

Research Items

A Second Neanderthal Man from Italy

THE discovery on July 16, 1935, of a Neanderthal skull, only the second to be found in Italy, in the quarry of Saccopastore, near Rome, is described by the Abbé Breuil and A. C. Blanc, the finders, in *L'Anthropologie*, 46, Nos. 1-2. It was also in this quarry that the first Neanderthal skull was found in 1929. The quarry is part of a low river valley terrace, and has been abandoned for some years. Water has accumulated in the centre, and makes the sections difficult of access. The new skull was found in the north section. The stratification is complicated. The deposits evidently belong to two complexes, of which one is much older than the other. The two are separated by a period of erosion of marked intensity. The skull was found in the upper part of Stratum *F*, a deposit of fine sand belonging to the older complex, showing no stratification, and homogeneous. It was, however, also partly in the lower deposits of Stratum *E*, consisting of fine gravel mixed with sand. Although at present freed only in part from deposit, the skull can be seen to have the dentition of the right side complete, while the face on this side, almost intact, is high, with little prognathism and shows no trace of the canine fossa. The orbital cavity is large and rounded, as is also the nasal aperture. Two flint flakes were found *in situ*, one in immediate contact with the skull being subtriangular and pointed, measuring 25 mm. by 13 mm., while the other, found some metres to the east at the base of Stratum *E*, is a small irregular flake of calcedony, 40 mm. by 16 mm., and showing no retouch. A third, a flake of calcedony of unknown provenance, was found near the entrance of the quarry. The distal part of a broken tibia of *Bos* has a transverse fracture at its distal end caused by an intentional blow. The evidence of malacological fauna and molluscs, examined by Mr. A. S. Kennard, and the geological evidence, concur in ascribing the deposits in which the skull was found to a period of a cold dry steppe climate preceding the oncoming of Würm I.

Primitive Medicine in Malabar

MR. A. AIYAPPAN describes in *Man* of April the growth of a cult in the Cochin State of Southern India and its function among the populace as a means of curing a number of ailments. The shrine is situated near the Mullurkara railway station, where a flat-topped hillock surmounted by a huge dolmen has on one side a vertical wall of granite, in which is a niche about 10 ft. high, with a spirited figure of Siva as *Dakshināmūrti* sculptured on it. The figure is in an unusual pose, turning away from two students at its feet. It has been attributed to the period between the sixth and eighth centuries. It was discovered accidentally by slaves, who were clearing vegetation. It was afterwards worshipped, first by low caste men and then by higher castes. Although it is in the possession of the Nayars, it is still used by all castes, including the unapproachable castes, who are allowed to make their offerings in person without the intervention of a priest. The reason for this variation from custom is thought to be that low castes began the cult. The people have discovered that *Dakshinā-*

mūrti could be successfully invoked for driving away pestering spirits. To the unsophisticated Hindu, his deity and temple are more hope-giving than a hospital; and here the largest number of offerings are for curative purposes. Figures of an affected limb are offered in wood, stone or pottery, or when the disease is more general effigies of the whole body. Similar figures of live-stock are offered when they are ill. Cradles are offered for getting children, and figures of breasts by young women whose own breasts are under-developed. Figures of animal pests, such as rats, boars, etc., are used to secure protection from them. A wooden tortoise is said to have been a cure for stomach-ache. All offerings are placed before the deity for a short time and then heaped up by the side of the temple.

Viscera of Primates

STRAUSS (*Proc. Amer. Phil. Soc.*, 76, No. 1; 1936) has dissected fully the viscera of three specimens of orang-utan, an old male with an anterior trunk height of 49.8 cm., a juvenile male and a new-born female. He has utilised the information thus obtained to preface a comparative account of the viscera of primates in general. It is found that the four anthropoids and man exhibit a group of characters in common that indicate their affinities and close genetic relationship. These include the high and partially transverse disposition of the heart, the reduction of lobation of the lungs, the restriction of the pleural sacs and their sternal dissociation, a true vermiform appendix, a sigmoid colon, the completion of an ascending mesocolon, the development of a secondary jejuno-ileal mesentery and the reduction (save in the gorilla) of hepatic lobulation. All of them offer a curious mixture of primitive and specialised characters, but there appears from the parts under review no reason for supposing man to be more closely related to the chimpanzee or even to the chimpanzee-gorilla stock than to the other primates.

