

joined the staff of the Botany Department at the University of Leeds in 1919 and was appointed reader in 1922. Dr. Pearsall has taken an active part in many scientific societies; he acted as secretary to the Society for Experimental Biologists in 1928-33, and has just completed his term of office as president of the British Ecological Society; this year he has also taken over the editorship of the *Journal of Ecology* from Prof. A. G. Tansley. He acted as joint secretary of the Yorkshire Naturalists' Union with the late Mr. F. A. Mason in 1919-29 and since 1933 has been co-editor of *The Naturalist* with Mr. W. R. Grist; in 1937 he served as president of the Union. From 1931 until 1937 Dr. Pearsall acted as honorary director of the Freshwater Biological Station at Wray Castle, Windermere, where he has taken an active part in organizing most successful short courses in freshwater biology for senior university students; his guidance has also been of great value to a series of investigators, who have studied problems of freshwater biology at this centre.

DR. PEARSALL'S published scientific work has been mainly upon problems of ecology and upon various aspects of the physiology of growth in plants, with especial reference to problems of nitrogen nutrition. His work, with which his father was associated at its inception, upon the freshwater biology of the English Lakes, is very widely known. It has provided an admirable basis for many of the more intensive investigations that can now be attempted with the establishment of a permanent centre of investigation upon Lake Windermere. Dr. Pearsall's interests in ecology have ranged very widely; his recent presidential address to the British Ecological Society dealt especially with soil factors in relation to plant distribution. The importance of the oxidation-reduction potential is stressed, and Dr. Misra under his guidance has recently shown the significance of this factor in connexion with the mud deposits in the Lakes. Dr. Pearsall's studies upon plant metabolism have been linked up with his extensive studies of the growth of algæ, especially *Chlorella*, in pure cultures. This work has been extended recently with the aid of a grant from the Leverhulme Fund, but already many studies of plant metabolism have been published by Dr. Pearsall and his students in the last few years, including (with Dr. M. C. Billimoria) some very suggestive notes upon nitrogen loss from plants.

Atlantic Meteorology and Trans-Atlantic Flight

MR. F. ENTWISTLE, head of the Overseas Division of the Meteorological Office, Air Ministry, delivered the Symons Memorial Lecture before the Royal Meteorological Society on March 16, taking as his subject, "Atlantic Flight and its bearings on Meteorology". Mr. Entwistle stated that the success of the flights across the North Atlantic last year by Imperial Airways, Ltd., in conjunction with Pan American Airways, Inc., was due in very large measure to the thorough preparations which preceded them and to the ground organization, including radio

and meteorological services, which was provided. The preliminary investigations carried out by the Overseas Division of the Meteorological Office in order to provide essential operational data before the flights commenced were described. The first investigation, commenced early in 1936, had as its object the determination of the maximum average head wind component that would be experienced on an east to west track along the great circle route between Ireland and Newfoundland. The results, which were based on an examination of data covering a period of ten years, indicated that while the maximum wind speed likely to be encountered at any point was 95 m.p.h., the maximum average speed over the whole route was 60 m.p.h. This average speed, however, occurred only once in ten years, and if, in the operation of a trans-Atlantic aircraft, an allowance was made for a maximum head wind on the east-west track of 40 m.p.h., there would be very few occasions in any one year when it was necessary to cancel the flight. A more comprehensive investigation followed in which the times of flight of aircraft of different air speeds on alternative trans-Atlantic routes were compared.

LATER investigations were concerned with the meteorological conditions affecting the operation of aircraft in Newfoundland, the variation of wind with altitude over the North Atlantic and the frequency and minimum heights of low cloud. For one year from November 1936 a technical officer of the Overseas Division of the Meteorological Office was attached to the *Manchester Port*, a cargo ship operating between Manchester and Canada. He completed eight round voyages, in the course of which he made regular pilot balloon observations to determine the wind speed and direction at different altitudes, constructed daily weather charts from observations received by radio from Europe and North America as well as from ships at sea, and studied in detail the characteristics of the Atlantic disturbances through which the ship passed. These investigations, which are essential to the supply of accurate meteorological information for trans-Atlantic flying, will benefit meteorological science generally and, in particular, the weather forecasting services of the countries of western Europe, the greater part of the weather of these countries developing over, and moving from, the Atlantic. The development of long-distance air routes in various parts of the world is stimulating similar meteorological activity and is providing data for investigation on a scale hitherto unknown.

