1876.

NEW ZEALAND.

BEET-ROOT SUGAR.

CULTIVATION OF SUGAR-BEET IN NEW ZEALAND, AND MANUFACTURE OF SUGAR, (PAPERS RELATING TO).

Presented to both Houses of the General Assembly by Command of His Excellency.

SIR,— Wellington, June, 1876.

When I was at Home my attention was very much directed to the subject of the manufacture of beet sugar: not only on account of the number of applications made to me on the subject, but also because of the extraordinarily increased production of beet sugar as compared with cane sugar, and the very strong feeling which seems to exist that beet sugar produced by free labour is likely, in the chief civilized countries of the world, to supersede cane sugar when the production of the latter by slave labour finally ceases. Interest in subject.

I forward, with this letter, correspondence with Mr. Neville and his solicitor, Mr. F. Heritage (Appendix D). These gentlemen desired to obtain a grant of land, in consideration of undertaking a large expenditure on beet sugar works. I was favourably inclined to the project at first, and proposed to communicate with the Superintendent of Otago on the subject, as I was aware that the establishment of this industry had been very much desired by the Otago Government for some time. Further consideration, however, convinced me that, if beet sugar manufacture is to be a success in New Zealand, express care must be taken not to give special advantages to one or two particular establishments, as by doing so other establishments would have to start at a disadvantage. If advantages are to be offered at all, they must be of so general a nature as to be open to whoever wishes to profit by them. Neville correspondence.

I enclose herewith an interesting report sent to me by Mr. A. Savile Grant, after I had a long conversation with him on the subject (Appendix E). Mr. A. S. Grant's report.

Mr. Rattray, a well-known merchant of Dunedin, applied to me when I was in England to obtain for him official introductions in France and Belgium which would enable him to make himself acquainted with some of the beet sugar establishments in those countries. Through the Colonial Office I obtained from the Foreign Office introductions for Mr. Rattray, of which that gentleman availed himself. Before I conclude I shall refer to some of the information which Mr. Rattray has kindly placed at my disposal as the result of his investigations. Mr. Rattray's report, page 25.

The subject had been brought so much under my notice that I thought it desirable to obtain all the information which printed books could afford; and in my researches I was surprised to find that so little interest has been taken in the production of beet sugar in Great Britain. The industry has been so unpopular there, that very few books of value relating to it can be pro- Sources of information.

Sources of information.

cured. I obtained an interesting little book, published in America in 1871, by Mr. E. B. Grant (not the same Mr. Grant to whom I have already referred), in which that gentleman enthusiastically recommends to the farmers and producers of the United States the introduction of beet-root sugar. I shall make several extracts from this work before I conclude. Various publications, such for example as *Sugar Cane*—a periodical, as its name denotes, devoted to the interest of sugar produced from cane—trade returns, and other books, have afforded me some statistics. Some of these I shall quote, and it will be apparent to you that there is a great deal of diversity in the returns given. They will, however, be interesting to set out; for they will show the results of investigations made from many points of view. I felt, however, that more accuracy might be obtained from, and greater weight be placed upon, official returns; and I therefore decided to ask the Colonial Office to obtain some information for me. I enclose the letter in which I made the request and the replies thereto, and I cannot too sufficiently express my acknowledgments for the attention which it has received. Inquiries were instituted by the representatives of Her Majesty at all the Courts in Europe, and the mass of information obtained in response gives probably a better statistical history and account of the present condition of beet sugar production in Europe than is to be found in any publication extant, certainly in any publication in the English language (Appendix A). Some of the returns I have had translated, as also extracts from *Statistique de la France*, by Maurice Blóck, published in 1875, which Lord Lyons obtained. I have only one volume of the two books of statistics forwarded by Lord Lyons. Probably the other has been mislaid and will yet arrive. It contains the French legislation on the subject, as also the rates of duty, &c. I submit, to be attached hereto, as many of the documents as it seems to be desirable to publish.

What has been done in New Zealand.

It will be well, before proceeding further with the subject, to briefly allude to what has hitherto been done in this colony. For some years past, the impression has prevailed in New Zealand that it would be an exceedingly desirable thing to introduce the industry of beet-root sugar production. The Province of Otago at one time moved very actively in the matter. A bonus was offered, and seed of the best kind of beet was procured. The Select Committees of the General Assembly have at various times reported favourably of beet-root sugar, and, in response to the recommendation of that Committee, the Colonial Government offered a reward, procured seed and distributed it to the Superintendents in February, 1875, with what result will be seen by the replies to a circular telegram sent last month, which I forward to you (Appendix F). A notice of claiming the reward offered has from time to time been given, but, as far as I am aware, no step whatever has been taken towards establishing a beet sugar manufactory. The Curator of the Museum and his assistants have exerted themselves with a view to obtain information as to the saccharine qualities of the beet grown in this colony, but the efforts they made have not been largely responded to. The Museum authorities are not to blame for this want of success, as they have taken great care in getting out seed, and spared no trouble in seeking for information. The small results which have followed their efforts are rather to be explained by the fact that people had too many other things to attend to, to be desirous of spending time and trouble in the investigation of what to them, at the time, must have appeared to be merely scien-

tific research. Not, however, that such is the case, because probably, before any large amount of capital is invested here, some satisfactory proof will be required of the result of the cultivation of beet-root. So far as that cultivation involves the production of heavy crops per acre, there can be little doubt upon the subject; and I have to draw your attention to the very interesting report which the Rev. Mr. Bluett, of Canterbury, has obligingly furnished to me, and which will be found further on in this letter, where I refer more particularly to the question of the probable profitable cultivation of beet.

What has been done in New Zealand.

Mr. Bluett's report, page 13.

The question, however, of the percentage of saccharine matter in beet is of very great importance, and one which has not as yet been satisfactorily solved. The *Cyclopædia of Agriculture*, 1875, in an article bearing the initials A.V., and evidently written by Dr. Augustus Voelcker, Member of the Chemical Committee of the Royal Agricultural Society, whose works are largely quoted from by all writers on this subject, says,—

Saccharine matter in beet.

On an average the proportion of sugar contained in the various kinds of beet which are cultivated for sugar-making can be assumed at about 10 per cent. In the manufacture of beet-root sugar, however, a large quantity is changed into uncrystallizable sugar or glucose, which constitutes the principal part of molasses or brown syrup. In France the average percentage of sugar which is actually obtained in beet-root sugar manufactories amounts to about 5 per cent. A production of 6 per cent. is considered a satisfactory result, and 7 per cent is seldom obtained, even in favourable seasons. It is, however, by no means impossible to increase the percentage at present obtained in the manufactories by a still more improved process of preparation. . . . . According to some experiments of Herman, roots of sugar beet,

Weighing ¼lb, contained ... 13 per cent. of sugar.	Weighing 2lb, contained 8–10 per cent. of sugar.
„ ½lb–1lb „ ... 11–12 „	„ 3lb „ 6– 7 „

The Secretary for Agriculture of Victoria, in his report for 1874, says,—

According to the returns sent in, it appears that the roots manufactured into sugar and spirit gave on an average 7·09 per cent. only of sugar—a quantity much too small to render the manufacture of sugar from beet-root a profitable industry in Victoria. The average quantity contained in beet-roots used for the manufacture of sugar on the Continent of Europe is 10–13 per cent.

I have caused some samples of sugar-beet, procured at Napier, to be analyzed by Mr. Skey, Government Analyst, with the following results:—

No.	Mark on Sample.	Approximate Average Weight.	Sugar, per cent.
1	"Botanical Gardens"	4 lbs.	4·9
2	"Mr. H. W. Smith"	4¼ „	5·8
3	"G. Fannin, Jun."	2⅓ „	8·4
4	"Harding"...	3¼ „	7·6

I cannot say how far, without further demonstrative experiment, it will be accepted as a necessary conclusion that a country like New Zealand, with its varieties of soil and climate and the conditions it possesses suitable to the growth of beet, may be relied on to produce the root with sufficient saccharine matter to serve the purpose of sugar manufacture.

I have already referred to the marvellous increase in the production of beet sugar. That increase has been continuous over a lengthened period, and has been largely augmented during the last few years. The very low price of sugar which prevails in Europe at the present time, coupled with the greatly enlarged production, suggests that the appliances for making sugar are much improved, and that those appliances which are known to exist may be yet more economical and efficient than is supposed. Persons as a rule are not desirous of divulging trade secrets, and it is fair to conclude, from the fact of the very large increase in the production of sugar of late years, that some great improvements have been made

Increase in production.

in the appliances for that production. Indeed, such are admitted, and the only question is, whether the admission goes to the full extent that it might.

Early history.

The early history of beet-root sugar is probably known to most people. So early as 1747 it was first discovered by the Prussian chemist Marggraf that beet contained sugar. In 1789, Achard, the famous Prussian chemist, after twenty years' investigation, reported that he had been able to produce sugar of good quality, and at a low price, from beet. It is stated, on the authority of the late Emperor of the French, that—

> The British Government, alarmed lest the discoveries of Achard should injure the colonial interests of Great Britain, offered him, anonymously, first 50,000 thalers, and subsequently 200,000 (about £30,000), if he would report that his experiments had resulted unfavourably; but that this humiliating offer was rejected with contempt, and the successful result of his labours made public.

Beet-root sugar production seems to have had a varying history of success and misfortune during many years, and no doubt it would have died out altogether but for the heavy protection which was afforded to it. It appears to have had, throughout, the unfailing opposition of the English Government.

The *Encyclopædia Britannica*, quoting from the *Farmers' Magazine*, Vol. 1, p. 481 (June, 1852), says,—

> Some years since the manufacture of sugar from beet-root began to be attempted, and not without success, in England. The absence of any excise duties, and an existing considerable import duty on colonial sugars, seemed to offer a kind of premium to the English makers. The Government naturally took alarm: a revenue on imported sugars, which in 1850 yielded about £4,130,000, could not be allowed to be endangered. Parliament therefore interfered; and by the 1st Victoria, c. 57 (1837), a duty of 24*s.* per cwt. was imposed on all sugar made from beet-roots in the United Kingdom.

France—production.

I take also from the *Encyclopædia Britannica* a statement of the production of inland sugar, and foreign sugar entered for consumption, in France, from 1820 to 1839; from which it will be observed how enormous, even up to that time, was the proportionate increase of home-manufactured sugar to that of foreign sugar.

