

About the turn of the century, mining began to assume an important role in the economy of the country. The far northern parts of Canada were generally inaccessible for mining, and geological work was therefore directed to detailed studies that would be of more immediate assistance to the development of a mining industry. About this time, too, the Ontario and Quebec Departments of Mines began geological studies. These are still expanding as are several other provincial organizations that came into being in the 1930's and 1940's. The turn of the century also saw increasing specializations, so that topographers, land surveyors, ethnologists and biologists were engaged, thus freeing geologists of all duties except their specialities. Today the Geological Survey of Canada is concerned only with geological studies.

In the first hundred years the Geological Survey was almost solely concerned with mapping but, immediately following World War II, laboratory investigations became of increasing importance and no doubt will become still more important. Nevertheless, the first priority of the Survey is to complete as soon as possible the reconnaissance geological mapping of Canada, an area of more than 3,800,000 sq. miles, of which only slightly more than half has so far been examined. Reconnaissance, or exploratory, mapping results in maps published on a scale of one inch to eight miles or four miles. Selected parts of such map-areas are then studied on a scale of one inch to one mile in those regions where the geological conditions appear economically worthwhile. Later, where important mineral deposits are known or important scientific data may be obtained, smaller areas are mapped on a scale of one inch to 1,000 feet, or even 200 feet. The Survey is essentially the only organization that undertakes mapping on reconnaissance scales, although some provincial governments have done so and certain mining exploration companies do so for their own information in geologically unmapped areas.

Geological maps are the basic tool for all geological investigations, for they provide the fundamental data on which all the studies depend. However, the immediate economic use of areal geological maps prepared by the Geological Survey of Canada and the provincial geological surveys is to guide prospectors by indicating the extension of rocks or structures already known to contain valuable mineral deposits. They are also the only means of evaluating the potential resources of unprospected areas which in the future may become accessible by railway or road, and they provide engineering data in rapidly expanding metropolitan areas. In many instances, however, no immediate economic use of a map may be foreseen because the area is inaccessible and because no valuable mineral deposits are known in it. But inaccessibility is relative, and as transportation improves even the most remote areas become of interest to the prospector. Demands for minerals also change and a mineral that is valueless today may be eagerly sought tomorrow. Thus, a geological map for many years may be of scientific interest only and then suddenly become of paramount economic interest. A recent example was the geological map of the Blind River area of Ontario, published by the Geological Survey in 1925. At that time uranium was not considered a valuable mineral nor was it known to occur in this area but almost thirty years later, in 1952, astute application of geological theory led to the realization that a particular rock unit shown on this map might hold deposits of uranium. The result was extensive staking of mining claims guided by this old map, and by 1955 a major new mining camp was established which now has the largest proved reserve of uranium ore in the world and which, in 1959, produced uranium precipitates valued at an estimated \$242,000,000. The Blind River map demonstrates that geological maps should be available in advance of demand. Geological mapping, if started after a major mineral discovery, cannot keep pace with needs, and large sums may be wasted through inefficient planning, prospecting and exploration.

Up to 1952, after 110 years of mapping, only about 1,000,000 sq. miles or slightly more than one-quarter of the land area of Canada had been geologically mapped on any scale whatsoever, and much of this mapping was not up to modern standards since it dated back to the old exploration surveys that were confined to navigable streams, shorelines of lakes, and mountain trails. Systematic mapping had gained considerable impetus in the 1930's