Yukon.

A common house spider; outbuildings, hollow trees, stumps.

*Retained by Nathan Banks for the Harvard Museum of Comparative Zoology, Cambridge, Massachusetts.

8. *Psilochorus pullulus* Htz.
Comanche Co. 20, 29, 30. VI. 28. (N. M. N.).
*Comanche Co. 4. VII.
Hollow trees, stumps; outbuildings. Irregular web.

DRASSIDAE

"The Drassidae, like the Lycosidae, are ground spiders, though some genera are common in summer on bushes. They make nests in the form of a bag or flattened tube, but no cobwebs for catching insects, and are commonly found running about among dead leaves and short grass and sometimes even on bare ground and sand. In form they are usually two or three times as long as they are wide, like the Lycosidae, but more often flattened on their back. The legs differ but little in length, and the first and second pairs are directed forward, the third and fourth backward. Their hairs and spines are short, giving them a smooth, velvet-like appearance."

9. *Callilepis imbecilla* Keys.
Cleveland Co. 15. X. 27. (L. B.) Norman.
Comanche Co. *11, 20, VI, 28. (N.M.N.).
Runs on ground. Dry areas.

10. *Drassus neglectus* Keys.
Cleveland Co. 5. III. 30. (G. D. and T. L.) Norman.
Woods Co. 29. VI. 30. (R. D. B.).
Under stones, rubbish, etc. Silken bag web.

11. *Gnaphosa fontinalis* Keys.
Comanche Co. 5. VII. 28. (N. M. N.).
Crevices of dead trees and stumps. Woodland.

12. *Gnaphosa sericata* Koch.
Comanche Co. 22. VI. 28. (N. M. N.).
*Cleveland County. 21. VI. Norman.
LeFlore Co. 24. VI. 27. (A. I. O.) Kiamichi River.
Same habitat as 13 and 15.

13. *Herpyllus ecclesiasticus* Htz.
Comanche Co. 28. VI. 28; 4. VII. 28. (N. M. N.).
Under dry cow dung, stones; in crevices, dark places.

14. *Sergiolus variegatus* Htz.
Caddo Co. 27. XII. 31. (O. S.) Devil's Canyon.

15. *Zelotes ater* Htz.
Comanche Co. 16. VI. 28. (N. M. N.).
Under dry cow dung, stones, etc., prairie areas.

CLUBIONIDAE

16. *Anyphaena gracilis* Htz.
Alfalfa Co. 18. X. 30. (R. D. B.).
Caddo Co. 27. XII. 31. (O. S.) Devil's Canyon.
Cleveland Co. 29. X; 13. XI. 27. (L. B.) Norman.
Cleveland Co. 27. IV. 29. (N. M. N.) Norman.
Cleveland Co. 21. X. 29. (L. B.) Norman.
Comanche Co. 8, 12. VI. 28. (A. O. W.).
Comanche Co. *17, 28. VI. 28. (N. M. N.).
Grass, herbage, and low shrubs.

17. *Castianeira crocata* Htz.
Comanche Co. 16. VI. 28. (N. M. N.).
On ground. Prairie.

18. *Castianeira longipalpus* Htz.
Cleveland Co. 8, 15. X. 27. (L. B.) Norman.
*Cleveland Co., 3. XI. Norman.
Murray Co. 10. IV. 29. (N. M. N.) Arbuckles.
Ottawa Co. 20. VII. 29. (N. M. N.) Prairie.
On ground, under stones. Prairie.

19. *Castianeira trilineata* Htz.
Comanche Co. 7. VI. 28. (N. M. N.).
*Delaware Co. 16. VII.

20. *Castianeira* sp.
*Comanche Co. 18. VI.
An immature specimen of still another species.

21. *Chiracanthium inclusum* Htz.
Carter Co. 6. X. 27. (L. B.).
Cleveland Co. 7. VI; 6. X. 28; 21. XI. 31. (N. M. N.) Norman.
Cleveland Co. 17. VII. 29. (R. D. B.) Norman.
Silken tube web on leaves of shrubs.

22. *Gayenna celer* Htz.
Comanche Co. 19, *24. VI. 28. (N. M. N.)
Record of specimen taken on tent floor at night.

23. *Micaria* sp. probably *M. agilis* Bks.
*Cleveland Co. Norman. Immature.

24. *Phrurolithus formica* Bks.
*Cleveland Co. 31. X. Norman.

ATTIDAE

THE JUMPING SPIDERS

"The Attidae are jumping spiders, many of them brightly colored and quick in their movements and living in open places among the tops of low plants. They are usually short and stout spiders, with a large cephalothorax, which is wide in front, where the eyes have a peculiar arrangement in three rows, somewhat as in the Lycosidae, but with the middle eyes of the front row much the largest, so that at first sight many of them appear to have only two eyes. The eyes of the second row are very small and hard to see, and those of the third row are far back on the head and usually turned a little backward. They walk backward or sideways as well as forward, and many of them jump great distances. They make no cobwebs, but some species make silk tubes or bags on plants or under stones in which they hide to moult or lay their eggs or to pass the winter."

25. *Dendryphantes nubilus* Htz.
Cleveland Co. 6, 29. X. 27. (L. B.); 27. IV; 4. V. 29. (R. D. B.); 5. III. 30. (T. L.); 21. X. 31.
Comanche Co. 9. X. 27. (L. B.); 2, 7. VII. 28. (N. M. N.). *10. VI. 28. (N. M. N.).
Delaware Co. 15. VII. 29. (N. M. N.).
Grady Co. 1. II. 31. (R. D. B.).
Ottawa Co. 20. VII. 29. (N. M. N.).
Sweeping collections; grassland areas.

26. *Habrocestum pulex* Htz.
Comanche Co. *13, 25. VI; 4, 6. VII. 28. (N. M. N.).
On rocks. Mountainsides.

27. *Hentzia (Wala) palmarum* Htz.
Cleveland Co. 29. IX; 21. X. 27. (L. B.) Norman.
Comanche Co. 23, 28. VI. 28. (N. M. N.).
*Osage Co. 22. VII. 29. (N. M. N.).
Sweeping collections. Prairie.

28. *Hyctia pikei* Peck.
Comanche Co. 17. VI. 28. (N. M. N.); *19, 29. VI. 28. (A. O. W.).
*Osage Co. 22. VII. 29. (N. M. N.).
Sweeping collections. Prairie and open woodlands.

29. *Maevia niger* Htz.
Cleveland Co. 7, 14. V. 28. (M. J. B.).
Comanche Co. 18. VI. 28. (N. M. N.); *4. VII. 28. (N. M. N.).
Delaware Co. 17. VII. 29. (N. M. N.).
On fallen leaves and tree trunks. Forests.

30. *Marpissa undata* DeGeer.
Cleveland Co. 3, 10. X. 27. (L. B.) Norman.
Latimer Co. 11. VII. 31. (W. F.).
Murray Co. 10. IV. 29. (N. M. N.) Arbuckles.

31. MENEMERUS FRATERNUS sp. nov. (Fig. 4)

Very similar in appearance and structure to *M. vittatus* Bks. but differs in the vulva and lacks the pale dorsal stripe on the abdomen.

There are two color forms, one black, one reddish. The first has the cephalothorax black, with whitish hair; the mandibles dark red-brown; femora black except the yellow tips, rest of legs yellowish, very heavily banded with black, all with much white and some black hair; sternum dark red-brown; abdomen blackish but faintly marmorate with pale, especially on upper sides, some median patches of white hair, but no dorsal stripe; venter paler. The other form is wholly suffused with reddish brown, the cephalothorax with red-brown hairs, the femora also tawny, the bands on the legs less distinct, there are two rows of faint, pale spots on the abdomen, and the muscle spots near the middle are black.

Structure like *M. vittatus*, the eye-area a little longer; the front legs enlarged, the tibia with three pairs of stout spines below, tibia II with one spine at base and a pair near the tip; tibiae III and IV without lateral spines (as in *vittatus*), below with one at base and a pair at tip. The vulva shows a broad transverse cavity with a large dark central area, which contains the two openings rather narrowly separated; behind there is usually a rather deep notch.

Length 7 mm.

I retain this and *M. vittatus* in *Menemerus* since the sternum is not as much narrowed in front as in the typical *Marpissa*, and there are no lateral spines on tibia III which are present in *Marpissa* including *M. melanognatha.* NATHAN BANKS.

Type: Murray Co. 4. II. 30. (R. D. B.). In Museum Comparative Zoology, Harvard College.

Paratype: Cleveland Co. 5. III. 30. (Z). In Museum Comparative Zoology, Harvard College.

Paratype: Cleveland Co. 5. III. 30. (T. L.). In Museum of Zoology Univ. Oklahoma.

32. *Metacyrba taeniola* Htz.
Comanche Co. 30. VI. 29. (N. M. N.).

33. *Pellenes limatus* Peck.
Cleveland Co. 21. XI. 31. Norman.
*Comanche Co. 14. VI. 26. (A. E. R.). Camp Boulder.
Osage Co. 22. VII. 29. (N. M. N.). Sand Creek.
Small sac-webs under stones. Prairie.

34. *Pellenes peregrinus* Peck.
*Comanche Co. 5. VI. 28. (N. M. N.).
Sweeping collections. Open woodland.

35. *Phidippus ardens* Peck. ?
Cleveland Co. *20. IX; 22. IX. 27. (L. B.). Norman. Two males.
This is the form mentioned by Peckham (Rev. Attidae; Warburton C., Trans. Wisc. Acad., 1909. 16.355-646.) as a variety of *ardens* from Oklahoma. It is different from his Colorado male of *ardens,* and may belong to another species. (N. BANKS.)

36. *Phidippus audax* Htz.
Canadian Co. 21. IX. 29; 15. X. 30. (N. M. N.). Yukon; 3. XI. 31. (R. D. B.).
Cleveland Co. 21. IX; 9, 11, 14, 18, 19, 27, 29. X; 24. XI. 27; 2. IV. 28. (L. B.). Norman; 27. IV. 29. (R. D. B.). Norman; 4. VII. 29. (N. M. N.).
Comanche Co. 8, 13, 16. VI; 4. VII. 28. (N. M. N.). *30. VI.
Grady Co. 28. IV. 29. (R. D. B.).
Osage Co. 21. VII. 29. (N. M. N.).
Tillman Co. 9. X. 27. (L. B.). Frederick.
Very common. Usually crawling on tree trunks, fences, buildings, etc. Often makes silken bag web in corner of outbuildings. Hibernates in rotten logs and under bark.

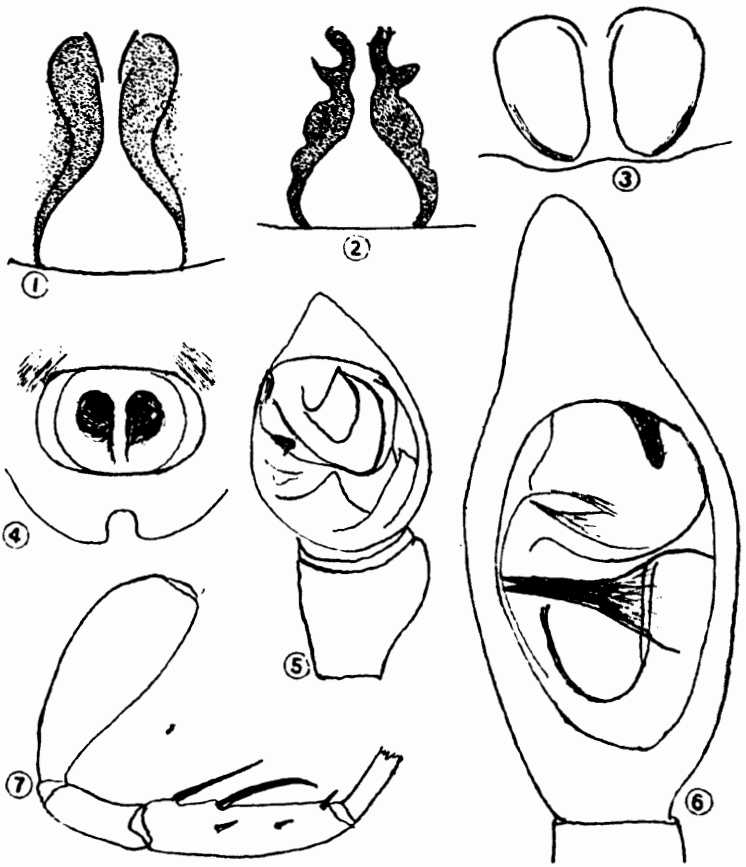
37. *Phidippus cardinalis* Htz.
Cleveland Co. 30. XI. 30. (R. D. B.).
Murray Co. 26. X. 29. (W. N. C.).
Seminole Co. 1. V. 30. (P. N.). Bowlegs.