Antarctic Foraminifera

MR. ARTHUR EARLAND has now published Part 3 of the Foraminifera ("Discovery" Reports, 10, pp. 1-208. Cambridge: University Press, 1935. 37s. 6d. net). This embraces the Falkland Sector of the antarctic (excluding South Georgia), the first part having dealt with the bottom deposits of the Falkland Islands and adjacent seas, an area outside the extreme limit of the pack-ice, with a characteristic sub-antarctic fauna; the second part with the deposits of South Georgia, which lies within the antarctic regions although very nearly in the same latitude as the Falkland Islands. The present report deals with a large area farther south, extending over nearly 90° of west longitude, or practically a quarter of the south polar circumference. This is a very interesting contribution to our knowledge of the distribution of the group. It is a question whether the deep sea was populated by migration from cold polar waters, or whether the antarctic fauna had its origin in the deep sea. The author is inclined to the view that the antarctic fauna originated in migration principally from the deep water of the adjacent

oceans, and that the invasion is still in active progress. He believes that, with the exception of a few species which appear to have a circumpolar distribution and are not found in the deep sea of warmer latitudes, the present antarctic fauna represents the successful attempt at the colonisation of a fresh area. There are not many genera and species, and these are chiefly primitive forms, principally belonging to the Arenacea; conditions of life not having favoured the hyaline and porcellanous forms to any great extent. Certain species of Pacific origin were found in these regions which had no previous antarctic history yet were known from Australia and New Zealand areas. This is specially the case with the genus *Lagena*, but there are also other forms which show an extension of the range of species in an eastern direction across the South Pacific. A few species appear to have a complete circumpolar distribution, and are not known outside the Antarctic.

Mallophaga or Bird-Lice from the Tinamous

M. A. CARRICKER, jun., has recently published an extensive paper on the above subject (*Proc. Acad. Nat. Sci. Philadelphia*, 88, 45-218; 1936). Next to the struthious birds, the tinamous represent the oldest living family of birds. Their mallophagous parasites form the most extraordinary group of these lice of which we have any knowledge. The generic differences and extremes are very remarkable and can only be explained on the basis of the great antiquity of the host family. The great majority of the Mallophaga found on tinamous belong to a group of genera which constitute a new family—the Heptapsogastridae, the chief character of which is the reduction of the abdominal segments to seven in number. This feature is brought about either by the complete loss of the first segment or by the fusion of the first and second segments. The author remarks that the tinamous possess the most diversified and bizarre collection of genera and species of Mallophaga, while the family, as a whole, will undoubtedly take first rank in the number of genera and species found on a single host species and individual.

An Amphidiploid Wheat

AN interesting new wheat hybrid is described by Dr. D. Kostoff (*C.R. Acad. Sci. U.S.S.R.*, 1, No. 1) between the tetraploid *Triticum Timopheevi* with 28 chromosomes and the diploid *T. monococcum* with 14. The F_1 hybrids were all sterile, but in a head which had been crossed with the pollen of an F_4 segregate from the triple hybrid, *T. turgidum* \times *T. dicoccum* \times *T. vulgare*, a single large grain was obtained. The plant raised from it had 42 chromosomes, and the evidence indicates that it was an amphidiploid produced by the parthenogenetic development of an egg of the *Timopheevi-monococcum* hybrid which had failed to undergo meiosis. This amphidiploid is intermediate between the two parent species, both of which, as well as the F_1 hybrid, were immune to rust and mildew. The amphidiploids are highly fertile, with spikes like the F_1 in glume and awn characters but, as is to be expected, the cells are larger. This new hexaploid wheat (called *T. Timococcum*) is regarded as a very promising form to cross with *T. vulgare*, and thus introduce immunity into the bread wheats. It is possible, however, that immunity may be determined, at least in part, by cell size, the diploid and tetraploid species being more immune because of their smaller cells.

