tively into the glass. Anodes of lead oxide or copper oxide are insoluble, and exhibit the same phenomena as platinum or graphite anodes.

Among other investigations, either completed or in course of progress, the following may be mentioned:—Anode rays, the Doppler spectrum in canal rays, determination of the constant c of the law of black-body radiation, the thermal expansion of metals at high temperatures, electrolytic valvular action, influence of chemical composition and heat treatment on the magnetic and electric properties of iron alloys.

E. S. HODGSON.

AWARD OF BEIT MEMORIAL FELLOWSHIPS.

THE trustees of the Beit Memorial Fellowships for medical research have elected the following to fellowships. Each fellowship is of the annual value of 250*l.*, payable quarterly in advance. The usual tenure is for three years, but the trustees have power in exceptional cases to grant an extension for one year. The general character of the research which each fellow proposes to follow, and the place of research, are indicated.

Dr. Ida Smedley, the processes involved in the formation of fat in the organism (the Lister Institute of Preventive Medicine). Dr. R. A. Chisolm: An investigation into the production of experimental nephritis by various methods, and the problems arising therefrom (the Pathological Department, Guy's Hospital). Dr. D. V. Cow: (1) Investigation of the diuretic action of certain tissue extracts, especially of an extract obtained from the intestinal mucous membrane; (2) investigations of certain bacterial diseases with the object of ascertaining any possible beneficent action thereon of organic compounds of a non-toxic nature (the Pharmacological Laboratory, Cambridge). Miss Elsie J. Dalyell: Investigation of gastro-enteric diseases in infants, with reference to etiology (bacteriological research), influence of diet (chemical and bacteriological research), vaccine therapy as a protective and curative measure (Lister Institute of Preventive Medicine). Dr. C. Funk: An investigation into the nature of the so-called deficiency diseases (beri-beri, scurvy, &c.), with special reference to the chemical nature and physiological properties of the substances concerned in their etiology and prevention (the Lister Institute of Preventive Medicine).

Prof. A. B. Macallum: Problems in metabolism in disease, especially those concerned with the formation of urea, ammonia compounds, and uric acid and their excretion (Prof. Fredrik von Müller's Laboratory, Munich). Dr. J. McIntosh: Certain problems concerning the immunity of syphilis (Bacteriological Laboratory, London Hospital Medical College). Dr. S. W. Patterson: (1) Questions concerned with diabetes, especially the fate of lævulose in the normal and diabetic organism; (2) later, to investigate the toxæmias of intestinal origin, especially the influence of different forms of diet on the production of poisonous products, amine derivatives of amino-acids, &c. (Institute of Physiology, University College, London). Miss Helen L. M. Pixell: The life-histories of parasitic protozoa (the Protozoology Laboratory, Bedford College, and the Lister Institute of Preventive Medicine). Dr. H. L. H. Schütze: Studies concerned with the modern absorption theory of the union between bacillary antigen and the antibodies of the blood serum (the Lister Institute of Preventive Medicine).

All correspondence relating to the fellowships should be addressed to the honorary secretary, Beit Memorial Fellowships for Medical Research, 35 Clarges Street, Piccadilly, W.

ZOOLOGY AT THE BRITISH ASSOCIATION.

SECTION D, which was largely attended, presented a very full and varied programme, and the interest in the meetings of the section was well sustained throughout.

A lantern lecture, of a semi-popular nature, was given by Mr. F. Balfour Browne, on the life-history of a water-beetle. After describing his methods of keeping and rearing water-beetles, he proceeded to detail the life-history of a type of each of the two groups of water-beetles, taking *Dytiscus lapponicus* as a type of the group Hydradophaga, and *Hydrocharis caraboides* as a type of the group Palpicornia. The former, which has a very restricted distribution in the British Islands (N.W. Ireland and W. Scotland), being apparently a remnant of the fauna which in earlier and colder times occupied this area, seems to be the first species of the genus the life-history of which has been followed in detail. Mr. Balfour Browne gave an account of the egg-laying habits, the development of the larva and its escape from the egg by means of a pair of small spines on the head, the scraping of which against the shell ultimately ruptures it, and allows the larva to wriggle out. He stated that the larva, in addition to sucking the juices of its prey, from time to time reverses the action of its pharyngeal pump, so as to pour digestive juice into the prey (*e.g.* an insect larva), so that all the soft parts are dissolved and a thin pellicle of chitin only remains. He showed how the larva, after it is full grown and leaves the water, builds the pupal cell, and he referred to the winter habits of the perfect insect. He then compared the life-histories of Hydrocharis and Dytiscus, and pointed out how each type has adopted different means to attain the same end, and that it was just such differences which enabled each species to hold its own in its particular community in the great struggle for existence.

