

BIOLOGICAL NOTES.

FOSSIL FISH REMAINS FROM NEW ZEALAND.—Mr. Davis has recently described a number of fish remains from the Tertiary and Cretaceous-Tertiary formations of New Zealand. The memoir forms a part of the Transactions of the Royal Dublin Society, and is illustrated by seven well-executed plates of the fossils. Some short time ago Mr. Davis received the remains of some fossil Tertiary Elasmobranchs from Prof. F. W. Hutton, from New Zealand, which formed the subject of a short communication to the Geological Society of London; but a much larger collection having been in the meanwhile received, permission was granted for the withdrawal of the paper, and now, based on several additional collections, we have the present memoir, which for the first time does justice to these interesting fossil forms by full descriptions and excellent figures. The memoir opens with an account of the Tertiary formations of New Zealand, based on the results attained by the Geological Survey under Sir James Hector, while notice is taken also of the views of Prof. Hutton and Sir J. von Haast. In addition to the remains of fish, some Saurian teeth, as well as those of a Squalodon, have been found. Of the thirty-five species of fish described, no less than twenty-eight appear as new species; of these thirty-five, twenty-eight are Sharks, four are Rays, two belong to the Chimerids, and one to the Teleostei. A new species of toothed Whale, *Squalodon serratus*, is also described.—(Transactions of the Royal Dublin Society, vol. iv. (ser. 2), part i. pp. 1-50, plates i.-vii.)

MAMMALS OF LIBERIA.—Dr. F. A. Jentink continues his account of the recent zoological researches in Liberia, which have been carried on for the last seven or eight years by J. Büttikofer, C. F. Sala, and F. X. Stampfli. The amount of information collected by the first-named investigator is very great, and merits the high praise bestowed upon it by the Director of the Leyden Museum. Of the ninety species of Mammals sent home, thirteen belong to the Monkeys, eleven to the Carnivores, thirty-three to the Ruminants, five to the Pachyderms, twenty-five to the Rodents, one Sirenian, four Insectivores, seventeen to the Bats, and three to the Edentates. Among the more interesting species mentioned are the following: *Cercopithecus stampflii*, n. sp., from Pessy Country; *Terpome longiceps*, Gray; *Cephalophus doria*, Ogilby, and *Euryceros curyceos*, Ogilby; *Graphiurus nagtglasii*, n. sp.; *Claviglis crassicaudatus*, n. g. et n. sp.; *Crocidura buttikoferi*, n. sp., and *C. stampflii*, n. sp.; *Pachyura megalura*, n. sp.; *Epomophorus veldkampii*, n. sp.; and *Vesperugo stampflii*, n. sp. This number also contains notes of 151 species of Birds, collected by J. Büttikofer and F. X. Stampfli, during their last sojourn in Liberia. The last-named is still collecting on the Farmington River, a large confluent of the Junk.—("Notes from the Leyden Museum," vol. x. Nos. 1 and 2, January and April, 1888.)

ON NEW ENGLAND MEDUSÆ.—In a list of certain Medusæ, found by Mr. J. Walter Fewkes, off the coast of Maine and from Grand Manan, he redescibes and figures the interesting and beautiful *Nanomia cara*, A. Ag. This Physophore, described some twenty-five years ago, though repeatedly referred to in text-books and general works on zoology, seems to have since escaped attention, but many specimens were found at Grand Manan. It will be remembered that the form thought to be adult by A. Agassiz, is not above six inches in length, but Mr. Fewkes captured specimens measuring, when extended, over four feet in length, and three feet when retracted; while many hundreds were seen of the size of the specimen he figures, which is about sixteen inches long. When floating in the water they were easily distinguished from the southern Physophore, *Agalma elegans*; the nectocalyces are biserial, the specimen figured has thirteen pairs of well-developed bells, and many of the adults had fifteen pairs. Among the most interesting and it would seem exceptional structures in this form are the organs referred to by A. Agassiz as the "third kind of polyps," now called "hydrocysts" or "tasters"; these hang from the polyp stem midway between the polypites, a single adult and many half-developed tasters occurring between each pair of polypites. They are small, slender, flask-shaped bodies, the distal end is closed, and near the basal attachment there is a prominent red body of spherical shape, known as the "oil globule"; each taster has also a single long tentacle. Contrary to what A. Agassiz thought, the adult *Nanomia* has male and female bells on one and the same colony; each female bell carries a single ovum, which, when they escaped, could be easily seen by the unassisted vision.