Meteorology in Great Britain

THE latest volume of the "Weekly Weather Report" of the Meteorological Office, Air Ministry, which is now published only as an annual volume, is the fifty-seventh of the series. It covers the period March 4, 1934–March 2, 1935. The report is in the form that was first adopted for the volume giving data for 1929, according to which the information is partly expressed as weekly averages of the different meteorological elements regarded as of most importance for agriculture—temperature, accumulated temperature, rainfall and bright sunshine—and partly as deviations of these elements from their 'normals' or long period averages. There are fifty-seven well distributed stations to represent the British Isles, the stations being the same as those employed in the preceding volume. A table of normal weekly values for the twelve districts into which the British Isles are divided, based on the records of the standard 35-year period 1881–1915, is followed by another giving weekly departures for each district from the corresponding district normal, for the period under review, and these weekly deviations from normal are averaged for the four seasons and for the year. The character of the year in any district can be ascertained by a glance at this table. Then follow the weekly data for each individual station, one station filling one page, an arrangement which similarly presents the main features of the year, but for a particular place, in a very compact form. It can, for example, be seen with little trouble that in London (Kew Observatory) temperature in the whole year ranged from 27° to 84° and was nearly two degrees above the average; that rainfall was distinctly below and sunshine distinctly above the average in spite of the very wet and dull winter, notably sunny periods being enjoyed in July and again during the last part of August and the early part of September. The column of figures representing the departure from normal of temperature shows that there was only one week which was so much as 5° below the normal—that beginning on Oct. 28, with an average of 42°; that in the week beginning on Dec. 2 temperature averaged the remarkably high figure of 52.4°, an excess of nearly 11° above normal; that, moreover, the cold week was preceded by twenty out of which only one was cold.

An Optical Model for Studying the Acoustics of Theatres

THE acoustic characteristics of a hall or theatre are almost completely determined by the reflection of the sound waves at the walls. The sound audible to the audience is caused by several factors. There are first the 'direct sound' waves; secondly, the 'useful sound' which, in addition to the direct sound, includes every sound wave striking the ear within 1/15 of a second after the arrival of the direct sound; thirdly, 'reverberation' which includes the useful sound and all the contributed sound waves which reach the ear after 1/15 of a second; and finally 'echoes'. An echo is a reflected sound wave which owing to the peculiar shape of part of the reflecting walls predominates over the reverberation by means of its high intensity. The reverberation period is defined as the time taken by the intensity of the sound to decay to the millionth part of its initial intensity. In the case of musical productions and the spoken word, definite reverberation periods give optimum results. In the ideal theatre, the whole sound radiated from the source would reach the audience

as useful sound. Unless the speaker is surrounded by a sound reflector, this acoustic ideal cannot be even approximately realised. In *Philips Technical Review* of February, there is a description of an optical model which was used to perfect the acoustics of the Philips theatre at Eindhoven. The model of the hall is made of sheet aluminium, and a small movable lamp is used as a 'sound-source'. About 50 per cent of the light is reflected from the walls, so that after three reflections the initial intensity of the light is reduced to about ten per cent. The luminous intensity at each point on the model is therefore determined by the interaction of only a few reflected rays and so the resultant luminous intensity is an approximate measure of the useful sound intensity. The model showed at once that the greatest part of the audible sound came from the roof. This proves that in an open air theatre the spoken sound is much less audible. Further experiments with another model enabled completely satisfactory results to be obtained.

High-Frequency Electric Melting Furnace Equipment

In the *G.E.C. Journal* of May a description is given of a high-frequency electric melting furnace equipment recently installed in the Novo Steel Works at Sheffield. When the works were first founded in 1870, the whole of the steel produced was made from wrought iron by the cementation process followed by forging. Since then, the equipment has been continuously altered as the demands made for complete heat treatment, especially the treatment required for the high-class steels used for aircraft and motor-cars, have increased. The conditions required for their manufacture in the casting shop are now comparable for those associated with laboratory methods so far as precision, control and cleanliness are concerned. Analysis shows that the steel made in the high-frequency furnace on a commercial basis is of exceptional purity and uniformity. Stainless and other steels which contain high percentages of chromium, tungsten, molybdenum and other alloying additions are made without appreciable loss of these constituents and without carbon increment or the picking up of sulphur or other deleterious elements. It has been proved that if more than one ingot is poured from one melt, each ingot and every part of each ingot gives practically the same analysis. This is due to the well-known stirring effect caused by convection currents within the molten charge, a phenomenon inherent and peculiar to the high-frequency furnace. So far as the workmen are concerned, the working conditions are greatly improved, as it is comparatively cool and comfortable in the neighbourhood of the furnace. The capacity of the larger of the two furnaces described is half a ton.

