quring the purification of waste before it enters the stream. The general trend of modern legislation is towards the latter course, no doubt due largely to the influence of the increasing number of State Boards of Health; but why not make it a question of municipal economy?

If Newark, for example, wants her water supply from the Passaic river, whose waters are polluted, does it not seem absurd, speaking broadly, that she should be required to purify her supply of twenty million gallons a day when the pollution comes, perhaps, from one mill discharging only one million gallons? If one woolen mill on a stream causes pollution that obliges a dozen cities further down the stream to construct filtration works, provided they are to drink the water with any degree of safety, would it not be more economical to oblige the one mill to purify its comparatively small amount of waste before it is allowed to enter the stream, instead of permitting the pollution of the whole river? *Vice versa*, streams already devoted to the service of mills and manufacturies may better serve the general economy by continuing in that service; and the one or two cities can build filtration plants at less cost than that of purifying the wastes of all the manufactories. Only a careful study of the condition of the communities along the banks can ascertain in which way the gain to the whole people is found, in which way public economy is best maintained.

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*MARINE LABORATORY OF THE UNITED STATES FISH COMMISSION AT WOOD'S HOLE STATION, SUMMER SEASON OF 1895.**

THE present 'Laboratory of Scientific Research' was constructed after Professor Baird's designs in the year 1884, as part of the large building which serves the department of fish culture. This is, therefore, the eleventh season during which scientific research has been prosecuted under these conditions both by government patronage and by individual responsibility, and it is instructive to look back over these years and see how many well-known workers have been accommodated here, and of how much service these advantages have been to the learned institutions which they represent, such as Yale, Princeton, Harvard, Johns Hopkins, Columbia, and the University of Pennsylvania, besides a large number of smaller colleges both East and West.

There have been present at the Laboratory this summer thirty workers, representing twenty important educational institutions of this country, and one German university; four of these institutions are various high schools of the city of Chicago. These thirty have been engaged upon such a wide range of problems that only the more notable can be mentioned.

One piece of research, by Prof. H. V. Wilson, upon the sponges from the Gulf of California and the Galapagos Islands, collected by the U. S. steamer *Albatross*, under the direction of Professor Alexander Agassiz, has drawn our attention to the value of that side of biological work. Embryology naturally fills a large place here and two phases of it have been followed. The first, by Prof. W. Patten, deals with abnormal development in *Limulus embryos*. A certain small proportion of the eggs pass through the normal formation of the perfect embryo, only to then reverse the process and fade back to the original simple egg condition; or a double embryo may be formed, or a triple embryo in regular sequence, or one side of the embryo

*This has been an especially active season at the Government and Marine Biological Laboratories at Wood's Hole. At our request Professor Peck, who has been in charge of the research work at the Government station this summer, sends to SCIENCE this informal report.

may disappear. It is expected that the singular behavior of these eggs will throw some light upon the physiology of growth in the embryos. It has been the good fortune also of another of our number, Dr. Lewis Murbach, to have obtained the eggs of the beautiful medusa *Gonionemus*, which this season has been unusually abundant in the 'eel pond.' An account of the occurrence of the adult in this locality is being prepared, while material for a very complete study of the development has also been secured. This piece of investigation is well under way and has contributed much of interest to all who have followed its progress. Interesting stages in the larval development of *Perophora* have been observed by Mr. George Lefevre, as the free swimming tadpole larva settles down to the fixed state, with loss of tail and sense organs.

Much cytological study has been directed upon the ganglion cells of the central nervous system. The center of this line of research was at the room of Dr. Ira Van Gieson, who, with his assistant, Mr. I. Strauss, made many careful preparations of the ganglia of the invertebrates, Mollusca, Tunicata, Annelida, for comparative study; while some of the clearest results were obtained from the large motor cells from the brain of the Torpedo. Neurological work in other directions has attracted several investigators, and one might mention in this connection the very successful application of the methyline blue method by Mr. J. E. Peabody to the study of the distribution of the nerve termini in the sense ampullæ of the dogfish and Torpedo. The work—originally suggested and directed by Professor H. Ayres—is tending toward important results as to the sensory or glandular nature of these characteristic structures. Altogether, including several students working under the direction of the investigators before mentioned, there have been seven of our number engaged in special study of nerves by means of Nissl's method, the Golgi, Weigert and methyline blue methods.

