

Research Items.

NEOLITHIC PAINTED POTTERY FROM THE BUKOVINA.—Mr. V. Gordon Childe describes in vol. liii. pt. 2 of the *Journal of the Royal Anthropological Institute* a representative series of painted pottery from Schipenitz, a late neolithic station in Bukovina belonging to the important neolithic culture of the famous black earth belt of South-Eastern Europe, for which affinities with the Ægean have been suggested. The sites of the black earth belt fall into three groups of which the eastern forms the true Tripolye culture. Of the central group, to which Schipenitz belongs, Cucuteni alone shows any stratification. Here the pottery of the later of two culture levels corresponds to that of Schipenitz, as also does that of the later of two chronological groups on the Dniepr. The painted pottery is generally found in rectangular structures of wattle and daub. At Schipenitz it shows no sign of development and belongs to a single cultural epoch. It exhibits a considerable range of form with a characteristic but limited range of design based upon the S-shaped spiral for each. Black monochrome or black with thin red line hatching is applied to a polished surface ranging from deep red to yellow, or to a thin slip varying from brown to creamy white. The people of Schipenitz were pastoralists, but there is evidence that they also practised agriculture. Their culture came to an end owing to the inroads of nomads from the east and north, and apparently did not outlive the second Middle Minoan period.

SOCIAL ORGANISATION OF THE MANCHUS.—In extra volume iii. of the North China Branch of the Royal Asiatic Society, Dr. Shirokogoroff deals in great detail with the Manchu clan organisation—a subject in which any addition to our scanty information is welcome. While reserving broad generalisations for later consideration, he concludes that the Manchu clan is a group united by agnatic relationship, owning a common ancestor and a group of spirits peculiar to the group, and including women adopted as wives of the male clan members. The ancient social organisation has been preserved but adapted to the new conditions involved by residence among the Chinese. The military and economic domination of the Manchus over the Chinese preserved them from complete assimilation by the latter. The clan organisation is closely bound up with their system of spirits, Shamanism being one of the elements forming the basis of the clan organisation which could not exist apart from it. Their classificatory system of relationship is based on a division into classes, each of which is divided into junior and senior groups. This represents the unification of two systems, one matrilineal and the other patrilineal, the latter showing traces of Chinese influence. The clan organisation indeed, in certain particulars, affords evidence pointing to an earlier system which allowed greater rights to women than at present.

PSYCHO-ANALYSIS AND ANTHROPOLOGY.—In *Psyche* for April, Dr. Malinowski has subjected the nuclear family complex of the psycho-analysts to a critical examination on the comparative lines suggested in his communication to *NATURE* (see *NATURE*, November 3, 1923, p. 650). The nuclear family complex, the most important fact in human mentality according to Freud, is due to the action of a certain type of social grouping. The psycho-analysts, basing their views upon the typical patriarchal family, assume that the Ædipus complex is universal, but they fail to take into account the possibility of variation according to the constitution of the family. A comparative study of conditions in three types of family life, the peasant and the well-to-do in a civilised community, and a family under the

matriarchal system, in this case in the Trobriand Islands, shows that while there are differences in degree rather than in kind in the case of the two civilised units, both differ entirely from the matriarchal type. The characteristic relations between child and parents, and the attitude towards sex and kindred matters which give rise in the patriarchal family to the Ædipus complex, are absent in the matriarchal family, and their place is taken by analogous relations to the mother's brother and in sexual matters to the sister, resulting in a matrilineal complex essentially different from the Ædipus complex. It would appear, therefore, that in studying each type of civilisation, it is necessary to establish the special complex which pertains to it.

LIFE WITHOUT OXYGEN.—Modern views on the subject of respiration are much occupied with the subject of anaerobic life. In spite of the incredulity with which the theory of life without oxygen was received in the past, it is now generally admitted to be thoroughly well established. In his presidential address to the Chemical Society of Washington in January on "Life without Oxygen" (*Journ. Wash. Acad. of Sci.*, March 19), Dr. W. Mansfield Clark says: "In the arguments of those who insist upon the necessity of molecular oxygen are many fallacies. Undoubtedly the outstanding fault is psychological." Pasteur wondered how it was that anaerobes were able to exist in an environment permeated so universally with free oxygen. He himself supplied the answer: anaerobes are found in company with aerobes, and the latter, by using up the oxygen of the environment, provide anaerobic conditions without which the anaerobes could not thrive. We know that the organism of tetanus, for example, will not develop in a wound unless there is also an infection with aerobes. It is also a fact that certain anaerobes have the power of themselves using up oxygen from their surroundings, and so creating their own anaerobiosis. In the investigation of the reducing power of living cells, the reduction of such coloured substances as methylene blue or indigo carmine have been the tools most frequently employed. The researches of Dr. W. Mansfield Clark have thrown a new light on these reduction phenomena, and have given information of the intensity conditions governing these reductions in terms of electrical potentials. A mixture of indigo carmine and leuco indigo carmine at constant H-ion concentration gives a definite electrode potential difference, which can be interpreted in terms of the oxyhydrogen gas cell. Knowing the potential difference in terms of a hydrogen electrode and the P_H, we can then calculate for a partially reduced indigo solution the hypothetical hydrogen or oxygen pressures in equilibrium with the system. In a case where 80 per cent. reduction had occurred, the oxygen pressure came out at 10⁻³⁶ atmospheres. This is, as Dr. Clark says, "some anaerobiosis."

