Research Items

Duration of Life in Prehistoric Man

DR. HENRI V. VALLOIS, in view of the fact that the age of the individual in the study of skeletal remains of prehistoric man has been treated as a matter of secondary importance, has endeavoured to arrive at a more precise statement of the facts on the recorded evidence and in the light of a personal examination of a number of the specimens (*L'Anthropologie*, **47**, 5–6). Of two criteria of age, the evidence of the teeth and the closure of the sutures of the cranium, the latter is taken as the more generally trustworthy and suitable for this purpose. The evidence is classified as Neanderthal, upper palæolithic and mesolithic. On the whole, the striking fact emerges that the life of fossil man was short. Of one hundred and eighty-seven subjects of determinable age, 55 per cent Neanderthal, 34·3 per cent upper palæolithic and 37 per cent mesolithic subjects died before reaching the age of twenty years; while of the remainder, the majority, 40 per cent Neanderthal, 53 per cent upper palæolithic and 58·5 mesolithic, died between twenty and forty years. Of the remaining sixteen, 5, 10·8, and 1·5 per cent respectively died between forty and fifty years, while only three survived the age of fifty years. Yet even these three had not attained true old age, as important sutures were still not closed. In addition to the numbers given above, there were thirty-one specimens for whom it was not possible to determine the exact age; but of these nineteen were not yet adult, and it is practically certain that the remaining twelve had not attained old age. These additional specimens bring the total up to 218. Notwithstanding defective evidence, there would appear to be a marked increase in the duration of life in the Bronze Age and among the Egyptians of the Roman period. In the fossil groups, man appears to have lived longer than woman. Especially below the age of forty is feminine mortality higher. As regards the cause of the early mortality, so far from civilization having shortened the natural span of life by 'dysharmonics' as Metchnikoff thought, it appears to have lengthened it.

Easter Island Inscriptions

DR. A. METRAUX, Bishop Museum fellow, figures and describes in *Man* of January two inscribed tablets and an inscribed fragment from Easter Island, now in the Bernice Pauahi Bishop Museum, Honolulu, which have not been recorded by those who have written previously on the subject of the Easter Island inscriptions. Sixteen authentic tablets deposited in various institutions are now known. Most of these have been described. When the Easter Island tablets were first discovered the islanders were perfectly willing to part with them; but the modern natives, realizing the interest taken in them by Europeans, have manufactured imitations. The tablet acquired by the British Museum in 1903 is probably modern in origin. The signs are poorly engraved and suggest the style of modern artists. Faked tablets were made in the island even prior to 1882, as witness a faked gorget in the Australian Museum. The two tablets of the Bishop Museum are in poor condition, the wood being partly rotted away. Signs appear on one side only, the other side being decayed. The best preserved specimen is twelve inches long, three and three-quarter inches wide and three-quarters of an inch thick. The signs are incized according to the best classical tradition. The symbols have been engraved with an obsidian or shark's tooth point. The signs form eleven rows; of the characters, one hundred and twenty are legible. The rows of signs are reversed alternately. The second tablet, twenty-seven and a half inches long, three and a quarter inches wide, and one inch thick, contains twenty-five unobliterated signs around a natural hole in the wood. A few years ago it was suggested by Mr. de Hevezy, a Hungarian linguist, that there were striking and incontrovertible parallels between the Easter Island script and the Indus Valley inscriptions from Mohenjo-daro and Harappa. It is now shown that the resemblances were due to inaccurate reproductions of both groups. The only resemblances are simple geometrical signs. The Hungarian author suggested that the Easter Island signs might be thousands of years old; but the largest tablet in existence in the Museum of Brain-Lecombe is carved on a European oar.

