not narrowed laterally, with its margins strongly arcuate, but nearly parallel; third and fourth each only a little more than half as long as the second and but little narrower; fifth and sixth shorter and suddenly narrower. Legs rather short and not very stout; anterior tibiæ without bristles: middle tibiæ each with a pair of unequal bristles at the basal third and with two long spurs and several shorter bristles at the tip; hind tibia with a series of about ten strong bristles externally, about as long as the width of the tibia; these form a single row except at the base where three of them are in a second row anterior to the first one. Color: head, thorax and legs pale brownish yellow, the antennae and palpi lighter; abdomen fuscous, darker laterally and at tip; underside quite decidedly paler than the upper. Described from a single female from Natal, August, 1915. (B. Marley.) In the collection of the South African Museum.

FOSSIL CYNIPIDÆ.[1]

By Alfred C. Kinsey.

The following references to fossil Cynipidæ have been made regularly throughout the literature, but as here indicated no one of the references applies to a description or location of a true gall-wasp.

Schlotheim, E. F., 1820. *Die Petrefactenkunde.* Gotha. Page 43, merely names "Cynips" in a list of fossil insects *known*, mainly from amber.

Presl, J. S., 1822. *Deliciæ Pragenses Historiam Naturalem Spectantes.* Pragæ., Vol. 1, p. 195, has this: "Cynips succinea. Longitudo $\frac{3}{4}$ lineæ. Caput globosum, parvulum, rufescens; antennæ longæ, fere quater longitudine sua caput superantes, evidenter ex articulis minutis æqualibus compositæ. Thorax tergo atro, pectore rufescente. Abdomen ovale, stylo dependens, lucidum, fuscum. Alæ quatuor, anteriores obovatæ, latæ, corpore longiores fere tantum, quantum longitudo abdominis efficit, pellucidæ, inquibus decursus venarum non determinabilis quoniam alæ posteriores subtus jacent; alæ posteriores parum breviores

[1] Contributions from the Entomological Laboratory of the Bussey Institution, Harvard University, No. 154.

anticis, margine interiori et anteriori longis ciliis obsitæ. Pedes teneri, mediocriter longi. Ab omnibus Cynipsibus hucusque notis longe differens."

This description has been the basis of the most persistent reference to a fossil Cynips. The *Deliciæ Pragenses* is rather rare, so it seems worth copying the description in full. I cannot see that it is possible to refer the above to a particular Hymenopterous family, much less to consider such a vague description as defining a species.

GRAVENHORST, J. L. C., 1835. *Die in Bernstein erhalt. inseckt.* Page 92, merely includes "Diplolepis" in the list.

MENGE, A., 1856. *Lebenszeichen vorweltlicher, im Bernstein engleschlossener Thiere.* Danzig. Page 25. Number five is described as a wingless animal, a male, with thread-like, 14-jointed antennæ, the 3rd joint incised; at the tip of the abdomen is a rather short projection, somewhat thickened at the tip. This may have been a true Cynipid, but still the description is too brief to define even the family, especially as I have seen a male Belytd with similar antennæ in Baltic amber, together with a wingless female belonging to the same family.

SCUDDER, S. H., 1886. *Bull. U. S. Geol. Survey, No. 31, p. 98.* Says that the Cynipidæ are "very abundant at Florissant and two or three galls have been obtained there." The Scudder collection is the source of two of the species described in the present paper; the galls are undoubtedly *not* Cynipid, though it is usually useless to attempt to decide on the nature of fossil galls.

BRUES, C. T., 1910. *The Parasitic Hymenoptera of the Tertiary of Florissant, Colorado.* Bull. Mus. Comp. Zoöl. LIV, p. 1. Describes ANDRICUS MYRICÆ, a gall on a Myrica leaf. Prof. Cockerell has drawn my attention to the fact that this is obviously a synonym of *Cecidomyia* (?) *pontaniiformis* Cckll. (cf. Bull. Am. Mus. Nat. Hist. 1908, Vol. XXIV, p. 66.)