HABITATS OF LIMNÆA.—Dr. W. R. G. Atkins and Dr. Marie Lebour contribute a note (*Sci. Proc. R. Dublin Soc.*, March 1924, pp. 327-331) on *Limnæa truncatula* and *L. pereger* in relation to hydrogen-ion concentration and other conditions. The latter is truly a water snail and can endure even somewhat stagnant water; the former is amphibious, and can live either in shallow, well-aerated water or on moist land, or even on cliffs in a region of high humidity. The observed ranges for the two species as regards acidity and salt-content of the water are almost identical.

REVERSAL OF GEOTROPISM.—In three recent papers the results which Prof. J. Small believed he had obtained in causing stems to grow downwards and roots to grow upwards, by placing the former in an acid and the latter in an alkaline medium, have been controverted. Prof. F. C. Newcombe (*New Phytol.*, vol. 22, No. 5) has repeated many of the experiments both with roots and stems. He obtained only negative results and points out various sources of error in the experiments. Cholodny (*Ber. deut. Bot. Gesells.*, vol. 41) has reached similar conclusions, finding the downward bending of young stems in an atmosphere of carbon dioxide to be due to a softening of the tissues. Messrs. R. E. Chapman, W. R. I. Cook, and Miss N. L. Thompson (*New Phytol.*, vol. 23, No. 1), in another series of experiments with seedlings in 10-60 per cent. carbon dioxide, also find only normal geotropic response of stems, unless the growth is inhibited altogether. In the higher concentrations of carbon dioxide, geotropic curvature usually occurs before the heliotropic, and as the carbon dioxide concentration increases the stomata tend to close.

ICE IN THE ARCTIC SEAS.—The Danish Meteorological Institute has published its well-known report on the state of the ice in the Arctic Seas for 1923. In many respects the year was an exceptional one. In the Kara Sea conditions were unusually favourable, for not only was the southern part ice-free in July, but also practically the whole sea was clear of ice in August and September, and probably much of October. The Barents Sea was unusually clear from April to the end of the summer. In August there was open water to Franz Josef Land and the Wiche Islands and well to the north of Spitsbergen. Around Spitsbergen the ice conditions were also somewhat exceptional. Bear Island was clear of pack by the end of April, and the west coast of Spitsbergen had no ice of significance from May until November. The north coast was so free from ice that Spitsbergen was circumnavigated with comparative ease. While reports from the east coast of Greenland were few, there is evidence that ice conditions in that region were bad and that the ice was packed closely against the coast. In spring and early summer there was an unusual quantity of ice on the Newfoundland Banks, but in Davis Strait the ice was scarce. Scantiness of information from many Arctic seas necessarily detracts from the value of this annual record, but it represents the only systematic collection of data relating to ice-movements in which it may be possible in time to recognise some periodicity in occurrence.

SHELLS OF FOSSIL BRACHIOPODS.—Mr. W. E. Alkins has measured some four hundred specimens of a Rhynchonellid, doubtfully referable to *Rh. boweti*, from the base of the Forest Marble at Harbyleigh, Dorset, now in the collection of the Manchester Museum. The length, width and depth of the shells were measured and the correlations determined. The species as represented by these specimens is shown to be homogeneous; the correlation between length and width is fairly high (0.86), but between length and depth is surprisingly low (0.31). A similar series of measurements is recorded for 300-400 specimens of *Terebratulina punctata* (Manchester Memoirs, vol. 67, No. 9, 1923).

