show up in the diagrams connecting tropical temperatures with rainfall in New South Wales, South Australia, and the Upper Darling. Tinted diagrams are given showing for the whole continent the monthly departures from mean minimum temperature and mean rainfall, except for the summer months when rain is inappreciable. W. W. B.

Prehistoric Man and Racial Characters.

THE annual meeting of the Prehistoric Society of East Anglia was held on March 23 at the rooms of the Geological Society, the members of the Prehistoric Society being the guests of the Royal Anthropological Institute. The chair was taken by Prof. J. E. Marr, who delivered his presidential address. His subject was "The Relationship of the Various Periods of Prehistoric Man to the Great Ice Age." He regarded the existence of Pliocene man in East Anglia as proved, and also accepted Mr. Reid Moir's views that the "Mid-Glacial" implements of Ipswich were of Lower Palæolithic age, and that Lower Mousterian implements were incorporated in the Chalky Boulder Clay. He brought forward confirmatory evidence of this from the drainage area of the Great Ouse basin, and regarded the Chelles-Archeul period as intermediate between the two glaciations marked by the Cromer Till and Chalky Boulder Clay respectively. After the formation of the latter clay there seemed to be a recession of ice followed by a re-advance in Magdalenian times, but, as O. Holst argues, this need not indicate an inter-glacial period. If there was a Pliocene glaciation in this country, the evidence seems to point to two succeeding glaciations in Pleistocene times, the last being marked by a period of ice-recession in Aurignac-Solutré times, in which case Lower Palæolithic man lived between the second and third glaciations, and the men of the periods from Mousterian to Magdalenian inclusive during the period of the third glaciation, with its interval of temporary ice-retreat. The questions of earth movements and diversions of river drainage during the periods under consideration were briefly considered.

The presidential address was followed by a paper by Mr. H. Dewey entitled "Flat-based Celts from Kent, Hampshire, and Dorset," dealing with a group of implements that were found lying on the surface in various parts of those counties. They differ in outline from one another, but agree in possessing flat bases. Some of the bases were produced by the removal of a single flake, and retain the terminal cone of percussion. Others resulted from the removal of a number of flakes from the sides of the implement, with the obvious intention of making the base level and flat. Most of them are pointed at one end, and have a horizontal chisel-edge at the opposite extremity. In their general form they resemble fat slugs or caterpillars. Sir John Evans figures some examples. Their age is unknown, but would by most archæologists be assigned to the Neolithic period. The discovery, however, in gravels of similar forms renders hasty classification hazardous.

A very fine collection of stone implements from Grime's Graves was exhibited by Dr. A. E. Peake.

In the evening, at a joint meeting of the Royal Anthropological Institute and the Prehistoric Society of East Anglia, Sir Everard im Thurn in the chair, Prof. Arthur Keith gave an address entitled "How Far can Osteological Characters Help in Fixing the Antiquity of Human Remains?" Certain characters of the nose, orbit, palate, and lower jaw have never been seen in British skulls belonging to any period older than the Roman occupation, and become increasingly frequent as we approach the present time. These characters consist of (1) the "margination" or flanging of the lower border of the nasal opening; (2) the retreat of the incisor part of the alveolus of the upper jaw, leaving the nasal spine and lower margin of the nose as an overhanging jib and ledge; (3) the reduction in size of the malar bone, leading to the lower margin of the orbit being depressed in a downward and outward direction; (4) the arching of the upper margin of the orbit; and (5) a reduction in the development of the angular part of the lower jaw. If these characters are found in a British skull, the conclusion may be drawn with certainty that it is of a Roman or post-Roman date. Contraction of the palate was also a character unknown in Britain until a Late Celtic date. The rounded type of head found in graves of the beaker period in Britain were not known in England before Late Neolithic times, but pure representations of this type of skull are still to be seen in our modern population. A type of skull was found in the deeper deposits of the Thames bed which were identical with the skulls found under the Neolithic pile-dwellings of the Swiss lakes. So far as our knowledge of Neanderthal man will take us, we are justified in regarding him as confined to the Mousterian period of European culture. If any characteristic part of the skull or skeleton of this race were discovered in an undisturbed deposit, that deposit may be safely assigned to the period of the Mousterian culture.

A College of Tropical Agriculture.[1]

A STRONG Committee was appointed in August last to report to the Secretary of State for the Colonies upon the desirability of establishing a tropical agricultural college in the West Indies and upon matters connected therewith. Its report has just appeared, and is one which may be fraught with important results for the future of agriculture in our extensive tropical Dependencies, more especially in the West Indies, where, thanks to the work of the Imperial Department of Agriculture, general agricultural prosperity has in the last two decades been placed upon a much sounder footing. It is significant of the trend of modern practice that a Committee like this, composed of planters, commercial magnates, and scientific men, as well as administrative officials, should have reported unanimously in favour of the establishment of such a college.

The selection of a site affords much ground for discussion, and after careful consideration Trinidad was chosen as being near to the headquarters of the Imperial Department, and having good communications with the other islands, besides a great variety of crops in cultivation. Incidentally, in view of the growing importance of oil in that colony, a subsidiary school of oil technology is proposed. A postscript to the report, however, suggests that the last word may not yet have been said on the subject of location.

A governing body of about twenty-three, representing all the different interests involved, is proposed, and a staff of ten professors (agriculture, mycology, entomology, agricultural chemistry, organic chemistry, agricultural bacteriology, agricultural and physiological botany, genetics, sugar technology, and agricultural engineering and physics), besides lecturers in stock and veterinary science and in bookkeeping.

