

Research Items.

BONE HARPOONS DISCOVERED IN YORKSHIRE.—In 1922 Mr. A. Leslie Armstrong described in *Man* two bone harpoons said to have been found at Hornsea, West Yorkshire. At the Hull meeting of the British Association the harpoons were again exhibited, and Mr. Sheppard, curator of the Hull Museum, questioned their authenticity on various grounds. The matter having been brought to the notice of the Council of the Royal Anthropological Institute, a committee, consisting of Sir C. H. Read, Dr. A. Smith Woodward, and Prof. Percy F. Kendall, was appointed to investigate the matter. The report of the committee is published in the April issue of *Man*. The members report that there is no evidence in the objects themselves that is conclusively against their genuineness: that the similarity of the barbs in the two examples, though found 4 miles apart, points to the conclusion that they are the work of the same individual. "It is worthy of remark that at the time the earlier find was made there was no available example of a Maglemose harpoon." "Mr. Sheppard appears to have had strong grounds for doubting the authenticity of the harpoons, but the evidence on which his judgment is based is no longer verifiable."

BABY CLINIC STATISTICS.—No. X. of the "Studies in National Deterioration" (Cambridge University Press, 15s.), forming a subsection of the series of Drapers' Company Research Memoirs, is a thorough analysis of data provided by a baby-clinic in a large manufacturing town, carried out by Miss M. N. Karn and Prof. Karl Pearson. The authors have made very full use of the method of correlation and reach various conclusions of interest and practical importance. Two of these may be noted. The first is that there is a considerable if not very large (0.37-0.43) correlation between the health of an infant at birth and at the end of the first year, a result compatible with general biological considerations, incompatible with the catch word "all babies are born healthy." The second is that although the use of a baby "comforter" is associated with ill health over the full period of observation, the correlation is almost doubled when the health of babies under 14 days old is correlated with use of a comforter. The most plausible interpretation is that the delicate babies are preferentially supplied with comforters rather than that the comforter itself is an important cause of ill health. Those readers who are not versed in the correlational calculus will find the numerous diagrams helpful.

BOTANY IN INDIA.—The report for 1921-22 of Lieut.-Col. A. T. Gage, the director of the Botanical Survey of India, directs special attention to the appearance of Parts I. and II. of the "Botany of Bihar and Orissa," by Mr. H. H. Haines. These two parts contain the description of 76 families, from the Ranunculaceæ to Cornaceæ. Part IV. of the "Flora of the Presidency of Madras," by Mr. J. S. Gamble, has also appeared, containing the families Rubiaceæ to Ebenaceæ. The most interesting economic development in progress appears to be the promotion of cinchona planting in Southern Burma under the superintendence of Mr. P. T. Russell. Cinchona seedlings were planted out in May 1921, on a site near the Heinze river at an elevation of 1700 feet. Unfortunately this situation proved to be apparently "the point of impact of the very arrow head of the monsoon"; during June, July and August more than 240 inches of rain fell and more than half the seedlings succumbed. The survivors have since

been growing very well, but it is proposed to recommence operations farther south in the Tenasserim Division of Burma, where the rainfall is both less in amount and more evenly distributed over the year. The cultivation of Ipecacuanha has apparently commenced very successfully on an experimental scale in Southern Burma, the temperature being more equable in this climate than in the Eastern Himalayas where this plant is grown.

