

local differences to be worked out in detail, but others already recorded have a similar meaning.

When the highest terraces and shingle beds were formed upon the Porcupines there is further evidence to show that in the body of water of which these formed the shores a pretty definite current must have existed. Some distance to the eastward, this probably flowed southward or south-westward, but where it reached the Rocky Springs plateau the appearances indicate that it was moving nearly parallel to the border of the glaciated region in Montana,\* west or to the north of west; thence it impinged upon the base of the Rocky mountains and was deflected to a northeasterly direction, a circumstance shown by the occurrence, elsewhere referred to, of pebbles of the locally developed greenstone of the mountains in some abundance on the higher parts of the Porcupine hills. Such a current may reasonably be accounted for by the prevailing direction of the winds at the time and season of the driftage of the ice.

In the case of these high-level drifts of the Porcupines the deposit of eastern and western material must have been contemporaneous. Both find their upper level at the same plane, and there are no antecedent deposits at such a height from which either can have been derived. At this time, moreover, some deposit must have been in course of formation beneath the surrounding deeper waters across which the debris-bearing ice floated, and, because of the melting of the ice and other accidents, this could not have been otherwise than a notably stony one. As already stated, this is believed to be represented by the upper boulder-clay, the silts overlying it, or in part by both.

The terracing of the Porcupines is not so pronounced as to require the long presence of the water-margin at any of the higher levels, but the well rounded character of most of the stones, particularly those from the mountains, is such as to imply prolonged attrition. The same character is notable in the vast majority of the stones included in the boulder-clays. It seems, in fact, probable that during the winter months at this period a massive ice-foot formed along the abrupt base of the mountains, upon which, in the spring, gravels from flooded streams were often discharged, while large angular limestone blocks from cliff-falls also lodged upon it in some localities. When in summer this ice broke away it would carry with it the load thus acquired.

That the glaciers which at the period of the Saskatchewan gravels protruded from the mountains must at this time have shrunk back within the range, in the southern part of the district at least, is shown by the stranding of Laurentian boulders upon the old moraines of these glaciers close up to the foot of the mountains. It is possible that the Bow Valley

\* Report of Progress, Geol. Survey of Canada, 1882-'84, p. 148 C.