

Research Items.

PREHISTORIC CULTURES OF SIBERIA.—While certain parts of Central Asia and Mongolia have recently attracted the attention of anthropologists and archaeologists, the neighbouring country of Siberia remains scarcely explored in this respect. This consideration induced the State Russian Museum (formerly the Museum of Alexander III.) in Leningrad to send a palæ-ethnological expedition to the Altai mountains during 1924-1925. The expedition, under the leadership of Prof. S. J. Rudenko, explored in a systematic way a very large part of the country, and the results of the numerous excavations made indicate that the cultural life of the country was very intensive. The earliest remnants found belong to the later phase of the stone age; the skeletons found were brightly painted with ochre. About twenty places, with remnants of the bronze age, have been explored, and numerous articles, ornaments, and implements found. Some rather more recent stone graves discovered on the River Tchulishman contained, amongst other things, ornaments plainly indicating some connexion between the Altai nomads of those days and the Byzantinian culture.

THE INDIANS OF HUAXTEC.—The recently published vol. 18 of the *Journal de la Société des Américanistes de Paris*, contains a study by Dr. Waltier Staub of the area known to the Aztecs as *Cuectlan* (Shores of the Salt Water), and to-day known as Huastec—land on the eastern side of the Mexican plateau, bordering on the steppe country of the north in which the culture of the nomad tribes contrasts with that of the settled agriculturists of the low-lying lands below. The special interest of this area from the ethnological point of view is that the inhabitants would appear to be an early offshoot of the Maya. At the time of their first settlement they would appear, judging from certain clay figures found in the alluvium of the Rio Panuco, to have been already acquainted with weaving and pottery-making. On the other hand, the absence of stone temples, of hieroglyphs, or any system of writing, indicates a fission before the Maya were acquainted with the calendar or had developed their system of writing. According to Lehmann and Sapper, the dialect which most closely resembles the Huastec of to-day is the Chicomucelotec of the frontier of Chiapas-Guatemala, their separation being due to an incursion of Totonacs and Olmecs towards the Atlantic coast. The geographical position of the Huastec country, borderings on the steppe lands, made it more suitable for hunting and fishing than agriculture, and it was thus left free from the intrusion of other peoples; while it was never occupied by the Aztecs, although it paid tribute to them. The inhabitants were thus able to preserve their culture and their language unaffected. The Huastecs of to-day are still extremely primitive, living in hamlets in bamboo circular huts, often without chairs or tables. They sleep on the ground and do not use the hammock. The principal deity of the pre-Columbian Huastecs was the earth goddess, and until recent years sculptured representations of her were frequently to be found on the hills, but of these many have now been removed for sale.

NEMATODE EGGS FROM SKIN AND GILLS OF SHARK.—G. A. MacCallum records (*Proc. U.S. Nat. Mus.*, Vol. 67, Art. 16, 1925) the occurrence of the eggs of a nematode, probably a species of *Capillaria*, on the under surface of the nose, in front of the mouth, of a large shark, *Carcharinus commersoni*, taken near Woods Hole. The dark brown, almost black, eggs

were laid in the groves between the scales and attached by transparent adhesive material. Similar eggs were found on the lighter coloured portions of the fins of another shark of the same species. In a later paper (vol. 70, Art. 6, 1926) the same author records eggs, tentatively referred to the genus *Capillaria*, on the gill arches of *Carcharinus milberti* at Woods Hole. These eggs are in patches, sometimes two inches long by half an inch wide, and the egg shell is spinous. In neither case were adult worms found which could have laid the eggs.

CREEPING ERUPTION IN AMERICA.—A short note in the *Official Record of the U.S. Dept. of Agriculture*, vol. 5, No. 43, Oct. 1926, summarises the recent work on creeping eruption in man by J. L. Kirby-Smith, W. E. Dove, and G. F. White (see *Arch. Dermatology*, 13, 1926, pp. 137-173). The eruption is caused by a nematode larva. During a further study, Messrs. Dove and White have recovered infective nematode larvæ from the fæces of the dog and the cat in a locality where there was a high incidence of creeping eruption. The larvæ were applied to the human skin and produced the characteristic symptoms and lesions. These larvæ have "in general the appearance of hookworm larvæ." In 26 out of 27 dogs from the streets of Jacksonville and in both of two cats, *Ancylostoma* were found and two species identified as *A. braziliense* and *A. caninum*. The authors state that further work is in progress. Creeping eruption occurs chiefly in the South Atlantic and Gulf States, but it has been reported so far north as New Jersey and inland so far north as Oklahoma. Damp sand in these areas has been observed to be a favourable environment for the parasite and a likely location for infection.

