

Research Items

Eskimo Cultural Origins in East Greenland

AFTER taking part in Helge Larsen's archæological investigations in Dødemandsbogten on Clavering Island, P. V. Glob excavated twenty-seven houses and a number of graves in Eskimo settlements in Kempe Fjord and King Oscar Fjord (*Meddelelser om Grønland*, 102, 2). These settlements had long been deserted when the fjords were first navigated and mapped by the Swedish expedition under A. G. Nathorst in 1899. Their culture in fact falls entirely within the eighteenth century. The finds from north-east Greenland have been classified into (1) an early culture, coming from the south, comprising Ingsuk types; and (2) a mixed culture in two stages, the early and later north-east Greenland culture, consisting of types from the north, the Thule culture, and local types. The Kempe and King Oscar Fjords settlements do not show evidence of the early culture. The characteristic oval house is absent and no house contains Ingsuk types only. The culture found is the Northeast Greenland in its earlier and later forms, though certain types are new. As found here, it probably originated outside the area, as the result of an admixture of Eskimo with a Thule culture from the north and Eskimo with an Ingsuk culture from the south. The house types fall into two groups, in the earlier of which the house type is large. The small house represents a late stage which was degenerate with diminishing numbers. In the group of large house types there is indication of an additional element from the south, marked by the four-sided house, as well as of the incoming of the later stage of Northeast Greenland from a source not evident, but clearly one in which the Thule types had persisted. A noteworthy feature was the occurrence in a number of houses, in which artefacts were usually numerous, of isolated human jaw-bones. Six in all were found. The reason for their occurrence is not clear, but it may be due to disposal of the dead by partial exposure.

Ethnology of Futuna

In a report on the information collected during a visit to Futuna and Alofi, islands about 150 miles north of Fiji, in 1932 (Bull. Bernice P. Bishop Museum, No. 138), Mr. Edwin Burrows states that the islanders have been little affected by change. Some of their dances and ceremonies are still performed in the traditional manner, and activities, such as the construction of houses and canoes, agriculture, the preparation of food, and the making of bark-cloth and clothes are unaffected. In such small islands as these, the culture is simpler than in the large Polynesian units, and many features of Samoan and Tongan social organization are absent. For example, there are no talking chiefs and no village maids as in Samoa, nor are there sub-chiefs and a chiefs' language as in Tonga, nor is there the Tongan practice of assigning each individual a fixed position within the kindred. On the other hand, practices now lost elsewhere are here found as essential cultural features—for example, inheritance of the position of master craftsman. Futunan culture, therefore, is not only Western Polynesian, but early

Polynesian. Thus, two methods of making bark-cloth are found, felting and pasting. Felting is practised as the only method of making bark-cloth in Hawaii, the Society Islands, the Marquesas, the Cook Islands, the Tuamotus and, in fact, throughout the eastern Polynesian area, with the exception of New Zealand. Pasting is the method of Samoa and Tonga. While both are present in Futuna, there is evidence that pasting is here the more recent. The distribution suggests that felting is the old method, while pasting was invented in Samoa and Tonga and the old method forgotten. The different methods of decorating bark-cloth seem to have a like local origin, freehand drawing being the oldest.

The Argentine Ant in the United States

SOME time previous to 1891 this ant, known as *Iridomyrmex humilis* Mayr, which is an inhabitant of South America, entered the United States at New Orleans. In less than fifty years it has come to invade and establish itself in more than 4,000 square miles of territory, including most of the Southern States and a considerable area of California. An account of this insect, together with methods of its control, has been written by Mr. M. R. Smith (*Circ.* No. 387, U.S. Department of Agriculture, May 1936). It appears that the ant becomes disseminated chiefly via railroad commerce, and is readily transported in consignments of lumber, plants, dry goods, etc. The hold which it has obtained in its adopted territory is due to its ability to produce enormous numbers of individuals able to exterminate competitive species. It thrives both in human habitations and in the open, and can exist up to 4,000 feet. It is chiefly as an indoor pest that it is most troublesome: it is omnivorous and swarms on foodstuffs, etc. Out of doors it affects poultry-keeping and often kills young chicks to obtain their blood: this ant also invades beehives besides fostering aphids and mealy bugs. The official recommendations for its control include systematically planned poisoning by means of a mixture of syrup and sodium arsenite, placed in small containers at specified intervals throughout infested areas.

