

Research Items

Recent Cave Exploration in Britain

At the recent Norwich meeting of the British Association, reports of two committees of Section H (Anthropology) dealt with explorations of caves in Britain which have been subsidised by the Association. Of these, the report on the work carried out in Kent's Cavern, Torquay, indicates that during the past year a stage of excavation has been reached which promises well for future results, though at an enhanced expense. The work of the past year, which was resumed in October, 1934, and continued until the end of May, 1935, was directed to the centre of the Vestibule at the north entrance, which has been the scene of operations of the last three seasons. It proved most remunerative in the quantity and size of the animal relics, among them being the tibia of an Irish elk, believed to be the largest ever found in the cave, a very long rib of a rhinoceros, a well preserved tooth of a mammoth, and the whole of the incisors of a horse. These bones were remarkably free from the gnawing of carnivores. Probably they had dropped between the interstices of the large fragments of rock, with which the floor had then been covered, and thus escaped the further attention of the hyenas by which they had been brought to the cave. In the Creswell Caves of Derbyshire, which have now been under exploration by Mr. A. Leslie Armstrong on behalf of the Association Committee for some years, a section showing the stratification of the deposits in the cave has been prepared for permanent preservation. It is announced that application has been made to the Office of Works for the cave to be preserved and maintained as an ancient monument. In the meantime, Mr. Armstrong has begun work on the deposits at the entrance of the cave, with the view of penetrating to the two Mousterian levels underlying the superficial levels which were all that were examined by the Rev. Magins Mello in 1875. Valuable additions have been made to the fauna and artefacts from Mother Grundy's Parlour. It is now proposed to excavate the Boat House Cave.

Influence of Illumination on Work-Efficiency

A JOINT report of the Industrial Health Research Board and the Illumination Research Committee gives the result of an investigation by H. C. Weston into the relation between illumination and efficiency in work (H.M. Stationery Office, 1935. 4d. net). This report describes the first experiment, and deals with the illumination necessary for different sizes of work. Eighteen men were given sheets of paper on which were printed rows of incomplete circles. The gap in each circle pointed a different way, and each of the several sheets had different sized circles and gaps. The men had to cancel the circles in which the gap pointed a certain way. The same tests were given in six different degrees of illumination. Conditions were controlled so that there was no chance of memorising, no violent change in illumination, the minimum fatigue, and full allowance for individual variations. The results were judged according to the speed and accuracy of the subjects' discrimination alone. They show that although the smallest size

could never be seen as easily as the largest, the right illumination obtained the maximum performance for each size. A change in size among the smaller and the larger sizes necessitated less alteration in illumination than a change among the intermediate ones. The range of illumination found necessary in the test is easily obtainable in practice.

Adaptation in *Artemia salina*

THE report submitted to Section D at the Norwich meeting of the British Association by the Committee, of which Prof. R. A. Fisher was chairman and Dr. F. Gross secretary, appointed to investigate the progressive adaptation to new conditions in *Artemia salina* (diploid and octoploid, parthenogenetic and bisexual), describes some highly suggestive experiments. Treatment of different races of *Artemia salina* with sodium arsenite showed a considerable difference in susceptibility between the diploid bisexual and the octoploid parthenogenetic forms. Of the latter, several lines showed 100 per cent survival of nauplii, when tested for twenty-four hours at the age of 1-4 days with 0.6 per cent of an N/10 solution of sodium arsenite, whereas in the bisexual races even the 50 per cent point of survival lies well under 0.5 per cent poison. In the bisexual races, parallel families showed consistently different degrees of resistance, although, as shown in the report, there were irregularities in the response of different broods of the same parentage, the cause of which has not yet been established. As regards the question whether there was any increase in resistance due to treatment and selection, comparisons were made which indicate in both a parthenogenetic line and in bisexual strains, a higher percentage of surviving nauplii after one and two generations treatment. "In both cases it is difficult to avoid the conclusion that the strength of poison needed to produce a given death-rate has been increased by at least 10 per cent., and probably more for the bisexual material."

Crabs from the Dutch East Indies

DR. ISABELLA GORDON has described in detail a collection of crabs from the Dutch East Indies ("Résultats Scientifiques du Voyage aux Indes Orientales Néerlandaises de LL.AA.RR. le Prince et la Princesse Léopold de Belgique". *Mémoires du Musée royal d'histoire naturelle de Belgique*. Hors Série, 3, Fasc. 15. 1934. Crustacea Brachyura). The material includes several uncommon and interesting forms. The genus *Phymodius* is revised and *P. monticulosus* separated from *P. unguatus* as a distinct species. The sub-family *Eumedoninae* in the family *Parthenopidae*, and the genus *Xenocarcinus* are also revised. The text-figures in this work are good and, especially in the drawings of the male pleopods, show an extraordinary amount of different types. These male pleopods in many genera are found to be of much specific importance and are a valuable diagnostic character, differing as they do very appreciably in those forms in which they are used for systematic work. Further reports in the same series recently published include the Rhizocephala and the Stomatopod larvæ.

