

*INVESTIGATIONS AT COLD SPRING HARBOR.*

THE investigations at this Laboratory during the present summer have covered a wide field as the following enumeration of subjects and abstracts shows. In Botany work is being done in the determination of the species of the rich cryptogamic flora of the vicinity, in the study of the tension zone where fresh water and marine species meet and in various other ecological matters. In Zoology, investigations are being carried out on the supermatogenesis of certain higher crustacea, on the development of Trematodes, of Squilla, of Phascolosoma, of Pectinatella and of Hemiptera. Studies on the development of color markings in insects have made good progress, the insect fauna is being systematically studied, and the food habits of fishes are being analyzed. Quantitative variation studies are being carried out on sea anemones, Daphnia, Amphipoda, lamellibranchs, Myriapoda, several groups of insects and mice. The following brief statements give further details concerning some of these studies.

*Cryptogamic Studies at Cold Spring Harbor:*

By DR. D. S. JOHNSON.

The work accomplished in the study of the cryptogams, aside from class work, has been chiefly systematic, including a study of the distribution of the marine algæ in various parts of Cold Spring Harbor, Huntington Harbor, and Smithtown Bay. Few new forms have been added to the flora, but forms hitherto known only from free fragments have been found abundantly in their natural habitat. Many notes have also been made as to the different species preponderating in the same locality in different years. Fungi have been much restricted in distribution and numbers because of the dry season, but several interesting finds have been made. Of the Myxomycetes, Mr. D. N. Shoemaker has added twelve additional genera and thirty-eight

additional species to those reported from other sources in Jelliffe's list of Long Island plants and only one species mentioned by Jelliffe has not been seen here. Several specimens of Dictyophora (Ravenellii?) apparently new to the Island have been found and a group of over twenty specimens of *Simblum rubescens*, of which four had double stipes and an elongated receptaculum.

*Studies in Ecology:* By DR. HENRY C. COWLES.

The work in this department has been chiefly along two lines. Considerable attention has been paid to variations in form, especially in leaves, with a view to the suggestion of a series of hypotheses, which may be made the basis of further observation and experiment on these matters. Perhaps the most fruitful field of study has been in relation to the development of the Long Island vegetation in connection with the physiography. The succession of plant societies along the xerophytic shores strikingly resembles that along the Great Lakes. The genetic relations of salt, brackish and fresh swamps have been looked into, and one student has taken up this problem as a special field for research. Another student is preparing to make a comparative chemical analysis of forms which grow in both maritime and inland conditions. Two other students are contemplating leaf variation studies. Our present plans also include a series of culture experiments on halophytes conducted in the interior under various soil conditions.

*Trematode Studies:* By DR. H. S. PRATT.

The adult form of Apoblema (Distoma) appendiculatum has been found in considerable numbers in the menhaden, attached to the wall of the stomach. Immature forms of this worm have been plentiful at Cold Spring Harbor during the past five years, although they have not been observed at any other part of the Atlantic coast of this

country. They occur in the body-cavity of copepods and also free-swimming in the plankton.

Three species of Trematodes have been observed on the gills of *Fundulus heteroclitus*. Two of them are minute monogenetic Trematodes belonging to the genera *Tetraonchus* and *Gyrodactylus* which have not before been observed in North America. The species of *Tetraonchus* is undoubtedly a new one. It is found attached to the gills, from one to three individuals usually occurring on each fish. The species of *Gyrodactylus* was rare, but four individuals being found during five weeks on the large number of fishes examined. The species is probably new although it may prove to be identical with *G. Groenlandicus* Levensen.

In addition to these monogenetic Trematodes large numbers of an encysted distomid worm belonging to the genus *Echinostomum* were also found. The cysts are oval in shape, each containing a single worm. These were found in all stages of development, the largest showing the two suckers, the digestive and excretory tracts, and the characteristic oral spines. In quite small fishes the cysts were either absent or contained very young worms, and numerous minute ciliated organisms, which were probably the miracidia of *Echinostomum* were found swimming rapidly over the surface of the gills or lying closely applied to them.

*Development of Squilla Empusa*: By DR. C. P. SIGERFOOS.

This interesting form has been found in great numbers and is apparently much more abundant than usual. It lives at low tide mark in muddy sand to soft mud, in burrows one to four feet or more in length and open at both ends. Observations on the development are in progress. The eggs, very numerous and less than a millimeter

in diameter, are cemented into a large plate, which is rolled into a bunch and carried in a basket formed by the anterior thoracic appendages. The incubation seems to be slow, and the larvæ are about all hatched before August 1st. The new-hatched larva is two and a half millimeters long and of much more advanced organization than in the forms described by Claus. It moults in three days. The later stages have been taken in the tow-net and at this writing (August 11th), are seven millimeters long and in perhaps the sixth or seventh stage. The smallest adults found are over ten centimeters long indicating that this size is attained in one year.