Foraminifera.

Messrs. Heron-Allen and Earland maintained that the life-history of Saccammina, as described by Rhumbler, was a composite sketch, and involved three separate organisms: (1) the early phases were stages of *Crithionina mamilla*, a sessile rhizopod, which, although often associated with *S. sphaerica*, has a wide distribution apart from that species; (2) the next phase was really *Psammosphaera fusca*, an extremely variable species, occurring both free and sessile, always without a general aperture, and found under conditions of depth, &c., in which Saccammina never exists; (3) the "Saccammina" stages, described by Rhumbler, which represent the complete life-cycle of *S. sphaerica*. Early shell-bearing stages of this species differ from the adult only in their smaller size, somewhat less finished exterior, and in the form of the general aperture, which is at first a mere fissure. The nipple-like protuberance, on which the aperture of the adult is placed, gradually develops later.

The Isle of Wight Disease of Bees.

Dr. H. B. Fantham gave an account of the causal organism of this disease—a minute microsporidian parasite, *Nosema apis*—which was discovered by Dr. Annie Porter and himself. The organism is, in the main, a parasite of the alimentary tract of the bee. Spores of the parasite, swallowed by the bee, give rise each to an amœbula, which enters an epithelial cell of the gut, becomes rounded, grows and feeds for a time, and then begins to multiply by various types of binary fission, producing clusters or chains, each individual of which is ultimately uninucleate. The presence of these parasites causes derangement of the bee's digestive processes, and may be fatal.

The second phase of the life-cycle (sporogony) leads to the formation of pansporoblasts, each of which becomes converted into a spore, which serves for the transference of the parasite to a new host. The symptoms of this disease, which has been termed microsporidiosis, vary; inability to fly, crawling, dislocation of the wings, abdominal distension, and "dry dysentery," followed by early death, may be noted. Warm weather favours the bee, damp aids the parasite. The method of infection is contaminative. Hives, comb, honey, and pollen from comb, bees' drinking places, flowers, water from foliage, and dew near infected hives have been observed to contain spores. Some bees can adapt themselves somewhat to the parasite, which forms crops of spores within them, and these bees act as reservoirs of the disease.

Preventive measures seem to be of most value in treating this disease. The only certain destructive agent for Nosema spores is fire. All dead bees should be burned, old combs and hives untreated by a painter's lamp are to be avoided, and it should be remembered that old wax is not sterilised by being merely melted. Weak stocks of bees should not be united, and great care should be exercised in importing bees from other places in the British Isles or from abroad. Provision of abundant honey and pure water supply, together with scrupulous clealiness of the hive and its surroundings, are great aids in the prevention of microsporidiosis.

Prof. Minchin directed attention to the fact that hereditary infection of bees by *N. apis* had not been found to take place, whereas the allied parasite (*N. bombycis*) of silkworms penetrated the ovary, and entered the eggs, so that the next generation was born infected. The latter parasite was able thus to tide over the winter. Hereditary infection of bees with *N. apis* was not necessary to enable the parasite to tide over the winter, for it can pass the winter in hibernating adult bees.

A Sessile Ctenophore.

Dr. Th. Mortensen gave an account of a sessile Ctenophore—*Tjalfiella tristoma*—found attached to the stems of Umbellula taken off west Greenland. This Ctenophore is compressed, elongated in the transverse plane, and has lost its costæ. The apical organ is rudimentary, being—as a static organ—of no use in a sessile organism. The tentacles are simple, and there is a branching canal system, as in Cœloplana and Ctenoplana. The animal is viviparous; its eggs develop in brood-chambers on the sides of the body, giving rise to cydippiform young, which swim, for a short time, by means of their well-developed costæ, then become attached by the mouth and at once begin to assume the adult form. Tjalfiella is closely related to Cœloplana, and especially to Ctenoplana, and Dr. Mortensen held that its anatomy and development support the Selenka-Lang theory of the origin of Polyclad Turbellaria from Ctenophores.

Mr. E. S. Goodrich expressed himself as unwilling to accept the view that Polyclads were derived from Ctenophores. But even if these two groups were related, they must have diverged in remote time, and it seemed to him inconceivable that their common ancestor should be still extant. Prof. Dendy did not share this view.

