

extended over long distances accumulative errors crept in, and were discovered only when one survey joined other surveys started from other points. The only way in which these errors can be avoided is to have them checked at intervals by a survey of superior accuracy, and this is one of the functions of the Geodetic Survey of Canada.

10.—The Topographical Survey.

The Topographical Survey, Department of the Interior, is engaged in publishing the national topographic series of maps of Canada. The information shown on these map sheets is obtained from original surveys, supplemented by material from all other available sources. The maps are generally published on scales of one mile, two miles, and four miles to the inch, the scale depending on the amount of available information to be depicted and also on the economic possibilities of the area mapped.

In its earliest history this branch had control of the survey and administration of all the resources of the Dominion lands, but as the work increased other branches were formed in the Department to take over the administration of Dominion lands and the development of special natural resources, while the Topographical Survey concentrated on surveys and the publication of maps and plans. Up to the outbreak of the Great War the demand for land surveys was so insistent that little attention could be devoted to the publication of topographic maps, but all the time a control system for those maps was being laid down in the system of survey of Dominion lands, whereby an area of 180,000,000 acres of land has been surveyed. Since that time good progress has been made in the publication of topographic maps, and the work has extended to the eastern as well as the western provinces. Since 1921 the science of map making from aerial photographs has been developed by officials of the branch and is now largely used in conjunction with ground methods for the production of topographic maps.

In addition to the publication of topographic maps and the cadastral survey of Dominion lands, other activities of the branch include photographic surveys of mountainous areas, control traverse surveys of waterway systems in the newer parts of the country, exploration surveys in the northern parts of Canada, the delimitation of interprovincial boundaries wherever Dominion lands are affected, surveys of mineral claims, timber berths and townsites, wherever Dominion interests are concerned, the classification of land for settlement purposes, and magnetic surveys for determining the declination of the magnetic needle and the march of the compass for the whole country. There is also maintained a physical testing laboratory for standardizing measures of length, for testing thermometers, optical instruments, and other instruments of precision used in surveying or engineering work.

11.—The Dominion Observatories.

The Dominion Observatory, Ottawa, was founded in 1902, and completed and organized in 1905 as a branch of the Department of the Interior. It was an outgrowth of the astronomical surveys of the Department, which began in 1884 with the survey of the Railway Belt in British Columbia, continued later in the form of field latitude and longitude determinations for mapping purposes and in connection with the survey of international boundaries. Dr. W. F. King, made Chief Astron-