

### Research Items.

**THE FINNISH HOUSE.**—Some interesting details of the plan and methods of construction of the traditional type of habitation in Finland are given by Mr. Donald Smith in Part 4 of *Observation*. These houses were constructed to contain several generations, and the communities were self-contained, the men being hunters, fishers, graziers, farmers, and artificers, lacking only a forge; while the women performed the operations of grinding, baking, brewing, spinning, etc. They grew their own tobacco. The first portion of the house to be erected was always the bathroom of round unshaped logs—of the "steam-bath" type, with a stove of rough blocks of granite. Then followed a vestibule used as a store-room and dairy connecting the bath-house with the living-room or house proper. This was roughly square with a seat fixed to the wall running round two sides, and an oven of clay and granite blocks in the right-hand corner. Smoke was emitted by the door or slits in the wall, but sometimes a hollow tree-trunk served as a chimney, its lower end being closed by a slide which was opened at intervals. A trough was provided to give the horses warm meals in winter, for which purpose they were brought in from the stables. The upper end of the room was divided into the man's corner and woman's corner, each pursuing their occupations on their respective side of the line, the woman alone crossing the line rarely as her duties required.

**THE EARLIEST MAYAN DATES.**—Among the contributions to the Göteborg session of the twenty-first International Congress of Americanists, of which the proceedings have just been published, is an examination of the earliest evidences for Maya dates and the inferences which can be drawn from them, by Dr. Sylvanus G. Morley. The earliest dates known at present are on the Leyden jadeite plaque and the Tuxtla statuette, which show Baktun 8 dates equated, that on the latter with 97 B.C. and that on the former with A.D. 61. It is probable, though by no means certain, that in both cases the dating is contemporaneous. Dr. Morley gives a table showing 29 early dates, of which 24 are certainly or probably contemporary and five non-contemporaneous, ranging from 97 B.C. to A.D. 275. Of the dates covering Baktun 8 and part of Baktun 9, the former come from two sites only, Uaxactun and Uolantun. It is established by Stele 10 at Tikal, the latest of the Old Empire monuments, that the Baktuns—the name given to the Maya cycle of 144,000 days—numbered 8, 9, and 10 fitted into a system which could not complete itself in more than sixty-four millions of years. Taking the evidence bearing upon dating as a whole, it would appear that Uaxactun was the first Maya city at which stone monuments came into use. Before that time, it is generally agreed, the stelæ were carved out of wood; and these have now disappeared. Exhaustive search in the region of the oldest cities has failed to reveal any simpler beginnings of the elaborate time count. Uaxactun is at the heart of the Yucatan peninsula and of the Old Empire. Its geographical and topographical position concur with the archæological and chronological evidence in pointing to it as the central point of distribution of Mayan culture to other regions.

**TRYPARSAMIDE IN SLEEPING SICKNESS.**—The efficacy of tryparsamide in the treatment of sleeping sickness in the Belgian Congo is the subject of a communication by Dr. Clement C. Chesterman in the *Lancet* for November 7, p. 965. He notes that though spontaneous recovery may sometimes occur without

any treatment, he himself has observed no case in a series of 650 which has remained in good health. On the other hand, there is evidence that after single doses of atoxyl, soamin, arsacetin or tartar emetic, early cases may remain in perfect health, while with repeated dosage the number of cases which appear to be cured is greater. Bayer 205 likewise gives good results in cases in the first stage of the disease, which means that there is no involvement of the central nervous system as evidenced by changes in the albumin and cell content of the cerebro-spinal fluid. In the second stage of the disease, none of these drugs gives satisfactory results. In tryparsamide, first used in sleeping sickness by Pearce of the Rockefeller Institute of Medical Research, there is hope of permanent cure even in cases in very advanced stages of the disease. Of the first stage cases originally treated by Pearce in 1920, so many as 100 per cent. are still in good health and may reasonably be regarded as cured. Of cases in the second stage, Van den Branden and Van Hoof have carefully followed 35 which were treated with tryparsamide. Of these 45.7 per cent. have remained in good health for an average period of three years. Dr. Chesterman himself has obtained cures in 37.5 per cent. of 40 cases observed for two and a half to three and a half years. A number of cases, however, do not react to the drug, and the reason of this is obscure. The drug *in vitro* is only feebly trypanolytic, so that its curative action appears to depend on some factor in the human body. There is evidence that this may be found in the liver, and that when this organ does not function properly, the drug has less chance of acting favourably in sleeping sickness. Dr. Chesterman concludes that tryparsamide should be the mainstay of our attack on sleeping sickness. The principle has been adopted by the Belgian Government, which is responsible for the treatment of 50,000 cases annually.

