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# THE HISTORY OF THE SALT INDUSTRY IN WESTERN CANADA

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From the Mackenzie Basin southeastward across the Athabasca River into northwestern Manitoba, and thence along the eastern base of that escarpment of hills which terminates in the Pembina Mountains in North Dakota there stretches a line of salt springs, pouring immense quantities of sodium chloride into the rivers and lakes which the springs feed. These springs are notable features in the landscape, and can not fail to have attracted the attention of the early inhabitants of the country. The traveler comes quite unexpectedly to a bare spot in the forest, circular or oval in shape, half an acre it may be or many acres in extent, and fringed with dark green spruce with a background of lighter green poplar. Within such an area many springs may occur, which may have formed around themselves, volcano-wise, a rim a foot or two in height, due to the deposition partly of material out of solution but mainly of the fine clay which they have carried in suspension from below - for they usually come to the surface through a laver of clay, and only rarely is solid rock to be found in the immediate vicinity. Normally the salt water flows in rivulets from the springs to lake or river, but the surface of the ground is impregnated with salt to such an extent that these areas are absolutely devoid of vegetation. On the high ground, however, and around the margins of the springs the small red salt-loving plant, salicornia herbacea, occasionally grows in profusion.

In only a few localities has any considerable thick-

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### 278 MISSISSIPPI VALLEY HISTORICAL ASSOCIATION

ness of salt been deposited in consequence of the natural evaporation of these brines. One such locality is to be found on the Salt River, a tributary of the Slave River north of Fort Smith. As a rule, in order to obtain salt from the brines, artificial methods of concentration have to be adopted. It is with the historical aspect of this phase of the subject that I wish to deal in this brief paper.

In Canada the process of evaporating these brines for the purpose of obtaining salt was carried on as far back as the early years of the last century and continued until at least 1876. The district which has been the most prominent in connection with the industry is that which was known as the Swar River district, embracing the country west of Lake Winnipegosis, where the springs are most numerous, and where on the whole the concentration of the brines is greatest. The point has been discussed as to whether the Indian had learned the secret of the extraction of salt by the evaporation process before the advent of the white man. Keating ' in 1825 refers to the claims of the Potawatomie Indians in this regard, in connection with the manufacture of maple sugar, as follows:

The use of salt previous to the arrival of the European is elaimed by the Indians. They trace the origin of their acquaintance with this valuable condiment to the observation of the preference given by elks to the water from salt licks: having tasted it, they liked it, and took some to boil their vegetables with and having found it palatable, they boiled down the water in the manner that they had done the sap, and then obtained salt. It is not improbable, that the sediments of white salt, which are frequently observed during dry seasons in the vicinity of salt springs, may have taught them that it was by evaporation that the substance could be separated from the water which holds it in solution: for although the Indians were totally ignorant of the nature and causes of evaporation, they had noticed

<sup>1</sup> Narrative of an Expedition to the Source of the St. Peter's River, 1828, Vol. I, p. 116.

the process and were aware that it could result from the action of fire as from that of the sun.

While it would seem only reasonable to concede that the Indians, endowed as they are with considerable powers of observation with regard to natural phenomena, would of themselves have reached this deduction, we seem to have, in the Western Canadian territory at all events. no authentic records of the Indians making use of the process prior to the development of the industry by white men. Hind <sup>a</sup> states that forty years before the date when he visited the Monkman's Salt Springs (which was in 1858) James Monkman had started working the springs; while Richardson<sup>3</sup> refers, in 1823, to salt springs at the base of the Pasquia Hills "from which the Indians sometimes procure a considerable quantity of salt by boiling". Still earlier than Hind's reference, Harmon,4 in one of his visits to the Swan River district between 1800 and 1804, states that a few miles from the Swan River Fort, on the Swan River, "there is a salt spring, by boiling down the waters of which tolerable salt is made. It is less strong than that brought from Canada, but, made in sufficient quantity, it will preserve meat very well". While Harmon does not refer specifically to the point, the inference seems to be that the salt was made, not by the Indians, but by the engagees of the North-West Company, to whom the fort belonged and in whose services Harmon at that time acted as clerk. While, then, the specific evidence of the early records favors the view that in this district the white man has priority, it is altogether probable that at a still earlier date the Indians may have utilized the brines for salt, not on an industrial scale but

<sup>2</sup> Hind's Saskatchewan and Assiniboine Exploring Expedition in Journals of the Legislative Assembly of the Province of Canada, Vol. XVII, No. 36, p. 94.

Appendix to Franklin's Journey to the Polar Sea, p. 506.