MEDUSÆ OF THE DANISH INGOLF-EXPEDITION.—Dr. P. L. Kramp, of the Copenhagen Zoological Museum, gives a most interesting account of the Anthomedusæ of the Danish Ingolf-Expedition (vol. v. 10, Medusæ, Part 2, Copenhagen, 1926). This work follows the same plan that was used in the Leptomedusæ (Kramp, 1919) of the same expedition, the main study being the horizontal and vertical distribution, seasonal occurrence and dependence on the various hydrographical conditions. Whilst keeping these points in view, however, the author is able to show a great deal that is new with regard to the comparative morphology of many of the species, especially of those belonging to the Codonidæ. Such points as the structure of the manubrium, morphology of the tentacles and their basal bulbs, and the abaxial spurs are dealt with in detail and show important features useful in classification. *Sarsia tubulosa*, that common and much-discussed species, or group of species, is fully investigated, the conclusion being that most of the closely related forms such as *S. decipiens*, *S. pulchella*, and *S. mirabilis* are merely local varieties. An interesting point is shown in the fact that the farther north it is found the more the time of occurrence of this medusa is delayed, the liberation from the hydroid taking place later in the colder regions. That the farther north we go the later the medusa is budded off seems to be a general principle for these northern forms. The author places *S. flammia* in the genus *Euphysa*, having found therein certain muscular bands which probably do not exist in *Sarsia*. *Corymorpha nana* is the hydroid of *Euphysa aurata*, the latter probably being a separate species from *E. mediterranea*. Interesting facts are noted amongst those proliferating medusæ *Lizzia blondina*, *Rathkea*

octopunctata, and *Hybocodon prolifer*. In the first species, apparently all the young specimens normally bud and later on each one becomes sexually mature, whereas in the other two the first budding generations probably never become sexually mature. The budding of *Rathkea* in one and the same area is dependent on the water temperature, being accelerated and ceasing earlier when the water is warm than when it is cold.

THE BIOLOGY OF THE SAW-TOOTHED GRAIN BEETLE.—In the *Journal of Agricultural Research*, vol. 33, No. 5, 1926, Messrs. E. A. Back and R. T. Cotton record a number of interesting observations on the biology of this cosmopolitan insect. Although it may occur in almost any stored food of vegetable origin, and has been known for more than 150 years, the life-cycle of *Oryzaecephalus surinamensis* Linn. has received but little attention from entomologists; even Redi in 1671 figured an insect which is very possibly this same species. Linné received specimens from Surinam, and for that reason gave it the specific name by which it is known. A remarkable fact brought to light by Messrs. Back and Cotton is the longevity exhibited by the adult beetle. Under laboratory conditions, male individuals lived more than two years, and one example survived for three years and three months. The females appear to be shorter lived; few lived longer than one year, but one example survived for two years and eight months, laying 216 eggs during that period. Under the most favourable weather conditions, the whole life-cycle may be passed through in 27 days. On the other hand, low temperature may prolong the period to 315 days. At Washington, D.C., there are four or five generations annually, but in the tropics there are doubtlessly more. It is interesting to note that a temperature of 0° to 5° F. for one day will kill all stages, and if the temperature be raised to 125° F. all stages succumb within an hour. A vacuum of 29 in., continued for seven hours, killed the adult insects.

THE LANDFALL OF COLUMBUS.—In a paper read before the Royal Geographical Society on Feb. 14, Lieut.-Commander R. T. Gould returns to the much-debated question of which island in the Bahama group Columbus first sighted. Since the original journal of Columbus is lost, the available evidence is circumstantial and indirect, and at best can indicate only the most probable island. At the outset Commander Gould dismisses, as unsupported by any evidence, the suggestion that volcanic disturbances or changes in sea-level may have altered the appearance and distribution of the islands since Columbus's voyages. The island which Columbus named San Salvador was clearly one of the Bahamas and has been variously identified with Cat, Grand Turk, Watling, Mariguana, and Samana Islands. Commander Gould discusses in turn the grounds for each identification in the light of the evidence available. This falls under several heads: (1) Courses and distances sailed by Columbus between his departure from Gomera in the Canaries and Guanahani, the native name of his landfall, for which the material is very scanty; (2) evidence from the small-scale chart of Cosa (1500) or the chart of Herrera (1601); (3) comparison of Columbus's description of Guanahani with the various likely islands as they exist to-day; (4) plotting on a modern chart the relative bearings and distances of the islands discovered by Columbus. The result of each line of researches leads Commander Gould to the same conclusion, that Columbus's landfall was Watling Island, now also known as San Salvador.

