

Research Items

Chinese Mesolithic Industry

EARLY in 1935 a party of geologists, which included P. Teilhard de Chardin and Dr. W. C. Pei, while engaged in a survey of the Cenozoic formations of Kwangsi on behalf of the Geological Survey of China, discovered in the caves of the area a definite type of cultural deposits, which in the absence of any pottery, or of even incompletely polished celts, are to be regarded as belonging to a typically mesolithic cultural stage, though clearly similar to the 'Bacsonian' (early Neolithic) of Indo-China. The conditions of stratification and palæontological content have already been described by P. Teilhard de Chardin (*Bull. Geol. Soc. China*, 14, No. 2). The artefacts are now described by Dr. W. C. Pei (*ibid.*, No. 3). They are derived from caves, of which three are situated in the south of the province almost at the border of Indo-China, and one in the north, this distribution pointing to a wide extension of this culture over a large part of southern China. The artefacts included grinding stones, perforated stones—the perforation being by pitting, not drilling—hammer-stones, side- and end-scrapers, and weights. A doubtful worked tip of deer antler and a much worked terminal piece of tine were also found. The most interesting specimens were an elaborately decorated grinding stone of green slate, polished on one side by use and on the other decorated by incised parallel bands, and a core scraper, a pyramidal artefact in green slate made from a rolled implement of much older and possibly palæolithic date. One hammer-stone showed evidence of having been painted with hæmatite and afterwards used. The affinity of this Kwangsi mesolithic industry with the Bacsonian of Indo-China is evidently a subject for future investigation.

Canadian Folk-song and European Cultural Origins

AN unexpected source of evidence bearing upon certain aspects of European cultural development has been brought to light in the study of Canadian folk-songs by Mr. Marius Barbeau ("Folk-Songs of Old Quebec", National Museum of Canada, *Bull.* 75, *Anthrop. Ser.* No. 16). It was long thought that E. Gagnon's "Chansons populaires du Canada" had exhausted local tradition; but during the last fifteen years renewed search, with the assistance of a few collaborators, has brought to light 6,700 versions of songs from Quebec, the Maritime Provinces and New England, where there are many immigrants from Canada. Of these songs, ninety per cent are French in origin and retain their traditional character, the remaining ten per cent being a purely Canadian product. The true folk-songs, forming the bulk of the repertory, were introduced between 1608 and 1673. Others, more recent, but in the true folk-song vein, were brought in after 1680 as marching and college songs by soldiers, priests and teachers. The true folk-songs came with the settlers from Normandy and the Loire valley. They do not belong to the troubadour tradition, which is aristocratic and in the dialect of *oc*, but are probably a survival of the obscure literary upheaval, free from Latin influence,

which took place in the Loire valley and the north, and found popular expression in the *jongleurs*. It inherited and conserved the older traditions of the land, presumably as the heir of the ancient Druids and the Celtic culture that had undergone a mutation, but had not altogether ceased to exist. Although the *jongleurs* had died out, and there is no reference to them in the New World, these old folk-songs of Canada, more numerous and better preserved than in France, thus represent an ancient stratum of French literature never wholly submerged by neo-Latin influences from the south.

Ram Sarcophagus from Southern India

IN February 1935, a terracotta sarcophagus in the form of a ram was unearthed at Sankavaram, a small village in the Chuddapah District of Madras, and has since been transferred to the Madras Government Museum. In an account of the find (*Current Science*, November 1935) Mr. M. D. Raghavan states that the skeletal remains place it beyond doubt that the interment was human. The only other known funerary vessel in animal form from southern India is a small elephantoid urn from the banks of the Tungabhadra River. In the present example, the trunk of the ram is so modelled that the lower part supported by the legs served as the receptacle for the bones. The upper part, made in two pieces, has a clearly modelled head, the curling horns being emphasised, but the ears omitted. There is an aperture at the apex of a well-arched neck. About half way from the top of the front section a hole is placed symmetrically on either side. The back portion is well rounded to simulate the hinder portion of the animal, but lacks a tail. The figure is elaborately decorated with impressed rope-work ornament, suggesting the trappings of an animal equipped for riding. Two pieces of iron, a spear-head and a fragment of a knife or sickle were inside the sarcophagus, and an interesting series of pottery was associated with it, a squat type of vessel with shield shape back, and shallow all black pans predominating. The pans are highly polished and bear spiral marking inside. In primitive thought the ram is often looked upon as an embodiment of the soul of the dead, and in the early Indian faith the ram deity was invoked as Naigamêsha to obtain a son, though in the medical treatises, Naigamêsha as a ram-faced demon causes children's diseases. Association of the two ideas may have suggested the use of the ram-faced form as a request that the deceased might through Naigamêsha's influence be born back on earth.

