Ontario Research Foundation

In his annual report for 1947 to the chairman and governors of Ontario Research Foundation (43 Queens Park, Toronto 5), the Director of Research refers to the virtual completion of the extension of the main building and to a considerable expansion of the scientific and administrative staff. During the year a new Industrial Research Services Department was established particularly to help the numerous small industrial units of the Province, and the Department is expected to handle about two thousand inquiries a year. The Chemistry Department prepared a comprehensive report for the Minister of Mines on the processes in operation for the removal of sulphur gases from smelter fumes ; fellowships were concerned with emulsion inks, waxes and transparent paper, sulphite liquor, the manufacture of carboxymethylcellulose, and the polymerization systems butadiene – styrene, butadiene – isoprene and isoprene – styrene. In the Department of Engineering and Metallurgy, sixty-seven investigations were undertaken on behalf of various firms, and fellowships on the influence of chemical composition and physical structure of forged steel balls and their resistance to wear during grinding, and on wire rope, and work on the economics of ferrous smelting in Ontario continued. The Department of Parasitology carried further its work on the life-histories and the factors influencing the activity of black flies and leucocytozoon infection in ruffed grouse and other birds, especially domestic ducklings. Several drugs used successfully in combating malarial infection in man gave negative results on infected birds.

The Physiography Department is completing a study of the geological history of southern Ontario, has co-operated with the Department of Agriculture in a chemical investigation of pasture grasses, and has assisted the Meteorological Service of Canada in equipping and supervising twelve new weather stations at selected points. The work of the Textiles Department has been handicapped by shortage of staff and accommodation ; but the Courtaulds (Canada) Ltd. fellowship has continued its work on dye formulæ and methods of finishing and the development of consumer standards, while under the Canadian Industries Ltd. fellowship, in addition to developing fabric construction to meet the demands of the consumer, the behaviour of the nylon fibre under different physical and chemical conditions is being investigated. Some progress is also reported by the Department in investigations on the transmission of water vapour through fabrics, the physical properties of nylon and the factors involved in removing oils used as lubricants after processing textile materials.

Barton's Ruling Engine

In the possession of the Science Museum, London, there are six beautifully engraved buttons, classified as diffraction gratings, which are still regarded as masterpieces. They were the work of Sir John Barton, deputy comptroller of the Royal Mint in the early part of the nineteenth century, about whom little is known personally, but who must have been an ingenious inventor and capable engineer, for in 1806 he invented a differential screw measuring instrument capable of measuring to 10^{-6} inch. In 1822 he was granted a patent for his engraved buttons. After Sir John's death the ruling engine on which the buttons had been ruled passed into the possession of his grandson and then to his great-grandson, Mr. R. V. Barton, who, in 1925, presented the engine, together with some handwritten notes of his father's concerning the working of the machine, to the Science Museum. The above details are given in a valuable and interesting illustrated article entitled "A Ruling Engine Used by Sir John Barton—and its Products" which P. Grodzinski, the technical editor of the *Industrial Diamond Review*, contributes to the February number of that journal. It would appear that this is the first authoritative description.

From his inspection of the machine and relevant documents, Grodzinski concludes that the engine was not Barton's own design but is probably a Harrison straight-line engine. The machine itself is made of brass except for the screws, spindles and pivots, which are steel. The tools are of well-ground steel; but diamond tools, generally octahedral Brazilian stones with curved edges, are provided. Six engraving tools work on six specimens simultaneously, and the method of movement of the tools is ingenious, kinematically sound, and simple. It is fully described in the article, with clear diagrams and photographs. The high precision of division and the engraving of six specimens at once are the special merits of this machine.

Tables of Uranus for the Period 4000 B.C.–A.D. 3000

MM. M. Kamieński and R. Walter have a paper with this title (*Extrait Bull. de l'Acad. Polon. Sci. et Lettres*, 1947) which provides a simple and rapid method for finding the heliocentric co-ordinates of Uranus, the perturbations of the other planets having been taken into consideration in the compilation of the Tables. An explanation of the method for applying the Tables is given, and an accuracy of about 1′ is obtainable, which is sufficient in a great many cases. The Tables should prove very useful, especially in investigating the influence of Uranus on the motions of comets in ancient times, though, of course, they will prove helpful in many other cases as well. Special investigations were made of the long-period inequalities of Uranus, and it seems that these, namely, those of the mean longitude, the eccentric angle, longitude of perihelion, and semi-major axis, can be approximately represented by a Fourier interpolation formula. These inequalities are so regular that the corresponding formula for perturbations in longitude can be extended even beyond the limits of the Table, for the period 6500 B.C.–A.D. 5500, with a mean error of less than 1′.

Conference on Experimental Biology, Peiping

More than one hundred teachers, research workers and senior students in biology of the universities and institutions of Peiping met in the new campus of the College of Agriculture of the National Tsinghua University during July 17–25. The instigator of the conference was Dean P. S. Tang, ably and generously assisted by his colleagues of the College. The campus is next to the famous Summer Palace which was freely accessible to the members during this conference, and one of the most enjoyable parts was the boating at night on the lake inside the Palace. Preliminary meetings consisted of lectures on the place of biology in ancient Chinese history, and on the teaching methods of biology in colleges and high schools. So many contributed valuable suggestions to the latter subject that a special committee was appointed to explore further this important and fertile field. The regular programme consisted of symposia and lectures on recent advances in genetics, hormones, nutrition, viruses and rickettsia,