

Bundle 51 # 11

GLACIATION OF BRITISH COLUMBIA.

[*Extracted from the* GEOLOGICAL MAGAZINE, August, 1889.]

TRÜBNER & Co., 57 and 59, Ludgate Hill, London.

The first part of the book is devoted to a general history of the United States from its discovery by Columbus in 1492 to the present time. It covers the early years of settlement, the struggle for independence, and the formation of the Constitution.

The second part of the book is devoted to a detailed history of the United States from the year 1789 to the present time. It covers the early years of the Republic, the struggle for the abolition of slavery, and the Civil War.

The third part of the book is devoted to a detailed history of the United States from the year 1865 to the present time. It covers the Reconstruction period, the Gilded Age, and the Progressive Era.

The fourth part of the book is devoted to a detailed history of the United States from the year 1914 to the present time. It covers the First World War, the Roaring Twenties, and the Great Depression.

The fifth part of the book is devoted to a detailed history of the United States from the year 1945 to the present time. It covers the Second World War, the Cold War, and the Vietnam War.

The sixth part of the book is devoted to a detailed history of the United States from the year 1970 to the present time. It covers the Watergate scandal, the Vietnam War, and the current political situation.

GLACIATION OF HIGH POINTS IN THE SOUTHERN INTERIOR OF
BRITISH COLUMBIA.

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IN an article published in the *GEOLOGICAL MAGAZINE* for August, 1888, an outline was presented of some facts resulting from recent investigations on the glaciation of British Columbia and adjacent regions, bearing more particularly on the flow of ice in a northerly direction brought to light by explorations in the Yukon district, but touching also on the south-eastern extension of the great western glacier-mass of the continent, which I have proposed to name the Cordilleran glacier. Field-work carried out by me during the summer of 1888 has resulted in the accumulation of many new facts relating to the southern part of the area, which was at one time covered by the Cordilleran glacier, from which it would appear that it may ultimately be possible not only to trace the various stages in the recession of the main front of the great confluent glacier beneath which the interior or plateau region of British Columbia was buried, but even to follow the later stages of its decline as it became broken up into numerous local glaciers confined to the valleys of the several mountain ranges which limit the plateau.

As, however, work is to be continued in the same southern part of British Columbia during the present summer, it is not at present intended to discuss these general features, but merely to call attention to the noteworthy heights at which glaciation has now been found to occur on some of the higher parts of the Interior Plateau and its mountains, and to the great mass thereby indicated for the southern part of the Cordilleran glacier.

The highest point on which I had previously noted the marks of

glacier ice in this region was Iron Mountain, at the junction of the Nicola and Coldwater rivers, the summit of which is 3500 feet above the neighbouring river valleys, or 5280 feet above the sea.¹ Evidence of the same kind—all implying the movement of a great glacier-mass entirely independent of the local features of the country—has now been discovered on several still higher points, the most elevated being Tod Mountain, situated 25 miles north-east of Kamloops, and rising 7200 feet above the sea. The actual summit of this mountain is, however, but lightly glaciated, and in this circumstance and the apparent influence which local irregularities of rock-surface have had upon the direction of striation, evidence seems to be afforded that the summit was never deeply covered by the great glacier. This conclusion is further borne out by the fact that a few hundred feet only lower down the same mountain, the glaciation is much stronger, and fluted rock-surfaces and other easily recognized marks of heavy glacier ice are observed. Tod Mountain is the culminating point of a region surrounded on three sides by the wide and important valleys of the North and South Thompson Rivers and Adams Lake, the nearest points comparable in elevation to it being in the Gold Range, at a distance of over 25 miles in a north-easterly direction, or nearly at right angles to the direction of the glaciation. There can be no question as to the fact that the glaciation met with at this place is due to the general or Cordilleran glacier, and it is thus evident that at one period the glacier ice must have attained a thickness of about 6000 feet in the valleys above named, while it covered even the higher portions of the irregular plateau of this part of the interior of British Columbia to a depth of at least 2000 to 3000 feet. When it is taken into consideration that evidence has already been obtained of the south-easterly motion of this part of the Cordilleran glacier for a distance of at least 300 miles to the north-west of Tod Mountain, it is apparent that the mass of *névé-ice* accumulated over the country north of the 55th parallel of latitude from which the southerly- and northerly-flowing extensions of the great glacier were fed must have been enormous.

As previously stated by me, the condition of this part of the Cordilleran region, at the period of its maximum glaciation, must have been clearly analogous to that of Greenland at the present day, save that in the case of British Columbia it has been impossible for any large proportion of the ice to escape to the eastward or to the westward because of the bordering mountain ranges.

Some of the principal new localities at which distinct evidence of the passage of the Cordilleran glacier over the southern part of British Columbia were observed during the summer of 1888, with the approximate position and height of each and the direction of motion indicated, are given below. The variation in direction found in comparing even the highest stations is generally explicable on consideration of the influence of adjacent important orographic features. A number of observations made at points somewhat lower than these here quoted show, as might be anticipated, an increasing

¹ Quart. Journ. Geol. Soc. vol. xxxiv. p. 272.