Air-Raids on Barcelona

LAST week in the House of Commons, Mr. Chamberlain expressed his own and indeed the general view of the recent air-raids on Barcelona when he said that no one could read the reports "without horror and disgust". This feeling must be aroused by the whole practice of bombing from aircraft, especially from great heights, for it is inevitable that there should be loss of many innocent

lives and destruction of buildings of no military significance such as universities and scientific and other learned institutions. In this connexion we have received a copy of the following cable from the "Subsecretario Instruccion Publica" addressed to the president of the Royal Society of Medicine: "The Regular Air Force of Germany and Italy is demolishing the cities of Spain. The University of Barcelona like the Cajal Institute in Madrid has been almost completely destroyed. The same has happened to other centres of culture. During the last three days of terrible and continuous bombing, more than a thousand people were killed in Barcelona alone. We Spaniards of liberal and democratic convictions who only devote ourselves to literary and scientific activities protest against these monstrous crimes. At the same time we appeal to the sensitivity of our English colleagues and ask for their help in the defence of the independence of our country as well as of the universal principles of humanity, justice and law which the Spanish Republic implies. We ask you to bring to bear all your influence on the British Government so that it may take steps to avoid these barbarous atrocities, which are directed not only against defenceless human beings but also against the civilization and peace of the world. Jacinto Benavente (Nobel Prize); Ignacio Bolivar (naturalist); Pio Del Rio Hortega (biologist); P. Bosch Gimpera (archeologist); Enrique Moles, D.Sc.; Jose Xirau, D.L.; A. Duprier, D.Sc."

Exhibition of British Archaeology

THE exhibition illustrating finds in Britain and Northern Ireland in the course of archaeological exploration during the last five years at the Institute of Archaeology of the University of London, Regent's Park, London, which was opened by Sir Charles Peers on March 21, is unique and the occasion historic. No exhibition of the kind has been held before, nor has so widely varied a collection of archaeological material been assembled for temporary exhibition previously. Considering the relatively brief period during which the work of excavation has been carried out, the exhibition shows a remarkable and healthy activity in practical archaeological study in Great Britain such as, it is probable, could not be paralleled elsewhere. The area covered includes England, Scotland, Wales and Northern Ireland, and the exhibits are drawn from sites in more than thirty counties. In time they range from the pre-glacial industries of East Anglia to Stuart pottery from the ditch of the Tower of London, lent by the Office of Works. Among the sites of major importance represented are Verulamium, of which the close of excavation just comes within the period, Miss Kenyon's excavations at the Old Jewry Wall of Leicester, with its evidence of Belgic occupation, and Dr. R. E. Mortimer Wheeler's exploration of Maiden Castle, with the interesting evidence of cannibalism and the remains of the last defenders of the fortress in A.D. 43. Material which should prove of intense popular interest is that from Castle Dore in Cornwall, which removes King Mark,

father of Iseult, from the category of legendary figures and makes him a historical personage. Recent activities in, and discoveries by, air photography are well displayed. The exhibition will remain open daily from 11 a.m. to 4 p.m. until May 2.

Electron Diffraction and Surface Structure

IN opening the discussion on electron diffraction and surface structure before a joint meeting of the Physical and Chemical Societies held on March 17, Prof. G. I. Finch compared electron diffraction with other methods of surface structure examination, and cited cases where the microscope or X-rays may give a wrong impression of the structure of deposits and of the size, shape and chemical nature of thin crystal line films. He described, among others, a striking experiment on the orientation of fatty acids by friction, which seems to have a direct bearing on the nature of the mechanism of lubrication. Thus the previously unorientated molecules in a stearic acid layer deposited on a metal surface can be made to point in a common direction by rubbing. If the surface be rubbed in all manner of ways, it is the last stroke only which determines the final direction of orientation of the stearic acid chains. Prof. Finch also gave an account of new experiments which confirm the conclusions previously arrived at by electron diffraction as to the structure of the polish layer on calcite. Sodium nitrate crystals were found to orientate in such a way as virtually to continue the structure of calcite when deposited on the polish layer on a cleavage face and which electron diffraction had shown to be of single crystal structure integral with the main crystal. A calcite surface cut and polished in such a manner as to be steeply inclined to all cleavage planes, however, gives a halo pattern characteristic of an amorphous layer, and on such a surface the nitrate crystals do not orientate but point in all directions just as they do when grown, for example, on a glass surface. After heating, which causes this amorphous polish layer to recrystallize, the sodium nitrate crystals orientate once more.

The Fulham Power Station

THE Institutions of Civil Engineers and Electrical Engineers had a joint meeting on March 22 to discuss the new Fulham Power Station, which when complete will be the largest municipally owned base-load station in the British Isles. The station lies east and west, with the boiler house on the east, and is situated 60 ft. from the river frontage along the west bank of the Thames from Wandsworth Bridge. The first half of the paper was written by J. F. Hay and describes the constructional work, and the second half, by W. C. Parker and H. Clarke, discusses mechanical and electrical considerations. A point which has come prominently forward during recent years is the necessity of having as wide a specification as possible for the coal used. The effect of having two of the base-load stations on the Thames equipped with the same kind of stoker and similar methods of feeding is making a considerable demand for a special type of coal from the coalfields, and this both increases