

others in the Department of Railways and Canals. Wherever surveys of townships or Indian Reserves have been made by the Dominion Lands Branch, these surveys are marked by full lines. The old locations of the Canadian Pacific Railway, both north of the Duck Mountain and south of the Riding Mountain, have furnished valuable lines through the country. For the rest, the topography is laid down from odometer and track-surveys made by ourselves, frequently checked by latitudes taken with a brass sextant of eight-inch arc reading to 10". The contour lines are laid down from the heights given on the two railway-surveys just mentioned, as well as from numerous heights obtained from observations made with a mercurial barometer and two aneroids, compared with the readings taken thrice daily from the standard barometer at Minnedosa. The height of the standard barometer at Minnedosa is 1689 feet, a height twenty-four feet higher than that given by the railway profiles, an error of this amount having been found by Mr. Warren Upham to have been made in connecting the surveys east of the Red River with those to the west of it.

Extent of country mapped.

The map as now published embraces an area of 12,000 square miles, but of this, Lake Winnipegosis is merely sketched in from former surveys to show the discharges of the various streams, and the Porcupine Mountain, in the north-west corner of the map is as yet unexplored. This leaves an area of 8,500 square miles, or 5,440,000 acres, a tract larger than that of the State of Massachusetts, which has been more or less carefully examined. It embraces Duck and part of Riding Mountains, with the included and surrounding valleys and the more level country east of these mountains, lying between them and lakes Winnipegosis and Dauphin. It is drained on the north by Swan River, which flows north-eastward through Swan Lake into Lake Winnipegosis, its main tributaries being the Bear's Head, Favell, Rolling and Sinclair rivers, flowing northward from the north face of the Duck Mountain. On the west, it is drained by the Assiniboine, with its tributaries Little-Boggy and Big-Boggy creeks and Shell River. On the south, some of the small upper tributaries of Bird-tail Creek drain a limited area in the Riding Mountains. On the east, Turtle, Ochre, Vermilion, Wilson and Valley rivers pour their waters into Lake Dauphin, flowing across the fertile plain south and west of this lake. Fork, Pine and Duck rivers flow from the face of Duck Mountain, the former into Mossy River and the latter into Lake Winnipegosis.

Drainage

General physical features.

In its general physical features it presents very great diversity of character. The mountains, or rather the one mountain cut in twain by the great depression of Valley River, cross the country in a north-north-westerly direction, forming a high, rugged ridge rising in different places from thirteen to nineteen hundred feet above Lake Winni-