

darius), British, presented by Mr. T. E. Gunn; two Pintails (*Dafla acuta*), two Wigeons (*Mareca penelope*), European, presented by Mr. Charles E. Boulton; a Margined Tortoise (*Testudo marginata*) from the Ionian Isles, presented by Miss Mansell; a Purple-faced Monkey (*Semnopithecus leucoprymnus* ♀) from Ceylon, a Pinche Monkey (*Midas edipus*) from Brazil, two Common Marmosets (*Hapale jacchus*) from South-East Brazil, deposited; a Chimpanzee (*Anthropithecus troglodytes* ♂), a Chimpanzee (*Anthropithecus calvus*? ♀) from West Africa, a Chipping Squirrel (*Tamias striata*) from North America, two Bramblings (*Fringilla montifringilla*), European, purchased; two Simon's Dwarf Jerboas (*Dipodillus simoni*) from Arabia, received in exchange; six Long-nosed Vipers (*Vipera ammodytes*), born in the Gardens.

BIOLOGICAL NOTES

OBSERVATIONS ON THE EMBRYOLOGY OF THE TELEOSTS, by J. S. Kingsley and H. W. Conn. The observations were made during the summers of 1881 and 1882 at the Summer Laboratory of the Boston Society of Natural History at Annisquam, Mass., on the egg development of *Ctenolabrus coruleus*. The eggs were obtained by surface skimming, and were usually equally abundant during the day and in the evening, and as a rule were more so on the flow than on the ebb of the tide. Half an hour's skimming would produce on an average 150 eggs. These eggs all floated at or near the surface of the water, and presented a marked contrast to those of either an Elasmobranch, Batrachian, Reptile, or Bird, in that the germinative portion is invariably downward or on the lower surface of the egg, while the deutoplasm is uppermost. The stages observed were: the maturation of the ovum, the phenomena of segmentation until the formation of the germ layers, the formation of the three primary layers, the segmentation cavity, the invagination of the hypoblast, and the appearance of nuclei in the intermediary layer of Van Bambeke, the formation of the notochord and neural cords, the former arising from the hypoblast at first as a longitudinal median thickening of that layer, and subsequently becoming segmented off and taking its place among the mesoblastic tissues, the development of the optic bulbs and protovertebræ.

EMBRYOLOGICAL MONOGRAPHS.—Under this title Prof. Alexander Agassiz proposes to issue a series of selections from embryological monographs, so as to give the student in an easily accessible form a more or less complete iconography of the embryology of each important group of the animal kingdom. It is not intended that these monographs should be handbooks to the subject, but rather act as atlases to accompany any general work on the subject. The plates will be issued in parts, each part covering a somewhat limited field, and occasional appendices may be published to prevent the plates from becoming antiquated. The illustrations will be accompanied by carefully prepared explanations, and by a bibliography of the subject in octavo. This work, planned out in 1873, has only now been matured. The first part is on the embryology of Crustacea, with fourteen plates, edited by Walter Faxon. The figures on these plates are taken from all the most reliable sources, and an important volume of bibliography accompanies the atlas. The parts devoted to Echinoderms, Acalephs, and Polyyps are well advanced, and it is intended to figure the phenomena connected with fecundation and maturation and the history of the formation of the embryonic layers in a separate part, without regard to the systematic zoological connection of the observations.

CERATODUS FORSTERI.—Mr. Morton got twelve specimens of this fish in the Mary River, Queensland, one only in a net; all the others were trapped by the blacks by being forced through a narrow passage in the river formed by a kind of brushwood. He noticed a curious circumstance as regards their habits. At the time of his visit a number of Eucalyptus trees were in full flower by the banks of the river, and as the blossoms dropped into the water they were eagerly seized and swallowed by these fish. The stomachs of each of the specimens captured were literally crammed with these flowers. An old resident told Mr. Morton that during June to August these fish go in pairs, that they make slight indentations in the muddy bottom in from six to ten feet of water, in which the spawn is deposited, that the male and female fish

remain near the spawn, and are not then easily disturbed, that they frequent the same place every year, and that the spawn is frog-like. He had taken it and hatched it in a tub of water, keeping the young alive for some weeks. (W. Macleay in *Proc. Linn. Soc. New South Wales*, vol. viii. part 2, July 17, 1883).

GLYCOGEN was lately found by M. Errera in fungi of the order Ascomycetes (before, it had only been observed in the animal kingdom and in Myxomycetes, organisms which naturalists have placed, sometimes among animals, sometimes among plants). Continuing his researches, he now finds the substance (*Bull. Belg. Acad.*, No. 11, 1882), not only in Ascomycetes, but in many Mucorinæ, such as *Phycomyces nitens*, *Mucor nucado*, and *stolonifer*, *Pilobolus crystallinus*, *Chaetocladium Fonsii*, *Piptocephalis Freseniana*, *Synecephalis nodosa*. He has specially studied *Phycomyces nitens*, the large size of which is an advantage. In it the glycogen does not occur in localised masses, as in the *Asci* of Ascomycetes. When the mycelium filaments are young it is distributed throughout the protoplasm; later it is carried to the top of the cell which is destined to give rise to the sporangium. Its quantity does not diminish notably during formation of the sporangium, so it does not seem to have a preponderant rôle in growth of the membrane. It is found in the spores, and probably another portion serves for respiratory combustion; the rest may be utilised for growth of membranes of the sporangium-filament and the spores. Having got 40 grammes of dried *Phycomyces*, M. Errera extracted glycogen with all its reactions, confirming the results of micro-chemical analysis.