*Hydrichthys mirus*¹ is also described and figured as a new genus and species belonging to the Hydroida; it was found attached to the side of a small fish (*Seriola zonata*, Cuv.) which had been taken in the dip-net at a time when the sea was quiet. The patch had at first all the appearance of a Fungoid growth. The fish and Hydroid parasite were kept alive for some time in an aquarium, and from the latter many thousands of Medusæ were raised. The Hydroid colony formed a cluster of reddish and orange-coloured bodies; the basal attachment is a flat thin plate with ramifying tubes; upon it are separate clusters of gonosomes and (?) hydranths. Each gonosome is botryoidal; the free extremity of the gonosome is without tentacles, its rim is entire, and it is destitute of Medusa buds. It seems possible that no food is taken in by the gonosomes, but that the whole structure is dependent upon the tubes of the basal plate for its nutrition. The filiform structures (hydranths?) are elongated flask-shaped bodies of about uniform size, with terminal openings. The Medusa is closely related to Sarsia, and so far shows the new Hydroid to be allied to the Tubularians, but there are not wanting certain features which hint at a kindred to the Siphonophores. The rare and interesting *Callinema ornata*, Verrill, is redescibed, and for the first time figured. With a remark of the author, "that histological researches lose some of their value if not preceded by an accurate identification or specific description of the animal studied, if it be different from known species," we heartily agree.—("Studies from the Newport Marine Laboratory," Bull. Mus. Comp. Anat. Harvard College, vol. xiii. No. 7, February 1888.)

THE BILL FOR THE PROMOTION OF TECHNICAL INSTRUCTION.

THE following is the Bill for the promotion of technical instruction, introduced by the Government:—

Be it enacted by the Queen's most Excellent Majesty, by and with the advice and consent of the Lords Spiritual and Temporal, and Commons, in this present Parliament assembled, and by the authority of the same, as follows:

1.—(1) Any School Board in England may from time to time supply or aid the supply of such manual or technical instruction, or both, as may be required for supplementing the instruction given in any public elementary school in its district, whether under its own management or not.

(2) Manual or technical instruction shall not be supplied or aided under this section except for such scholars as—

(a) are recognized by the Education Department as in attendance at a public elementary school and receiving instruction in the obligatory or standard subjects prescribed by the minutes of the Education Department for the time being; and

(b) (in the case of technical instruction only) have obtained from the Education Department certificates of having passed the examination in reading, writing, and arithmetic, prescribed by the standard set forth in the schedule to this Act, or an examination equivalent thereto.

(3) For the purpose of supplying or aiding the supply of manual or technical instruction under this section, a School Board shall have the same powers, but subject to the same conditions, as it has for providing sufficient public school accommodation for its district, subject to this restriction that the amount of the rate to be levied in any one year for the additional purposes authorized by this section shall not exceed the sum of *one penny in the pound*.

2.—(1) If a School Board aids the supply of manual or technical instruction in any school or schools under its own management, it shall, on the request of the managers of any other public elementary school in its district fulfilling like conditions as to the supply of manual or technical instruction in conformity with the requirements of the Department of Science and Art, and on proof of sufficient demand for such instruction in that school, aid the supply of such instruction in that school in like manner as it aids such supply in the school or schools under its own management, subject to such terms as may be agreed on or determined in pursuance of this Act.

(2) If the managers of a public elementary school in the district of a School Board object to the terms on which the School Board proposes to aid the supply of technical instruction in that school, the Department of Science and Art shall, on the appli-

¹ Vide NATURE, vol. xxxvi. p. 604, where we believe this genus and species were first described by the author.

cation of those managers, determine whether the terms so proposed are reasonable.

3.—(1) Any local authority empowered to carry into execution the provisions of the Public Libraries Acts with respect to the establishment and maintenance of public libraries, public museums, schools for science, art galleries, and schools for art, may from time to time supply or aid the supply of technical instruction by providing or aiding in the provision of teachers, apparatus, or buildings to such extent and on such terms as the authority think expedient, and may exercise its powers under this section either with or without exercising any of its powers under the Public Libraries Acts.

(2) Provided as follows:—

(a) In a district for which there is a School Board, the local authority shall not out of their own funds supply or aid the supply of technical instruction suitable for scholars receiving at a public elementary school instruction in the obligatory or standard subjects prescribed by the minutes of the Education Department for the time being, except to the extent, if any, to which the authority was so supplying or aiding before the establishment of a School Board.

(b) In a district for which there is not a School Board, the managers of a public elementary school shall not receive aid under this section except for scholars for whom technical instruction may be supplied or aided by a School Board in a district for which there is a School Board.

(3) The amount of the rate to be levied in any one year under the Public Libraries Acts as amended by this Act for the additional purposes authorized by this section shall not exceed the sum of *one penny in the pound*, and where the powers given by the Public Libraries Acts are exercised concurrently with the powers given by this section shall not exceed *two pence in the pound*.

4.—(1) The managers of any technical school in the district of a School Board or local authority may make an arrangement with the Board or authority for transferring their school to that Board or authority, and the Board or authority may assent to any such arrangement.

(2) The provisions of section twenty-three of the Elementary Education Act, 1870, with respect to arrangements for the transfers of schools, shall apply in the case of arrangements for the transfers of schools in pursuance of this section.

5.—Every minute of the Department of Science and Art with respect to the condition on which grants may be made for technical instruction shall be laid on the table of both Houses of Parliament within three weeks after it is made, if Parliament is then sitting, and if Parliament is not then sitting, within three weeks after the then next session of Parliament, and shall not come into operation until one month after being so laid.