After-Ripening and Germination of Rose Seeds

THE propagation of garden roses by budding good varieties upon stocks raised from seed is likely to find extensive application in the near future. Rose seeds are, however, rather difficult to germinate, but a paper by Dr. M. A. H. Tincker (*Roy. Hort. Soc. J.*, 60, Pt. 9, Sept. 1935) shows that suitable storage conditions before planting will render propagation from seed much easier. Achenes from the rose hips should be scattered in layers in damp sand within a plant pot which is then sunk in ashes in the open. This process is known as 'stratification', and if the seeds remain under these conditions from early November to the beginning of March, subsequent germination is hastened considerably. The paper reports a number of trials of unsuitable methods, the results of which are, nevertheless, illuminating. Storage at low or cool temperatures, for example, did not hasten germination; the seeds apparently require fluctuations in temperature and moisture content such as are provided by stratification.

A Virus Disease of Wallflowers and Stocks

GARDENERS are now familiar with the pathological condition of the tulip known as 'breaking', and it is interesting to note that wallflowers and stocks are subject to a similar malady ("Colour Changes in Wallflowers and Stocks" by Dr. Kenneth Smith, *Gard. Chron.*, 112, Aug. 10, 1935). The cause of the trouble is a virus disease of cauliflower and broccoli. This produces a mottling of diffuse yellow patches on the leaves, and such plants serve as sources of infection for wallflowers and stocks, the aphid *Myzus persicae* being the transmitting agent. The last-mentioned floral crops have mottling of the leaves, but their flowers are also streaked with white or yellow—a most conspicuous and bizarre effect. Control measures are routine spraying of young plants with a wash to kill the aphids, the destruction of any infected plants, and the separation of the culinary members of the Cruciferae from the beds with wallflowers and stocks.

Nevada Earthquake of 1934

EARTHQUAKES of moderate intensity are very rarely accompanied by superficial fault-displacements, and thus the account given by Messrs. E. Callaghan and V. P. Gianella of the earthquake of January 30, 1934, in the Excelsior Mountains, is of much interest (*Bull. Amer. Seis. Soc.*, 25, 161; 1935). The shock was of intensity 8 or 9 (modified Mercalli scale) and its epicentre lay in about lat. 38.2° N., long. 118.6° W. Numerous faults traverse the mountain area, and, along one of them on the southern slope and directed N. 66° E., a rupture occurred, about 4,500 ft. in length, with a scarp 5 in. in maximum height, showing that the summit area of the range had subsided with reference to the southern side.

Wind Records in Open Sea

"WIND Records from the Bell Rock Lighthouse", by A. H. R. Goldie, is the title of Geophysical Memoir No. 63 of the Meteorological Office (H.M. Stationery Office. 2s. 6d.). A Dines anemograph was erected at the Bell Rock in 1929, fourteen feet above the dome of the lighthouse, and 130 ft. above the mean level of the sea; the position, twelve miles from that part of the east coast of Scotland in the neighbourhood of Arbroath, is unique for its representation of open-sea

conditions. Nevertheless, the detailed analysis of records obtained in the first two years during which the instrument was working, and their comparison with similar records obtained on the very exposed island of Tiree, suggest that the Scottish mainland is not without its influence on the structure of the wind, even at that distance. The absence for a great distance in all directions of any objects except the sea waves that might cause gustiness by mechanical friction leads one to expect low figures for the 'gustiness'—defined as the difference between the average wind speed in gusts and in lulls divided by the mean speed. The analysis showed that gustiness is greater in winter than in summer, an effect attributed by the author to the greater lapse-rate of temperature in winter. The memoir contains a section dealing with wind waves and squalls which is of particular interest in view of the work done at Cardington on the cell structure of squalls. There appears to be very strong evidence that wave-like fluctuations of wind speed at Bell Rock are nearly always associated with marked horizontal stratification of the atmosphere, while squalls of the type where the wind speed increases very suddenly with a veer of direction and falls off gradually (a feature of the convexional cells found at Cardington) are associated with a steep lapse-rate of temperature.

A Device for Stream Field Study

IN a paper communicated by the Structural Research Laboratory of the Royal Technical College, Copenhagen (*Ingeniørvidenskabelige Skrifter. A, Na. 39: A New Device for Direct Stream Field Studies and its Application: with an Appendix on the Pressure Distribution on a Triangular Prism.* By Paul Neményi. Pp. 23. Copenhagen: G. E. C. Gad. 3.00 kr.), Paul Neményi describes a new device which he has designed for stream field studies, and gives details of its application to the determination of wind pressures on buildings. Recent investigations have shown that with small roof slopes there is a partial vacuum on the windward side, and that when the slope becomes steeper this condition changes somewhat abruptly to pressure. The results obtained from experiments made in the Ahlborn Channel being to an unknown extent influenced by capillary phenomena, it was thought desirable to check and correct these by constructing a closed channel with measuring arrangements to give the direction of the stream, the total velocity pressure and the static pressure. The wind channel is horizontal, and across it is placed a horizontal tube having an almond-shaped section with a single hole in the symmetry axis of the central section. This tube can be raised from bottom to top of the wind channel, and can also be turned through any angle so that the pressure and its direction can be taken at any height in the central plane of the channel. The paper provides an illustration and description of the channel and measuring apparatus, and proceeds to describe a number of typical experiments made on models representing solid and perforated walls and buildings, and on a triangular prism. Diagrams show the pressure distributions obtained in these experiments both in the form of contour maps and cross-sections for various directions of the wind relative to the surfaces. These diagrams exhibit very clearly the surprisingly high negative pressures which occur locally near roof edges. At one point, for example, the negative pressure was found to be 326 per cent of the normal velocity pressure.