The species described in the present paper are, then, the first fossil Cynipidæ definitely characterized. It is noteworthy that the three species belong to one genus, or to two very closely related genera. Aulacidea differs from Aylax only in having a closed radial cell, and since only the third species shows that cell, the first two may belong to Aylax. In any event, the relationship of

the three is close, which is the more remarkable because their places of origin were widely separated, both geographically and geologically. I expect to publish later data from a study of present-day species of gall-wasps; it points to Aulacidea as the most primitive Cynipid genus. It would be important to know something of the time and manner of origin of the more highly specialized, oak-gall-forming species with their complex biology. A careful search through collections of fossils would likely lead to the discovery of species that might supply further information on that question.

Aulacidea Ashmead

The characters of the first three antennal segments, and the size of the second abdominal segments of all the fossils are Aylax or Aulacidea characters. The straight apical branch of the subcostal vein, and the arcuate first abscissa of the radius shown in two of the species are rare characters among Cynipidæ outside of Aulacidea.

Aulacidea progenitrix sp. nov.

Female. Head: with the 1st and 2nd antennal joints stouter than the following joints, and the last joint longer than the penultimate. *Thorax:* with parapsidal grooves apparent. *Abdomen:* broadly oval, the second tergite half the length and little more than half the depth of the whole abdomen, with three other segments apparent, and the sheaths of the ovipositor extending to the dorsal line. *Length:* 3.5 mm.

Locality: Miocene, of Florissant, Colo.

Type: specimen number 2376 in the Scudder collection of fossils in the Museum of Comparative Zoölogy. (Fig. 1, A.)

This specimen has the head very much distorted, and traces of but fragments of the antennæ, legs, and wings. The second dorsal abdominal plate extends little beyond the dorsal line, and is smaller than in any other species of true Cynipid, likely indicating more primitive relationships.

Aulacidea ampliforma sp. nov.

Male. Head: with filiform antennæ, the second joint stoutest. *Thorax:* with parapsidal grooves apparent. *Abdomen:* broadly oval, the second dorsal plate extending half the length of the abdo-

men, and on the sides two-thirds to the mid-ventral line. *Wings:* with the apical part of the subcosta straight, the first abscissa of the radius arcuate, the areolet of moderate size; cubitus arising

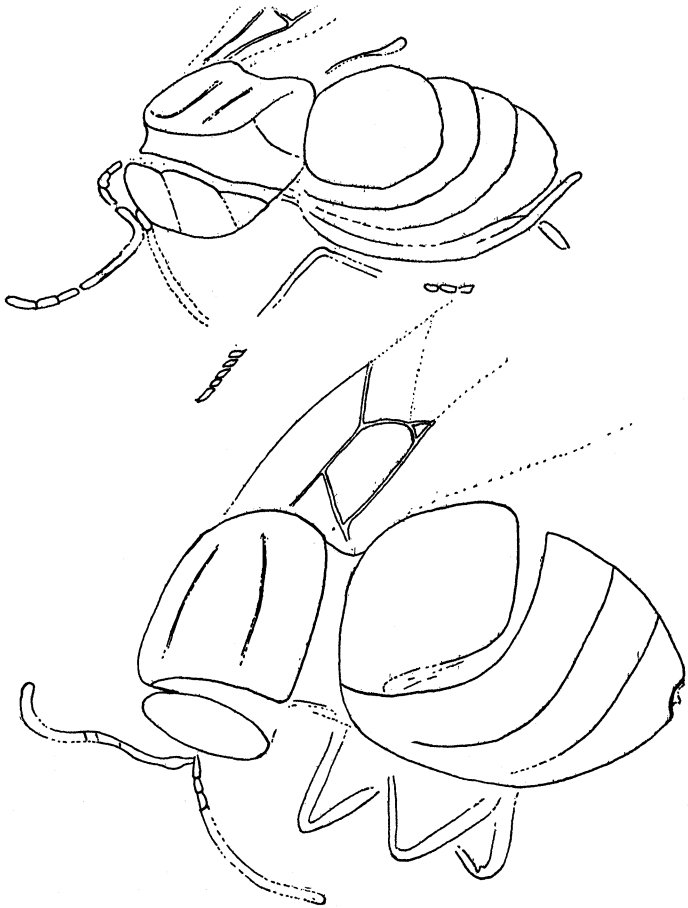

Fig. 1. Above: *Aulacidea progenitrix* sp. nov. Below: *Aulacidea ampliforma* sp. nov.

very much below the middle of the first cross-vein. *Length:* 5.5 mm.

