

The Physical Metallurgy Division aids in the growth of the metal industries through the development of new alloys, new manufacturing techniques, and new applications; in the improvement of present practices in metal fabrication industries; and in the more effective use of metallic products by the consumer. Close co-operation is maintained with the National Research Council, particularly in the metallurgical work associated with the development of the atomic energy project at Chalk River, Ont.

The Mineral Resources Division—through the wealth of data amassed over many years on mineral properties and operating mines, mineral exploration and development, processing and production, new research development, uses and marketing of minerals and their products, world sources of minerals and new discoveries, and on mining laws and taxation—provides a general mineral information service that is freely used by government departments, mining and allied industries, and others interested in mining or its significance in the Canadian economy. A mineral resources index inventory has been established of all known occurrences and mines, both active and potential, special attention being given to occurrences of those minerals in which Canada is deficient.

The Division makes specific economic studies of various phases of the mining industry. It gives technical advice as required for the administration of the Emergency Gold Mining Assistance Act and prepares reports, on request, to aid the administration also of such matters as: tax exemptions on new mining properties; tax deductions as an encouragement to prospecting for base metals, other minerals and petroleum; and tax allowances for the drilling of deep-test wells for oil in unproven fields.

*Surveys and Mapping Branch.*—The Surveys and Mapping Branch provides the base maps required for use in the development of Canada's natural resources, produces and distributes all Canadian aids to navigation, is responsible for all legal surveys of federal lands, and provides a national system of levelling and precision surveys for use as geodetic control by federal, provincial and private agencies.

New developments in mapping equipment and new techniques in mapping practice make it possible to increase the output of maps and charts, and to cover areas, such as northern Yukon Territory where lack of transport facilities and shortness of field season previously had made the cost of mapping prohibitive.

The Geodetic Survey provides the original surveys which form the framework or basic control for mapping throughout Canada and for engineering and surveying projects related to natural resources development. The control is provided by establishing survey stations at fairly regular intervals across Canada. These stations are marked by permanent monuments whose latitudes, longitudes and elevations above mean sea level are determined with a high degree of accuracy.

The determination of geographical position by astronomical observations for mapping purposes in northern areas is being superseded by Shoran trilateration in which the recently developed adaptation of radar is meeting with success. During the 1951 and 1952 field seasons geodetic control was thus extended to the Far North many years in advance of the time that would have been required by conventional methods.

The Topographical Survey provides base topographical maps that show all significant natural and artificial features fundamental to the study and economic development of mineral and other natural resources. The Topographical Mapping