

reviewed the occurrence of the eight dihydroflavonols in the plant kingdom: dihydro-kæmpferol and -myricetin occur most frequently. Dihydroflavonols have been synthesized by six methods: oxidation of 2'-hydroxychalcones and flavanones; bromination of flavanone, followed by nucleophilic replacement of halogen; ring-closure of 2'-hydroxy- $\alpha$ -methoxychalcones; treatment of 2'-acetoxychalcone dibromides with silver acetate or alkali; dithionite reduction of flavonols; and reaction of aromatic aldehydes with 2-hydroxyphenacyl chlorides. Under the influence of alkali, dihydroflavonol disproportionates into the flavonol and flavanone, or affords the corresponding 2-benzyl-2-hydroxycoumaran-3-one.

Dr. W. B. Whalley (Organic Chemistry Department, University of Liverpool), discussing the stereochemistry of the chromans and related compounds, dealt with a stimulating application of conformational analysis. In common with King, Dr. Whalley agrees with the assignment to catechin and *epicatechin* of *trans*- and *cis*-structures, respectively, but he produced evidence in favour of fresh conformations with 3( $\alpha$ )-hydroxyl groups for both substances. Conformational analysis has been extended to the 3-hydroxyflavanones, 2-hydroxyisoflavanones and flavan-3:4-diols, and it is evident that Dr. Whalley will elucidate the conformation of the complicated O-ring heterocyclics by application of stereo-specific reactions.

The Society will publish the symposium lectures and discussions in book form, and this should interest all those whose work brings them into contact with polyphenols, tannins and vegetable tannin materials.

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## EAST AFRICAN INDUSTRIAL RESEARCH ORGANIZATION

### REPORT FOR 1954-55

THE East African Industrial Research Organization, which incorporates the East African Industrial Research Board, came into existence on April 1, 1955, and its first annual report\* is a progress report covering the period January 1, 1954-June 30, 1955. The new Organization absorbs the staff of the previous Board, and provision is made for a 50 per cent increase during the next two years. The British Government is contributing, from Colonial Development and Welfare Funds, 75 per cent of the capital expenditure for offices and laboratories and housing, and half the recurrent expenditure during the next two years. The Organization will be responsible to a board, on which the East African Government and the East African High Commission are represented.

The present report summarizes the work in the production of hecogenin from sisal waste, the plant for which has operated successfully since it was officially opened in June 1954. A preliminary report has been issued on the investigation of coffee processing which indicates that there are three stages in drying fermented coffee and that it is desirable to dry-wash the fermented coffee initially as quickly as possible, without using too high a temperature. When the coffee is dry enough to be safe from deterioration, the remaining process may be a slower

\* East African High Commission. East African Industrial Research Organization: Annual Report 1954-55. Pp. ii+17. (Nairobi: East African Industrial Research Organization, 1955.)

removal of moisture in a conditioning bin. Work with dual-fuel engines, using oil and indigenous wood, has shown that producer gas can replace diesel oil in a diesel engine and is utilized as efficiently thermally as the oil. Satisfactory ignition of the gas-air mixture can be achieved with a low proportion of the full-load consumption of oil; at least 70 per cent of the full-load rating of a coupled diesel engine and alternator can be carried on gas, while the governor retains full control of speed, and existing engines can be modified economically on the site.

Chemical engineering research has been concerned with the utilization of natural steam, the production of salt and lime burning; in ceramics a refractory grog has been produced by calcining fine kyanite, bonded into pellets with molasses in a rotary kiln, and also a porous grog by grinding raw kyanite with charcoal, pelleting with molasses and calcining in the laboratory at 1650° C. Other work has been concerned with the production of phosphatic fertilizers and the pelletizing of cetyl alcohol for use in retarding the evaporation of water from dams. For this latter purpose, following work by A. F. C. Cole, who died during the period, apparatus has been devised by which an output of 20 lb. a day has been achieved. The apparatus is described and illustrated in the report.

## CURRENTS THROUGH THE STRAITS OF DOVER

NEARLY a hundred and twenty-five years ago Faraday predicted that electrical potential differences would be set up in sea water, a conducting fluid, by its motion in the Earth's magnetic field. His predictions were verified by measurement of voltages induced on submarine cables. During recent years, oceanographers have begun to use measurements of the voltage differences in sea water as a useful method of studying water transport. In a recent paper (*Phil. Trans. Roy. Soc., A*, 248, 953; 1956) K. F. Bowden has demonstrated the value of the method in his study of the flow through the Straits of Dover. He has taken as his raw material fifteen months of continuous observations of the voltage fluctuations induced on a cable crossing the Straits of Dover, together with four months of similar observations on a cable crossing the southwestern portion of the North Sea. Regular voltage fluctuations, about one volt in amplitude, produced by the tidal currents are a dominant feature of his records. These fluctuations, while serving a useful purpose for calibrating the voltage in terms of the mean flow through the Straits, have to be eliminated to study the more interesting residual currents. The calibration, which depends on the conductivity of the sea bed as well as the sea water, is done empirically. Shorter-period fluctuations produced by magnetic disturbances are eliminated by filters in the measuring equipment and by smoothing of the graphical records.

Prof. Bowden shows that the residual currents, which sometimes run with speeds as high as one and a half knots in either direction, are highly correlated with the local winds and the slope of the sea surface along the Straits. The correlation is also high with the wind system over the southern part of the North Sea and the English Channel, indicating that the surface slope along the Straits is largely a consequence