38. *Phidippus howardi* Peck.
Comanche Co. 18. VI; *1. VII. 28. (N. M. N.).
Latimer Co. 11. VII. 31. (W. F.).
Major Co. 26. VI. 30. (R. D. B.). Cimarron River.
Crawling on objects in dry situations.

39. *Phidippus insolens* Htz.
Alfalfa Co. 16. VI. 30. (R. D. B.). Cherokee Salt Plains.
*Cleveland Co. 5. III. 30. (T. L.) Norman.
Comanche Co. 10, 14. VI. 26. (A. E. R.); 18, 22. VI; 4. VII. 28. (N. M. N.).
Harmon Co. 22. VI. 26. (A. E. R.).
Woods Co. 13. VII. 30. (R. D. B.)
On bushes and weeds; prairie.

40. *Phidippus pius* Scheff.
Comanche Co. 22. VI. 28. (A. O. W. and N. M. N.).
*Osage Co. 22. VII. 29. (N. M. N.).
Taken usually in sweeping collections. Grassland areas.

41. *Phidippus podagrosus* Htz.
Comanche Co. 14. VI. 26. (A. E. R.). Camp Boulder; 24. VI; 3. VII. 28. (N. M. N.).
Nowata Co. 21. VII. 29. (N. M. N.). Mud-dauber's nest.
Osage Co. 22. VII. 29. (N. M. N.).



EXPLANATION OF FIGURES

Drawings by Nathan Banks

1. *Philodromus washita,* sp. nov., vulva.
2. *Philodromus washita,* sp. nov., vulva.
3. *Lycosa gosiuta* Chamb, vulva.
4. *Menemerus fraternus,* sp. nov., epigynum.
5. *Lycosa gosiuta* Chamb. palps.
6. *Geolycosa missouriensis* Bks., palps.
7. *Lycosa gosiuta* Chamb. Leg I.

*Osage Co. 22. VII. 29. 8 miles N. Pawhuska. Sand Creek.
Ottawa Co. 20. VII. 29. (N. M. N.).
Woods Co. 3. VII. 30. (R. D. B).
Sweeping collections, grassland. Silken bags on weeds.

42. *Phidippus rauterbergi* Peck.
*Comanche Co. 7. VII. 28. (N. M. N.).

43. *Phidippus texanus* Bks.
Cleveland Co. 15. X. 27; 5, III. 28. (L. B.). Norman.
Comanche Co. 11, 13, VI. 26. (A. E. R.). Camp Boulder. 29. VI. 28. (A. O. W.); 2. VII. 28. (N. M. N.). *1. VII.
Murray Co. 1. IV. 29. (N. M. N.). Arbuckles.
Tillman Co. 8. X. 27. (L. B.). Frederick.
Woods Co. 11, 13. VII. 30. (R. D. B.)
Tree trunks, herbage. Usually on edge of prairie.

44. *Phidippus variegatus* Lucas.
Cleveland Co. 3. XII. 27. (L. B.) Norman. One male from Norman, rather out of its range. (N. Banks).

45. *Philaeus militaris* Htz.
Cleveland Co. 3. VII.
Murray Co. 7. III. 28. (L. B.). Turner's Falls.

46. *Sassacus popenhoei* Peck.
Alfalfa Co. 10. VI. 30. (R. D. B.). Cherokee Salt Plains.
Comanche Co. 8. VI. 28. (A. O. W); 17, *23, 24. VI. 28. (N. M. N.).
Sweeping collections. Prairie.

47. *Thiodina puerpera* Htz.
Comanche Co. 24. VI. 28. (N. M. N.).
One taken in sweeping collection in grassland area near buffalo wallow.

48. *Tutelina elegans* Htz.
Cleveland Co. 7. V. 28. (M. J. B.).

49. *Zygoballus parvus* Htz.
*Ottawa Co. 20. VII. 29. (N. M. N.).

DICTYNIDAE

50. *Dictyna foliacea* Htz.
Cleveland Co. 2. XI. 30. (R. D. B.).

51. *Dictyna longispina* Emer.
Comanche Co. 5. VI. 28. (N. M. N.).
Sweeping collections. Woodlands.

52. *Dictyna volucripes* Keys.
Canadian Co. *3. IX. 29; 9. XI. 30. (N. M. N.). Yukon.
Cleveland Co. 15. X. 27. (L. B.); 27. IV. 29; 21. XI. 31. (N. M. N.). 21. X. 31.
Comanche Co. 5. VI; 5. VII. 28. (N. M. N.).
Osage Co. 22. VII. 29. (N. M. N.). Sand Creek.
Ottawa Co. 20. VII. 29. (N. M. N.).
Washington Co. 22. VII. 29. (N. M. N.).
Small irregular webs in heads of weeds. Prairie and open woodland.

53. *Titanoeca americana* Emer.
Alfalfa Co. 7. VI. 30. (R. D. B.). Cherokee Salt Plains.
Cleveland Co. 5. III. 30. (T. L.). Norman.
Osage Co. 22. VII. 28. (N. M. N.). Sand Creek.
Small sac webs under stones. Prairie.

AGELENIDAE

"The larger Agelenidae are the makers of the flat wide cobwebs that are so common on the grass and in the corners of barns and cellars."

54. *Agelena naevia* Htz.
Canadian Co. 9. XI. 30. (N. M. N.). Yukon.
Cleveland Co. 21. X; 5. XI. 27. (L. B.); 4. VII. 28. (N. M. N.). 29. IX. 29; 1, 2. XI. 30. (R. D. B.).
Comanche Co. 5, 7, 8, 9, 11, 13, 16, 17, 18, 22, 25, *26, 29. VI. 28; 1, 3, 4, *5, 6. VII. 28. (N. M. N.).
Delaware Co. 15. VII. 29. (N. M. N.). Honey Creek.
*Garvin Co. VIII.
Latimer Co. 23, 27. VI. 31. (R. D. B.); 11. VII. 31. (W. F.).
Oklahoma Co. 26, VII. 29. (N. M. N.).
Payne Co. 25. VII. 29. (N. M. N.) Stillwater.
Seminole Co. IX. 30 to V. 31. (P. N.) Bowlegs.
Concave sheet or funnel webs suspended in varied situations, from grass to trees up as high as 15 feet. Web usually recessed in some natural hollow. Often an irregular net is suspended above the sheet. The most abundant of Oklahoma spiders, commonly known as the "grass spider." Forest and open woodland.

55. *Cicurina arcuata* Keys.
Canadian Co. 1. X. 30. (N. M. N.) Yukon.
Cleveland Co. 1. X. 27. (L. B.). Norman.
Small sheet webs under stones.

56. *Coras medicinalis* Htz.
Canadian Co. 6. X. 30. (N. M. N.). Yukon.
Sheet web with funnel form retreat. Hollow trees and outbuildings.

57. *Hahnia cinerea* Emer.?
Cleveland Co. 31. III. 30. (T. L.). Norman.
Delicate sheet webs over depressions in ground; often under stones and leaves.

58. *Tegenaria derhami* Scop.
Cleveland Co. 13, X. 27. (L. B.); 4. IX. 29. (N. M. N.); 2. XI. 30; 20. II. 31. (R. D. B.).
Delaware Co. 15. VII. 29. (N. M. N.) Honey Creek.
Murray Co. 10. IV. 29. (N. M. N.). Arbuckles.
Payne Co. 25. VII. 29. (N. M. N.). Culvert.
Small funnel-sheet webs in crevices of overhanging rocks and clay banks, usually near water.

THERIDIIDAE

"The Theridiidae are the builders of the loose and apparently irregular webs in the upper corners of rooms, in fences and among rocks, and between the leaves and branches of low trees and bushes. They are generally small, soft, and light-colored spiders, with the abdomen large and round and the legs slender and usually without spines."

59. *Asagena americana* Emer.
Cleveland Co. 14. V. 28. (M. J. B.). Norman.
Usually under stones.

60. *Dipoena nigra* Emer.
Delaware Co. 15. VII. 29. (N. M. N.).
Small irregular webs, in bushes and low branches of trees.

61. *Euryopis emertoni* Bryant.
*Comanche Co. 19. VI. 28. (A. O. W.). Recently described from Georgia, South Carolina and Rhode Island (N. Banks).

62. *Euryopis funebris* Htz.
Grady Co. 1. II. 31. (R. D. B.).

63. *Lathrodectus mactans* Koch.
Canadian Co. 19. X. 30. (N. M. N.). Yukon.
Cleveland Co. 7. V. 28. (M. J. B.). 2. VIII. 28; 10. IV. 29. (N. M. N.); 23. II. 29. IX. 29; 25. II. 31. (R. D. B.); 8. IV. 30. (Z.).
Comanche Co. 30. VI; 1, 5, 7. VII. 28. (N. M. N.).
Logan Co. 26. VII. 29. (N. M. N.). Cimarron River Bridge.
Love Co. 15. VI. 29. (N. M. N.).
*Murray Co. 10. IV.
Oklahoma Co. (N. M. N.). Culvert.
Osage Co. 22. VII. 29. (N. M. N.).
Seminole Co. IX. 31. (P. N.). Bowlegs.
Woods Co. 8. VII. 30. (R. D. B.).
Irregular web which is coarse and tough. In outbuildings, stone walls, hollow logs. Variety in southern part of state which makes webs in tall grass of forest areas recessing them in the roots of the grass, fallen leaves, etc. Common in all parts of the state. This is the Black Widow or Hour Glass Spider. The only poisonous spider of the state.

64. *Lithyphantes pulcher* Keys.
Cleveland Co. Norman.
Under stones.

65. *Spintharus flavidus* Htz.
Delaware Co. 15. VII. 29. (N. M. N.).
Single strand webs suspended from trees. Under surface of leaves.

66. *Teutana triangulosa* Walck.
Logan Co. 26. VII. 29.
Irregular webs under culverts and bridges.

67. *Theridium differens* Emer.
Cleveland Co. 5. XI. 27. (L. B.). Norman.
Murray Co. 10. IV. 29. (N. M. N.). Arbuckles.
Irregular webs usually on plants.

68. *Theridium murarium* Emer.
Comanche Co. 25. VI. 28. (N. M. N.).
Irregular webs in branches of trees.

69. *Theridium spirale* Emer.
Osage Co. 22. VII. 29. (N. M. N.). Sand Creek.
Irregular webs.

70. *Theridium tepidariorum* Koch.
Cleveland Co. 3. VI. 29. (N. M. N.). Norman.
Comanche Co. 20. VI. 28. (N. M. N.).
Delaware Co. 16, 17, 19. VII. 29. (N. M. N.). Elk River, Honey Creek.
Logan Co. 26, VII. 29. (N. M. N.).
Mayes Co. 13. VII. 29. (N. M. N.).
Murray Co. 10. IV. 29. (N. M. N.) Arbuckles; 4. II. 31. (R. D. B.). Mystic Cave.
Nowata Co. 21. VII. 29. (N. M. N.). Big Creek.
Osage Co. 22. VII. 29. (N. M. N.). 10 miles west of Pawhuska.
Irregular webs in outbuildings, cellars, and under bridges.

