

canal as a mass, and with the Lamellibranchs to the mantel lobes and their extensibility. In these cases we have, however, an expression of structural features in the animal and this he thinks to be the case even with the genus *Spondyliaspis*. He would, therefore, accept names in this class. In cuttle-fishes, for example, we have forms distinguished by the pen, which is an excretion. He referred also to the Coprolites or fossil dung of extinct animals as being in certain cases expressions of structure. He thought that the subject of excreta has been too much overlooked, and referred to the widely differing dung of the domestic animals as an example.

Mr. Schwarz stated that he would not recommend the erection of genera upon larval cases, but he believes in using in diagnoses every character, whether morphological or not, which can be defined. Referring to excreta, he stated that Dr. Hagen had made a very interesting collection of the excremental pellets of Lepidopterous larvæ, many of them being specially characteristic.

Mr. Howard, referring to Signoret's error in considering *Inglisia* synonymical with *Spondyliaspis*, said that he had in a joint article with the late Dr. Riley unfortunately followed Signoret's error, and that Mr. Maskell, in his Aleyrodid paper referred to by Mr. Schwarz, had evidently supposed that Dr. Riley and the speaker were responsible for the suggestion of the synonymy. Maskell apparently had overlooked Signoret's 1881 note.

—The following paper, by Mr. Chittenden, was read by title :

ON THE PARASITES OF ADULT COLEOPTERA.

By F. H. CHITTENDEN.

SARCOPHAGID PARASITE OF AN ADULT CARABID.

During June of 1894, Mr. Theo. Pergande captured an adult of the common carabid beetle, *Scarites subterraneus*, from which soon afterward a living larva issued. For some reason the parasite was not reared, although nearly a score of the beetles were confined in a rearing-jar for this purpose. Mr. Pergande was of the opinion that the parasite would not be so apt to be found in beetles under stones as in those that might be taken in

roads and pathways. At his suggestion I kept a lookout for the insect and on the 1st of July succeeded in securing a specimen running across a roadway from which was reared the parasite.

July 5, a large, fleshy maggot crawled out of the body of its host, which was now dead, and on being placed in a jar of moist earth it at once burrowed downward and disappeared. On the 18th of the same month the fly issued from the puparium. At 9.30 A. M., when first noticed, its wings were still unexpanded, but in half an hour, when next examined, the insect had fully matured.

It has been identified by Mr. D. W. Coquillett as belonging to the true genus *Sarcophaga* as at present constituted, a group in which the species are not well understood.

This is, so far as I am able to learn, the first instance of a sarcophagid parasite having been reared from a living adult beetle. Instances, however, are not lacking of somewhat similar habits in this group. I have at hand a reference cited by Brauer of a European species closely related to *Sarcophaga*, viz., *Blæsoxipha grylloctena* Loew, having bred from the bodies of *Pezotettix alpinus* and other Acridiidae. Our common *Sarcophaga carnaria* Linn., which is common to both the old and new worlds, has been reared from dead adults of *Oryctes nasicornis* and *Polyphylla fullo*, and it may be interesting to note in this connection the rearing of another sarcophagid, *Helicobia helicis* Towns., from the dead body of *Allorhina nitida*. Two flies issued July 27, 1895, Washington, D. C. It has previously been recorded as bred from *Lachnosterna* (*Psyche*, vol. VI, p. 468), but there is no mention as to whether the host was living or dead. The decomposing bodies of the larger Scarabæidæ emit an unusually powerful stench, especially such as are washed up on the shores of lakes or other bodies of water, and it would seem that they are particularly attractive to the carrion-feeding sarcophagids.

Just what attracts the parasitic *Sarcophaga* to the living Scarites it would be interesting to know. Can it be possible that the parasitized individuals are diseased?

There is in the National collection a series of the tachinid *Eutrixa masuria* Walk. bred from the adult of *Lachnosterna arcuata* at Washington, D. C., in March, 1895.

The tachinid parasite of the adult of *Calosoma peregrinator* Guer. mentioned by Mr. Coquillett in *Insect Life* (vol. II, p. 234) has since been identified by him as *Biomyia georgiæ* Br. and Berg. This species has also been reared from *Calosoma calidum* and is mentioned in the report on the gypsy moth published in January, 1897 (p. 83) as *Pseudotrætocera calosomæ* Coq. (MSS.).

BRACONID PARASITE OF ADULT COCCINELLIDÆ.

In the first volume of *Insect Life* (pp. 101-104) the late Dr. Riley gave an interesting account of a parasite of the spotted ladybird, *Megilla maculata* DeG., the initial paragraph of which reads: "Up to the present time no parasite of adult Coccinellidæ have been recorded in this country." A brief mention of this same parasite published ten years earlier was evidently overlooked. It is by Townend Glover and appeared in the Annual Report of the Commissioner of Agriculture for the year 1877, as follows: "A parasitic insect attacks the *Hippodamia* (*Coccinella*) *maculata* (Fig. 43), or spotted ladybird, in a very similar manner, [to *Aphidius* or *Trioxys* infesting plant-lice] and was taken in Maryland."

Glover's illustration is perfectly recognizable as the same species figured by Dr. Riley, and Mr. Ashmead expresses the opinion that it will prove to be identical with the *Microctonus* (*Dinocampus*) *terminatus* Wesm. of which Ratzeburg has given a good account in his *Ichneumonien der Forstinsecten* (vol. III, p. 61).