Northern Harpacticids

KARL LANG has investigated the harpacticids from the Swedish Expedition to Spitsbergen 1898 and Greenland 1899, and although the material was difficult to handle, having been laid aside for more than thirty-five years in alcohol, he has found in it much that is new and interesting ("Die während der Schwedischen Expedition nach Spitzbergen 1898 und nach Grönland 1899 eingesammelten Harpacticiden. *Kungl. Svenska Vetenskapsakademiens Handlingar*. Tredje Serien. 15, No. 4; 1936). There are many new species and these were mostly taken in deep waters (1,750 m. and 2,700 m.) at a greater depth than any harpacticids have been collected before in these regions. The number of species is comparatively large, the number of individuals, in most cases, very small and often confined to a single individual. The present work is purely systematic, the author intending to deal with the geographical distribution in

further publications. New species are described of *Cerviniopsis*, *Bradya*, *Stenhelia*, *Ameira*, *Paramesochra*, *Argestigens*, *Eurycledotes*, *Mesocledotes*, *Hemicledotes*, *Paranannopus* and *Rhizothrix*, whilst a new genus and species *Canuellopsis typica* is proposed for a form closely related to *Canuella*. *Eurycledotes echinatus* n.sp., collected at a depth of 1,750 m., possesses a very peculiar alimentary canal, the stomach reaching the third abdominal segment and being strongly lobed before narrowing to a funnel-shaped end with a thick circular muscle. At the sides are large glands, enormously developed. The author suggests that the hind part of the gut may serve for respiration in these great depths. Keys to the species of *Eurycledotes*, *Mesocledotes* and *Rhizothrix* are given.

A New Group of Filterable Organisms

SIR PATRICK LAIDLAW and W. J. Elford (*Proc. Roy. Soc.*, B, 120, 292; 1936) have been searching for new organisms in sewage. They removed all visible organisms by filtering the sewage through gradocol membranes with an average pore size between 0.6 μ and 1 μ . The filtrates contained a new group of organisms which may prove to be a link between the larger bacteria and the pathogenic viruses. The larger forms have a diameter of about 0.5 μ , and are visible under dark-ground illumination as small rings. The smallest forms have a diameter of about 0.15 μ . The organisms can be grown in a rich broth. If the small forms are filtered off and cultured, large forms develop, so that the same organism probably varies widely in size at different periods of its life history. The organisms appear to be purely saprophytic, because it was impossible to produce any obvious disease when cultures were administered in various ways to rats, mice and rabbits. Several closely related strains were distinguished immunologically in material from different sources.

Geometrical Laws of Egg Cleavage

It is obvious that the planes of cleavage in the developing egg are conditioned, within limits, by mathematical or rather geometrical laws. Monteil ("L'Oeuf." G. Doin and Cie, Paris, 1936) discusses these geometrical ideas so far as they are applicable to alecithal and telolecithal eggs exhibiting radial and oblique segmentation. The nucleus at the commencement of division tends to take up a position at the centre of gravity of the cytoplasm of the cell and this, while it does not have much effect in the alecithal ovum, is of great importance in the telolecithal ovum. In order to allow for the influence of the yolk in the latter type of egg and not to make the interpretation too complicated, the author deals with the yolk-containing portion of the egg as if it could be divided into zones each with simple proportions of cytoplasm and yolk and the proportions varying from no yolk to no cytoplasm. The axis of the spindle is in general parallel with a tangent to the surface of the egg sphere, and as the cleavage planes are at right angles to this it follows that the internal surfaces of the cells are walls of polyhedrons and not of cubes as is usually depicted in diagrams. Thus, for example, in the eight-celled stage of the frog's egg, the lower internal surfaces of the micromeres together form four sides of a tetrahedron the angles of inclination of which are determinable because they are at right angles to the spindle axes. While the geometrical figures involved in the early

stages are simple, they become more and more complex as segmentation proceeds. The provision of short summaries and a large number of diagrams adds considerably to the ease of following the argument.