Effectiveness of Administered Hormones

THE preparation in pure form of the products of those endocrine glands which produce chronic effects in the body, has had the untoward result of making more difficult the experimental or therapeutic imitation of their actions. The hormones of the gonads, anterior pituitary and adrenal cortex and insulin appear to be utilized or eliminated soon after they enter the circulation, and in these circumstances their physiological effectiveness depends very largely on the method by which they are administered. Thus, a given dose of œstrone in aqueous solution is known to be more effective if given in a series of divided doses than when given in a single large dose; similarly, esterification of œstrone and of androsterone and testosterone has been found to increase their activity; but whether this increase in activity was due to delayed absorption or to slow hydrolysis after absorption was not clear. Drs. Deanesly and Parkes (*Proc. Roy. Soc.*, B, **124**, 279; 1937) have recently studied the variations in effectiveness of a large number of gynæcogenic and androgenic compounds brought about by different methods of administration, involving subdivision of the dose, the nature and volume of the solvent, the addition of fatty acid, esterification and mode of administration. It is clear that the increased effectiveness of the esters is due to delayed absorption from the site of injection, since they are no more effective than the free hormone, when both are given intravenously. The esters are most effective when given in such a form that they might be expected to crystallize out in the tissues, and this finding led the authors to investigate the effects of giving the hormone by subcutaneous implantation of crystals or compressed tablets. This method was found to be extremely effective. A further advantage of the method is that, at the end of the experimental period, the tablet can be removed and weighed, and a reasonably accurate determination made of the actual amount of hormone absorbed.

Control of the Bed-bug

THE common bed-bug, *Cimex lectularius*, has spread during recent years to an extent that probably about four million people in Greater London alone are, to some degree, troubled by this pest. Slum clearance campaigns have caused the demolition of many bug-infested quarters. Unfortunately, in many instances precautions were not taken to eradicate the bed-bugs before the families moved into their new homes. The result has been that new colonies of the insect have been founded and new areas, formerly free from the pest, have now become infested. Probably the chief means of dissemination is the carriage of bed-bugs in furniture and bedding, but there are many other methods of lesser importance. While bed-bugs do not transmit any actual disease in Great Britain, the constant irritation due to the injection of minute doses of the insects' saliva into the blood is likely to contribute largely to the ill-health of children and even sometimes of adults. The habits, behaviour and means of control of this insect are dealt with in a pamphlet on the subject, entitled "The Bed Bug" and issued by the British Museum (Natural History) as No. 5 of the Economic Series. This pamphlet, which is in its fourth edition (1937), is written by Mr. A. W. McKenny-Hughes, assistant keeper in the Department of Entomology. It is obtainable either from the Museum or through booksellers, price 6*d*.

Genitalia of Hymenopterous Insects

THE attention of students of insect morphology is directed to a paper by Mr. O. Peck (*Canadian J. Res.*, **15***D*, 221; 1937) which embodies an illustrated account of the structure and supposed homologies of the male genitalia in the Hymenoptera. Four main components are distinguishable in these organs. (1) An annular basal gonocardo which bears a pair of claspers (2), and each of these latter carries an inner clasper or volsella (3). A median organ or ædeagus (4) with a pair of lateral parameres or sagittæ are supported by the claspers and volsellæ. The true homologies of these parts are very uncertain and have not as yet been definitely established. The remainder of the paper is devoted to a detailed study of the male genitalia of the Ichneumonidæ in particular. This account is to be completed in a later issue of the *Journal*.

Anatomy of Protobranchs

PROF. HAROLD HEATH in his paper "The Anatomy of some Protobranch Mollusks" (Mémoires du Musée royal d'Histoire Naturelle de Belgique, deuxième série, fasc. 10, 1937) shows several important points in connexion with the comparative study of various species belonging to six genera obtained from both Atlantic and Pacific coasts: *Nucula* (10 species), *Acilia* (4 species), *Yoldia* (8 species), *Yoldiella* (2 species), *Malletia* (one species), *Leda* (6 species). It is shown that the muscular system in all is very similar, the pedal muscles especially being complicated. It is interesting that differences exist between the specimens of *Yoldia thraciæformis* from the Atlantic and Pacific, the western representatives being considerably smaller than the eastern, yet all are sexually mature, and the larger individuals possess certain small muscles in the vicinity of the anterior adductor which are apparently not present in the smaller form. In studying the digestive system, the author finds that the simplest types of intestine occur in *Nucula* and *Acila* from shallow water, between 5 and 125 fathoms, whilst in the deeper water species of *Nucula* it is much more complicated. However, *Yoldia*, *Yoldiella*, *Malletia* and *Leda* possess intestines of the same relative length and with the same arrangement in species from all depths ranging from 11 to 1569 fathoms. There thus appears to be in *Nucula* a correlation between length of intestine and depth; but it is carefully stated that too few specimens have been examined as yet to be quite sure of the fact. "If such be the case it may be that nutritive material diminishes according to depth and that complete digestion and absorption of food demands correspondingly elongated intestines".