FIG 2.—*Megilla maculata*, parasitized
[from INSECT LIFE]

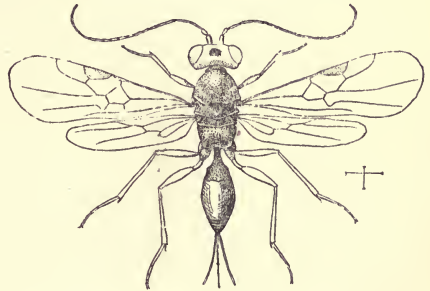


FIG. 3.—*Perilitus americana* [from INSECT LIFE.]

It was reared from *Coccinella 7-punctata* and *C. 5-punctata*, common European ladybirds not known in this country. Dr. Riley gave a translation of Ratzeburg's notes and proposed for the American specimens the provisional name of *Centistes americana*, afterwards describing it (l. c., p. 338) as *Perilitus americanus*.

In June, 1891, there were received at the Division of Entomology, from the Death Valley Expedition, several living specimens of *Hippodamia 5-signata* Kirby, with the statement that they had been found in great abundance on Mt. Magruder, in Nevada, at a high altitude above snow line. Being desirous of studying

their habits several specimens were kept alive, and in due time a parasitic larva issued and spun up its cocoon. The host was dead when discovered, but there is little doubt that in nature it clasped the cocoon as is the habit of *Megilla maculata*, and stood over it until death ensued. A few days later the perfect insect appeared and, on being referred to Mr. Ashmead, was pronounced after careful comparison with Mr. Cresson's type in the collection of the American Entomological Society, of Philadelphia, and with the published description, to be *Euphorus sculptus*, which was described by Cresson a quarter of a century ago from a single specimen from Illinois. (Can. Ent., vol. IV, p. 227.)

In the year 1892 Mr. Coquillett reared this same species from "yellow ladybirds with six elytral black spots," imported from Australia to California, as reported in Bulletin No. 30, Division of Entomology (pp. 15-16). *Hippodamia convergens* and *Coccinella sanguinea*, common to both the western and eastern sides of our continent, are also mentioned as hosts of this parasite. The Australian host is now identified as *Coccinella repanda* Muls.

The year following, Mr. Koebele recorded the following hosts: *Hippodamia spuria*, *H. parenthesis*, *Coccinella juliana*, and *Adalia frigida* (Insect Life, vol. VI, p. 14).

A PARASITE OF ADULT SCOLYTIIDÆ.

A minute chalcidid of the subfamily Entedoninæ was reared by the writer, June 18, 1894, from an adult of the scolytid *Phlæotribus frontalis* Ol. and described by Mr. Ashmead under the name *Secodes phlæotribi* (Trans. Am. Ent. Soc., vol. XXIII, p. 233). What is with little doubt the same species has been reared by Mr. A. D. Hopkins from the adult of *Pityophthorus minutissimus* and by the writer from *Chramesus icoriæ*. From the latter species the parasite issued through a round hole that occupied nearly the entire dorsal surface of the prothorax of its host.

TACHINID PARASITES OF ADULT CHRYSOMELIDÆ.

June 15 a dipterous parasitic puparium was found in a vial in which was confined an adult of the flea-beetle, *Disonycha xanthomelæna* Dalm. The puparium was fresh, having just been formed, as the beetle, then dead, had been noticed living the day previous. June 26 the adult fly issued, having passed 11 days as pupa.

The bred specimen was referred to Mr. Coquillett, who

identified it as the tachinid, *Hypostena barbata* Coq., described from New Hampshire and Southern California (Jour. N. Y. Ent. Soc., v. III, p. 57), and not previously reared.

This case is paralleled by that of the tachinid which is parasitic on *Diabrotica*. This species, referred to *Celatoria diabroticæ*, was first observed by the late Dr. Hy. Shimer in 1870 preying upon the striped cucumber-beetle, *Diabrotica vittata* Fab., and an account of it was given in volume V of the American Naturalist (p. 219), where it is described under the name *Tachina (Melanosphora) diabroticæ*. This parasite is quite common about Washington and has been reared from the adult beetles by the writer and others from July to September. *Celatoria crawii* Coq., described from specimens reared in California from *Diabrotica soror* (Insect Life, vol. II, pp. 233-236) is a synonym. It has also been reared from *Diabrotica 12-punctata*.

OTHER PARASITES OF ADULT BEETLES.

The subject of the parasitism of the adult of *Eleodes suturalis*, a large western tenebrionid, has been discussed by Dr. Riley in former meetings of this Society (Proceedings, vol. II, pp. 211, 219).

Anomæa laticlavata, a common chrysomelid that affects leguminous plants chiefly, is also parasitized in the adult state, the writer having seen a larva that had crawled out of the body of this beetle.

Of interest as having some bearing on this subject is an observation made upon one of the parasites of *Tyloderma foveolatum*. A larva of one of these parasites, presumably *Eurytoma tylodermatis* or *Catolaccus tylodermæ*, was observed, September 3, fastened to a newly transformed adult of the curculionid. All other parasitic larvæ were attached to the larvæ or pupæ of their host.

Dr. Fitch once observed "a minute chalcidian parasite in the act of ovipositing in the tip of the body of the female" of the flea-beetle, *Psylliodes punctulata* (Tenth N. Y. Rept., p. 39).

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JANUARY 7, 1897.

President Marlatt in the chair and Messrs. Schwarz, Linell, Stiles, Benton, Busck, Heidemann, Gill, Banks, Ashmead, Smith, Hopkins, Woods, and Howard also present.

Mr. G. W. Kirkaldy, of Wimbledon, England, was elected a corresponding member.