

They paved the way for us ; their dearly bought experience will benefit us. The present processes are the perfection of certainty and economy. We need but consider that in—

1836	it took 2,000 lbs. of beets to manufacture 100 lbs. sugar, or.....	5	per cent.
1846-56	" 1,500 " " " "	6 $\frac{2}{3}$	"
1857-68	" 1,250 " " " "	8	"
1872	" 1,000 " " " "	10	"
1878-79	" 800 " " " "	12 $\frac{1}{2}$	"

We have all the advantages that have led to these magnificent results. All the numerous mechanical and chemical contrivances that have reduced expensive labour are our inheritance !

We have to say a few words to those who fear that our long and cold winter will prove a "Moscow" to this otherwise promising enterprise; we must, though, give first a short sketch to indicate the *modus operandi* of beet sugar making. The roots, after being washed by mechanical appliances, are by machines cut into oblong cubes and slices, then are brought into contact with hot water, extracting thus all the saccharine matter. The juices obtained pass through various processes of purification, are evaporated into thick syrup, finally boiled under vacuum. The compact mass now passes the centrifugal machines, which separate the consumable sugar from the molasses. Twenty-four hours suffice for the whole operation. The sugar when refined is similar to the very best cane sugar, so much so that no chemist nor commercial buyer can, with both sugars as samples, tell which is which. The molasses undergoes a second and third process to separate a further quantity of sugar, and is finally converted into alcohol, or disposed of to breweries, or used for feeding purposes.

Now, then, as to the winter season, we benefit by the experience of the Russian or Swedish sugar-makers who have to contend with a similar climate, and we have to follow their example. We have learned that beets even if frozen are not injured for sugar-making purposes, but that alternate thawing will spoil them. We know the art of keeping beets during the winter, safe from heating and freezing. This is, however, nothing new in Canada, for at the great stock-breeding farm of the Hon. M. H. Cochrane very large lots of roots are kept till May as fresh as in November. Thus all that is required is to follow ordinary rules and precaution.

But our winters are even a very decided advantage. Beets can be kept without sprouting till the end of April, whereas in Europe all the stock must be worked up by the end of February. Our readers will at once perceive the immense advantage of this, and herein lies another proof that Canada *must* excel any other nation except Russia, which is similarly situated. While in Europe the sugar making has to be done in five months, we have seven months, or 40 per cent. more time. Thus we can, with the same capital and plant, work up 40 per cent. more material; or, a factory working 200 tons a day can in Europe work 28,000 tons, while in Canada 39,000 tons can be worked up. Every capitalist will at once see the bearing.

Although we have shown that by the latest contrivances it takes but 800 lbs. to make 100 lbs. sugar, and although we have *proved* that Canada can do as well as any other country, still we will here for argument's sake admit that we would require 1,250 lbs. A factory working 30,000 tons of beets would produce 5,880,000 lbs. sugar; thus, as Canada now consumes 150 million pounds, it would require twenty-six factories of this capacity to supply the wants of Canada, not to speak of our own progress nor of export. These factories would consume 780,000 tons of beets, which would, at \$5 per ton, yield to the farmer an amount equal to \$3,900,000,—a sum far beyond what any other crop would realize, so far as profit to the farmer is concerned. Nor are these all the advantages which the farmer realizes. We will next show up the beet-pulp and beet-leaf question. When the saccharine properties are extracted, the beet-pulp is sold to the farmer at a nominal price, for cattle fattening. Analysis has proved the nourishing quality equal to mangold roots. The commercial value of pulp, the residue of one acre, is equal to two tons of the best hay. An acre, furthermore, furnishes three tons of green leaves, which after three months' keeping are reduced to two tons, equal in commercial value as five tons of leaves are equal to one ton of hay. Thus this secondary product is equal in value to 2 2-5 tons of hay per acre. This is to be added to the price received for the beets. But what is more important to the farmer than the money value is, that he is enabled to fatten a great number of cattle, *although* he has sold the beets. We leave it to the farmer to calculate how many additional heads in his individual case he can fatten. We have here to do with the *tout ensemble*, the pulp and the leaves of 780,000 tons of beets. This much we will say, that it means an export capacity to Canada *tenfold* of the present! it means to see our summer and winter ports continually filled with cattle steamers, a large increase to our shipping, insurance, labour, commission. . . . Nor have we indicated all the advantages accruing to the farmer; it remains to be said that this additional quantity of cattle furnishes him with fertilizers, and the rotation of crops thus rendered easy will enrich the farm and the farmer. The model farm of the Hon. M. H. Cochrane gives the best evidence of the influence of a large herd of cattle fed on root crops.

