

Research Items

Pre-Folsom Culture in California

OWING to lack of funds, it has been found necessary to bring to a close the excavations on the stone age site at Borax Lake, California, which were being conducted by an expedition of the Southwest Museum of Los Angeles under Mr. M. R. Harrington. This expedition, as already announced (see *NATURE*, 141, p. 1004) had discovered stone artefacts at a depth of eight feet below implements of the Folsom type, thought to be contemporary with the Folsom industry found in New Mexico in association with an ice age type of fauna, now extinct. Further investigations at Borax Lake since the first announcement only serve to confirm the initial view of the high antiquity of the implements from the lower series; but the deposits are at too great a depth, and the site too vast, for complete systematic examination with the limited financial resources the museum expedition has at its disposal. This would be possible only if Government assistance were forthcoming through a grant from the Public Works appropriation. In the meantime, it is announced in a statement issued by Science Service of Washington, D.C., certain tentative conclusions have been formed on the basis of this first season's work. Presumably the Folsom people who camped at Borax Lake were of the same type as those of the Folsom sites of New Mexico and Colorado, and were their contemporaries. Before the arrival of the Folsom people, the site was occupied by another race, who lived there for a sufficient length of time to build up an accumulation of more than eight feet of soil mixed with human refuse. The building up of this eight feet of soil and refuse gives a minimum period of time for the oldest occupation, as the level of the Folsom culture, on the surface or near it, may have been lowered by erosion, whether by wind or by water, as is known to have happened in some of the sites examined, for example, in New Mexico. Much further work on the stratification is needed before these conclusions can be regarded as in any way final.

Iodides as Antidotes in Thallium Poisoning

IN the course of some investigations at the Brno Veterinary School upon the action of thallium acetate on rats, Prof. O. V. Hykeš and Dr. F. A. Diakov have found that iodides administered subcutaneously greatly reduce the toxic and other effects of thallium (*Biologické Spisy Vysoké Školy Zvěrolékařské*, 15, pp. 29-45). Six groups of rats were dieted for 32 days with an addition of 0.3 mgm. of thallium acetate and then for 6 days with 0.4 mgm. per hundred grams of body weight. Four of the groups were given daily injections of 0.5 c.c. of solutions of the iodides of lithium, potassium, sodium, and magnesium containing 20 mgm. iodine per c.c., respectively. Animals of the fifth group were treated with calcium iodide, but they soon showed signs of dermatitis due to the calcium, and they were afterwards given injections of sodium iodide. The sixth group, serving as a control, were given the thallium acetate with their diet but without the iodide injections. They quickly developed symptoms of acute thallium poisoning, and the acetate had to be omitted periodically from their diet.

A seventh control group received no chemical treatment and the animals grew normally, the females having litters. All the animals treated with lithium, potassium or sodium iodide looked healthy, and increased in weight and preserved their coats. Rats injected with magnesium iodide looked healthy, but had lost much hair. Those of the sixth group had lost almost all hair and even the feelers were affected. After 35-40 days they developed eye cataracts; but no indication of this was observed with animals subjected to iodide injection. Administration of iodides is thus shown to reduce very considerably the toxicity and loss of hair due to thallium salts, and the authors conclude that this antidotal effect is brought about in a physico-chemical manner. It would appear that the action of thallium acetate is direct and does not pass through the endocrine or endocrine sympathetic system.

Phyllopod Crustacea

PAUL MATHIAS has published a most useful general memoir entitled "Phyllopoda: Biologie des Crustacés phyllopoques" (*Actualités scientifiques et industrielles*, 447. Paris: Hermann et Cie. 1937). This is a good account of the group by one who has worked at it to a considerable extent. All interested in these small Crustacea should possess it. General characters, conditions of life, movement, respiration, alimentation, reproduction, eggs, growth and duration of life, regeneration, enemies, uses, distribution both recent and fossil, all have their fair share of attention. This is an ancient group, and some of the oldest fossils known show a structure very similar to recent forms. The earliest Phyllopoques are found in marine deposits, but from Cambrian times freshwater forms are well characterized. The author draws largely on his individual store of knowledge, especially in experimental work, making the essay specially valuable. There is a good and full bibliography.

Greenkeeping Research

THE latest issue of the *Journal of the Board of Greenkeeping Research* (5, No. 18; 1938. 3s. 6d.) contains an article on the effects of sulphur in improving the physical condition of clay soils. Results from experiments suggest that surface application of sulphur increases the porosity of heavy soil, but readers are recommended to approach the St. Ives Research Station, Bingley, Yorks, for advice before making trials themselves. Although compost sterilization to destroy weed seeds, eelworm, etc., has been used for some years, more efficient methods are always being sought, and an article in this number of the *Journal* describes the latest steaming and electric plants designed for this purpose. Interesting accounts are also given of the problems of greenkeeping research in New Zealand and the differences between greenkeeping conditions in the United States and Great Britain. Particulars are supplied of the third course of instruction for greenkeepers which it is proposed to hold in the autumn provided the demand is sufficient, and attention directed to the fact that the principal makes of mower and other implements may be inspected at the Permanent Implement Exhibition at the Station.