4 Harmon's A Journal of Voyages and Travels in the Interior of North America, 1820, p. 57.

279

#### 280 MISSISSIPPI VALLEY HISTORICAL ASSOCIATION

for family purposes, without attention being called to it by the traveler of that time.

To this industry belongs the distinction of being the first important development of a mineral product in the Northwest. We can not consider of equal importance the use made of the tar sands on the Athabasca River, where, according to Harmon,<sup>5</sup> the "bitumen, which is in the fluid state, is mixed with gum, or the resinous substance collected from the spruce fir, and is used for gumming canoes". No doubt the natural salt of the Salt River in the Mackenzie Basin was used much more extensively in the early years of last century, and in fact throughout the century. To quote Harmon again." "down Slave River, there are several places, where almost any quantity of excellent clean white salt may be taken, with as much ease as sand along the seashore. From these places the greater part of the northwest is supplied with this valuable article." If the Northwest be taken in its present-day, strict geographical sense as the Mackenzie Basin, his words, written in the early years of the century, still hold to-day. We are concerned more particularly with the evaporation processes of the Swan River district, however, because they represent a more specialized stage in the development of the mineral industry, analogous to the extraction of the metals from their ores. As a commercial industry salt-making was practically from the beginning, and throughout its history, in the hands of the freemen. Mr. Donald Macdonald of Fairford, formerly in charge of the Shoal River post, believes that the first independent manufacturer in the district was Marcette, who extracted salt from brines at the mouth of the Shoal River, Swan Lake, and that the business was subsequently taken up by Chartrand

<sup>6</sup> Harmon's A Journal of Voyages and Travels in the Interior of North America, 1820, p. 171.

<sup>6</sup> Harmon's A Journal of Voyages and Travels in the Interior of North America, 1820, p. 172.

281

and Monkman, to whom evaporation kettles were supplied by the Hudson's Bay Company. Monkman carried on operations at Swan River, Duck River, and at Monkman's Salt Springs, Lake Winnipegosis. The freemen evidently extended their field to Lake Manitoba; for Simpson' writes in 1836 that "on some of its [Lake Manitoba] tributary streams tolerable salt is obtained by the freemen from saline springs". At that time, also, operations were evidently active at Swan River. Simpson reached the river at a point "close to the tents of some freemen, who subsist by hunting, fishing, and making salt and maple sugar".\*

In 1858, at the time of Hind's visit, manufacture was carried on "with profit for the Hudson's Bay Company, at Swan River, and at Winnipegosis Lake by Monkman's sons". 9 In 1874, J. Y. Spencer 10 visited Monkman's Springs, and found that Mr. McKay, the only person engaged in the business, made about five hundred bushels, or less than half the quantity which had been manufactured in previous years. Before 1889, when J. B. Tyrrell examined the Winnipegosis district, the industry had ceased, though the Indians occasionally boiled down a little salt from the brines." Mr. Isaac Cowie of Winnipeg informs me that until 1876, at which time he was in charge of the Swan River district, the salt for all the Hudson's Bay Company posts from Norway House to Qu'Appelle was supplied from Lake Winnipegosis. The manufacturers evidently found that it was increasingly difficult to compete with imported English salt, which

<sup>7</sup> Simpson's Narrative of the Discovery of the West Coast of America, 1843, p. 31.

<sup>8</sup> Simpson's Narrative of the Discovery of the West Coast of America, 1843, p. 63.

<sup>9</sup> Simpson's Narrative of the Discovery of the West Coast of America, 1843, p. 94.

10 Geological Survey of Canada, Report of Progress, 1874-1875, p. 69.

<sup>11</sup> Geological Survey of Canada, Annual Report, Vol. V, Part I, 1890-1891, p. 220 E.

#### 282 MISSISSIPPI VALLEY HISTORICAL ASSOCIATION

found a market in the Red River Settlement, and the industry in consequence languished and finally died.

We are indebted to Hind <sup>12</sup> for the following very interesting description of the process of manufacture:

At the works there are two small loghouses and three evaporating furnaces. The kettles, of English construction, are well made rectangular vessels of iron, five feet long, two feet broad, and one foot deep. They are laid upon rough stone walls, about twenty inches apart, which form the furnace. At one extremity is a low chimney. The whole construction is of the rudest description: and at the close of the season the kettles are removed, turned over, and the furnace permitted to go to ruin, to be rebuilt in the following spring.