Source of Infection in Puerperal Fever

IT is generally recognised that strains of the micro-organism known as the 'hæmolytic streptococcus' are the principal agents in the causation of puerperal or 'child-bed' fever. Evidence at present available goes to show that these puerperal strains are rarely, if ever, present in the genital tract at the beginning of labour, and it must be assumed, therefore, that they are introduced from some extra-genital source during labour or soon afterwards. What this source

may be the subject of an investigation by Dora C. Colebrook, the results of which have just been published (Medical Research Council, *Spec. Rep. Series*, No. 205. London: H.M. Stationery Office. 1s. 6d. net). Of 67 infected puerperal women investigated, an extra-genital strain of streptococcus identical with the infecting strain was identified in 48 of the patients (76 per cent). These were isolated from the respiratory tract—throat and nose—of the patient (24 times), or of an attendant or member of the household, once from a septic focus of the skin of the patient herself, and once from the skin of a child. The types of infecting hæmolytic streptococci found were those commonly met with in tonsillitis, middle ear disease and scarlet fever. It is estimated that could infection with these organisms be eliminated, the deaths of nearly 600 parturient women in England and Wales might be avoided annually, as well as the non-fatal illness of at least 2,300 women.

Some Insects of Oceania

RECENT publications (1935) of the Bernice P. Bishop Museum, Honolulu, comprise several papers on some insects of Oceania. Dr. Herbert Osborn, in Bulletin 134, contributes an account of the Cicadellidæ or leafhoppers of Hawaii. This paper is based upon nearly three thousand specimens of the family, and it appears that the great majority of the species belong to the genus *Nesophrosyne*, which is limited to the Hawaiian Islands. The members of this genus are found more particularly upon trees and shrubs or woody plants. The species occur in all the main islands of the Hawaiian group. Some, such as *N. perkinsi*, are found on at least four of the islands, while others, like *N. lineata*, *angulifera* and *bicolorata*, are known from a single island only. Among other genera, *Nesophryne* is confined to Kauai Island. Among Occasional Papers of the Museum, vol. 11, is a check list of the ants of Oceania, by Prof. W. M. Wheeler. Some 560 forms (339 species, 108 subspecies and 113 varieties) are enumerated. All the subfamilies of the Formicidæ are represented, excepting the Dorylinæ and Leptanillinæ. The greatest interest is attached to those genera and subgenera which, so far as known, occur only in the Pacific Islands. Their taxonomic affinities seem to indicate that they are remnants of the ancient Tertiary and Pretertiary ant fauna which is still well represented in Australia and Papua. Dr. Karl Friederichs lists the Embioptera of Oceania. No embiids are known in New Zealand, and only undeterminable larvæ have been found so far in Papua. The other islands of Oceania have, so far as is known, no endemic species. In some of them two species occur, one Asiatic and the other tropicopolitan, but probably of African origin. A new beetle of the family Lathridiidæ, *Mumfordia monticola*, is described by Mr. E. C. Zimmerman from Tahiti. The family is represented in Oceania, outside New Zealand, by thirteen species only, and six of these are either widely distributed or cosmopolitan.

