

bacteriologists in a technical rather than a microscopical sense.

A discussion took place on the report of the Fuel Economy Committee. At nearly every recent meeting of the association a somewhat similar discussion has taken place, and though fuel economy is far more imperative now than it has ever been, and is most unpleasantly brought home to all of us by our local Coal Controllers, it cannot be said that the discussions have been very constructive. They range over a wide field, they are disjointed, and while each speaker's communication is of value in itself, the discussion as a whole somehow seems unreal and almost futile. One wishes that the committee round the report of which the discussion centres were able to present definite propositions which, if approved after due discussion, could be sent through the council of the association to the Government Department, or whomever else they concerned. They would be received with more of the importance due to them if they came from the British Association as a whole. Fuel economy, however, is so vast a subject that probably the committee has scarcely had time yet to distil the essence from the great quantity of valuable material it is collecting.

Prof. E. C. C. Baly, Prof. A. Lapworth, and Prof. R. Robinson wound up the meeting with three papers on pure chemistry of great interest, since they all dealt with the mechanism of chemical reaction. In these papers the writers discussed the molecular and other aspects of chemical reactivity. It is refreshing to find that the great demands of war on the genius of chemists has not smothered the efforts of those who seek to probe deep into the very fundamentals of the science.

Mention must be made of a very enjoyable and interesting excursion to the Naval Cordite Factory at Holton Heath. By kind invitation of the superintendent, Capt. Desborough, eighty members of the Section were shown all over the factory, which in its completeness is second to none.

In conclusion, it should be stated that the meetings of the Section were very well attended, and more enthusiasm was shown than for many years past.

ZOOLOGY AT THE BRITISH ASSOCIATION.

SECTION D attracted a representative gathering of zoologists, and the papers were the subject of much interesting discussion. The following is a summary of the proceedings of the Section:—

Mr. E. S. Goodrich, in a paper on phagocytosis and protozoa, stated that phagocytosis of living protozoa had rarely been observed in vertebrates. Invertebrates deal more successfully with protozoal parasites; the leucocytes cling together, surround and finally smother a parasite. This power of aggregation appears to be due to the fact that the floating leucocytes are provided, not with outstanding pseudopodia, but with delicate films of protoplasm ready to spread over any foreign substance. It is the optical sections of these folded films which are usually figured as pseudopodia.

Mr. E. Heron-Allen, for Mr. Earland and himself, directed attention at a joint meeting of Sections D and K (Botany) to some hitherto unemphasised modifications of growth in the life-history of Foraminifera. He exhibited slides showing the modifications brought about by the cultivation of Foraminifera in hypertonic sea-water, the affinity of certain genera for gems as building material, and the power of selection of material exercised by certain species.

Dr. A. C. Coles exhibited photomicrographs of

Leptospira icterohaemorrhagiae—the organism of infective jaundice in man—from the kidney of local rats.

Mr. A. T. Watson gave further details on the tubebuilding operations of the Polychæte worm, *Pectinaria koreni*.

Prof. E. W. MacBride described some further experiments on the artificial production of *Echinus* larvæ with a double hydrocoele. He stated that the optimum result was obtained when larvæ three days old were transferred from normal to hypertonic sea-water for a week or ten days and then put back into normal sea-water, and he offered a tentative explanation.

Prof. G. H. F. Nuttall gave a lecture on "Lice and their Relation to Disease." Commencing with the biology of *Pediculus humanus*, of which there are two races—*capitis*, the head-lice, and *corporis*, the body-lice—Prof. Nuttall described the mode of oviposition, the development, hatching, moulting, feeding, etc. The female lays 150 to 300 eggs, and under favourable conditions the life-cycle from egg to egg is completed in sixteen to seventeen days. Under experimental conditions dark or pale lice can be reared at will according as they are raised on dark or light backgrounds respectively. Hermaphrodites in large number have been obtained by crossing the two races *capitis* and *corporis*. After pointing out that lice transmit relapsing, typhus, and trench fevers, Prof. Nuttall described some of the methods of control on a large scale, e.g. hot-air disinfestors (Orr's huts) and railway vans into which steam from a locomotive was introduced under pressure.

