

undertaken during the year—the largest area so far accomplished in any one year; and this in spite of the fact that a large number of blanks, due to the drought of 1928, had to be filled up in the existing plantations before any new work could be commenced. This afforestation work is undertaken in several different ways. (1) The greater part of the plantations are made on land that has been clear-felled for timber and fuel and then cleaned up and cultivated by forest squatters. The work, in spite of difficulties, is cheap and efficient. The method is analogous to the *toungya* method employed in Burma and elsewhere in India. (2) When squatters are not available and when the Department is afforesting grasslands, the area is either ploughed and cultivated by contract or a small sum is paid for ploughing and the contractor is allowed to have the use of the land for two to three years before planting; or again, bush-covered land is being afforested by planting trees in lines cut through the bush, the growth being slower, but the bush acting as a nurse to the young trees and keeping down weed growth. Of the 4000 acres planted, 1063 acres were afforested by this method. This represents an addition to the Colony's forest capital. (3) In certain types of forest, for example, *Brachylaena*, *Ocotea*, and some *Podocarpus* forests, natural regeneration, with assistance, is sufficient to replace the timber cut. (4) Special attention is being concentrated upon fuel plantations and various exotics are being experimented with, and private planting is being encouraged. Both railway and public take large amounts of fuel; the former utilised from all sources, Government and private lands, 13,867,025 cub. feet during the year. As private resources are cut out, the demands will fall increasingly heavily on the Government forests. Fuel is now being supplied in large quantities from *Eucalyptus* plantations formed on the sites of natural forest cut for railway fuel. The demand for fuel for domestic and industrial purposes is increasing rapidly round Nairobi and is becoming more and more difficult to supply. In a few years, however, large areas of plantations will be maturing, as well as large plantations of black wattle, which is being planted on private land for the production of tanning bark.

Kenya is so much before the public at the present time that the operations of the Forestry Department, so far as they affect the future well-being of the Colony, appear to merit some prominence.

Marine Research in the Mediterranean.

THE fisheries of Egypt, though small in comparison with the vast fisheries of the northern waters of Europe, are varied and interesting. They comprise the sea fisheries along the northern coast of Africa in the Mediterranean, and in the Red Sea; the Nile and delta lake fisheries, the latter of which in 1928 supplied about three-quarters of the whole weight of fish landed in Egypt; and also the valuable sponge fisheries of the North African coast lying in territorial waters between Alexandria and Sollûm, which furnish sponges unrivalled in the world for their excellence of quality.

We have received the report of the fisheries for the year 1928,* and amongst other items of interest are given comparative figures of the yield in kilograms per unit area of fish from the delta lakes. These lakes are of exceptional interest, extending over huge areas and never exceeding much more

than a metre in depth; they form a link between the Nile and the sea, for into their southern margins empty the drains of fresh water that have been drawn from the Nile to irrigate the land, while all but one are connected with the sea. The lakes are thus stocked both by fresh-water fish and by fish entering from the sea. By far the most important fish, however, are the grey mullet, which grow and flourish extremely well under the conditions existing in the lakes, and which, at certain periods of the year according to the species, leave on their spawning migrations for the sea. Figures are given to show that during the last eight years the average yield of fishes from lakes Menzaleh, Brullos, Maryût, and Edkou together amounted to so much as 142 kgm. per hectare. Parallel figures are given for the North Sea as 17.3 kgm. per hectare, and for cultivated carp ponds as 65.5-165 kgm. For a natural fishery these delta lakes are therefore extremely rich.

In 1924 the Office of Fisheries Research was closed down; it was reopened towards the end of 1927 by the appointment of Mr. R. S. Wimpenny as Director of Fisheries Research. In the report under review there is little of scientific work published, but it is evident that movements are on foot to establish a department sufficient to attack a few, at any rate, of the many problems of interest that Egyptian waters afford, not the least of which from a biological point of view would be a thorough survey of the conditions in the delta lakes themselves.

The Government has ordered a small motor Danish seiner to explore the possibilities of the fishing grounds on the Egyptian coasts, and a plea has been put forward for a marine laboratory and necessary scientific assistants, and also for a steam trawler for oceanographic research. It is to be hoped that this will soon materialise. The knowledge of the fundamental problems underlying the productivity of the sea is essential to fishery research, and, while to administrative officials the immediate gain may appear to be insignificant, it is certain that in the long run such work will prove its value. It is to be hoped, therefore, that the Egyptian Government will see its way clear to supply the means for the establishment of an active marine biological laboratory; situated as it would be amid surroundings of absorbing interest, with problems such as the interchange of faunas between the Red Sea and the Mediterranean and the effects of the Nile flood, it is certain that information would be forthcoming that would add much to our knowledge of life in the sea.

F. S. R.

University and Educational Intelligence.

CAMBRIDGE.—Smith's prizes have been awarded as follows:—Mr. H. S. M. Coxeter (Trinity), Mr. H. R. Hulme (Gonville and Caius). Rayleigh prizes have been awarded as follows:—Mr. H. Davenport (Trinity), Mr. B. Kuttner (Christ's), Mr. J. C. P. Miller (Trinity).

LONDON.—The following doctorates have been awarded: *D.Sc. in Physics* to Mr. J. P. Andrews, East London College, for a thesis entitled "Investigation into the Elastic and Plastic Behaviour of Materials" (*Proc. Phys. Soc.*, 1925, 1931; *Phil. Mag.*, 1925, 1928-29, 1931). *D.Sc. in Geology* to Mr. E. Spencer for a thesis entitled "A Contribution to the Study of Moonstone from Ceylon and Other Areas and of the Stability-Relations of the Alkali-Feldspars", and a subsidiary contribution. *D.Sc. in Physics* on Mr. H. Shaw for a thesis entitled "Interpretation of Gravitational Anomalies", and fourteen subsidiary contributions.