Papers on Helminthology.

Dr. W. Nicoll gave a *résumé* of recent progress in helminthology. He directed attention to the use of internal instead of external features as the basis of specific diagnosis, and to the correlation between habit and systematic position, which is clearly brought out by the new method of classification. He noted the great importance of the discovery that infection by Ankylostoma and Schistosomum takes place through the unbroken skin. Turning to morphological questions, he directed attention to the so-called "shell-gland" of Trematodes, pointing out that recent researches have shown that the shell-substance is secreted by the "yolk-glands," and that the function of the "shell-gland" remains unknown. Of interest also is the discovery of the existence of a communication between the intestine and the excretory vesicle in certain digenetic Trematodes.

Mr. J. W. Chaloner has investigated a disease of trout in Loch Morar, due to a larval Bothriocephalid (plerocercoid larva), found encysted in the wall of the intestine and adjacent organs, the cyst-wall being formed by the tissues of the trout. The larvæ varied in length from ¼ to 8 in. The birds of the loch were examined, and, in an adult merganser, a Diphyllobothrium—possibly the adult of the larva described—was found. All the merganser were found to be infected with the larval and adult sexual form of *Schistocephalus gasterostei*, obtained from the sticklebacks, which form a large part of the food of these birds.

Papers on Polychaeta.

Prof. W. C. M'Intosh directed attention to the close structural resemblances between the genus Filograna, which has an operculum for closing the tube, and Salmacina, which has no operculum. It was shown that the presence or absence of an operculum was not a point on which great dependence could be placed, since in the north—Shetland, Moray Firth, St. Andrews—amidst vast swarms of those devoid of opercula, a few occurred with them. Further, it was shown that the opercula are exceedingly variable in development, and that when they are absent the tips of the branchial filaments show great susceptibility to growths of a more or less conspicuous character; especially is this the case in Neapolitan specimens. The branchial pinnæ are variable in length according to the age or surroundings of the specimen, and the bristle-tufts of the anterior region likewise vary from five to ten pairs; yet, throughout the whole series of those with or without opercula, the structure of the bristles is precisely the same. Both forms are gemmiparous. After examining numerous examples and noting the plasticity of the organs, Prof. M'Intosh said he would prefer to refer all the forms to one species of the genus Filograna.

Mr. F. A. Potts gave an account of the habits of a new species of Phyllochætopterus, found living in shallow water off Vancouver Island. It lives in creeping tubes of translucent material, which generally possess several openings, each situated at the end of a branch of the main tube. In nearly all tubes more than one individual is present, sometimes as many as six. The tube is constructed, in the first place, by a single individual, which is formed from a fertilised egg; this worm propagates itself by autotomy, the posterior part becoming detached and regenerating an anterior region. Modification and branching of the tube occur to suit the increasing population. Circulation of water in the tube is maintained by the movement of cilia on the median segments and by undulatory movements of the abdomen.

Mr. Potts also described the formation, in Trypanosyllis sp., of reproductive buds, to the number of one to two hundred, from a patch of tissue extending over the ventral surface of the last one or two segments. Ectoderm and mesoderm alone take part in the formation of these buds; there is an entire absence of alimentary canal. In *T. gemmipara*, from the N.W. Pacific, bud-formation is accompanied by the rapid addition to the stock of a tail of forty to fifty

segments, which, unlike the buds, contains a prolongation of the alimentary canal of the stock, and, like the buds, develops generative products. In the earliest stage of proliferation observed, the body-cavity near the region of proliferation was filled with leucocytes, which also migrated into the cushion of mesoblast present immediately within the thickened ectoderm. Mr. Potts suggested that these leucocytes served a nutritive function, and also that they gave rise to the greater number of the mesoblast cells, from which are formed the gonads, cœlomic epithelium, and connective-tissue. The muscular and nervous systems of the bud grow out from those of the stock.

Dr. Cresswell Shearer traced the development of the mesoderm and the head kidneys of Pomatoceros, which he found to follow the same course as in Eupomatus (see Q.J.M.S., vol. lvi., 1911, pp. 568–585).

Papers on Echinoderms.