Another line of research, by Dr. T. H. Montgomery, Jr., was concerned with the histology of the Nemertine worms, and has added many interesting features to the anatomy, histology and embryology of that group, especial attention having been paid this season to the development of the proboscis.

It is very encouraging to note how much of the work heretofore enumerated is definitely upon its way to publication by the authors. Some of it is already promised to leading journals; some of it will be incorporated in theses to be offered for the degree of Doctor of Philosophy at our universities, and all of it will, I believe, find its way into important and useful channels. One piece of research, by the present writer, was advanced directly under the auspices of the U. S. Fish Commission. This relates to the food of fish fry, especially of the earliest stages after the embryo becomes capable of free-swimming existence and able to take food; the nature of the food of fry of from a quarter to half an inch in length of several families is demonstrated, while the results will be published, together with previous studies upon planktonic material and the food of certain adult fishes, for the Fish Commission.

Much might be said about the students who have come to this station for their first seaside studies, who ask common questions about common things, or common questions about rare things, or sometimes rare questions about common things. Their work never grows old, is never finished, and seems more important each year than it did the year before. Inasmuch as no regular instruction is provided at the laboratory, much depends upon the careful outlines of work to be furnished students who come here alone by those who have them in charge. Great help can be given to students by fur-

nishing in advance definite ideas of what forms to select for work, how to proceed, and what to read, and, if possible, by putting the student into communication with some one who is willing to give an occasional word of advice. This help may be well given in advance at the universities and colleges from which students come, as is proved by our experience this season; much time thereby is saved for them and their work is more consistent and fruitful.

Another advantage of the presence of students who are doing work of a more general character is the custom of regular towing, and of constantly bringing into the Laboratory fresh supplies of living material of many kinds. The tow net is also drawn each day by Collector Vinal N. Edwards, of this station, and this, together with the large and beautiful aquaria in the exhibition room of the Laboratory, keeps all the men engaged in special research in association with general phenomena of the most attractive kinds.

It is very interesting also to see how much material for future work is each year taken from this Laboratory. Every research worker carefully collects all that he can to furnish his basis of study during the winter to come; every teacher secures also a collection of forms for class demonstration in the coming academic year, while some come here entirely for such general collecting. In this way biological work in all of the twenty universities, colleges and secondary schools represented here this season will derive many advantages from this station. In this connection we feel that too much cannot be said of our appreciation of the excellent collecting facilities offered here by the equipment of boats and other apparatus, nor of our grateful recognition of the invariable courtesy and coöperation of the U. S. Fish Commission authorities immediately in charge of this station.

Some of the most pleasant occasions of the summer were the informal gatherings held each Monday evening, at one of the large rooms of the 'Residence,' at which some of the older members of the Laboratory described the results of their various lines of investigation. Seven different themes of original research were thus presented, while the interest was much increased by the very general discussions and questions which followed each talk.

Altogether, this has been a very successful season at the Laboratory; there has been an earnest tone of work that has made itself felt throughout. We also owe very much to the advantages coming from our proximity to the Marine Biological Laboratory, and consider that much of our success is due to being so near to the active work of that institution.

We learn just at the closing of the season of the death of the Commissioner of Fish and Fisheries, Marshall MacDonald. Our grief is very deep at this sad news, for he was to all of us who have been associated with him a personal friend whom we loved, even as we respected his most liberal mind. His generous appreciation of all purely scientific work was a direct fulfilment of the original design of Professor Baird. Commissioner MacDonald's kindness, sympathy and personal interest in the young men working at this Laboratory will ever remain as most cherished memories by those who thus knew him.

J. I. PECK.

GEOGRAPHY AT THE BRITISH ASSOCIATION.

AT the Ipswich meeting of the British Association, the Geographical Section was distinguished by the exceptionally small number of papers offered for reading, and several of those which were presented were read, contrary to the usual practice, in the absence of their authors. These facts must not be taken as implying any loss of interest