Year.	Production of Inland Sugar.		Foreign Sugar entered for Consumption.		Total Consumption of Sugar.	
	Kilogrammes.	Tons English.	Kilogrammes.	Tons English.	Kilogrammes.	Tons English.
1820	50,000	49	44,416,795	43,730	44,416,795	43,730
1821	100,000	98	41,502,749	43,770	41,502,649	40,769
1822	300,000	294	49,328,057	48,457	49,328,057	48,457
1823	500,000	490	37,590,270	36,926	38,590,270	37,806
1824	800,000	784	56,048,430	55,057	56,048,439	55,057
1825	1,000,000	980	48,546,683	47,689	49,546,683	48,678
1826	1,600,000	1,568	64,407,342	63,270	65,407,342	64,250
1827	2,000,000	1,960	50,797,139	49,899	52,797,139	51,859
1828	2,700,000	2,646	61,987,771	60,891	64,987,771	63,831
1829	4,400,000	4,312	62,160,175	61,061	66,160,175	64,981
1830	5,500,000	5,390	54,647,941	53,622	60,647,941	59,502
1831	7,000,000	6,860	67,750,207	66,552	74,750,207	63,412
1832	9,000,000	8,820	62,642,643	61,535	71,642,643	70,355
1833	12,000,000	11,760	57,874,877	56,861	69,874,876	68,621
1834	20,000,000	19,600	65,643,511	64,483	85,643,511	84,083
1835	30,000,000	29,400	64,095,647	62,962	94,095,647	90,362
1836	40,000,000	39,200	56,276,475	55,281	96,276,475	94,481
1837	45,000,000	44,100	64,167,840	63,033	109,167,840	107,133
1838	50,000,000	49,000	63,251,965	62,143	113,251,965	111,143
1839	55,000,000	53,900	62,731,995	61,622	117,731,095	115,649

From Mr. E. B. Grant's work, published in America, on beet-root sugar and the cultivation of beet, and from other sources, I have been able to compile the following return of the production of beet sugar in France, from 1840 to the present time:—

France—production.

Year.	Tons.	Year.	Tons.	Year.	Tons.	Year.	Tons.	Year.	Tons.
1840	22,000	1848	56,000	1856	92,000	1864	145,745	1872–73	408,649
1841	26,000	1849	44,000	1857	80,874	1865	270,000	1873–74	396,578
1842	30,000	1850	64,000	1858	150,444	1866	270,000	1874–75	450,877
1843	28,000	1851	75,000	1859	131,762	1867	224,767	1875–76	475,000
1844	30,000	1852	60,000	1860	130,000	1868	213,904		
1845	37,000	1853	75,000	1861	146,414	1869	285,146		
1846	49,000	1854	77,000	1862	173,675	1870	300,000		
1847	60,000	1855	45,000	1863	108,495	1871–72	335,351		

Mr. Grant also shows the reduction in the average price of sugar, exclusive of duties, in Paris, in the following interesting tables:—

Year.	Cents.	Pence.	Year.	Cents.	Pence.
1816	$12\frac{5}{10}$	$6\frac{1}{2}$	1823	$8\frac{6}{10}$	$4\frac{1}{4}$
1817	$11\frac{6}{10}$	$5\frac{3}{4}$	1824	$10\frac{3}{10}$	$5\frac{1}{4}$
1818	$12\frac{1}{10}$	$6\frac{1}{2}$	1825	$9\frac{9}{10}$	5
1819	$11\frac{9}{1}$	6	1826	$10\frac{3}{10}$	$5\frac{1}{4}$
1820	$10\frac{8}{10}$	$5\frac{1}{2}$	1827	$9\frac{9}{10}$	5
1821	$10\frac{8}{10}$	$5\frac{1}{2}$	1828	$9\frac{9}{10}$	5
1822	$7\frac{8}{10}$	4			

From 1828 to 1854 the price gradually fell, and the following table shows the average prices from 1854 to 1865:—

Year.	Cents.	Pence.	Year.	Cents.	Pence.
1854	$5\frac{8}{10}$	$2\frac{3}{4}$	1860	$6\frac{1}{10}$	3
1855	6	3	1861	$5\frac{9}{10}$	$2\frac{3}{4}$
1856	$6\frac{4}{10}$	$3\frac{1}{2}$	1862	$5\frac{2}{10}$	$2\frac{3}{4}$
1857	$7\frac{6}{10}$	$3\frac{3}{4}$	1863	$5\frac{2}{10}$	$2\frac{3}{4}$
1858	$5\frac{6}{10}$	$2\frac{3}{4}$	1864	$5\frac{2}{10}$	$2\frac{3}{4}$
1859	$6\frac{9}{10}$	3	1865	5	$2\frac{1}{2}$

The price in April 1866 was $4\frac{3}{4}$ cents per pound.

The preceding table shows that the price of sugar has constantly fallen since 1816; yet production has steadily increased.

It will be seen that the price of sugars, exclusive of duties, was in 1816 about three times greater than it is at present. But this does not fully convey an idea of the difference in the state of things existing then and now.

Revenue from beet sugar.

I have already referred to the fact of the beet-root sugar manufacture owing its success to the protection which was afforded to it in the earlier stages of its history. It must not be supposed that this was continued. On the contrary, all European countries have gradually passed from giving exceptional advantages to inland-produced sugars to obtaining from them a heavy revenue; and in France, at the present time, if I am correctly informed, the duty on sugar imported from the French colonies is less than the Excise duty on beet sugar. Mr. E. B. Grant, the American writer, says on this subject of protective duty,—

From 1816 to 1833 beet sugars were protected by a duty on foreign sugars, varying from 5 to 8 cents per pound.

From 1833 to 1840 they had a protection of $2\frac{1}{4}$ to $5\frac{3}{4}$ cents per pound.

From 1840 to 1860 they were protected by a duty of from 1 to $3\frac{1}{2}$ cents per pound on foreign sugar.

From 1860 to the present time (1870) not only has there been no protection as against foreign sugars, but sugars of the French colonies have had an advantage over all others of nearly half a cent per pound.

Revenue from beet sugar.

It must be recollected that Mr. Grant was writing early in 1870, and that great changes in taxation have taken place in France since that time. The information afforded by Lord Lyons (Appendix A, Enclosure to No. 5) gives further and accurate information on this subject.

So-called protection.

As I have spoken about beet-root sugar not being protected at the present time, and as in the various English papers the question of French protection of beet-root sugar has been very much discussed and widely complained of, perhaps it would be well that I should explain to those not acquainted with the facts the meaning of the outcry raised against this so-called protection. The plan that has been adopted in France is to allow a drawback on refined sugar on an arbitrarily fixed proportion supposed to be yielded by raw sugar, on which the duty is collected in advance. Thus, we will suppose, a certain quantity of raw sugar on which duty is paid is sent to be refined. A drawback is applied for, for a certain number of tons of refined sugar which the French authorities suppose the raw sugar to be capable of yielding; but owing to improved appliances the raw sugar yields considerably more refined sugar than the arbitrarily fixed amount. The Government therefore, in paying the drawback upon the supposed produce of a certain amount of duty-paid raw sugar, either give a drawback on a larger quantity than that on which they have received Excise duty; or, to put it more precisely, the additional sugar produced, upon which virtually no duty has been received, is left to be sold for home consumption as if such duty had been paid.

To give an example: an estimate was made that in 1874 the quantity of loaf sugar exported from France was 185,874,000 kilogrammes, which under the French estimate was supposed to be produced from 224,770,000 kilogrammes of raw sugar, upon which quantity drawback was allowed. But in reality the last-mentioned quantity of raw sugar was understood to have produced nearly 10 per cent. more than the refined sugar exported, and on that 10 per cent. the French producer virtually received a remission of Excise duty. No doubt this does operate as a bonus on exported sugar, and has been a great grievance to the English producer, because it has flooded the English market with refined sugar at a much less price than a similar article could be produced in England. At the same time it must be remembered that the advantage thus gained is only so much out of the enormous amount obtained by the French Government from the Excise duty on beet-root sugar; and this advantage or bonus, by a convention already signed by Belgium, France, Great Britain, and the Netherlands, is to cease some time during the present year, by the adoption of a plan which, in the terms of the convention, is thus stated:—"The drawbacks granted on the exportation of sugar from the contracting countries shall only be the exact representation of the Customs and Excise duties levied on the same products."

Germany—production.

I have alluded particularly to France; but there are other countries in Europe which attach great importance to beet-root sugar manufacture, and in which it has progressed to an enormous extent—notably Germany, the returns from which are no less instructive. The following interesting return is from the same American book, Mr. E. B. Grant's, from which I have already quoted:—

TABLE showing approximately the Quantities of Beets used in the Manufactories of the Zollverein, the Products extracted, and Rate of Taxation, from 1840–41 to 1865–66. Germany—production.

Year.	Number of Factories.	Beets used, tons.	Raw Sugar, tons.	Molasses, tons.	Tons of Beets to a Ton of Sugar.	Sugar, per cent.	Molasses, per cent.	Total yield, per cent.	Tax on roots per ton. Dols.
1840	145	241,486	13,445	8,955	18	5·55	3·7	9·25	·12
1845	96	222,754	14,850	6,905	15	6·67	3·1	9·77	·71
1850	184	736,215	52,586	19,877	14	7·14	2·7	9·84	1·42
1851	234	914,495	60,966	27,434	15	6·67	3	9·67	1·42
1858	257	1,833,427	146,674	45,835	12·5	8	2·5	10·50	3·56
1860	247	1,467,701	126,526	35,224	11·6	8·62	2·4	11·02	3·56
1861	242	1,584,619	122,838	38,050	12·9	7·75	2·4	10·15	3·56
1862	247	1,835,663	138,042	44,055	13	7·52	2·4	9·92	3·56
1863	253	1,999,576	151,180	47,989	13·2	7·55	2·4	9·95	3·56
1864	270	2,079,729	165,978	49,913	12·4	7·98	2·4	10·28	3·56
1865	300	2,106,000	180,000	50,544	11·7	8·54	2·4	10·94	3·56

In a memorandum written by Mr. F. A. Krull, German Consul in this city, in 1871, that gentleman says,—

There are now 296 beet-root sugar manufacturers at work on the Zollverein. The beet-root sugar now pays a duty equal to 10s. per cent.: but it is by no means protected; on the contrary, the duty is in favour of unrefined sugar imported from the colonies, inasmuch as the residue syrup from that sugar is considerably higher in value than that left from the beet-root.

Steadily and surely has this industry increased, until it is now one of the most productive the States possess; and not only does it yield a revenue of £2,000,000, but it creates a demand for labour to the same amount, and returns to the soil as nearly as possible an equivalent in manure and stock-carrying capacity. Besides, it has imparted to land, before almost unproductive, an immense value, and opened up a field for the profitable employment of a very large capital.

The *Sugar Cane*, a periodical to which I have already referred, gives the following return, as the estimated crop of beet-root sugar on the Continent of Europe for the season 1875–76, as compared with the four previous periods:— Europe—production.

