

SUBSIDENCE OF THE ATLANTIC COAST OF NOVA SCOTIA.
(Introductory to a paper by Mr. McIntosh)—BY HENRY
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(Read 21st December, 1903.)

When the question of modern subsidence of this country is mooted, reference is invariably made to Louisbourg as a spot where evidence of an undoubted character has been obtained. This view has been accepted, and, so far as is known, remained unchanged for forty years. It is hence entitled to the respect which goes with age, and has to be met, if it can be, by arguments as weighty as would be required to establish a similar reputation for a new locality. Yet this is an age when the reverence for traditions saves but few from re-investigation and criticism, and this one regarding Louisbourg, is, I consider, open to such a treatment.

It appears that the parent source of the statement respecting Louisbourg was a paper by Dr. Abraham Gesner, entitled, "Elevations and Depressions of the Earth in North America." It was published in vol. xvii, page 386, of the *Journal of the Geological Society of London*, 1861; only one hundred years after the second and final fall of the great fortress on which France had spent so many millions of francs to maintain her hold of possessions in North America. Now when a further period nearly half as long has elapsed, we are justified in expecting that the evidence that carried conviction to Dr. Gesner forty years ago, would be intensified and be now patent to all observers. On my own part, a casual acquaintance with the old town extending over the life of a generation, has left with me no confirmatory impression, and lately led me to seek for data on which the accepted conclusion has been based.

Dr. Gesner's remarks were as follows:—"Had Louisbourg continued to exist up to the present time, its abandonment would not have been the less certain; for the sea now flows within its walls, and overflows sites that were formerly inhab-

ited. Its submersion is plain and distinct. The rock upon which General Wolfe landed has nearly disappeared. The waves break against the south wall, which they have undermined and thrown down. . . . each succeeding tide flows freely into the northern side of the deserted city. The lands westward also bear testimony to an extensive submergence."

A year ago, having heard that Mr. K. McIntosh, of St. George's Channel, Cape Breton, had lately made a survey, the first accurate one ever made of the old town and its fortifications, and knowing that he was a man of exceptionally keen discernment, and withal a student of science, I obtained from him the statement which is here appended.

This statement I submitted to Major O. C. Williamson, R.A., who has made a critical study of fortification and the fads of each school and period, and he appended a few comments which accompany it. These, he would have extended, had he not been suddenly called to take command of a battery in India. However, coming from so good an authority, they may be regarded as convincing that the French engineers purposely built their foundations down to the level of low water; and therefore that the partial submergence now noticed is no evidence of subsidence subsequent to the building of the fortress.

There is still to be considered Dr. Gesner's paper as a whole. The statements accompanying those relating to Louisbourg treat of the general question regarding recent elevation and depression including the quarternary period. These remarks of his should be now read in the light of modern ideas on the changes that occurred during the glacial epoch, and the sharp distinction that has to be drawn between the movements of the land in relation to the sea as a base level, acting in a vertical direction, and wave erosion which makes a constant and destructive lateral advance on our coast. It is clear that Dr. Gesner did not carefully distinguish the actions of the several agents of a destructive character that have been at work on the shores and structures at Louisbourg, and it would seem he has imputed to the former changes that have been brought about by the denudation resulting from the latter agency alone.

So far as Louisbourg is concerned, I submit there is there no evidence of subsidence within historic times.