

the absorption of the water and resulting, early in May, when the clay beds had thus become thoroughly saturated, in the landslide which has been described.

#### PROTECTION FROM SIMILAR DISASTERS

The only way in which the recurrence of such slips in regions of country of the same character and under similar exceptional conditions of precipitation can be guarded against appears to be the provision of effective surface drainage, such as to carry off the excess of water before the rather slow process of absorption by the subjacent clays can take place.

#### SIMILAR OCCURRENCES IN THE SAME REGION

In a paper entitled "*L'Eboulis de Saint Alban*,"\* Monseigneur Laflamme has given an excellent account of a landslide that occurred on April 27, 1894, on the Sainte Anne river, distant about 7 miles only from that above described and affecting similar deposits of the same plain, although at Saint Alban a large part of the slide consisted of the Saxicava sands, there developed in great thickness above the Leda clay.

The landslide at Saint Alban was also much larger than that on the Blanche, an area more than 3 miles in length along the river and about 7,700 feet in greatest width having moved bodily down into the valley. Five or six farm-houses were destroyed or swallowed up, four lives were lost, and the entire mass of the slide is estimated at from 600,000,000 to 700,000,000 cubic feet.

The landslide at Saint Alban was also different in its cause and character. The river was first dammed by a comparatively small slide, and when the water thus held back eventually broke through, its undermining action on the high banks of the valley was such as to precipitate the collapse of the much greater area above noted.†

A brief description of a landslide almost identical in character with that of the Blanche and affecting a similarly situated part of the same Saint Lawrence plain has, however, previously been given by Sir William Logan in a paper read before the Geological Society of London in 1842.‡

This landslide occurred on the Maskinongé river, about 50 miles to the southwest of the Rivière Blanche, on April 4, 1840, and was examined by Logan in the following autumn. Like that on the Blanche, its outlet through the bank of the valley was narrow, and its greatest width, about 600 yards, occurred at some distance back from this bank. The length of the collapsed area was 1,300 yards, and its area about 84 acres, the depth of the depression being about 30 feet. The nearly liquid clay flowed both up and down the valley of the Maskinongé for a distance of about three-quarters of a mile in each direction, bearing with it large blocks and masses of unbroken clay. The whole movement was effected in about 3 hours, the first mass of clay detached being about 200 yards in width by 700 in length.

\* Transactions Royal Society of Canada, vol. xii, part iv, 1891, p. 63.

† Since the present paper was read a short note by the same author on the Blanche landslide has been published in the Report of the Commissioner of Colonization and Mines of Quebec for 1898, p. 131.

‡ Proceedings of the Geological Society of London, vol. iii, p. 767; also Life of Sir William Logan, p. 95.