* Ministry of Finance: Coastguards and Fisheries Service. Report on the Fisheries of Egypt for the year 1928. By R. S. Wimpenny. (Cairo: Government Press, 1930.) P.T.5.

APPLICATIONS for grants in aid of scientific investigations bearing on agriculture to be carried on in connexion with a university, university college, or other approved institution or society in England and Wales during the academic year beginning Oct. 1 next are invited by the Ministry of Agriculture and Fisheries. Conditions on which the grants will be made are to be found on Form A.53/T.G., copies of which are obtainable from the Secretary of the Ministry, 10 Whitehall Place, S.W.1. The latest date for the return of completed forms of entry is May 15.

SECONDARY education in England and America is the subject of an article by Dr. Grizzell, professor of secondary education in the University of Pennsylvania, appearing in the December number of *School Life*. This is the fortieth of a series of articles sponsored by the National Committee on Research in Secondary Education, and records some of the conclusions reached as the result of a carefully planned co-operative study undertaken by a joint committee of experts of the two countries in 1928. Dr. Grizzell recognises the existence in both of a tendency in the direction of wider educational opportunity for the adolescent; but the resultant general reorganisation has been more rapid in the United States. The recent development in England of the higher elementary and central schools is compared with the high school movement which began in the United States almost a century earlier. He notes also a tendency in both countries to extend the period of secondary education upward. The 'junior college' movement in America is the counterpart of the development in England of two-year courses of specialised study after the 'first' school examination, but is, to all intents and purposes, a separate institution and avoids extreme specialisation in the academic field. The greater part of the article is devoted to a survey of contrasting practices and divergent tendencies which the author has observed in every important aspect of secondary education in the two countries. Some of these differences are summed up in the dictum, "To the English teacher, education is dominantly an art; to the American it is rapidly becoming a science".

THE United States Commissioner of Education, discussing, in his report for 1928-29, recent significant events and tendencies in higher education, gives the first place to increased scientific investigation of institutional problems and objectives. Such investigations have been reported during the year by scores of universities. Scientific and semi-scientific methods of investigation have been ousting the older methods of philosophy and mere observance of tradition. William James's passion for grappling with 'stubborn facts' seems to pervade the learned world, and this is attributed to necessity rather than choice, for the increasing industrialisation, machine production, changing of social customs, and other characteristics of a fast evolving civilisation make imperative a correspondingly rapid adaptation on the part of educational institutions, and for this they find themselves compelled to depend more and more on research and scientific study. Changes in general organisation of collegiate work are illustrated by the rapid growth of 'junior colleges' (including the first two years of the traditional 4-years liberal arts college course): the increase in their number during the year amounted to 25 per cent. Registration of full-time students in colleges and universities meanwhile increased by only 2 per cent. With some of the pressure of numbers removed and with a continued increase in financial support, stress may now be put, says the Commissioner, on quality of output. Institutions are studying, as never before, both the quantitative and qualitative demands by society for their human product.

Birthdays and Research Centres.

Mar. 29, 1890.—Dr. H. SPENCER JONES, F.R.S., H.M. Astronomer at the Cape of Good Hope.

The erection of a large reflecting telescope in the southern hemisphere is an urgent need. It should have an aperture of at least 72 inches, since, for many purposes, great light gathering power is essential, and it should be equipped with a spectroscope adapted for one-, two-, or three-prism dispersion. Such a telescope would be available for determining the radial velocities of faint stars, and for the study of distant nebulae and other problems which are beyond the reach of existing instrumental equipment. The full interpretation of many observations obtained with large instruments in the northern hemisphere is dependent upon similar observations being secured in the southern hemisphere.

In recent work, the need has been felt of a publication in which are summarised the analyses of spectra for which the multiplet relationships have been investigated. The identified energy levels in the atom and the excitation potentials and multiplet identifications of individual lines should be given. Many of the original papers are in publications which are not available for reference anywhere in South Africa.

April 4, 1852.—Prof. A. P. COLEMAN, F.R.S., emeritus professor of geology in the University of Toronto.

Recent work along the St. Lawrence and near Moose Factory and Churchill on Hudson Bay proves that the marine beds, long known in those regions, include not only postglacial deposits, as usually stated, but also interglacial beds. The interglacial sea reached twice the height of the postglacial one. The last glaciation in eastern America was much less massive than an earlier one, suggesting that the greater load of ice implied a correspondingly greater depression of the lowlands. How close to isostatic equilibrium do such adjustments come, and how much lag is to be expected when the load of ice is removed? Have similar relations been found between interglacial and postglacial marine levels in northern Europe?

Societies and Academies.

LONDON.

Physical Society, Feb. 6.—E. B. Moss: A ballistic recorder for small electric currents. The standard thread recorder is so modified that it records ballistic throws in instead of the usual steady deflection. By this means, the current-sensitivity may be increased at least twenty-five times.—F. J. Scrase: The instrumental phase-difference of seismograph records: an illustration of the properties of damped oscillatory systems. A discussion is given of the method of interpretation of the maxima shown on the records of earthquakes during the surface-wave phase. The usual procedure is to treat the waves (which actually appear as beats) as being truly simple harmonic. In general, this procedure does not necessarily lead to the correct interpretation. In direct registration, the true earth maximum may have occurred one half-period later than the time obtained by the usual correction. With galvanometric registration, the maximum may have occurred either one, two, or three half-periods earlier than the time indicated by the usual formula due to Galitzin. For direct registration, the phase correction at present in use appears to be as good as one of the alternatives. For galvanometric registration, the correction suggested by