

Research Items

Intoxicants in Sarawak

MR. E. BANKS, curator of the Sarawak Museum, has made a study of the customs and behaviour of Sarawak pagan tribes in relation to native alcoholic drinks (*Sarawak Mus. J.*, 4, 4). It is usual among the pagan tribes to offer visitors to the long house a drink made mainly from fermented rice and occasionally from sweet potato, sugar-cane, or even fruit. This helps to place hosts and guests at their ease and assist free discussion of intimate matters. The women, though brewing the liquor, drink sparingly, if at all, fearing intoxication. The Land Dayaks of Kuching and Salong prepare a very sweet yellow-brown drink from a reddish orange fruit. This contains 23 per cent alcohol. These people, who are much repressed, are abstemious from fear of intoxication. If they become intoxicated, they are never quarrelsome, but fall asleep. The Sea Dayaks, or Iban, brew a sweet and milky drink with about 20 per cent alcohol; but they drink rarely and are singularly sober. This, however, is due largely to thrift and lack of opportunity; and European drinks, if free, are absorbed in large quantities by both men and women without noticeable effect. Drink plays a very large part in the life of both Kayan and Kenyah, no birth, death, or marriage ceremonies being complete without a liberal supply of drink for all, including visitors. The same applies to agricultural ceremonial. Cooked rice mixed with water is the mainstay of the drink, which is brewed by women, but with great uncertainty as to what the product will be, both in strength and flavour. Fruit, berries and a yeast are added to the rice liquid, the alcoholic content in samples tested ranging from 18 to 23 per cent. Strong alcohol is obtained from this liquor by distillation. There is considerable etiquette in drinking, and the ritual is prominent in their customs. They drink frequently and jovially, and hold their drink well. The Kelabit and Murut, on the other hand, living farther north and at a considerably greater altitude—3,000–4,000 ft. where the nights are cold—are mighty drinkers; but whereas the Kelabit shows no ill-effects, the Murut is drinking himself out of existence.

Biological Action of X- and γ -Rays

THE keynote to "Some Quantitative Aspects of the Biological Action of X- and γ -Rays" by C. M. Scott (Med. Res. Coun. Special Report Series No. 223. London: H.M. Stationery Office, 1937. Pp. 99. 1s. 6d.) is the term quantitative, for the author has summarized and criticized the work of radiologists where quantitative, rather than qualitative, results have been claimed. All the important effects of X- and γ -rays upon living tissues come under consideration in Part 1—some at length, others more briefly. The author's chief aim is to direct attention to our scanty knowledge of the nature of the primary action of these rays, at the same time maintaining that this action is largely exerted on the nucleus of the cell and thereby on the cell processes that control growth. Part 2 contains detailed description of the author's experimental work upon the effects of X-rays and radium on the isolated frog's heart and upon the eggs of *Calliphora erythrocephala*. The

general plan of these experiments might well serve as a model for others, showing as they do the essential features of quantitative work. Mr. Scott's conclusions will not be accepted by all, but they will be treated with the respect that their sincerity warrants, and his views generally will prove a stimulant to research.

The Protein of Yellow Enzyme

THE importance of the 'yellow enzyme' is considerable: its identification as lactoflavin-5'-phosphoric acid, of known structure, coupled with a specific protein, has been one of the outstanding achievements in the laboratory of recent years. A successful attempt has now been made by Prof. Richard Kuhn and P. Desnuelle of Heidelberg to establish the nature of the protein (*Berichte*, 1907; 1937). Normally such an analysis requires very considerable quantities of material, whereas the yellow enzyme is known in milligrams rather than in grams. The absorption process of Weygand has enabled somewhat larger quantities of the pure yellow enzyme to be prepared so that the amino acids obtained on acid hydrolysis of the protein could be estimated quantitatively. To do this the latest microbiological technique has been applied, colour reactions for the individual amino acids have been used to estimate them photometrically, and the hexone bases were separated by electro-dialysis. The achievement is a striking one and an outstanding example of the delicacy and the advantage of this new technique. So far, no particular variation from the known proteins is shown either in the nature or the quantity of the amino acids—65 per cent of the nitrogen has been identified. The hexone bases are of importance, since the protein is attached through basic groups to the rest of the molecule in two places. It may be of significance that the total of histidine, arginine and lysine is the same as in the protein of hæmoglobin, but their relative proportions are entirely different.

Insects and Mites in Stored Grain

THE attention of entomologists is directed to Miscellaneous Publications 258 (July 1937) of the United States Department of Agriculture, written by Messrs. R. T. Cotton and N. E. Good. This 80-page brochure lists the insects and mites associated with stored grain and cereal products from all parts of the world. Under each species is given its geographical range, habitat, food habits, its parasites and predators together with its relative importance as a pest: wherever necessary, references to literature are also given. The various invaders of grain, etc., are classified according to their status or, in other words, whether they are of major or minor importance or only incidental pests. They are also classified taxonomically, which facilitates easy reference from that point of view.

Antarctic Vegetation

AN interesting geographical extension of the scanty flora of the Antarctic regions is noted in an article in the *Polar Record* of July on the work of the R.R.S. *Discovery II*. Until recently, the only two flowering plants, a grass (*Deschampsia antarctica*)

and a small caryophyllaceous plant (*Colobanthus* sp.), recorded were poor and stunted specimens from the South Shetlands and the north-western part of Graham Land. These two species are now recorded from Signy Island which lies on the south of Coronation Island, the largest of the South Orkney group. The previous search by the *Scotia* expedition for these plants on Laurie Island, another island of the group, had proved fruitless. The discovery of a liverwort on Signy Island is another extension of geographical distribution in the Antarctic.