Vitamin C in the Potato

FOLLOWING the publication by Ijdo of work on the vitamin C content of different varieties of potato (cf. NATURE, **140**, 977–78; 1937), A. M. Smith and W. Y. Paterson record in the *Biochemical Journal* (**31**, 1992–9; 1937) results which confirm and extend those of the Dutch investigator. These authors examined a large number of tubers, from the 1935, 1936 and 1937 crops, for ascorbic acid, using the usual method of extraction with trichloroacetic acid and titration with 2 : 6-dichlorophenol-indophenol, and also a modification of it suitable for rapid routine testing. They found that the vitamin C content varied with the variety of potato and with the time and temperature of storage, but was independent of size and weight of tuber, of environment, including soil conditions and manuring, and possibly season. They also discovered that the content was significantly higher in tubers suffering from mosaic disease or leaf-roll. Therefore, determination of ascorbic acid in potatoes affords not only a method of identifying variety, but also of testing the presence of virus disease, under uniform storage conditions. The test should assist growers in selecting stock seed for the next season's crop.

A Criticism of Warnstorf's "Sphagnologia Universalis"

As the result of a visit to the Warnstorf Herbarium at Berlin-Dahlem, A. le Roy Andrews expresses his opinion that the Warnstorf "Sphagnologia Universalis" is "inflationary" and needs drastic revision (*Ann. Bryologici*, **9**, 1936. Leyden. British agents, Dawson, London). As a new and simplified classification Andrews suggests that the two main sections (termed sub-genera by Andrews) *Inophlœa* (*Cymbifolia*) and *Litophlœa* (the other groups), which date back to Russow, still stand, but the sub-sections of these according to Warnstorf appear to be of unequal rank. Andrews separates *Rigida* under Müller's name Section *Malacosphagnum* from the remaining groups which fall under Section *Acisphagnum*. As a result of careful comparison, it is also suggested that Warnstorf's eight groups of *Litophlœa* (exclusive of *Rigida*) may justifiably be reduced to three: A. Series *Squarrosa*, B. *Cuspidata* (including *Subsecundum*, which appears to have no fundamental distinction from *Cuspidata*) and C. *Acutifolia*. This classification is based on the usual characters of leaf section, pores, etc., in conjunction with certain features of specialized stem leaves and perichætial leaves. Andrews points out that the presence or absence of fibrils needs to be used with caution, as also the degree of exposure of chlorophyll cells; the latter, as shown by Russow, have equal exposure at both surfaces in initial stages and only reach unequal

exposure during subsequent development. In Warnstorf's "Sphagnologia" 342 *Sphagnum* species are described and to these subsequent additions have been made. Andrews doubts that any really critical student could confirm at most more than a 100 good species.

Antirrhinum Rust

A SEVERE infection of antirrhinum plants in 1934 by the rust fungus *Puccinia antirrhini* stimulated the prosecution of much intensive research on the disease by D. E. Green, mycologist to the Royal Horticultural Society. The text of a lecture which reviewed these investigations is now published in the Society's *Journal* (62, Pt. 12, pp. 530–537, Dec. 1937). Antirrhinums in Canada, California and Bermuda have been attacked very severely by the fungus for a decade or more, but the disease had not been reported from Europe prior to 1933. Uredospores are produced, and also teleutospores, which, however, have not been found to re-infect snapdragon plants. The method of overwintering is still a problem, but the most obvious means would appear to be persistence of the fungus in perennating antirrhinum plants in frost-free localities. Uredospores appear thereon in the following summer, and infect other plants. Spraying is an exorbitant and economically ineffective control, but Mr. Green's lecture ended with an account of progress with rust-resistant snapdragons. Some American strains can claim 70–90 per cent resistance, largely at the expense of their horticultural beauty, but the results of work in 1937 at the Society's gardens at Wisley show that a number of more attractive strains obtained by crossing have achieved 50–75 per cent resistance.