**GOLD COAST SURVEYS.**—The report of the Survey Department of the Government of the Gold Coast for the year ending March 1925 shows a record of steady progress not only in the production of topographical and cadastral surveys, but also in the attainment of a high standard in local production of maps. In addition to a great deal of cadastral work including several town plans, the topographical survey is proceeding satisfactorily. Of the total area of the Gold Coast and mandated territories, some 92,000 square miles, 41,000 have been surveyed, including 2500 during the year under review. The scale is 1 to 62,500 from the coast to lat. 7° 30' N., and half that scale to the northward. The reproduction of the smaller scale maps is now undertaken at Accra instead of sending them home. To judge from the sheet attached to the report, there is little scope for improvement. Experiments with the use of wireless in longitude determinations are leading to useful results.

**AGRICULTURAL POPULATION IN EUROPE.**—At the International Geographical Congress at Cairo last April, Prof. A. Demangeon opened a discussion on agricultural systems and schemes of distribution of population in western Europe. The subject evoked so much interest that an international commission was appointed to investigate the matter and prepare reports for a later Congress. In the autumn issue of the *Geographical Teacher*, Prof. Demangeon's paper is printed in full. His conclusions are as follows: The nature of the rural habitat is closely related to the system of exploitation of the land. The isolated farm and small hamlet, characteristic of western

France, Flanders, the Campine, and many parts of England, is very ancient in regions of predominant stock-raising, in contrast to the compact village which may be held to imply the existence, at least in origin, of some form of communal cultivation. The latter is found chiefly on fertile lands which lent themselves to early settlement by reason of lack of forest. Prof. Demangeon does not believe that the origin of the compact village can be ascribed to any one people. In France it appears to be a very ancient feature evolved before the Frankish conquest. The article concludes with some contributions by other geographers to the discussion at Cairo.

**MIOCENE MOLLUSCA FROM JAMAICA.**—A fine volume on the Miocene Pelecypoda and Scaphopoda from Bowden, Jamaica, by W. P. Woodring, part of a series of reports dealing with the geology and palæontology of the West Indies, has been issued as one of the invaluable Publications (No. 366) of the Carnegie Institution of Washington. The work, save for some brief but adequate introductory remarks, is devoted to a systematic description of the species met with. These are estimated to amount to 185 species and subspecies of bivalves and 20 of scaphopods, of which some 85 are claimed to be new, while new sections and genera have also been founded. The accompanying illustrations are included in 28 plates, and are some of the finest we have had the pleasure to meet with. In the treatment of his subject the author has taken a most important step for a palæontologist, since he acknowledges the importance of following the International Rules of Zoological Nomenclature and points out that the "time-consuming task of attempting to discover what generic names should be used has no direct bearing on the history of the earth and therefore may seem like wasted time for a palæontologist. But if the significance of the genera composing a fauna is considered, and their rise, spread, and restriction are analysed, the uniform use of generic names is essential."