Locality: Miocene, of Florissant, Colo.

Type: specimen number 2063 of the Scudder collection in the Museum of Comparative Zoölogy. (Fig. 1, B.)

This specimen is apparently a male, as indicated by the shape of the abdomen and the absence of hypopygium or ovipositor sheaths. The second dorsal abdominal segment in this species is relatively larger than in *A. progenitrix*, and the insect has a length 1.5 mm. greater than in any other known Aulacidea.

Aulacidea succinea sp. nov.

Female. Head: about as broad as the thorax; palpi 4 (?)-jointed; antennæ 14-jointed, the first joint obconical, elongate, the second globose, the third joint the longest, more slender than and

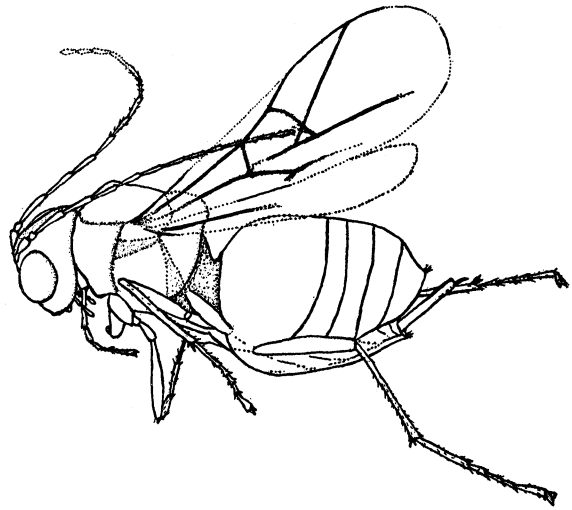

Fig. 2. *Aulacidea succinea* sp. nov.

as long as 1 plus 2, remaining joints diminishingly shorter to the 13th, 14th about as long as the 12th, and with a short pubescence absent only on the basal half of the antennæ; the antennæ originate about on the mid-line of the eyes. *Thorax:* distinct parapsidal grooves extending to the pronotum, converging slightly toward the scutellum; the scutellum longer than wide, with two large, broad, moderately deep foveæ. *Abdomen:* with plates 2–6 visible, the 2nd about one-half the total abdominal length, plates 3–6 subequal in length; hypopygium regular, abruptly ending, the tip pubescent. *Legs:* the tibiæ very slender; 1st tarsal joint almost half the total tarsal length, 4th joint the shortest; claws simple,

broad; tarsi pubescent. *Wings:* radial cell slender, closed; apical portion of the subcosta straight; first abscissa of the radius arcuate; cubitus arising distinctly below the middle of the first cross-vein. *Length:* 3.5 mm.

Locality: Oligocene, in Baltic amber.

Type: A single specimen from the collection of the Königsberg Museum, and temporarily at the Bussey Institution, of Harvard University. (Fig. 2.)

This specimen is most remarkably preserved, exhibiting an almost complete set of specific characters.

THE OCCURRENCE OF WINGLESS PHORIDÆ ON THE FIJI ISLANDS.

By Charles T. Brues,
Bussey Institution, Harvard University.

Dr. William M. Mann recently gave me for examination some wingless flies which he reared from dead snails when in the Fiji Islands several years ago. There are numerous specimens of two species, and both appear to be identical with forms described from the Bismarck Archipelago. The first is *Chonocephalus dorsalis* Wandolleck and the second *Puliciphora lucifera* Dahl, of which there is also a winged male. Chonocephalus is known from various localities in the tropics of both hemispheres where it is represented by several species. In addition to the form mentioned, another has been found in the South Seas, *C. depressus* De Meij. from Sumatra, and I have an undescribed one from New Guinea. Puliciphora is represented by numerous species, nearly all confined to the tropics.

It may seem strange that these species should be found on such widely separated islands, but they breed in decaying animal and plant matter of various kinds, in common with some other Phoridæ, and have great opportunities to be distributed on shipboard.