

Mineral Springs of Canada; the discovery of the presence of boracic acid in several springs, and the analysis and description of some new minerals. We proceed to extract the most prominent illustrations of these additions to our knowledge of the physical history of the United Provinces.

"Having in the month of October last, collected a farther supply of the alkaline water from the Grand Coteau at Chambly, described with an incomplete analysis, in my Report for last year, I was enabled to confirm the results before obtained, and to make a more extended examination. It will be recollected that it was described as a strongly alkaline water, containing beside chlorid of sodium, with traces of the iodid and bromid, and carbonates of lime and magnesia, a large proportion of carbonate of soda, besides silica in some soluble state. To these must be added, carbonates of baryta and strontia, and borate of soda. It is but a few months since Professor H. Rose, of Berlin, pointed out a reaction which enables us to detect borates, even when present in minute quantity. It depends upon the power of free boracic acid to change to red, the yellow colour of paper stained with turmeric. The liquid suspected to contain a borate is neutralized with hydrochloric acid, and slips of turmeric paper are dipped in it and allowed to dry, when they are to be moistened with somewhat diluted hydrochloric acid, which at once produces a red-brown colour when boracic acid is present. By the aid of this test, Fresenius, Bouis, and Filhol, have just succeeded in discovering the presence of boracic acid in many of the mineral springs of Germany and France, and the same means have enabled me to detect it in several springs in this Province. When the Chambly water is evaporated to one-tenth, and neutralized with hydrochloric acid, turmeric paper which has been three or four times dipped in it and dried, becomes very red when moistened with diluted hydrochloric acid. Our present processes do not afford us any direct means of determining the amount of boracic acid when associated with carbonates and chlorids; but some experiments to be mentioned farther on, serve to give an approximate notion of the proportion in which it exists."

CANADIAN MINERAL WATERS.

The number of mineral waters described in this and the preceding Reports is in all fifty-four. Of these twenty-two making the water bitter and disagreeable to the taste like seawater, but far more intense; those chlorids are also present in large proportion in the waters of Kingston, Bay St. Paul, and Rivière-Ouelle, and render them unpalatable. The waters from 3 to 12, that of Rivière-Ouelle excepted, are very much alike in character, and are all agreeably saline to the taste. Of the waters among these last, which have been quantitatively analyzed, the Intermittent of Caledonia will be seen to contain the largest amount of these earthy chlorids, after which follow the St Léon, and Georgian Springs, then those of Lanoraie, Caxton and Plantaganet, which contain the least of all.

In the second division of saline springs, these earthy chlorids are wanting, and we find instead, a portion of carbonate of soda, which gives to the waters when concentrated, an alkaline or soapy taste. Some of these are at the same time strongly saline, but in others the alkali predominates, and renders the taste of salt in the evaporated waters, hardly perceptible. They all afford the reactions of bromine and iodine, and many, perhaps all of them, contain a portion of borate of soda.—Carbonates of baryta and strontia are found in all those which do not contain a portion of alkaline sulphate.

CLASS I. SALINE WATERS.

Division B. Containing Carbonate of Soda.

NAMES AND LOCALITIES.	IN 1000		SEE REPORT FOR
		PARTS.	
1 Varennes, (Outer Spring.)	B	10 72	*1849 p. 49
2 " (Inner Spring.)	B	9-58	* " " 51
3 Fitzroy, (Gillan's Spring.)	B	8-34	*1851 " 49
4 Caledonia, ("Gas" Spring.)	S	7-77	*1848 " 141
5 " ("Saline" Spring.)	S	7-34	* " " 143
6 Belœil.	B	7-33	*1851 " 51
7 La-Baie, (Courchène's Spring.)	B	7-29	*1853 " 161
8 Chambly, (Rang-des-Quarante.)	B	5 74	1852 " 116
9 Ste-Hyacinthe, (Providence Spring.)	B	5 16	1850 " 162
10 La-Baie (Houlé's Spring.)	B	1 96	1853 " 161
11 Caledonia, (Sulphur Spring.)	S	1 94	*1848 " 145
12 Chambly, (Grand-Coteau.)	B	2 13	*1853 " 154
13 Ste-Martine.	S	1 98	1852 " 114
14 Nicolet, (Hébert's Spring.)	S	1 56	*1853 " 162
15 St.-Ours.	S	53	* " " 157
16 Ste-Anne-de-la-Pocatière,	S	36	1852 " 113
17 Jacques-Cartier River.	S	34	*1853 " 159
18 Nicolet, (Roy's Spring.)	S	" " 162

The quantity of alkaline carbonate bears no constant proportion to the whole amount of saline matter, for while the waters of Varennes, Caledonia, Fitzroy and Belœil, contain but from .05 to .58 parts in 1000 parts of carbonate of soda, equal to from 1 to 12 per cent. of the whole amount of soda salts present, the Jacques-Cartier Spring contains 1.95, that of St.-Ours .134, that of the Grand-Coteau of Chambly 1.06, and Hébert's Spring in Nicolet, 1.13 parts, equalling 82, 63, 52, and 72 per cent. of the whole amount of alkaline salts present. These less saline waters then contain not only relatively, but actually, more alkaline carbonate than the more strongly saline springs. It will be understood that a small undetermined portion of the soda represented as carbonate, exists combined with boracic acid.

The second class of springs consists of a small number containing free sulphuric acid, together with sulphates of lime, magnesia, alumina, protoxyd of iron, and small portions of alkalis, without any trace of chlorine; they all contain sulphuretted hydrogen. Of these four are known, all being in the same region of Western Canada; they are the Tuscarora Sour Spring, containing 1.87 parts of sulphates and 4.29 of free hydrated sulphuric acid, in 1000 (See Report for 1848 p. 152); another in Niagara with about .6 parts of sulphates of the above bases, and two parts of free acid in 1000; besides a third from near Chippawa, described by Dr. Mack, of St. Catharines, C. W., in the British American Journal, vol. v. p. 63, which in composition and strength is very much like that of Tuscarora, and a fourth furnished me by Dr. Chase of St. Catharines, from the vicinity of St. Davids, and similar to the last, although weaker. (Report for 1850, p. 100.) The connection of these springs with the gypsiferous rocks, and their supposed relations to the deposits of gypsum, have been discussed in the Report for 1848.

The Charlotteville Spring is not included in either of the above classes, as its saline ingredients are principally earthy sulphates and carbonates, with but a very small proportion of chlorids; its solid ingredients amount to 2.49 parts in 1000. This water is remarkable for the great quantity of sulphuretted hydrogen gas which it holds in solution, amounting to 32.1 cubic inches to an imperial gallon. (Report for 1848, p. 157.)