

RESEARCH ITEMS

Early Islamic Decorative Technique

THE first occasion on which it has been possible to analyse early Islamic niello is recorded in connexion with a group of objects in the precious metals said to have been dug up at Nihavand, a city of Persian Iraq, by Mr. Basil Gray (*Brit. Mus. Quarterly*, 13, 3; 1939). The group in question has recently been acquired by the British Museum (Bloomsbury). Apart from its value as an addition to the collections, its importance is the greater because of the extreme scarcity of objects with precious metals from Islamic lands, where there are no tomb burials, and successive invasions caused widespread destruction. The find consisted of forty pieces, of which thirty-nine are of silver, nearly all enriched with gilding and niello, while one, the most considerable in size, is of gold. This latter is a wine bowl decorated with engraved roundels and an inscription in Arabic around the outside of the lip. Among the silver pieces are two series of plates which formerly decorated leather belts, two beads, a small circular plaque, a butt of a halberd possibly, and four other inscribed objects, as well as some fragments of buckles. The style unmistakably points to the Seljuk period. Epigraphic and stylistic evidence alike suggest the latter part of the twelfth century. Dr. Plenderleith reports after examination that there are microscopic particles of white metal embedded in the gold of the bowl; no iron is present and the particles are non-magnetic. They are extremely hard and there is good reason to regard them as iridium. Spectrographic examination of the niello indicates the presence of copper, silver, gold, tin, lead, with traces of aluminium, potassium, magnesium and boron. Analysis of filling taken from one of the small fragments of silver reveals the presence also of sulphur. The composition of this niello is, therefore, probably the same as Western niello, in antiquity according to Pliny, in the Renaissance period according to Collini.

Cattle and Marriage among Southern Bantu

AMONG the Lovedu of the north-eastern Transvaal marriage, being patrilineal, involves, as among other Southern Bantu tribes, the transfer of *munywalo*. The nature of this institution has been analysed by J. D. Krige (*Africa*, 12, 4; 1939), who points out that the various interpretations in which it is regarded as the legalization of marriage, as a guarantee of a wife's status or good behaviour, and in terms of compensation, economic or ritual, are in the nature of parodies. To discover the real place of *munywalo* in the social system, it is necessary to appreciate the relation of the cattle exchanges to the social structure, as cattle constitute the essence of *munywalo* and the exchanges are the most important use to which cattle are put. The people do not rely on cattle raising. Milk is not used at all; the meat of cattle which die is much appreciated as a relish; the skins are used or discarded indifferently. Ploughing has added to the uses of the cattle, but social values centre in agricultural productivity rather than the role of cattle in contributing to this result. Cattle constitute no great standard of the kind of affluence that is important, this being based on maize. It is hidden

rather than displayed, and gives no man the privileges of rank. Yet like other Bantu tribes, the Lovedu have a strong emotional attachment to their cattle, though they are not regarded as sacred. Nevertheless, they are not sold or slaughtered, though there is no taboo against it. This is neither economic nor anti-economic, but *sui generis*. The chief function of cattle is in *nywalo* exchange, which accounts for more than 95 per cent of all transfers of cattle, the only other occasion being when judgment debts are paid. There are about 330 marriages each year, for which the theoretical minimum number of cattle needed is about 2,600—only 400 short of the total in the society. A distinction is drawn between cattle which have become involved in *munywalo* exchange and those which are unencumbered. Thus about 87 per cent of the cattle are held in a chain of rights and restrictions which the temporary owner cannot ignore. The exchange conditions, and is conditioned by, two main social arrangements, cross-cousin marriage, and the allocation of a sister's *munywalo* to her brother. Hence arise series of cattle linkages by which social groups, originally unrelated, are bound together in a close network of social interests and responsibilities.

Increased Mutation due to Hybridization

HYBRIDIZATION leads to increased variability by the mechanical recombination of genes present in the parents, followed by segregation. A. H. Sturtevant (*Proc. Nat. Acad. Sci.*, 25, 308-310; 1939) has shown that inter-racial hybridization also may lead to an increased mutation rate. By crossing marked races *A* and *B* of *Drosophila pseudoobscura* and back-crossing to race *A* or race *B*, he found that about 8.5 per cent lethal and about 0.5 per cent sex-linked visible mutations were obtained. This is a much higher mutation frequency than usually found in intra-racial crosses, and has important implications regarding the evolution of new forms.

Development of Wings in *Drosophila*

C. H. WADDINGTON (*Proc. Nat. Acad. Sci.*, 25, 299-307; 1939) has made a study of the development of the wings of normal and mutant *Drosophila* in order to investigate the times and modes of effect of different genes upon wing formation. The normal wing expands rapidly until about seventeen hours after pupation. At about twenty hours, contraction takes place from the periphery inwards, and some veins make their appearance first as broad bands which rapidly narrow. At about twenty-five hours the wing is a thin blade, and at forty hours the wing is fully formed and hairs appear. This definitive wing stage is followed by folding accompanied by a second expansion. At emergence, drying out of the wing leads to the second contraction and obliteration in the internal structures. The effects of twenty-four genes affecting the wings were studied. These relate to shape, size, vein breakage and additions, blisters and wing-curvature. The first visible effect of some is seen in the prepupal stage (*dy* and *m*), while the visible effect of others is not seen until unfolding in the young imago.

