

## THE FORMATION OF THE GREAT PLAINS OF NORTH-WESTERN CANADA.\*

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The plains of Canada form but a portion of the larger plains of the continent, which occupy a large part of the interior and are divided into an eastern and a western portion by a great central valley. The eastern plains which extend to the St. Lawrence lowlands are forested and, therefore, seldom referred to as plains. Westward, the rainfall being lighter, there is a thinning of the forests and there are more open areas. These are generally referred to as the plains. In Canada the open prairie of the plains is being invaded by the forests from the north, so that a division can be made of treeless plains, plains with scattered trees, and forested plains.

The first requisite in a definition for these plains would perhaps be a nearly level surface, supplemented by a soil covering, and a climate admitting of the production of some vegetation, for the absence of moisture soon produces desert conditions. The formation of a level surface, to take a homely example, suggests either *planing* or *plastering*. The planing process of nature is a slow decay of the old surface and its removal by erosion. The surface thus planed is inclined to be rocky, and, as it is losing its rock waste, the soil is to be found sparingly in the hollows or valleys. In plastering the nature process consists of the spreading out, generally by large bodies of water, of the rock waste poured in by the streams. This produces a more perfectly even surface outline than is ever produced by the planing process, but our surface features are the product of both. If the surface were a part of a perfectly rigid sphere, it would be difficult to explain the presence of large areas containing the rock waste, or of those plains built up by the spreading action of the sea, but as there is a vast amount of evidence showing that the continent has not been stable but sank in certain areas, rose in others, and repeated the sinking and rising several times, we are forced to believe that the crust is flexible, and that its equilibrium is influenced by tangential strains or the shifting of load. To this we owe the submergence of those parts which received a coating of rock waste deposited by the sea. Much of this rock waste underlies the great agricultural areas or plains, so that we may say that the flexibility of the crust made possible the peopling of the earth by providing soil covered areas for the plant growth necessary to sup-

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