	1875–76.	1874–75.	1873–74.	1872–73.	1871–72.
	Tons.	Tons.	Tons.	Tons.	Tons.
France	475,000	450,877	396,578	408,649	335,351
Germany (Zollverein) ...	305,000	250,579	288,972	258,663	189,166
Austro-Hungary ...	170,000	121,520	169,250	214,107	161,527
Russia and Poland ...	150,000	130,000	150,000	150,000	90,000
Belgium	75,000	71,079	70,366	75,978	72,236
Holland and other Countries	30,000	30,000	35,000	35,000	25,000
Total	1,205,000	1,054,055	1,110,166	1,142,397	873,280

For the returns of the years 1867 to 1870 I am indebted to a statement made by Mr. Caird before the Society of Arts in 1871. The quantities for 1867, 1868, and 1869 are ascertained, those for 1870 estimated:

	1867.	1868.	1869.	1870.
France	224,767	213,904	285,146	300,000
Germany	165,014	208,140	215,407	250,000
Austria	124,068	101,601	152,205	175,000
Russia and Poland	112,500	87,500	132,500	135,000
Belgium	31,039	37,078	43,552	50,000
Holland, Sweden, and Italy	7,500	10,000	12,500	15,000
Totals	664,888	658,223	841,310	925,000

When you notice these returns, and compare them with the following statement of the production of beet sugar by the manufactories in Europe for the

Europe—production.

period 1865–66, which I take from Mr. E. B. Grant's book, you will understand what I mean, when I say that the increase has been astonishing in amount:—

France	270,000	tons.
Holland	5,000	,,
Austria	80,000	,,
Zollverein	180,000	,,
Russia	50,000	,,
Belgium	30,000	,,
Poland	14,000	,,
Sweden	1,000	,,
Total	630,000	,,

America—production.

In a lecture given by Colonel Stewart at Kingston, Jamaica, about the middle of last year, that gentleman stated that statistics which he had carefully studied convinced him that the sugar crops of the world in 1874 amounted to 3,375,000 tons of sugar, from which he deducted 1,350,000 tons of beet sugar grown in Europe and California. I am not able to state to what extent the production of beet sugar has reached in California. When I was there some years ago the industry had only just commenced; and in other parts of America there was a strong prejudice against the production of sugar from beet-root, and in favour of its production from sorghum. You will find in a letter which I wrote from America then, and which was published in the Appendix to the Journals of the House of Representatives, 1871, G.—14, pp. 10 and 11, that I stated I was told that all attempts to grow beet profitably in Illinois and the neighbouring States had been a dead failure, in consequence of the expense involved in the culture. That statement was made by a manufacturer of machines for the production of sorghum sugar. The American book from which I have quoted (Mr. E. B. Grant's) was written with the avowed object of showing that beet could be profitably cultivated in America, and I shall have something to say upon that subject presently. In the meanwhile, I may mention that the only information I have as to the success or otherwise of the attempt to produce sugar in California is contained in the following extract from Colonel Stewart's lecture, to which I have just referred:—

> By the Press of California we see beet sugar is becoming one of the chief industries of that wonderful State. From the San Francisco papers of January 7th, I find the following report:—
>
> "The beet grows here very abundantly, and yields very heavily to the acre, the average percentage of sugar being about 8 per cent. One factory this season has cultivated 1,500 acres, which is estimated to yield over 3,000,000 pounds of saccharine matter. Judging from the crop of the previous year (which was from 800 acres of beets, producing 982,125 pounds of sugar, and 146,000 gallons of molasses), it would give in round numbers about 2,000,000 pounds of sugar, and a similar proportion of molasses."
>
> When you bear in mind this is only the fifth year since its introduction into that State, seeing this great interest is in the hands of your cousins, and considering what France has done, you may readily conclude, when California has 2 per cent. more than the European beet, what may be expected in a few years.

Comparative production and consumption of cane and beet sugar.

In a paper by Mr. N. Lubbock upon the production and consumption of sugar, a very interesting comparison is made of the average increased production of cane and beet sugar. Mr. Lubbock's statistics come down to the year 1873 inclusive. After giving elaborate tables, he says,—

> It thus appears that, of the average increased production of cane sugar, during the last sixteen years, amounting to 440,426 tons, no less than 343,297 tons have come from Cuba, whilst the rest of the world has only increased its production by 97,129 tons, a fact easily explained by Cuba having enjoyed the advantages of slave labour; whilst the rest of the world, with the exceptions until lately of Brazil and Porto Rico, has had to employ free labour.

He then proceeds to give an account of the increase of beet sugar in the following terms:— Comparative production and consumption of cane and beet sugar.

The average production of beet sugar in Europe, in 1853-57, was 208,000 tons; and in 1869-73, 983,075 tons—an increase of 775,075 tons, or 372 per cent., in the sixteen years. The increase, during the last ten years, has averaged 65,800 tons per annum. The increase on the first five years of this decade was 42,000 tons per annum, whilst during the last five years it was 119,000 tons per annum, notwithstanding that the last five years included the period of the French and Prussian war. If we analyze this increase still further, we find that the years showing the largest increase over preceding ones were,—

1865	increase over	1864	was	34	per cent.
1866	„ „	1865	„	22	„
1869	„ „	1868	„	27	„
1870	„ „	1869	„	11	„
1872	„ „	1871	„	31	„

whilst

1867	„ „	1866	„	4	„
1868	„ „	1867	„	1½	„
1871	deficiency below	1870	„	7	„

He next goes on to consider the question of price, and comes to this conclusion:—

These facts would appear to show that, at prices for sugar equivalent to 22s. per cwt. for fair refining, there is no great inducement to increase beet production.

Then in respect to consumption of all kinds of sugar, he says,—

The consumption of Europe and the United States, during the six years ending 1873, was, according to M. Licht, of Magdeburg, as follows:—

	Tons.		Tons.
1868	1,544,000	1871	1,872,000
1869	1,630,000	1872	1,850,000
1870	1,790,000	1873	2,049,000

These figures show an average increase in consumption of 100,000 tons per annum. In 1872, however, the consumption in Germany and France was 100,000 tons less than in 1871, no doubt the effect of the war, and it is only apparently last year that these countries have recovered its effects, as far as sugar is concerned. The figures for 1874 have not yet been published, but there is reason to believe that the consumption for 1874 will exceed that of 1873 by not less than 150,000 tons.

As will be seen above, 1873 showed an excess of 199,000 tons over 1872; the year 1872 showed no increase of consumption over 1871, but the deficiency of 100,000 tons in the consumption of Germany and France was made good by other countries; 1871 showed an increase of 80,000 tons over 1870, 1870 an increase of 160,000 tons over 1869, and 1869 an increase of 86,000 tons over 1868.

It thus appears that the consumption of the world is at present increasing at the rate of 150,000 tons per annum.

Comparison of Production and Consumption.

According to M. Licht, the production of sugar exceeded consumption in the following years:—

1873 by 98,000 tons.
1872 „ 120,000 „

whilst consumption exceeded production in

1871 by 57,000 tons.
1870 „ 16,000 „
1860 „ 51,000 „

1874 will show a considerable excess of consumption over production, so that, on the whole, it may be said that during the past six years the one has fairly kept pace with the other.

In comparing consumption and production, it is to be noted that the crops of beet-root and Cuba, for the two years 1872 and 1873, showed together an excess of 521,000 tons over 1871. The whole production of the world, however, only showed an excess of 330,000 tons for those two years, so that it is evident the production of the rest of the world has fallen off.

Can the beet-root growers and Cuba continue to meet the increasing demands of consumption?

In a private letter upon the subject which I lately received, the statement is made that in London it is estimated that the total production of sugar at the present time in the world is 3,000,000 tons, of which quantity half is beet sugar and half the balance proceeds from Cuba. One and a half million tons in 1876, compared with six hundred and thirty thousand tons in 1866, is certainly a wonderful result.

I have endeavoured to look at the matter dispassionately from many different points of view, taking into consideration on the one hand the very strong prejudice in favour of beet sugar on the Continent of Europe, and on the other hand the very strong prejudice against it in England; and the conclusion I have arrived at is that slave-produced cane sugar is well able to hold its own, but that cane sugar Comparative cost of producing cane and beet sugar.

Comparative cost of producing cane and beet sugar.

produced by free labour has not much chance against beet sugar produced in a similar manner in countries where freight and other charges would add to the cost of the cane sugar on the spot. As between the cost at the place of production of cane sugar in localities where it can be produced favourably by free labour, and the cost of beet sugar under similar circumstances at the place of production, cane sugar can be produced somewhat cheaper. But when it is a question of supplying one country from another—of sending the cane sugar from a tropical to a temperate climate—the cane cannot compete with the beet sugar produced in the consuming country, under the improved conditions of growth and manufacture which have been arrived at. Looking at the history of the industry from a broad point of view, it is impossible to fail to recognize that the progress of beet sugar has not only been concurrent with improvement in production, but also with the gradual abolition of slavery. It is important to remember this fact when we come to consider the question of encouraging the production of beet sugar. For, whatever may be said upon the question of free trade or protection, there is no one who will think it is right, in such a country as ours, to refuse opportunities to free labour for the purpose of aiding a few persons to make profits out of forced human labour. In Queensland a statement has been made that sugar can be produced with profit by free European labour. On the other side, assertions equally strong have been made that the production of sugar will not be a success until coolie labour or Island labour can be procured. Without discussing the question as to whether or not it is desirable in such a climate to introduce such labour, I venture to think we are not likely in New Zealand to be influenced in our policy by a desire to make the employment of coolie or Island labour profitable in tropical Australia.

Advantages of beet cultivation.

Allied to the question of the production of sugar, it appears to be the opinion all over the beet-producing countries of Europe that the cultivation of beet materially increases the production of cereal and other crops, and of animal food, and that therefore it stands pre-eminent as a beneficent industry. The concurrence of testimony on this point is very remarkable. Basset, in his work, *Guide Pratique du Fabricant de Sucre*, says,—

> The manufacture of sugar from beets is one of the most important elements of public prosperity. Resting on agricultural progress and the wants of a constantly increasing population, allied by reason of the cattle which it supports with the production of meat and bread, based upon improving cultivation, it renders to modern society the greatest services, at the same time that it attains for itself the highest point of prosperity and glory to which any industry ever had the ambition to aspire.

In respect to the general advantages of beet sugar manufacture, M. Dureau, author of several valuable works on beet sugar, and also the editor of the *Journal des Fabricants de Sucre*, says,—

> The cultivation of the beet is getting to be highly popular. The president of an agricultural society is sure to gain all hearts when he talks about beets. No agricultural newspaper can abstain from entertaining its readers with accounts of the precious plant, and there is no farmer who does not introduce it into his fields with the view of its conversion either into sugar or alcohol. Everybody sings its praises; and surely none have a better right to join in the concert than we, who have always been its advocates for the sake of the industry with which it is allied.

Another writer says,—

> Of all species of industry which it is desirable to see extended in France, the manufacture of sugar and alcohol occupies the first rank. Branches of industry which are pursued in the winter deserve to be supported, because they give employment to labourers who work in the fields in summer, and thereby enable them to increase the amount of their yearly wages.

Another writer says,—

Advantages of beet cultivation.

All cultivators and economists are unanimous in recommending the cultivation of the sugar-producing plant, which is the source of deep tillage, heavy manuring, and increased production. No one believes now that it exhausts and impoverishes the soil, or that it hurts other crops: these are the prejudices of a by-gone age, which science and practice have banished, to set up in their place a recognition of benefits of the highest order produced by the culture of the beet.

