

the responsibility of compiling topographical, geological and aeromagnetic maps, aeronautical and hydrographic charts, electoral maps and such specialized maps as those that appear in the *Canada Air Pilot*.

The Department's mapping policy is to provide as soon as possible complete topographical coverage of all of Canada on a scale of approximately 1 inch to 4 miles and coverage of the settled and developed parts on a scale of approximately 1 inch to 1 mile; geologically, to provide maps of all land areas on scales of 1 inch to 4, 8, or 16 miles.

At mid-1955 over 50 p.c. of Canada excluding the Arctic Islands had been covered topographically by published maps or maps in hand on the 4 mile scale, and almost 25 p.c. at the more detailed scale. This mapping is being carried out by the Department's Surveys and Mapping Branch. In its geological mapping the Department, through the Geological Survey of Canada, is giving top priority to reconnaissance work and to the development of more rapid reconnaissance methods. It is doing this to provide within the foreseeable future vital geological data on Canada's vast northland for use by the mineral industry and those concerned with the planning and guidance of Canada's economic development. The Department's Geographical Branch meanwhile is carrying out surveys of the physical geography of northern regions and of the economic and social geography of selected areas in southern Canada.

#### SURVEY METHODS

The mapping of Canada presents many challenges to federal mapmakers, the chief being the ever present problems of great distances and of areas that are practically impossible of access. In meeting these challenges the Department has been greatly assisted in recent years by the use of the aeroplane and the helicopter, of air photography and various modern devices such as shoran trilateration—an electronic method of measuring distance—and by the development of modern photogrammetric plotting instruments for the plotting and compilation of maps from air photos.

*Air Transport.*—The Department uses the aeroplane to carry men and supplies to distant points and in its application of shoran trilateration. The helicopter is being used more and more in areas which, because of muskeg or mountains, are sometimes difficult or impossible to survey or map by ground parties or other methods. It is also used for geological reconnaissance mapping in Canada's northland and in mountainous areas to speed up the pace of mapping.

Since World War II aerial photography has become a necessity in mapping: in fact no mapping is attempted today without air photography. Much of the pioneer work in using and adapting aerial photography to mapping in Canada was done by the Department's Topographical Survey. Today aerial photographs are taken for the Department mostly by contract with commercial companies.

*Air Photography.*—The use of air photography has made the mapping of the Canadian north on a 1 inch to 4 mile scale practicable. During World War II the north was covered by trimetrogon pictures which consist of one vertical and two lateral oblique photographs taken at the same time. These pictures allowed the preparation of general maps on the scale of 1 inch to 8 miles. Such maps were satisfactory for air navigation and for reconnaissance investigations of the geology and mineral deposits, but were too limited in accuracy for more detailed studies. Consequently all areas that were covered in a preliminary way by trimetrogon photographs are now gradually being covered by vertical photography. Much of the flying is done at about 30,000 feet to give wider coverage; lower flying is required in areas where greater topographic detail is required for special purposes.