MARINE ZOOLOGICAL LABORATORIES¹

[THE following communication has been forwarded to us by an eminent biologist, with the request that it be reproduced in our pages]:—

Nearly all the European States except England have on their sea-coast marine zoological laboratories; it may therefore, especially in view of the recent proposals of Prof. Lankester, and the manifesto of biologists which has followed it, perhaps be interesting to your readers to peruse the following description of these laboratories; they will then be able to appreciate their utility, indeed absolute necessity, in order to study or pursue investigations in certain branches of science.

These seaside laboratories, or *stations zoologiques maritimes*, have nearly all been founded by zoologists for the purpose of advancing zoological science. Fortunately they also help both students and scientists in other branches of science than that of zoology, the one to arrive at a proficiency of knowledge, the other to carry out interesting and valuable researches which, but for this brotherly help, would be impossible. The countless species of marine animals attract physiologists, histologists, and comparative anatomists to work in a field which may reveal facts hitherto undiscovered in that more limited area which is included in the study of terrestrial and fresh-water animals.

The success of these laboratories is doubtless increased by the fact that they are always in a healthy locality on a bracing seashore, so as to allow a realisation of the apparently anomalous combination of work and rest. The scientist, worn out by fatiguing researches made in town laboratories, finds fresh elements of health and a fresh field for research by passing three or four months at a seaside laboratory.

The first of this class of laboratory is the one founded at Naples by Herr Dohrn, a private enterprise almost exclusively German, which nevertheless has received substantial aid from the city of Naples, and some years hence will become the town property.

In order to work in the Naples laboratory a heavy fee is exacted. Nearly all the tables are retained yearly by different universities or scientific societies; the British Association has two tables. The revenue is greatly increased by the fees of admission to an aquarium of marine animals.

This laboratory is admirably organised; there is an agreement between the authorities and the fishermen that the latter shall take to the laboratory all rare animals that they may chance to find; likewise there is every necessary arrangement for dredging excursions and for diving into the depths of the sea to find such animals as are required for study. There are several sailing boats and a steamboat belonging to the laboratory, which is also

¹ From the *British Medical Journal*, October 13, "Special Correspondence, Paris."

well provided with diving dresses. The animals are kept in a large tank, which is large enough for specimens of considerable dimensions.

France, apart from the laboratory of the Science Faculty at Marseilles, which has an aquarium and a boat, possesses five seaside laboratories. They are distributed as follows: one at Villefranche, superintended by M. Barrois; one at Banyuls, near Port Vendres, superintended by M. Lacaze Duthiers; another at Concarneau, on the south coast of Brittany, superintended by MM. Robin and Pouchet; another at Roscoff, on the north coast of Brittany, superintended by M. Lacaze Duthiers; and one at Havre, superintended by M. Paul Bert. Besides these principal establishments, there are two or three others, such as those of Arcachon and Lucques, which have been founded either by provincial scientific societies, or by professors who have received some slight aid from the corporations of the towns where these laboratories are established; but these laboratories possess neither special tenants, boats, nor sailors, therefore they are only of use to their founders and a limited number of pupils.

The laboratories of Villefranche, Roscoff, Concarneau, Banyuls, and Havre are founded and kept up by the French Government; in some cases the corporations have given money or granted land. The laboratories of Concarneau and Roscoff present two varieties widely different.

The laboratory at Concarneau is situated at the entrance to the port; it was founded by Coste, the well-known embryologist, who wished to study the different conditions attending the reproduction of marine animals. The building consists of two stories: the ground floor is used for the aquariums, three in number; on the first floor are the workrooms. The rocks facing the laboratory have been utilised, and are transformed into eight basins or reservoirs of water, each from 300 to 1200 feet square, and from 15 to 20 feet deep. The aquariums are filled with water by means of a pump set in motion by the wind. There is only one boat belonging to this laboratory, but the French Government always place a war sloop at the disposal of its director; this summer some of the laboratory workers wanted to dredge a long way out at sea, and the Government lent them a despatch boat. The coast abounds in marine animals, but is poorer in invertebrates than that of Roscoff; it is more especially a coast for sardine fishing. The surrounding scenery is lovely.

Roscoff perhaps offers greater advantages, though fewer attractions. Cabbage-fields and tracts of land devoted to the cultivation of artichokes, though a proof of the mild and delightful climate of this little seaport, are by no means an acceptable substitute for the beautiful scenery of Concarneau, but the treasures of the sea here, more abundant than on the coast of Concarneau, or indeed on any other part of the whole French coast, are ample consolation to the crowd of workers who annually avail themselves of the facilities for studying and carrying out researches which the Roscoff laboratory, founded by M. Lacaze Duthiers, affords them free of cost.