Pollination of Plums

THE effective pollination of orchard crops is an essential factor in the production of satisfactory yields of fruit, and in many cases care must be taken to interplant self-sterile varieties with other sorts to act as pollinators, in which case the flowering periods must overlap. Though the main English plum varieties Czar, Purple Pershore, Victoria and Giant Prune appear to be largely self fertile, cross-pollination is advantageous, and with many other varieties is essential. A recent paper by C. H. Hooper (*J. South Eastern Agric. Coll., Kent*, 38; 1936) contains a classification of plums relative to their degree of self-fruitfulness, and a useful table is given to show varieties in flower at the same time. Pollination is brought about mainly by bees, but observations recorded in the paper cited show that the blossoms are visited by a number of other insects which were counted and identified. The data on flowering periods should prove a useful guide when plum orchards are being planted.

Bactericidal Action of Radiation

THE bactericidal action of radiation depends on a number of factors such as the duration and intensity of the exposure, the wave-length, and the nature of the bacterium. A simple and accurate method of studying the effect of these factors has been described by G. Dreyer and M. L. Campbell-Renton (*Proc. Roy. Soc.*, B, 120, 447; 1936). The organisms are spread out evenly on an agar plate. Radiation is then allowed to fall on a localized area about 3 mm. in diameter. A number of such small areas can be treated with different times of exposure or different wave-lengths. The plate is incubated for 22 hours. It is then placed in the 'reading machine', in which a beam of light is thrown obliquely up and the amount of light scattered by the organisms is measured in a gas-filled potassium photo-electric cell. After applying a correction for the dead background, the authors calculate the percentage of survivors from the amount of light scattered in the spot, expressed as a percentage of the amount of light coming from a neighbouring untreated spot. They find that the product of the intensity and duration of irradiation for a given effect is constant over at least an 8-fold range. The shape of the curve connecting percentage growth with log (duration) varies when different organisms are used. The relative bactericidal action of different wave-lengths also varied irregularly and the effect was not proportional to the energy, but in all cases the line 2655 A. was the most effective. The effects of disinfectants were also studied by applying drops of different dilutions to localized areas on agar plates and measuring the effect by the method used in studying the effect of radiation.

Promotion of Nitrogen Fixation in Tropical Soils

At intervals since the beginning of the present century studies have been made of the value of molasses as a soil improver, and a number of investigators have examined the possibility that the action of the molasses was partly an indirect one, that of

increasing nitrogen fixation. As there has been a certain conflict of results, particularly on the practical side, there is room for further investigation of the problem, and the contributions of Prof. N. R. Dhar and his co-workers at the University of Allahabad are to be welcomed. They have already shown considerable nitrogen fixation under tropical conditions when energy-rich materials such as soluble carbohydrates or molasses are added to the soil. They are now attacking the general problem of increasing soil nitrogen by supplying the nitrogen-fixing organisms with sources of energy, and in a communication to the Editor dated August 18, 1936, Prof. Dhar and Mr. S. K. Mukerji report appreciable gains in nitrogen content when soils, to which filter paper, dried leaves, or leaf juice had been added, were kept under laboratory conditions for several months. There were still greater increases in nitrogen content when molasses was also added, while soils exposed to sunlight for 6 hours daily gained slightly more than those kept in the dark. Sodium salts of organic acids, namely, sodium citrate, stearate, palmitate and oleate, exposed to light under similar conditions gave smaller but consistent increases in soil nitrogen. From one half to two thirds of the added carbon was oxidized at the same time. The authors point out that since molasses and cellulosic materials not only increase the humus content of the soil and improve its physical condition, but also promote nitrogen fixation, the manuring of tropical soils with such substances should be a highly important practical proposition.