LINYPHIIDAE

71. *Diplocephalus crenatum* Emer.
Latimer Co. 16. VII. 31. (W. F.).

72. *Erigone autumnalis* Emer.
Comanche Co. 12. VI. 28. (A. O. W.).

73. *Grammonota maculata* Bks.
Osage Co. 22. VII. 29. (N. M. N.).

74. *Linyphia communis* Htz.
Adair Co. 24. VI. 27. (A. I. O.). Kiamichi River.
Cleveland Co. 1, 5. X; 27. (L. B.); 27. IV. 29. (N. M. N.); 2. XI. 30. (R. D. B.).
Comanche Co. 19. XI. 27. (L. B.); 25, 26, 30. VI; 1, 2, 5. VII. 28. (N. M. N.).
Murray Co. 10. IV. 29. (N. M. N.). Arbuckles.
Ottawa Co. 18. VII. 29. (N. M. N.). Spring River.
Combination "bowl and doily" webs suspended in low branches and bushes. Forests.

75. *Linyphia marginata* Koch.
Comanche Co. 13, 17, 18, 25, VI; 1, 4, 6. VII. 28. (N. M. N.).
Delaware Co. 15. VII. 29. (N. M. N.). Honey Creek; 16. VII. 29. (N. M. N.). Elk River.
Murray Co. 10. IV. 29. (N. M. N.). Arbuckles; 4. II. 31. (R. D. B.) Mystic Cave.
Combination "filmy dome," web suspended in dead limbs of trees and between weeds. Sheltered situations; forests.

ULOBORIDAE

76. *Uloborus plumipes* Lucas.
Comanche Co. 22. *29. VI. 28. (N. M. N.).
Delaware Co. 17. VII. 29. (N. M N.). Elk River.
Logan Co. 26. VII. 29. (N. M. N.). Culvert.
Payne Co. 25. VII. 29. (N. M. N.).
Small orb webs. Varied situations.

TETRAGNATHIDAE

77. *ALLEPEIRA basilica* McCook.
Comanche Co. 25, 30. VI; 7. VII. 28. (N. M. N.).
Combination irregular net-sheet, "filmy dome" webs suspended in branches of trees and bushes.

The generic name *Hentzia* proposed by McCook was already used by Dr. Marx for what has been called *Wala*, therefore I propose a new name, *ALLEPEIRA*. (N. BANKS).

78. *Eugnatha pallescens* Cambr.
Comanche Co. *11. VI. 26. (A. E. R.). Camp Boulder; 8. VI. 28. (N. M. N.).
Woods Co. 7. VII. 30. (R. D. B.).
Orb webs suspended over water.

79. *Leucauge hortorum* Htz.
Cleveland Co. 1. X. 28. (L. B.).
Comanche Co. 10. VI; 4. VII. 28. (N. M. N.).
Delaware Co. 16. VII. 29. (N. M. N.). Elk River.
LeFlore Co. 24. VI. 27. (A. I. O.). Kiamichi River.
Nowata Co. 21. VII. 29. (N. M. N.). Big Creek.
Ottawa Co. 18. VII. 29. (N. M. N.). Spring River.
Very perfect orb; irregular net web suspended in sheltered situations. Forest areas; timbered mountain slopes.

80. *Tetragnatha grallator* Htz.
Comanche Co. 22. VI. 28. (N. M. N.). *6. VII. 28. (N. M. N.).
Delaware Co. 15. VII. 29. (N. M. N.). Honey Creek; 16, 17. VII. 29. (N. M. N.). Elk River.
*Latimer Co. 11. VI. 31. (R. D. B.). Gaines Creek.
Murray Co. 1, 10. IV; 4. X; 12. XI. 29. (N. M. N.). Arbuckles.
Nowata Co. 21. VII. 29. (N. M. N.).
Ottawa Co. 18. VII. 29. (N. M. N.). Spring River.
Pawnee Co. 23. VII. 29. (N. M. N.). Black Bear Creek.
Payne Co. 25. VII. 29. (N. M. N.).
Woods Co. 3. VII. 30. (R. D. B.). Dog Creek.
Large orb webs usually suspended over water.

81. *Tetragnatha laboriosa* Htz.
Alfalfa Co. 21. VI. 30. (R. D. B.). Cherokee Salt Plains.
Canadian Co. 5. XI. 29. (N. M. N.).
Cleveland Co. 2. IV. 30. (M. W.).
Comanche Co. 10, 14. VI. 26. (A. E. R.). Camp Boulder.
Grady Co. 2. V. 31. (R. D. B.).
Murray Co. 10. IV. 29. (N. M. N.). Arbuckles.
Ottawa Co. 20. VII. 29. (N. M. N.).
Woods Co. 1. VII. 30. (R. D. B.).
Orb webs in meadows. Sweeping collections.

EPEIRIDAE

The Epeiridae are makers of the familiar round cobwebs.

82. *Acacesia folifera* Marx.
Delaware Co. 15, 16. VII. 29. (N. M. N.).
Orb webs in low branches. Forest areas.

83. *Acrosoma gracilis* Walck.
Adair Co. 7. VII. 27. (A. I. O.). Sallisaw Creek; 8. VII. 27. (A. I. O.). Illinois River.
Comanche Co. 22. VI. 28. (N. M. N.); *24. VI. 28. (N. M. N.).
Delaware Co. 15, 16, 17. VII. 29. (N. M. N.).
LeFlore Co. 24, VI. 27. (A. I. O.). Kiamichi River.
Oklahoma Co. VII. 29. (N. M. N.).
Orb webs of many spirals suspended between low branches of trees and shrubs. Forest areas.

84. *Acrosoma mitrata* Htz.
Delaware Co. 16. VII. 29. (N. M. N.).
*Ottawa Co. 18. VII. 29. (N. M. N.).
Orb webs. Forest areas.

85. *Acrosoma spinea* Htz.
*Ottawa Co. 18. VII. 29. (N. M. N.).
Orb webs of many spirals. Forest areas.

86. *Argiope aurantia* Luc.
Canadian Co. 17. X. 30. (N. M. N.). Yukon.
Cleveland Co. 10. X. 27. (L. B.); 2. VIII. 28. (N. M. N.); 29. IX. 29. Norman.
Logan Co. 26. VII. 29. (N. M. N.). Cimarron River.
Seminole Co. IX. 30 to V. 31. (P. N.). Bowlegs.
Woods Co. 11. VII. 30. (R. D. B.).
Orb web with stabilimentum in center, suspended in varied situations.

87. *Argiope trifasciata* Forsk.
Canadian Co. 21. X; 9. XI. 30. (N. M. N.). Yukon.
Cleveland Co. 15, 21. X; 3. XI. 27. (L. B.); 31. XI. 31. Norman; *5. VI; *29. IX.
Comanche Co. 10. VI. 26. (A. E. R.). Camp Boulder; 5. VI. 28. (N. M. N.); 25. VI. 28. (A. O. W.).
Nowata Co. 21. VII. 29. (N. M. N.). Mud-dauber's nest.
Ottawa Co. 20. VII. 29. (N. M. N.).
Seminole Co. IX. 30. to V. 31. (P. N.). Bowlegs.
Woods Co. 4. VII. 30. (R. D. B.).
Orb web with stabilimentum.

88. *Cyclosa caudata* Htz.
Pawnee Co. 21. VII. 29. (N. M. N.). Black Bear Creek.
Orb webs in shrubs, prairie, or open woodland.

89. *Epeira conchlea* McCook.
Comanche Co. 21, 22. VI. 28. (N. M. N.); *7. VII. 28. (N. M. N.).
Delaware Co. 16. VII. 29. (N. M. N.).
Orb webs. Forest.

90. *Epeira displicata* Htz.
Comanche Co. 24. VI. 28. (N. M. N.).
Sweeping collections. Prairie.

91. *Epeira domiciliorum* Htz.
Canadian Co. 21. XI. 29; 13, 14. X; 9. XI. 30. (N. M. N.). Yukon.
Cleveland Co. 5, 13. XI. 27. (L. B.); 24. XI. 28. (N. M. N.). Norman.
Comanche Co. *29. VI. 28. (N. M. N.); 1. VII. 28. (N. M. N.).
Delaware Co. 15. VII. 29. (N. M. N.). Honey Creek.
Latimer Co. 7, 16. VII. 31. (W. F.).
Nowata Co. 20, 21. VII. 29. (N. M. N.). Big Creek.
Osage Co. 22. VII. 29. (N. M. N.).
Pawnee Co. 23. VII. 29. (N. M. N.). Black Bear Creek.
Payne Co. 25. VII. 29. (N. M. N.).
Seminole Co. IX. 30 to V. 31. (P. N.). Bowlegs.
Orb webs usually in forest areas. Food of mud-daubers.

92. *Epeira gigas* Leach.
Nowata Co. 20, 21. VII. 29. (N. M. N.). Big Creek. One specimen retained by Banks.
Orb webs in branches of shrubs and trees. Forest areas.

93. *Epeira nigrifoliata* Keys.
Comanche Co. 22, VI. 28. (N. M. N.).
*Delaware Co. 16. VII. 29. (N. M. N.).
*Osage Co. 22. VII. 29. (N. M. N.). Oak Creek.
Orb webs. Forest.
A southwestern species, rarely recorded (N. Banks).

94. *Epeira oaxacensis* Keys.
Comanche Co. 22. VI. 26. (A. E. R.). Camp Boulder.
Harmon Co. 22. VI. 26. (A. E. R.).
Orb webs. Frequently used as food by mud-daubers.

95. *Epeira pratensis* Htz.
Osage Co. 23. VII. 29. (N. M. N.).
Orb webs. Frequently used as food by mud-daubers.

96. *Epeira prompta* Htz.
Adair Co. 9. VII. 27. (A. I. O.). Watts.
Canadian Co. 1. IV. 29. (N. M. N.). Yukon.
Cleveland Co. 3. XI. 30. (R. D. B.). Norman.

Comanche Co. 8. VII. 28. (N. M. N.).
Delaware Co. 15. VII. 29. (N. M. N.).
Latimer Co. 11. VII. 31. (W. F.).
Murray Co. 10. IV. 29. (N. M. N.). Arbuckles.
Nowata Co. 21. VII. 29. (N. M. N.).
Osage Co. 22, 23. VII. 29. (N. M. N.). One retained by Banks.
Pawnee Co. 21. VII. 29. (N. M. N.). Black Bear Creek.
Payne Co. 25. VII. 29. (N. M. N.).
Orb webs in branches of shrubs and trees. Forest areas.

97. *Epeira scutulata* Htz.
Cleveland Co. 26. II. 31. (R. D. B.).

98. *Epeira strix* Htz.
Canadian Co. 15. X. 30. (N. M. N.). Yukon.
Delaware Co. 16. VII. 29. (N. M. N.). Elk River, Honey Creek.
Murray Co. 1, 10, IV. 29. (N. M. N.). Arbuckles.
Ottawa Co. 18. VII. 29. (N. M. N.).
Payne Co. 25. VII. 29. (N. M. N.).
Orb webs. Along streams; on bridges.

99. *Epeira trivittata* Keys.
Cleveland Co. 1. XI. 30. (R. D. B.). Norman.
Comanche Co. 20. VI. 28. (N. M. N.).
Osage Co. 23. VII. 29. (N. M. N.).
Seminole Co. IX. 30. to V. 31. (P. N.). Bowlegs.
Orb webs. Forest areas.
In the northeast U. S. this is much more common than *E. domiciliorum*. (N. Banks.).