NATURAL OIL-RESERVOIRS AS "STOCK-TANKS."—The somewhat novel idea of utilising exhausted oil-reservoirs for storage, not only of heavy fuel-oil but also for lighter distillates, has been mooted on more than one occasion in the past. It is therefore interesting to be able to record details of an actual case of recourse to this extremity, showing that in practice the idea is not such a wild one as appears from first consideration. During the War, crude oil obtained in Sarawak was the

source of several thousand tons of valuable fuel for the British and allied navies operating in eastern waters, but owing to a shortage of tankers, there arose great difficulty in disposing of the lighter oils necessarily produced when refining the crude material. Rather than waste such valuable products, certain wells in the Miri field, known to be practically exhausted, were used for pumping into the sands they had previously drained, more than 30,000 tons of petrol, often at quite high pump pressure (over 100 pounds to the square inch). This policy was resorted to particularly in 1916-17. With the cessation of hostilities, there were more tankers available and the oil was re-pumped from the wells, so that in 1919 no less than 14,000 tons of oil were recovered in the form of a light crude. According to the Hon. T. G. Cochrane, who dealt with this subject at a meeting of the Royal Society of Arts on March 4, the total amount of oil recovered was actually in excess of that quoted, as owing to migration, some of the oil appeared in producing wells located at a distance from the storage wells. A fifty per cent. recovery is obviously better than a hundred per cent. wastage, which would have occurred had some expedient not been adopted to deal with the situation. Loss of oil due to migration, however, is in most cases bound to be substantial, and while this practice may be defended in extenuating circumstances, the conversion of derelict reservoirs into temporary stock-tanks is a policy scarcely likely to meet with general approval.

THE CRUDE OILS OF BURMA AND ASSAM.—Most of the crude oil produced in Burma emanates from the Yenangyung, Singu, and Yenangyat fields, situated in the basin of the Irawadi River, some 300 miles north of Rangoon. There is much similarity between the oils produced in these three fields, though the Singu and Yenangyat crudes tend to be richer in light fractions. In general the oil is green in colour (brown by transmitted light), has a pleasant odour, and is practically free from water; the sulphur content is low. The chief characteristic of Burma crude is the exceptionally high content of solid paraffins, causing the oil to have a setting point below about 70° F. As it contains an appreciable amount of asphalt, it cannot be classed as a pure paraffin base crude, though the specific gravity (0.835) is by no means high. An average distillation, in the absence of cracking, gives 28 per cent. petrol, 35 per cent. kerosene, 6 per cent. intermediate oil, 10 per cent. paraffin, 13 per cent. lubricating oil base, and 8 per cent. residuum; these and the foregoing data were given *inter alia* during the course of a paper read by Mr. W. J. Wilson at the Institution of Petroleum Technologists on April 8. The author also discussed the crude oil of Assam, derived principally from the Digboi and Badarpur oilfields, the product of both areas being essentially different. The Digboi crude has an average specific gravity of 0.856, a larger percentage of solid paraffins than that of Burma, and a greater amount of asphalt. The Badarpur crude, described by the author as a "freak oil," has a high gravity (0.9775) and is a natural fuel-oil, usually void of gasoline, solid paraffins, and having a residuum resembling rosin rather than asphalt, of which only a small amount is present on analysis. This oil is further characterised by the poor lubricating quality of its heavier distillates, which is apparently impossible of remedy by subsequent treatment; some of the still heavier fractions are adhesive like glue and have a specific gravity greater than unity.

LATERITE AND BAUXITE.—The peculiar nature of laterite was first clearly recognised in South India by Francis Buchanan-Hamilton so long ago as 1807, when this name was proposed by him for the peculiar brick-like product of rock weathering under tropical conditions. Following Buchanan-Hamilton's obser-

vations, an enormous amount of literature was published, especially in India, referring to laterite. In 1898 a new turn was given to the discussion by Max Bauer's recognition of the similarity in chemical constitution between bauxite and the laterite of the Seychelles. Bauer's work inspired a new crop of literature, dealing first with the origin of bauxite, and secondly with the possibility of utilising the highly aluminous laterites of the tropical belt as a source of aluminium. Recently the Geological Survey of India has published a memoir by Mr. C. S. Fox (Mem. Geol. Surv. Ind., vol. xlix. part 1), in which has been gathered together a well-balanced survey of the known facts regarding the bauxites and laterites of the world. Mr. Fox's memoir promises to become the reference work on this subject for many years, as Dr. Fermor's memoir, published through the same medium, is now regarded as the standard work of reference on manganese-ores. Mr. Fox discusses in his first chapter the mode of occurrence, physical characters, mineral constitution, chemical composition, origin, age, and economic uses of bauxitic laterites. His second chapter is a detailed description of the occurrences in India, and the third chapter is a summary of the facts known regarding the bauxites and laterites of extra-Indian countries. The final chapter gives a summary of the chief points of each paper of importance previously published on this subject. In dealing with the constitution and origin of bauxite Mr. Fox has made a definite advance upon the previously recorded ideas, for he has applied the newly developed science of colloid chemistry to the constitution of bauxite, and has directed attention to the remarkable way in which the lateritic hill-caps in Peninsular India fringe, as well as lie on, the Deccan trap area and probably represent the decomposition product of the trap and its outliers.