Dr. J. F. Gemmill described the development of the starfish *Asterias rubens*. The eggs were artificially fertilised in April at the Millport Marine Biological Station, and, at an early stage of segmentation, were taken to the University of Glasgow, and kept there in small aquaria provided with a simple "convection current" system of internal circulation. Metamorphosis took place in seven or eight weeks. The chief features of the bipinnaria and brachiolaria larvæ were described, as were also several interesting cases of double hydrocœl. Dr. Gemmill concluded that the epigastric and hypogastric cœloms correspond on the whole with one another and with the right and left body-cœloms of Balanoglossus, while the dorsal sac, which pulsates subrhythmically, is the homologue of the "pericardial vesicle."

Prof. E. W. MacBride gave an account of his studies, made at Millport, on the development of *Echinocardium cordatum*, the larvæ of which he was able, by feeding on the diatom Nitschia, to rear until they metamorphosed into young heart-urchins, which took place about eighteen to twenty-three days after fertilisation. The egg segments rapidly and forms an ellipsoidal blastula, which escapes from the egg-membrane. This becomes converted into a gastrula, which bears anteriorly a tuft of specially long cilia. Soon the formation of the skeleton and the arms of the larva is initiated. The cœlom arises as an unpaired vesicle nipped off from the apex of the archenteron, and becomes divided into right and left halves. Both right and left cœlomic vesicles send out prolongations which become pore-canals, and open to the exterior, but subsequently the two pores merge in a single median pore from which right and left pore-canals diverge. Prof. MacBride traced the metamorphosis of the larva, and pointed out that the mouth of the young Spatangoid is surrounded by five plates, from each of which springs an inwardly directed spine, the rhythmical movements of which suggest that they represent the teeth of the regular Echinoids.

Mr. H. M. Fuchs described work done at Plymouth on the hybridisation of species of Echinus. Three species—*E. acutus*, *esculentus*, and *miliaris*—were used in the experiments, and the early and variable larval characters were discarded in favour of more definite features developed by the later plutei. The late plutus of *E. miliaris* has no posterior epaulettes, but has a pair of green pigment masses on the anterior epaulettes; the late plutei of *E. acutus* and *E. esculentus* possess a pair of posterior epaulettes, but lack the green pigment. In 1909, 1910, and 1911 it was found that the inheritance of these characters in reciprocal hybrids between *E. miliaris* and *E. esculentus* or *E. acutus* was invariably maternal. During the spring and summer of this year the experiments have been repeated, and it has been found that the inheritance is different from that of previous years. All cultures of the crosses *E. esculentus* ♀ × *E. miliaris* ♂ and *E. acutus* ♀ × *E. miliaris* ♂ have been maternal, as previously, with one exception. In that case some of the larvæ possessed posterior epaulettes, some lacked them, and some had an epaulette on one side only. The crosses in which *E. miliaris* was the female parent were this year obtained only with difficulty, and, with one exception, they showed a purely paternal inheritance, *i.e.* an exact reversal from the condition of former years. The exception mentioned was the only case in which a large percentage of the eggs developed; the resulting larvæ were some of the paternal and others of the maternal type. No parallel seems to be known for this reversal of inheritance, the cause of which is unknown, but Mr. Fuchs suggested that it was due to a condition of the parents and not to the environment of the larvæ.

Miss Jordan Lloyd described methods of raising parthenogenetic larvæ of *Echinus esculentus*. The method found most successful consisted in treating the unfertilised eggs first with butyric acid to cause membrane-formation (Loeb's method), and then with tannic acid and ammonia in a mixture of sea water and cane sugar (Delage's method). In this way as many as 90 per cent. of the eggs have produced blastulæ, and the larvæ were vigorous and grew for the first three weeks as rapidly as larvæ from fertilised eggs. A few of the larvæ completed their metamorphosis, but the young urchins have not been kept alive more than a few days.

A New Parasitic Copepod.

Prof. H. F. E. Jungersen described *Chordeuma obesum*, a new parasite copepod found enclosed in a membranous capsule formed by the host—*Astronyx loveni*. Sometimes these cysts are extremely numerous, and in these cases the gonads of the host seem not to develop. A cyst which encloses a ripe female contains also its eggs and brood, and usually also a male and empty spermatophores. Embryonic development and most of the post-embryonic metamorphoses occur inside the cyst. Cyclopiform larvæ are liberated from the cyst, and either settle in the same host, thus augmenting the stock of parasites, or leave by way of the bursal apertures to infect other Astronyx, which they enter through the corresponding openings. In both cases the larva fixes itself by its hooked maxillæ, and causes the production of a cyst. The larval cuticle is cast off and the adult form assumed. The adult female is about 5 mm. long and sausage-shaped. Eyes, mandibles, and maxillulæ are wanting. The mouth leads through the pharynx and narrow œsophagus into a capacious stomach, but there is no intestine and no anus. The adult male is not more than 2 mm. long, subcylindrical in form, and has fundamentally the same structure as the female. The nauplius larva has the typical three pairs of appendages, but eyes are wanting, as in all later stages. There are three metanauplius phases followed by the cyclops stage, which is liberated from the maternal cyst. Prof. Jungersen stated that he could not at present indicate the systematic position of this new parasite.

