

is concerned, however, to improve selection and to make the best possible use of the students who have been selected, so as to reduce the present wastage; about a hundred of the present intake of five hundred freshmen fail to go forward to the second year. In this connexion, Dr. Linstead said the College hopes soon to reintroduce an optional preliminary year which would not demand a knowledge of science and would thus provide a special means of access for the gifted non-scientist. This scheme is related to one invented by Sir Henry Tizard during his rectorship, but the majority of the first-year entry would continue to have had a sound science training at school.

Last year there were 631 full-time postgraduate students, or rather more than a third of the total, and it is intended to raise this proportion to 45 per cent. Most of the postgraduate students are taking advanced courses designed to train technologists of the highest quality. Postgraduate research is a first charge on the College, and Dr. Linstead stressed the proportion of postgraduates from overseas—at present about three hundred from forty-nine centres, mainly in the Commonwealth. Nearly two hundred of the postgraduate students came from posts in industry and in government, and in this connexion Dr. Linstead is less confident about maintaining the supply of postgraduate students, unless maintenance support is forthcoming on an adequate scale.

The College aims to produce engineers and scientists who are at the same time well-educated men and women, and Dr. Linstead thinks that this is being achieved. As regards residence, however, the College is in the worst position of all major colleges or universities in Great Britain, only 8 per cent of its students during 1953–54 being residential. It is proposed to increase this to 16 per cent, or about five hundred students, by the end of the expansion period and also to provide general amenities for all its students on the lines of what is commonly called the Ashby plan. In his address, Dr. Linstead made no specific statement on the building plans, but expressed the opinion that the decisions taken in 1953 were wise and also paid tribute to the co-operation of all concerned, not least of the 1851 Commissioners.

ONTARIO RESEARCH FOUNDATION REPORT FOR 1954

IN his annual report for 1954 to the chairman and governors of the Ontario Research Foundation*, the director of research, Dr. H. B. Speakman, notes that, in spite of a recession in some branches of industry, there was no marked reduction in the demands made on the Foundation but rather an increase in developmental work. The Biochemistry Department was very active, work under the Rice Mills Fellowship centring largely on the development of a new milling principle designed to reduce drastically the amount of broken rice that is normal with present equipment. In the utilization of municipal waste, progress has been made in partial conversion into sugars such as xylose and certain volatile organic acids. In a fundamental study of the continuous production of protein by fermentation of yeast, it has been established that there is practically no waste

* Ontario Research Foundation. Annual Report, 1954. Pp. 30 + 4 plates. (Toronto: Ontario Research Foundation, 1955.)

of sugar and that a higher percentage yield of yeast on the sugar consumed is obtained by feeding sugar at low rather than at higher concentrations. The basic study of the deterioration in flavour of edible oils continued, and substantial progress was made in the group fellowship working on the evaluation of new tanning materials.

In the Department of Chemistry, the balance between basic research, long-term sponsored fellowship projects and short-term investigations submitted by smaller industrial units is emphasized. Filter-paper chromatographic techniques have demonstrated that normal sodium phosphate glasses, rapidly quenched from the molten state and dissolved in water, show only linear polymers with a reproducible distribution of molecular weight, depending only on the sodium/phosphorus ratio, and the technique has been improved so that small amounts of ring or linear polymers can be determined in the presence of large amounts of the other kind. Two surveys of air pollution, at Maitland and Millhaven, were concluded, and the laboratory is developing new apparatus and methods for the accurate determination of air contaminants. A study of the production of grafted polymers continued, and one of methods for the production of alkyd resins has indicated that straight-chain alkane sulphonic acids may be suitable catalysts in the condensation. Definite progress is reported in the study of the chemistry of waste sulphite liquors; a number of lignin compounds have been examined as dispersing agents for use in drilling oil-wells, while others may be useful in treating boiler feed water to prevent scaling, and a condensate of lignin and phenolic compounds was found to possess tanning properties.

In the Department of Engineering and Metallurgy, investigations on the production and properties of steel of controlled density have led to striking improvements in the product, and the study of the causes and the detection of faults in wire ropes has led to some progress in the design of an instrument which can be used at the mines under operating conditions.

The Department of Parasitology continued its work on tapeworms found in carnivorous animals as well as a survey of animals infected with the larval or adult forms of the parasites. Work on flies of the genus *Protocalliphora* continued, as well as the investigation of the filariid nematodes in birds; and the extensive researches on two species of flukes of the genus *Alaria*, occurring in foxes, are almost complete. Further data on the epizootiology, transmission and development of *Leucocytozoon* in ducks confirmed the conclusion that asexual parasites occur in the blood of infected ducks during their cycle of development.

The Department of Physiography finished the mapping between North Bay and Sault Ste. Marie and made differential thermal and X-ray analyses on the clay, less than 1 micron in diameter, from all main types of glacial till in southern Ontario. A new installation for evapo-transpiration studies was set up at Kapuskasing Experimental Station, and an unbroken daily record was secured for the summer months; a study of soybean growth and development was commenced on five varieties with a range of maturity.

In the Textiles Department, besides research on nylon, the optimum temperature at which fabrics from different synthetic fibres can be ironed has been studied, as well as factors affecting the photochemical degradation of viscose rayon.