M. Dureau says,—

The manufacture of beet sugar was formerly charged with being a local industry. To-day it no longer deserves that reproach, for it is not alone in the North of France that it is pursued; but it has penetrated into the East, the West, and the South,—into Germany, Russia, Italy, Austria, Spain—everywhere.

Another says,—

Everywhere the beet is cultivated in France, land advances in value, and the wages of workmen take the same direction. All Europe, though France has contributed the largest and most glorious part towards the accomplishment of the result, is destined to become a great sugar-producing country, not less important than those where they cultivate the cane, which many believed to be the only plant suitable for the production of sugar, that precious food of which people of the present age are such large consumers. Why should not sugar, which the mysterious forces of Nature have secreted in the beet, be extracted from it, and the soil, prepared for new harvests, and rendered doubly fertile by the thorough cultivation it demands, furnish increasing quantities of food for man and for beast? It is the triumph of industry.

L'Echo Agricole says,—

All farmers who obtain first prizes at the agricultural exhibitions are either sugar manufacturers, distillers, or cultivators of the beet. Those who have adopted this branch of agriculture, either as proprietors or tenants, have really obtained astonishing results. They would be surprised if they did not carry off all the first prizes at the public exhibitions, and were consequently mentioned in the official reports of the Government.

M. Vallerand, who took the first prize in the Department of Aisne, bought, in 1853, a farm of 832 acres, the sales of produce from which amounted to 8,000 dols. In 1859 it produced 41,200 dols. M. Dargent, who took the first prize in the Department of Seine Inférieure, cultivated only fifty acres. He so increased the production of this farm that he obtained 154,000 pounds, or 68 tons and 168 pounds of beets from a single acre. His yield of wheat was 43½ bushels, and of oats 59½ bushels, to an acre.

M. Hary, Pas de Calais, obtained from 295 acres 5,225 bushels of wheat, 2,500 tons of beets, and fattened 150 head of cattle.

The culture of the beet involves the necessity of deep ploughing, heavy manuring, and thorough weeding. The pulp from which the juice is extracted in the manufacture is an excellent food for cattle, the number of which has been increased, in the districts devoted to that industry, from eight to ten fold since the introduction of sugar-making.

The cattle furnish an immense amount of manure, which, applied to the deeply-ploughed and well-weeded beet lands, enhances their productiveness for the cereal crops.

In 1853, when the Emperor and Empress came to Valenciennes, a triumphal arch was erected, with the following inscription:—

SUGAR MANUFACTURE.

Napoleon I. who created it.	*Napoleon III. who protected it.*
Before the manufacture of beet sugar the arrondissement of Valenciennes produced 695,750 bushels of wheat, and fattened 700 oxen.	Since the manufacture of beet sugar was introduced, the arrondissement of Valenciennes produces 1,157,750 bushels of wheat, and fattens 11,500 oxen.

The brothers Fievet have a model farm of 552 acres at Masny, which is considered the best in France. They are sugar manufacturers, and fatten 800 head of cattle and 3,000 sheep every year. I visited there last winter, and spent a day in their manufactories and on their farm. They attribute their success as cultivators to the immense amount of manure that the beet pulp enables them to make, to the improved condition of the soil, and also to the increased amount of profitable service of the land, consequent upon beet culture, no fallows being required.

They have cultivated the farm for thirteen years: the crops are beet, wheat, oats, rye, and hay. I shall give some of the results of the eleven years preceding 1864. The average amount of land in oats had been thirty acres. In 1853 the crop was 45½ bushels, in 1862 nearly 92¾ bushels, and the average for the whole time within a fraction of 90 bushels to the acre.

The crop of straw increased in like proportion, and averaged two tons to an acre. In 1863 it was nearly three tons.

The crops of rye improved in a still greater ratio—increasing from 17 to 34½ bushels per acre, averaging nearly 30 bushels, with two tons of straw to the acre.

The average crops on 156 acres of wheat had been over 36½ bushels to the acre.

Parts of the land had sometimes produced 67⅝ bushels to the acre, and no portion had ever yielded less than 20½ bushels. The yield of hay had been over three tons, and of beets twenty tons to an acre.

In 1865, thirty, thirty-five, and even forty tons of beets were raised on an acre.

As to the cost of producing these crops, the Messrs. Fievet stated that the thorough cultivation of the ground for beets reduced the cost of cultivating succeeding crops enormously.

Thus, after deducting the proceeds of the straw, their oats cost them less than 30 cents, their wheat less than 60 cents, and their rye less than 38 cents, per bushel.

Advantages of beet cultivation.

This they attribute to underdraining, to the use on the beet crop of lime, either pure or the carbonate of lime from the filter presses of the factory, to the liberal application of other manures, to deep ploughing, thorough weeding, and cultivation. The grain crops are not manured, and the ground is so thoroughly prepared by the beet for succeeding crops, that a single light ploughing suffices for the grain, which is all sown in drills by a machine.

Before the introduction of the sugar industry into France, workmen in the country, by reason of a lack of employment, were so constantly emigrating to the city that Government instituted inquiries to ascertain the cause, and also the best method of preventing it. Now, the natural tendency of workmen to seek the capital is not noticed in the sugar-producing districts, where the industry gives ample and well-paid employment to all, both in summer and in winter, and where crime and pauperism have sensibly diminished.

Agriculture was looked upon as the calling of peasants, requiring little intelligence and no education. It is far otherwise now, and to be successful as a farmer involves the necessity of having a good education. The introduction of sugar-making into France, and the intimate relation between that industry and agriculture, called for improved methods of culture, and a more intelligent and scientific application of labour. Intelligence and education were decentralized for the benefit of the whole country; capital also lent its powerful aid, and agriculture made rapid progress, while the condition of the labourers also was materially improved.

Louis Napoleon, the present Emperor of the French, when he was imprisoned at Ham, in 1842, said of the beet sugar industry, in his "Analyse de la Question des Sucres," "It retains workmen in the country, and gives them employment in the dullest months of the year; it diffuses among the agricultural classes good methods of culture, calling to their aid industrial science and the arts of practical chemistry and mechanics. It multiplies the centres of labour. It promotes, in consequence, those sound principles upon which rest the organization of society and the security of Governments, for the prosperity of a people is the basis of public order. . . . . Wherever the beet is cultivated, the value of land is enhanced, the wages of the workmen are increased, and the general prosperity is promoted."

In another place the same author puts the following words in the mouth of the sugar industry:—"Respect me, for I improve the soil. I make land fertile which, without me, would be uncultivated. I give employment to labourers, who otherwise would be idle. I solve one of the greatest problems of modern society. I organize and elevate labour."

Mr. Grant, from whose book I have obtained many of the above quotations, himself says,—

The amount of beets raised in France in 1865 could not have been, on 297,000 acres of land, less than 5,000,000 tons, producing at least 1,000,000 tons of pulp—an amount sufficient to feed 90,000 cattle or nearly 1,000,000 sheep for one year, or to fatten in the winter months nearly three times that number. It also furnished agriculture with more than 1,500,000 tons of manure. In an agricultural point of view, the effect produced by the culture of so much land in beets, and the application of the manure of so many cattle, with the consequent increase in the amount and value of subsequent crops, is perfectly apparent. The quality of wheat raised after beets is better than that usually produced; the ears are larger and heavier, the straw stronger, and not so liable to lodge. The berry is larger and brighter; its specific gravity is also greater, weighing from two to three pounds per bushel more than ordinary wheat.

But these effects are not all, even of those having an agricultural bearing, which the great industry produces. They are not confined to the comparatively narrow circle that surrounds the factory, in which are expended for beets and for labour large sums that foster industry and scatter plenty in the surrounding villages. The distribution of these large amounts for labour and for the crop opens a better market for the productions of other branches of industry—agricultural, mechanical, manufacturing, mining, and commercial.

To till the land and to consume the pulp, many horses, as well as vast numbers of cattle and sheep, are required. These are purchased from other sections; for the departments in which the beet is cultivated are not grazing districts in which cattle are raised, but they are pre-eminently distinguished for supporting and fattening cattle.

The improved condition of the 70,000 labourers engaged in this industry, one-fifth of whom are women and children, makes them larger consumers of tea, coffee, meat, clothing,—of all the necessaries of life. Their enlarged means place within their reach many hitherto unattainable luxuries.

The industry also calls into existence many establishments for the manufacture of agricultural tools. It gives employment to chemists and engineers; to machinists, founders, carpenters, blacksmiths, coppersmiths, wheelwrights, and plumbers; to woollen and linen manufacturers for the sacks it requires. It is a large consumer of coal, of iron, and of other metals, products of the mine. It contributes largely to the support of railroads and canals. It adds its quota to the extension of commerce. Finally, it pays to Government an Excise tax on sugar and alcohol of more than $27,000,000 per annum, without taking into account other taxes, State and local, that are assessed on the $45,000,000 that it has invested in buildings and machinery.

It has not only added immensely to the extent of arable land, but has largely increased the productiveness and value of that already cultivated. It has enabled France to produce more corn at less cost than she ever did before, and kept down the prices of all grains, of beef, and of mutton. At the same time it produces for man sugar, meat, bread, alcohol, potash, and soda; it furnishes nutritious food for cattle, sheep, and swine, together with hay and grain for the horse. In the opinion of eminent French statesmen, it has twice within fifteen years saved France from a famine.

The historian Thiers has called it "the Providence of the Empire."

Mr. Crookes, in his work on the manufacture of beet-root sugar, says,— Advantages of beet cultivation.

Russia in 1866–67, in the Departments of Kiew, Podolia, and Volhynia, manufactured 1,153,880 cwts. where fifteen years before not one pound had been grown.

The *Chamber of Agriculture Journal* says:—The annual value of the raw sugar made from beet-root in France now exceeds five millions sterling. The total number of beet-root sugar factories on the Continent now amounts to more than 1,800, turning out the enormous quantity of 611,000 tons of sugar per season. In the year ending 1867, no less than 55,000 tons of beet-root sugar were imported into the United Kingdom; or, in other words, we paid the Continental makers £1,600,000 for a commodity which, it is now believed, we could just as well have produced ourselves. Beet-root sugar is successfully competing with cane sugar in London and other English markets; and probably a remission of the Customs and Excise duties would have no other effect than to increase the consumption of beet-root sugar, and render its manufacture more profitable than it already is.

The harvest of 1865–66 in France yielded 275,000 tons of raw sugar. Now, in addition to this, there were 100,000 pipes, each containing 100 to 120 gallons, of strong spirit (distilled partly from the root and partly from the molasses), the value of which was £1,350,000; 20,000 tons potash were made from the refuse after distillation, and valued at £500,000; 1,600,000 tons of pulp remaining when the juice had been extracted from the root, estimated to be worth £1,000,000, and purchased eagerly as food for cattle, who devour it with avidity, and thrive on it even better than on mangel-worzel, especially when it is mixed with a small proportion of hay or oil-cake. In addition to all this the leaves and scum were valuable manures. Thus the manufactured produce of that beet harvest represented a value, without including the leaves and scum, of—

Sugar	£6,250,000
Spirits	1,350,000
Potash	500,000
Pulp	1,000,000
Total	9,200,000

Yet the ground cultivated with this imposing result was only $\frac{1}{237}$ of the acreage of France, and actually less in extent than what was devoted to rape-seed.

