

made up as follows: Cross Lake, 39; Cedar Lake, 425, and Moose Lake, 513 square miles. While there might be a possibility of storage on these lakes, investigations are at present being made as to the reclamation of low lands in the vicinity of Cedar Lake through the lowering of the latter, which if carried out would forestall storage possibilities. Investigation is also being made as to the storage possibilities in the headwaters of the Saskatchewan River.

Making the assumption that the flow of the winter months from October 1st, 1913, to April 1st, 1914, would be similar to the same period during 1912-1913, mean curve studies (See Fig. 1) show that a storage of 305 billions of cubic feet would be necessary for a uniform flow of 32,000 second-feet. A 1-foot storage on Cross, Cedar and Moose Lakes would give approximately 27 billion cubic feet, indicating that a storage slightly over 10 feet would be necessary to create a uniform flow for a period similar to that found year ending September 30th, 1913.

Water Power.—An estimate of the power available at the three rapids, as indicated in Fig. 2, is given below. The power available has been based on a 80% efficiency and is also computed, 1st, for an estimated minimum flow of 5,000 second-feet, and 2nd, for a flow of 34,000 second-feet, this being the lowest monthly mean flow for the 6 highest months of the year ending September 30th, 1913, and extending from April to September, and the power as indicated refers only to this period.

No estimate has been made as to the additional power available during periods of low flow through any storage system:—

Estimated Horse-power on 80% Efficiency.

Possible power site.	Head in ft.	Minimum flow 5,000 sec.-ft.	Period 6 mos. April-Sept. 34,000 sec.-ft.
Demi Charge ..	15	6,808 h.p.	46,289 h.p.
Red Rock	15	6,808 h.p.	46,289 h.p.
Grand Rapids ..	80	36,305 h.p.	246,877 h.p.

Mayor Curley of Boston is advocating the consideration of the erection of a municipal asphalt and bitulithic paving plant, pointing out the significance of the fact that the Central Construction Company, which recently installed a plant for paving work, was the lowest bidder on work recently advertised by 10 per cent., bidding against one of the largest firms in the world.

In co-operation with Connecticut's plan for developing New London as an ocean port the United States War Department on January 19th recommended to Congress a channel 33 feet deep at mean low water and 600 feet wide, at an estimated cost of \$330,000. The department recommended a first appropriation of \$170,000 and a second of \$160,000 to complete the work in two years, conditioned upon assurances that the State will carry out its terminal plans, for which it has already appropriated \$1,000,000.

It has been reported at Buffalo that the Legislature proposes making an appropriation of \$30,000 to cover the expense of a commission of 15 citizens who shall be known as the Peace Centenary Commission. The idea of the commission is to get up a plan for proper celebration of the 100 years' peace between the United States and other countries, barring Mexico. The project contemplated is the erection of a bridge which will connect Fort Erie and the Canadian border that shall be sufficiently large to accommodate the great traffic certain to use it.

THE DETERMINATION OF THE MAGNETIC DECLINATION, DIP AND TOTAL FORCE IN WESTERN CANADA.

ALTHOUGH the compass is not used in running lines on Dominion land surveys, it is a valuable accessory, especially in unexplored parts of the country.

Where no line of definite bearing is available, it may be used advantageously as a finder of Polaris in daylight observations for azimuth. To accomplish this, however, a knowledge of the local magnetic declination is necessary; in other words, one must know within a reasonable degree of accuracy the angular interval between magnetic north and astronomic north.

The Topographical Surveys Branch, Department of the Interior published, in conjunction with the latest report of the Surveyor-General of Dominion Lands, a description of the determination of the magnetic declination, dip and total force in Western Canada, written by D. E. Chartrand, B.Sc., and reproduced in part as follows:—

The accurate determination of the magnetic elements in western Canada dates as far back as the year 1842, when Lieut. J. H. Lefroy, under the direction of the Royal Society, made a magnetic survey of that portion of the country. Magnetic observations were taken in the year 1887 by the Topographical Surveys Branch, but nothing further to any extent was done by it until 1908, when its Dominion land surveyors were instructed to observe the magnetic declination during the course of their surveys.

An isogonic map, on a very small scale, was published in 1904, chiefly from data obtained from Lefroy's survey and the 1887 observations of this Branch. Some information along the international boundary and around the Great Lakes was obtained from the United States Coast and Geodetic Survey.

In 1911 an isogonic map, on a very small scale, of that portion of Canada south of the 54th parallel of latitude was prepared and published in two sections, one for eastern Canada and the other for the western provinces. The declinations used for the western section were derived from the observations of this Branch. The sources of information for the compilation of the eastern section were: the Director of the Meteorological Service at Toronto, the British Admiralty charts, and the United States Coast and Geodetic Survey.

Area Covered.—As the survey operations under this Branch are confined entirely to the lands under the control of the Dominion government, the stations occupied since 1908 are limited to the provinces of Manitoba, Saskatchewan, Alberta and British Columbia. The districts where meridian, base line and subdivision surveys have been in operation since that date have been dotted with stations for the magnetic declination. A special effort has been made to gather magnetic data from the settled districts by means of travelling parties employed on miscellaneous surveys. These surveys generally cover a wide stretch of country and provide the only means now at our disposal of observing the magnetic elements in the settled parts of western Canada.

Compass Used for Declination.—The determination of the magnetic declination is made by means of a trough compass attached to the standards of the transit theodolite used on the Dominion land surveys. The needle is made as light as possible in order to reduce friction on the pivot to a minimum. The graduation of the end blocks consists of a single fine line, and readings are made on both ends of the needle. The range of readings of a first-class needle, well balanced, and in the hands