Original Laterite of Buchanan

MUCH of the controversy as to the nomenclature of laterites has resulted from the fact that no exact data concerning Buchanan's original laterite have been available. In order to settle the question, Dr. C. S. Fox visited the type localities in Malabar during 1933. His results are now published (*Rec. Geol. Sur. India*, 389-422; 1936). From this paper, it is clear that Buchanan's laterite consists mainly of what would now be called lithomargic laterite and even, in part, lateritic lithomarge. The rocks studied by Buchanan represent but a stage in the passage from granites and gneisses, through kaolin or lithomarge, to a rock consisting mainly of hydrated oxides of alumina and iron in which combined silica is characteristically absent. The latter portion of this process of weathering is now generally known as lateritization, and the finished product is called laterite. Thus Buchanan's 'laterite' is an intermediate form needing some qualifying adjective such as *lithomargic*. Dr. Fox has shown a sense of proportion in recognizing the facts of present usage. Otherwise, had he insisted on a purely academic application of the law of priority, the term laterite would have to be restricted to the lithomargic rocks studied by Buchanan; a completely new term would have to be adopted for the high-level fully formed laterites of the Deccan and elsewhere; and the term lateritization would have to be abandoned. Fortunately, there is no suggestion that any such confusion is likely to be introduced.

Constants of Diatomic Molecules

THE accumulation of spectroscopic data concerning such molecular constants as vibration frequency, ω_e , and internuclear distance, r_e , for diatomic molecules is stimulating further efforts to determine a more

accurate relation between these constants. Allen and Longair, Badger and Douglas Clark have each suggested different modifications of the approximate Morse rule, $\omega_e r_e^3 = \text{constant}$. It is found that the results are more satisfactory if attention is paid to the periodic groups to which the atoms forming the molecule belong. Consequently each of the three modifications contains a period constant. Douglas Clark and Howell have also shown that a simple relation exists between the ω_e values of such molecules as A_2 , B_2 and AB where A and B belong to the same group. It appears that ω_{AB} is almost equal to the arithmetic mean of the frequencies ω_A and ω_B . Dr. N. R. Tawde, of the Royal Institute of Science, Bombay, has sent to NATURE a communication containing the substance of a paper by him, to appear in the *Bombay University Journal*, in which he discusses the same result and also describes his investigation of the variation of the ratio B_e/ω_e for molecules within a given periodic group. As a result of this study, he finds it possible to estimate values of B_e for a number of molecules, and, ultimately, to determine r_e from the relation $B_e = h/8\pi^2 M r_e^2$. Where it is possible to check these calculated values against those already established, agreements to within 2.5 per cent or better are obtained.

Refrigeration in Agriculture

"REFRIGERATION FOR THE FARM AND DAIRY" is the title of an illustrated bulletin by C. A. Cameron Brown, published by the Institute for Research in Agricultural Engineering, Oxford (1s. 6d.). The preparation of the bulletin was prompted by the number of inquiries on the subject of milk cooling recently received by the Institute, and it is specially intended for the guidance of farmers, small dairymen and in particular the producer-retailer. After an introductory account of the theoretical side of refrigeration, the compression and absorption systems for obtaining the low temperatures are discussed from the practical point of view, the comparative suitability of the various chemicals that can be used, the type of plant employed and its efficiency all coming under review. The second half of the bulletin deals with the application of refrigeration, chiefly in relation to dairying. A full description is given of the two principal methods for cooling milk, namely, the direct-expansion and the circulation methods. The important question of sterilizing is not overlooked, for the choice of cooling plant may be largely determined by the technique in sterilizing preferred. Cold storage is also considered in detail, the equipment required, its mode and operation being fully described, while figures for running costs are quoted from actual farms. Smaller sections are devoted to the question of portable cooling for the dairymen, and refrigeration on the fruit farm, in the bulb and market gardening industry and in poultry farming.

Ammonium Mandelate in Urinary Infections

IN a note in a former issue of NATURE (June 20, 1937, 1027), reference was made to this agent in the treatment of *Bacillus coli* infections of the urinary tract, and to a granular form of this compound, 'Neoket', supplied by Boots Pure Drug Co., Ltd., Nottingham. Messrs. Boots now supply an 'elixir' in fluid form, in which the unpleasant taste of ammonium mandelate is successfully covered by the use of suitable flavouring agents, and which is therefore more palatable than 'Neoket'.