The coast of Roscoff offers peculiar advantages for a seaside laboratory, or, in French terminology, *station zoologique maritime*. The numerous boulders of granite serve as places of shelter for the neighbouring marine animals. It also presents a vast expanse of sand sea-shore and a large bay of slime, thus all the different kinds of marine animals are within reach.

Notwithstanding these remarkable qualifications which M. Lacaze Duthiers quickly detected, he had considerable difficulty to get a footing for his laboratory. It now consists of a large house bought by Government, to which has been recently added the village schoolhouse (*École Communale*), abandoned, since education has become compulsory, for another affording increased accommodation. A third house, opposite to the one bought by Government, is hired for the convenience of the laboratory workers. It must be remembered that Roscoff is only a little fishing village, and it is often difficult to find a room during the summer season, therefore M. Lacaze Duthiers offers a bedroom to all who work in his laboratory.

There are two sailors belonging to the laboratory; and one of the attendants from the Sorbonne laboratory is on duty at Roscoff during the summer months. The garden of the laboratory reaches down to the sea. A large reservoir, measuring 4200 feet, has been constructed, where are kept marine animals, either at liberty or in cases. On a small island opposite the laboratory there is a "bed" where animals of sedentary habits are kept almost at liberty.

The laboratory has three sailing boats adapted for taking excursions among the rocks and on the neighbouring shores, also for dredging either with the usual drag, oyster-drag, or with a coral-fishing apparatus. The fishermen also take a considerable quantity of marine animals to the laboratory.

This Roscoff *station zoologique maritime*, which M. Lacaze Duthiers had so much trouble to found, is now in its fifteenth year. The French Government by degrees added to its local habitation, which, if even at the present time not perfect, is nevertheless of immeasurable utility to scientific workers, and therefore contributes to the progress of science.

The Roscoff laboratory is perhaps more frequented than any other, and is an enduring testimony to the patience and laudable determination of its founder and director. The expenses are defrayed from the fund annually voted by the French Parliament for public instruction. Here, as in all establishments in France for higher education, no fees are paid; but this success was hardly won; the necessary sum was with difficulty wrung from the Government, and the local authorities, notwithstanding the evident advantages such an establishment brings to the village, were equally tardy to grant the concessions eventually obtained, unlike those of Banyuls, who conceded a building site, also a yearly revenue, and subsequently presented the laboratory with a boat.

The most recently organised seaside laboratory is at Havre; the building it occupies was formerly a public aquarium, which the corporation handed over to M. Paul Bert. It is supported from Government and corporation funds, and is more especially destined to facilitate physiological research. Doubtless, when the arrangements now in course of completion are perfected, they will offer all the requirements for studying this branch of science, a qualification evidently all but absent in laboratories founded by zoologists.

It must be admitted that all these seaside laboratories, or *stations zoologiques maritimes*, taken both separately and in the aggregate, render important service to biologists of all nations. Every year there is a large percentage of foreigners among the workers, the English element bearing always the largest proportion, a proof that our countrymen fail to appreciate their good fortune in possessing a more extensive sea-coast than that of any other country, or they would be able to offer this useful form of hospitality as well as seek it. Nevertheless, considering the scanty encouragement given by the public and the English Government to biological science, it is to be feared that many years will pass by before *stations zoologiques maritimes* exist on the English coast.

The only similar laboratory in Holland belongs to the Universities of Utrecht and Leyden. The Dutch coast is not rich enough in marine animals to suggest the advisability of establishing many zoological laboratories, therefore a movable or migratory laboratory has been organised, which consists of a wooden house, easily taken down and put up again; there are three rooms in it, a large workroom, and two smaller ones used for the aquarium and fishing apparatus. At the beginning of every summer it is set up on the coast on a piece of land hired for the purpose, or more frequently lent by the nearest village; thus the Dutch scientists visit the entire coast, study its marine animals, and even that of their neighbours. Russia has a laboratory on the Black Sea, and Austria possesses one at Trieste.

In connection with the above communication, we may state that Mr. Romanes writes to Tuesday's *Times* forcibly pointing out the need of a thoroughly equipped zoological station on the British coast, and its value both to science and to our fisheries. Referring to the recent manifesto, so influentially signed, printed in our columns, Mr. Romanes hopes the executive committee will see their way to adopting its suggestions.

THE ASSOCIATION OF GERMAN NATURALISTS AND PHYSICIANS

THE fifty-sixth annual meeting of this flourishing association was held this year in the city of Freiburg, Baden, under the presidency of Dr. A. Claus. The proceedings opened with an informal gathering in the Concert Hall on Monday, September 17, and concluded on the following Saturday with an excursion to the romantic watering-place of Badenweiler. During the four intervening days the several Mathematical, Physical, Biological, and Medical Sections met regularly in the old University,