Dr. E. Hindle traced the history of isolated pairs of body-lice and of their offspring raised through five generations. Out of sixty families, twenty-four were mixed (composed of males and females), nineteen were female, thirteen male, and four crosses were sterile. The lice were all fed on the same individual and under similar conditions, and no explanation of the occurrence of the three sorts of families could be discovered. The proportion of females to males in the total number of adults raised to maturity agreed almost exactly with that occurring in Nature—60 per cent. females and 40 per cent. males.

Dr. M. C. Grabham gave an account of the Argentine ant (*Iridomyrmex humilis*) in Madeira. The ant was introduced twenty-seven years ago, but was only identified three years later, when it had become firmly established. Coffee cultivation has been ruined and every sort of fruit-tree—citrus especially—which would support coccus or aphid has been almost entirely destroyed. Sugar-cane and bananas still exist, though badly attacked, but sweet potatoes have disappeared in many districts. Attention was directed to the methods of the ant in searching for food, and to the harmony in working, there being a singular absence of fighting when separate communities meet. The ant has few enemies, e.g. spiders and Pholcus. A covering of powdered chalk on the basal part of the trunk of a tree is a deterrent to the ant, and banding the trees with rags soaked in corrosive sublimate has also been found effective. Dr. Grabham suggested that our Colonies should be warned as to the importance of this pest.

Prof. Dendy delivered a lecture on "Grain-pests and the Storage of Wheat," for the main points of which the reader is referred to NATURE for March 20 last, p. 55.

Before a joint meeting of Sections C (Geology) and D, Mr. C. Tate Regan spoke on the distribution of fresh-water fishes, with special reference to the past history of continents. He dealt particularly with the Ostariophysii—the dominant group of fresh-water fishes—and took the view that they originated in Gondwana Land in Cretaceous times, and that Australia and Mada-

gascara became isolated before these fishes could reach them. The severance of Africa from South America and from southern Asia probably left Characiformes and Pimelodidae in South America, Characiformes and Bagridae in Africa, and Cypriniformes and Bagridae in southern Asia. At the end of the Cretaceous new land connections may have enabled the ancestors of the Catostomidæ and Amiuridæ to reach North America through eastern Asia. Isolation of the continents during the Eocene helped the development of endemic types, and the union that followed in the Oligocene or Miocene probably gave Cyprinidæ to North America and a few Nearctic fishes to eastern Asia.

Prof. MacBride and Mr. Goddard expressed some doubts as to the value of the evidence, on the zoological side, for the existence of Gondwana Land, but Dr. D. H. Scott regarded the evidence afforded by the Glossopteris flora as strongly in favour of the former existence of such a land area. Mr. D. M. S. Watson considered that the evidence from fossil plants, Pelecypoda, and vertebrates indicated a connection between Africa and America in Permian times, but whether this continued to the Cretaceous was doubtful.

Dr. J. W. Evans did not agree with those who dwell on the incompleteness of the evidence for the existence of Gondwana Land. He was inclined to look with favour on the view that the land-masses had not always held their present relative positions, e.g. Africa and South America may have been nearer together. The Falkland Islands show closer geological relationship to Africa than to America.

Mr. Tate Regan, in replying, reaffirmed his belief in the former existence of Gondwana Land.

Before the same joint meeting Mr. D. M. S. Watson gave a paper on "Palæontology and the Evolution Theory," an account of which will be given in the article upon the proceedings of the Geological Section.

Dr. Marie Lebour summarised the results of her investigations, extending over three seasons at Plymouth, on the food of larval and post-larval fishes. Most of the fish examined were from 0.5 mm. to 15 mm. in length. The greater portion of their food consists of Entomostraca; diatoms seem to be little eaten by young fish except at a very early stage. Other unicellular organisms are rarely found in young fish, but the flounder up to about 10 mm. in length was found to be feeding exclusively on the flagellate *Phæocystis*, but at about 11 mm. it changes to a diet of copepods. Larval molluscs, though often abundant in the plankton, are much more seldom found than Crustacea in young fishes. The young fishes thus select their food to a great extent, but that which is selected is generally common, and there is no indication of any special migration on the part of the pelagic young in search of food.