100. *Epeira verrucosa* Htz.
Adair Co. 8. VII. 27. (A. I. O.). Illinois River.
Delaware Co. 15, 16, 17. VII. 29. (N. M. N.).
Nowata Co. 21. VII. 29. (N. M. N.). Big Creek.
Ottawa Co. 18. VII. 29. (N. M. N.).
Orb webs. Forest.

101. *Larinia directa* Htz.
Cleveland Co. 5. III. 30. (T. L.).
McClain Co. 22. II. 30. (R. D. B.).
Oblique webs in weeds and grass. Prairie.

102. *Mangora gibberosa* Htz.
Cleveland Co. 29. X. 27. (L. B.).
Comanche Co. 5. VII. 28. (N. M. N.).
LeFlore Co. 24. VI. 27. (A. I. O.).
Orb webs. Forest areas.

103. *Mangora maculata* Keys.
Ottawa Co. 18. VII. 29. (N. M. N.).
Orb webs. Forest areas.

104. *Mangora placida* Htz.
Delaware Co. 16, *19. VII. 29. (N. M. N.).
LeFlore Co. 24. VI. 27. (A. I. O.). Kiamichi River.
Murray Co. 10. IV. 29. (N. M. N.). Arbuckles.
*Payne Co. 25. VII. 29. (N. M. N.).
Orb webs. Forest areas.

105. *Metepeira labyrinthea* Htz.
Comanche Co. 13, 17, 24. VI; 3. VII. 28. (N. M. N.); 16, 27, 29. VI. 28. (N. M. N.).
Nowata Co. 21. VII. 29. (N. M. N.).

Ottawa Co. 18. VII. 29. (N. M. N.).
Washington Co. 22. VII. 29. (N. M. N.). Hogshooter Creek.
Woods Co. 23. VII. 30. (R. D. B.).
Orb-irregular net webs suspended in branches of shrubs and trees. Forest.

106. *Plectana stellata* Htz.
Alfalfa Co. 21. VI. 30. (R. D. B.). Cherokee Salt Plains.
Canadian Co. (N. M. N.). Yukon.
Cleveland Co. 24. XI. 28. (N. M. N.); 27. IV; 4. V. 29. (R. D. B.); 2. IV. 30. (M. W.); 21. X 31; *10. X.
Comanche Co. 2. VII. 28. (N. M. N.).
Delaware Co. 12. VI. 27. (A. I. O.). 6 miles northwest of Grove.
Osage Co. 22. VII. 29. (N. M. N.).
Pawnee Co. 21. VII. 29. (N. M. N.). Black Bear Creek.
Woods Co. 6, 9. VII. 30. (R. D. B.).
Orb webs on fences and in grass. Prairie areas.

107. *Singa nigripes* Keys.
Cleveland Co. 14. V. 28. (M. J. B.).
Small delicate orb webs in weeds and grass. Low prairie areas.

108. *Singa shefferi* Bks.
Comanche Co. 21. VI. 28. (N. M. N.).
As above.

MIMETIDAE

109. *Mimetus interfector* Htz.
*Cleveland Co.
Delaware Co. 15. VII. 28. (N. M. N.). Honey Creek.
Irregular net webs under rock ledges. Timbered mountain slopes.

THOMISIDAE

110. *Coriarachne versicolor* Keys.
Grady Co. 1. II. 31. (R. D. B.).

111. *Ebo latithorax* Keys.
Cleveland Co. 20. II. 31. (R. D. B.).

112. *Misumena americana* Keys.
Comanche Co. 6. VII. 28. (N. M. N.); *23. VI; *4, *5. VII. 28. (N. M. N.).
Nowata Co. 21. VII. 29. (N. M. N.). In mud-daubers nest.
Payne Co. 25. VII. 29. (N. M. N.).
On leaves of trees. Forest and woodland.

113. *Misumessus asperatus* Htz.
Adair Co. 9. VII. 27. (A. I. O). Watts.
Alfalfa Co. 4. VI. 30. (R. D. B.). Cherokee Salt Plains.
Cleveland Co. 19. IX; 15, 21. X. 27. (L. B.); 4. V. 29; 2. XI. 30. (R. D. B.).
Comanche Co. *10. VI. 26. (A. E. R.). Camp Boulder; 10, 11, 13, 14, 17, 21, 22, 24, 27, 28, 29. VI; 1, 2, 4. VII. 28. (N. M. N.); 8, 12, 19, 25, 26, 29. VI. 28. (A. O. W.).
Delaware Co. 15. VII. 29. (N. M. N.).
Harmon Co. 22. VI. 26. (A. E. R.).
Major Co. 26. VI. 30 (R. D. B.). Cimarron River.
Nowata Co. 21. VII. 29. (N. M. N.). In mud-dauber's nest.
Osage Co. 23. VII. 29. (N. M. N.).
Ottawa Co. 20, 22. VII. 29. (N. M. N.).
Woods Co. 1, 9. VII. 30. (R. D. B.).
Sweeping collections, more usually from grassland overgrown with flowers. Prairie areas.

114. *Philodromoides pratariae* Scheff.
Canadian Co. VIII. 30. (N. M. N.). Yukon.
Comanche Co. 13. VI. 26. (A. E. R.). Camp Boulder; 24. VI. 28. (A. O. W.); 17, 29. VI; 2, 3. VII. 28. (N. M. N.).
Latimer Co. 7. VII. 31. (W. F.).
*Woods Co. 1. VII.
Sweeping collections. Prairie areas.

115. *Philodromus inquisitor* Thorell.
Cleveland Co. 5. XI. 27. (L. B.); *24. X. 31. (B. S.); 31. X. 31.
None quite mature but markings agree. (N. BANKS.)
The *Philodromus inquisitor* of Walckenaer was based on one of Abbot's unpublished figures, so has no standing. In 1872 Cambridge described a *Philodromus thorelli*, so the *thorelli* of Marx is preoccupied. I think that *Philodromus spectabilis* Keys. may be the male of *P. inquisitor*. (N. BANKS.).

116. *Philodromus pernix* Blk.
*Canadian Co. VIII. 30.
Comanche Co. 18. VI. 28. (N. M. N.).
Foliage of trees and shrubs. Forest and woodland.

117. PHILODROMUS WASHITA sp. nov. (Figs. 1, 2).

Cephalothorax pale yellowish-brown, the sides with faint short irregular white lines; eyes with white around them, and down on middle of clypeus, and white lines behind the eyes, and a large white V-mark at the end of the pars cephalica. Legs pale yellowish, with numerous small dark dots, no bands on legs; sternum pale; abdomen pale gray in one with some faint brown spots in middle of base above, and some near tip behind; venter pale, unmarked.

Cephalothorax broader than long, fairly broad in front; all eyes subequal, anterior median little if any larger than others, the laterals with posterior median make a plainly isosceles triangle; legs rather stout, femora fairly broad, leg II plainly longer than I; femora I and II with three rows of spines above, three in each row; tibiae I and II with two pairs of long spines below, besides short pair at tip, a row of three spines on the front side, above, and on the posterior side, hind femur with a very short spine above toward base, two longer ones beyond in a row.

The vulva shows an elongate dark area, the median septum broadly triangular behind, and a slender part in front. In one specimen the sides of the cavity are sinuous and dentate.

Length 4.6 mm., femur II 3 mm., patella plus tibia II 3.5 mm.

(NATHAN BANKS.)

Type: Cleveland Co. 24. IX. 28. (N. M. N.). In Museum Comparative Zoology, Harvard College.

Paratype: Cleveland Co. 24. IX. 28. (N. M. N.). In Museum of Zoology, Univ. Oklahoma.

118. *Runcinia aleatoria* Htz.
Adair Co. 9. VII. 27. (A. I. O.). Watts.
Comanche Co. 6. VII. 28. (N. M. N.).
*Nowata Co. 21. VII.
Sweeping collections. High prairie.

119. *Synema parvula* Htz.
Cleveland Co. 19. II. 30. (M. W.). Norman.

120. *Thanatus lycosoides* Emer.
Comanche Co. *22, 24, 26. VI. 28. (A. O. W.); 3. VII. 28. (N. M. N.).
Sweeping collections from grass. Woodland areas.

121. *Tibellus duttoni* Htz.
Cleveland Co. 15. X. 27. (L. B.); 21. XI. 31. (D. S.).
Comanche Co. 8, 9, 12, 18, 30. VI. 28. (A. O. W.); 17, 19, 29. VI. 28. (N. M. N.).
Ellis Co. 25. XII. 29. (G. A.).
McClain Co. 22. II. (R. D. B.).
Osage Co. 23. VII. 29. (N. M. N.).
Sweeping collections from grass and weeds. Woodland.

122. *Tmarus caudatus* Htz.
Delaware Co. 15. VII. 29. (N. M. N.).
Leaves of trees. Forest and woodland.

123. *Xysticus auctificus* Keys.
Comanche Co. 10, 11, 13, *29. VI. 26. (A. E. R.). Camp Boulder; 3. VII. 28. (N. M. N.).
Ottawa Co. 20. VII. 29. (N. M. N.).
Sweeping collections. Woodlands.
A western species. (N. BANKS.)

124. *Xysticus cunctator* Thor.
Comanche Co. 7. VI. 28. (N. M. N.).
A western species. (N. BANKS.)

125. *Xysticus gulosus* Keys.
Cleveland Co. 15. X. 27. (L. B.). Norman.
Comanche Co. 25. VI. 28. (A. O. W.).
Sweeping collections as *X. triguttatus*.

126. *Xysticus nervosus* Bks.
Canadian Co. 1. X. 30. (N. M. N.).
Cleveland Co. 21. X. 27. (L. B.).
Sweeping collections, low herbage. Woodland and prairie.

127. *Xysticus triguttatus* Keys.
*Comanche Co. 13. VI. 26. (A. E. R.). Camp Boulder.
LeFlore Co. 24. VI. 27. (A. I. O.).
Ottawa Co. 20. VII. 29. (N. M. N.).
Sweeping collections in low herbage and grass. Woodlands.

PISAURIDAE

128. *Dolomedes scriptus* Htz.
Alfalfa Co. 16. VI. 30. (R. D. B.).
Cleveland Co. 12. III. 30. (M. W.); 5. VII. 31. (R. D. B.).
Comanche Co. 22. VI; 1. VII. 28. (N. M. N.).
Delaware Co. 17. VII. 29. (N. M. N.). Elk River.
Latimer Co. 13, 27. VI. 31. (R. D. B.).
Murray Co. 26. X. 29. (G. A.). Arbuckles.
Nowata Co. 21. VII. 29. (N. M. N.).
Payne Co. 24. VII. 29. (N. M. N.). Stillwater.
Woods Co. 3. VII. 30. (R. D. B.). Dog Creek.
Commonly found under banks overhanging water, on drifts, etc. Seems to prefer water of swift moving streams.

129. *Dolomedes sexpunctatus* Htz.
Cleveland Co. 29. X. 27. (L. B.).
Latimer Co. 12. VI. 31. (W. F.).
McCurtain Co. 4. IV. 31. (R. D. B.). Stick Lake.
On plants over water. Often dives quickly into water when approached. Seems to prefer very cold water, as spring marshes.

130. *Dolomedes urinator* Htz.
*Comanche Co. 13, 22. VI; 4. VII. 28. (N. M. N.).
Delaware Co. 17. VII. 29. (N. M. N.). Elk River.
Latimer Co. 28. VI. 31. (R. D. B.).
Habitat much the same as *D. scriptus.*

131. *Pelopatis undulata* Keys.
Cleveland Co. 21. XI. 30. Norman.
Not mature. (N. BANKS.)

132. *Pisaurina undata* Htz.
Cleveland Co. 28. IV. 29. (N. M. N.); 9. III. 31. (R. D. B.).

