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[PLATES I-III.]

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PAPERS FROM THE HOPKINS STANFORD GALAPAGOS EXPEDITION, 1898-1899.

VII.

ENTOMOLOGICAL RESULTS (6).

ARACHNIDA.

BY NATHAN BANKS.

WITH FIELD NOTES BY ROBERT E. SNODGRASS.

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PART I.

EXTENT AND CHARACTER OF THE COLLECTION.

ABOUT six hundred and fifty Arachnids were collected by this expedition, making the collection by far the largest ever brought from the Galapagos Islands. The specimens belong to forty-eight species which fall in the three great groups of Arachnida as follows: Araneida, thirty-nine species; Arthrogastra, six species; Acarina, three species.

The thirty-nine spiders represent fifteen families, of which the Epeiridæ have nine species, the Attidæ five, the Theridiidæ four, the Sparassidæ and Lycosidæ three each, while the other families are represented by but one or two species each.

Twenty-five species are considered new, and are here first described; two are classified only generically; twenty-one are known species, of which four are peculiar to these islands. The collection contains, with two exceptions, specimens of all species ever taken on these islands. The exceptions are *Segestria æquatoria* of Marx's manuscript, and his young *Agalena*.

The first spider known from these islands—*Gasteracantha insulana*—was described by Thorell in 1859. It has been taken by all subsequent collectors. In 1877 Butler published in the Proceedings of the Zoölogical Society of London a list of the species collected by the Petrel expedition. In 1889 Dr. Marx published a list (without descriptions) in the Proceedings of the U. S. National Museum of the species collected by the Albatross expedition. These lists together include not more than thirteen species, though appearing under sixteen names. They are as follows:

RECORDED BY BUTLER.	RECORDED BY MARX.
<i>Androctonus americanus</i> Linn.	<i>Segestria æquatoria</i> sp. nov.
<i>Lycosa indomita</i> Nicolet.	<i>Agalena</i> (immature).
<i>Theridium carolinum</i> sp. nov.	<i>Loxosceles galapagoensis</i> sp. nov.
<i>Lathrodectes apicalis</i> sp. nov.	<i>Filistata oceanea</i> sp. nov.
<i>Gasteracantha insulana</i> Thorell.	<i>Lathrodectes apicalis</i> Butler.
<i>Epeira cooksonii</i> sp. nov.	<i>Lathrodectes scelio</i> Thorell.
<i>Thomisoides ultriformis</i> sp. nov.	<i>Gasteracantha insulana</i> Thorell.
	<i>Epeira cooksonii</i> Butler.
	<i>Heteropoda venatoria</i> Linn.
	<i>Menemerus galapagoensis</i> sp. nov.
	<i>Centruroides luctifer</i> sp. nov.
	<i>Vejovis galapagoensis</i> sp. nov.

Probably all of those recorded by Butler are in this collection. The *Theridium* I consider as a young *Lathroedectes*; the *Lycosa* as one of the three species, but none agree with Nicolet's figure; and the *Androctonus* was probably one of the two scorpions.

Of those recorded by Marx all but two are represented in this collection; the *Segestria* and the *Agalena*. Dr. Marx never published descriptions of the new species mentioned. His *Filistata* and *Loxosceles* agree with my species of the same genera; his *Menemerus* is *Plexippus paykulli*; his *Centruroides* is *Centrurus princeps*; his *Vejovis* is *Hadruioides lunatus*, and his *Lathroedectes scelio* was probably the young of *L. apicalis*.

Many of the spiders collected by this expedition and not collected by others were taken in December, January, February and March. Other species will doubtless be found in September and October, so that the total Arachnidous fauna of the islands will probably reach one hundred species.

With one important exception all the large groups of Arachnida are represented. There is no Phalangid. The presence of a Solpugid is unexpected, and it must have been a rare accident that stranded one of these animals alive so many miles from the mainland.

AFFINITIES OF THE FAUNA.

As to the affinities of the spider-fauna of these islands, it should be stated that a number of the new species belong to groups which have been but little collected on the mainland, and therefore may yet be found to occur elsewhere. This is illustrated by the fact that one species described by Butler from these islands now turns out to be identical with a species common in Mexico and the southwestern United States.

The affinities of the fauna can best be shown by tabulation. I have arranged them in five groups.

Cosmopolitan.

	No. of specimens.
<i>Tegenaria derhami</i>	on shipboard 1.

Common Tropical Species.

<i>Argiope argentata</i>	64
<i>Heteropoda venatoria</i>	6
<i>Plexippus paykulli</i>	2
Total.....	72

Known from Western South America.

	No. of specimens.
<i>Argiope argentata</i>	64
<i>Tmarus stolzmanni</i>	2
<i>Heteropoda venatoria</i>	6
<i>Plexippus paykulli</i>	2
<i>Hadruroides lunatus</i>	19
Total.....	93

Known from Central America, West Indies, and Colombia.

<i>Dictyna parietalis</i>	1
<i>Theridium mixtum</i>	20
<i>Argyrodes jucundus</i>	10
<i>Argiope argentata</i>	64
<i>Epeira oaxensis</i>	109
<i>Epeira labyrinthea</i>	87
<i>Epeira prompta</i>	11
<i>Epeira gregalis</i>	4
<i>Cyclosa caudata</i>	65
<i>Argyropeira nigriventris</i>	10
<i>Heteropoda venatoria</i>	6
<i>Plexippus paykulli</i>	2
<i>Marptusa californica</i>	1
<i>Centrurus princeps</i>	5
Total.....	395

Known only from the Galapagos.

<i>Sicaroides ultriformis</i>	4
<i>Loxosceles longipalpis</i>	10
<i>Filistata fasciata</i>	2
<i>Coryssocnemis</i> (two species).....	3
<i>Ariadne tarsalis</i>	5
<i>Pæcilochroa bifasciata</i>	1
<i>Prosthesima galapagoensis</i>	1
<i>Aysha pacifica</i>	3
<i>Theridium</i> sp.....	1
<i>Lathrodectes apicalis</i>	27
<i>Gasteracantha insulana</i>	27
<i>Tetragnatha galapagoensis</i>	22
<i>Misumena inclusa</i>	2
<i>Olios galapagoensis</i>	14
<i>Selenops galapagoensis</i>	6
<i>Odo</i> (two species).....	9
<i>Lycosa</i> (three species).....	14
<i>Philæus pacificus</i>	5
<i>Cyrba insularis</i>	1

<i>Admestina insularis</i>	1
<i>Charinus insularis</i>	8
<i>Ammotrecha solitaria</i>	1
<i>Pseudoscorpions</i> (two species).....	8
<i>Amblyomma pilosum</i>	49
<i>Argas transversa</i>	1
<i>Tyroglyphus</i> sp.....	3
Total.....	227

It thus appears that, though only fourteen species are common to the Central American region, as against thirty found only in the Galapagos, the Central American species are represented by nearly twice as many specimens. Moreover, some of the species confined to the Galapagos are very closely allied to species from the Central American region. For example, the *Olios galapagoensis* is very close to *O. fasciculatus* from Mexico and the southwestern United States. Excepting *Charinus* (an Asiatic genus), and *Coryssocnemis* (a Brazilian genus), the genera of the Galapagos species are all represented in the Central American region. Again, when we compare the distribution on the Galapagos Islands of the commoner species we find that the species from the Central American region are the most widely distributed, as will be seen by the following tables :

Species represented by more than ten specimens are distributed as follows :

Confined to Galapagos.

Amblyomma : all from Albemarle except one from Narboro.

Tetragnatha : Albemarle, Narboro.

Lathrodictes : Bindloe, Tower, Charles, Chatham.

Olios : Narboro, Albemarle, Chatham.

Gasteracantha : James, Charles, Chatham, Narboro, Albemarle.

Loxosceles : Albemarle, Hood.

Known from Central American Region.

Theridium : Albemarle, James, Narboro.

Argyropeira : Albemarle, James, Narboro.

Argiope : Albemarle, James, Narboro, Charles, Hood, Bindloe, Barrington, Indefatigable.

Epeira prompta : Albemarle, James, Narboro.

Epeira oaxensis : Albemarle, James, Charles, Chatham, Hood, Duncan, Barrington, Indefatigable.

Epeira labyrinthea: Albemarle, James, Narboro, Charles, Chatham, Hood, Barrington, Bindloe, Tower, Abingdon, Indefatigable.

Cyclosa: Albemarle, Narboro, Hood, Indefatigable.

Argyrodes: Albemarle, Narboro.

From these considerations I conclude that the Arachnidan fauna of these islands is more closely related to that of the Central American region than to that of any other portion of the globe.

TECHNICAL DESCRIPTIONS.

Order *ARANEIDA*.

Family *FILISTATIDÆ*.

FILISTATA FASCIATA sp. nov.

