

cult by the great tenacity of the clayey deposit, which is too expensive to work by ordinary means. It is only where the glacial drift has been re-arranged by water that gold can be found sufficiently concentrated to make it worth working. Gold washings have been wrought with considerable returns at Isaac's Harbor, Wine Harbor, Tangier Harbor, Gold River and the Owens,—and Mr. Campbell has called attention to many other localities of auriferous gravel, and especially to a considerable area of this kind in Cape Breton, to be noticed farther on.

The existence in Nova Scotia of gold-bearing alluvions older than the boulder-clay is a contingency not to be lost sight of; the presence of considerable quantities of gold at Gay's River in Colchester County, in conglomerate beds at the base of the Carboniferous series, which are nothing more than consolidated alluvions of that period, shows the great antiquity of alluvial gold in this region. In the province of Quebec the boulder-clay is generally destitute of gold, but in his report on the gold deposits of that province, (*Geological Survey*, 1866, pages 61, 65 and 87) Mr. Michel has shown that beneath this sterile clay is an ancient deposit of alluvial gravel abounding in gold, of which the rich washings of the Gilbert River in the Chaudière district are an example.

Analogous conditions are presented by the rich alluvial deposits of Victoria, Bolivia, and California. Mr. Michel, therefore, insists upon the importance of carefully searching in certain parts of Nova Scotia for similar ancient alluvions beneath the boulder-clay or glacial drift. Such deposits, when we consider the abundance of gold in the quartz lodes of the region, may reasonably be expected to be of great richness.

#### ON GOLD WORKING IN NOVA SCOTIA.

The gold mines of Nova Scotia belong to the Crown, and the law of May 10, 1864, extracts from which will be given in an Appendix, regulates all questions as to their concession and working. In accordance with this Act the Governor in Council may, on the discovery of gold in any locality, declare it, by proclamation in *The Royal Gazette*, to be a gold district, and assign limits and bounds to such district, which may afterwards be enlarged or contracted if desirable. Besides those proclaimed districts are numerous others in which gold has been found, but which are not yet proclaimed, and, in many cases, are unurveyed. Of the proclaimed gold districts, the following appear in the monthly returns of the Chief Commissioner of Mines:—Stormont, Wine Harbour, Sherbrooke, Tangier, Montague, Waverley, Oldham, Renfrew, and Uniacke. The gold obtained from the other localities is classed in the official returns as coming from "Unproclaimed and other districts."

The above mentioned districts, with the exception of Stormont and Tangier, were visited by Mr. Michel and myself, in company, and we also went together to the district of Lawrencetown and to Upper Stewiacke. Repeated visits, for the purpose of more careful study, were afterwards made by Mr. Michel to the districts of Waverley, Renfrew and Uniacke. His opinions, and the results of his personal observations upon the mode of working, etc., will generally be given in his own language, and the portions translated from his manuscript report will appear as quotations. Before proceeding to describe the various gold districts, it will be well to notice briefly the modes of working and treating the mineral generally adopted in Nova Scotia. Under this head Mr. Michel remarks as follows:—

"The appearances furnished at the outcrop of the lode can only give an approximate notion of its attitude and relations to the adjacent rocks, to obtain which subterranean workings are necessary; and when the enterprise is to include several lodes, it becomes indispensable, before working them, to know their structure and the mode in which they are grouped. The successful direction of a quartz mine requires something more than a practical knowledge of the processes required for the extraction and treatment of the mineral; the science and the experience which provides for the future of the mining operations, and for the accidental variations of structure and arrangement sometimes met with in the veins, are not less necessary; and it is to be feared that all of these conditions have not been fulfilled by many of the directors of mining operations in Nova Scotia. I make this remark in no spirit of criticism, and with no intention of a special application of it to individual cases, but only to explain, from my point of view, the reasons of the failures of many mining enterprises which have been ascribed to impoverishment or disappearance of the vein, or to various difficulties of working, which would never have su-