

steep-sided drift-built hills," the "ridge extending northwest from Pinto-horse butte" (near the head of the middle branch of Old Wives creek and in approximate lat. $49^{\circ} 45' N.$, long. $107^{\circ} 45' W.$) in a general direction parallel to the Coteau and about fifty miles southwest from it, and the "spur south of the west end of the Cypress hills" a hundred miles still farther west.

West of this ridge and south of lat. $51^{\circ} N.$ no terminal moraines have been recognized, except such as have been formed by glaciers flowing from the valleys in the mountains, these being characterized by the angularity of the included pieces of rock and the absence of eastern erratics. North of lat. $51^{\circ} N.$ there are a number of ridges of distinctly morainic character. One of the most typical of these surrounds the southern and eastern sides of the Hand hills. These latter hills form a high table-land rising twelve hundred feet above the surrounding plains, and are surmounted by two hundred and seventy feet of sands, silts, and gravel of Miocene age. Towards the northwest, west, and southwest they rise in an abrupt escarpment five hundred feet to their summit; towards the east and southeast they decline gradually and regularly for a short distance, and then the slope is covered with a ridge of rounded knob-like hills separated by deep kettle holes, in the bottoms of which often nestle small isolated lakes. Their summits are thickly overstrewn with boulders.

From fifty to sixty miles further north, near the southerly bend of the Red Deer river, another similar ridge is met with, the knolls rising in many places to more than two hundred feet above the bottoms of the depressions.

Turning directly eastward a rough, irregular tract, known as the Neutral hills, is seen, the higher points of which are thickly covered with gneissic and limestone erratics, lying on a base of unmodified morainic material. The hills themselves lie on an elevated plateau of Cretaceous shale, which has been very irregularly eroded, so that it is often difficult to say without sections whether an individual hill is a product of denudation or is one of the irregularities of the moraine.

North of the Battle river the Blackfoot hills form another area of deep, unconnected depressions and high, rounded knolls, sprinkled over with boulders of eastern gneiss.

Other morainic belts doubtless occur in this area south of the North-Saskatchewan river, but as yet they have not been traced out. Enough has been done, however, to show the former existence of a great glacier, or "mer de glace," which spread over the plains from a source or sources of supply on or north of the Archean rocks to the east, and which flowed in a southerly and southwesterly direction almost to the foot of the Rocky Mountains, from whose valleys numerous small glaciers flowed eastward to join the mighty advancing ice-sheet, leaving intervening areas along the foot of the mountains, and roughly west of the 3,000-foot contour line, unglaciated.