*Variations in Color pattern produced by Changes in Temperature and Moisture*: By W. L. TOWER.

The relations which exist between the variations of the color pattern, moisture and temperature conditions have been tested experimentally during the last two years in *Leptinotarsa decemlineata* Say, the Colorado potato beetle. Extremely abnormal conditions were avoided and only such deviations from the normal were used as might be encountered in different parts of North America. In several series of experiments known deviations of temperature and moisture were used and the results derived by quantitative methods.

The series of experiments show that a deviation above the normal (+) of either temperature or moisture, or both, up to a certain critical maximum, will produce melanism; but a deviation of either factor beyond this maximum will produce albinism. A deviation below the normal (—) produces albinism if both factors are —; but a + temperature and a — humidity produce albinic specimens; and a — temperature and a + humidity produce melanism up to the critical point where the opposite color variations begin to predominate.

*A Study of the Variations in the Number of Grooves upon the Shells of Pecten irradians (Lam.):* By FRANK E. LUTZ.

The material for this study was gathered from East Beach, Northport Bay, L. I., during the scallop season of 1899-1900. The Beach is an extremely well-protected one in an almost land-locked harbor. The results given by a count of five hundred specimens of each valve were as follows:

*Lower valve.*—Average =  $17.456 \pm 0.022$ ; Standard Deviation =  $0.726 \pm 0.015$ ; Coefficient of Variability =  $4.163\% \pm 0.888\%$ .

*Upper valve.*—Average =  $17.110 \pm 0.027$ ; Standard Deviation =  $0.922 \pm 0.019$ ; Coefficient of Variability =  $5.388\% \pm 0.115\%$ .

The curves obtained in both cases were nearly normal—that of the lower valve approaching the closer. The shells show the least variability of any Pectens yet studied.

*Statistical Studies on Sand Fleas:* By MABEL E. SMALLWOOD.

Five hundred sand fleas (*Talorchestia*), apparently adult, were gathered from the Sand Spit at Cold Spring Harbor. They ranged in length from 15 mm. to 27.5 mm. The length of the antennæ ranged from 5.5 mm. to 24.4 mm., the average was 13.01 mm.  $\pm 0.14$  mm. and the standard deviation was 4.67. Attempts to fit a theoretical unimodal curve were unsuccessful. From inspection of the distribution of frequencies it seems probable that the observed curve is multimodal with two principal modes placed so near together that their distinctness is hidden, and that these two modes correspond to two moultings. The length of the tentacle is proportionately much longer in the larger individuals and it seems probable that the two recognized species—*T. megalopthalma* and *T. longicornis* are merely two different moults of the same species. Breeding experiments are now in progress to test this conclusion.

*Pedigree Mouse Breeding:* By C. B. DAVENPORT.

Quantitative data are being collected from a colony of fifty mice of different races concerning inheritance of color and other measurable characteristics. Especially noteworthy are the relative prepotency of different races, reversion, the skipping of a generation in inheritance, the *localization* of white patches and of the other parental color-markings on particular parts of the body of the offspring. The results are not yet ready for publication.

C. B. DAVENPORT.

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#### SCIENTIFIC BOOKS.

*Tarr and McMurry's Geographies.* First Book—Home Geography and the Earth as a Whole. Pp. xiii + 279. Second Book—North America, with an especial full treatment of the United States and its dependencies. By RALPH S. TARR and FRANK M. MCMURRY. New York, Macmillan. 1900. Pp. xviii + 469.

The first volume is a disappointment. The authors call it 'a radical innovation,' but the claim does not seem well founded. Apparently they have meant to make the Home Geography and the maps the *features*.

Home Geography is a misnomer for the book. The idea that the child ought to begin with the study of forms about him is good, but not new, and the idea is not realized in this volume. A few sentences connect hills and valleys and soils with environment; the mountains are said to look like clouds on the horizon. The rest is descriptive and not Home Geography at all.

Suggestions for further home study are appended to the chapters, 8 or 10 pages in the 280, but they are subordinate and will be neglected by most teachers as such, especially as teachers are still untrained in outdoor work.

For instance, the first suggestion is, "Find a place where men are digging a ditch or cellar, to see how the dirt looks below the surface"—an admirable thing to do, but the inertia of the