

RESEARCH ITEMS

Hungarian Throwing Sticks

POSSIBLE ethnological affinities for a 'casting staff' in use in Hungary some thirty to forty years ago have been suggested by Béla Garda, of the Ethnographical Museum, Budapest (*Man*, Jan. 1941). The Hungarian casting staff was a characteristic weapon of the herdsmen, who were never without them. They were used in fights among the herdsmen themselves or against wolves attacking their herds. Cattle thieves also employed them to drive off anyone attempting to intercept them on their marauding expeditions. The casting staff was a rounded wood cudgel, 65 cm. long and 5 cm. in diameter and pointed at each end, the points being hardened by fire. In throwing, it was held at one end, and it was effective up to 50-100 paces. It appeared first on the Greater and Minor Kunsag of the Hungarian plateau, where a pastoral life was the characteristic condition. Literary references to it are found from the fifteenth century onward. This throwing staff is entirely different from the throwing sticks and boomerangs of European prehistoric and later times. An identical form, however, is found in the Malay Peninsula, in Borneo and Marshall, Gilbert and Yap Islands. Zs. Bátky, the Hungarian ethnologist, is of the opinion that the Hungarian weapon was brought by the Hungarians from the East, its ancient home being the great steppe lands of Asia. In support of this, it is here pointed out that the social organization and civilization of the Hungarian herdsmen show the marked eastern character of the horse-nomads. It is possible, therefore, that the connexion between the casting staves of Hungary and Indonesia-Micronesia may be placed in the same great prehistoric-ethnological culture-frame to which belong the conformities of the Asiatic nomad cultures and of the Oceanic culture of the Farther Indies.

Saxon Relics from Lincolnshire

St. Peter's Church at Barton-on-Humber, North Lincolnshire, one of the oldest churches in England, dates in part from Saxon times; but up to the present, little evidence has been obtained as to the people by whom it was first built. Recent excavations for an air-raid shelter brought to light two or three human skeletons and some pieces of metal which were handed to T. Sheppard of the Hull Museum, by whom the site was visited, and these and later finds are now described (*Hull Mus. Pub.*, No. 208; 1940). It was evident that a number of Anglo-Saxons had been buried just below the original surface, which at a later date had been covered by 5-6 ft. of boulder clay. The bones showed that one body was that of a woman, while another was that of a man of large proportions aged about 45 years. The most interesting find was a large thin bronze bowl with three escutcheons with hooks, each fastened with three bronze rivets; otherwise it is devoid of decoration. It is comparable with other bowls of this type found with Saxon remains, but which T. D. Kendrick has assigned to a Romano-British or British origin. Remains of a trivet with two feet suggest the deposit at Barton of a second bowl of the trivet stand type,

but the bowl itself has not been found. Another interesting object was a cylindrical bronze box with a bronze loop, presumably for attachment to a lady's chatelaine. Such boxes were used for carrying sewing or other materials. A long gold bead is unique among Anglo-Saxon gold beads. Extension of the excavation raised the number of skeletons to five in all, and produced a very fine short sword, a set of scales and weights, remains of a bone comb, a large decorated bronze handle and a heavy curved piece of bronze. The scales consist of two plain pans, slightly concave, each $2\frac{1}{2}$ in. in diameter, and each perforated for three bronze rings for suspension. The balance beam is of circular bronze wire 5 in. long with zoomorphic terminals, such as have not previously been recorded on balance beams. Beneath each terminal is a loop containing a small bronze ring. From the centre rise two upright pieces of bronze 2 in. in length. Swinging between the two is a pointer of bronze 1 in. in length. Four metal weights ranged from 200.4 grains down to 95.9 grains; other pieces of metal and a Roman coin presumably used as weights from 39.9 grains down to 8.7 grains. A few days after the find of a hanging bowl at Barton, a similar bowl was found at Manton Common, Lincs, while a fine example was found at Caistor in 1857.

Minor Plant Diseases

W. C. MOORE has described three minor plant diseases (*Trans. Brit. Mycol. Soc.*, 24, Pts. 3 and 4, 345-351; Dec. 1940). An angular leaf spot of the apple, previously attributed to the fungus *Phyllosticta angulata* and another species, is now shown to be initiated by an insect, the frog-hopper *Cercopsis sanguinea*. The fungi are there as secondary parasites, but only serve to accentuate a malady already present on the foliage. Leaf spot of lettuce, caused by *Septoria lactuce*, was observed in Harpenden during the summer of 1940. Infected plants formed hearts, but were very unsightly. Colchicum plants are subject to attack by the fungus *Pythium ultimum*, which is also the cause of watery wound rot in Duke of York potatoes and a rot in tulip bulbs. The disease in Colchicum appears usually during the summer, and indeed some corms are completely disorganized when lifted. Pathogenicity has been established by inoculation with pure cultures.

Origin of Secondary Trisomics

M. M. RHOADES (*Genetics*, 25, 483-520; 1940) has provided cytogenetical evidence that a secondary trisomic involving chromosome 5 of maize arose from an abnormal chromosome which consisted of one arm of chromosome 5 and therefore had a terminal centromere. This terminal centromere is shown to be unstable both in meiosis and mitosis. Transverse division of the centromere during the first microspore division would give a chromosome with a median centromere and two identical arms. Cytogenetical evidence is given of the mode of disjunction in a trivalent and of the linkage group 72 units in length involving 8 genes.

