

RESEARCH ITEMS

Bronzes from Southern Nigeria

A REMARKABLE collection of bronze castings found at Igbo, Southern Nigeria, is figured and described by J. O. Field, assistant district officer, in *Man* of January 1940. They were unearthed in the course of digging a well, but no details are available. The castings would seem to have been made by the *cire perdue* process, though rubber latex may have been used instead of wax. The castings are covered with a rich green patina. The finest piece is an urn or cauldron 10½ inches high with a diameter across the top of 8 inches. It forms a shallow bowl with broad lip on a wide hollow stand. It is decorated with a series of rosettes interspaced with beetles and grasshoppers. At top and base are bands of hatched triangles and in the middle a broad band with a complicated design of rectilinear figures and circles. The edge of the lip and the base are decorated with a twisted cord design. Among other objects are two scabbards in which are the remains of iron blades, but without hilts, a bust with evidence of bead ornament, small shells which rotate, a human head, possibly female, showing cicatrization resembling the modern style, two highly conventionalized rams' heads, with highly ornate twisted horns and three spiral objects, of which two display a snake motif, while another peculiar object is a massive casting elaborately ornamented with eyelets, loops and whorls, and also extensively ornamented with coloured beads, and near the top a series of rings from which emerge small snakes' heads, having above them a wheel-like flange with a great number of triangular spokes and on top of this a wide metal ring. The occurrence of an 'Aro knot' suggests contact with the Aro people, but the earliest tradition of their presence in the region does not go back beyond about the middle of the last century. Otherwise there is nothing to determine the origin of this metal work. The Igbo people are not themselves metal workers, and it is improbable that they were made by Benin craftsmen.

Canoe-making in Ancient Hawaii

A TREATISE on the canoe-making profession of ancient times, of native authorship but undated, found among the archives of the Bernice P. Bishop Museum, Honolulu, has been translated and edited by Kenneth P. Emory and Mary Pukui (*Occasional Papers, Bernice P. Bishop Mus.*, 15; 1939). The writer opens with the statement that the profession was much practised in Hawaii to provide the canoes for fishing, for war and for voyaging from island to island, the experts who built them being much honoured and favourites of the chiefs. There were classes of experts under the classes of royal builders, such as the experts of the supreme ruler, of the ruling chiefs, of the district chiefs, and so forth. Of the timbers used, the koa (*Acacia koa*) was the best. All the forests were occupied by experts for making canoes. The adzes used were of stone. Their making was a laborious task, in which the various operations, chipping, grinding, lashing, were each done by different specialists. Different adzes were used for the various operations—chopping, hewing, hollowing. The canoe-makers were supplied with ancestral gods,

who helped in the hewing and hauling. They were both male and female. The canoe-makers were also provided with offerings. If the canoe belonged to a chief these offerings were a hog, red fish, clothing, coconuts and awa. The hog was cooked at the place where the koa tree was to be found. The ancestral gods partook after an invocation, and then all the priests present partook of their portion. The cutting of the tree then began, the priests cutting in pairs. A little bird signified whether the tree would be good or the reverse. The canoe of a chief was hauled to the shore by the people after a feast. Felling the path of the canoe was the last thing to be done. If a new canoe was first taken on a fishing trip, the first fish caught was brought back and offered to the ancestral gods.

Birds of Newfoundland and Colour Modification

SURPRISINGLY little is known of the birds of eastern Newfoundland, and accordingly brief explorations made by David C. Nutt while a member of the Robert A. Bartlett Greenland Expeditions of 1937, 1938 and 1939, have added considerably to the knowledge of distribution, abundance and geographic variation. The results, by John W. Aldrich and David C. Nutt, have recently been published (*Sci. Pub. Cleveland Museum Nat. Hist.*, 4, 13; 1939). From a general point of view, the most striking result is the discovery that where geographic variation has taken place among resident birds it is shown in a marked darkening of the plumage. This was found, for example, in birds so different as a creeper, *Certhia familiaris*, robin, *Turdus migratorius nigrideus*, "the most deeply coloured of all the American robins", warbler, *Dendroica brevilinguis*, water-thrush, *Seiurus n. noveboracensis*, crossbill, *Loxia l. leucoptera*, and others. A similar darkness of plumage was noted in 1919 by G. K. Noble in birds from the western part of the island, but in the east the deepening of colour is even more marked, and confirms Noble's opinion that Newfoundland is a region where the differentiation of dark coloured races is beginning to take place. It may be associated, as is probably also the case in the outer islands of Scotland, with the exceptional humidity of the region.

Transpiration into a Saturated Atmosphere

H. H. Dixon and J. S. Barlee have recently published a paper describing further experiments on transpiration into a saturated atmosphere (*Sci. Proc. Roy. Dub. Soc.*, 22, No. 20, 211; Feb. 1940). A potometer method for comparing the rates of transpiration in gases supersaturated with water is described, and it is shown that replacement of air with nitrogen around the leaves depresses and ultimately inhibits the upward movement of water in a stem. Renewal of the air restores transpiration. Anaesthetization with chloroform reduces or stops the movement; and at least temporary recovery may be attained by surrounding the leaves with supersaturated air. If the supply of supersaturated nitrogen or chloroform is prolonged, reversal of the upward current is produced, and the shoot behaves like a dead system and the water condensing on the leaves flows downwards in the stem.

Inheritance of Inability to Sweat

L. C. Glass and Darrell H. Yost (*J. Hered.*, **30**, 477-478; 1940) report the inheritance of the inability to sweat. The affected individuals show distress at above 85° F., are subject to severe headaches and stomach trouble. The pedigrees suggest that the character is either inherited as a monogenic recessive or on a multiple factor basis. Not only is there an absence of sweat glands in the skin, but also other anomalies of skin development are present.