(Pl. I, fig. 15.)

Length 5 mm.

Cephalothorax dull yellowish: legs similar, with not very distinct dark marks on the femora beyond middle, and base and tip of tibia, and on tip of metatarsus; abdomen dark brown above, with two pale spots at base and four curved pale bands, the intermediate two being barely interrupted on the middle line, none of them reaching the sides, also an indistinct apical spot; venter rather paler than dorsum, especially at base; sternum yellowish. Cephalothorax of usual shape (broken and positions of eyes not evident); palpi large and heavy; legs rather short and hairy; abdomen large; projecting considerably beyond the spinnerets.

Two specimens, one young, from Wenman in December. Easily recognized by its banded abdomen and legs. It will fall in F. O. P. Cambridge's genus *Filistatoides*; but I do not deem a division of *Filistata* to be necessary.

Family *SCYTODIDÆ*.

SICAROIDES ULTRIFORMIS Butler.

Thomisoides ultriformis BUTLER, Proc. Zool. Soc. Lond., 1877, p. 77.

Several specimens from Hood Island, May. Described from the Galapagos. The genus occurs in Central America and Chili.

LOXOSCELES LONGIPALPIS sp. nov.

(Pl. I, fig. 13.)

Length ♀ 11 mm.

Cephalothorax, legs and sternum pale yellowish, the legs more reddish toward tip; the mandibles pale reddish brown; dorsal groove

and anterior furrows blackish; eyes on black spots; abdomen grayish, more yellow below; in the male the palpi are yellowish on femora and patellæ, reddish beyond; the eyes in groups as usual, the S. E. in the female fully their longest diameter from the M. E., in the male they are closer to the M. E. Otherwise the structure is similar to *Z. rufescens*, but the male palpus, especially the tibial joint, is much longer than in that species.

Ten specimens from Albemarle and Hood, May.

Family PHOLCIDÆ.

CORYSSOCNEMIS CONICA sp. nov.

(Pl. I, figs. 1, 2, 3.)

Length 4.5 mm.

Cephalothorax pale yellowish; with a median brown stripe, not quite reaching to hind border, but in front extending down to clypeus, broad in front, with parallel sides to beyond middle where it is suddenly constricted to one half the width; a curved brown stripe each side which is connected to the cornea of the median stripe; each group of side eyes is situated on a jet black spot; legs pale, faintly greenish, with a brown preapical band on femora and tibiæ beyond which is a band of pure white. Abdomen rather bluish gray, indistinctly marked with darker patches. Cephalothorax broad and flat, eye-region slightly elevated. The median eyes small and above the anterior laterals. Legs long and very slender. Abdomen elevated behind into a pointed cone; the epigynum prominent.

Two specimens from Hood in May.

CORYSSOCNEMIS INSULARIS sp. nov.

(Pl. I, fig. 6.)

Length 4 mm.

Cephalothorax yellowish, black around eyes, a broad median brown stripe reaches from eyes to near hind margin, suddenly narrowed before dorsal groove, a brown median stripe on clypeus; mandibles pale reddish brown; legs pale brownish, with a very distinct apical white band on all femora and tibiæ; abdomen bluish gray, without marks, paler beneath. Structure as in *C. conica*, but the legs are much stouter and longer than in that species, and the abdomen is not prolonged above in a pointed cone, but broadly rounded behind, although it projects considerably over the spinnerets; the epigynum is large and prominent, reddish brown.

One specimen from Iguana Cove, Albemarle Island; in June.

Family **DYSDERIDÆ.****ARIADNE TARSALIS** sp. nov.

(Pl. I, fig. 9.)

Length 8 mm.

Cephalothorax yellowish brown, scarcely darker in eye-region, side margin black; mandibles dark red-brown, almost black at tips; sternum and legs yellowish, metatarsi and tarsi of anterior pairs dark brown, metatarsus I nearly blackish at tips; abdomen dark gray above, slightly paler beneath; spinnerets pale. General structure as usual; tibiæ I and II with four pairs of stout spines beneath; metatarsi I and II with nine pairs of spines beneath; a few spines on tibia and metatarsus III; no spines on leg IV except small one under base and one at tip of metatarsus.

A few specimens from Culpepper Island, December.

This is not the *Segestria æquatoria* of Marx, which is a genuine *Segestria* of usual appearance; herring-bone mark on back, and banded legs.

Family **DRASSIDÆ.****PROSTHESIMA GALAPAGOENSIS** sp. nov.

(Pl. II, fig. 7.)

Length 5 mm.

Cephalothorax uniform yellowish brown, margins black; mandibles more red-brown; legs and sternum more yellowish; abdomen grayish brown, paler beneath. Posterior eye-row slightly procurved, the P. M. E. oval and touching at hind angles, about their short diameter from the equal P. S. E.; quadrangle of M. E. once and one-half higher than broad, broadest in front: anterior eye-row plainly procurved, A. M. E. rather larger than P. M. E., less than their diameter apart, and still closer to the equal A. S. E. Sternum but little longer than broad, broad in front, but little wider in middle, pointed behind between the hind coxæ. Legs moderately slender, no spines under tibiæ I and II, one at base and one near tip under metatarsi I and II, many on hind pairs, some above. Abdomen one and three-fourths times as long as broad, but little depressed, and not much widened in the middle, truncate at base, pointed behind.

One female from Albemarle taken at sea level near Iguana Cove in June.

PÆCILOCHROA BIFASCIATA sp. nov.

(Pl. I, fig. 4.)

Length 5.5 mm.

Cephalothorax and legs shining yellowish brown; the mandibles and sternum more reddish brown; eyes on black spots; abdomen pale

yellowish, a narrow scarcely visible basal black band, a broad sub-basal band, a still broader, middle band, and two small spots each side near tip, black; spinnerets black; venter pale. Posterior eye-row distinctly recurved; the P. M. E. round, fully their diameter apart, and as far from the equal P. S. E., anterior eye-row procurved, some distance in front of the posterior row, the quadrangle of M. E. being nearly twice as long as broad; A. M. E. larger than P. M. E., less than their diameter apart, and about one-half their diameter from the smaller A. S. E. Metatarsi and tarsi I and II with scant scopulas; three pairs of spines under metatarsus I and II; sternum truncate in front, scarcely wider in middle, blunt behind; abdomen depressed, the male with a basal reddish horny plate extending nearly to middle band.

One male from Narboro in January. Taken from Termite excavations in a piece of dried wood washed ashore near the northeast point of the island.

Family CLUBIONIDÆ.

AYSHA PACIFICA sp. nov.

(Pl. I, fig. 11.)

Length ♂ 4.5 mm.; ♀ 5.5 mm.

Cephalothorax pale yellowish brown; the dorsal groove and an irregular stripe each side not reaching hind margin, brown; eyes on black spots; mandibles dark red-brown; legs pale yellowish, hind tibiæ distinctly banded with blackish near tip; abdomen pale, marked with blackish, a large elongate spot each side near base, followed by a series of small and irregular spots, blackish (in the male these marks nearly cover the dorsum); venter and sternum pale (in male with three median spots on venter). P. M. E. rather larger than other eyes, A. M. E. fully equal to A. S. E.; clypeus very low; mandibles stout, but nearly vertical; legs of moderate length; fold of venter much nearer to base than to tip. Palpus of male small.

Two specimens from Albemarle in January, and one from Chatham in May.

Family AGALENIDÆ.

TEGENARIA DERHAMI Scopoli.

SCOPOLI, Entom. Carniolica, p. 400 (1763).

One specimen from water cask (filled in Tagus Cove, Albemarle Island) on schooner, in February. A cosmopolitan species; the specimen may have come from San Francisco, and not now belong to the Galapagos fauna.

Family **DICTYNIDÆ**.**DICTYNA PARIETALIS** Cambridge.

CAMBRIDGE, Biol. Cent. Amer., Arach. Araneida, 1, p. 171 (1896).

One specimen from Albemarle Island, in March.

Apparently the same as this common Mexican species.

Family **THERIDIIDÆ**.**THERIDIUM MIXTUM** Cambridge.

CAMBRIDGE, Biol. Cent. Amer., Arach. Araneida, 1, p. 206 (1898).

Twenty specimens from Albemarle in March; from James in April; and from Narboro in April. Described from Guatemala; also occurs in Texas, and probably in northern South America. Both pale and dark colored forms were taken on same day and at same place.

THERIDIUM sp.

A small, pale species, with a large globose abdomen. The cephalothorax with a broad black stripe, broader behind than in front; abdomen with a large black basal spear mark, on each side of which is a white mark and a white dot; leg I with reddish at tip of femur and tibia, also on tip of tibia IV.

One female from Albemarle in January. Near to *T. limaense*. Found in a curled leaf, containing also a cocoon and adult of *Aysha pacifica*.

LATHRODECTES APICALIS Butler.