The Oriental Peach Moth in Australia

THE oriental peach moth (*Cydia molesta*) has caused serious damage to the fruit industry of the Goulburn Valley, Victoria, during the past few years. Infestations which had occurred in this region for many years had been attributed to the codling moth (*Cydia pomonella*) whereas, in so far as peaches are concerned, the most damage was caused by *C. molesta*. The degree of infestation varies seasonally, and in 1933-34 this insect caused damage to orchardists amounting to about £70,000. The losses are sufficiently serious to threaten the canning industry and to call for a thorough study of the problem. G. A. H. Helson, of the Commonwealth Division of Economic Entomology, gives an account of the problem in Pamphlet No. 88 (1939) of the Council of Scientific and Industrial Research for Australia. It appears that little good can be expected from spraying as a method of control, and this has caused more attention to be concentrated on biological means of repression. Nine species of parasites are known to be primary agents attacking the insect in Australia. Of these the chalcid wasp *Dibrachys boucheanus* is the most effective: it parasitizes larvæ up to ninety per cent at the latter end of the season. Since this is not sufficient to ensure an economic degree of control of the oriental peach moth, it was considered that the introduction of parasites attacking the spring and summer generations of this insect might prove advantageous. The result has been that four species of larval parasites and one species of egg parasite were introduced into Australia during 1935-38. Recoveries made in the field show that the Braconid *Macrocentrus ancylivorus* is the most promising of these parasites, and it is proposed to make further introductions of this insect.

Antirrhinum Rust

A RUST disease of the antirrhinum made a lightning descent upon Great Britain in 1934, but has not since troubled our gardens. The causal fungus, *Puccinia Antirrhini*, appeared in Egypt in 1936, however, and as it has since occurred rather frequently, Dr. Amin Fikry has made a study of the malady and its control (*Min. Agric. Egypt, Tech. and Sci. Service Bull.*, No. 223. Govt. Press, Bulaq, Cairo, 1939. P.T.4). Many interesting features of the disease which were not apparent in the temperate climate of Great Britain are described for Egypt. Applications of various sulphur fungicides made at intervals of two or three weeks, for example, can control the disease most effectively, and it appears that the beneficial effect of this treatment is dependent upon a temperature higher than 22° C. All varieties grown in Egypt appear to be susceptible to the disease, and teleutosori have even been found on the roots of some plants. Larvæ of species of Cecidomyiidae were obtained from the rust pustules, but do not appear to diminish the effects of the fungus. Several plates illustrate this account of the disease, which also contains good descriptions of the various symptoms, and a short summary of previous knowledge about the malady.

Apple Canker

THE canker disease of apple trees is still a very serious malady. It is caused by the fungus *Nectria galligena*, and though it has been controlled to a large extent by correct pruning, present-day knowledge of the disease is not very detailed. Two recent papers

in the *Annals of Applied Biology* (26, No. 3, August, 1939) describe investigations into the discharge and determination of spores (by R. G. Munson, pp. 440-457), and into the incidence and control of shoot infections (by R. W. Marsh, pp. 458-469). Perithecia are formed in the cankers, and the ascospores are forcibly ejected throughout the year, when atmospheric humidity is sufficiently high. Ascospore discharge is at a minimum in summer, however, but attains a maximum in January and February. Conidia are liberated during the wet periods in spring and autumn, and germination of both kinds of spore can take place between 2° C. and 30° C. The fungus therefore appears to be well equipped for parasitism, so far as its reproductive bodies are concerned.

Recent Volcanic Activity in Japan

ACCORDING to H. Tanakadate, volcanic activity in Japan during the period November 1935-December 1938 (*Jap. J. Astro. and Geophys.*, 16, Nos. 2-3, 93-121; 1939 Tokyo) may be divided into four groups: (1) Secondary phenomena having no direct connexion with deep-seated magma; (2) the Volcanian type of explosive eruption; (3) the Strombolian type of eruption; (4) the formation of a new volcano. Of the latter there were two: (a) Taketomi islet near Alaid Island (1934), which was of the homate type, and (b) Iōzima-Sintō, south of Kyūsyū (1934-36), which was of the tholoid type. What may be regarded as a typical volcano-tectonic earthquake occurred in part of the Kuttuyaro Caldera, which is one of the largest in the world and noted for its sulphur production, on May 29, 1938, at 1.42 a.m. The top surfaces of both domes of Noboriondo and Maruyama fractured in the direction of the chain (N. 60° W.), the dormant fumarole on the northern side of the Oakots became active and the lake coast of the region rose about one metre in the north. It is believed that the earthquake was caused by movement of lava still in the molten state in the deep-seated root of the three domes. The most active volcano in Japan is that of Asama-yama, which is subject to frequent explosive eruptions of the Volcanian type. In the volcano observatory at Mine-no-Tyaya, 4 km. east of the crater, constant observations are carried out with seismographs, tiltmeters, earth current meters, magnetometers and other instruments. According to Minakami, the accumulation of ejectamenta on the crater rim reached 18 m. thickness from 1917-35.

The Goose Lake Siderite

PROF. F. C. LEONARD has a short account of this siderite in *Popular Astronomy* (47, 6; June-July, 1939). It was discovered on October 13, 1938, was removed a year later, and is now the property of the Smithsonian Institution and the United States National Museum. Its weight is 2,573 lb. (1,167 kgm.), and on etching the polished surface of a small fragment with dilute nitric acid, the characteristic Widmanstätten figures were seen, indicating that the specimen is a medium octahedrite. As all the original fusion crust is missing, it is thought that the meteorite is a very old fall. When the body was found about two miles west of the western shore of Goose Lake, it rested in the centre of a saucer-like depression about five feet in diameter and one foot deep. It is considered to be the fifth largest meteorite known to have fallen in the United States and the third largest on record for the three Pacific Coast States.