

3. An examination of the exposures about the capes proves this conclusion to be correct. The lowest bed of the series cropping out in the marsh inside of Jourmain island is a large shale bed associated with some soft sandstone. This bed reposes on the mill stone grit. On the top of this shale are five or six feet of red sandstone seen on the outside of Jourmain island. This is followed by another extensive bed of shale exposed on the beach at low tide and for more than a mile out of this clay bottom prevails. Then comes a reef of rock making an elevation on the profile of the bottom of the strait (in A, section n^o 1). This reef is produced by a well known brown and grey sandstone band occurring in this part of the formation, the same that produces St. Peter's island and reef. Succeeding this going northward is another great shale bed whose easy denudation has made the deepest soundings in the strait (B, sec. 1). Near the Prince Edward Island coast sandstones come in with the shales, but that the latter still greatly predominate is evident from the deep soundings. Six fathoms well into Carlton Point.

The strata between the capes repose in a very undisturbed position being out of the line of the great anticlinals of the gulf.

They have, however, a gentle inclination toward the centre of the gulf basin giving them a dip of 1° E.N.E. This undisturbed condition and small inclination of the beds makes them very favourable for tunnelling as the excavation would enter the great shale beds on Jourmain island, and be able to follow them a long way with little cutting across the strata. I must add, however, that the section given is but a rough outline of the general features of the formation under the straits. In order to give a detailed and accurate account of the beds one would need to examine carefully and extensively the sections along the borders of the strait and probably require the assistance of some test borings along the line of the proposed tunnel.

Most respectfully yours,

FRANCIS BAIN.

NORTH RIVER, 14th March, 1891.

Hon. Senator HOWLAN.

SIR,—In reference to an extract from a communication of Sir Douglas Fox, which you kindly showed me, I beg to state that the cross section of the strait referred to, viz.: that sent to Sir Douglas last November, was drawn on a scale which represented the vertical depth proportionally thirteen times greater than the horizontal extension. This represented the beds with a dip thirteen times greater than they actually possess.

The real dip of the beds is very small, being about 60 feet to the mile on the average.

This small dip also is not quite regular being greater on the Cape Jourmain side and less on the Prince Edward Island side.

So far as I can ascertain there are no abrupt flexures or outbreaks of the strata, but they lie undisturbed on the slightly inclined, ancient carboniferous floor of the gulf. This floor has been broken up by anticlinals in other parts of the basin thus relieving the strain on the beds and leaving the strata undisturbed in the capes.

I now send you sheet no. 2 with a section (fig. 1) in which the beds are represented on a natural scale. It has the advantage of presenting this nearly horizontal position at once to the eye.

In this section as in the former there appears several well defined beds of sandstone. To these Sir Douglas Fox refers in particular. The most important of these are no. 2 and the sandstone bands in no. 4 (see figs. 1 and 2, sheet 2).

No. 2 is represented as being 50 feet sandstone. In reality it consists of irregular deposit of brown and red sandstone and red shale with some calcareous beds. We find it appearing in several widely separated localities; but it is irregular and not continuous.