

or breadth and an average of from 20 to 60 (40) in thickness (nearly one and a half million cubic yards) — the land slide or wash out at Chicoutimi of half a million tons of earth ; and being at present engaged as consulting engineer on law suits arising out of recent land slides at Ste Anne de Beaupré below Quebec ; I had much satisfaction in reading in your last issue your correspondent's description of the land slide at Frank or from the so called Turtle Mountain.

It will of course have struck you M.M. Editors, and your readers, that if, as stated, the debris reached away so far from the mountain, or to a horizontal distance equal to several times the height of the mountain, and even up the incline on the opposite side of the valley ; this could not occur through the natural tendency of the rock to be propelled so far ; and hence, it must be conceded that some explosive and therefore repulsive force was exerted from behind the mass to thus thrust it almost as far as if it had fallen down the slope of a hill. This fact of approximately, at least, how far the rock fell forward, or to what horizontal distance it was projected or rolled over, can and must be estimated to prove whether or not, the force acting in rear of the mass, was anything more than to just move it forward or beyond the vertical.

The Quebec land or rock slide of 1889 was brought about—as explained by the writer in a memoir on the subject read before the Society of Civil Engineers of Canada and published with diagrams in the Society's " Transactions " — by percolation, for years then past, of water from the Citadel ditches above, into and between the strata of the cliff. This water on freezing in winter and expanding, thrust apart the almost vertical strata (or which from their former horizontal position had been tilted up by seismic action, so that they actually leaned backwards ; when in course of years or may be centuries, the foliations or separate layers opened out at top until the portion of the rock that fell over projected, before the thing occurred, not less than 6 ft. beyond the vertical, or overhang the ground beneath by that number of feet.

The shove which the fallen cliff experienced on the night, or at the moment it fell, was but one of six inches or less, due to hydrostatic pressure by the water in a crevasse at a distance

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