133. *Thanatidius dubius* Htz.
Canadian Co. VIII. 30. (N. M. N.); IX. 30. (N. M. N.). Yukon.
*Cleveland Co. 2. XI. Norman.
None mature. (N. BANKS.)

134. *Thanatidius tenius* Htz.
Alfalfa Co. 14. VI. 30. (R. D. B.).
Cleveland Co. *2. IV. 30. (M. W.); 2. XI. 30. (R. D. B.) Norman.

LYCOSIDAE

"The Lycosidae are among the commonest spiders, or, at any rate, those most often seen. Most of them live near the ground and move actively about without attempting to conceal themselves. Their colors are black and white or the colors of the ground, stones, and dead leaves, sometimes nearly uniform all over the body, in other kinds arranged in a distinct pattern, with strong contrasts between the light and dark parts. In some species the markings are brighter and more characteristic on the under side than on the back."

135. *Geolycosa missouriensis* Bks.
Alfalfa Co. 18. X. 30. (R. D. B.). Cherokee Salt Plains.
Canadian Co. 22. X. 30. (N. M. N.). Yukon.
Cleveland Co. 15. X. 27; 25. III. 28. (L. B.); 2, 3. XI. 30. (R. D. B.).
Comanche Co. 21, 22. VI. 28. (N. M. N.).
Ellis Co. 25, *29. XII. 29. (G. A.).
Seminole Co. IX. 30 to V. 31. (P. N.) Bowlegs.
A figure of the male palpus is given. (Fig. 6) (N. BANKS.)
Burrowing. Prairie areas.

136. *Geolycosa wrightii* Emer.
Alfalfa Co. 15. VI. 30. (R. D. B.). Cherokee Salt Plains.
Woods Co. 23. VII. 30. (R. D. B)

137. *Lycosa antelucana* Montg.
Canadian Co. 15. X. 30. (N. M. N.). Yukon.
Seminole Co. 28. X. 30. (P. N.). Bowlegs.

138. *Lycosa baltimoriana* Keys.
*Canadian Co. 15. X. 30. (N. M. N.).
Dewey Co. 14. VI. 28. (N. M. N.).

139. *Lycosa carolinensis* Htz.
Canadian Co. 3, 15. X. 29. (N. M. N.). Yukon.
Cleveland Co. 3. XI. 30. (R. D. B.).
Comanche Co. 16. VI. 28. (N. M. N.). *7. VII. 28. (N. M. N.).
*Love Co. 6. VI. 29. (N. M. N.). Hickory Creek.
Seminole Co. 28. X. 30. (P. N.) Bowlegs.
Burrowing. Leaves burrow and hunts freely at night. Prairie areas.

140. *Lycosa erratica* Htz.
Alfalfa Co. 11. VI. 30. (R. D. B.). Cherokee Salt Plains; being killed by a *Lophopompilus carolina* Bks.
Cleveland Co. 29. IX. 29. Norman.
Comanche Co. 10, 11. VI. 26. (A. E. R.). Camp Boulder; 6, 9, 10, 11, 16, 18, 19, 20, 21, 22, 24, 25, 29. VI; 7. VII. 28. (N. M. N.).
Payne Co. VII. 29. (N. M. N.); 29. IX. 29. (R. D. B.). Stillwater.
Seminole Co. 28. X. 30. (P. N). Bowlegs.
Woods Co. 1. VII. 30. (R. D. B.).
Commonly found running on ground in open grassy areas. Prairie and open woodland.

141. *Lycosa fatifera* Htz.
Seminole Co. 28. X. 30. (P. N.). Bowlegs.
Burrowing.

142. *Lycosa frondicola* Emer.
Cleveland Co. 1. X. 27. (L. B.); 22. I. 31. (R. D. B.). Norman.
Seminole Co. 28. X. 31. (P. N.) Bowlegs.
Among fallen leaves and sticks. Forest and woodland areas.

143. *Lycosa gosiuta* Chamb.
*Canadian Co. 15. X. Yukon.
Cleveland Co. 5. III. 30; 29. IX. Norman.
*Payne Co. 28. II. 30. (R. D. B.).
This species is close to *L. avara,* but differs at once in vulva and palpus (Figs. 3, 5, 7). In the male the outer second spine under the tibia I is not only more elongate than in *L. avara,* but curved. The species also occurs in the Eastern States, but has been mixed with *L. avara.* I have not seen the type (which is in Chamberlin's collection) but there is a specimen named by Chamberlin in the Museum collection. (N. Banks.)

144. *Lycosa helluo* Walck.
Canadian Co. 21. IX. 29. (N. M. N.). Yukon.
Cleveland Co. 1, 29, 30. X. 30. (L. B.); 27. VI. 29. (N. M. N.).
Love Co. 13. VI. 29. (N. M. N.). Red River.
Under stones, logs, etc.

145. *Lycosa lenta* Htz.
Cleveland Co. 10. X. 27. (L. B.); 24. X. 31. Norman.

146. *Lycosa permuda* Chamb.
*Cleveland Co. 10. X. 30. (N. G.). Saltwater Lake.

147. *Lycosa pratensis* Emer.
Comanche Co. 16. VI. 28. (N. M. N.).
Osage Co. 22. VII. 29. (N. M. N.).

148. *Lycosa pulchra* Keys.
Caddo Co. 27. XII. 31. (O. S.). Devil's Canyon.
Canadian Co. *10. IX, 29; 15, 19. X; 9. XI. 30. (N. M. N.). Yukon.
Cleveland Co. 22. X. 27. (L. B.).; *13, *15. X.
Ellis Co. 26. XII. 29. (G. A.).

149. *Lycosa punctulata* Htz.
Canadian Co. 4. X. 30. (N. M. N.). Yukon.

150. *Lycosa rabida* Walck.
Adair Co. 11. VII. 29. (N. M. N.) Barren Fork.
Canadian Co. 20. X. 30. (N. M. N.) Yukon.
*Cleveland Co. 29. IX; 1. XI.
Comanche Co. 19, 23. VI. 28. (A. O. W.); 7, 10, 11, 12, 16, 17, 25, 29,30. VI; 1, 3, 5, 6, 7. VII. 28. (N. M. N.).
Delaware Co. 15, 17. VII. 29. (N. M. N.). Elk River, Honey Creek.
Murray Co. 4. II. 31. (R. D. B.).
Osage Co. 22. VII. 29. (N. M. N.). Sand Creek.
Payne Co. 29. IX. 29; 1. XI. 30. (R. D. B.). Stillwater; 24. VII. 29. (N. M. N.). Stillwater.
Seminole Co. IX. 30. to V. 31. (P. N.). Bowlegs.
On ground as *L. erratica.*

151. *Pardosa mercurialis* Montg.
Canadian Co. 15. X. 30. (N. M. N.). Yukon.
Cleveland Co. 20. IX; 15. X; 5. XI. 27. (L. B.); 28. XI. 29. (R. V. J.).
Comanche Co. 11, 13, 24. VI. 28. (N. M. N.).
Delaware Co. 16. VII. 29. (N. M. N.).
Logan Co. 26. VII. 29. (N. M. N.). Culvert.
McClain Co. 22. III. 31. (R.D.B.).
Murray Co. 10. IV. 29. (N. M. N.).
Osage Co. 22. VII. 29. (N. M. N.). Sand Creek.
Payne Co. 28. VII. 31. (R. D. B.).
Pontotoc Co. 30. X. 27. (L. B.) Ada.
Tillman Co. 8, 9. X. 27. (L. B.). Frederick gravel pit.
On sandy areas near water.

152. *Pardosa minima* Keys.
Cleveland Co. 2. IV. 28. (L. B.).
*Logan Co. 26. VII. 29. (N. M. N.). Culvert.
Washington Co. 22. VII. 29. (N. M. N.). Hogshooter Creek.
On rocks and sand along streams.

153. *Pardosa sternalis* Thor.
*Canadian Co. 5. IX. 29. (N. M. N.). Yukon.
Cleveland Co. 29. X. 27. (L. B.). Young.

154. *Pirata insularis* Emer.
Comanche Co. 4. VII. 28. (N. M. N.).
Delaware Co. 17. VII. 29. (N. M. N.). Elk River.
Damp grasslands. Sandy banks of streams.

155. *Pirata wacondana* Scheff.
Cleveland Co. 30. IX. 27. (L. B.). Norman.

156. *Schizogyna gracilis* Bks.
Caddo Co. 27. XII. 31. (O. S.). Devil's Canyon.
Cleveland Co. 1. X. 27. (L. B.).
Comanche Co. 7, 11. VI. 28. (N. M. N.).
Murray Co. 10. IV. 29. (N. M. N.). Arbuckles.

157. *Schizogyna ocreata* Htz.
Comanche Co. 11. VI. 26. (A. E. R.). Camp Boulder; 7, 11, 16, 25. VI; 3, 7. VII. 28. (N. M. N.).
Nowata Co. 21. VII. 29. (N. M. N.). Big Creek.
On ground, under rocks and debris. Forest and woodland.

158. *Trochosa cinerea* Fabr.
Canadian Co. 21. IX. 29. (N. M. N.). Yukon.
Cleveland Co. 15, 27, 29. X. 27. (L. B.); 12. III. 30. (M. W.); 19. III. 30. (J. S. M.); 2. XI. 30. (R. D. B.).

Comanche Co. 7, 11, 13, 26, 28. VI; 7. VII. 28. (N. M. N.).
Major Co. 20. VI. 30. (R. D. B.).
Seminole Co. IX. 30. to V. 31. (P. N.). Bowlegs.
On sand and gravel stretches along streams. Often runs out on water.

OXYOPIDAE

159. *Oxyopes salticus* Htz.
Adair Co. 9. VII. 27. (A. I. O.). Watts.
Canadian Co. 15. X. 29. (N. M. N.). Yukon.
Cleveland Co. 13. X; 13. XI. 27. (L. B.); 7, V. 28. (M. J. B.).
Comanche Co. 10, 11, 13, 14. VI. 26. (A. E. R.). Camp Boulder; 24, 25, 26, 29. VI. 28. (A. O. W.); 10, 12, 20. VI. 28. (N. M. N.).; *4. VII.
Delaware Co. 15. VII. 29. (N. M. N.).
Latimer Co. 6, 18. VII. 31. (W. F.).
LeFlore Co. 24. VI. 27. (A. I. O.).
Major Co. 28. VI. 30. (R. D. B.).
Osage Co. 22, 23. VII. 29. (N. M. N.). Sand Creek.
Ottawa Co. 20. VII. 29. (N. M. N.).
Tillman Co. 27. XI. 27. (L. B.) Frederick.
Woods Co. 4. VII. 29. (R. D. B.).
Sweeping collections. Prairie.

160. *Oxyopes scalaris* Htz.
*Cleveland Co. 27. XI.
Comanche Co. 25. VII. 28. (N. M. N.).
Foliage of trees and shrubs. Woodland.

PHALANGIDA

1. *Cynorta sayii* Simon.
Cleveland Co. 2. XI. 30; 9. III. 31. (R. D. B.); 21. XI. 31. (D. S.).
Comanche Co. *6, 8. VI. 28. (N. M. N.).
Grady Co. 1. II. 31. (R. D. B.).
Latimer Co. 11. VI. 31. (R. D. B.).
Murray Co. 26. X. 29. (G. A.).

2. *Hadrobunus grande* Say.
Latimer Co. 11. VI. 31. (R. D. B.).
Payne Co. 28. II. 31. (R. D. B.).

3. *Liobunum crassipalpis* Bks.
*Comanche Co. 1. VII. 28. (N. M. N.). Elk Mountain.
Johnston Co. 25. X. 30. (R. D. B.). Oil Springs.
Love Co. 12. VI. 29. (R. D. B.).
*Murray Co. 25. X.
A rare species. (N. BANKS.)

