student at the laboratory, and both board and room may be engaged in advance by application to the director of the Laboratory.

For further particulars inquire of Professor Franklin W. Hooper, Brooklyn Institute of Arts and Sciences, N.Y., or of Professor Herbert W. Conn, Wesleyan University, Middletown, Conn. Applications for admission as students should be sent to the Institute.

THE MARINE BIOLOGICAL LABORATORY.

THE corps of instructors this year consists of Dr. C. O. Whitman, director, professor of zoology, Clark University; editor of the *Journal of Morphology;* H. C. Bumpus, associate professor of zoology, Brown University; E. G. Conklin, professor of biology, Ohio Wesleyan University; Pierre A. Fish, instructor in physiology and anatomy, Cornell University; Jacques Loeb, professor of physiology, Bryn Mawr College; W. A. Setchell, instructor in botany, Yale University; Sho Watase, assistant in animal morphology, Clark University; W. M. Wheeler, assistant in animal morphology, Clark University; Ryoiche Takano, artist; G. M. Gray, laboratory assistant; J. J. Veeder, collector.

In addition to the regular courses of instruction in zoology, botany, and microscopical technique, consisting of lectures and laboratory work under the direct and constant supervision of the instructors, there will be a number of lectures on special subjects by members of the staff. A course of lectures in embryology will be given by Professor Whitman; in biological physiology, by Dr. Loeb; and two or more courses in invertebrate zoology, by Dr. Bumpus and Dr. Wheeler.

There will also be ten or more evening lectures on biological subjects of general interest. Among those who may contribute these lectures and take part in the discussions upon them may be mentioned, in addition to the instructors above named, the following: Dr. H. Ayers of the Lake Laboratory; Professor H. H. Donaldson, Clark University; Professor William Libbey, Jun., Princeton College; Dr. Warren P. Lombard, Clark University; Professor Charles Sedgwick Minot, Harvard Medical School; Professor E. S. Morse, Salem; Professor H. F. Osborn, Columbia College; Professor W. T. Sedgwick, Massachusetts Institute of Technology; Professor E. B. Wilson, Columbia College.

The Laboratory is located on the coast at Wood's Holl, Mass., near the Laboratories of the United States Fish Commission. The building consists of two stories — the lower for the use of teachers and students receiving instruction, the upper exclusively for investigators. The Laboratory has aquaria supplied with running sea-water, boats, a steam launch, collecting apparatus, and dredges; it is also supplied with reagents, glassware, and a limited number of microtomes and microscopes. By the munificence of friends the library will be provided henceforth not only with the ordinary text-books and works of reference, but also with the more important journals of zoology and botany, some of them in complete series.

The Laboratory for investigators will be open from June 1 to Aug. 30. It will be fully equipped with aquaria, glassware, reagents, etc., but microscopes will not be provided. In this department there are twenty-four private laboratories supplied with aquaria, running water, etc., for the exclusive use of investigators.

Owing to the growth of the Laboratory and the great demand for tables, the trustees have voted to enlarge the present building so that a spacious new wing will be ready for use on July 1. Those who are prepared to begin original work, but require supervision, will occupy tables in the general laboratory for investigators, paying for the privilege a fee of fifty dollars. The number of such tables is limited to ten. An elementary course in investigation will be introduced this season, designed to meet the needs of those who have completed the general courses in the Students' Laboratory. Definite problems of limited scope will be assigned and worked out as a means of training in the ways and methods of research. The fee for this course also will be fifty dollars, and the number of tables will likewise be limited to ten. For the completion of any considerable piece of investigation, beginners usually require from one to three full years. It is not expected, therefore, that the holders of these tables will finish their work in a single season. The aim is rather to make a secure beginning, which will lead to good results if followed up between sessions, and renewed, if need be, for several successive years.

The Laboratory for teachers and students will be opened on Wednesday, July 6, for regular courses of seven weeks in zoology, botany, and microscopical technique. The number admitted to this department will be limited to fifty, and preference will be given to teachers and others already qualified. By permission of the director, students may begin their individual work as early as June 15 without extra charge, but the regular courses of instruction will not begin before July 6. Though more advanced students who may wish to limit their work to special groups will have an opportunity to do so, the regular course in zoology, in charge of Professor Bumpus, will embrace a study of the more typical marine forms and elementary methods of microscopical technique. Mr. W. A. Setchell will have charge of the work in botany. The tuition fee is thirty dollars, payable in advance. Applicants should state whether they can supply themselves with simple and compound microscopes. Microscope slides, dissecting and drawing instruments, bottles, and other supplies, to be finally taken from the Laboratory, are sold at cost. Further information, if desired, may be had by addressing Professor Hermon C. Bumpus, Wood's Holl, Mass.

Applications for places in either department should be addressed to Mrs. Anna Phillips Williams, secretary, 23 Marlborough Street, Boston.

Rooms accommodating two persons may be obtained near the Laboratory, at prices varying from $2 to $4 a week, and board from $4.50 to $6. By special arrangement, board will be supplied to members at The Homestead at $5 a week.