Experiments in Selection

THE number of hairs on the ventral surface of the fourth and fifth abdominal segments are inherited as polygenic characters in *Drosophila melanogaster*. K. Mather (*J. Gen.*, 41, 159-194; 1941) subjected the F_2 of certain crosses to selection for the number of such hairs. In one cross, the greatest change in hair number took place in the first two selected generations. In another cross involving two different stocks, an advance with selection took place in the first two selected generations, followed by a period of stability which was again followed by a considerable advance. By intercrossing the inbred selected lines a greater variation was found in their F_2 as compared with that of the original F_2 . This is interpreted to mean that the first advances are due to recombination of independent genes and the second to recombination of linked genes. This presupposes the existence of a balanced combination of genes controlling polygenic characters in one chromosome. Such linked genes will be favoured by natural selection, since the mean expression of a selected variable character will almost coincide with the optimum in the population. Stability of this mean is necessary in the present environment and is achieved by linkage, whereas ability to vary with changing environment is necessary for evolution and is brought about by crossing-over by linked genes. The author therefore accounts for clines in wild populations.

Estimation of Carbon Dioxide in Air

A NEW method of estimating small quantities of carbon dioxide in air by the absorption of infra-red radiation is described by H. Dingle and A. W. Pryce in *Proc. Roy. Soc.*, B, 129, 468-474 (1940). Older methods of making this measurement, which is of considerable importance in plant and animal physiology as well as in chemistry, depend on chemical processes or on measurement of the electrical conductivity of solutions in which the carbon dioxide is absorbed. In 1937, however, McAlister introduced a spectrometric method, in which the amount of carbon dioxide was estimated directly from the amount of absorption, by the air under examination, of infra-red radiation near 4.3μ , the maximum of a strong absorption band of carbon dioxide. The radiation, after passing through the air, was received by a spectrometer set at this wave-length. Dingle and Pryce, however, show that the spectrometer is unnecessary if the air is dried, since the only atmospheric gases which absorb radiation in the near infra-red are carbon dioxide and water vapour. It is therefore necessary merely to compare the total radiation from a bunsen burner transmitted by the air under examination, with that transmitted by a standard quantity of dry air free from carbon dioxide, in order to determine the amount of carbon dioxide present. The amounts of radiation transmitted by the two samples of air fall on two thermopiles connected so that the galvanometer shows the difference in the currents produced. In addition to its greater convenience, this method has three advantages over the measurement at the maximum of the absorption band; it eliminates the cost of the spectrometer, it gives much greater sensitivity since the whole of the transmitted radiation is used, and it is much less affected by variations of temperature, which change the position of the absorption band but do not greatly alter the total absorption.

Surface Effect in Slow Combustion of Hydrocarbons

A SYSTEMATIC study has been made by R. G. W. Norrish and J. D. Reagh (*Proc. Roy. Soc.*, A, 176, 429-48; 1940) of the effect of surface on the slow oxidation of several hydrocarbons, both saturated and unsaturated. Special reaction vessels of approximately constant volume but widely varying diameter were used. All reactions were of the degenerate branching type, and were found to be principally homogeneous in character. When the diameter of the reaction vessel was sufficiently reduced, the reaction rate fell abruptly towards zero, whilst the corresponding induction period increased towards infinity. In narrow vessels, surface deactivation can predominate over other processes of deactivation. In wider vessels, surface and volume deactivation occur to a comparable extent over a considerable range of pressure. The surface deactivation almost alone can suppress the factors leading to chain branching when the vessel diameter is decreased to a critical value. From the reactions studied, the occurrence of this critical diameter appears to be general for hydrocarbon oxidation, in conformity with the theory of degenerate branching.

Motion of Solar Prominences in Three Dimensions

THE application of kinematography to the spectroheliograph has given us, during the past few years of solar activity, some spectacular motion pictures of solar prominences. Outstanding among the institutions engaged in this fascinating work is the McMath-Hulbert Observatory on Lake Angelus, Mich. A further development is now reported from this station (*Publ. Obs. Univ. Mich.*, 8, 57; 1940): a new spectroheliograph has been designed to give a continuous record of the line-of-sight motions of solar phenomena, particularly of prominences at the limb. The instrument differs from an ordinary spectroheliograph only in the motions executed by the slits in making the record. The first slit is narrow, as is an ordinary entrance slit, and during the recording it scans the prominence image and the adjacent sky intermittently at positions separated by 2 mm. intervals. The second slit is 2 mm. wide and limits the length of the spectrum recorded on the film to 1 mm. on either side of (say) the $H\alpha$ line, which appears in absorption in the light of the sky and in emission in the prominence. The intermittent motion produces a series of such strips placed end to end, and the grid of absorption lines so formed is used to detect at various points in the prominence those displacements of the emission line which are characteristic of line-of-sight motions. In order to facilitate identification of the feature whose radial velocity is being recorded, the wide second slit is automatically narrowed after the intermittent exposure, and a continuous scan then superposes a faint prominence picture on the grid of absorption lines. The whole cycle is then repeated with the first slit moved on, with respect to the solar image, by its own width; and so on until the whole 2 mm. is covered. No part of the prominence, then, can escape the intermittent scan, and on completion of twenty such cycles, a record of the radial velocity at all points on the image has been obtained. Correlation of such records with conventional spectroheliograms taken simultaneously will give three-dimensional pictures which cannot fail to add considerably to our knowledge of prominence motions.