

southern England and in Palestine of groups of flint implements made upon precisely the same definite and specialised plan". It seems scarcely probable that a race of people in Palestine worked out a series of this kind of flint implements on exactly the same lines and produced identically the same technique as another race living in southern England and—unless the early Pleistocene age of the Palestine implements is accepted—at a much later date. Mr. Burkitt, in discussing implements from India (see *Antiquity*, September 1930), compared them with implements from South and East Africa, and suggested that they were on a periphery of distribution of a single industry. Mr. Reid Moir is now strongly inclined to the view that the implements of Early Chellean type from Africa, India, and Palestine are to be referred to the same age as those in England, the early Pleistocene, and that at certain periods of past geological time stone implements were being made on the same highly specialised plan over enormous areas of the earth's surface, having started from a common centre. Hence it is not surprising to find that Mr. Reid Moir accepts the almost inevitable corollary that in the conditions governing movement, whether of culture or of race, at this early age, great periods of time must have been involved, with the implication that in most of the current computations man's antiquity is much underestimated.

Development of Weather Forecasting.

THE *Quarterly Journal of the Royal Meteorological Society* for July 1931 contains an interesting survey of the present position of weather forecasting, by C. K. M. Douglas. The author pays tribute to the work of J. Bjerknes and other Norwegian meteorologists, who have developed in greater detail the system of analysis of synoptic weather charts according to the past history of the different air streams begun by Shaw and Lempfert many years ago in "The Life History of Surface Air Currents". He points out that for short-period forecasting the value of the method is undoubted, especially for periods up to twelve hours ahead. Any adequate discussion, however, of practical forecasting must always take note of peculiar tendencies observed, at least in European weather, described as 'persistence of type' and 'mood'. An excellent example of the first is mentioned, that of the severe spring snowstorms of April 2 and 11, 1917. The synoptic charts that accompanied these storms are said to have had features in common not shared by any other charts during the present century. The second tendency is for rain to be absent in certain seasons when the distribution of pressure is such that in an ordinary year it would be accompanied by rain at that season.

The mere recognition of these two tendencies does not greatly help the forecaster, but does indicate a line of research that might lead to important advances. In the case of persistence of type, it may be that by using synoptic charts covering a very wide area, most cases where a particular type of pressure distribution over, say, the British Isles and the North Sea appears to return after an interruption of two or three days, there will be seen to be a distribution of pressure over a much larger area that has been persistent during the interruption, the latter appearing as a mere local disturbance.

'Mood' is less easy to explain, and very difficult to investigate with our present limited information about the upper atmosphere, if, as seems probable, it is due, as the author suggests, to long-period fluctuations of temperature and humidity in the upper atmosphere.

University and Educational Intelligence.

CAMBRIDGE.—The treasurer of the University has received a cheque for £1000 from the Worshipful Company of Goldsmiths, for the better equipment of the Metallurgical Laboratory.

Mr. J. W. A. F. Balfour-Browne has been elected to a Frank Smart studentship in zoology at Gonville and Caius College.

At St. John's College, G. Bateson and R. O. Redman have been elected to fellowships. Mr. Bateson is an anthropological student, while Mr. Redman is assistant director in the Solar Physics Observatory.

For the eleventh year in succession, Trinity College announces the offer of a research studentship open to graduates of other universities who propose to come to Cambridge in October next as candidates for the degree of Ph.D. The value of the studentship may be as much as £300 a year. The same College offers, as usual, dominion and colonial exhibitions to students of dominion and colonial universities who wish to come to Cambridge next October as candidates for the degree of B.A., M.Litt., M.Sc., or Ph.D. These exhibitions are of the titular value of £40; if the financial need of an exhibitor cannot possibly be met by this amount, the Council has power, if it sees fit and if funds are available, to award him an additional payment. Candidates must apply through the principal authority of their university. Applications for the studentship and exhibitions should reach the Senior Tutor (from whom further particulars may be obtained) by July 1, 1932.

OXFORD.—Dr. Herbert H. E. Craster, fellow of All Souls College, has been elected by the curators of the Bodleian Library, to be Bodley's Librarian, subject to the approval of Convocation on Nov. 3.

APPLICATIONS are invited by the Grocers Company, Grocers Hall, E.C. 2, for research scholarships in sanitary science, each of the annual value of £300, plus an allowance for expenses. The necessary form of application and information respecting the scholarships are obtainable from the clerk to the company.

THE Council of the Institution of Naval Architects has made the following awards: Vickers Armstrong scholarship in naval architecture (1931) to Mr. Leonard Redshaw, of Messrs. Vickers-Armstrongs, Ltd., Barrow-in-Furness—the scholarship is of the value of £150 per annum and will be held at the University of Liverpool for three years; and the Duke of Northumberland prize (in connexion with the 1931 examinations for national higher certificates in naval architecture) to Mr. James Irwin, of the Royal Technical College, Glasgow.

Birthdays and Research Centres.

Oct. 31, 1872.—Sir JOHN RUSSELL, O.B.E., F.R.S., Director of the Rothamsted Experimental Station, Harpenden.

My work—indeed, my whole life—is so intimately bound up with Rothamsted and my colleagues there that I find it difficult to disentangle myself from them. Our general purpose is to see how far science can go in solving the problems of country life. The most fundamental problems are those associated with crop production: the management of the soil, the nutrition of the plant, the ways of dealing with destructive insects, fungi, and other pests, and the ways of utilising

the crop to the fullest advantage in the service of men and of animals. These problems, therefore, form the basis of our work.