Nor do these figures show the whole advantage derived from this root. To fairly estimate this, allowance must be made for the undoubted facts that its culture as a rotation crop so prepares the soil that it needs not to be left fallow, and so improves the wheat that from one-fourth to one-third more is produced than before beet preceded it; and that cattle fed on the leaves and pulp are exceedingly prolific, while their milk becomes more abundant and of better flavour; so that the production of beet adds to the supply of bread and meat, and these three leading necessaries of man's existence stimulate and aid each other.

Before proceeding to the question of how far the price of labour in this country will affect the profitable manufacture of sugar from beet, I should say a few words upon the question of the cost of producing the root. The returns per acre vary so widely that it would be very difficult to express an opinion as to the rate at which the farmer might be able to sell with profit. Judging from the various authorities, it would appear that, if the farmer were able to receive as his profit the pulp after the bulk of the saccharine matter is extracted, he would do very well. Not only would it enable him profitably to feed his cattle, but the production of the beet would materially aid him in producing other crops in rotation, and would improve the character of his land. The following is the report kindly furnished to me by the Rev. Mr. Bluett, and to which I have already referred in passing:— Cost of production, and return therefrom.

Sir,— Holcombe, Leeston, Canterbury, N.Z., 5th May, 1876. (Mr. Bluett's report.)

You did me the honor, a few days ago, to ask my opinion on the culture of sugar-beet, but more especially on its probable success in this country. In reply I may state that I have never grown the sugar-beet except in small quantities as an experiment for the purpose of cattle-feeding, and the result has been exceedingly satisfactory. A small patch of rich land, without manure, produced a crop at the rate of something like 45 to 50 tons per acre.

The seed used was the white Silesian, and I calculate that roots grown from this kind of seed will yield from 6 to 8 per cent. more of saccharine matter than the ordinary beet-root, or the mangel-wurzel, and are, therefore, so much the more valuable as a food for stock.

I consider that this country is admirably adapted for the growth of sugar or any other root of the beet kind, and at a comparatively small cost per acre. To produce very large crops the land would require to be ploughed 5 or 6 inches deep, and subsoiled another 4 or 5 inches—then worked as for ordinary beet or mangel-wurzel. Of course, if the land could have a dressing of dissolved Peruvian guano or well-rotted farm-yard manure, so much the more satisfactory would the result be.

I need not here give the details, but I have calculated that the cost of growing the sugar-beet, up to the time and including the gathering in of the roots, would be something like £17 2s. 6d. per acre, and estimating the yield at 40 tons per acre, and the price 15s. per ton (this is putting the yield and price at a low average), equal to £30, and thus leaving a profit of £12 17s. 6d. per acre, and the pulp, which, mixed with cut straw or chaff, makes excellent cattle feed, to the good.

Cost of production, and return therefrom. (Mr. Bluett's report.)

In France, where this industry was first commenced in the year 1810, I have seen large tracts of land under sugar-beet, and it paid both the grower and manufacturer very handsomely.

In the year 1829 the quantity of sugar produced in France from the sugar-beet was 4,000 tons only, but in 1835 it had increased to 40,000 tons. And Dr. L. Gautier, in a pamphlet on this subject, says that in the season of 1872–73 France possessed 487 beet-root sugar-works, producing 400,000 tons of sugar; Germany had 304 sugar-works, turning out 260,000 tons; Russia, 318, producing 150,000 tons; Austria, 220, making 205,000 tons; Belgium, 117, producing 80,000 tons; Holland, 26; Sweden, 6; Italy, 2; America, 2; and England, 1 sugar-works—these latter producing in all 35,000 tons.

Valenciennes alone has 64 sugar-houses, and produces one-seventh of the whole of the sugar produced in France.

According to the "Dictionnaire Industriel," by M. E. Lacroix, 277,500 acres of land are devoted to the cultivation of the sugar-beet, the produce of four-fifths of which is reserved for the making of sugar, and the rest for the distillation of spirit.

The distilleries, 900 in number, produce about 90,000 gallons of spirits. A small proportion, about 17,000 acres, is cultivated for the feeding of cattle.

The crop, he goes on to say, varies according to the nature of the soil, the temperature, the variety cultivated, the preparation of the ground, and the specific gravity of the roots.

The process of manufacture is very simple. After the roots have been well washed, and pulped with a machine similar to those used in the cider-making counties of England—Devon, Somerset, and Herefordshire—for grinding apples into a mash, and the juice extracted by pressure in a press similar to the ordinary cider-press, the juice has to be purified to get rid of foreign matters, and then concentrated by evaporation, and finally the crystals are cleansed of their mother-water and refined.

The method generally considered the best is the following:—The juice is treated at one operation with lime and carbonic acid at a high temperature. The heat coagulates the albumen, and most of the foreign matters form insoluble compounds with the lime: they are decomposed by disengaging the ammonia. The excess of lime forms a sucrate of lime, which the carbonic acid decomposes. Alkaline sucrates are thus formed by setting at liberty the organic acids united with potash and soda. Other insoluble matters, such as the cellular substances, are carried off with the serum. The lime is finally carried off by a second treatment analogous with the first, by filtering the juice through animal charcoal, which absorbs the lime and the saline matters, and at the same time takes the colouring matter from the juice. The whole is then evaporated to produce crystallization.

To show the value of the sugar-beet as a food for stock, and its superiority over other saccharine-producing roots, allow me to add the following table, the result of analyses and experiments tried in England:—Turnips contain 8 to 9 per cent. of nutritious matter; swede turnips, 10 to 13; mangel-wurzel, 10 to 13; carrots, 12 to 14; and well-ripened sugar-beet, 16 to 18 per cent. One ton of sugar-beet would therefore, without taking into consideration the superiority of sugar in the beet as a fattening element, be equivalent in nutritive properties to 2 tons of turnips, $1\frac{1}{2}$ of swedes, $1\frac{1}{2}$ of mangels, or $1\frac{2}{3}$ of carrots.

Growers of sugar-beet must bear in mind—1. That the *Silesian* white is the best seed they can get; 2. Dissolved Peruvian guano the best manure they can use; and 3. That the portion of the root which is covered with earth is that which contains the greatest quantity of saccharine matter, and therefore in growing the beet for the manufacture of sugar it is essentially necessary that the roots, after having attained a considerable size, should be moulded up in the same way as the potato plant; and this can be done expeditiously, cheaply, and well with the ordinary plough, or better, if at hand, the double-breasted plough. In conclusion, I might state that French manufacturers, from long experience and continued experiments, are able, from every 100 lbs. of beet, to produce 12 lbs. of sugar in the short space of 12 hours—a fact which ought to be very encouraging to any one desirous of embarking in an enterprise of this character; and it does seem a pity that, in a country like this, where soil and climate are both admirably adapted to the growth of this valuable plant, and where so much money is spent every year in importing sugars, something should not be done to stimulate and further this enterprise.

I have, &c.,

The Hon. Sir J. Vogel, G.C.M.G., Premier of New Zealand. W. J. G. Bluett.

It will be seen by this report that Mr. Bluett calculates the rate per acre at which beet could be produced at £17 2s. 6d. He supposes that the average yield should be 40 tons to the acre, in which case the cost of the beet would be 8s. $6\frac{3}{4}$d. a ton. The general average, however, of sugar-beet appears to be very much smaller than Mr. Bluett estimates, and for some time to come it is not reasonable to suppose that the farmer will be able to produce good saccharine beet so cheaply as in most parts of Europe. In the same American work, Mr. Grant's, from which I have already extracted, I find the following concerning the cultivation of beet:—

In France the manufacturer contracts with the farmer for the culture of a certain number of acres in beets, at a fixed price per ton, and the crop is always sold in advance of its production.

The relative cost, in the Department of the Maine et Loire, of raising an acre of beets and an acre of wheat, by the same cultivator and in the same year, is shown by the following figures. It is fair to remark, however, that labour in the region referred to is somewhat lower than in the North of France, where the beet is most extensively cultivated.

Cost of production, and return therefrom.

The total cost of cultivating and harvesting the beets on 580⅝ acres of land was as follows:—

		£ s. d.		£
Four ploughings...	$9.18 per acre =	1 16 8	... $5,335.34 =	1,067
Manures ...	9.77 „ „	1 19 0	... 5,676.31	1,137
Seeds ...	.53 „ „	0 2 0	... 310.46	62
Sowing...	1.84 „ „	0 7 6	... 1,078.35	216
Cultivation ...	3.56 „ „	0 14 0	... 2,069.10	414
Harvesting ...	1.42 „ „	0 6 0	... 827.64	165
Transportation ...	1.18 „ „	0 4 8	... 690.09	138
Sundries	.27 „ „	0 1 0	... 156.26	31
Total ...	...$27.75 „ „	5 10 10	...$16,143.55	3,230

The total cost of cultivating and harvesting the wheat on 511⅝ acres of land was as follows:—

		£ s. d.		£
Ploughings ...	$4.04 per acre =	0 16 0	... $2,065.37 =	513
Manures ...	7.46 „ „	1 10 0	... 3,817.68	763
Seed-sowing ...	3.55 „ „	0 14 0	... 1,818.30	363
Harrowing and rolling	1.28 „ „	0 5 0	... 658.98	132
Harvesting and threshing	3.40 „ „	0 14 0	... 1,745.12	349
Sundries	.27 „ „	0 1 0	... 138.81	28
Total ...	...$20.00 „ „	£4 0 0	...$10,244.26	£2,148

From the above figures it appears that the cost of cultivating and harvesting an acre of beets was $27.75 [£5 11s.], and of an acre of wheat $20 [£4]. Rent of land is not included in either account. The cost, then, of the acre of beets, was nearly 38 per cent. more than that of the acre of wheat.

The cost of preparing and planting the ground in Illinois with a crop of beets would not exceed that of preparing and planting it with corn, for it would all be done by the same machinery that is now used. The increase of cost would arise from the greater amount of hand labour required on the beets to keep them entirely free from weeds. In France this labour is all done by the piece. The following are the prices paid for each operation subsequent to planting the seed, upon the above-described field, containing 580⅝ acres:—

		£ s. d.
First weeding	$1.18 per acre =	0 4 8
Second weeding	1.03 „ „	0 4 0
Third weeding	.90 „ „	0 3 8
Thinning out	.23 „ „	0 1 0
Pulling the beets	1.42 „ „	0 6 0
Loading into wagon	.03 per ton =	0 0 1½
Putting into "silos"	.04 „ „	0 0 1¾

At these prices the workmen make from $0.38 [1s. 6¼d.] to $0.42 [1s. 8d.] per day. Much of the work is done by women and children.

On a crop of twenty tons to the acre, the cost of this labour would amount to $6.16 [24s. 7d.] per acre. It is certainly safe to assume that the same work would not cost over $20 [£4] per acre in this country; for I have found that the prices of labour in the United States are certainly not more than three times those prevailing in France, where a farm hand gets from $0.50 [2s.] to $0.60 [2s. 4¾d.] per day in gold.

