

THE ONTARIO RESEARCH FOUNDATION

THE report of the Ontario Research Foundation for 1957*, which includes a list of papers published during the year, records a slight excess of income over expenditure—33,958 dollars over an expenditure of 1,248,421 dollars, but the Director in his introductory report refers to the curtailment of basic research because the sum available has remained stationary over the past ten years. Additional support has now been requested from the Ontario Government.

In biochemistry, work on the development of tanning materials from waste sulphite liquor has shown that sole leather can be tanned with a phenol condensate in pilot-scale experiments, and large-scale commercial trials are necessary to determine the economics of the process. By impregnating sole leather with mixtures of synthetic resins and plasticizers its rating on an abrasion test machine was increased by 200 per cent, but the result was not confirmed in wear tests on shoes. An edible spread from Canadian edible oils which could be spread at -10° F. and did not 'oil off' at 100° F. was very satisfactory on pilot plant tests, and very encouraging techniques have been developed for separating amino-acids from commercial protein hydrolysates.

Encouraging growth in sponsored research is reported in the Chemistry Department, and three new fellowships were initiated in the Wood Chemistry Section. Studies of the isopropyl alcohol extract of waste sulphite liquor and the residual aqueous fraction yielded a new tanning material, and a phenolated high-molecular weight lignin fraction was superior in dispersing properties to the quebracho used in lime-base oil-drilling muds and increased the fluidity of wet concrete. A study of the kinetics of crystallization of calcium sulphate dihydrate from supersaturated solutions showed that, after an initial nucleation period, the process followed first-order kinetics, the rate constant depending on the initial degree of supersaturation. Significant differences have been demonstrated in the corrosion resistance of a Watts nickel deposit as a result of various methods of polishing the steel. A complete revision of the paper

* Ontario Research Foundation. Annual Report, 1957. Pp. 35. (Toronto: Ontario Research Foundation, 1958.)

chromatographic techniques reduced the errors in analysing phosphate glasses for structural components to those associated with cutting the chromatogram to separate the polymers.

In the Department of Engineering and Metallurgy three new sponsored fellowships were initiated, including one to study the oxidation of nickel at high temperatures. The study of the fundamental fatigue of metals continued with the view of detecting signs of elementary strain or damage during tensile or fatigue loading. Brittle fatigue is being studied with a special jig developed for the purpose and steels for high-temperature service incorporating non-metallic materials by a new design of creep extensometer. High-strength steels of good tensile properties have been produced by rapid heat-treatment methods. In the Ferrous Metallurgy Section hematite has been converted to magnetite by flash roasting and magnetite reduced to metallic iron in the jet smelter. The Department of Mathematical Statistics examined sampling procedures for the Bureau of Broadcast Measurement, surveyed the fuel consumption of trucks and buses for the Ontario Department of Transport and continued an extensive programme on sizing systems for garments in co-operation with the Textiles Department, where a satisfactory technique has been developed for measuring the modulus of rigidity of a wool fibre immersed in a liquid, which gives a sensitive means of following changes in physical properties caused by chemical processes. A long-term study was completed of methods for stabilizing viscose rayon fabrics against dimensional changes in laundering.

The work of blood parasites of birds continued with promising results, attention being concentrated on two, *Leucocytozoon* and *Haemoproteus*, which invade the red corpuscles, and the data accumulated show that different kinds of birds have distinctly different types of parasite. A microscopic study of the fine sands from samples of horizons from selected soil profiles was started, and observations regarding evaporation from small plots of grass on moist soil were again taken daily at Norman Hills and at Kapuskasing on the Dominion Experimental Farm.

SUPPORT AND DIRECTION OF RESEARCH AT AMERICAN ACADEMIC INSTITUTIONS

IN a symposium on "The Changing Patterns of Academic Research", which had been organized by Sigma Xi, Dr. Lloyd V. Berkner, president of Associated Universities Inc., discussed the support and direction of research at academic institutions in the United States (*Amer. Sci.*, 46, No. 2; June 1958). He first examined the direction and balance of effort that is likely to produce the most significant advances to human knowledge. Research problems tend to be in competition among themselves for support, and a single large research effort may involve funds that could generate a great many research efforts on a smaller scale. In management of research, therefore,

one is faced with advance assessment of the significance of a large effort in contrast to the integrated significance of a number of smaller efforts which that large effort potentially represents. Having defined research as having goals beyond the limits of human knowledge, it is apparent that such decisions in allocation of research-support require a 'crystal ball'.

Berkner arbitrarily divided research activities according to the size of the effort involved as follows: (1) conventional research on an individual scale involving essentially 'string and sealing wax techniques' or corresponding theoretical activity; (2) group research in a particular area or discipline of