Origin of Lead Ores

THIS problem has been recently discussed in the light of atomic weight evidence by Arthur Holmes (*Econ. Geol.*, 763-782; 1937). The lead dispersed through rocks in minute quantities is called rock-lead; it consists partly of common lead, originally present in the rock material, and partly radiogenic lead, generated in the same rock material by the disintegration of uranium and thorium during geological time (taken as about 2,000 million years). From the available determinations of lead, uranium and thorium in various types of rocks, it is shown: (a) that the average atomic weight of granitic rock-lead should have decreased progressively during geological time from 207.21 at the beginning to 207.14 at the present day; (b) that the average atomic weight of basaltic rock-lead should have similarly decreased from 207.21 to 207.10. The atomic weight of rock-lead concentrated in cotunnite from the 1906 magma of Vesuvius is 207.05, a result which confirms the inference that rock-lead has an atomic weight significantly lower than that of common lead. The atomic weight of common lead, that is, the lead concentrated in ore-deposits, is found to be 207.21 ± 0.01 and—as far back as 1,300 million years—to be independent of the geological age of the ore. It follows that such ore-lead cannot have been derived from granitic or basaltic rocks, or from the sediments formed from such rocks, and that it has no genetic connexion with acid or basic magmas. Ore-lead must, therefore, have ascended from depths below the sialic and basaltic layers of the earth's crust. The view of the late J. W. Gregory that "the source of the ores appears to lie in a zone deeper than that of the ordinary igneous rocks" is thus largely confirmed, so far as lead ores are concerned. The data for peridotites are too few to justify the extension of this generalization to ultrabasic rocks and magmas.

Earthquakes off the Coast of Northern California

THE coastal portion of California is one of the most interesting earthquake regions in the world. This is due to the connexion of many of its earthquakes with the remarkable San Andreas fault that traverses the whole length of the State. As Prof. Byerly points out in a valuable paper (*Bull. Seis. Soc. of America*, 27, 73-96; 1937), recent earthquakes cluster in three segments of the fault, a northern one in the counties of Del Norte and Humboldt, a central one from the Golden Gate to San Luis Obispo county, and a southern one in the Imperial Valley; while the regions of great displacement, such as that in 1906, occupy the intervening portions. The frequent occurrence of earthquakes with their centres at sea off Humboldt County has led to the suggestion that there may be another active portion along a linear extension of the fault beyond Punta Arenas. The greater part of Prof. Byerly's paper is devoted to the

determination by two methods of the epicentres of three earthquakes in 1934, 1935 and 1936. The positions obtained by the methods are in fair agreement. As, however, the distances of the points nearest the continued fault-line are about 23, 15 and 45 miles, the author concludes that there is no real connexion of the earthquakes with movements along the San Andreas fault.

Carbonization of Coal at Low Temperatures

THE Department of Scientific and Industrial Research has published a report issued by the Director of Fuel Research of a test made on the plant of the National Coke and Oil Co., Ltd., at Erith, for carbonizing coal at low temperatures. The process consists in carbonizing a paste of about equal parts of coal and oil in rotary cylindrical retorts, the oil produced by the plant itself serving as vehicle, after removal of spirit. About 15 cwt. of coke was obtained per ton, ranging in size from 4 in. downwards. It was dense, easily ignitable and easy to burn in open fires. About 10 cwt. of this was less than $\frac{1}{2}$ in. and was crushed and briquetted. 8.9 gallons of refined mixed spirit was obtained per ton of coal and, in addition, oil suitable for Diesel engines. Both caking and non-caking coals were carbonized in the plant, the retorts of which were externally heated, and for this purpose all the gas produced in the process is required.

Infra-red Absorption of Hydroxy Compounds near 3μ

MANY compounds containing the hydroxyl group have a sharp absorption band at 2.75μ and another wider band about 3μ , attributed to associated molecules. This association band diminishes on dilution with a non-polar solvent and on increasing temperature. An investigation of these bands for phenol and certain aliphatic and aromatic alcohols in solutions of carbon tetrachloride and other solvents is reported by Drs. J. J. Fox and A. E. Martin (*Proc. Roy. Soc., A*, 162, 419; 1937) and the results are characterized by the same interest, thoroughness and comprehensive treatment which has been a distinctive feature of previous infra-red work carried out in the Government Laboratory. Phenol has been investigated in several solvents, and the intensity of its association band is proportional to the number of molecules not contributing to the shorter wave length band. Equilibrium between single and double molecules is set up at moderate concentrations, and the forces acting between such molecules are considered on the basis of London's theory of intermolecular forces. With chloroform as solvent, the intensity of the association band is reduced to about half the value with carbon tetrachloride. For both solvents association is reduced by increased molecular complexity in the series, PhOH , PhCH_2OH , Ph_2CHOH , Ph_3COH . Factors affecting the locations and intensities of the bands in these compounds are discussed. The effects shown by normal and tertiary butyl alcohols are compared and data for stearyl and cetyl alcohols are given. Influence of structure on the CH vibration bands has also been studied. Aliphatic CH bands for CH , CH_2 , and CH_3 groups have constant intensity for the CH linking in each molecule and it is distributed among the one, two, or three CH linkings attributed respectively to each group; whilst in aromatic alcohols the positions of the CH bands remain unaltered, but relative intensities are not always retained.