BUTLER, Proc. Zool. Soc. Lond., p. 75 (1877).

Twenty-seven specimens from Bindloe, June; Tower, June; Chat-ham, May, and Charles, May. Described from the Galapagos. It is very much like our common *L. mactans* Koch. Does not appear to have been found on Albemarle, though collecting was extensive there at the proper time.

Theridium carolinum Butl. *ibid.* is, I think, without doubt, a young specimen of *Lathrodectes*.

ARGYRODES JUCUNDUS Cambridge.

CAMBRIDGE, Proc. Zool. Soc. London, p. 326 (1880).

KEYSERLING, Die Spinn. Amer. Therid., p. 190 (1884).

Ten specimens from Albemarle, January, and Narboro, January. Described from Brazil; occurs also in Mexico and extreme southern California.

Family EPEIRIDÆ.

GASTERACANTHA INSULANA Thorell.

THORELL, Nya Exotiska Epeirider; Öfv. K. Vet. Akad. Forh., p. 302 (1859).

Twenty-seven specimens from Albemarle, January and June; Charles, May; Chatham, May; James, April; and Narboro, January. Described from the Galapagos. Recorded by both Butler and Marx. It belongs to a group of species very common throughout the warmer parts of America. Those from Chatham Island have the dorsum mostly black, with two rather small spots on anterior half; in the other specimens these spots cover most of the anterior part of the dorsum.

ARGIOPE ARGENTATA (Fabricius).

Aranea argentata FABRICIUS, Entom. System., II, p. 414 (1793).
Argiopes argentata C. KOCH, Die Arach., v, p. 38 (1839).

Sixty-four specimens from Albemarle, May; Charles, May; James, April; Narboro, April; Hood, May; Bindloe, June; Barrington, May; and Indefatigable, May.

Very common throughout tropical and subtropical America.

EPEIRA OAXENSIS Keyserling.

KEYSERLING, Sitzungsber. d. Isis, Dresden, p. 121 (1863).
KEYSERLING, Die Spinn. Amer., Epeiridæ, p. 238 (1893).
E. cooksonii BUTLER, Proc. Zool. Soc. Lond., p. 76 (1877).
E. vertebrata MCCOOK, Proc. Acad. Nat. Sci. Philad., p. 196 (1888).

One hundred and nine specimens from Albemarle, March; Charles, May; Chatham, May; James, April; Hood, May; Indefatigable (many), April; Barrington, May, and Duncan, May.

E. cooksonii was described from the Galapagos; *E. vertebrata*, from California, and later (McCook, Amer. Spid., vol. III, p. 152), recorded from the Galapagos. Marx has called attention to the fact that the two are one species, and in manuscript also refers them to *E. oaxensis*, with which I fully concur; this last species was described, as its names indicates, from Mexico.

EPEIRA LABYRINTHEA Hentz.

HENTZ, Journ. Bost. Soc. Nat. Hist., v, p. 471 (1847).

Eighty-seven specimens from Albemarle, Charles, Chatham, James, Hood (many), Narboro, Tower, Indefatigable, Barrington, Bindloe and Abingdon Islands, in February, March, April, May and June. Widely distributed throughout North and some parts of South America. Dr. Marx had, in manuscript, proposed to consider this a dis-

tinct species, but many of the specimens agree perfectly with specimens from the United States, and the variations are not extreme.

EPEIRA GREGALIS Cambridge.

CAMBRIDGE, Biol. Cent. Amer., Arach. Araneida, 1, p. 22 (1889).
KEYSERLING, Die Spinn. Amer., Vol. IV, Epeiridæ, p. 177 (1892).

Four specimens from Narboro Island in April.

Described from Panama; recorded by Keyserling from Brazil.

EPEIRA PROMPTA Hentz.

HENTZ, Journ. Bost. Soc. Nat. Hist., v, p. 472 (1847).
E. parvula KEYS., Besch. n. Orbitel., p. 131 (1864).

Eleven specimens from Albemarle, Narboro, and James islands, in February, March, and April. Described from the United States; occurs quite commonly in Mexico and Central America. An extremely variable species, but these specimens are of an ordinary form.

CYCLOSA CAUDATA Hentz.

HENTZ, Journ. Bost. Soc. Nat. Hist., VI, p. 23 (1850).

Sixty-five specimens from Albemarle, Hood, Narboro and Indefatigable islands, in January, February, March, April and May. A species widely spread over the United States, Mexico and Central America.

ARGYROEPEIRA NIGRIVENTRIS Keyserling.

KEYSERLING, Neue Spinn. a. Amerikas, I, p. 316 (1879).
A. fragilis CAMBRIDGE, Biol. Cent. Amer., Arach. Araneida, I, p. 6 (1889).
A. volupis KEYSERLING, Die Spinn. Amer., Vol. IV, Epeiridæ, p. 356 (1893).

Ten specimens from Albemarle, Narboro, and James islands in February and April. Described from New Granada (Colombia); recorded by Cambridge from Guatemala, and by Keyserling from Brazil. One specimen comes from Cocos Island.

TETRAGNATHA GALAPAGOENSIS sp. nov.

(Pl. I, fig. 10.)

Length ♀ 10 mm., ♂ 7 mm.

Cephalothorax, mandibles and legs pale yellowish, eyes on black spots, fang of mandibles dark red-brown, tips of legs dark; abdomen brownish yellow, with a pale irregular stripe around base and on sides, indistinct in the male, venter in the female with a median brown stripe. Eyes with S. E. as widely separated as M. E., and A. S. E. rather smaller than the others. Mandibles in both sexes as long as

the cephalothorax, deflected at angle of 45° , slightly divergent, sub-cylindrical, seen from the side scarcely convex above. In the male there is, on the under side, a row of about twelve teeth at nearly equal distances apart, those at the tip stouter but not much longer than those toward base; above there are three large subequal teeth near tip, on inner side four, a small one near base, close to it one of the others, these three being subequal in size and very much smaller than those at tip. The fang reaches in an even curve almost to the base of mandibles, its apical third on inner margin is microscopically denticulate. In the female there is one tooth over base of fang, and one near apical fourth, on inner margin; below there is a row of six to eight small teeth; the fang at base beneath is swollen in a blunt tooth. Legs moderately slender, femur I fully twice as long as cephalothorax. Abdomen about twice the length of the cephalothorax, in male nearly cylindrical, in female swollen at base above. The tibia and patella of male palpus are subequal in length, femur very long.

Twenty-two specimens from Albemarle and Narboro islands in February and March. Differs from all described species in the armature of the male mandibles.

Family THOMISIIDÆ.

TMARUS STOLZMANNI Keyserling.

(Pl. II, fig. 5.)

KEYSERLING, Die Spinn. Amer., Laterigradæ, p. 138 (1880).

Two specimens from Albemarle Island in March. Described from Peru. It agrees with the description and figure, except that there is a broad brown stripe on the venter of these specimens as usual in the genus. The agreement of the male palpus makes the identification certain.

MISUMENA INCLUSA sp. nov.

Length 6 mm.

(Pl. I, fig. 12.)

Cephalothorax pale yellowish, side of caput rather darker; eye region surrounded by a white line leaving only an opening behind between the P. M. E.; a faint white median line on caput; legs pale yellowish, unmarked, spines black; sternum yellowish; abdomen pale grayish above and below. Quadrangle of M. E. slightly broader above, about as high as broad above; eyes of posterior row subequal in size; A. S. E. larger than A. M. E. which are about equal to P. M. E., eyes of anterior row at subequal distances; tibiæ I and II scarcely as long as cephalothorax, beneath with two rows of

four spines; metatarsi I and II with five pairs beneath; none on the femora; abdomen convex, broadest beyond the middle.

The male has a brown stripe on each upper side of the cephalothorax; eye region as in female; legs I and II with the greater part of patellæ, apical third of tibiæ, apical two-thirds of metatarsi, and apical half of tarsi, red-brown; a red-brown stripe on each side of abdomen, and a series of median marks above.

One pair from Tagus Cove, Albemarle Island, in March.

Family SPARASSIDÆ.

HETEROPODA VENATORIA Linn.

LINNÉ, Syst. Nat., Ed. x, p. 1037 (1758).

Aranea regia FABRICIUS, Syst. Ent., II, p. 408 (1793).

Six specimens from Charles and Chatham, in May. A common and widely distributed tropical spider; its northward range extends through the extreme southern parts of the United States.

SELENOPS GALAPAGOENSIS sp. nov.

(Pl. 1, fig. 8.)

Length 12 mm.

Cephalothorax reddish; side-margins, dorsal groove and around eyes, black; mandibles red-brown; legs pale, metatarsi black, femora and patellæ marked above with blackish bands, those on tibiæ are often darker, confluent, and extend around the joint; sternum paler, apparently slightly bifid at tip; abdomen pale brown above, paler below, above with blackish markings more or less plain, a basal spear-mark and side spots. The epigynum differs much from *S. aissa* Walck, and *S. spixi* Perty.