The method is to gain knowledge about the soil, the growing plant, and the animal. Experience has shown that this is incomparably better than the search for ways of overcoming particular difficulties; it gives a solid foundation of knowledge on which to develop agricultural education, advisory activities, and further research, and it has proved highly successful in adding to the resources of the countryman in his hard task of wresting a living from the soil.

Nov. 1, 1857.—Prof. JOHN JOLY, F.R.S., professor of geology and mineralogy in the University of Dublin and president of the Royal Dublin Society.

In 1914 I contributed to the *Proceedings of the Royal Dublin Society* a paper on the subject of the radioactive treatment of malignant disease and urged that uniformity of radiation would seem to be more hopeful than the use of concentrated central dosage as then generally practised. Ultimately the present extensively used 'needle method' of application resulted, and was first put into practice by the late Dr. Walter C. Stevenson.

I have since contributed to the Royal Dublin Society suggestions for the use, in certain cases, of bi-radiant needles, namely, needles emitting rays differing unilaterally in density. Suggestions regarding deep-seated radium therapy have also been contributed to this journal as coming from our Irish Radium Institute. No problem is more urgent than this.

I have also in view considerations arising out of the surface history of the earth; the elements of which history I believe to be now well established.

Nov. 4, 1855.—Prof. F. O. BOWER, F.R.S., formerly regius professor of botany in the University of Glasgow.

Since my retirement from the chair of botany in the University of Glasgow in 1925, circumstances have not been favourable for continuing detailed observation as in former years. The opportunity has, however, been used for completing "Ferns", vol. 3, published in 1928, and a small volume on "Size and Form in Plants" in 1930. This leaves me free to draw together many facts and arguments—partly included in volumes already published, partly scattered in isolated memoirs and addresses—into a collective and revised statement relating to archegoniate plants. This will take time, and its completion—if it ever be completed—cannot be expected at any early date. All my available time will now be devoted to this end.

Nov. 5, 1876.—Prof. H. B. FANTHAM, professor of zoology in the University of the Witwatersrand.

The study of animal parasites has always interested me, and for some years I have been working on surveys of the parasitic and free-living Protozoa found in South Africa. The former have been considered from the morphological, biological, and experimental points of view with the view of shedding light on the evolution of pathogenicity among them. The free-living Protozoa have been studied ecologically, while making a first survey of those occurring in various types of soils and fresh waters. Human biology is also of deep interest to me. My investigations have been chiefly on cases of human heritable conditions and on racial admixture, a problem of increasing importance in South Africa, as well as in other parts of the world.

Nov. 5, 1892.—Prof. J. B. S. HALDANE, Reader in Biochemistry in the University of Cambridge, head of the Genetical Department, John Innes Horticultural Institution.

I am directing and conducting research into the biochemistry of individual and specific differences, both in higher plants and bacteria. Progress in genetics demands as exact a knowledge as possible of what genes do. For example, it would appear that one gene may cause the oxidation of a particular substance, another its methylation, and so on. In some cases at least, this is done through a definite enzyme. Exact data as to the effect of genes on viability are also being collected with the view of quantitative testing of the Darwinian theory. I am developing a mathematical theory of natural selection, in which a population is represented by a point in many-dimensional space, and its trajectory under a given selective system is investigated. A number of differential, integral, and finite difference equations arising in this theory demand investigation.

Nov. 6, 1886.—Prof. I. M. HEILBRON, D.S.O., F.R.S., Heath Harrison professor of organic chemistry in the University of Liverpool.

My main interests at the present time are directed towards: (a) the chemistry of the sterols with special reference to ergosterol and vitamin D, and (b) investigations relating to the occurrence, isolation, and structure of vitamin A. Under the first heading, I am attempting to elucidate the structure of the ergosterol molecule, concerning which, apart from its obvious relationship to cholesterol, little is definitely known.

Under the second section, I am continuing, in conjunction with Dr. R. A. Morton, a spectrographic and chemical investigation of vitamin A and related substances.

When time permits, I intend to extend my investigations so as to include a detailed study of the unsaponifiable matter of many animal and vegetable oils, preliminary work upon which has revealed the presence of many interesting substances.

Nov. 7, 1888.—Sir C. V. RAMAN, F.R.S., Palit professor of physics in the University of Calcutta, and Nobel laureate in physics, 1930, honorary secretary of the Indian Association for the Cultivation of Science, Calcutta.

During the last ten years, the attention of the workers at the Indian Association for the Cultivation of Science has been principally directed to the study of the scattering of light and its relation to the nature of radiation and the constitution of matter. Since 1928, monochromatic light has been exclusively employed and the scattered radiations have been analysed spectroscopically. This has led to a very great extension of the field of study. Probably the most important problem now under investigation is the nature of light itself. The phenomena of light-scattering make it clear that we have to atomise light and ascribe to it a specific quantum of energy and also definite values of linear and angular momentum. They also suggest that we must atomise sound, and consider it as being associated with molecular aggregates of variable size. The discovery of the phenomenon of anomalous polarisation in light-scattering has also opened up new vistas of research, which are being actively pursued. Light-scattering is also being applied to numerous physico-chemical problems.

Magnetic and magneto-optical researches are also receiving attention at the present time at Calcutta.