The usually estimated cost of cultivating beets in France is from 450 [£18] to 600 [£24] francs per hectare, which is from $35 [£7] to $38 [£7 12s.] per acre. This includes taxes, and also rent of land, which latter varies from $8 [32s.] to $25 [£5] per acre per annum; and manures, which are applied at a cost of from $10 [£2] to $15 [£3] per acre. Labour, of men, horses, and oxen, including ploughing, harvesting, and transport of crop to the manufactory, does not materially exceed $15 [£3] per acre.

I submit here the estimate of a practical French gentleman upon the cost of labour on an acre of beets:—

		£ s. d.
Ploughing	$5.54 =	1 2 0
Weeding	3.96	0 16 0
Harvesting	1.98	0 8 0
Transport	3.96	0 16 0
Total	$15.44	£3 2 0

I can see no reason, then, why the Western farmer cannot cultivate an acre of beets at a cost certainly not exceeding $45 [£9] to $50 [£10], for the cost of his acre of land will not average *twice the annual rent* of the acre in France; and unless the present system of cultivation is materially changed, he will not apply fifteen dollars'-worth of manure to the acre, as they do in France. The use of labour-saving machines would probably enable him to diminish considerably the amount of hand labour employed, as compared with France. Even if he employ the same amount, and pay three times the prices paid by the French, not only for his labourers, but for his teams also, his work will not cost him over $45 [£9] per acre.

Assuming that the cost of cultivating an acre of beets would be even as high as $60 [£12] per acre,—which is from $15 [£3] to $20 [£4] more than the cost of an acre of sorghum,—that the crop produced would be as great as that of a fair yield in France, or say twenty tons, then at $4 [16s.] per ton the

Cost of production, and return therefrom.

crop would produce $80 [£16], leaving a *direct* net profit of $20 [£4] per acre—a sum nearly as great as the gross receipts average at present, as shown by table on page 32.

I have said a *direct* net profit of $20 [£4] per acre, because it has been found in Europe that there is also an *indirect* profit on the beet crop in the large increase of crops succeeding it, and in the cattle supported upon the pulp; experiments having conclusively proved that lands now yield from two to three times as much grain, and support from eight to ten times as many cattle, in the beet-growing districts as they did before the beet was introduced. The great beet-producing districts of France are the grain districts, and cattle districts also. The three branches of agriculture always co-exist.

* * * * * * * * *

It will be shown that the product, per acre, of sugar from beets, is greater than the general average from cane.

But the advantages in favour of beet culture do not stop here. The cane crop is exhausting; it is a bad forerunner of other crops; the ground on which it is cultivated must lie fallow at least half the time; it feeds and fattens no sheep, cattle, nor swine; consequently, it affords little material for enriching the soil. The beet, on the contrary, is an enriching and cleaning crop. It requires no fallow; it is the very best known forerunner of other crops; it feeds multitudes of stock, and, instead of impoverishing the soil, constantly improves it.

(Lavenham factory.)

The latest edition of the *Encyclopædia Britannica* contains the following:—

The Silesian white beet has long been cultivated in various States of Continental Europe for the production of sugar, and in several of them is now a staple product of very great value and importance. After several abortive attempts to introduce this industry into our own country, it seems at last to have obtained a firm footing in England, through the enterprise and perseverance of Mr. James Duncan, sugar refiner, of Mincing Lane, London, who five years ago erected the necessary buildings and machinery at Lavenham, in Suffolk. Through the kindness of Mr. Duncan, we are enabled to submit to our readers the following details regarding this most interesting enterprise.

The sugar factory at Lavenham was erected in 1868, although not completed until February, 1869. Mr. Duncan had, first of all, contracted with various farmers in that neighbourhood to grow beet for him at the price of 20s. per ton of clean roots delivered at his factory, with the option to the growers of receiving back the resulting pulp at 12s. per ton, if removed as made. Mr. Duncan also procured from the Continent the necessary supplies of seed of the best sort, and furnished the growers with instructions as to the proper mode of cultivation.

In growing mangolds, farmers try to grow the largest possible weight per acre, and for this purpose they manure heavily, and give the individual plants ample space. This will not do in the case of sugar-beet, as it is found that small roots are richest in sugar, and that 2½ lbs. each is the best size to aim at. The endeavour, therefore, must be to have the roots small individually, and yet to secure a good weight per acre. As the part of the bulb that grows above ground contains very little sugar, a further object is to have as little of it exposed to light as possible. All this is accomplished by sowing the crop in rows about sixteen inches apart, and leaving the plants close to each other. If all is well managed, the crop should yield from fifteen to twenty tons of cleaned roots per acre. The delivery of the roots at the factory begins about the end of September, when they are carted direct from the field as they are pulled. The exigencies of wheat-sowing and other field labour at that season induce the growers to store a considerable part of their beet crop at home, and to deliver it at the factory from time to time as they can overtake this heavy cartage. The roots lose weight rapidly when kept in clamps, to cover which a little extra price is given as the season advances. The convenience of the growers is much furthered by this arrangement; but it sometimes results in irregular supplies, and consequent loss to the manufacturer.

Owing to the extreme drought of 1868, the beet was late in being sown, and the crop was small, amounting only to 1,200 tons; but it was exceedingly rich in sugar. The following season was moist, and the yield per acre good, but the area under crop was small, and the total quantity delivered at the factory about 3,000 tons. The year 1870 was again an extremely hot and dry one, with a gross produce of 4,500 tons, which yielded 12 per cent. of syrup. The produce in 1871 was 6,000 tons, yielding 10 per cent. of syrup; and that of 1872 exceeded 7,000 tons of very good roots, but the wetness of the season and strikes among the labourers so protracted the factory work, that, instead of being completed in December, it was prolonged until March, and the percentage of sugar was smaller than it ought to have been. The particulars of this last crop are as follow. The total weight of clean roots from 571 acres was,—

Delivered fresh from the fields	2,370	tons.
Clamped by growers at their farms	5,485	„
	7,855	„

Of the 571 acres, 89 by two growers averaged 17 tons per acre.

„	115	„	„	16	„
„	61	„	„	15	„
„	21	by twenty-six	„	14	„
„	147	„	„	13	„
„	10	„	„	12	„
„	33	„	„	11	„
„	18	„	„	10	„
„	15	„	„	9	„
„	62	„	„	8	„

So that, with a total average of 13¾ tons per acre, two-thirds of the crop averaged 15 tons, and the remaining third only 9⅓ tons. The proportion of feeding pulp has been large in 1871 and 1872,—both having been moist seasons,—and has been 22 per cent. of the weight of the roots. In 1870, it

was only 19 per cent. The details of the disposal of the pulp from the crop 1872 are also interesting. Of 1,235 tons of pulp purchased by nine farmers,— Cost of production, and return therefrom. (Lavenham factory.)

597 tons were taken by one.
326 „ „ „ by another.
116 „ „ „ by another.
95 „ „ „ by another, not a grower of beet.

In addition to these quantities sold, about 500 tons were stored at the factory, where at the same time about 100 tons of crop 1871 were still on hand, and in excellent condition. To this latter fact we can add our own testimony, having been favoured by Mr. Duncan with a sample of it after it had been eighteen months in store, when we found it perfectly sweet and good, retaining unimpaired the taste and smell of fresh beet-root. The mode of storing the pulp is very simple. On a piece of dry ground a trench is dug out about 7 ft. wide and 1 ft. deep. Into this trench the pulp is firmly trodden by the feet of the labourers, and gradually drawn to a point, precisely as is done in storing roots. The whole is then covered with earth to the depth of 12 in.; and, thus stored, the pulp keeps well for two or three years. In using it a thin crust from the outsides is rejected. In Germany and Austria tanks of brick-work are used to economize space, but not in France or Belgium. Three tons of this pulp are estimated to be equal in feeding value to one ton of good hay. Hitherto farmers give the preference to fresh-made pulp, but Mr. Duncan regards this as quite a mistake, as in his own practice he finds that pulp a year old is a better feeding material than when newly made. In 1872 he fattened fifty cattle on pulp *three* years old, and in the summer of 1873 he had sixty cattle consuming the surplus of the previous season. These cattle (twenty-seven yearlings and thirty-three two-year-olds) consumed daily 35 cwt. of pulp and 4 cwt. of cut chaff (of hay and barley straw) mixed together. The older beasts received daily in addition 7 lb. each of bean-meal, on which ration they made good progress. To meet the cartage difficulty, Mr. Duncan contracted that year (1873) with one grower to perform the haulage of 2,000 tons of beet-root a distance of five miles by a traction engine.

Several joint-stock companies have been formed for prosecuting this industry, but Mr. Duncan's is the only factory as yet in actual operation. It is known also that Mr. Lawes and Dr. Gilbert have for several years been engaged in extensive experiments on sugar-beet, and with most successful results.

The manufacture of sugar from beet-root has attained to very great dimensions on the Continent of Europe. It is known that from the crop of 1872 there has been produced 1,025,000 tons of sugar, worth £24 per ton, and 250,000 tons of molasses, worth £3 per ton; and that new factories, some of them on a gigantic scale, are now in course of erection. A most important fact connected with this rapidly-extending industry is that the erection of a sugar factory is immediately accompanied by an improvement in the agriculture, and an increase in the value of the land, of the surrounding district. In many places farmers gladly contract to supply beet-root at 18s. per ton for ten years, on condition that they receive back pulp in fair proportion to the quantity of root supplied by them. Russia produces the finest quality of beet, instances being known in which the roots yielded 10 per cent. of loaf sugar. There are good grounds for concluding that Russia will, at no very distant date, take a prominent place as a sugar-producing country.

There seems at present a reasonable prospect that the cultivation of sugar-beet will be adopted in various parts of our own country. It has already been proved that the beet grown in the south-eastern counties of England is richer in sugar than that produced in the North of France; and it seems worth while to ascertain, by careful experiment, whether in certain parts of Scotland, such as the Lothians, Fife, and the Carses, sugar-beet could not with advantage be substituted for the precarious and exhausting potato crop. The repeal of the sugar duty would give a great stimulus to this enterprise, and should be pressed for in the interest of our native agriculture.

Referring to Mr. Duncan's factory at Lavenham, the Commissioners of Inland Revenue, in their report for the year ending 31st March, 1874, say,—

The season (1873) was a very short one, owing to the deficient and irregular supply of roots, as well as to the fact of the proprietor having been threatened with proceedings for pollution of the local streams with the refuse of his works. These circumstances have, we understand, decided him to suspend the manufacture, if not wholly to abandon it, at Lavenham.