Six specimens from Chatham and Albemarle in February.

OLIOS GALAPAGOENSIS sp. nov.

(Pl. 1, fig. 7.)

Length 16 mm.

Cephalothorax yellowish, darkest in front; mandibles black; legs yellowish, metatarsi and tarsi brown; sternum pale yellowish; maxillæ and lips, except tips, dark brown; abdomen brownish above, with a basal darker spear-mark, margined with pale spots; venter pale, with a median brown stripe. Extremely similar to *O. fasciculatus* of Mexico and the southwestern United States. Differs in the rather smaller size, and proportionately longer legs, most noticeable when comparing leg II where the tibia plus patella of *O. fasciculatus* is only equal to the tibia of *O. galapagoensis*.

Fourteen specimens from Chatham, Albemarle and Narboro in January and March.

Family CTENIDÆ.

ODO INSULARIS sp. nov.

(Pl. I, fig. 14; Pl. II, fig. 12.)

Length ♀ 17 mm., ♂ 13 mm.

Cephalothorax yellowish brown, with a broad black stripe on each side, leaving an equally broad median area, side-margins black, eye-region black; mandibles black, red-brown on tips; legs yellow-brown, the tibiæ with black bands at base and beyond middle; palpi blackish on last joint; sternum red-brown, blackish on sides; abdomen blackish above, with an irregular pale central area, broken into spots behind; venter pale, with a few scattered dark dots. Eyes as figured for *O. agilis*; mandibles long; lip broader than long; sternum broad; legs long and stout, three pairs of spines under tibiæ I and II, two under these metatarsi, several spines above on tibiæ. Legs of male very slender.

A few specimens from Tagus Cove, Albemarle Island, in February and March.

ODO GALAPAGOENSIS sp. nov.

Length 12 mm.

(Pl. II, fig. 2.)

Cephalothorax clear yellowish, black side-margin; eye-region black, and a broad black stripe on each side, leaving a broad area which narrows behind head, then suddenly widens to surround the black-margined dorsal groove; mandibles red-brown; sternum yellow-brown; legs yellow-brown, usually with apical bands on femora, and basal and preapical ones on tibiæ; dorsum of abdomen mottled with gray and black, below pale, with a few black dots. The S. E. of posterior row are not so far back as usual, the S. E. of lower row are rather oblong, the two rows rather closer together than usual; lip broader than long; sternum broad; legs slender, but two pairs of spines under tibiæ I and II, and two under these metatarsi; no spines above on anterior tibiæ, but several on posterior.

A few specimens from Hood in May, Tower in June, and Chatham in May.

Family LYCOSIDÆ.

LYCOSA GALAPAGOENSIS sp. nov.

Length 12 mm.

(Plate II, Fig. 3.)

Cephalothorax yellowish brown, with a pale stripe through the middle, narrow on eye-region, widened behind, then suddenly constricted,

then slightly widened again, then tapering to hind margin; the lateral margins irregularly pale; eye-region black; mandibles dark red-brown; palpi yellow-brown, the last joint blackish; legs yellow-brown, usually showing faint darker bands on femora and tibiæ, especially of those of the hind pairs, the tarsi of anterior pairs darker; sternum and maxillæ reddish brown; abdomen blackish above, with a spear-mark at base, margined each side by pale; venter pale. Anterior eye-row nearly straight, the M. E. about one-half their diameter apart, slightly farther from the subequal S. E., eyes of second row less than diameter apart, eyes of third row equal to those of second; legs moderately stout, on leg I three pairs of spines under tibiæ, the basal pair as long as width of joint, two pairs under metatarsus I.

Several specimens from Iguana Cove, Albemarle Island, in December and June; and Chatham, in May.

LYCOSA ALBEMARLENSIS sp. nov.

(Plate II, Fig. 10.)

Length 12 mm.

Cephalothorax brown; a narrow median pale stripe starting in eye region and reaching hind margin, of nearly even width throughout, and a submarginal pale stripe each side; in the brown near the median stripe is an indistinct oblong pale spot; eye region black; mandibles light yellow-brown; legs and palpi brownish yellow, darker on tips, rarely with indistinct bands; sternum and maxillæ yellowish; abdomen black, a spear-mark at base, margined by pale, which behind is broken into spots; venter pale. Anterior eye-row slightly recurved, M. E. less than one half their diameter apart, plainly farther from the slightly smaller S. E.; eyes of second row less than their diameter apart; legs of moderate size, tibia I with three pairs of spines beneath, the basal pairs much longer than width of tibia; metatarsus I with two pairs of long spines on basal half beneath.

Several specimens, all from Albemarle, in January.

LYCOSA SNODGRASSI sp. nov.

(Plate II, Fig. 1.)

Length ♀ 16 mm., ♂ 13 mm.

Cephalothorax brown, with a rather broad pale median stripe, starting as a line between eyes of the second row in front; dorsal groove, with a small indentation each side, a submarginal pale stripe each side quite close to the margin; eye region and mandibles black; legs and palpi brownish yellow, darker on metatarsi and tarsi; sternum and maxillæ dark; abdomen dark brown above, in female scarcely

marked, in male with a large basal pale area containing a dark spear-mark; venter pale or light brown. Anterior eye-row slightly procurved, the M. E. less than one-half their diameter apart, much farther from the plainly smaller S. E.; eyes of second row a little less than diameter apart; legs stout; on tibia I three pairs of spines beneath, the basal pair (in the female) much shorter than width of the tibia, in male longer; on metatarsus I two pairs of short spines, in male long ones.

A few specimens from Albemarle in June, Hood in May, and Chatham in May.

Family ATTIDÆ.

PLEXIPPUS PAYKULLI Aud. et Sav.

AUDOUIN et SAVIGNY, Descr. d. l'Egypte, xxii, p. 172 (1827).
Attus ligo WALCKENAER, Ins. Aptères, I, p. 426 (1837).

Two specimens, one from Tagus Cove, Albemarle, March, the other from James in April. A common tropical spider, extending northward into the southern parts of the United States.

MARPTUSA CALIFORNICA Peckham.

PECKHAM, Attidæ of N. Amer., p. 81 (1888).

One male from Albemarle, in March. Does not appear to differ from typical Californian specimens. Known also from Mexico.

CYRBA INSULARIS sp. nov.

Length 6.7 mm.

Cephalothorax black, abdomen dull black above and below, no trace of the white lines seen in *C. tæniola*, but venter with a row of pale dots each side; legs brownish yellow, the first pair darkest, though none are black on any of the joints; palpi pale; sternum reddish brown. Cephalothorax flat, similar to *C. tæniola*, as is the structure throughout. Epigynum shows a pale cavity nearly as broad as long, traversed by two red parallel lines connected behind.

One specimen from Tagus Cove, Albemarle Island, in January.

ADMESTINA INSULARIS sp. nov.

(Plate II, Fig. 4.)

Length 3.8 mm.

Black, with black, white and yellow hairs, the white and yellow slightly scale-like; cephalothorax with mostly black hair, a narrow white side-margin; abdomen above and below sparsely, but regularly clothed with white hairs and a few yellow ones on middle of sides

above, not enough to form markings; legs black, the coxæ, patellæ and a band on tibiæ and tarsi of hind pairs pale, and here clothed with white hair; some white hair above on basal joints of palpi. Cephalothorax long, narrow and flat, thoracic part scarcely widened; anterior eye-row slightly up-curved, the eyes of second row rather nearer to those of the third row than to laterals of first row. Legs short, I the stoutest, especially the tibia, which is sparsely clothed with long fine black hairs; legs without spines, except two on anterior metatarsi and some weak ones at tips of tibiæ III and IV; some stiff bristles above on the femora. Lip much longer than broad; anterior coxæ separated by width of lip, hind coxæ contiguous, abdomen long, slender, depressed; spinnerets distinct.

One male from Mangrove Point, Narboro Island, in April.

Appears to be as close to *Admestina* as to any genus yet described.

PHILÆUS PACIFICUS sp. nov.

Length 4 mm.

Cephalothorax reddish brown, darkest in eye region, in male there is a white stripe each side of eye region, but no trace of white median spot; legs and mandibles yellowish brown, leg I quite dark, hind pairs often pale; abdomen margined with a whitish stripe; in female pale above, with four pairs of black spots; in male shining brown, with three pairs of white dots. Mandibles of male elongate and porrect. Similar in structure to *P. militaris*, but smaller.

Five specimens from Albemarle and Narboro in January and April.

Order ARTHROGASTRA.

PHRYNIDA.

CHARINUS INSULARIS sp. nov.

(Pl. II, fig. 8.)

Length 9 mm.

