

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 Catostomidae and Amiuridae 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 Cyprinidae 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 "Palaeontology 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 *Phaeocystis*, 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

Kingdom, was the effort made, in camps both at home and abroad, to continue, however imperfectly as to means and methods, the education already gained, having regard to the fact that sooner or later large numbers of men would return to civil occupations and duties, and that it would be desirable, so far as time and circumstances permitted, that military service should offer opportunities of continued study. It is gratifying to observe that the Army of Occupation on the Rhine, which numbers 250,000 men, is animated by the same spirit. The 222nd number of the *Cologne Post*, a daily paper printed and published at Cologne in English for the Army of Occupation, and the Christmas souvenir number of the same journal (price 9d., or 7 marks), both contain articles urging the vital importance of education, not only in its general and scientific aspects, but also as applied to the promotion of special phases of industry, of commerce, and of agriculture, with the view of fitting men for these several pursuits, and describes the means taken at Cologne and other Rhine towns for effective instruction and training in the various subjects by the institution of laboratories, workshops, and field allotments. At Siegfried there was held recently an exhibition in which was displayed a great deal of good work, the results of training men who had previously learned no trade to become wage-earners of the best possible type. The courses of study include educational facilities extending from the absolutely illiterate to the university graduate, but these articles are also remarkable for the point of view they express, namely, that the soldiers are urged on returning home to civilian life to insist that their children shall receive their due, and be trained to think and to appreciate the beauties of life.

SOCIETIES AND ACADEMIES.

LONDON.

Royal Meteorological Society, December 17.—Sir Napier Shaw, president, in the chair.—F. J. W. Whipple: The laws of approach to the geostrophic wind. The mode of transition from the winds near the surface of the earth to the general current at moderate heights has been discussed by various authors. In the present paper stress is laid on the geometrical aspect of the question. The term "relative wind velocity" being used for the velocity which must be combined with the geostrophic wind velocity by vector addition to give the actual wind velocity at any level, the laws of approach to the geostrophic wind are:—(1) The relative wind turns uniformly with increasing height; (2) the relative wind decreases with increasing height according to the exponential law; and (3) the actual wind at the surface and the relative wind there are inclined at 135° .—G. M. B. Dobson: Winds and temperature-gradients in the stratosphere. From the results of temperature observations by *ballon-sondes*, it can be shown that the horizontal pressure-gradient, and therefore the wind velocity, should decrease rapidly on passing from the troposphere to the stratosphere. Previously there had been little confirmation of this by actual observations. Seventy ascents recorded by the International Commission gave data for temperature, wind velocity, and wind direction to great heights. These showed that, almost without exception, winds of moderate or great velocity in the troposphere fall off very rapidly on entering the stratosphere, while the wind direction remained constant. On days with small pressure-gradients this effect was not usually found—a result which was to be expected, since the slope of the tropopause would then not necessarily be towards the low pressure. Horizontal pressure and temperature-

gradients calculated for the observed winds on typical days with moderate or large pressure-gradients show that the pressure-gradient is suddenly reduced, and the temperature-gradient suddenly reversed, on entering the stratosphere. The temperature-gradients calculated from the observed wind velocities are in good agreement with those deduced by Mr. W. H. Dines from temperature and pressure observations.—Capt. C. J. P. Cave: Quotations from the Diary of Samuel Pepys on the weather. In this the author has collected together all references to the weather from the "Diary," using for this purpose Wheatley's edition. These amount to as many as 557 entries, and are arranged in chronological order. They form a brief comment on the general weather conditions prevailing from January, 1660, to May, 1669. In a preliminary essay the author summarises the principal weather events for each year. He points out that Pepys cannot claim to be considered as a meteorologist, and that his references to the weather are such as anyone might make in writing a diary or in correspondence. He also states that Pepys's memory for meteorological events was not always good, and his remarks on the worst or best weather he remembers must be taken with caution.

EDINBURGH.

Royal Society, November 3.—Prof. F. O. Bower, president, in the chair.—Capt. T. B. Franklin: The cooling of the soil at night, with special reference to late spring frosts. The aim of this investigation was to obtain data on which predictions might be formed as to the coming night temperature. Continuing a course of investigation, the author gives a formula whereby the minimum temperature on any calm, clear night may be known by about 5 p.m. on the previous afternoon. A comparison of his results with the observed minimum soil temperatures on twenty favourable nights between April and October, 1919, shows an average error of 0.3° C. only; it would thus appear that, under the weather conditions favourable to spring frosts, it is possible to forecast the occurrence of a frost with great exactness.—Sir Thomas Muir: Note on the determinant the matrix of which is the sum of two circulant matrices.—G. F. Quilter: Note on and exhibition of photographs of appearances of mirage at Ingatestone. These photographs showed apparent pools of water in the street in which pillars appeared reflected at a distance of about a hundred yards. The photographs were interesting as following up a previous paper by Mr. Alex. G. Ramage communicated to the society in 1918.

December 1.—Prof. F. O. Bower, president, in the chair.—Dr. R. Kidston and Prof. W. H. Lang: Old Red Sandstone plants showing structure from the Rhynie Chert bed, Aberdeenshire. Part iii.: *Asteroxylon Mackiei*, Kidston and Lang. The fourth vascular Cryptogam found in the silicified peat-bed at Rhynie, the age of which is not younger than the middle Old Red Sandstone of Scotland, was a larger and more complex plant than *Rhynia Gwynne-Vaughani*, *R. major*, and *Hornea Lignieri*, described in the earlier papers of this series. It has been named *Asteroxylon Mackiei* after Dr. Mackie, the original discoverer of the chert-bed. The remains of *Asteroxylon* are abundant, though fragmentary, and give, with more or less certainty, a fairly complete knowledge of the plant.

December 8 and 9.—Prof. W. Peddie, vice-president, in the chair.—Prof. R. A. Sampson: (1) Newton's views on gravitation and their subsequent history. (2) The theory of Einstein and its observational tests. In the second address, by the kindness of Sir Frank Dyson, the Greenwich photographs taken at the expedition to