4. *Liobunum dorsatum* Say.
Comanche Co. 11, 14. VI. 26. (A. E. R.). Camp Boulder; 26. VI. 28. (N. M. N.).
Delaware Co. 17. VII. 29. (N. M. N.).
Latimer Co. 9. VI. 31. (R. D. B.).
LeFlore Co. 24. VI. 27. (A. I. O.). Kiamichi River.

5. *Liobunum ventricosum* (Wood).
Pushmataha Co. 25. VI. 29. (R. D. B.).

6. *Liobunum vittatum* Say.
Caddo Co. 27. XII. 31. (O. S.). Devil's Canyon.
Canadian Co. 30. N. M. N.). Yukon.
Cleveland Co. 1, 15. X; 5. XI. 27; 27. X. 28. (L. B.);*2. XI. 30. (R. D. B.). Norman.
Major Co. 24. VI. 30. (R. D. B.).

Pushmataha Co. 25. VI. 29. (R. D. B.).
Woods Co. 14. VII. 30. (R. D. B.).

This form has pale trochanters, and female with a very definite stripe like the male. (N. BANKS.)

8. *Mesosoma niger* Say.
*Adair Co. 9. VII. 27. (A. I. O.). Watts, Illinois River.
Cleveland Co. 24. IX. 29; *21. XI.
Comanche Co. 8, *26. VI. 28. (N. M. N.).
Osage Co. VII. 29. (N. M. N.).

SOLPUGIDA

1. *Eremobates pallipes* Say.
Comanche Co. 7. VI. 28. (N. M. N.); *21. VI.
Murray Co. 6. VII. 30. (N. M. N.). Arbuckles.
Seminole Co. 20. X. 30; IX, X, 31.(P. N.). Bowlegs.
Woods Co. 16. VII. 30. (R. D. B.).

SCORPIONIDA

1. *Centrurus carolinianus* Pal. Beauv.
Cleveland Co.
Garvin Co. VIII. 26.
Seminole Co. V. 31. (P. N.). Bowlegs.

III NOTES ON COMMON OKLAHOMA SPIDERS*

N. M. NEWPORT

INTRODUCTION

Because of the beautiful spinning of spiders, the superstitions and fears concerning them, these creatures have aroused a great deal of interest. The groups and individual spiders discussed in this section of the bulletin are not arranged in phylogenetic order but rather as they came to the mind of the writer. There are some spiders which naturally attract more attention than others, and are discussed at greater length, either because of their appearance, webs, unusual habits or superstitions connected with them.

The material in this paper was largely taken from notes and observations made by the writer in the field and laboratory. The Spider Book by J. H. Comstock (Doubleday, Page & Co.) has been a constant reference.

The writer wishes to express his appreciation to Dr. R. D. Bird who has given much helpful aid to and criticism of this work. He is especially grateful to Dr. Nathan Banks of Harvard University whose identification of the specimens has confirmed and corrected previous determinations, making possible the list which appears in this bulletin.

THE TARANTULA (*Eurypelma hentzi*)

There is no spider which attracts more attention nor arouses as much excitement as does this large hairy fellow, when he comes running briskly into view.

The tarantulas are abundant in Oklahoma, particularly in the Arbuckle, Kiamichi, and Wichita mountains. They make their homes in burrows which they dig under rocks, in crevices, and any place that offers a natural dark retreat near the ground. They usually hide during the day and hunt at night. They are greatly feared because of the supposed deadly nature of their bite. The venom of the tarantula is in all events too powerful to be entirely negligible to man. The effect might be fatal to a man in ill health but its effect upon a normal healthy subject would probably not be serious. Due to the size of the chelicerae and the habits of the animal there is a good chance for secondary infection in the wound.

It is thought that the venom injected is under control of the animal's will, the simple wound being sufficient in many instances to kill the prey. This may explain the widely divergent opinions concerning the venomous nature of the spider bite.

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*Contribution from the Zoological Laboratory of the University of Oklahoma. (New Series No. 112.)

According to Baerg, of the University of Arkansas, the tarantula occurs in greater or smaller colonies in various regions where conditions with reference to food and shelter are favorable. Hillsides or woodlands not completely shaded which are relatively free from weeds or tall grass may be regarded as suitable ground, especially if numerous flat rocks of medium size are available for shelter. "Although the spiders can and do dig their holes" says Baerg, "they very frequently do no more than dig an entrance underneath a large, flat rock, where they may live for several years."

The tarantula relishes grasshoppers, and these probably form a great part of the diet of the Oklahoma species. Mice and young birds are also eaten. They locate their prey by sense of touch as the eyes are small, and are situated so as to be practically useless. They can go without food for long periods.

The male seems to have more of an inclination to wander in the daytime than the females. One day as the writer sat tagging specimens in the Wichita National Forest a large male tarantula came hustling by. It was about ten o'clock in the morning, the sun was out, and altogether it was a bad time for a near sighted tarantula to be wandering within ten feet of a spider collector with a jar of alcohol and a screen cage at hand. The screen cage was chosen, the capture successful, and Mr. *E. hentzi* placed in solitary confinement for several days. The writer made a small sweeping collection of grasshoppers and other insects, the whole being dumped, together with the debris, into the cage. The tarantula did not eat immediately but the next morning the cage was scrupulously clean, as if it had been swept, and a neat ball of debris and bits of insects wrapped with silk lay at one side.

Regardless of the exploits of intrepid arachnologists in allowing themselves to be bitten by tarantulas the writer did not make any collections of these large spiders with his bare hands. The tarantula does not, as many people believe, jump into people's faces and bite them. He can jump short distances, but never more than one or two feet. The tarantula may attain quite large size, often having a leg spread of four inches. The females are larger than the males. They have been known to live for eleven years. Baerg says that the males die soon after the mating season, but the females live a long time.

The greatest natural enemy of the tarantula in Oklahoma is a large solitary wasp with golden wings and blue black body, belonging to the genus Pepsis. The "Tarantula Hawk," as he is called, is a very brave and unerring hunter. His movements are swift and business like, accompanied by an energetic flit of golden wings as he moves over leaves, sticks, behind rocks, and into crevices in search of his prey. How easy it is to imagine the terror of the hapless tarantula, who comes face to face with this ace of hunters, in an instant feels the numbing pain of his sting as it is driven home toward the ventral motor ganglion, and the slow creeping paralysis as the formic acid takes effect. This does not kill the tarantula, only resulting in a complete paralysis. The eggs of the wasp are laid on the abdomen of the helpless spider. When the wasp larvae hatch they have an abundance of fresh food..

The Grass Spider (*Agelena naevia*)

The webs of this spider may be seen in any forest or parkland. It is given the common name of "Grass Spider" because the webs are commonly found in grass. As a matter of fact it could well be called the "Brush Pile Spider." It is abundant in the Wichita National Forest, where the webs may be seen, funnel like, suspended in tall grass, brush piles, hollow stumps, between rocks, upon mats of fallen leaves, and in such a variety of places that one would be prone to conclude that there had been a shower of spiders, each one building a web where he landed.

The size of the web varies from two inches to two feet in diameter, depending largely on the size of the spider. The spider always waits in the recessed tube of the web surveying the sheet, ready to dash out with incredible swiftness if an insect alights there. Above the sheet there is often an inconspicuous tangle of threads to impede the flight of insects, causing them to fall upon the sheet.

One day the writer counted twelve webs of *Agelena naevia* in one brush pile. They were about a yard apart and built close to the mat of dead leaves. The lateral surfaces of the web were attached to branches sticking down into the mat. The webs were large, some at least eighteen by twenty inches. Most of the webs were occupied by adult male spiders. On the same day he found a large web of *Agelena naevia* in a tree six feet above the ground, recessed in a hollow limb. This web was evidently very old, for it was greatly reinforced near the recess by the drag line which the spider spins each time he comes out upon the sheet.

According to Comstock there is a wide range of variation in the size of this spider; adult males occur that are less than one third of an inch in length, while the full grown female may be three fourths of an inch or more in length. He states further that there is also great variation in the general color of the body, ranging from pale yellow with pale grey markings to dark reddish brown with black and grey spots. Both varieties seem to be present in Oklahoma. One of the most noticeable features about the grass spider is the great length of its spinnerets, which project from the posterior end of the abdomen. This is a very inoffensive spider. I have picked up hundreds of them with my fingers. Sometimes they will attempt to bite and I have had them bite me, but I did not notice the bite any more than if it had been a slight pin prick. The egg sacs are placed under loose bark, under stones, on fence posts, usually in damp places.

Two common relatives of the grass spider are the barn spider, *Tegenaria derhami*, and the medicinal spider, *Coras medicinalis*. The barn spider in Oklahoma seems to prefer moist, overhanging rock ledges. The webs are of the sheet-funnel type but are much smaller than those of *Agelena*. They are often found in colonies in the above situations. "The web of *Coras medicinalis* was formerly believed to be narcotic," says Comstock. Hentz states that "for some time the use of its web as a narcotic in cases of fever was recommended by many physicians of the country, but now is probably seldom used."

The Crab Spider (*Thomisidae*)

In this family are represented those spiders having the first and second pair of legs much stouter and longer than the third and fourth pairs. The body is short and broad with the exception of the genus *Tibellus*. They do not build webs but usually lie in wait for their prey on a flower, tree trunk or any surrounding which nearly matches their mottled brownish red, bright yellow, green or grey markings.

Misumessus asperatus is the most common of the Oklahoma crab spiders. The female is twice as large as the male, being about one fourth inch in length. Commonly she has a pale yellow or greenish yellow ground color with red markings. The thorax has two longitudinal brownish red stripes on its dorsum toward the lateral borders. These spiders are very abundant in flower areas, where they are completely camouflaged. In areas where yellow flowers with brown centers (*Coreopsis*) are predominant the markings tend to be yellow and brown. Spiders with a greenish ground color tend to stay on the green parts of the plant.

A contrast is at once apparent if the collector will go from a yellow flower area to a green weed or grass area. Here the predominant colors will change to green. This camouflage is of value to the spiders in protecting them from their one great enemy, the mud-dauber. The writer found two practically snow white *Misumessus* on a white thistle blossom one day.

The genus *Xysticus* is represented by five species in the state, *triguttatus* being the most abundant as a rule. These are fawn colored and brown mottled. A very abundant species is represented in sweeping collections from grass land areas. This is *Philodromoides pratariae*. *Tibellus duttoni*, a small crab spider characterized by a slim pointed body marked by three longitudinal brown stripes, is also very common.

The Black Widow (*Lathrodectus mactans*).

Alias the "Hour Glass Spider," alias "Shoe Button Spider," alias "Pokomoo;" this is one Oklahoman with a well earned bad reputation. "Perhaps the Black Widow is vicious because she is lonely," suggested a high school boy who came to the writer's desk after school one day. "No," I replied, "she doesn't deserve any sympathy. If the male does not leave the web immediately after the mating, he is promptly killed."

The female *Lathrodectus* is very much larger than the male, often being one half inch long while the male is seldom over one fourth inch in length. With a shiny black color, rotund form, and long tapering legs she presents a formidable appearance in her coarse, strong web. Her most conspicuous and distinctive marking is an hour glass shaped, orange-red spot on the ventral aspect of the abdomen. Quite often the female has red or orange markings on the dorsum of the abdomen. The male is much more conspicuously marked above, and possesses also the characteristic hour glass marking ventrally. Immature specimens may be marked quite variably, both male and female having dorsal markings; sometimes these are gray or brownish.

The web consists of a coarse, irregular maze of threads built usually in out-buildings, hollow stumps, recesses under stones, etc. The writer has collected a number of specimens from webs built on stone lawn curbings along sidewalks in Oklahoma City. These were situated near crevices in which the spider hid. In southern Oklahoma there is a variety of *Lathrodectus* that builds its web in the grass of forest clearings and among the low shrubbery. It is larger than the variety found in the central part of the state, having also conspicuous red markings on the dorsum of the abdomen. A red band running down the dorsal median line of the abdomen is often present.

