is very rare. This had been bred from galls on black locust infested by a moth (*Ecdytolopha insiticiana* Zell.).

MEETING OF APRIL 2, 1907.

Held at the American Museum of Natural History. President C. W. Leng in the chair with sixteen members and six visitors present.

The librarian reported the receipt of the following exchanges:

Berliner Entomol. Zeitschrift, LI, Nos. 2 and 3.

Zeitschrift f. wissenschaftliche Insektenbiologie, III, No. 1.

Proc. Amer. Acad. Arts and Sciences, XLII, Nos. 20–25.

Dr. Felt exhibited a large series of original photomicrographs illustrating the wing venation and genitalia of Cecidomyiidæ. He is engaged in preparing a monographic account of this group, and stated that these flies vary greatly in structure. Some 750 European forms have been listed and it is probable that our fauna is somewhat richer, possibly totaling 1,000 or 1,200 species. The habits and general biology of the group together with the methods of collecting were discussed in an informal way.

Professor Wheeler exhibited photographs and specimens of the agricultural ants which occur in the arid regions of the southwest. These possess a curious arrangement of long hairs underneath the head similar to those which have been found in the ants of the Sahara. He had thought that these were adaptations for carrying water, but among the specimens of a species kept in captivity he could find no such use made of the hairs. He suggests that these are more likely used for toilet purposes, acting as a brush to assist the strigil of the leg. Professor Wheeler also exhibited some excellent photographs of ants.

Mr. Joutel spoke of the finding of a Ptinid beetle (*Gibbium scotias*) at the Produce Exchange by Mr. Davis. This is an unusually rare species.

MEETING OF APRIL 16, 1907.

Held at the American Museum of Natural History. President C. W. Leng in the chair with thirteen members and two visitors present.

The librarian reported the receipt of the following exchanges:

A Collection of Ants from British Hondurus by Wm. M. Wheeler. Bull. Am. Mus. Nat. Hist., XXIII, pp. 271–277.

Canadian Entomologist, XXXIX, No. 4.

Verhandl. d. k. k. bot.-zool. Gesellschaft. Wien, LVII, No. 1.

Zeitschrift f. Wissenschaftliche Insektenbiologie, III, No. 2.

The Insect World, XI, No. 3.

Georgia State Board of Entomology, Bull. No. 23.

Mr. Davis of the field committee reported that there would be a society excursion to Newfoundland, N. J., on April 26.

Professor Wheeler gave an interesting talk on the genus *Formica* and said in part as follows:

The genus *Formica* was the only one recognized by Linnæus as including the various species of ants; but gradually it became divided, first by Latreille and Fabricius, and later by others until now it includes only a small number of our species All species belonging to it are found in the North Temperate Zone, none extending as

far south as the Equator and they are of wide distribution. This genus can be separated into five groups, all of which are found in North America. These groups center about *F. sanguinea*, *exsecta*, *rufa*, *pallidefulva* and *fusca*. The genus apparently originated in the Rocky Mountains, probably in Colorado as the species belonging to it are found there in greatest number and variety. It is unfortunate therefore that the European forms should have been known and described before those of America, as they are probably only varieties of the latter. The consideration of the different groups is interesting because of the differences in habit. The *sanguinea* group represented by the well-known *sanguinea* form of Europe, which differs slightly from our own, includes a number of distinct species and the commonest form with us is *rubicunda*. The ants belonging in this group can be distinguished by the distinctly notched clypeus. The *exsecta* group is represented by the European *exsecta*. In this division the clypeus is entire but the posterior margin of the head is incised and the species have the habit of cutting off the heads of their foes. The *rufa* group is represented by *rufa* and a few other forms in Europe and many forms in this country and could be again divided into smaller groups. *Rufa* forms are exceedingly abundant in Colorado; and in the Rocky Mountains in general, at an altitude of between 7,000 and 9,000 feet. Some of these forms very closely resemble the European *rufa*, *pratensis* and *truncicola*. The *pallidefulva* group which is recognized by the very slender thorax and the small colonies is not represented in Europe. *F. schaufussi* is the common species of this division and it is widely distributed in the United States east of the Rocky Mountains. The *fusca* group is the most widely distributed of all and is represented throughout the northern hemisphere. It is represented in Alaska and in Colorado in the mountains up to an altitude of 12,000 ft. In the west *fusca* runs into many varieties, while *subsericea* is one of the commonest forms with us in the eastern states. The species of this group are recognized by the slender antennæ. Concerning the habits of the insects Dr. Wheeler said that the forms belonging to the *pallidefulva* and *fusca* groups were widely distributed while those belonging to the other groups — *sanguinea*, *exsecta* and *rufa* — were parasitic upon them and hence sporadic in occurrence. In studying a species — *difficilis* — of one of the parasitic groups (*microgyna*), in which the queens are of very small size, it was found that the queen layed its eggs in the nest of *schaufussi*, the parasitized forms, where they were cared for by the workers of *schaufussi* which in turn died off owing to the fact that there was no queen of the latter to continue the species. In Tunis Dr. F. Santschi found a species of *Bothriomyrmyx* parasitic in the nest of *Tapinoma*. In this case the queen of the former kills that of the latter and rests upon its dead body where it is immune to attack. Gradually it acquires the odor of the new nest and is adopted by the *Tapinoma* workers, who die off in due time, because they have no queen to propagate their species. Huber found that the workers of *sanguinea* went out and robbed the nest of *fusca* of young, brought them to their own nests and reared them. In experimenting with these forms in Connecticut last summer Dr. Wheeler found that by removing the wings of the *sanguinea* queens he changed their instinct and behavior. When new queens were placed with *fusca* workers, the latter attacked the queen *sanguinea* but later she retaliated, killed them off and gathered the cocoons of *fusca* and cared for them. It is probable that under normal conditions a weak colony is sought by the *sanguinea* queen for the purpose of establishing her own formicary. Thus, the queen possesses all the