That there was merely a temporary suspension of the works, if any, will be apparent from the latest edition of the "Encyclopædia Britannica," now in course of publication, still speaking of the factory at Lavenham as an existent institution. How far the pollution of streams, and consequent threatened actions, affected the successful working of Mr. Duncan's factory, I have not the means of judging; but such a difficulty does not appear to have arisen in connection with any of the factories on the Continent or in America, and is not referred to in any of the works on beet sugar manufacture in those countries. The cause for the hitherto comparatively unsuccessful pursuit of this industry in England may probably be gathered from the following remarks of the Commissioners:—

There is good reason for believing that the Revenue regulations have had no share in the bringing about of this result by interfering with the process adopted by Mr. Duncan, or checking the productiveness of his enterprise. We are also satisfied that the non-extension of the system to other parts of the kingdom is in no degree owing to the fear of our requirements, but that the manufacture has not

Cost of production, and rent therefrom.

as yet been begun elsewhere, simply on account of local difficulties in obtaining a sufficient supply of roots of the proper description, the growing of which in this country would not seem to be so remunerative as in Belgium, &c., where the mode of cultivation is different.

Considering all the discrepant accounts relative to the cost of cultivating beet-root, and making allowance for labour-saving appliances and low price of land, I think it will be some years before growers in New Zealand will be able to supply good sugar-beet, with profit, at 17s. per ton. I incline to estimate 19s. or 20s. per ton as nearer the mark for several years.

(Effect of price of labour.)

The question of the effect of the different prices of labour upon the cost of producing sugar from beet is one deserving serious consideration, and upon that I can do little more than say that there appear to be very varied opinions as to the exclusive cost of the labour. It is fair to consider that the cost of labour in this country is two-and-a-half times that which prevails in Germany and most parts of France. On the other hand, it is fair to give very great consideration to the plea, that has been urged in America, that where labour is dear a great deal of expense is avoided by the use of labour-saving machinery. I give the following extracts from Mr. Grant's book. Between the statements in some of these extracts, and those in others on the same points, it is not difficult to find discrepancies. My object, however, is to enable persons who read this paper to judge for themselves; therefore, where I have found contradictions, I have thought it right to place them before you, so that those who wish to form a judgment upon the subject can do so:—

In France the expense of manufacturing raw sugar, including the cost of the beet, varies from 3 to 4 cents per pound.

The average expenses of converting 1,000 tons of beets into sugar by the best processes are about as follow, not including taxes or interest on capital:—

1,000 tons beets, at $3.80	$3,800	£760
Coal, 120 tons, at $3.00	360	72
Bone-black waste	300	60
Sacks for pulp, 250, at 70 cents	175	35
Labour, 220 men, 5 days at 70 cents	770	154
Administration and salaries	200	40
Lighting	50	10
General expenses, insurance	250	50
Lime, metals, rasp blades, repairs, &c.	845	169
	6,750	1,350
From this is to be deducted, say—		
200 tons pulp, at $2.50	500	
30 „ molasses, at $0.22	660—1,160	= 232
Leaving, as total cost of working 1,000 tons beets	$5,590	£1,118

The cost per pound of sugar produced varies in accordance with the percentage of yield, as shown in the following table:—

Yield.	Sugar.	Cost per pound.
6 per cent.	134,440 lbs.	4·15 cents = 2d.
7 „	156,800 „	3·56 „ 1¾d.
8 „	179,200 „	3·10 „ 1½d.

In one establishment that I visited in France, I asked in writing of the proprietor, to whom I had letters that warranted me in doing do, his percentage of sugar and molasses, and the cost of manufacturing.

This gentleman had been very successful, kept his accounts with great accuracy, and, as he manufactured by the old process, I selected him as a good representative of the old system, and asked him many questions, which he answered with great courtesy and in the fullest and most satisfactory manner. His yield of juice was 80 per cent. of the beets worked; his percentage of sugar was 6·85, and of molasses 2·75 per cent. *of the juice.*

This gives a result of 5·48 per cent. of sugar and 2·2 per cent. molasses on the beets worked, which was the poorest result with which I met.

In reply to my question as to the expense of converting a ton of beets into sugar, I shall give a literal translation of his reply, stating that the estimate was made from the business of nine years, in which time he had made improvements and enlargements of his mill, all of which were charged to expenses:—

"Hand labour, general expenses, 10 per cent. depreciation of machinery, coal, taxes, in one word,

every expense, even those for enlargements of works and improvements of machinery, amount to 13.75 francs the 1,000 kilogrammes of beets [11s. per ton nearly]." Cost of production, and return therefrom.

This is about $2.60 [10s. 4¾d.] per ton of beets worked. The average price paid for beets in the above-described establishment was 18 francs the 1,000 kilogrammes, or $3.42 per ton [13s. 8d.], making the total cost of a ton of beets and its conversion into sugar $6.02 [24s.]. From this is to be deducted the value of the pulp and molasses.

Say, for 1,000 tons of beet, at $3.42	... $3,420			
Manufacturing 1,000 tons of beets, at $2.60 ...	... 2,600—$6,020 = £1,204			
Less, 200 tons pulp, at $2.50	... 500			
22 „ molasses, at $0.22	... 484—	984		196
		$5,036		£1,008

Yield of sugar at 5·48 per cent., 54·8 tons, or 122,752 pounds, leaving the net cost of a pound of sugar $4\frac{1}{10}$ cents.

The expense for labour at 3½ francs, or 66 cents, per day (the average) was 92 cents per ton of beets worked, being 35 per cent. of the cost of converting a ton of beets into sugar, and 15·2 per cent. of the *total cost*, including the price paid for the beets. This, if charged entirely to sugar, would make the cost of labour in a pound of sugar six mils.

Inquiry has satisfied me that the expense of manufacturing 1,000 kilogrammes, or 2,200 pounds, of beets into sugar in France, including in the expenses taxes, interest on capital, and depreciation of machinery, averages from 18 to 20 francs, or $3.47 [13s. 10½d.] to $3.87 [15s. 5¾d.] per ton of beets. In some cases it is as low as 15 francs, or $2.88 [11s. 6¼d.], per ton, and in others as high as 22 francs, or $4.25 [17s.], per ton. In the case quoted above it was 13.75 francs, or $2.60 [10s. 4¾d.], per ton.

The expense for labour in the best establishments is, as a rule, about 25 per cent. of the cost of *manufacturing*.

From these figures, which I know to be reliable, the cost of a pound of sugar and the proportion due to labour are shown in the following table; labour being reckoned at 66 cents per day, and the cost of beets at $3.80 [15s. 2¼d.] per ton; yield of molasses at 2½ per cent., price $22 [£4 8s.] per ton; pulp, 20 per cent., price $2.50 [10s.] per ton:—

Cost of Labour and Total Cost per Pound of converting Beets into Sugar.

Manufacturing Cost per Ton of Beet.	Yield.	Cost of Labour per Pound.	Total Cost per Pound.
$2.88=11/6	6 per cent.	5·3 mils.	4·1 cents = 2d.
	7 „	4·5 „	3·6 „ = 1⅗d.
	8 „	4· „	3·1 „ = 1½d.
$3.47=14/-	6 „	6·4 „	4·6 „ = 2d.
	7 „	5·5 „	3·9 „ = 1½d.
	8 „	4·7 „	3·4 „ = 1½d.
$3.87=15/6	6 „	7·1 „	4·9 „ = 2d.
	7 „	6·1 „	4·2 „ = 2d.
	8 „	5·4 „	3·6 „ = 1⅗d.
$4.25 =	6 „	7·9 „	5·2 „ = 2⅕d.
	7 „	6·7 „	4·4 „ = 2d.
	8 „	5·9 „	3·9 „ = 1½d.

I know of an establishment in France where the total cost of producing sugar, exclusive of interest on capital, is but 36 francs per 1,000 kilogrammes [28s. 10d. per ton nearly] of beets, or $3\frac{1}{10}$ cents [1⅗d.] per pound of sugar.

The yield of sugar is about 8 per cent., of which 4½ per cent. is of a quality fit for direct consumption, and would bring 15 cents per pound here to-day. 2½ per cent. is of a grade better than No. 14, and 1 per cent. is equal to No. 12. In another about the same amount and quality is produced at a cost of $3\frac{7}{10}$ cents [1¾d.] per pound.

I know of another establishment where the total cost, including every expense, interest on capital at 5 per cent., and depreciation of machinery at 10 per cent., was in 1865–66 but the fraction of a mil over 4 cents [2d.] per pound.

The amount of sugar produced was 7½ per cent.; but the quality was not so good as in the previously described cases, although the first quality, which amounted to 4 per cent. of the beets worked, sold readily at 75 francs the 100 kilogrammes, or 6½ cents [3¼d.] per pound.

Profits on Beet Sugar.

It is believed that the only material item of expense in the manufacture of sugar that would be greater in the United States than in France is the single one of labour. All others in excess of those of France are here more than offset by the lower cost of coal, of land, and of taxation.

In relation to labour, it is well known that in the United States the use of labour-saving machines is greater than in any other country, because the high price of labour has stimulated their invention. It is a fact that the number of hands employed in sugar refineries in this country is much smaller than in European establishments of the same capacity of production, and it would doubtless be possible to effect some saving in that direction as compared with France in an American sugar manufactory.

The labour in a beet sugar factory in this country would certainly not require a greater number of men than is required in a similar establishment in France. But, assuming that the same number would

Cost of production, and return therefrom.

be necessary, it is proper to ascertain the exact relation that the price of labour bears to the cost of production.

In Europe the number of skilled hands required in a sugar manufactory is very small, the great proportion of workmen being common farm labourers, who work in the fields in summer and in the mills in winter. The making of beet sugar is only carried on in the fall and winter months, say from October to February. With us, by reason of a more favourable climate, not only for the earlier development, but also for the better preservation of the beet, it could be extended from September to March, or even later. It will be acknowledged that these are the months in which labour in this country can be most readily and reasonably procured. The probability is, inasmuch as the establishment of this industry in Illinois would permit the hiring of men by the year, that the price of labour per day would average considerably less than it does at present in the summer time, which, in the region I have selected, is about $1.50 per day [6s.] for a first-rate hand.

One of the first merchants and manufacturers of France told me that, with wages at 3½ francs [2s. 11d.] per day, the value of labour in 100 kilogrammes [220 lb.] of sugar should not exceed 4 to 4½ francs [3s. 4d. to 3s. 9d]. That is, with wages at 66 cents [2s. 9d.] per day, the cost of labour should be less than 4 mils [¼d.] per pound.

By the preceding tables the cost of labour at 66 cents per day varies in a pound of sugar from 4 to 7_{10} mils in France. The average is not far from 5_{10} mils per pound.

If the same amount of labour be required here as the average of France, and its value be three times greater, or $2 [8s.] per day, then the average cost of a pound of sugar from beets yielding 7 per cent. will be 5¼ cents [2½d.], instead of 4 cents [2d.], per pound.

I herewith present a table showing the results that I have no doubt can be attained in Illinois by a company with $300,000 capital, of which $200,000 shall be appropriated for buildings and machinery, and $100,000 reserved for working capital.