MINERAL DEPOSITS IN RUSSIA.—Results of current research in mineralogy in Russia are being published mainly by the Institute of Applied Mineralogy and

Metallurgy in Moscow, and by the Geological Committee of Leningrad. The Moscow Institute published during 1926 some ten papers of considerable practical and theoretical interest, including the results of original investigations on the chemistry of minerals by Ginsberg, and on kaolin and other deposits in the Urals. An outstanding work is that by V. A. Obrutchev on "Metallogenetic Periods and Regions of Siberia"; the author finds six separate metallogenetic periods in Siberia; Archean (numerous deposits of gold, and several of iron, silver, lead, and molybdenum); Eozoan (still more gold, some copper, iron, and tungsten); Caledonian (little gold; deposits of copper, silver, lead, zinc, and tungsten also not numerous); Hercynian (gold deposits rare, but those of polymetallic ores numerous; some tin, tungsten, and mercury); Tian-Shanian (polymetallic ores prevalent); nickel, platinum, copper ores); Meso-Neozoan (gold, copper, silver, lead, zinc, iron, bismuth). A geo-morphological survey of Siberia is given by the author and important bibliography appended. In the series of publications by the Leningrad Geological Committee there is an interesting report by A. D. Natsky on the sulphur deposits in the Karakum desert of Turkestan; M. M. Tetaiev gives a classification of Russian tungsten ores, and A. K. Meissner presents an almost monographic description of gold deposits of Russia.

DEVONIAN FLORA.—The most important contribution to Devonian palaeobotany since the discovery of the Rhynie fossils is described by Dr. Dukinfield Henry Scott in the *New Phytologist* (vol. 25, No. 5). The new specimens, which came from several localities near Elberfeld and belong to the lowest division of the upper Middle Devonian, have been investigated by Drs. Kräusel and Weyland (*Abhandlungen der Senckenbergischen Naturforschenden Gesellschaft*, Bd. 40, Heft 2, 1926). So far they have described the following five plants: *Asteroxylon elberfeldense* n.sp., *Aneurophyton germanicum* K. and W., *Hyenia elegans* n.sp., *Calamophyton primævum* n.gen. et sp., *Cladoxylon scoparium* n.sp. There is a far-reaching agreement between the Elberfeld and the Rhynie *Asteroxylon*. They differ, however, in the presence of pith in the German form, in the stellate form of stele, and in the occurrence of pitted tracheids. *Aneurophyton* was probably a tree with the habit of a tree-fern, and its frond structure may throw some light on the question of the origin of the fern-like frond. The chief point of interest in regard to *Hyenia elegans* is the presence of the fructification, previously unknown in the genus, and taking the form of loose spikes with numerous forked sporangiophores arranged on the axis. On account of the dichotomous branching, *H. elegans* and *Calamophyton primævum* are relegated to two distinct series of a new class, the Proto-articulatae, although, in view of the close agreement in the structures of their fructifications, there seems some reason for including them in one series. The last species, *Cladoxylon scoparium*, is an unexpected find in the Middle Devonian, and the external habit and the fructification, hitherto unknown, have now for the first time been revealed. "The discovery of this Middle Devonian species must reopen the disputed question of the Upper Devonian or Lower Carboniferous age of the Saalfeld *Cladoxylons*."

THE SPECTRUM OF ARGON.—A few years ago, F. Paschen succeeded in analysing the complicated line spectrum of neon. A similar analysis has now been effected for the 'red' spectrum of the next inert gas, argon. In two recent papers (*Zeits. f. Phys.*, 39, p. 172, and 40, p. 839) K. W. Meissner has shown

that this, too, can be derived from four sets of s -terms, ten of p -terms, and twelve of d -terms. Most of the wave-numbers are from his own measurements, but some lines observed by other workers in the ultra-violet fall into the same scheme. An interesting consequence has been pointed out by W. Grotrian (*idem*, 40, p. 10). The screening effect of the inner electrons for the X-ray $M_{21}M_{22}$ doublet in the heavy elements, in which the M shell of electrons is complete, is such as to reduce the effective nuclear charge by 8.5. Meissner's analysis shows that the screening constant is 7.3 for argon, where only the first eight electrons of the M shell are present; for the next element, chlorine, its value is 7.5.

STRUCTURE OF THE MOLECULE OF CARBON MONOXIDE.—Recently spectroscopists have been able to show, from the analysis of some carbon band spectra, that the outer electrons in an excited carbon monoxide molecule have energies which fall into a scheme very similar to that for an atom of the second group of the periodic table. This analogy has now been extended by F. L. Mohler and P. D. Foote (*Phys. Rev.*, 29, p. 141, 1927). By the 'partial current' method for measuring excitation potentials, the effect of inelastic collisions of an electron with gas molecules is shown by the change in the electron current to a collecting electrode as the energy of the electrons is varied. When such experiments are made with carbon monoxide and mercury vapour under comparable conditions, the current-voltage curves obtained exhibit an astonishing similarity. The form of the curves yields information about the relative probability of occurrence of the possible quantum transitions, and it is concluded that not only the energy levels, but also the movement of a valence electron from one to another of them, are alike in the respective molecules and atoms.