Cephalothorax, mandibles and palpi red-brown; legs more yellowish; abdomen light brown above; coxæ and venter paler. Cephalothorax very broad and short; palpi of usual length; femur in front above with three short spines, below three longer ones, the basal one the longest; the tibia has above in front five spines, the first near the middle being short, the next three increasing in length, and the fifth shorter than the second; below there are two spines, the apical the longer; the hand has on inner side two spines, the apical much the longer, and on outer side near tip one spine; legs short, hind tibiæ four-

jointed, the basal joint as long as the three others; metatarsus as long as first joint of tibia; tarsus tipped with a pulvillus; sternum is rather small.

Eight specimens from Albemarle, Narboro, Chatham, and Hood in March and May.

This genus is found only in Australia, in islands of the Pacific, and in southern Asia.

SCORPIONIDA.

HADRUIOIDES LUNATUS Koch.

KOCH, Verh. zool. bot. Ges., Wien, p. 235 (1867.)

H. maculatus THORELL, Atti Soc. Ital., XIX, p. 186 (1877).

H. charasus KARSCH, Mitt. Münch. Ent. Ver., III, p. 135 (1879).

Nineteen specimens from Albemarle, James, Barrington and Narboro, in March, April and May.

Distributed along the coast region of western South America.

CENTRURUS PRINCEPS Karsch.

KARSCH, Mitt. Münch. Entom. Ver., III, p. 121 (1879).

KRAEPELIN, Mitt. Mus. Hamburg, VIII, p. 139 (1891).

Six specimens from Hood and Chatham in May. Previously known only from Hayti, but the specimens agree with this species in all important particulars. The hand is hardly fuscous; the body is pale brownish, sometimes with traces of transverse dark marks; one specimen shows the region between the submedian ventral keels darker than elsewhere; there are ten full keels on segments one to three; on under side of fifth segment is a median keel, also a lateral keel and a submedian keel, which latter, however, is not complete but lost in the granulation of the general surface; the tubercle under the sting is very small; the fingers show the lobe and cavity as described by Karsch. The largest specimen is about 44 mm. long.

PSEUDOSCORPIONIDA.

ATEMNUS INSULARIS sp. nov.

(Pl. II, fig. 11.)

Length 3.7 mm.

Cephalothorax and abdominal scutæ yellowish brown, darker on anterior half of cephalothorax; palpi reddish brown, darkest on fingers; legs pale. Cephalothorax rounded in front, once and one-third as long as broad; at anterior third there is a short transverse depression; on anterior margin are two white eye-spots. Mandibles

small; lower finger with a minute stylet near tip. Palpi large, stout; femur broadest near base, convex on inner side near base; tibia about equal to femur, convex each side; hand stout, tapering each side to the fingers, which are much shorter than the hand. The trochantins show plainly in all legs. Abdomen elongate, nearly three times as long as cephalothorax, the scutæ entire; body and appendages sparingly clothed with simple hairs.

Seventeen specimens from Albemarle in January and February.

CHELANOPS NIGRIMANUS sp. nov.

(Pl. II, fig. 6.)

Length 2.9 mm.

Cephalothorax nearly black; palpi dark red-brown, black on hand, nearly so on base of femur and middle of tibia; legs pale greenish brown; abdominal scutæ reddish brown. Cephalothorax much tapering in front, with an eye-spot on each side; palpi moderately long; femur subcylindric, about as long as cephalothorax is broad in middle; tibia fully as long as femur, long pedicellate, inner margin slightly concave before tip; hand nearly twice as broad as femur, rounded at base, tapering each side to fingers, which are plainly, though not greatly, shorter than the hand, and slightly curved; on the trochanter, femur and tibia the hairs are short and thick, but not plainly clavate; similar hairs border the abdominal scutæ.

One specimen from Albemarle in March.

SOLPUGIDA.

AMMOTRECHA SOLITARIA sp. nov.

(Pl. I, fig. 5.)

Length, without mandibles, 10 mm.

Cephalothorax uniform dull brown; mandibles brown above; fingers red-brown; legs and palpi pale yellowish, the femora, tibiæ and base of metatarsi of hind pairs blackish brown; abdomen uniform dull brown above, paler beneath. Cephalothorax with a median furrow, eye-tubercle slightly elevated; eyes scarcely their diameter apart; palpi short and slender, the tibia equal to femur, the metatarsus one-half the length of the tibia, the tarsus two-thirds the length of the metatarsus. The movable finger of the mandibles has two large teeth, and one small tooth at the base of the first large one; the upper finger has three small teeth, then a large one with a small one on its outer base, then two rather small teeth; there is a small ridge above on the finger.

One specimen from Iguana Cove, Albemarle Island, in December.

Order *ACARINA*.

Family *IXODIDÆ*.

AMBLYOMMA PILOSUM Neumann.

NEUMANN, Mém. Soc. Zool. France, p. 209 (1899).

Many specimens from Albemarle in March; one from Narboro in April. Described from the Galapagos Islands from a specimen in the Marx collection.

ARGAS TRANSVERSA sp. nov.

(Pl. II, fig. 9.)

Length 1.1 mm.; width 2.1 mm.

Blackish, legs paler. Body flattened, nearly twice as broad as long; around the margin are rows of tubercles, each bearing a short stiff bristle, the upper row with the longest bristles; the surface above is traversed by many irregular lines, dividing the surface into irregular flattened elevations; a median and two lateral depressions and two behind; below granulate on sides; behind the legs the surface is clothed with yellowish sharp denticles; legs short, scarcely visible from above, hairy; mouth-parts small.

One specimen from Tagus Cove, Albemarle Island, in February. Easily recognized by shape of body.

Family *TYROGLYPHIDÆ*.

TYROGLYPHUS sp.

A few specimens from Narboro Island, in March. Not sufficient material for determination.

PART II.

FIELD NOTES ON SPECIES DESCRIBED IN PART I.

BY ROBERT E. SNODGRASS.

SICAROIDES ULTRIFORMIS.

Rare; secured at only one place in the archipelago, viz., under rocks on flat area at top of cliffs west of Gardner Bay, Hood Island. The soil at this place and the unweathered under sides of the surface rocks are of a bright brick-red color. All the individuals of this spider seen were also of this same color. They were, accordingly, inconspicuous so long as they remained quiet. Several other normally colored species occurred at the same place.

The eggs are inclosed in a cup-shaped case, having a flat top with a projecting rim (Plate III, fig. 9). A nest secured is composed of fine particles of earth held together in a delicate network of threads (Plate III, fig. 10), having, consequently, the same color as the rock to which it was attached, and, were it not for its extraordinary shape, would appear to be a part of it. The nest was taken in April. In September numerous young spiders had emerged through a transverse slit-like opening near the top, extending so far around that the top was almost separated from the rest like a lid.

LOXOSCELES LONGIPALPIS.

All the Hood Island specimens were taken at the same locality as the last species. They occurred in the crevices of rocks lying on the surface. Some were without webs, others had an irregular one spun about them in the recesses of the rock.

CORYSSOCNEMIS CONICA.

Found only on Hood Island, under rocks at top of cliffs west of Gardner Bay, along with last two species. Spins an irregular web on the under surfaces of rocks. Exceedingly swift in its movements. On disturbing one it first darted out of its web, then as quickly back again, and, clinging to the center, vibrated it so rapidly as to be almost invisible.

AYSHA PACIFICA.

Rare in the archipelago. The Albemarle specimens were both taken in the Turtle Point mangrove swamp. One was secured in a net by beating the leaves of the trees, the other was taken with its

cocoon within the cavity of a dead pendent mangrove leaf having the two edges rolled together (Plate III, fig. 2). The Chatham specimen was taken from an exposed cocoon containing the adult and numerous young ones.

DICTYNA PARIETALIS.

Only one specimen seen. Taken at Tagus Cove, Albemarle Island, from irregular network of straight threads spun about the end of an acacia twig.

THERIDIUM MIXTUM.

Found only on Albemarle, Narboro and James Islands. On Albemarle the species was found only on the dryer parts of the island. It was abundant in the dry, brushy region surrounding Tagus Cove, but none were found at Iguana Cove or in the mangrove swamps. Of the two Narboro specimens one is from the southeast side of the island at an elevation of about 1,500 feet, the other is from the mangrove swamp at Mangrove Point. The James specimens were taken at James Bay.

The webs constructed by this species on the Galapagos Islands generally consist of a large and irregular network of threads spun across one another in all directions, most frequently attached to the side of the trunk of a Palo Santo tree (the only tree of the islands) or suspended between the trunks of two neighboring trees. One was found in the hollow of a dead Palo Santo stump. Often the web has the form of a flat sheet. Two specimens taken at Tagus Cove had apparently appropriated deserted webs of *Epeira labyrinthea*, since they were found in webs consisting in part of a network like that spun normally by their own species, but having connected with it also a regular orb.