Sweet Potato Breeding

THE sweet potato rarely flowers or sets seed under field conditions in Louisiana. J. C. Miller (*J. Hered.*, **30**, 485-492; 1940) reports useful methods for the induction of flowers and seed under these conditions. By staking the plants, three varieties were induced to flower, while girdling trebled the number of flowers and also induced earlier flowering. Seed setting was considerably increased by keeping a flowering branch in a water solution of artificial fertilizers in a house.

Cytological Investigations in Allium

S. W. MENSINKAI reports on the chromosomes of seventeen species of *Allium*, fifteen of which had not been previously reported. *A. sativum*, and *A. Cepa* ($2n=16$) are taken to be secondarily balanced diploids since they possess two pairs of nucleolar chromosomes and two pairs of nucleoli. Univalents were observed at meiosis in *A. Cepa*, *A. Sewerzowii*, *A. nigrum*, *A. scorzoneraefolium* (all diploids) and *A. Bidwelliae* (tetraploid). The individuals examined of *A. Cepa*, *A. Sewerzowii*, *A. cilicum*, *A. scorzoneraefolium*, *A. nigrum* and *A. Bidwelliae* were inversion heterozygotes.

Wound Hormones of Plants

MANY plant tissue extracts are capable of inducing renewed growth activity in mature plant cells. These growth-inducing extracts are usually obtained from ground or heated tissues and are capable of evoking cell division and cell enlargement in unwounded cells. The active principles have been referred to as wound hormones by Haberlandt. J. English, J. Bonner and A. J. Haagen-Smit (*J. Amer. Chem. Soc.*, **61**, 3434; 1939) find that the crystalline substance isolated from string bean pods and capable of inducing renewed cell division and cell extension activity in the parenchymatous cells of the bean pod is 1-decene-1,10-dicarboxylic acid (which they propose to call 'traumatic acid'), which was also synthesized. This is capable of inducing wound periderm formation in washed disks of potato tuber and to function thus as a wound hormone. Traumatic acid is also capable of partially replacing the juice of the tomato fruit in reversibly inhibiting the germination of tomato seeds.

Synthesis of Vitamin K₁

L. F. FIESER (*J. Amer. Chem. Soc.*, **61**, 3467; 1939) has found that synthetic 2-methyl-3-phytyl-1,4-naphthoquinone is identical with natural vitamin K₁ by a direct comparison of samples with regard to analysis, spectrum, anti-hæmorrhagic activity, colour reaction, and the melting point and mixed melting point of a crystalline derivative. This confirms the conclusion reached by Doisy and co-workers from degradative experiments (*ibid.*, **61**, 2558; 1939) and from a further synthesis (*J. Biol. Chem.*, **130**, 433; 1939), published after the present work was completed. The synthesis was essentially a one-step

process utilizing 2-methyl-1,4-naphthoquinone and phytol, and provides a method of preparing the vitamin in quantity. By separating and purifying the product in the reduced form prior to oxidation, the quinone is obtained in a pure condition without recourse to distillation or adsorption. Natural vitamin K₁ can be isolated very easily from alfalfa concentrates by a similar procedure. Vitamin K₁ yields phthiocol on cleavage with alcoholic alkali.

Oxidation with Lead Tetra-acetate

IT is known that the cleavage of the carbon chain in compounds containing two and three adjacent hydroxyl groups can be carried out with lead tetra-acetate in aqueous as well as in non-aqueous solution. J. M. Grosheintz (*J. Amer. Chem. Soc.*, **61**, 3379; 1939) finds that the cleavage of the carbon chain of a number of glycosides with lead tetra-acetate is parallel to that known to be produced with periodic acid. The oxidative changes of alpha- and beta-methyl-*l*-arabinopyranosides can be carried out quantitatively in aqueous solution. Contrary to previous experience, three molecules of lead tetra-acetate instead of two were required to complete this reaction, and the reason was found to be the oxidation to carbon dioxide of one molecule of formic acid formed during the first reaction. This reaction does not occur in dry organic solvents or in oxidation in aqueous solution by means of periodic acid, and the formic acid may be oxidized in its ortho-form.

Photometry of the Solar D Lines

ALTHOUGH the *D* lines have been measured several times previously, there has always been some doubt about the instrumental corrections, more especially for the central intensity. In a recent paper (*Mon. Not. Roy. Astro. Soc.*, **100**, 1; November 1939), C. W. Allen gives the results of his measurements, corrections derived from a comparison with terrestrial water-vapour lines having been used. The sun telescope and three-prism spectrograph of the Commonwealth Solar Observatory were utilized for the solar spectra of the *D* region. Plates were taken of both centre and limb of the sun near midday, and others were exposed for a few minutes after sunrise to ensure strong water-vapour lines. The results for the central intensities and equivalent breadths are in good agreement with his observations made some five years ago, but the central intensities are much smaller than Houtgast's results published in 1938. The discrepancies are due to the fact that Houtgast made no corrections for finite resolving power.

An Altazimuth Mounting for Reflecting Telescopes

THE REV. W. REES WRIGHT has described a useful wooden mounting to carry a 9-inch reflector which he has manufactured himself (*J. Brit. Astro. Assoc.*, **50**, 3; 1940). The base of the stand is merely a stout three-legged stool, each leg being 30 in. long and 3 in. by 2 in. in section. The top consists of two thicknesses of 1-in. wood, screwed together with the grain crossing, and twelve ball-casters are screwed to the upper piece so as to form a circular bearing for the head. It is possible to raise or lower these casters slightly to make certain that all bear on the head in all positions. Many other details are given which can be easily followed by amateurs, who are recommended to study the description with the diagram if they require a cheap and efficient mounting for a small reflector.