Shoran and Other Methods.—Use of shoran trilateration to measure distance has greatly facilitated the fixing of triangulation nets of points—more simply, the setting up of the framework of control for mapping—throughout the country. This control framework is necessary in order to place map sheets in their proper relationship to one another and in their proper place with reference to longitude and latitude. Moreover the elevations of these points must be determined with precision so that the surveyed altitudes of the points have true relations to one another and to the datum of sea level. Before the advent of shoran trilateration the Department of Mines and Technical Surveys erected signalling towers and by a rather slow process of observing angles between stations, built up a triangulation net in which all points of observations were accurately determined. Since World War II the Department has replaced this older method, in the north particularly, by shoran trilateration by which it is possible to measure lines 300 miles in length within an error of 20 feet.

Canada's work in shoran trilateration, which is done by the Department's Geodetic Survey, has become a model for geodetic work in all undeveloped parts of the world. Its use has allowed Canada in a few years to extend a triangulation net for accurate mapping from southern Manitoba to the Arctic and across the Arctic Islands to Labrador, where it is being joined to a net from the St. Lawrence. Because of the remoteness and isolation of most of the areas covered much of this work would have been impossible by the older methods. Shoran has also been applied to the location in relation to the ground stations of the position, at the instant of exposure, of the aeroplane taking air photographs. The establishment of the positions along certain control lines by this means provides the necessary horizontal control for maps and air charts of the scale required throughout large areas of the north.

Another electronic measuring device, the radar altimeter, measures the approximate distance from an aeroplane to the surface of the ground. The idea for this device originated in the Department of Mines and Technical Surveys and was developed by the Department with the co-operation of the National Research Council. Radar altimetry is being used in contouring air charts and is being developed for use in larger scale mapping.

Great progress has been made in using various types of plotting instruments to transfer information from air photos to a map surface and the older methods of plotting topography in the field by the use of the plane table have wholly disappeared. The use of the elaborate present day photogrammetry equipment has effected an appreciable saving both in time and cost in the field, particularly in view of the short field season and the transportation difficulties encountered in many areas in Canada, and has resulted in an increased production of maps.

THE SURVEYS AND MAPPING BRANCH

The Surveys and Mapping Branch of the Department of Mines and Technical Surveys placed 73 parties in the field in 1955: 18 of these came from the *Geodetic Survey of Canada* which provides the framework of control for all mapping carried out in Canada; 25 were from the *Topographical Survey* which surveys Canada's actual physical features and maps them with the aid of aerial photographs; 12 were from the *Legal Surveys and Aeronautical Charts Division* which carries out all land boundary surveys on Dominion Lands and produces all the necessary aeronautical charts to meet civilian and defence needs—and electoral maps as well; 18 were from the *Canadian Hydrographic Service* which charts Canada's coastal and inland waters, measures tidal currents and levels and issues charts and tables for shipping.