6.—In this Act—

The expression “technical instruction” means instruction in the principles of science and art applicable to industries and in the application of special branches of science and art to specific industries or employments. It does not include teaching the practice of any trade or industry or employment, but, subject as aforesaid, includes instruction in the branches of science and art with respect to which grants are for the time being made by the Department of Science and Art, and any other form of instruction which may for the time being be sanctioned by that Department by a minute laid before Parliament and made on the representation of a School Board or local authority that such a form of instruction is required by the circumstances of its district.

The expression “technical school” means a school or department of a school which is giving technical instruction to the satisfaction of the Department of Science and Art.

The expression “manual instruction” means instruction in the use of tools and modelling in clay, wood, or other material.

The expression “the Education Department” means the Lords of the Committee of Her Majesty’s Privy Council on Education.

The expression “local authority” means the Council, Commissioners, Board, or other persons or authority carrying into execution, or empowered to carry into execution, the Public Libraries Acts.

The expression “Public Libraries Acts” means the Public Libraries (England) Acts, 1855 to 1887, and the Public Libraries (Ireland) Acts, 1855 to 1884.

7.—This Act may be cited as the Technical Instruction Act, 1888.

SCHEDULE.

STANDARD.

Reading.—To read a passage from some standard author.

Writing.—A short theme or letter on an easy subject, spelling, handwriting, and composition to be considered. An exercise in dictation may, at the discretion of the inspector, be submitted for composition.

Arithmetic.—Fractions, vulgar and decimal, simple proportion, and simple interest.

AGRICULTURAL EDUCATION IN NORTHERN ITALY AND IN PRUSSIA.

MR. COLNAGHI, Consul-General at Florence, in the course of an elaborate Report on his district, refers at some length to agricultural education in the province of Florence. He describes especially the well-known “*Accademia dei Georgofili*,” the Tuscan Society of Agriculture, the *Comizi Agrari*, or Agricultural Boards, the *Stazioni Agrarie*, and also refers to the various institutes and schools which have been established of late years in the province. The “*Accademia dei Georgofili*” of Florence was founded in 1753, and was the first Association of the kind formed in Italy to promote the science of agriculture. On the roll of the Academy are to be found the names of the most distinguished Italian agronomists, and the long series of its Transactions contains important papers on all points of interest connected with the agriculture of Tuscany.

The Royal Tuscan Society of Horticulture, which was established in 1854, now numbers about 700 members. Much useful work has been done by this body in encouraging the improved cultivation of fruit, vegetables, flowers, and ornamental places and by the holding of annual shows in Florence.

Each district of the province has its *Comizio Agrario*, the objects of which are to extend agricultural skill and knowledge, or encourage improvements, and to form a centre for the diffusion of information. The *Comizi* offer prizes for improvements in cultivation, hold Conferences on various subjects, and publish Bulletins containing much useful information on practical subjects. These bodies are supported by members’ subscriptions, and by grants from the Minister of Agriculture and from the province. Besides the annual shows held at Florence, there are regional agricultural shows (*Concorsi Agrarii Regionali*), instituted by the Ministry of Agriculture and the *Comizi Agrari*, which are held at stated periods, and in which some five or six provinces are included. These larger shows have been useful in bringing agriculturists from various parts of the country together, showing the latest improvements in machinery, and in displaying the various products of the different districts.

At the “*Stazione Agraria*” of Florence, which is a branch of the Technical Institute, and is under the direction of Prof. Bechi, experiments are made on the culture and diseases of the vine, the olive, and other plants, and analyses are made of soil, minerals, water, wines, &c. Attached to the *Stazione* is an experimental farm six hectares in size, and also a Government depot of agricultural machinery.

There is also in Florence a Bureau of Agricultural Entomology, under Prof. Tragioni-Tozzetti, where great attention is paid to the *Phylloxera*. This Bureau is in fact the centre of information for the whole of Italy on entomological subjects.

For practical instruction the province contains the *Regio Istituto Forestale* (Vallombrosa), the *Regia Scuola di Pomologia e d’Orticoltura* (Florence), and the *Scuole Agrarie* of Castaletti, near Signa, and of Scandicci, in the immediate neighbourhood of Florence. The Forest Institute of Vallombrosa, now under the Presidency of Prof. Piccioli, who is assisted by eight professors, was founded in 1869, on the model of the forestry schools of France, Germany, and Austria, to supply a sufficient number of trained officers for the Department of Woods and Forests. From 1869 till the present time, 159 students have entered the school, and of these 136 have received diplomas. All of these have entered into the service of their native country, except one who was a Swiss. The course of study lasts three years, during which time instruction is given in forestry and kindred subjects, and in French and German. The limits of age at entrance are sixteen and twenty-two, and the annual charge for board, residence, and instruction is fixed at 700 lire. The State pays a portion of the cost of some of the students, and sometimes their respective provinces do so.