GENETICS AND THE HISTORY OF WHEAT.—The Maine Agricultural Experiment Station continues to be prolific in genetic results, the chief contribution being from Drs. Karl Sax and John W. Gowen. In an important paper on sterility in wheat hybrids (*Genetics*, vol. 7, p. 513), Dr. Sax continues his work, in which it is shown that the three groups of wheat species, namely, the Einkorn, Emmer, and Vulgare groups, have respectively 7, 14, and 21 chromosomes as their haploid numbers. He has now investigated the chromosome behaviour in various hybrids between these different groups and finds conditions very similar to those obtained by Rosenberg, Gates, and others in similar hybrids. In crosses between members of the first two groups there are, for example, 7 bivalent and 7 single chromosomes, the latter separating at random when the former split. The origin of the tetraploid and hexaploid conditions in wheat is also discussed. Prof. Percival has shown that all three of the groups of wheat can be traced back to prehistoric times, Einkorn being grown in Central Europe in Neolithic times, Emmer and Vulgare also being prehistoric in Europe, and the former dating back to 5400 B.C. in Egypt. All the groups are therefore of sufficient age for a considerable evolution to have taken place within them. The higher numbers of chromosomes appear to have arisen by duplication of the original set of 7 pairs. This would mean also duplicating the hereditary factors present. Now in wheat, 14 different characters are known to be dependent on one factor, 4 depend on two factors, while only the red grain colour is represented by three independent factors. Hence it would appear that in the polyploid wheats most of these factors had arisen as mutations after the origin of the tetraploid and hexaploid conditions. Prof. Percival considers that the Vulgare (hexaploid) group arose as a hybrid between *Triticum aegilops* and a member of the Emmer (tetraploid) group. The study of the chromosomes is clearly of the greatest importance in tracing the history of our cultivated crops. The species of *Avena* (oats) show a similar series of chromosome numbers. Polyploid wheat hybrids produce small or wrinkled seeds. The endosperm in a cross between tetraploid and hexaploid forms may contain $14 \times 2 + 21 (= 49)$ chromosomes or $21 \times 2 + 14 (= 56)$ chromosomes according to which is the male parent, as the female parent contributes two nuclei. These unbalanced conditions result in abnormal development of endosperm.

INFECTION AND CYTOLOGICAL STUDIES OF PLASMO-PARA.—In the Journal of the College of Agriculture, Hokkaido University, Sapporo, Japan, Vol. XI., Part 3, Makoto Nishimura gives a description of the methods of infection and of fertilisation of *Plasmopara Halstedii* Farlow, parasitic upon *Helianthus annuus* and other Composites in America. Although published in Japan this work was carried out at Columbia University under the guidance of Prof. R. A. Harper. The most striking feature of the infection experiments is the demonstration of zoospore infection through the roots, the zoospores apparently penetrating the middle lamellæ in the absorptive region of the root.

Oospores were freely formed by the fungus, especially in the roots of the host, but also in stem and leaf, and fertilisation was studied in properly fixed and microtomed material. An interesting description is given of a large "receptive pupilla" of the oosphere which protrudes into the antheridial cell at first, in a manner that recalls Murphy's description of fertilisation in *Pythium erythroseptica*. Afterwards this protrusion is withdrawn and apparently its retraction conducts the fertilisation tube from the antheridium into the centre of the oosphere. One nucleus is discharged through this tube into the oosphere from the antheridium.

UNITED STATES GEODETIC SURVEY.—The annual report of the United States Coast and Geodetic Survey for 1922 contains a long record of work accomplished during the year. Hydrographic surveys were carried out principally in the approaches to Chesapeake Bay, off northern California, in the waters of south-east Alaska, and the Philippine Islands. New charts, to the number of 27, were published to cover all areas for which adequate data were available. In some areas, principally Alaskan waters, the production of new charts is delayed until the primary triangulation is completed. The aerial survey of the Mississippi delta was finished and promises such favourable results that an extension of this means of coastal survey is projected. Outstanding features of the geodetic work of the Survey were the completion of the 1600-mile arc from Huntsville in Alabama to Williams in Arizona by way of Memphis and Albuquerque. This arc furnishes accurate positions in seven states and crosses an area badly in need of horizontal control. Work was continued on several other arcs, including one from Dixon Entrance to White Pass, Alaska, which is part of a long arc from Puget Sound, in which the Canadian Geodetic Survey is co-operating. Good progress was made in precise triangulation in Alaska. The Survey is co-operating with a committee of scientific workers in making an intensive study of earthquake phenomena. Magnetic work and tidal observations were extended during the year. The director points out the need for investigations on the Atlantic coast and particularly for the exploration of the Gulf Stream. He urges also that oceanographical work should be undertaken in the Atlantic outside the 100-fathom line and in the Pacific beyond the 1000-fathom contour. Lastly, he emphasises the amount of wire-drag work that must be done along the coasts in the interests of navigation.