Spiders of the genus *Lathrodectus* are feared in all parts of the world where they occur. Riley and Johannsen in their handbook of Medical Entomology (1910) says the dread "Malmigniatte" of Corsica and southern Europe, the "Karakurte" of southeast Russia, the "Katipo" of New Zealand, the "Menavodi" and "Vancho" of Madagascar, and our own "Black Widow" all belong to the genus *Lathrodectus*. Concerning all of these the most circumstantial accounts of their venomous nature are given. "These accounts," say the writers, "are not mere fantastic stories by uneducated natives but in many cases are reports from thoroughly trained medical men." Comstock quotes a letter from Dr. C. Hart Merriam which reads: "the Indians of California uniformly rank it with the rattlesnake as poison. To poison their arrows they mash the spider and rub the points of the arrows in it. Sometimes this is the only poison used and sometimes it is one of the several things used to make the poison." The venomous nature of the Oklahoma *Lathrodectus* is well established by reports of physicians of the state. In one case the writer secured and identified the spider immediately after the man was bitten. Dr. E. W. Newport, Seiling, Oklahoma was in charge of the case. "I have never seen a man so near death not to die, nor undergo such apparent suffering," said Dr. Newport. The bite produces a very definite set of symptoms which make the nature of the affliction at once apparent. Its results have not been known to have been fatal in the state, but medical literature from other regions of the southern United States contains a number of reported fatalities. According to Kobert, the Russian pharmacologist, who experimented with extracts of the cephalothorax of *Lathrodectus,* the venom is of the nature of a toxalbumin.

This spider is common in all parts of the state, particularly in the southern part.

The Domestic Spider (*Theridium tepidariorum*)

The next time you go down into the basement or cellar look around for signs of the domestic spider. The web, very irregular, will usually be seen suspended between a beam and the ceiling. The spider, rotund in shape, a grey mottled color with dark chevrons on the tip of the abdomen, will probably be out in the web. There are often several brownish pear shaped egg sacks suspended in the web. The female is about three eighths of an inch in length and the male one sixth. The domestic spider seems to prefer dark quiet places to build its web, such as are furnished by outbuildings, cellars, and the under surface of bridges.

The Bowl and Doily Spider. (*Linyphia communis*)

The common name "Bowl and Doily" spider was proposed by Comstock because it most nearly describes the type of web which the spider builds. The central feature of the web is a bowl-like structure beneath which is stretched a nearly horizontal sheet. Above this there is an irregular maze of web. The spider clings to the lower surface of the bowl. Insects that strike the maze of threads above the bowl are seized by the spider from below. The webs are common in the buck brush along small creeks everywhere in Oklahoma. Low bushes or branches of trees in forest and parkland areas furnish typical habitats for the bowl and doily spider.

The female spider is about one sixth to one fourth of an inch in length with a broad, dark longitudinal band on the abdomen and vertical dark stripes laterally. The male is slightly smaller with less conspicuous markings than the female. The cephalothorax is a yellowish brown color.

The Filmy Dome Spider. (*Linyphia marginata*)

A cousin of the bowl and doily spider, the filmy dome spider also builds a combination sheet-irregular-net web. The web of the latter however is much more delicate. Instead of the bowl and horizontal sheet there is a huge dome of fine meshed silk in the center of the network. When the sun strikes the dome the silk appears iridescent. The web is much larger than that of *Linyphia communis*. The writer has observed webs in the Wichita National Forest a foot and a half in diameter.

The spider clings to the under surface of the dome. The female of *Linyphia marginata* is approximately one sixth of an inch in length and the male is about the same size. The abdomen is cream colored, and marked with a dark brown design on the dorsum, differing from that of *Linyphia communis* in being more irregular.

The Garden Spider. (*Argiopinae*)

These are the orb spinners par excellence. They spin a typical orb web accompanied by an irregular net. The net work is usually behind the orb. The webs of both of the garden spiders are often encountered in corn and cotton fields suspended between the green plants.

The Orange Garden Spider (*Argiope aurantia*) is beautifully marked and spins a beautiful orb web. The writer has collected adult females over an inch in length. The markings are silvery white, orange, and black. The legs are conspicuously banded in immature specimens but these markings are lost in maturity. The males are about one half inch long, marked somewhat differently than the females.

The web is large, often a foot and a half in diameter. The hub of the web is reinforced and is further characterized by the presence of a vertical stabilimentum, a wavy or zig zag band.

Late one evening as the writer was returning from a collecting trip he was abruptly confronted with a huge web suspended between two giant-ragweed plants. On the hub of the web there rested a large fe-

male orange garden spider. At my approach she shook the web vigorously by contracting her legs. This act probably attracts the attention of approaching larger animals so they will avoid running into the web. I backed off, sought a clearing, and captured a grasshopper. Approaching the web again I threw the grasshopper into it. She swathed him completely in broad sheets of silk twirling him with her legs. He was soon bound so tightly that he could not so much as move a leg. After administering the *coup de grace* with her sharp chelicerae she returned to the hub of the web, seemingly to contemplate: "the web is damaged considerably, but that can be repaired, and nice fat grasshoppers don't come flying into it every day." The orange garden spider is able to take care of the largest of beetles with dexterity when they are thrown into the web. However if you want to see some fun put a June Beetle into the web of one of the medium sized orb weavers.

The Banded Garden Spider (*Argiope trifasciata*) builds a web similar to that of the orange garden spider but is less often equipped with a stabilimentum. The female of this species is perhaps a little smaller than *A. aurantia*. This garden spider is the more common of the two in Oklahoma. A student proposed the name "cotton field" spider to the writer one day, because he said "they are so commonly found in cotton fields." The boy stated further that he found dozens of the webs every day he went out to pick cotton.

The abdomen of the female banded garden spider is cream colored and bears many transverse bands dorsally. On the posterior half of the abdomen there are usually three parallel longitudinal lines. The dorsum of the abdomen also bears four punctate marks. The male is much smaller than the female, never exceeding one fourth inch in length. The abdomen is white and the cephalothorax and legs have a yellowish tinge.

The writer has collected females of this species containing unlaid eggs as late as the middle of November, after freezing weather had set in. The egg sac is often found in weed patches or grass. The spiderlings do not emerge until the following spring.

Some Other Common Orb Weavers (*Epeiridae*)

Epeira trivitatta. This orb weaver, for which no common name has been proposed, is one of the most abundant of that group in the state. The web is a vertical, complete orb, usually encountered at night suspended in various situations in forest and park land areas. The spider hides during the day under a leaf, coming out at dusk to spin a web. The next morning the web is torn down.

Its color is most generally brown with red and yellowish markings. The spider appears somewhat greyish because of numerous stiff bristles on the legs and hairy growths on the cephalothorax. On the venter of the abdomen are two parallel broken yellow lines between which there is a black area. The markings of the male are very similar to those of the female. The female of this species is about one third to one half inch in length when mature, and the male is the same size.

While the Survey camped on the Kiamichi river a female *Epeira trivitatta* built a web on the front of the truck cab one night. As we

moved out the next morning the spider remained under the eave of the cab, her web still suspended as it was the night before. While we drove along she came out on the web and began tearing it down. She had an interested audience in the driver's seat. That night she built a new web in the same place. We were then about thirty five miles from the Kiamichi river. She spun webs several successive nights and as we traveled during the day she clung in a corner under the eave of the cab. I watched her tear down her web twice while we were moving. One night I put my black leather jacket over the front of the windshield thinking that she would spin a web over it and I could get a photograph. I had overlooked an overhanging branch a few feet away from the truck cab when I was cutting away the ones which I thought were particularly close. That night she spun a beautiful large web, suspending it between the branch and the truck. We had the truck parked in Miami, Oklahoma, in front of a street light on another occasion; that night her web was well supplied with insects. We carried her back to Norman on the front of the truck, a distance of a hundred and fifty miles from the Kiamichi river.

Epeira domiciliorum. The general color of this Epeira is much lighter than that of the preceding species. The predominant color is light brown. There are reddish bands on the legs. The markings on the venter at first sight appear the same as *E. trivitatta* but on closer inspection the yellow lines assume the forms of inverted '*L*'s' with the horizontal bar of the *L* turned inward. Between these marks is a dark area. The size of both sexes ranges about the same as *E. trivitatta*. The male and female are the same size. The web is of the vertical orb type, and is suspended in branches of trees and between shrubs in forest and parkland areas.

Certain of the mud-dauber w asps show great preference for this spider with which they almost entirely stock their nests. It is interesting to note that there is apparently another species of mud-dauber which seems to prefer crab spiders (Thomisidae) for this purpose. These wasps are in the writer's collection but have not been fully determined. They probably belong to the family Sphecidae.

Epeira domiciliorum is widely distributed in the state.

The Foliate Spider. (*Epeira strix*)

The abdomen of the foliate spider is a grey brown while the cephalothorax is shiny reddish brown, being darker brown at the edges. On the dorsum of the abdomen is a dark folium splotched with grey brown somewhat irregularly. The abdomen of the female is distinctly oval. The female spider is about one half inch in length and the male slightly smaller.

The orb webs of this spider are often found on the railings of bridges late in the evening or at night. During the day she hides in a crevice nearby. The web of the night before is torn down in the morning. There seems to be a distinct preference for aquatic situations. The writer has encountered many of the webs suspended in the branches of button bushes growing in shallow overflow ponds near streams.

The Spiny Bellied Spiders. (*Gasteracanthinae*)

The abdomen of the spiny bellied spiders is armed with prominent spines. They present a grotesque appearance but spin beautiful orb webs. In addition to the spines they are further characterized by the position of the spinnerets, these being elevated upon a projection on the ventral aspect of the abdomen. They are represened by three species in the state: *Acrosoma gracilis, Acrosoma spinea,* and *Acrosoma mitrata. Acrosoma gracilis* is the largest of the three. With her large spined box-like abdomen the female makes the male look very insignificant. The female is about three eights of an inch long while the male is about one fourth of an inch, with a long narrow abdomen devoid of spines. The ground color of the abdomen is generally light above, the spines and the rest of the spider are dark brown. Sometimes the ground color is darker.

The typical habitat for this spider is in heavy forests. Here the webs are suspended in various situations. They are of the vertical orb type, made up of many radii and close spirals. The hub of the web is open above and there is often a small stabilimentum. In the early morning when these webs are covered with dew and in the sunlight their beauty is unparalleled by anything in nature. They also have an iridescent sheen in the sunlight when free of dew. The spirals are so closely placed that the web is very conspicuous. The awkward appearance of the female spider does not seem compatible with the complexity and perfection of her web, and the ease with which she builds it.

Acrosoma spinea has a pair of long spreading spines on the terminal portion of the abdomen and two other smaller pairs of spines. The ground color of the abdomen is yellowish with small black spots. The cephalothorax is light brown edged with white. Taking into account the length of the spines the female of this species is about three eigths of an inch long. The web is similar to that of *A. gracilis* and is found in much the same situations.

Acrosoma mitrata is a smaller species than either of the preceding.

The Labyrinth Spider. (*Metepeira labyrinthea*)

This spider builds a combination orb irregular net web. The orb is of the incomplete type with many radii, and is placed in front and slightly below the irregular net portion. In the irregular net, about four inches from the orb, there is generally found a recess consisting of silk or particles of dry leaves held together by silk. A track of tube like construction runs from the recess to the hub of the orb where it opens to the outside. The usual habitat of the labyrinth spider is found in forest areas where the webs are built in branches of trees four to seven feet above the ground. Many of these webs have been observed by the writer in the Wichita National Forest.