The Luminous Cells of Pyrosoma and Cyclosalpa.

Prof. Ch. Julin detailed the histological characters of the luminous cells of *Pyrosoma giganteum*. Each of these cells contains a closely convoluted tube, the wall of which is achromophile and is traversed by an achromophile reticulum, on the knots of which are

numerous granules of nuclein, an albuminous substance rich in phosphorus. The tube is entirely immersed in a small amount of liquid, which fills the remainder of the cell. Prof. Julin then passed to consider the lateral luminous organs of *Cyclosalpa pinnata*, in which the cells are smaller than in Pyrosoma. In the substance of the cell lies a convoluted tube, frequently found to be broken up into vesicles. The tube is traversed by a reticulum bearing many nuclein granules.

Prof. Minchin suggested that the luminous particles, being formed in cytoplasm, might be volutin and not chromatin, and that the tube in the cell might be a schizomycete commensal or parasite.

An Hermaphrodite Amphioxus.

Mr. Goodrich described, and exhibited sections of, an hermaphrodite specimen of Amphioxus, found at Naples in the summer of 1911. It is an adult ripe male with twenty-five gonads on each side. All these are typical testes containing spermatozoa only, with the exception of the ninth gonad on the left side, which contains ova only, and is a typical ovary. This appears to be the first instance of hermaphroditism described in the Cephalochordata.

Scottish Sea Fisheries, 1898–1912.

Prof. W. C. M'Intosh held that a careful perusal of various statistical returns does not lead to pessimistic views of our fisheries, but rather bears out his views as to the safety of the supply of food-fishes. The herring, cod, haddock, plaice, lemon dab, sole, and turbot have been in turn the subject of gloomy forebodings, but the speaker maintained that not one of these was on the road to extinction or even to serious diminution.

Prof. Ewart pointed out that the appliances now used in fishing were more efficient than those in use fifteen years ago, but, as the take of fish had not increased in proportion, it seemed as if fish were less abundant than formerly.

Dr. Petersen remarked that, until statistics were available for the whole of the North Sea, the problem could not be fully discussed.

Reissner's Fibre and the Subcommissural Organ in the Vertebrate Brain.

Prof. Dendy described the subcommissural organ as a groove, or pair of grooves, lined by elongated, ciliated, epithelial cells, and situated beneath the posterior commissure. From these cells originate a large number of slender fibrils—probably elongated cilia—united together to form Reissner's fibre, which extends, as a highly elastic, tightly stretched thread, backwards through the brain-cavities and central canal of the spinal cord to the extreme end of the latter, where it is attached to a plug of connective-tissue lying in the *sinus terminalis*. Reissner's fibre and the subcommissural organ are well developed in all the great vertebrate groups from cyclostomes to primates. Prof. Nicholls's recent researches have shown that Reissner's fibre is not nervous (as it was believed to be by Sargent). Prof. Dendy has suggested that the subcommissural organ might be a kind of intra-cerebral sense-organ, concerned, with Reissner's fibre, in automatically regulating the flexure of the long axis of the body. Prof. Nicholls's recent experiments on fishes support this view, and further support is derived from the fact that in man, with his erect posture and but slightly flexible vertebral column, the subcommissural organ is reduced to a mere vestige—the mesocœlic recess—and Reissner's fibre is probably absent.

Papers on Birds.

Miss Laura Florence, who has examined the crops of about 1800 birds, belonging to ninety-five species, chiefly from agricultural land in the north-east of Scotland, with the view of finding which were injurious and which beneficial, gave a summary of her results. She emphasised the need for examining large numbers from different areas, and throughout the year, if trustworthy information is to be forthcoming. In some cases the verdict given by previous investigators has been confirmed, *e.g.* as to the injuriousness of the house sparrow, wood pigeon, and carrion crow, and as to the beneficial activity of the hedge sparrow, fieldfare, lapwing, and plovers. On the other hand, there are several cases in which the results up to the present do not confirm previous opinions, *e.g.* the diet of the black-headed gull and the common gull shows a striking resemblance to that of the useful lapwing.