The spider remains in the center of the web concealed beneath a shelter formed of bits of foreign material generally taken from the immediate vicinity, and resembling an accidental accumulation of such matter. For example, hiding places of webs in acacia bushes were generally made of bits of acacia leaves; the hiding place of one suspended in the hollow of a dead stump was made of pieces of dead wood, while hiding places of webs on the sides of trees frequently had bits of bark in them. The one specimen from James Island had its hiding place formed of a small sheet of closely-spun silk in the center of the web, together with a few bits of dead twigs and a dried leaf. In one case the spider had for its nest a curled leaf bent into a U-shape, suspended at the center of the web with the arms hanging downward (Plate III, fig. 6). Beneath the middle of the leaf is an inverted cup-shaped cavity used by the spider as its retreat. In another web was

found a large, elaborate and artistically constructed nest (Plate III, fig. 5) made of twigs and leaves, and so bound together with threads as to form, beneath and within the mass, a spacious chamber accessible through a circular opening in one side. To the upper part of the side of this nest are attached two small spherical egg cocoons (*eg*).

LATHRODECTES APICALIS.

For the most part rare in the archipelago. Common only on Charles where they were found in May about Black Beach and were especially common along the lower part of the road leading from the beach to the upper parts of the island. They live here in cavities of lava fragments lying loosely on the ground, spinning an irregular web about the entrance to their retreat. The spiders usually keep out of sight, but may generally be found in some crevice or hole of the lava blocks near the web.

On Chatham only a few individuals were seen, and the species was rare on Tower. On Bindloe it was rather abundant. The webs were here generally on the ground at the side of loose stones, or had one edge attached to the stone and the other to the ground. The spiders themselves hid, as did those on Charles Island, in crevices of the stones near the webs.

ARGYRODES JUCUNDUS.

Mostly taken from the web of a *Gasteracantha insulana*, some taken from small orbs attached to large ones of this species, one taken alone in an isolated orb. In the first two cases the *Gasteracantha* webs were occupied also by their proper owners.

GASTERACANTHA INSULANA.

Common on all the islands on which it occurs, except James. Has no special habitat. About Tagus Cove, Albemarle, equally abundant on the dry hillsides and in the wettest parts of the mangrove swamps; common also in the Narboro mangrove swamps, but very scarce in the swamps of Elizabeth Bay, Albemarle; abundant at sea level at Iguana Cove, Albemarle, and specimens found here also at 2,000 feet elevation.

The species constructs large regular orbs always vertical or nearly so. The spiders are conspicuous everywhere on account of their color and are easily captured for they make no attempt to escape or to deceive the intruder. Apparently they have no natural enemies on the islands.

ARGIOPE ARGENTATA.

This spider is common on most of the larger islands. It constructs large regular orbs, each having a conspicuous white zig-zag band spun across the center, remaining itself at the center of the orb with the abdomen directed upward and away from the web. When approached it leaps through one of the meshes of the web and assumes a similar position on the side away from the intruder so quickly that one does not easily observe the change of position, noticing only a sudden movement of the spider.

In January small individuals were abundant in the patches of salt grass growing along the inner edge of the mangrove swamp at Turtle Point, Albemarle. These constructed three sorts of webs. One was a plain simple orb, another had the white zig-zag line through the center, or several such lines, the third had a white central disc formed of a thread spun irregularly but closely over the hub of the orb. The spiders in these webs with central discs first reversed their positions on the web when disturbed, and then, if further annoyed, dropped into the grass; those in the other webs dropped at once.

Egg cocoons may be hung directly in the orbs, but are more frequently suspended in straight lines spun miscellaneously at one side of the orb. A large number of spiders often inhabit a small bed of cactus, the space not occupied by their orbs being mostly taken up with a network of straight lines bearing egg cases. These are flat (Plate III, fig. 8), all of some shade of green or yellow, and have the edges drawn out into angular lobes where the supporting threads are fastened.

The species is pretty generally distributed, living in barren as well as in fertile places. It is infrequent within the mangrove swamps, but their edges form a favorite habitat.

EPEIRA OAXENSIS.

By far the most abundant spider of the archipelago, but absent on all the northern islands—Abingdon, Bindloe, Tower, Wenman and Culpepper. Predominates on all the islands in its range except on Hood where it is surpassed in numbers by *Epeira labyrinthea*. They construct large strong-threaded orbs between bushes at a height of from one foot to six or seven feet. At Iguana Cove, Albemarle Island, the webs were so numerous that scarcely any two neighboring bushes were without at least one web between them, and often a narrow passage in the vegetation would be spanned by many webs placed abreast of one another. Walking here was very disagreeable on ac-

count of the webs. At James Bay, on James Island, the species was present in enormous numbers, being here even more numerous than at Iguana Cove. On Charles the webs were of such strength that they often entangled and firmly held the large powerful variety of *Schistocerca melanocera* that occurs here. On the other islands the species was less numerous, though abundant on Chatham and Indefatigable.

EPEIRA LABYRINTHEA.

Most widely distributed spider of the archipelago—unknown only on Duncan, Wenman and Culpepper. Second in numbers to *Epeira oaxensis*; predominates over this species on Hood Island, where individuals are also of unusually large size. The species occurs wherever there is vegetation, but not on the barren lava fields.

The webs are of the ordinary form as made by the species elsewhere, consisting of an orb and labyrinth. The hiding place in the center of the labyrinth consists ordinarily of a few bits of leaves. Anomalous forms, such as the following, are frequently met with. A Tagus Cove spider had the labyrinth spun about the end of a twig of cotton, and made the tip of the twig serve as a hiding place. A web was found on the northern Seymour Island consisting merely of a vertical orb a few inches from the ground, suspended above by a long horizontal thread attached at each end to bushes. In the bush at one end of this line was a very small labyrinth consisting of a few short threads spun irregularly across one another. In this was suspended an egg cocoon at the lower end of which the spider had her retreat. In some cases hiding places consisted of a small sheet of white silk suspended horizontally in the center of the labyrinth, sometimes with bits of foreign matter attached. A Barrington spider had its orb inclined at an angle of about forty-five degrees and the nest was suspended by means of a few threads near the upper edge of the orb.

The Hood Island individuals, in nearly all cases, constructed very scanty labyrinths. They generally consisted of merely a few lines radiating outwards from the hiding place, or egg cocoon, to convenient points of attachment. There were commonly only about five of these lines, and they usually lay all in one vertical plane, parallel with the orb. The number of lines observed varied from two to eight. Where but two were present, one extended upward and the other downward, virtually, one line. One web was found on this island constructed on more nearly the ordinary type, having the labyrinth composed of a large number of threads, but in this case even, most of the threads lay in a plane parallel with the orb. Labyrinths of these styles are

frequently met with on the other islands but are by no means the prevailing types. Two individuals were found on Hood Island having each an orb but no labyrinth. In each case the spider was at the center of the orb on a small vertical sheet of closely spun silk.

Males are infrequently met with; only one was found having an orb web, two were taken in labyrinths without orbs; all the other males of the collection were taken from the webs of females.

The eggs are enclosed in elongate, conical cases (Pl. III, fig. 7) hung vertically in the center of the labyrinth, and often decorated on the outside by bits of dried leaves. A cavity in the lower end of the cocoon serves the spider as a hiding place, the original one being discarded when the cocoon is formed. The interior of the cocoons (Pl. III, fig. 1) is divided by horizontal septa into several superimposed chambers. In each is placed a spherical mass of eggs covered over with a soft and rather thick covering of silk, but the entire pellet does not nearly occupy all of the cell.

EPEIRA GREGALIS.

Found at only one place in the archipelago, viz., at Mangrove Point, Narboro Island. One specimen was taken from an empty basal capsule of a mangrove pod. At the side of this was a horizontal orb web connected with the cavity of the capsule by a gangway of threads. All the other specimens were taken from a colony of eight nearly vertical orbs and numerous intersecting lines spun miscellaneously amongst the forks of a piece of dead mangrove wood lying on the beach. Three of the orbs were occupied by a spider at the center. Attached to the straight threads at the side of the empty webs were a number of egg cocoons, some of them open and some of them closed. Two adult spiders were taken from closed cocoons; one was taken from an open case in which were also numerous moulted skins of young spiders.

EPEIRA PROMPTA.

The webs of this species are the same as those of *Cyclosa caudata*, consisting of a vertical orb with a long horizontal line above. On Albemarle the species was found only amongst the bushes in the small canyon at the head of Tagus Cove. On Narboro it was common on the lava fields along the eastern shore. The webs were here mostly stretched across fissures in the lava. Early in the morning the spiders were to be found in the centers of their webs, but an hour or so later none were to be seen. When disturbed they ascend the orb to the horizontal line at the top and run along this to the rock at one side, hiding there in some crevice.