The female labyrinth spider rarely exceeds one fourth inch in length; the male is about one sixth inch. The dorsal surface of the abdomen is marked with a darker folium in which there is a white double cross, i.e. with two horizontal portions. The rest of the ab-

domen is a reddish brown color. The cephalothorax is brown and the legs are banded.

The Tetragnathids. (*Tetragnathidae*)

The name applied to this group means "four jawed." They are characterized by having very well developed chelicerae but are not four jawed. The most common species in Oklahoma is *Tetragnatha grallator*. This is an extremely long bodied, long legged spider with very formidable chelicerae. The webs, of the orb type, are found suspended in bushes over water. Swiftly running water seems to be preferred. The webs may be either vertical, inclined, or horizontal. Sometimes they are over two feet in diameter. The hub of the web is open; there are usually about ten or twelve radii. Very often the spider rests on a branch near the attachments of the web supports in the daytime. The long legs of the spider are stretched out in a parallel position along the branch. The female *T. grallator* is sometimes three fourths of an inch in length The dorsal aspect of the abdomen is ordinarily a greyish color with variable white markings, while the rest of the body and the legs are a yellowish brown. The adult male is about one fourth inch long; his coloring is more uniform.

Tetragnatha laboriosa is smaller than *T. grallator*, the adult female being about one third of an inch in length. The male is smaller. This species does not show aquatic preference but builds its webs in the tall grass of meadows where it is taken in sweeping collections.

The Jumping Spiders. (*Attidae*)

These are perhaps the most familiar of the spiders to many of us. They represent a very large and diverse group. They are characterized by large anterior eyes, and relatively large, convex cephalothorax. They do not build webs to ensnare their food, but stalk it. Their movements are quick and wary. Space will permit discussion of but a few of the more interesting and common ones found in Oklahoma.

Phidippus audax is the little fuzzy black fellow who is often seen hunting flies on the window screens in the summer time. It is also often seen on the sides of buildings, tree trunks, logs, etc. The most noticeable feature about it is the presence of three white spots on the dorsum of the abdomen, the more anterior of which is the largest. There is also a white band around the base of the abdomen. The chelicerae have a greenish metallic color. The female range in size from three eighths to one half inch in length. The Oklahoma *Phidippus audax* hibernates through the winter. The sac-like nests are often found in the corners of outbuildings and in rotten logs. The writer found a large group hibernating in a rotten log in the stream bed of the South Canadian river. The crevices of the log were filled with scores of the silken bags.

Phidippus insolens looks much like the preceding species but is brilliantly marked with red. The dorsal surface of the abdomen of the female is a bright orange-red while the male is all red above with the exception of a black border on the base of the abdomen and a dark area

in the eye region. The female is about the same size as *P. audax* and the male is slightly more than one fourth inch in length.

Phidippus cardinalis is another jumping spider with scarlet coloring, found in Oklahoma.

A very common jumping spider is represented in *Phidippus texanus*. This is a light brown species with a darker brown and yellow design along the middle of the dorsum of the abdomen. The length of the female is three eighths of an inch. I do not remember ever having seen a male. Collections from prairie areas show quite a number of this species.

Abundant in sweeping collections from prairie areas is a small, pale yellow spider with six black dots arranged in a 'V' shaped fashion on the posterior half of the dorsal surface of the abdomen. The eyes are black and conspicuous against the background of yellow. This is *Phidippus pius*. Represented also in these collections is another very common spider about three sixteenths of an inch long. This is *Dendryphantes nubilus*. The general color is brownish and the abdomen shows darker brown spots.

Some of the Attidae are minue iridescent species. *Sassacus popenhoei* is a good example of this type. These small spiders are dark with a metallic appearance and have a white band bordering the abdomen. They are numerous in flower areas where small insects are abundant.

The Wolf Spiders. (*Lycosidae*)

The name "Wolf Spiders" is applied to all members of this very large family. They are so called because they more often choose to run down their prey rather than to ensnare or stalk it. It is certain that they do not build webs, but sometimes lie in wait for insects upon a favorable leaf, a blade of grass, or upon the turret which many of the burrowing species build around the entrances to their vertical burrows. These turrets are usually coated with natural materials from their surroundings, this rendering them exceedingly inconspicuous. Some of the wolf spiders confine their active hunting and wandering to the darkness staying in hiding during the day in burrows or under objects. Others seem active at all times, running on the ground in low areas during the day, and ascending to the foliage of higher herbs and shrubs at night. The writer has collected a great deal at night with a carbide head lamp. The eyes of the Lycosidae shine very brilliantly, reminding one of the scintillation of light from a diamond, being visible for long distances. Spiders perched upon vegetation are at once apparent in this way. A head lamp flashed along the bank of a stream often reveals thousands of tiny pin points of light, some moving on the ground, others on vegetation.

A few species of Lycosidae are semi-acquatic, running on sandy and rocky beaches near the water. They are quite agile on the water out upon which they retreat when frightened. The most common species in the state is *Trochosa cinerea*, which is very abundant in the Wichita Mountains. The stream beds are largely made up of eroded red gran-

ite, a background against which these spiders are very effectively concealed. The average length of both sexes is about one half an inch. The ground color is a yellowish brown, often reddish. There is an abundance of grey and black hairs and irregular dark spots on the body. The spots on the cephalothorax have a radial arrangement about the median furrow. The legs are ringed with dark bands. In the same situation with this species is found a smaller spider, *Pardosa mercurialis,* which occurs in equal abundance. The size, as compared with *T. cinerea* is about one half, while the markings on the smaller spider are darker. There is a distinctly contrasting irregular light area on the cephalothorax. The egg sacs of both species are flattened; not uncommonly that of the latter is a bluish or green color. These are carried attached to the spinnerets.

Lycosa erratica is a very common spider of Oklahoma. It is of quite variable size and marking. The body length varies from one half to three fourths of an inch; and the color from a greyish brown to nearly black. Of the specimens which I have at hand two have black venters with a rectangular light spot in the center of the black area on the abdomen. Another larger specimen, a female with a body length of three fourths of an inch has only black trochanters, and a black lyre-shaped marking on the ventral surface of the abdomen. The markings above vary also but the most constant one is two broad longitudinal dark brown stripes on each side of the median line of the cephalothorax. The usual habitat of this spider is grassy prairie areas where it runs freely. It is not usually described as a burrowing type, but the writer has collected several specimens in burrows. The burrow is slanted near the opening and has a small turret around the mouth.

The most agile of the wolf spiders is *Lycosa rabida,* which is found in the grass of prairie and parkland areas everywhere in Oklahoma. The mature females often have a body length of one inch, and the males never more than three fourths inch. The general color above is yellowish brown with two parallel dark bands extending longitudinally on each side of the median line of the thorax. On the abdomen is a broad, serrate, dark, median band which is somewhat broken by light spots posteriorly. The legs are long and bear numerous spines. The spiders seem to prefer to run in the upper part of the grass; at night they commonly ascend to the foliage of tall herbs and shrubs. They can run very swiftly.

The burrowing Lycosas are represented by *Lycosa carolinensis.* This species is widely distributed over the United States. The female is often over an inch in length and the male about one inch. The cephalothorax is broad, greyish brown, with many numerous dark hairs and a dark area on each side of a lighter median one. The abdomen is a mottled brown with a lanceolate dark stripe near the base. The venter is entirely black. The burrow is vertical, from six to eight inches deep, with a turret around the entrance consisting of material from the immediate surroundings held together by silk. It is not unusual to find this species under stones or debris. The writer has collected several at night which were apparently wandering.

Another common burrowing species is *Geolycosa missouriensis*. This is a dark spider with chocolate colored, very convex cephalothorax. The abdomen is a dark grey, the legs and venter being somewhat lighter. The typical habitat is found in short grass prairie areas.

An interesting feature of the wolf spiders is the fact that the wandering types carry their egg cases with them at all times. When the young spiders hatch they crawl upon the back of the mother, where they are carried for some time. When they finally are crowded off or desert the mother's back they ascend to the top of a tall weed or any high place they can find. Here they spin out long strands of silk into the air; when the wind strikes this favorably they are carried away, sometimes for very long distances, where they begin taking care of themselves.

Water Spiders. (*The Dolomedes*)

Although the Dolomedes are considered by most authorities as semi-aquatic spiders they are the nearest to true water spiders in the state. Their very large size causes much attention to be attracted to them, especially by boys in swimming and fishermen along the streams. The habits of the family Pisauridae to which they belong are very interesting.

There are three species in the state of which *Dolomedes scriptus* is the most common. The body length of the mature female is slightly over an inch, but the leg spread is often three inches. The general color is a dark mixed grey, brown and black, the most characteristic marking being a series of distinct black chevrons on the posterior half of the abdomen. On drifts and under rocky banks overhanging streams are the usual habitats. The males sometimes wander for some distance from the water. These are very abundant on Elk river in Delaware County. Here there are many rock ledges overhanging the swiftly running waters. Scores of Dolomedes were observed by the writer. It was about the middle of July and some of the females were building nursery webs over crevices in the rocks, where the young spiders could be seen in irregular webs.

The so called "Diving" Dolomedes, *Dolomedes urinator*, is a larger species than the preceding. The female is more of a brown color. On the base of the abdomen are three or four pairs of light yellow spots. The male is characterized by a dark median area on the cephalothorax surrounded by a broad, light band. The abdomen of the male is small and somewhat pointed. The habitat of the diving Dolomedes is the same as that of *D. scriptus*. This species dives very freely and is able to stay under the water for long periods.

The Six-Dotted Dolomedes, *Dolomedes sexpunctatus*, is a very dark, greenish black species marked with white, which seems to prefer cold water such as is furnished by spring ponds and marshes. This is a beautiful spider. A white band extends completely around the abdomen of the male. The upper surface of the abdomen is marked with six to eight paired white spots. On the under surface of the cephalothorax are six dark dots. The markings of the female are much the same as the male. The Six-Dotted Dolomedes is usually found on water cress

or on lily pads growing in the marshes and when approached dives very quickly beneath these into the water.

Some Other Common Spiders

A rather interesting small spider is the "Lynx" spider, *Oxyopes salticus,* which is abundant in prairie areas on grass and weeds. The eyes of this spider appear to be arranged in a sort of crown, while the abdomen is tapered to a point. The cephalothorax of the female is marked by several parallel longitudinal lines. The palpi of the male are relatively large and black, the abdomen is of a darker color as compared to that of the female. Both sexes are about three sixteenths of an inch in length.

A group of spiders which are not as conspicuous as the others are the Clubionids. This family includes those which live in rolled leaves and under debris and stones on the ground. They are usually in hiding during the day, coming out only at night. This group is as common as any of the other groups of spiders but is less apparent because of their nocturnal habits.

The habits of the Drassids resemble those of the Clubionids and they are also found in great abundance. The small black and reddish spiders found under stones belong in this group.

Filistata hibernalis is a black spider with velvety sheen found in sac-like webs under stones and in peculiar webs in crevices of buildings, these webs consisting of irregular wavy threads radiating from a round entrance.

Among the cobweb spiders found in our homes are *Loxosceles rufescens, Psilochorus pullulus* and *Pholcus phalangioides.* These build their irregular webs in natural habitats as well. *Loxosceles rufescens* is characterized by a dark spot on the cephalothorax shaped like a pen point. *Pholcus phalangioides* is an extremely long legged spider with somewhat elongate body. *Psilochorus* is similiarly long legged, but the body is more rotund.

In the heads of dead weeds are the tiny irregular webs of the Dictynas. I have often broken the weeds off and brought them into the laboratory. They offer material for many interesting studies and the spiders seem quite content to stay in their new location. When the young hatch out in the fall of the year they remain in the web for some time. These small spiders are rarely over one fourth inch in length. The genus is well distributed in Oklahoma.

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