The process of making salt is as follows: When a spring is found, a well, five feet broad and five feet deep, is excavated, and near to it an evaporating furnace erected. The brine from the wells is ladled into the kettles, and the salt scooped out as it forms, and allowed to remain for a short time to drain before it is packed in birch bark roggins for transportation to Red River, where it commands twelve shillings sterling a bushel, or one hundred weight of flour, or a corresponding quantity of fish, pemmican or buffalo meat, according to circumstances.

The brine is very strong. From one kettle two bushels of salt can be made in one day in dry weather. There are nine kettles at the "works", seven being in constant use during the summer season. The halfbreeds engaged in the manufacture complained of the want of fuel — in other words, of the labour and trouble of cutting down the spruce and poplar near at hand, and the difficulty of hauling it to the furnaces. An objection of no moment, but characteristic of some of the people, who are generally unaccustomed to long continued manual labour. . . . It will be seen that the processes employed in the manufacture of salt are of the rudest description, so that without any outlay beyond a few days' labour, the quantity might be largely increased. I spoke to John Monkman, who now makes salt here, of pumps and solar evaporation. Of a pump he knew absolutely nothing. He had heard that such an apparatus had been

<sup>12</sup> Geological Survey of Canada, Annual Report, Vol. V, Part I, 1890-1891, p. 94.

contrived, but had never seen one. He readily comprehended the advantage to be derived from pumping the water into smaller troughs, dug in the retentive clay near the springs, and strengthening the brine by solar evaporation.

It would seem that concentration by freezing was never employed in the Swan River district, though it is stated by residents in Pembina that concentration by freezing was made use of by the Hudson's Bay Company in working the springs near Cashel, North Dakota.

Sufficient information is not available to justify any attempt to estimate, even roughly, the amount of salt that was produced during these years. The minutes of Council of Assiniboia from 1823-1840 show that from fifty to one hundred bushels of salt were bought from the freemen yearly by the Hudson's Bay Company at 7/6 per bushel. Keating 13 states that in the Pembina district, where, he avers, the salt was gathered from the white precipitates around the springs on the Big and Little Saline rivers, the price of the salt was four to six dollars per barrel of eighty pounds, and that one of the residents cleared five hundred dollars in one winter by the salt which he collected. From the statement of Spencer, already quoted, it would appear that in the years prior to 1874 more than one thousand bushels a year had been manufactured at Monkman's Springs. The salt was put into birchbark boxes, called "mococks", each holding one hundred pounds and was exported to the various Hudson's Bay Company posts and to the Red River Settlement. The product was decidedly unprepossessing in appearance, being characterized by a distinctly reddish color, and, judging from the chemical analysis of the brine and from its method of manufacture, it must have had as impurities considerable percentages of deliquescent salts. In fact, Keating states 14 that during his stay at Fort Alexander he inquired why salting was not

<sup>13</sup> Geological Survey of Canada, Vol. II, p. 36.
<sup>14</sup> Geological Survey of Canada, Vol. II, p. 82.

# 284 MISSISSIPPI VALLEY HISTORICAL ASSOCIATION

usually resorted to instead of the jerking of the meat. "We were informed that the prairie salt did not preserve flesh as well as that which was brought from England, with which the buffalo of which we had eaten had been cured. It is probable that in the salt of the prairies there are impurities, perhaps deliquescent salts, which render it unfit for the preservation of meat unless purified." Those of the residents of the Red River Settlement during the seventies, however, who still survive in Winnipeg, do not recall any feeling of dissatisfaction with the salt which was supplied to the colony from the Swan River district.

It may be of interest to discuss in conclusion the possibilities of a revival of the industry. In the Lake Winnipegosis district, more particularly on the west side of Dawson Bay, where the springs are most numerous, the total flow from a single salt flat is usually from ten to twenty gallons per minute. The percentage of total salts is five to six per cent, or only about one-fourth the strength of most of the brine used - for instance, in Michigan. It seems clear that, notwithstanding the fact that the total amount of salt which reaches the surface is very large, the economic situation of to-day will render impossible the revival of a salt industry in this district, if the springs alone are to be used, as was the case during the last century. From recent evidences obtained from deep wells, however, it has been shown that a strong brine may be obtained at greater depths - with which the surface springs may be connected but have been weakened owing to admixture with the waters of the upper levels of the ground-water table. At the present time, then, it seems not improbable that, by tapping the mineral near its source. the difficulties due to competition from other fields, which were practically non-existent in the early years of the industry, may be successfully coped with; and there may be revived an industry which has at least a historic inter-

76648

est as a forerunner of the mineral development which already plays an important part, and in the days to come will aid still more materially, in the stability and progress of the Canadian West.

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