CYCLOSA CAUDATA.

Most abundant on the lava fields of Albemarle north and east of Tagus Cove and west of Elizabeth Bay, and on Narboro along the east shore; a few found in the brushy vegetation immediately about Tagus Cove; rare at James Bay on James Island and on the southern Seymour Island; found elsewhere only on Hood. On the last island there are no open lava fields. The species, though not abundant on Hood, was not scarce, and its webs were nearly always to be found in open rocky places.

In its habits this species, on the Albemarle and Narboro lava fields, was almost gregarious, for wherever found there were generally present in the immediate vicinity a large number of individuals. They constructed their webs under projecting ledges of lava, between neighboring lava blocks, amongst the multitude of sharp pinnacles and rough prominences of the lava surface, but especially in the fissures of the lava. In fissures three to four feet wide often a great many webs occurred close to and parallel with one another stretched across from one side to the other. In one such crack in the lava field, inland about a mile from Tagus Cove, were counted fifty parallel webs of this species in a length of about fifteen feet.

The webs are vertical orbs generally supported above by a thick, straight, horizontal line having accessory stay lines running from it to the webs at the sides of and below the orb. The spider occupies the center of the orb, and usually, not always, when approached, first rapidly vibrates the web, then if the intruder approaches still nearer and attempts to molest the spider or even touches the web, ascends to the upper horizontal line and runs along this toward the support at one end. If still further annoyed the spider closes its legs beneath the body and drops to the ground, where it relies for protection on its remaining motionless and on its resemblance to the particles of lava and soil amongst which it has fallen.

Egg cocoons were found in several webs at Tagus Cove, in March. The cocoons were elongate papery cases attached to a thick vertical thread, running from the center of the orb in some cases to the upper horizontal line, and in others to a support several feet above the orb.

ARGYROEPEIRA NIGRIVENTRIS.

A rare Galapagos species. Found on Albemarle only in the mangrove swamps west of Elizabeth Bay. The Narboro specimen was taken on the southeast slope of the central mountain at an elevation

of about 1,500 feet. Almost the entire surface of this island consists of barren lava of apparently recent date. A few small scattered remnants of an older and rather luxuriant vegetation, however, have been left uncovered, and it was on such an oasis that the specimen of this species was taken. It was the only Epeirid found here. The single James Island specimen was taken at James Bay.

This species is the most common Arachnid of Cocos Island, where it generally constructs a fine, light and very delicate orb, but often simply an irregular network of straight threads.

TETRAGNATHA GALAPAGOENSIS.

Taken only on Narboro Island at Mangrove Point and on Albemarle Island west of Elizabeth Bay. The webs are generally horizontal. The Narboro specimens were taken in mangrove swamps. Some of the Albemarle specimens are from reedy swamps back of the mangrove swamps along the shore, and others were taken on the barren lava, where they were associated with *Cyclosa caudata*.

TMARUS STOLZMANNI.

Both specimens taken in the small brushy canyon at head of Tagus Cove, Albemarle. When disturbed they attempt to escape notice by remaining perfectly motionless on a twig, with the long anterior legs stretched out straight in front of the body.

MISUMENA INCLUSA.

Specimens all taken under bark of trees. The Albemarle specimens are from the Elizabeth Bay mangrove swamps. None could be found in the Turtle Point swamp on Albemarle, which swamp is, with regard to all other species, much richer than the Elizabeth Bay swamps.

HETEROPODA VENATORIA.

Common on Charles and Chatham Islands under stones, beneath bark of trees and in houses. Charles and Chatham are the only islands that have been inhabited for any length of time.

OLIOS GALAPAGOENSIS.

Found only at Tagus Cove, Albemarle, on Chatham and on Narboro. Taken at Tagus Cove from sea level to top of neighboring mountain—4,000 feet; found on ground and in holes of large carpenter bee (*Xylocopa*) in branches of bushes.

Three egg-cocoons were secured—one on Chatham, one on Albemarle and one on Narboro. The Chatham nest (Plate III, fig. 3) is ovate, the longer diameter an inch and a half, and is composed of a tough, papery web-fabric. It was attached in an upright position by its larger end to an Acacia branch about six feet above the ground. There was no opening, but within was an adult female and a packet of eggs. The Albemarle nest resembles the Chatham one, but is smaller and has an opening in the top closed by a flap which the female within drew tightly shut when disturbed by thrusting one of her legs over the outside of it. In this one were the adult female and numerous young spiders. The Narboro nest (Plate III, fig. 4) differs from the other two. It consists of a silken cell attached to the upper surface of a flat mangrove leaf, and has two curled leaves closely fastened down to its top and sides, being thus flattened, and wholly hidden within the leaves. It had no opening, but contained, as did the Chatham nest, a packet of eggs, and an adult female who was very active when liberated. The eggs, in both cases, were held in a spherical mass by a very gauzy silk wrapping.

ODO INSULARIS.

Specimens taken on the ground under logs about Tagus Cove, Albemarle.

LYCOSA GALAPAGOENSIS.

Found rather abundant on Chatham Island about Wreck Bay and in the higher cultivated parts. The Albemarle specimens were taken at sea level near Iguana Cove. Not met with elsewhere in the archipelago.

LYCOSA ALBEMARLENSIS.

Taken only in the long wet salt grass growing about the inner edge of the Turtle Point mangrove swamp, Albemarle Island.

LYCOSA SNODGRASSI.

Taken on Chatham and Albemarle at the same localities as *Lycosa galapagoensis*. The Hood specimens were secured under rocks near Gardner Bay.

PHILÆUS PACIFICUS.

The Narboro specimen was taken from the inside of a silk cocoon, otherwise empty, attached to a mangrove leaf in a swamp at Mangrove Point.

CHARINUS INSULARIS.

Rather rare in the archipelago; found on the ground under logs and stones. The Albemarle specimens were taken at Tagus Cove in

very dry places; those from Narboro were found at an elevation of 1,500 feet on the side of the central mountain of the island.

HADUROIDES LUNATUS.

Found more numerous about Tagus Cove on Albemarle than anywhere else in the archipelago. Not abundant, however, here. Found under bark of trees and beneath logs and stones, often in excessively dry places. One specimen was dug up from eight inches below the surface and another found at top of Tagus Cove mountain, 4,000 feet.

CENTRURUS PRINCEPS,

Rather abundant under rocks on Hood Island. On Chatham found only at an elevation of 1,000 feet in the interior of island.

ATEMNUS INSULARIS.

Found only on Albemarle. Rather common under the bark of trees in the Turtle Point mangrove swamp. A diligent search in the swamp at Elizabeth Bay at the same time of year yielded only one specimen.

CHELANOPS NIGRIMANUS.

This Pseudoscorpion apparently has a very different habitat from the last. The single specimen obtained was found within the hollow of a dead twig of a bush in the small, very dry valley at the head of Tagus Cove, Albemarle. The cavity in the twig opened to the exterior by a small round hole in one side.

AMMOTRECHA SOLITARIA.

Only one individual met with. Found under a log at Iguana Cove, Albemarle.

AMBLYOMMA PILOSUM.

Extremely abundant on the land tortoises of the archipelago. Found adhering, often in great numbers, to the loose skin of the neck and about the bases of the legs and tail. Abundant also on the vegetation of Albemarle, but not found on birds.

ARGAS TRANSVERSA.

The single specimen taken was found on a leaf of a bush growing at an altitude of 1,200 feet on the Tagus Cove mountain.

TYROGLYPHUS sp.

All taken from orb-webs on the lava fields of Narboro near Mangrove Point.

PLATE I.

- FIG. 1. *Coryssocnemis conica*, cephalothorax.
2. " " " eyes.
3. " " " side view.
4. *Pæcilochroa bifasciata*.
5. *Ammotrecha solitaria*, mandible.
6. *Coryssocnemis insularis*, side view.
7. *Olios galapagoensis*, epigynum.
8. *Selenops galapagoensis*, epigynum.
9. *Ariadne tarsalis*.
10. *Tetragnatha galapagoensis*, mandible.
11. *Ayscha pacifica*, epigynum and palpus.
12. *Misumena inclusa*, epigynum and palpus.
13. *Loxosceles longipalpis*, palpus.
14. *Odo insularis*, palpus.
15. *Filistata fasciata*.