instincts shown by the workers, and that the workers inherit their peculiar instincts from the queen.

The question of ants protecting plants was discussed by several members as was also that of the nesting habits of several species.

A few boxes containing some of the species of *Formica* were exhibited.

Mr. Schaeffer next spoke on Histeridæ and told of some interesting studies he had been making in this group. As a rule, he said, not much attention had been paid to this family. In considering the species the early authors had used the elytral striæ for specific separation. These he had found quite constant although in *Saprinus fimbriatus* and an allied form he had found some variation. The humeral striæ, however, vary to a considerable extent and if based upon these characters two of our species would have to be omitted from the list because they were found to be synonymous with others. Casey, in his studies, has laid some stress upon the punctuation of the pygidium, but Mr. Schaeffer found this to vary considerably in some instances and not to be altogether reliable. Notes were given concerning several of the species of the genus *Hololepta*. Altogether Mr. Schaeffer had found that when carefully studied these beetles exhibited some good specific characters and were not so difficult to determine as at first appeared. When questioned in regard to the habits of the insects Mr. Schaeffer said that they were carnivorous and that the character of the mandibles showed this to be the case. As a rule they were found in excrement or decaying matter but apparently they were not feeding on these substances but upon the larvæ of various kinds found in them. In the west he had taken *Hololepta yuccatæa* in the stems of the Yucca and *H. cacti* in decaying *Opuntia* between the dead and living tissue where dipterous and other larvæ were also found.

Mr. Davis stated that so far as he knew there were only three records in this country of *Histeridæ* having been observed feeding upon caterpillars. Mr. Joutel said that at Fort Lee he had observed a species doing this.

A box containing a number of Histeridæ was exhibited.

Mr. Dickerson made a few brief remarks on root maggots. He said there were several species of flies of the family Anthomyidæ, the larvæ of which were known as root maggots because of their habit of feeding upon the roots of plants. Several species have been found injurious both in Europe and America and two of these — the onion maggot feeding on the roots of onions and the cabbage maggot feeding on the roots of cabbage and several other cruciferous plants — had been particularly troublesome in New Jersey and several other states during the past few years. He told something of their habits and life history and said that owing to the fact that they lived under ground they were difficult to reach with insecticides of any sort. Two classes of remedies have been recommended. The one known as preventives, consists of placing something around the plant, such as a tarred paper disk, to prevent the eggs from being laid about the stem or if laid to prevent the maggots from getting to the roots. The other remedies might be termed destructive and consist of spraying or pouring such chemicals as carbolic acid emulsion around the plants in the effort to kill the maggots. But any remedies that are used must be timely and thorough. Further experiments against these pests are being carried on at the present time but so far none had been found which are altogether satisfactory. Phials containing maggots and puparia and pinned specimens of the adult flies were exhibited.

Mr. Davis showed several examples of the pellets formed by the "barred" owl.