New Mexican Crabs

MR. STEVE A. GLASSELL, in his paper "New or Little Known Crabs from the Pacific Coast of Northern Mexico" (*Proc. San Diego Soc. Nat. Hist.*, 8, No. 14; 1935), describes several new and interesting Brachyura, most of which were collected by himself. Notes on colour and habits make these descriptions valuable. A new species of *Polonyx*, *P.*

quadriungulatus, is found commensal with an annelid in tubes on an eel-grass mud flat. Each tube containing a crab was about a yard long and an inch in diameter. *Pinnotheres clavapedatus*, n. sp., is found commensal with the boring mollusc *Lithophaga attenuata*, taken at a depth of fifteen fathoms. More than two hundred females and five males were taken. Another *Pinnotheres* lives in the mantle cavity of a small oyster attached to rocks or mangrove roots, and a new species of *Dissodactylus* was found on the ventral exterior surface of several echinoids. When attached to an *Encope*, "it is usually placed in the proximal portion of the posterior interambulacral lunula. From this position to a point near the peristome or periproct of the echinoid the crab clears the actinal spines, thus forming for itself a roadway but little wider than its outstretched ambulatory legs". Another species of the same genus may occupy the same echinoid together with this one, but ranges over the entire ventral surface. Other crabs described include new *Pinnixias* inhabiting annelid tubes or living with lug-worms and sea cucumbers.

Californian Pectens

MR. LEO GEORGE HERTLEIN, in a paper entitled "The Recent Pectinidæ" (*Proc. California Acad. Sci.*, fourth series, 21, No. 25, Sept. 1935), describes eleven species of pecten from the Galapagos Islands collected by the Templeton Crocker Expedition of the California Academy of Sciences, 1932. One of these is a new species, *Pecten (Chlamys) lowei*, found also in the Gulf of California. This is very similar to some of the fossil pectens from the Miocene in California, Porto Rico and other localities, but with slightly different sculpture. It also somewhat resembles the European *Pecten varians*. All the species are characterised mainly by the ribs and their sculpture, but notes on colour are also given.

Seasonal Changes in Starch and Fat in Woody Trees

OBSERVATIONS upon five deciduous and two evergreen species under Japanese conditions have recently been reported by O. Ishibe (*Mem. Coll. Sci., Kyoto Imp. Univ.*, B, 11, No. 1 (1935)). The two maxima and minima of starch recorded both by British and American observers are again recorded for starch and though, in this case as in previous work, the conclusions are based on qualitative microchemical data, they must now be regarded as fairly well established. The deciduous trees showed a starch maximum at leaf-fall and a minimum in the growing season as also does the evergreen, *Quercus glauca*, but in *Pinus densiflora* the spring maximum in the stems occurs much later and at a time when growth is in progress. This is attributed to the continued photosynthetic activity of the evergreen leaves. The report of changes in fat content is also based upon qualitative microchemical observations (using Sudan III); these suggest that the changes in fat are independent of the changes in starch content. The fat content of the root is small, and remains almost constant throughout the year in most species.

The Boulder Dam

THE great Boulder Dam on the Colorado River is the subject of an illustrated article by Mr. G. B. Barbour in the *Geographical Journal* of December. The river, after leaving the Grand Canyon, crosses an area in which it flows alternately in gorges and open basins. Here in Black Canyon on the borders

of Nevada and Arizona, where the river enters on its last pronounced southward reach, the dam is being built which eventually will impound two years' entire flow of the river, amounting to ten billion gallons, and supply a generating plant with a capacity of 1,835,000 horse-power. The dam will be 726 ft. above the bed rock, and will raise the water-level 584 ft.; it will be 1,180 ft. in length along its crest. Before the dam was begun, the Colorado was diverted into four 50 ft. tunnels at points upstream from the site. When all was ready for diversion, the canyon walls below the tunnel entrances were blasted, thus forming coffer dams above the dam-site. The project was begun in 1933, and should be finished in 1937. It may be noted that it has employed 3,500 men, housed in the temporary Boulder City. For irrigation, California and Arizona will benefit most, the former especially by an eighty-mile canal from lower down which will carry water to the Imperial Valley. The total land in all States to be irrigated will be some two million acres. Cheap electric power will be available at Los Angeles, 250 miles away, and other cities.