Mr. A. Landsborough Thomson contributed a note on the method of bird-marking—by a light metal foot ring with inscription—applied by the Aberdeen University inquiry, which has already yielded interesting facts, *e.g.* records of an English-bred swallow returning to the breeding place the following summer, a Scottish-bred swallow returning to its birthplace the following summer, a Scottish-bred song-thrush migrating to Portugal in its first autumn, &c.

The Development of the Thymus.

Prof. J. P. Hill communicated a *résumé* of observations by Miss E. A. Fraser and himself on the development of the thymus, thyroid, and epithelial bodies in the marsupial *Trichosurus vulpecula*, and emphasised the following points—(1) the origin of the superficial cervical thymus, in major part at least, from the ectoderm of the cervical sinus; (2) the derivation of thymus iii. from the ventral as well as the entire caudal wall of cleft iii., thus affording a transition, as regards mode of origin, between thymus iii. of the lizard and that of Eutheria; (3) the presence of a well-developed thymus iv., a feature characteristic (so far as is known) of marsupials alone amongst the mammals; and (4) the lack of any topographical relationship of the epithelial bodies to the thyroid.

Fat-tailed Sheep.

Prof. J. C. Ewart discussed the origin of fat-tailed sheep. He considered it probable that, as the large inland seas common in Central Asia in prehistoric times dried up, domesticated sheep, to have a chance of surviving, found it necessary to store up fat as a means of providing nourishment during the long, dry season. In some cases fat was deposited to form fat-rumped races, in others to form fat-tailed races. Those individuals which, by increasing the number and length of the tail vertebræ, provided most accommodation for fat would, in the struggle for existence, have the best chance of surviving, as the aridity in Central Asia increased. Prof. Ewart considered it extremely probable that the long-tailed European breeds, instead of inheriting their long tails from an extinct long-tailed wild ancestor, as used to be assumed, are indebted for their long and apparently useless caudal appendages to fat-tailed ancestors. Evidence in support of this view is afforded by the fact that the fat in the tail gradually disappears when a sheep of the Afghan type is removed from the arid deserts of Central Asia to Western Europe, where green food is available throughout the year.

Survey of the Fresh-water Fauna of India.

In his account of the survey of the fresh-water fauna of India, which is now being carried out by the Indian Museum, Dr. N. Annandale laid great

stress on the importance of the fauna of any country being worked out in that country, and on the association of a study of the biology of a group with taxonomic research on that group. The recent liberal policy of the trustees of the museum, and the generosity of the Indian Government, had resulted in the acquisition of first-class zoological laboratories, and an excellent collection of zoological literature. He directed attention to the considerable number of zoologists now working in India, and to the zealous cooperation of numerous correspondents and collectors in different parts of the country. His paper was illustrated by photographs of the Indian Museum and its laboratories, and of species in the fresh-water fauna of special interest from a biological or taxonomic point of view, *e.g. Trygon fluviatilis*; Hislopia, *Pectinatella burmanica*, and other Polyzoa; fresh-water sponges and their gemmules; and a new Temnocephalid.

Zoological Results of the Scottish National Antarctic Expedition.

Dr. W. S. Bruce pointed out that the *Scotia* was fitted out especially for deep-sea work in high southern latitudes within the limits of pack ice. The result was a large collection of animals in the region of the Weddell Sea, from the surface down to a depth of 2000 fathoms. Altogether eighteen new genera and 263 new species have been found in the collections up to the present, particularly striking being the large percentage of new species from great depths, *e.g.* of sixty species of Echinoderms forty-four are new. The collections do not lend any support to the bipolarity theory.

Plankton of Lough Neagh.

Dr. W. J. Dakin and Miss M. Latarche presented a summary of their work on the plankton of Lough Neagh. Both the phyto- and zoo-plankton are made up of Arctic and central European species existing side by side. The authors do not accept the Wesenberg Lund-Ostwald theory—that seasonal variations in planktonic organisms are due wholly to changes in the viscosity of the water; such changes appear to be due chiefly to direct action of the temperature and the food supply. *Mysis relicta* was found in great abundance at the surface of the lough at midnight, whereas in daylight it was absent or rare.