THE PYCNOSONDE.—A new instrument for measuring the specific gravity of sea water, invented by Dr. D. la Cour of the Danish Meteorological Institute, is described in the *Marine Observer* for March. It consists of a glass tube bent twice at right angles and fixed on a metal frame for protection. One branch of the tube is narrow and the other wide. The narrow end is open and the wide end is closed by a water-tight valve opening inwards. As the tube is lowered in the sea the increasing pressure slowly forces water in through both ends and the air is compressed in the upper part of the wide arm. When the instrument is hauled up the valve keeps closed as the pressure decreases, and the expanding air escapes by the narrow arm. When the surface is reached the wide arm contains a complete sample of the various waters through which the instrument has passed, arranged in the proper order. In the wide arm, before lowering, are arranged small coloured glass floats—pynodevils—of certain specific gravities. They assume positions in the column of water corresponding to certain definite values. Thus when the pycnosonde is brought out of the water the pynodevils have arranged themselves at different heights, and the depths to which these heights refer can be readily determined by a suitable scale. It has been found in practice that there is no appreciable mixing of the layers of water in the tube even when the temperature of the whole instrument is altered. It is claimed that in shallow water this instrument works well, and can be used from a moving vessel with the Kelvin sounding machine.

MICROMAGNETIC OSCILLATIONS AT ZOUY.—In *Terrestrial Magnetism* for September 1926, Arnold Pödder, of the Meteorological and Magnetic Observatory at Zouy (formerly Irkutsk), Russia, discusses

the micromagnetic oscillations observed there by sensitive magnetographs. Two very different types of these waves are found to exist; in one the vibrations continue very regularly for hours or even days, with well-defined periods of from 5 to 15 seconds. In the other type the vibrations, though less regular, have a pronounced periodical character, the periods being considerably longer, however, with an average value of about 35 seconds. A year's observations are discussed, relating to all three magnetic elements; the vertical force observations were made both by a balanced magnet and by a horizontal coil. In the short-period oscillations the intensity increases with the period (from about 0.5 γ for 5 seconds period to about 2.5 γ for 15 seconds period—the intensity being nearly the same in the horizontal and vertical components); 90 per cent. of these vibrations have periods between 7 seconds and 9 seconds. They occur particularly between midday and 7 P.M. local time, while at night the longer periods are more prominent. No hypothesis is advanced as to the cause of the vibrations, but certain similarities to microseismic waves are pointed out.

FORMATION OF AMMONIA IN THE SILENT DISCHARGE.—Warburg and Rump (*Zeit. für Phys.*, vol. 40, p. 557, 1926) have recently studied the formation of ammonia in the silent discharge and have compared the results with those obtained in the production of ozone by the same method. A mixture of nitrogen and hydrogen was passed so quickly through a Siemens' tube that the amount of ammonia formed was so small that any decomposition could be neglected. It was found that the ammonia was formed chiefly at the walls, whilst the ozone is formed chiefly in the interior of the discharge tube, probably because of the greater heat of dissociation of nitrogen and the catalytic action of the surface of the tube. Variation of pressure produced very much less effect in the case of the production of ammonia than in the case of ozone, presumably because the number of ionic collisions at the walls was very small compared to the number in the interior of the gas.

CHARACTERISATION OF GENUINE PROTEINS.—The Hugo Müller Lecture, which was delivered before the Chemical Society by Prof. S. P. L. Sørensen on Oct. 28, 1926, has been published in the *Society's Journal* for Dec. 1926, and it gives an account of some of the diverse problems which, at the present moment, occupy the attention of those engaged in a study of the composition of the proteins. These problems are of two kinds: the first deals with the nature of the simpler compounds from which the protein molecules are built up, while the second is concerned with their 'elementary' composition. The decomposition products which can be obtained by treating the proteins with acids, alkalis, or suitable enzymes, form the most important clue as to protein structures, and about twenty such substances are now known. It is considered that protein molecules consist of a number of loosely knit polypeptide complexes, and this view accounts for the remarkable properties that the proteins possess. With regard to their elementary composition, it is well known that all protein substances contain carbon, hydrogen, oxygen, and nitrogen, and most of them also small quantities of sulphur and phosphorus. Since the sulphur and phosphorus contents are small, it has been suggested that the sulphur- or phosphorus-containing compounds are only loosely associated with the protein molecules, and are not integral constituents of them. Careful fractionation has shown that this is true of the serum proteins, but the phosphorus in egg albumen appears to be intimately bound up with the rest of the molecular complex.