A NEW ILLUMINATOR FOR EXAMINING METALS.—A new type of vertical illuminator for the microscopic study of metals was exhibited by Messrs. R. and J. Beck, Ltd., at a recent meeting of the Royal Microscopical Society (Industrial Applications Section). Existing illuminators are generally provided with a single adjustment for altering the angle of the reflector in one direction only. In the new Beck model the reflector can not only be moved in two directions at right angles to one another and to the optic axis of the microscope, but can also be tilted about two different axes. Reflectors of different shapes and sizes are provided, and these can be interchanged in the illuminator while it is in actual use. The series includes a set of concave mirrors, which have not been used hitherto for such work. By the use of a suitable type of mirror placed in the best position over the aperture of the object glass, considerable advantages can be gained in metallurgical examination. Thus, a transparent reflector with a small circular opaque spot in the centre effectively eliminates glare without appreciably injuring the resolution, while a silvered opaque reflector can also be used with but slight loss of resolving power. The illuminator can be fitted to any make of microscope, and should prove of considerable assistance to metallurgists.

A NEW "BAKER" MICROSCOPE.—Messrs. C. Baker and Co. (244 High Holborn, W.C.1) have submitted to us an example of their new model R.M.S. microscope. The instrument is of very rigid construction, so important for accurate work, and is quite stable in the horizontal, as well as the vertical, position. The fine adjustment and sub-stage slides are embodied in the limb, ensuring alignment and rigidity, and a substantial platform is included in the casting, to which the stage is attached. The stage is a rotating

one, with clamping arrangement, provided with verniers, and having movements of 60 mm. and 30 mm. in the vertical and horizontal directions respectively. The former movement has a clamping device to prevent the stage running down when the microscope is used in the horizontal position. The sub-stage is of new design. Only the ring carrying the optical system swings out, the slide with rack and pinion being stationary. This is done by pressing a small spring and sliding the sub-stage down the left-hand support. On reaching the bottom it can be turned out, and on swinging in again and sliding up the pillar, it comes back truly central and into focus. The body is fitted to an independent slide with clamp to that of the coarse adjustment. This arrangement has two advantages, one being the extra working distance available for very low powers such as 4-in. to 6-in. objectives, the other that the body can be entirely removed and replaced by a high power binocular. A rack and pinion adjustment to the drawtube of the monocular body can be supplied, extending to 250 mm. and closing down to 130 mm. The whole instrument is beautifully finished and is suitable for the most delicate research work and for photomicrography.

ELECTRIC FURNACES FOR HARDENING STEEL.—Messrs. The Automatic and Electric Furnaces, Ltd., Elecfurn Works, 173-75 Farringdon Road, E.C.1, have issued a new catalogue dealing with furnaces operating on the Wild-Barfield system. The special feature of the furnace is the magnetic detector. This consists of a secondary winding superimposed on the main heating winding and connected to an indicator by means of which a visual indication is given to the operator of the magnetic condition of the charge in the furnace. The basic idea is the fact that the temperature at which steel becomes non-magnetic is, for practically all carbon steels, the correct quenching temperature. A secondary feature of practical importance in these furnaces is the excess temperature cut-out. This consists of a loop of silver wire carrying the main heating current and entering the hot zone of the furnace. This loop fuses should the furnace temperature be allowed accidentally to rise beyond a certain point. It is stated that with electricity at one penny per unit, the cost per ton of work hardened has been reduced from 34s. to 26s. per ton on account of the improvements which have been effected in the design of the new furnaces.

THE COLOURS PRODUCED BY BECQUEREL RAYS.—In a communication to volume 20 of the *Zeitschrift für Physik*, Prof. K. Przibram, of the Radium Research Institute, Vienna, sums up the results which have been obtained by himself and his pupils on the nature and behaviour of the colours produced in otherwise colourless substances by the incidence of Becquerel rays on them. The colour is due to extremely small particles produced in the substance, so small that they cannot always be detected by the ultramicroscope. When the substance is an alkali salt, the colour produced is in general that of the vapour of the alkali, and in all cases it appears to approach a limiting value. It may be discharged either by heating or by allowing light to fall on the substance. During the discharge of the colour the substance may become luminescent and photo-electric. The author conceives the process as due to the absorption by a negative ion of the substance of a quantum of radiation and the consequent release of excess electrons. These reach the positive metal ion, and in neutralising it light is emitted and the substance takes the colour of the metal. On heating, the freer motion of the ions results in the return of the electrons to the negative ion and the discharge of the colour.