Carbohydrate Metabolism

A USEFUL review, by Prof. O. Meyerhof, of recent work on carbohydrate metabolism is published (in German) as a supplement to the March 1936 issue of *Current Science* (4, 669-682). The author confines himself chiefly to a discussion of experiments carried out in collaboration with K. Lohmann and W. Kiessling, in which the cause of alcoholic fermentation and the formation of lactic acid by enzymatic breakdown of carbohydrates were studied. As a result of these researches, the author formulates schemes for the series of changes occurring in both processes,

which represent a further advance in our knowledge of carbohydrate metabolism (see *NATURE*, 132, 337 and 373; 1933). The scheme for lactic acid formation is more detailed than that of Embden, from which also it differs at several points: thus in the initial reaction adenylypyrophosphate reacts with hexose to form hexosediphosphate and adenylic acid: the diphosphate is then converted into α -glycerophosphate and phosphoglyceric acid via dioxyacetone phosphate: Embden suggested that the intermediate stage was glyceraldehydephosphoric acid with dioxyacetonephosphoric acid. The phosphoglyceric acid is then converted to phosphopyruvic acid, which reacts with hexose to form hexosediphosphate and pyruvic acid. The latter reacts with more hexose and phosphate to form triosephosphate, which with pyruvic acid is converted to phosphoglyceric acid again and lactic acid: in Embden's scheme the process is simpler, the phosphoglyceric acid being converted to pyruvic acid and phosphoric acid, the former reacting then with α -glycerophosphoric acid to form triosephosphate and lactic acid. The paper is illustrated with curves describing the experiments from which Meyerhof has been led to suggest his modified schemes for both fermentation and formation of lactic acid.

Constitution of Acacipetalin, a New Type of Glucoside

DR. CLAUDE RIMINGTON has recently described the isolation and constitution of a new type of glucoside, which occurs in several South African species of *Acacia* (*S. African J. Sci.*, 32, 154; 1935). *Acacipetalin* is distinguished from all known cyanogenetic glucosides, including the corresponding product *sambunigrin*, which is found in the Australian *acacia*, in yielding neither aldehyde nor ketone when hydrolysed by acids. It is true that a small yield of acetone resulted from enzyme hydrolysis, but comparison of the molecular formula $C_{11}H_{19}O_6N$ of acacipetalin with that of linamarin $C_{10}H_{17}O_6N$, the β -glucoside of acetonecyanhydrin, led to the interesting discovery that the acetone was a secondary product, formed by disintegration of the unstable 'aglucone' or primary product of hydrolysis. The isolation of acacipetalin was rendered somewhat difficult on account of its association with *pinit*, the monomethyl ether of inositol, which is somewhat similar in properties. Eventually the glucoside was obtained as colourless crystals, which melt at 176° C. and are bitter to taste. The aqueous solution is laevorotatory, the value of $[\alpha]_D^{20}$ being -36.6° . Its molecular weight was determined cryoscopically, and ample chemical evidence was found of the presence in the molecule of prussic acid and one glucose unit. The results of acid hydrolysis were puzzling, since isobutyric acid was formed, but the key to the molecular structure was provided by subjecting the glucoside to the action of boiling baryta solution before attempting acid hydrolysis. The glucosidic linkage is practically untouched by the baryta, which merely hydrolyses the cyanogen group. This has the effect of stabilising the 'aglucone', which was identified as isobutyrylformic acid (α -oxo- β -methylpropane- α -carboxylic acid) $(CH_3)_2CH.CO.COOH$. This led to the establishment of the constitution of acacipetalin as the glucose ether of dimethylketene cyanhydrin $(CH_3)_2C : C(CN).O$. $C_6H_{11}O_5$, and it is tentatively suggested that the natural synthesis may be due to the condensation of glucose, acetone and formaldehydecyanhydrin.