Measurement of Water Passing Through a Net

WITH a very fine silk twnet, as used for obtaining plankton samples from the sea, the quantity of water filtered depends upon several factors; for example, the distance the net is drawn through the water, the speed at which it is towed, the extent to which the meshes become clogged, the amount of use the net has had, and whether or not it has been wet for some time before a station is worked. Where quantitative data are required for purposes of comparison, these variables can be overcome by using a net having a meter which measures the quantity of water passing into and through it. Such a net has been constructed by Mr. H. W. Harvey, of the Marine Biological Laboratory, Plymouth (*J. Con. Internat. Explor. Mer.*, 10, No. 2, 179-184 (1935)). During two and a half years of regular use, the apparatus has worked satisfactorily and produced valuable results.

Accurate Measurement of Temperature

THE Cambridge Instrument Co., Ltd., has just issued a pamphlet (price 1s. 6d.) which should be of value to all users of temperature-measuring appliances. It gives a concise survey of the methods of measuring temperature, and defines the field of application of the various types of pyrometers, thus enabling the user to select the instrument best adapted to his requirements. It is interesting to note that recent developments in the manufacture of the mercury-in-steel thermometer have made possible the employment of mercury vapour instead of liquid mercury. In this way temperatures between 350° C. and 800° C. may be measured. It is stated that the purification of platinum and its alloys has made such progress during the past few years that in order to maintain a constancy in the values given by the modern thermo-couple as compared with those of a few years ago, the rhodium content of the thermo-couple has been slightly increased. The modern standard couple is now platinum versus platinum 13 per cent rhodium instead of the original Le Chatelier of platinum versus platinum alloyed with 10 per cent of rhodium. An account is given of total radiation and optical pyrometers and due regard is paid to the limitations imposed by departure from 'full radiator' conditions. In the abridged specification of temperature measuring instruments manufactured by this firm, we note

a wide range of surface pyrometers adapted to meet the most diverse requirements of industry. The specification also contains a description of electrical thermometers specially designed for medical work. Tables are given for the comparison of the centigrade and Fahrenheit scales, the E.M.F.'s of thermo-couples, standard temperatures of the international scale and divergence between true and apparent temperatures with pyrometers sighted upon different materials in the open.

Polymerisation as Applied to Petrol Production

AT the annual meeting of the American Petroleum Institute at Los Angeles, it was claimed that with the aid of polymerisation, potential sources of motor-fuel in that country had been increased by twenty-five per cent, according to Science Service of Washington, D.C. The effect of polymerisation is to combine waste refinery gases in such a way as to unite two or more molecules to form polymers suitable for the production of gasolene, benzol, toluol and/or xylol. This process has also been successfully applied to natural gas, and from this source alone three billion gallons, or one-fifth of the American annual consumption of gasolene, can be obtained without in any way curtailing the supply of natural gas required for domestic and industrial uses.

Production of Lubricating Oils from Coal Products

ON December 12, a paper on production of lubricating oils from coal products was read before members of the Institute of Fuel. The authors, Messrs. F. C. Hall, W. R. Wiggins and A. W. Nash, contend that, while a great deal of attention has recently been paid to the production of motor fuels from coal, insufficient has been given to the possibility of obtaining lubricants from the same source. The chemical nature of coal renders it improbable that high-grade lubricating oils can be obtained directly by coal distillation, but various coal products might be used for the synthesis of such lubricants. Indirectly, lubricating oils can probably be obtained from coal by at least five different, indirect methods: namely, by the non-catalytic polymerisation of hydrocarbons; the catalytic polymerisation of olefines; the dechlorination of chlorinated hydrocarbons; the condensation of olefinic with aromatic hydrocarbons; and the condensation of alkyl chlorides obtained by the chlorination of coal products with aromatic hydrocarbons. The authors, having examined each of these methods in detail, have reached the conclusion that high-grade lubricating oils with viscosity characteristics comparable with those of certain commercial petroleum lubricants can be produced from ethylene by the use of modified catalytic methods. Further, using a metallic aluminium catalyst, they claim to be able to produce, by the condensation of aromatic hydrocarbons with chlorinated paraffins, oils the viscosity indexes and oxidation stability of which are superior to those of commercial products. It seems practicable, therefore, that gaseous olefines and paraffinic and aromatic hydrocarbons obtained in various coal treatment processes can be utilised for the production of lubricating oils. Admittedly consumption of such oils is substantially less than that of motor spirit, but even so it amounts to some 115 million gallons a year, and any new processes for its production should be given support, so far as is economically practicable.