THE CRUMPLING AND RIFTING OF EARTH-BLOCKS.—Otto Baschin, of Berlin, in *Die Naturwissenschaften* for February 9, directs attention to what he believes to be a hitherto unnoticed factor in the tectonics of the earth's crust. He starts by the admission of considerable vertical movements of elevation and subsidence in the crust, and these are probably of an order that Wegener's hypothesis rejects. Baschin urges that a rising earth-block, as it comes into a region with greater rotational velocity than that in which it previously lay, becomes a retarding influence in its new surroundings, and in consequence exerts a pressure towards the west. Similarly, a sinking block is an accelerating factor and exerts a pressure to the east. If a continental block sinks on the east side of a line running north and south, and rises on the west, rifting may occur along the line; if it rises on the east and sinks on the west, compression and axial folding are set up. Other cases are of course considered, and the drifting of blocks towards the equator (*Polflucht*) is discussed.

THE LARAMIE PROBLEM OF THE ROCKY MOUNTAIN.—The coal-bearing beds of the Rocky Mountain region have now been the subject of a considerable literature, and in Professional Paper 130 of the U.S. Geological Survey (Washington 1922), F. H. Knowlton presents a useful review of the progress of what is known as the "Laramie problem." In 1875 this problem led Cope to the conclusion that there was no alternative but to assume the possibility "that a Tertiary flora was contemporaneous with a Cretaceous fauna, establishing an uninterrupted succession of life across what is generally regarded as one of the greatest breaks in geologic time." The term Laramie itself arose out of the need for a non-committal term for beds regarded by Clarence King, then at work upon the exploration of the fortieth Parallel, and by F. V. Hayden, busy with the survey of Northern Colorado, as certainly conformable, although it was regarded by King as Tertiary and by Hayden as Cretaceous. Knowlton, having shown that the work of Lee and himself makes clear the existence of an unconformity in the midst of the coal-bearing so-called Laramie rocks of Colorado and New Mexico, points out that when their flora is studied in detail the strata below the unconformity are Cretaceous, and those above Eocene. This work, based upon a long study of all the main collections of plants from these strata, has been in progress since 1889, its publication being delayed until its author was clear that the long-standing problem was definitely in process of settlement. The flora so carefully studied is not in itself extensive, and the preservation of the plant impressions in the soft friable sandstone is far from perfect. The specimens are very fully described, and are figured in 28 plates, some pen drawings, and photographs.

OSAGE OILFIELD, WYOMING.—The Osage Oilfield, Weston County, Wyoming, was developed as the result of the chance striking of oil on land adjacent to the Chicago, Burlington, and Quincy Railroad in 1919, and there sprang into existence, within a year after this discovery, a town having a population of more than 1500 persons, possessing well-built roads and buildings in addition to the usual field equipment in connexion with the production of petroleum and its products. During the same period more than 200 wells were drilled, pipe-lines were laid, and a refinery with a capacity of 500 barrels of oil per day was established. According to investigations by A. J. Collier, published as a bulletin of the United States Geological Survey (No. 736-D), in 1921 the Osage field had an average daily output of 550 barrels of oil; several gas wells were giving collectively 500,000-1,000,000 cubic feet of gas per day, and some eight or nine *flowing* wells yielded a good supply of water (a characteristic feature of this part of the State). Production of oil was maintained during that year from about 100 good wells. Stratigraphically the rocks belong essentially to the Cretaceous system and are of typical Rocky Mountain region facies. The Colorado group, containing the Newcastle sandstone, is the important series of deposits from the point of view of petroleum production. Structurally the field is related to the Black Hills uplift lying to the N.E., and the general dip of the rocks is to the S.W., at about 5° where normal. Minor corrugations in what is otherwise a simple monoclinical structure determine the presence of local anticlines and of the oil. The oil-pools are formed by moderately porous sandstones (about 19 per cent. average porosity) occurring as lenses within the shale formations, and the oil itself is of a light olive-green colour, low specific gravity, and high petrol content.