'Stripe' Disease of Narcissus

AT a meeting on August 22 of Section K (Botany) of the British Association, Dr. J. Caldwell discussed certain aspects of this disease. The disease has been recognized by growers and others for a very long time, and there is evidence that it is spreading rapidly in the field. In some instances in commercial stocks every plant has been found to be infected. It must be noted, however, that some varieties show a high degree of tolerance to the disease, even though they are highly susceptible. The varietal response to the disease differs markedly, and while the symptom-complexes can be grouped into various categories, it is not possible as yet to determine beforehand which types of symptoms are to be expected in any new variety. The symptoms found in plants infected with 'stripe' fall into three main groups: (a) a more or less simple mosaic characterized by the appearance of small chlorotic areas on the leaves and flower-stalks of the plants, with some 'break' in the petals and coronas of varieties with coloured flowers; (b) severe mosaics characterized by the occurrence of large highly chlorotic areas on the leaves; and (c) proliferation and overgrowth of tissue on the leaves and flower-stalks as in Czarina and Weardale Perfection. There is probably a fourth group in which there is marked distortion in the plants; but it is not yet clear how far this differs fundamentally from the symptoms in group (c). The examination of a very large number of wild species of *Narcissus* growing under natural conditions has so far yielded no evidence that any of these symptoms are found in the wild *Narcissus* (*N. Pseudo-Narcissus*). There is no evidence that the disease is seed-borne in the cultivated varieties. No vector has yet been found by any of the investigators of the disease, and there is little detailed published evidence that the disease is experimentally transmissible. It has been found that the juice of infected bulbs is infective after passage through Pasteur-Chamberland L3 candles and that the agent reacts in a manner typical of a virus. The method of inoculation found to be most effective was by hypodermic needle with subsequent damage to the leaf tissue at the base of the leaves. In the main, inoculations made in the early part of the season are more effective than those made later. The histological changes in the tissues associated with the disease are also considered.

Curvature of Columnar Jointing in Volcanic Necks

THE mechanics of the columnar jointing of basaltic lava is already well understood. C. B. Hunt has now attempted to explain the characteristic curving of such joints in volcanic necks (*Amer. J. Sci.*, 142; 1938). The joints that first form are at the surface and stand in a vertical position. The heat loss in a vertical direction from a pipe diminishes with depth, whereas the heat loss laterally diminishes inwards from the sides. From an analysis of the contraction stress ratios and of the incipient fractures dependent on the variable rates of cooling, it is found that the fractures progressively change from a practically vertical position at the top to a practically horizontal position in depth. At any given point, fracturing may be along either of two sets of planes, one dipping outward towards the sides of the pipe, the other dipping inward. The set dipping outward is favoured by cracks extending downward from the surface, because contraction is greater towards the sides than towards the middle of the pipe. The analysis is illustrated by

reference to the numerous volcanic necks of the Mount Taylor region of New Mexico. (For a British example, see S. I. Tomkeieff. "The Dolerite Plug at Balleygalley Head, Co. Antrim". *Irish Nat. J.*, July, 1935.)

Chromatographic Separation of *Cis*- and *Trans*-Azobenzene

AN interesting application of chromatographic analysis has been made recently (Zechmeister, Frehden and Jørgensen, *Naturwiss.*, 26, 495; 1938), the process having been employed for the separation of *cis*- and *trans*-isomerides. G. S. Hartley (*NATURE*, 140, 281; 1938) discovered that azobenzene (m.p. 68°) suffered a partial transformation into the *cis*-form (m.p. 71°-72°) on exposure to sunlight. The heterogeneity of the product can readily be shown by chromatography. The solution of the mixture of the *cis*- and *trans*-forms of azobenzene in benzene or benzine is passed through a long tube filled with specially selected aluminium oxide. Benzene is also used as developer. The adsorbent shows two intense yellow zones separated by a broad white layer. After elution with ice-cold ether, the crystalline *cis*-compound was obtained, the properties of which were identical with those of the compound described by Hartley. The absorption affinity of the *cis*-isomeride is considerably greater than that of the *trans*-form. It would be possible to use the method to discover whether the spontaneous isomerization of lycopene (Zechmeister and Tuzson, *NATURE*, 141, 249; 1938) is a *cis-trans*-isomerization.

Inclination of Spiral Nebulae to the Line of Sight

IN January 1938, Mr. F. G. Brown published a paper in which he showed from his calculations of the inclinations to the line of sight of the planes of the extra-galactic nebulae of more than 2' in diameter in Reinmuth's catalogue that the preponderance of small inclinations could not be accounted for by observational selection, but was apparently due to a systematic orientation of the planes in space (*Mon. Not. Roy. Astro. Soc.*, 98, 3; 1938). A notice of this paper appeared in *NATURE* of April 30, p. 796. Dr. H. Knox-Shaw considers Mr. Brown's conclusions are so inherently improbable that he felt it worth while to investigate the matter further (*Mon. Not. Roy. Astro. Soc.*, 98, 7; May 1938). He has made a calculation similar to that of Mr. Brown, using the objects in the Shapley-Ames catalogue given in the *Harvard Annals* (88, 2; 1932), but adopting the revised dimensions and descriptions for 448 of the nebulae given in Part 4 of the same volume of the *Harvard Annals*. As this catalogue covers the whole sky and the dimensions of the nebulae contained therein are taken from a number of sources, it affords the best material for testing the matter under discussion. The Heidelberg catalogue used by Brown goes down to declination -20° only, and for this reason probably contains a larger proportion of nebulae from the polar cap than the Harvard catalogue, which shows that about one third of its objects are within 30° of the north galactic pole. The elongated spirals are a little more frequent in this region than elsewhere, and the large proportion of elongated objects found by Brown may be due to the preponderating influence of the rich polar cap. In any event, the difference between the results from the two catalogues suggests that selection has an important effect on the figures obtained, and the planes of the spirals are probably distributed in a random manner, contrary to the view advocated by Brown.