Mr. L. P. W. Renouf gave an account of the development of the Bute Laboratory and Museum.

J. H. ASHWORTH.

UNIVERSITY AND EDUCATIONAL INTELLIGENCE.

THE helpful paper, "On Lecturing with the Lantern," by Prof. G. A. J. Cole, which appeared in the *Journal of the Department of Agriculture and Technical Instruction for Ireland* (vol. xix., No. 1), has been reprinted with the permission of the Department, and is now published as a pamphlet by Mr. T. H. Mason, Dame Street, Dublin.

APPLICATIONS for the Tyndall Mining Research Fund studentship are invited by the Royal Society. The studentship is for study and research on subjects relating to mining and the safety of miners, is of

about 35*l.* in value, and open to any British subject. Applications must reach the Assistant Secretary of the Royal Society not later than January 15, give particulars of the kind of research it is proposed to carry out, and where, and be accompanied by not more than two testimonials or references.

YALE UNIVERSITY is offering two Theresa Seessel research fellowships for the promotion of original research in biological studies. Each fellowship will be of the value of 200*l.*, and preference will be given to candidates who have obtained their doctorate and demonstrated their fitness to carry out successfully original research work of a high order. Applications, accompanied by reprints of scientific publications, letters of recommendation, and particulars of the problem proposed by the candidate for investigation, must be made before May 1 next to the Dean of the Graduate School, New Haven, Conn., U.S.A.

THE Association of Science Teachers has issued a list of science books which are suitable for use in schools. That a compilation of this sort is a matter of some difficulty is doubtless the reason for its being so rarely attempted. The association has done well to risk imperfection so as to supply an obvious need. The list, which contains the names both of text-books for the use of pupils and of books of reference for the library shelf, is attractively printed and reasonably classified. It is to be regretted that biology (as distinct from botany) and astronomy find no place in the main divisions, despite the fact that Dr. Sophie Bryant, in her excellent foreword, directs attention to the desirability of these subjects in the early stages of a child's training. The "Book List (1919)," which we hope will become a periodical publication, may be obtained for 1*s.* 1*d.* from Miss F. Storr, hon. secretary of the association, 12 Angell Park Gardens, S.W.9.

WE are used to large private benefactions for education and science in the United States, but the announcement made in the *Times* of December 27 of a gift of 25,000,000*l.* for these purposes from Mr. John D. Rockefeller is really marvellous to those of us who know how little private generosity can be depended upon for like needs in our own country. The gift is divided into two equal parts of 12,500,000*l.* each to the General Education Board and to the Rockefeller Foundation. It is the largest sum of money ever given at one time to philanthropy, and it brings the total amount of Mr. Rockefeller's donations to 100,000,000*l.* The donation now announced is to be devoted to two purposes:—(1) To some plan of increasing the salaries of the teaching staffs of the colleges and universities of the United States; and (2) to the promotion of the objects of the Rockefeller Foundation, which are defined as the well-being of mankind throughout the world. The General Education Board was founded by Mr. Rockefeller in 1903, and the general purpose of the corporation is "the promotion of education within the United States of America, without distinction of race, sex, or creed." The principal funds of the board have been about 9,000,000*l.*, and grants amounting to about 400,000*l.* have been made annually to various institutions. It was only a couple of months ago that Mr. Rockefeller added 2,500,000*l.* to his previous endowment of the Rockefeller Institute for Medical Research. This gift was to meet rapidly growing needs in the institute's many lines of research and also to make new knowledge available in the protection of the public health and in the improved treatment of disease and injury.

ONE of the notable features of the great struggle in which the nation has been engaged, and for which recruits were drawn from all classes of the United