

TRANSACTIONS  
OF THE  
**Nova Scotian Institute of Science**

SESSIONS OF 192<sup>20</sup>~~1~~<sup>21</sup>  
(Vol. XV, Part 3)

EVIDENCE OF ELEVATION OF THE SEA COAST AS SHOWN BY  
FOSSIL DELTAS NEAR WOLFVILLE, N. S.—BY FREDERICK  
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(Read 8 November, 1920)

In speaking of elevation of a region, it is well to be a little guarded and use the term relative difference in level between sea and land; and in this article my object is to show that since these fossil deltas were laid down in water, there has been a change of at least from 60 to 65 feet between land and sea.

The marsh lands that extend north of Wolfville and Grand Pré, Kings County, N. S., are almost level, and are bordered on the south by a long range of hills from which several brooks flow northward, crossing these low meadows and emptying their waters into Minas Basin.

I purpose to describe two brooks and their fossil deltas which not only afford good evidence of land elevation, but also the amount of stream erosion that has since taken place.

One of these brooks is situated about a mile and a half east of Wolfville station. As it leaves the high land it flows a short distance northward, then changing its course flows nearly due west until it reaches the marsh land. Here its valley ceases and again it flows northward across the meadow. This brook, like the other which I am about to describe, is very small, and the description of one valley will almost complete a description of the other.

Bed-rock (Triassic) sandstone outcrops in this brook, but throughout the valley the stream has never deepened its bed to any great extent. The drift lies scattered everywhere and a number of boulders are well ice-scratched.

The delta that lies a little way up the valley's mouth, has experienced a large amount of sub-aerial erosion as well as that done by the stream, although the characteristic flat top of the delta is still to be seen, its surface is uneven in places, and as the brook has cut longitudinally through, one can see that its top-set and bottom-set beds are nearly horizontal. In other places, owing to the growth of grass, I could not make out much of its structure. Where the delta unites to the side of its valley, its top is quite level or has a gentle down-stream slope.

The other brook is about a mile to the west and flows almost due north. Near the head of this gorge there appears more drift and larger boulders are found. A little west of this valley is a splendid example of glacial drift, probably the lobe of a moraine.

The delta in this brook is in a somewhat better state of preservation than the other. Although time has marked it by erosion, it still shows a flat top, and where the present stream has cut its path through, one can see the bedding and imagine its former shape.

The material of these deltas is a fine calcareous, sandy loam, and I think there is some evidence to show that it has been in part derived from the boulder-clay over which these brooks have run.

As the beds of these brooks are above the marsh land, till evidently lies below them, as it has been found below the marsh in several places in this locality.

Although the present streams are quite small, these valleys seem too large to have been cut by the streams that now occupy them. These valleys are about forty feet deep and several hundred feet wide between the tops of their sides. However, I think they are of recent origin and have been cut quickly by swiftly flowing streams.

I believe the history of these brooks and their deltas may be found by piecing together the Post-glacial changes that have taken place in this part of the country. The evidence seems to show that these brooks began their flow after the final retreat of the ice. It is admitted that at the close of the Glacial Period the land stood a little higher relative to sea-level than it does

at the present day. This would give these streams a high grade and they could cut a gorge, both large and deep, through or into the loose drift and even into the soft bed-rock that lies below; but bed-rock has been reached by one stream only and that in one place.

That these brooks have cut into but not through the drift, seems quite evident. The absence of boulder-clay in these valleys I think can be accounted for by the fact that it is easily washed away from the surface. The larger material, such as boulders, remained as the stream was unable to remove them.

The melting of the ice must have supplied vast quantities of water, and the streams, as I before have stated, must have been larger than they are today.

Immediately after the retreat of the ice, the land stood high relatively to sea-level; but subsidence had already begun, and as the waters of the sea advanced upon the land these streams had their grades lessened until finally deposition began and the lower end of their valleys were drowned. Probably deposition continued until the tops of these deltas stood a little above the level of the receiving body of water which was the sea or rather the craters of Minas Basin.

The strong tides forcing their way up these small valleys seem even to have aided rather than hindered deposition, as we witness today in the growing deltas of the Gaspereau and Cornwallis rivers.

Following this submergence, a period of uplift in the land set in. This continued until these small deltas now stand well above sea-level.

As the railroad between Wolfville and Grand Pré stations is level and crosses the mouth of these brooks, I have chosen it as a datum place to show the difference in relative level between land and sea, since these deltas were laid down.

Where the railroad passes these brooks, it is 28 feet above sea level, and the base of both of these deltas is about six feet above it. The height of one delta above its valley floor is 22 feet, the other 26 feet. This makes the top of one delta 28 feet and the other 32 feet above the railroad, and 56 feet and 60 feet respectively above sea-level. As they both have experienced sub-aerial denudation, 65 feet would be a more correct estimate; and we must also remember that they may have stood a little above water-level.

As the streams have cut quite through these deposits, they have eroded their channels about 26 feet; besides they have cut their way quite deep in other parts of their course, and even in some places aggraded their bed.

While preparing this paper, I have observed several other fossil deltas in brooks near here; in one brook south of Wolfville the top of one delta now stands between 75 and 80 feet above sea-level.