Considerable interest attaches to a curriculum sug-

1 West Indies. Report of the Tropical Agricultural College Committee. (H.M. Stationery Office, 1920.) Price 2d.

© 1920 Nature Publishing Group

gested by Sir Francis Watts, the Imperial Commissioner of Agriculture for the West Indies, with which the Committee expresses itself as in general agreement. It includes (*a*) a junior course of two or three years, suitable for boys leaving the Colonial secondary schools and intending to follow ordinary agricultural pursuits, usually in the colonies from which they have come; (*b*) a senior course of similar instruction of not less than four years; (*c*) a two years' course, practically the same as the last two years of the previous course, for students who have already undergone a training in agriculture in a university or agricultural college, and thus intended to meet the case of students going out from Europe to work at agriculture in the tropics, whether on their own account or as officials; and (*d*) post-graduate study of special agricultural subjects, such as mycology or genetics, or the study of special crops such as sugar or cacao. It is incidentally recommended that a special school for the study of sugar should be established.

This is a very interesting and practical programme, and it is to be hoped that it may soon be translated into reality. The only criticism that occurs to one is to ask whether it is not just a trifle too ambitious for a commencement and too great a change from the customary methods of learning the work of tropical agriculture, and whether it may not tend to make the tropical student at least, and especially him who must work under seniors trained in the old way, a trifle unpractical. Great care will have to be exercised to make the instruction as practical as possible, and for this reason we note with pleasure the insistence upon making the new college work as much as possible in connection with the Imperial Department.

Finally, it is suggested that a fund of at least 50,000*l.* be raised by private subscription for the establishment of the college, and that for maintenance annual contributions be invited from the various Colonial Governments, and also from the Imperial Government, to which the proper development of the great tropical lands of the Empire is of such paramount importance.

Duplex Wireless Telephony.

ANOTHER of the interesting series of papers on wireless developments connected with the war before the Wireless Section of the Institution of Electrical Engineers was that of Capt. P. P. Eckersley, read on March 17, describing experiments by Major Whiddington and himself on the application of duplex wireless telephony to aircraft. The advantages of being able to converse freely and simultaneously both ways, as is done in a true duplex system, over using a change-over switch are obvious, but the electrical difficulties in the way of its successful accomplishment are considerable. The main problem lies in devising a form of circuit which will protect the receiver, without detriment to its efficiency, from the effects of the relatively powerful high-frequency alternating currents generated by the transmitter.

Two general principles have been adopted. In one, two separate aerials with different frequencies for transmission and reception are placed at right angles and spaced more than a quarter of a wave-length apart. In the other, which may employ a single aerial, the "earth" connection is split, and the branches are tuned so that the transmitter current passes through one and the receiver current through the other. Both these systems present difficulties, and have been used only to a limited extent. A compromise system, in which the transmitter oscillates only when the operator is actually speaking, with what is called a "quiescent aerial" was also experimented with, but the speech was found to be much improved by allowing a small permanent oscillation, increased sympathetically with the voice. Such an arrangement, called an "augmented oscillation transmitter," has certain practical advantages, as well as incidentally presenting some interesting theoretical points, but forms only a "partial duplex" system, as an interruption during speaking cannot be heard. The author's experiments have progressed well on the way towards the evolution of a practical and trustworthy system of duplex wireless telephony for aircraft, and form a valuable groundwork for future development.

University and Educational Intelligence.

ABERDEEN.—At the spring graduation ceremony Principal Sir George Adam Smith announced a gift of 20,000*l.* from Sir Thomas Jaffrey, head of the Aberdeen Savings Bank, for the establishment of a chair in political economy in the University. There has been a lectureship in this subject for a number of years.

The University has just conferred on Sir Jagadis Chandra Bose the honorary degree of LL.D.

BIRMINGHAM.—Mr. Arthur R. Ling, consultant in applied chemistry and lecturer in brewing at the Sir John Cass Institute, London, has been appointed to the Adrian Brown chair of brewing.

A bronze memorial tablet in memory of the late Prof. Adrian Brown has been erected in the Brewing School by past students.

A gift has been received from the Asiatic Petroleum Co. of a model drilling equipment, which will be exhibited at the forthcoming Petroleum Exhibition at the Crystal Palace.

Mr. Frank Shaw has been appointed assistant lecturer in electrical engineering, and Mr. Raymond B. H. Wyatt lecturer in bacteriology.

CAMBRIDGE.—Mr. G. E. Briggs, St. John's College, formerly University Frank Smart student in botany, has been elected to the Allen scholarship.

The new Statute of the University which gives the degree of Ph.D. to research students in the University is the result of the work of a syndicate appointed in December, 1917, "to consider the means of promoting educational collaboration with the universities of the Empire and foreign universities." The chief points of interest in the proposed regulations for working the Statute are as follows:—Research students, who must be at least twenty-one years of age on admission, must have graduated at some university (Cambridge itself included), or must satisfy the University as to their general educational qualifications. Before admission their proposed course of research must have been approved, and they must show that they are qualified to enter upon the course proposed. Students must pursue research for three years before submitting for a degree the dissertations embodying the results of their research. Those who are graduates of Cambridge need only spend one of the three years at Cambridge; others must spend at least two years at Cambridge. The remainder of the time must be spent at some place or places of study approved by the University. Research students who are candidates for degrees at other universities and who spend at least two terms in Cambridge may receive certificates of regular study and industry to cover the time spent in Cambridge. A Board of Research Studies is to be formed to supervise the carrying out of the new scheme. The proposals show a welcome movement away from the old spirit of "splendid isola-

© 1920 Nature Publishing Group