Biological Science and the Pearling Industry.

Dr. H. Lyster Jameson reviewed the scientific work which has been done up to the present with the view of rendering the pearl and mother-of-pearl producing industries more profitable, and stated that, so far as he knew, the Japanese "culture-pearl" enterprise was the only instance of the application of biological knowledge to the improvement of this industry which had proved an unqualified business success. He suggested that there should be some organising machinery which would bring to bear on this and similar problems all available specialist opinion.

Prof. L. Rhumbler discussed the relation of the mechanics of the cell to the mechanics of development, and showed, by some examples, how the study of the dynamic properties of cells, already established by the study of cell-mechanics, is able to elucidate physically, in a simple manner, whole series of phenomena exhibited by the behaviour of embryonic cell-complexes. Dr. C. J. Bond discussed the method by which the individual organism becomes adapted to new environmental stimuli by use-acquirement, and the dependence of use-acquirements on variation and selection of intracellular units. Dr. J. Wilson held that the "presence-and-absence theory" of inheritance was unsound. Prof. R. J. Anderson gave a paper on "speech" in animals, and notes on the skull of a grampus. These last five papers do not lend themselves to the purposes of a summary.

In the laboratories adjacent to the meeting-room there was an exhibition of interesting specimens:—Antarctic fauna (Dr. W. S. Bruce); Leduc's osmotic growths (Mr. Deane Butcher); molluscan histology and development of cartilage in young plaice (Dr. Dakin); sexual dimorphism in butterflies (Dr. F. A. Dixey), Foraminifera (Messrs. Earland and Heron-Allen); aërating and larva-hatching apparatus, and records showing the use of Aristotle's lantern in the locomotion of Echinus (Dr. Gemmill and Mr. Elmhirst); preserved specimens of Crustacea, &c., in which the articulations were flexible (Dr. Loir); apparatus for the "valuation" of the sea (Dr. C. G. J. Petersen); invertebrates from the Pacific coast of North America (Miss Pixell); Rotifera (Mr. C. F. Rousselet); specimens and drawings illustrating the diversity of size, form, and colour in Alcyonaria (Prof. J. A. Thomson), and nesting-boxes (Mr. W. M. Webb).

J. H. ASHWORTH.

UNIVERSITY AND EDUCATIONAL INTELLIGENCE.

OXFORD.—The vacancy in the Waynflete professorship of chemistry has been filled by the appointment of Dr. W. H. Perkin, F.R.S., professor of organic chemistry in the University of Manchester. Dr. Perkin has been admitted as a Fellow of Magdalen College.

Sir William Schlich, F.R.S., has offered to make over to the University a sum of 690*l*. 18*s*. 8*d*. as a contribution towards a fund for the permanent endowment of the professorship of forestry. On December 14 the offer was gratefully accepted by Convocation. Attention may be directed to the fact that the delegates for forestry propose to appoint a research officer to investigate diseases of trees, for a term of two years, at a salary of 400*l*. a year, besides travelling expenses. The research officer will begin work on February 1, 1913, or as soon after that date as may be possible. He will work in connection with the Oxford School of Forestry.

DR. T. MARTIN LOWRY has been appointed lecturer on chemistry at Guy's Hospital Medical School.

BY the will of Mr. R. J. Montgomery the sum of 5000*l*. is left to the Board of Dublin University and the Royal College of Surgeons, Ireland, for a "Mary Louisa Montgomery Lectureship" in ophthalmology, to be held alternately by the said boards for a period of five years, the lectureship for the first five years after his death being held by Dublin University.

MR. EDWIN TATE, J.P., has given to the Battersea Polytechnic the sum of 7000*l*., the interest upon 5000*l*. of this sum to be utilised for scholarships, and the interest upon the remaining 2000*l*. to be devoted to the purchase of books for the Tate Library, which was also generously given by the same donor. The gift is another instance of the interest which the Tate family has always shown to the Battersea Polytechnic.

THE Royal Commissioners of the 1851 Exhibition acting on the recommendation of the Council of the Institution of Naval Architects, have appointed Mr. P. Y. Brimblecombe, late of Armstrong College, Newcastle-on-Tyne, to the post-graduate scholarship in naval architecture, 1913 (of the value of 200*l*. per annum, and tenable for two years), for the purpose of carrying out a course of research work in naval architecture at the Armstrong College.