Now let us look into the corresponding interests—the fuel question. The rule is, that 100 tons of beets require 36 tons of coal; thus, in order to make the sugar we consume to-day, not to speak of progress nor of export, we shall require 180,000 to 280,000 tons of coal! What thinks our coal-producing East of that? Not only the first cost of coal, but freight, insurance, and labour charges. What a number of our people would, directly and indirectly, benefit by it! One word upon the Railway interest: it is not possible to make any reliable calculation as to probable tonnage, but taking into consideration the transport of beet, coal, cattle, sugar, molasses, limestone, machinery, phosphates, bones, we do not exaggerate when we put it down at a round million tons! Next our Machine-builders: after the first factory has been supplied with European machinery, or in part, the machinery for the subsequent ones would certainly be made here. The machinery for each factory may be put down at \$60,000, or 1½ million for the factories for home consumption of sugar, not to speak of corresponding agricultural machines, so often to be renewed. Next come the phosphates of Canada, which would find a home market, in the shape of super-phosphates, the manufacturing of which would again employ numerous hands. We have not touched yet the important item: labour, summer labour on our fields and winter labour in the factories at remunerative wages. Notwithstanding all labour-saving machines, close calculation shows that 17,000 hands would be required to grow beets, to tend the cattle, and to manufacture the beet into sugar; reckoning at an average of eighty cents a day, we have here a sum total of four million dollars distributed, so to speak, broadcast over the land each year. Thus it is our duty to appeal to our intelligent and able men seriously to consider if such a desirable end cannot be brought to pass, that we may thus furnish new sources of employment for our people, that we may attract to our shore thrifty emigrants and *retain* them.

In all countries where beet-sugar works are now flourishing, and where the income therefrom forms the most important item of the budgets, both, honour and fortunes are lavished on those who were courageous enough to risk their money, and were successful in the enterprise. Let us hope, that here also, energetic men will be found, who with perseverance will conquer all the opposition which all new enterprises have to encounter,—the timidity of capitalists and farmers. We know of no better investment for a large sum of money than the intelligent cultivation and utilization of sugar-beets. We need not at once think of establishing such immense factories like the one at Meaux, some twenty miles from Paris, where 1200 tons of beets per day are worked up, and from 75 to 80 tons of sugar produced; but we have to commence by overcoming the indifference of our people and bring all the facts forcibly to their full appreciation, in order to make a serious beginning!

Nor have we exhibited the entire bright prospect. Why and wherefore should we here stop to manufacture sugar for home consumption only? The affair is plain: either our land and climate is fit or it is not fit. Let us consider that the entire crop of Germany, 420,500 tons, or seven times as much as we consume in Canada, is raised on a belt of country 90 miles long and 30 miles broad, and we will not doubt, that with our immense fertile lands so much more fit, we will be quite able to compete with those tax-ridden countries where an acre is worth more than a thousand dollars, and where on an average three acres support a family. We cannot refrain repeating the memorable words of the best German authority: *Providence has done more for Canada than Canadians have improved and done for themselves, and if we had but a part of their lands, we would raise sugar to supply the world.*

Our memorandum draws to a close. We hope our object may be attained. We have given our readers an insight into this mighty business on the continent, and the magnitude of the result for State and individual, its remarkable spread everywhere it took a foothold, distributing welfare on its path. We have statistically shown that the consumption has doubled and trebled during the last 25 years; and finally, have proved that this our Canada is the El Dorado for this culture; that climate, soil, winter, cheap fuel and phosphates, all combine to make it so. We have shown, that hand in hand with it, our cattle export capacity will attain an enviable position. Let us hope that we have not appealed in vain, so that we may soon possess an industry, which, with those already existing, will elevate Canada to its proper standard.

The great Thiers said: "The beet-sugar industry has saved France thrice from ruin." Let us predict, that for us it will be, what cotton is for the South—an ever running stream of prosperity. So mote it be.

THE FUTURE.

The French poet who complained that he was born too late into a world too old, can hardly be said to have taken his bearings correctly. Most of us looking to what is going on around us in the way of progress, would rather be inclined to feel that we have come too soon into a world only yet in its infancy. It has lasted a good while, truly, this world ; but in a state of torpor and inertness, more or less, having only woke up and begun fairly to look about it.