Leaf Diseases of *Narcissus*

DR. P. H. GREGORY has collected information upon diseases of *Narcissus* leaves, in the Royal Horticultural Society's Daffodil Year-book for 1937. *Narcissus* leaf scorch is caused by the fungus *Stagonospora Curtisii*; white mould results from the activities of *Ramularia Vallisumbrosæ*, whilst a grey mould is induced by *Botrytis narcissicola*. *B. polyblastis* is responsible for the condition known as 'fire'. *Narcissus* 'stripe' is probably caused by a virus. Symptoms, life-histories and control are described from a horticultural aspect, and the paper should prove a useful review for the practical grower.

New Zealand Earthquake of June 17, 1929

MR. J. HENDERSON, the director of the New Zealand Geological Survey, has written a detailed report on this earthquake (*N.Z. J. Sci. and Tech.*, 19, 65–144; 1937). Its origin lay near Murchison along a fault directed a few degrees east of north. During the earthquake, the crust on the east side rose over a length of about five miles, especially where the fault crosses the Buller River. A few years before, bench-marks were laid along the railway line of the district. They were re-observed in August 1929, and again in March July, 1930. The first measurements showed that, to the west of the fault, there was an uplift of 5 ft., dying out within one quarter of a mile. At the fault itself, the uplift of the east side was 14 ft. 9 in., rising to 16 ft. in about a mile, and decreasing irregularly to zero at a distance of about 15 miles. The interval between the two surveys was marked by a general settling of the crust in four blocks. In that nearest the fault, about one mile wide, the changes were small. The next, about three miles across, was uplifted, at one point by 3 ft. 3 in. In the third, five miles wide, the crust sank uniformly by about 18 in.; while, in the fourth, of slightly less width, the subsidence decreased from about 17 in. to zero. The only evidence of horizontal displacement was provided by shifts in the railroad near the fault. Three points on the west side were moved about 4 in. west; while, on the east side, the average movements of five points were 9 ft. 5 in. north and 7 ft. 10 in. west. The terminal stations on the west side, distant 242 yards, are now nearly 6 in. farther apart, while those on the east side, distant 594 yards, are now nearer by 27 in.

Crystal Structure of Uranium

THE X-ray powder diagrams of uranium found by C. W. Jacob and B. E. Warren (*J. Amer. Chem. Soc.*, 59, 2588; 1937) indicate that the structure can be considered as a deformed hexagonal close-packed structure with four neighbours closer than the other eight. From its position in the periodic table, it might be suspected that uranium would have the body-centred cubic structure of chromium, molybdenum and tungsten, but this is not the case. It is also found that the densities of chromium, molybdenum and tungsten, when plotted against the atomic numbers, fall on a smooth curve, whilst uranium is off the curve. The structure of uranium is quite different from that of any other element. The only element which is in the same column of the periodic table and shows any relationship to uranium is neodymium, which crystallizes in the close-packed hexagonal system. The structure of uranium is essentially that of a pseudo-metal such as antimony or gallium. The four closest neighbours in the crystal structure indicate a tendency to form four covalent bonds.

Compensation of Spherical Aberration in Telescopes

C. R. BURCH has recently published a paper (*J. Brit. Astro. Assoc.*, 48, 3, January 1938) in which he describes his experiments with an under-corrected Newtonian telescope, of aperture 9½ in. He cancelled the spherical aberration by means of a compensating plate—a "pseudo-plane-parallel" glass plate having spherically aberrant surfaces, placed at a suitable distance in front of the eyepiece. When this compensator was in its best position, stellar images at focus appeared appreciably smaller and lunar detail appeared sharper. While Mr. Burch does not suggest that compensators should be used for imperfectly figured mirrors, nevertheless as compensators of the low power required are easy to figure, they might prove extremely useful. During the discussion, Mr. F. J. Hargreaves suggested that a compensator mounted in a tube with rack and pinion might be utilized to allow for changes in spherical correction occurring during observing. Capt. M. A. Ainslie remarked that he had once utilized the spherical aberration of an ordinary biconcave lens, mounted a few inches in front of the eyepiece, to compensate for under correction, the spherical aberration of the lens being opposite to that of the mirror. Those who use reflectors should read the paper and also the account of the proceedings of the meeting. They will derive a considerable amount of useful information on methods for dealing with under-corrections.