A Department of Laboratory Supply has been established in order to facilitate the work of teachers and others who desire to obtain materials for study or for classes. It is proposed to furnish, e.g., certain sponges, hydroids, starfishes, sea urchins, marine worms, crustaceans, mollusks, and vertebrates, preserved in good condition, at fair prices. Orders for the coming college year should be given as soon as possible. Circulars giving information, prices, etc., may be obtained by addressing the Department of Laboratory Supply, in care of the secretary.

Wood's Holl, owing to the richness of the marine life in the neighboring waters, offers exceptional advantages. It is situated on the north shore of Vineyard Sound, at the entrance of Buzzard's Bay, and may be reached by the Old Colony Railroad (2½ hours' from Boston), or by rail and boat from Providence, Fall River, or New Bedford. Persons going from Boston should buy round-trip tickets ($2.85).

The annual report of the trustees, containing an account of the organization and work of the Laboratory, may be obtained from the secretary.

HOMOPTERA INJURIOUS TO GRASSES.

AMONG the many insects that are destructive to the grasses the little leaf-hoppers take a very prominent place, and the writer is of the opinion that, although their work is often or for the most part entirely overlooked, they are really responsible for much of the damage accredited to other insects or to drought. Studies carried on during the last few years, and which have been reported in bulletins of the United States Department of Agriculture[1,2] and of the Iowa Experiment Station,[3,4] lead to the opinion that from one-fourth to one-half of the crop is lost regularly as a result of their work, and that a large part of this loss could be saved by the adoption of remedial measures. It seems also, at least for blue-grass in Iowa, that the common affection known as "silver-top" is to be charged against these same insidious enemies.[5]

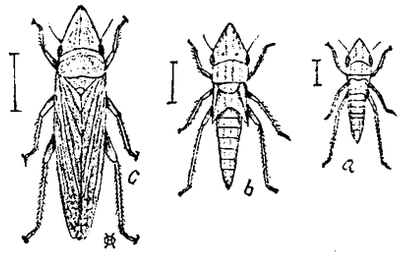

FIG. 1.

Diedrocephala mollipes (Original).

While there are many different species concerned in this work, many of which have still to be studied, and representing the families *Jassidæ*, *Cercopidæ*, and *Fulgoridæ*, the most numerous, and I think the most destructive, fall in the family *Jassidæ*, and a few of the more common ones may be enumerated here.

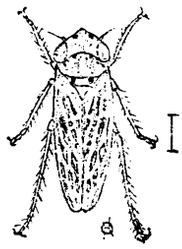

FIG. 2.

Deltocephalus inimicus (Original).

Diedrocephala mollipes is a grass-green species about one-third of an inch in length, and its general form, as well as the larva and pupa are shown in the accompanying figure. It occurs abundantly all over the country, but may be noticed more abundantly some seasons than others, and it shows a preference for ground that is moist rather than for very dry localities.

A quite similar species, *Diedrocephala noveboracensis*, is also quite abundant and widely distributed, but seems to occur more especially around the borders of thickets and in grassy woodland.

Perhaps the most abundant and widely distributed species of all is the *Deltocephalus inimicus* of Say. Its work ranges all through the season, and it may even be found on warm days in winter.

The insect is nearly a fourth of an inch in length and of a grayish color, the most distinctive marks being the black dots on head, front portion of thorax, and on the scutellum; two on each, as shown in the accompanying figure.

Another species which occurs, at times in immense numbers, is the *Deltocephalus debilis* of Uhler. This is smaller than the preceding species, but without a careful examination may be very easily confused with it. It is quite uniform in color, and without the black dots characteristic of that form. Its distribution is probably very wide, though it has not as yet been reported from as many localities as the preceding species.

FIG. 3.

Deltocephalus debilis Uhl. (Original.)

Aside from these especially abundant species there are many others belonging to the genus *Deltocephalus*, which seem to be confined to grasses as their food plant. *D. sayi*, *D. harrisii*, *D. melsheimerii*, and others having been taken in greater or less abundance in sweepings from grass.

Cicadula exitiosa Uhler was first described as a wheat pest, but it has proven a general grass feeder, and must be enumerated among the species affecting this crop. It is about two-tenths of an inch in length, of a brownish color, and the wings are quite distinctly marked with dark veins.

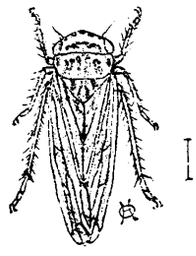

FIG. 4.

Cicadula exitiosa Uhl. (Original.)

The figure shows its form and the arrangement of the markings of the body.

Agallia sanguineolenta Prov. is an interesting little species, often secured in grass and conspicuous in very early spring, as the adults can be seen in great numbers under the grass or, on warm days, hopping about on the leaves. It has proved, however, to favor clover as its food plant, and probably feeds on grass only during fall, winter, and early spring. It is about one-eighth of an inch in length, quite broad, about half as wide as long, and marked with numer-

[1] Bulletin No. 22, Division of Entomology, United States Department of Agriculture, pp. 20–41.

[2] Bulletin No. 23, Division of Entomology, United States Department of Agriculture, pp. 58–59.

[3] Bulletin No. 13, Iowa Experiment Station, pp. 95–101.

[4] Bulletin No. 15, Iowa Experiment Station, pp. 253–261.

[5] Proceedings of the Society for Promotion of Agricultural Science (1890).