**MYCORRHIZA OF PINE AND SPRUCE.**—The relations of the fungus hyphæ of various species of Hymenomycete, including species of *Boletus*, *Cortinarius*, etc., to the roots of these forest trees have been very fully investigated by Elias Melin of Stockholm ("Untersuchung über die Bedeutung der Baummykorrhiza." Jena: Gustav Fischer, 1925, 7-50 marks). The fungi have been grown alone in pure culture, and seedlings of the conifers also raised in sterile culture, and their relation to the nutrient medium studied separately and when growing together. Melin concludes that whilst the trees can manage to assimilate inorganic or diffusible organic nitrogen (e.g. asparagin) readily, when the fungus is present they are able to utilise more freely complex organic nitrogen compounds. In this connexion he examines the fruit bodies of the fungi to obtain some light upon the digestive enzymes present in the fungi which may influence the utilisation of such nitrogen compounds. Melin has an interesting note on the effect of water-soluble "phosphatides," extracted from the conifer seeds by the methods of Hansteen Cranner, upon the growth of these fungi in culture. In quantities too small to permit of the result being due to their nutritive value, they excite a markedly catalytic action upon the rate of growth of fungi, which usually grow very slowly in the absence of the root system of the higher plant. Melin suggests these experiments may throw light on the relations of the fungi to the roots. In no case did he find evidence of fixation of atmospheric nitrogen, either by fungus or by fungus and host together.

**ATMOSPHERIC ELECTRICITY.**—The search for the cause of the potential gradient in the atmosphere has been stimulated by the theory of von Schweidler and Swann, and the September issue of *Terrestrial Magnetism and Atmospheric Electricity* contains a paper by Mr. C. H. Dwight on a search for rapid variations in the earth's electrostatic field. An insulated plate was suspended 8 metres above the roof of the laboratory and connected to one of the deflecting plates of a cathode ray oscillograph tube, the other plate of which was earthed. The two plates were shunted by a resistance of 12 megohms, which prevented secular accumulation of charge on the upper plate. The cathode rays were deflected by the field between the plates, and the light from the fluorescent spot they produced on the screen at the end of the tube was focussed on a revolving photographic film. The records show that there are no rapid variations of the electric field in the atmosphere except during actual lightning discharges.

**THE "HOLWAY" DIATHERMY APPARATUS.**—Messrs. Newton and Wright, Ltd., 471/3 Hornsey Road London, N.19, describe in a leaflet just issued the Holway diathermy apparatus, in which special attention has been paid to the spark gap. The spark gap consists of an aluminium chamber extensively ribbed on the outside, so that even with a large current it does not become unduly hot. This chamber is provided with an inlet and an outlet tap for gas dielectric, and can also be arranged for use with ether in cases where no gas supply is available. The actual gap comprises a large copper disc heavily silvered, bridging over the space between a pair of heavy copper electrodes, likewise silvered, so that the gap is in duplicate, an arrangement which conduces to a steady current, while affording means of convenient and delicate adjustment. The electrodes, which are mounted on thick mica diaphragms, are provided with radiation fins for cooling. There is no doubt that the surgical efficiency of some diathermy apparatus leaves much to be desired, and it is to be hoped that the design described will effect an improvement.

**HYDROGEN PEROXIDE.**—A solid hydrogen peroxide, sold under the registered name of "Hyperol," is described in *Chemistry and Industry* for November 20. Hyperol is a stable white crystalline compound of hydrogen peroxide and urea having the formula  $\text{CO}(\text{NH}_2)_2\text{H}_2\text{O}_2$ , and it contains 35 per cent. of hydrogen peroxide. The only impurity is a trace of citric acid which is not sufficient to affect methyl orange. It dissociates completely when dissolved in water or ether, and 1 gm. of "Hyperol" dissolved in 10 c.c. of water produces a 10-volumes strength solution of hydrogen peroxide.

**STRUCTURE OF MALEIC AND FUMARIC ACIDS.**—A description of an X-ray examination of maleic and fumaric acids carried out by K. Yardley appears in the September issue of the *Journal of the Chemical Society*. Preliminary investigation indicated that maleic acid has four molecules per unit cell, and from this it is shown that the planosymmetry given to the acid from chemical evidence does not exist in the crystalline state. A structure is suggested, and several projections of this on the planes of symmetry are given. On account of the poor nature of the crystals, the measurements with fumaric acid were more difficult; the minimum cell contains six molecules of fumaric acid. Further evidence shows that neither maleic nor fumaric acid has symmetry in the crystalline state.