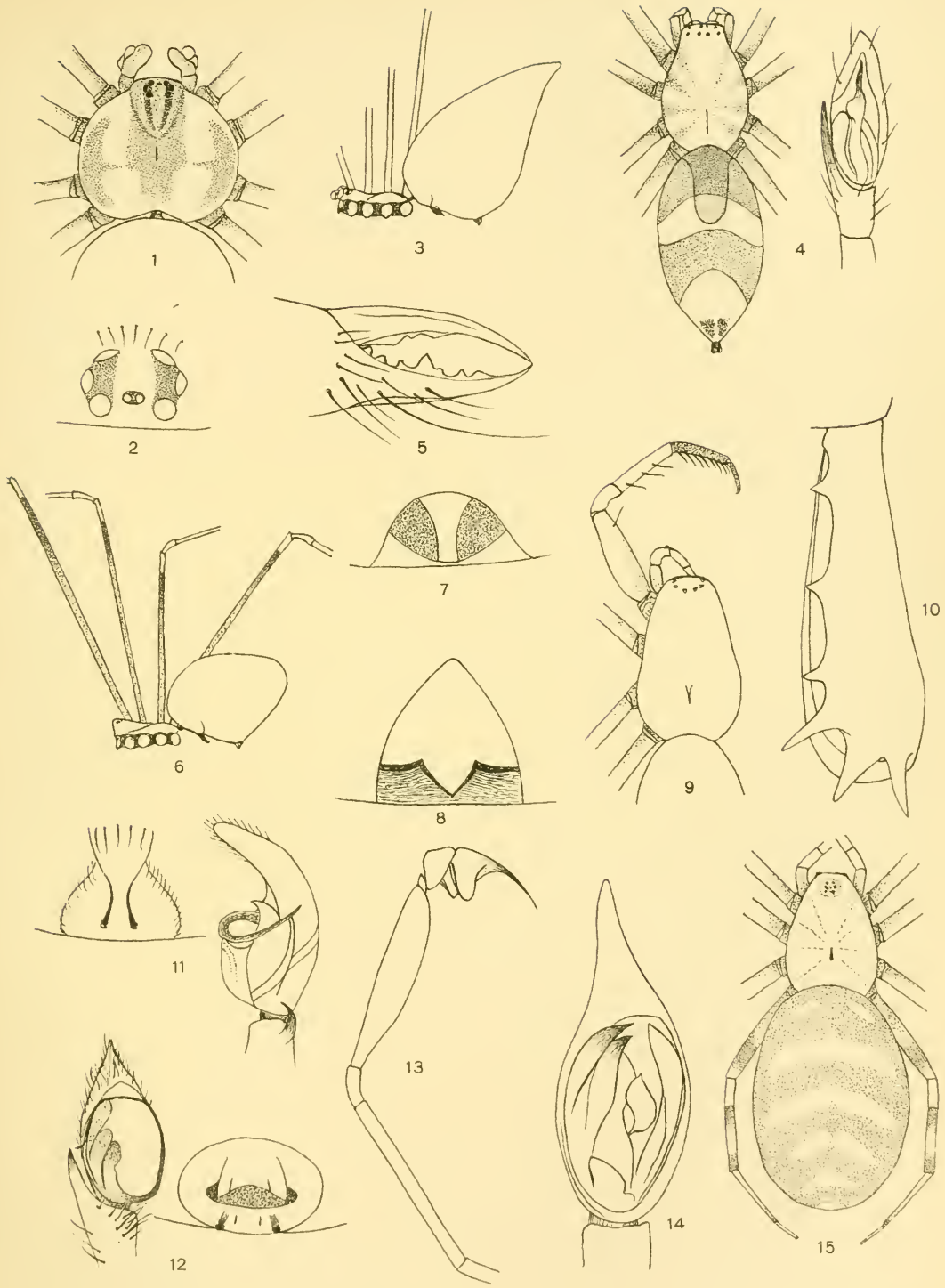
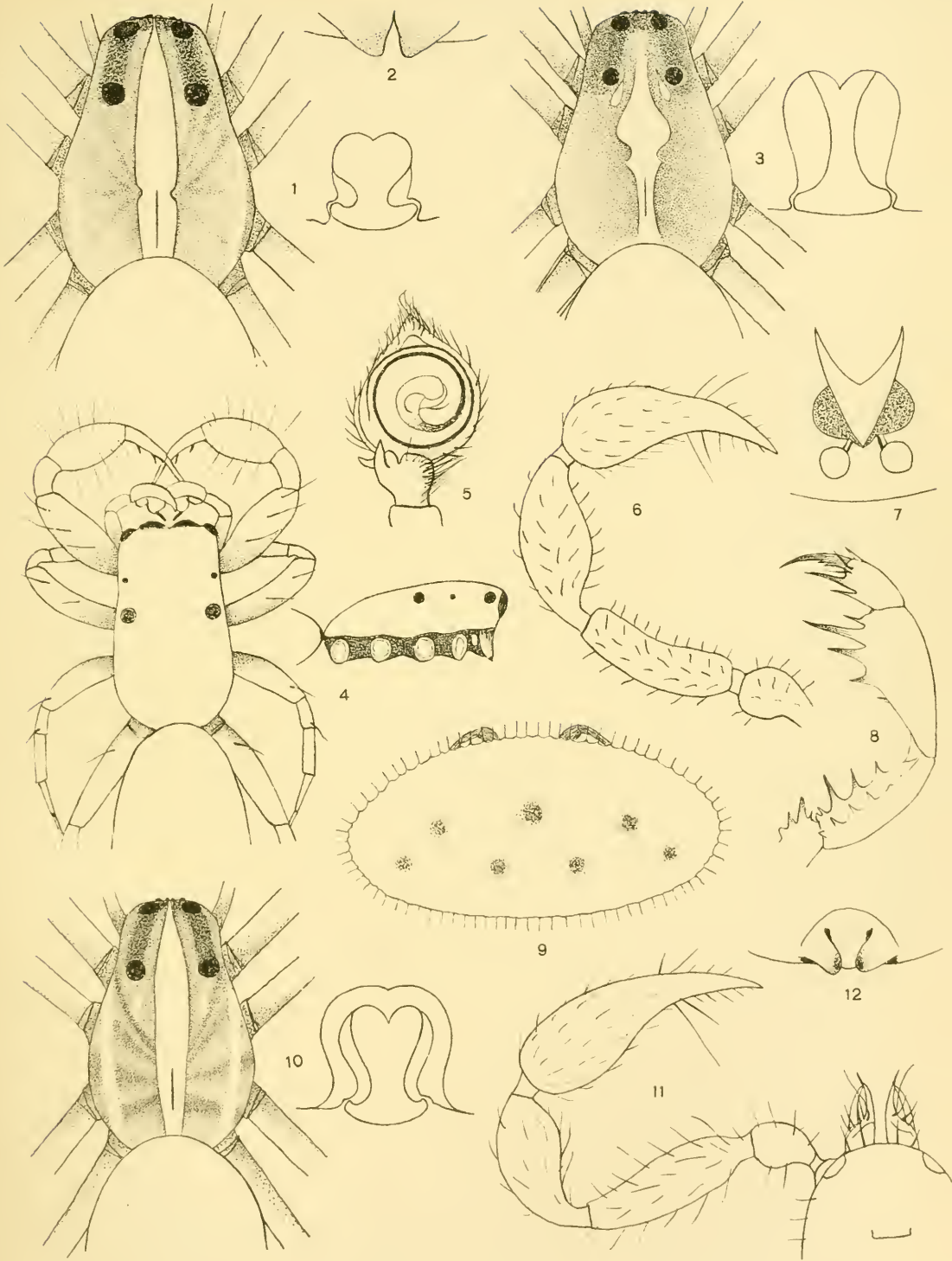


PLATE II.

- FIG. 1. *Lycosa snodgrassi*.
2. *Odo galapagoensis*, epigynum.
3. *Lycosa galapagoensis*.
4. *Admestina insularis*.
5. *Tmarus stolzmanni* palpus.
6. *Chelanops nigrimanus*, palpus.
7. *Prothesima galapagoensis*, epigynum
8. *Charinus insularis*, palpus.
9. *Argas transversa*.
10. *Lycosa albemarlensis*.
11. *Atemnus insularis*.
12. *Odo insularis*, epigynum.



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PLATE III.

- FIG. 1. Egg cocoon of *Epeira labyrinthea* with side removed to show chambers and egg packets. ($\times 2\frac{1}{2}$.)
2. Curled mangrove leaf containing nest of *Ayscha pacifica*. Natural size.
3. Nest of *Olios galapagoensis*. Natural size.
4. Three mangrove leaves containing nest of *Olios galapagoensis*. $\frac{1}{2}$ natural size.
5. Hiding place and egg cases (*eg*) of *Theridium mixtum*. ($\times 1\frac{1}{2}$.)
6. Hiding place of *Theridium mixtum*. ($\times 2$.)
7. Egg cocoon and hiding place of *Epeira labyrinthea*. ($\times 1\frac{1}{2}$.)
8. Egg cocoon of *Argiope argentata*. ($\times 2$.)
9. Egg cocoon of *Sicaroides ultriformis* attached to piece of lava. Natural size.
10. Particles of lava composing egg cocoon of *Sicaroides ultriformis*, showing binding threads. ($\times 18$.)

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