Expenses.		
24,000 tons of beets, at $4.00 = 16s.	$96,000	= £19,200
Labour, 225 men, 150 days, at $1.75 = 7s. per day ...	50,625	10,125
Salaries	10,000	2,000
Coal, 3,000 tons, at $1.50 = 6s. per ton	4,500	900
Sacks for pulp, 8,000, at $1.00 = 4s. per sack	8,000	1,600
Bone-black waste	7,500	1,500
Insurance	2,000	400
Lighting	750	150
Lime, metals, barrels, rasp blades, repairs, &c.	15,125	3,025
	$194,500	= £38,900
Receipts.		
1,680 tons sugar (yield calculated at 7 per cent.), at $200 per ton, or $8\frac{9}{10}$ cents per pound	$336,000	= £67,200
720 tons molasses (yield calculated at 3 per cent.), at $10.00 per ton, or 4 cents per gallon	7,200	1,440
4,800 tons of pulp, at $2.00 per ton (equivalent to hay at $6.00 per ton)	9,600	1,920
	$352,800	£70,560
Less expenses	194,500	38,900
Profit equal to 52 per cent. on capital	$158,300	£31,660
From which is to be deducted for local taxes and internal revenue	10,000	2,000
Net profit, being nearly 50 per cent. on capital	$148,300	= £29,660

It will be seen that the yield of sugar is placed at 7 per cent. I have no doubt it would be more, for by the method recommended, and which is in use in France, the yield is 8 per cent. The price of sugar is also calculated at $8\frac{9}{10}$ cents [4½d.] per pound, but samples made by the process referred to are declared to be now worth an average of 13 cents [6½d.].

The value of the molasses I have placed at 4 cents [2d.] per gallon, but it will produce 25 per cent. of its weight in 90° alcohol, and the market value of a material that will give that result is certainly not less than 25 cents per gallon.*

I have placed the market value of the pulp at $2 [8s.] per ton, at which price it has been ascertained, by years of experiment, to be equivalent to hay at $6 [24s.] per ton; therefore it cannot be said that the estimate is too high.

On the other hand, beets are charged at $4 [16s.] per ton, upon which there is little doubt a saving of 50 cents per ton, or $12,000 [£2,400], could be effected. On pages 26 to 39, the probable cost of beets is discussed. There can be little doubt that the actual cost to the farmer will rarely exceed $3 [12s.] per ton, even with small crops, while with twenty or thirty tons per acre, the larger of which is by no means an uncommon yield, the cost would be from $1.50 to $2 [6s. to 8s.] a ton. Manufacturers could certainly raise their own beets at $3 [12s.] per ton, and probably at considerably less.

* The molasses contains from 45 to 55 per cent. of crystallizable sugar. Until recently no economical method for its extraction was known. Last year, however, three or four establishments were erected in Europe for that purpose, and I have been assured that nearly all the sugar can be extracted at a cost of 3½ cents per pound.

In fact, there can be no doubt that the estimated expenses are placed sufficiently high, being at the rate of $4\frac{9}{10}$ cents [2½d.] per pound of sugar, or $1\frac{8}{10}$ cents [1d.] higher than in the French manufactory, which it is proposed to copy; while, excluding the item of labour, the balance of expenses would be less here than in France. The actual expenses for labour in the French manufactory are less than ½ cent [¼d.] per pound, and $1\frac{8}{10}$ cents [1d.] per pound has been allowed as the excess of cost here over that in France. Cost of production, and return therefrom.

I present below a table showing the estimated result, with the yield of sugar as great as in the French establishment—namely, 8 per cent., provided it were sold at its present market value, say 12½ cents [6¼d.] per pound, and the molasses at $25 [£5] per ton, or 10 cents [5d.] per gallon, which is less than half its actual value for distillation:—

1,920 tons of sugar, at 12½ cents per pound	$537,600	= £107,520
727 tons of molasses, at $25 per ton	18,000	3,600
4,800 tons of pulp, at $2 per ton	9,600	1,920
	$565,200	£113,040
Less expenses	194,500	38,900
Profit (equal to 123 per cent. on capital)	$370,700	£74,140
Or, deducting taxes and internal revenue	16,000	3,200
118 per cent.	$354,700	= £70,940

By the poorest methods prevailing in Europe 6 per cent. of sugar is obtained. By the best processes 9 per cent. of sugar and 2½ per cent. of molasses can be and repeatedly have been extracted from beets containing 12½ per cent. of saccharine matter, which is the amount in the beets raised in Illinois on the first experiment. I submit, therefore, the accompanying table as an indication, on the one hand, of a result that is possible to be realized, and also, on the other, of a result that in the present state of the art is certain to be at least equalled.

In this table sugar is credited at 10 cents [5d.] a pound, molasses at 10 cents [5d.] per gallon, and pulp at $2 [8s.] per ton. Expenses are reckoned as in the preceding table [page 20].

TABLE showing the Products of Sugar from 24,000 tons of Beets, yielding 6, 7, 8, and 9 per cent. with the Amount and Percentage of Profit on a Capital of $300,000 [£60,000]. Taxes and internal revenue not deducted.

Yield per cent.	Yield of Sugar, tons.	Profit.		Profit per cent.
6 ...	1,440 ...	$152,660 =	£30,532 ...	$50\frac{8}{10}$
7 ...	1,680 ...	206,420	41,284 ...	$68\frac{8}{10}$
8 ...	1,920 ...	260,180	52,036 ...	$86\frac{7}{10}$
9 ...	2,160 ...	313,940	62,788 ...	$104\frac{6}{10}$

On pages 40 to 48 I have discussed fully the probable cost of manufacturing beet-root sugar, and have arrived at the conclusion that under no circumstances, with a yield of 7 per cent. of sugar, can the cost exceed 5¼ cents [2¾d.] per pound. My belief is that it would be less, say 4¾ cents [2¼d.] at the outside. But if it cost 5¼ cents [2¾d.], and sold at 10 cents [5d.], there would still be a profit of 90 per cent.

After making all allowance for contingencies that I can imagine as possible to arise, I have not the slightest doubt that there can be realized on the manufacture a profit of at least 80 per cent. on the capital invested.

In a conversation with a French gentleman, a manufacturer of sugar machinery for all parts of the world, and who is also largely interested (and with most favourable results) in the manufacture not only of cane sugar in Martinique, but also of beet sugar in France, in Germany, in Poland, and in Russia, he gave it as his opinion that the beet was destined to become the great sugar-producing vegetable of the world, for the reason that it can be cultivated in the temperate latitudes, in countries of dense population, and consequently in close proximity to the consumers of sugar. In his judgment sugar can be produced from it as cheaply in Europe or in the United States as it can be from cane in the West Indies or Brazil. And even if that position were not tenable, the expenses of transportation are so great as to render it absolutely certain that sugar produced from the cane cannot compete with beet sugars in the markets of Europe or the United States.

From Mr. Crookes' book, to which I have before referred, I take the following extract:—

LABOUR AND GENERAL ESTIMATES.

With perhaps the exception of two or three men, no skilled labour is required in new beet-root sugar works, as most of the operations are of a simple mechanical nature, easily taught to inexperienced country hands by a competent superintendent and his overseers.

The only skilled hands really needed are an engineer, a hydraulic pump man, a defecator, a sugar-boiler, and a bone-black burner. Of these the defecator and sugarboiler should have already had some experience in a beet-sugar factory, as the best "sugar refiner," accustomed to cane syrups alone, would not understand the practical difficulties incident to important minutiæ in the special treatment of the juice of the beet.

We here give a general estimate of the cost of labour for a 150,000 per diem factory, on the basis of 4s. per shift, of which two take place every twenty-four hours, the work being continuous day and night.

We have added, as a separate item, the necessary additions to be made for the extra salaries to

Cost of production, and return therefrom.

be paid for specialists in the various departments. The calculation is based on a campaign of 100 days :—

I.—Washing and Pulping.

Transportation and washing of the beets, fourteen men, two shifts per 24 hours=2,800 days' labour at 4s.	£560
Press department, twenty-eight men, two shifts per 24 hours=5,600 days at 4s.	1,120
Sack washing and darning, eight women, two shifts=1,600 days at 4s. ...	320

II.—Defecation.

Eight men per 24 hours=800 days' labour at 4s.	160

III.—Scums.

Six men per 24 hours=600 days at 4s.	140

IV.—Carbonatation.

250 days at 4s.	50
Monte-jus	40
Carbonic acid (preparation of)	40

V.—Filtration.

Three men every 24 hours, at 4s.	60

VI.—Concentration.

Two men every 24 hours	80

VII.—Boiling.

Two men every 24 hours	80

VIII.—Crystallization and Centrifugals.

1,500 days' labour	300

IX.—Generation of Steam.

Two shifts of three men=600 days at 4s.	120

X.—Breaking and Packing.

Five men, at 4s. per day	100

XI.—Men in the Yards, &c.

Five men, at 4s. per day	100

XII.—Management.

One general superintendent and two overseers	800
Book-keeper and clerk	320

XIII.—Extras.

Carpenter, plumber, smith (three months), ...	300
Extra pay to skilled labourers	500
General total of cost for one year's campaign.	£5,190

The quantity of coal consumed by such an establishment as we have described would average 600 tons, which at 15s. per ton would cost £450.

The bone-black, 30,000 lbs., would cost for the first outlay, at 2½d. per lb., £312 ; but in succeeding years would only amount to replacing of waste.

The lime used would amount to 4,500 bushels, and cost about £280.

The cost of 15,000,000 lbs. of beet-roots to be worked up into sugar would at 12s. per ton be £5,400.

Annual Expenses.

Summing up the above, we calculate that the yearly expenses will amount to,—

Labour	£5,190
Coal	450
Bone-black (waste)	100
Lime	280
Purchase of beet-roots	4,500
Adding 20 per cent. for additionals	2,100
We have a total of	£12,620
To which have to be added taxes and insurance, which we have computed at	400
Interest on capital invested	960
Making a grand total of	£13,980

Cost of production, and return therefrom.

First Costs.

The first outlay for the establishment of machinery, buildings, &c., may be summed up as follows:—

Production of straw	£925
Washing and pulping	1,967
Defecation	295
Scums	134
Sacks, trays, sack-washing	620
Carbonatation	632
Filtration	595
Evaporation of juice	2,300
Crystallization and turbines	760
Bone-black department	255
Pipes and cocks	750
Packing and unpacking	400
Tubs and tanks	60
Brickwork	500
Sundries and tools	400
Carriage of 200 tons of machinery (say)	250
Total	£10,845

Adding £2,000 for the erection of the works, and £312 for first cost of bone-black, we have the sum of £13,157 needed for the first establishment of a manufactory of sugar from beet-roots for the produce grown on 500 acres of ground, and which ought to produce at least 1,200,000 lbs. of raw sugar.

Realization.

The products to be realized in our example of a sugar factory would be as follow:—

Sugar from 15,000,000 lbs. beets, at 8 per cent. of sugar, the sugar being sold at 24s. per cwt	£14,400
2,700,000 lbs. pulp, calculated at ½d. per lb.	5,620
5,000 gallons molasses at 40° Beaumé, at 1s. per gallon	250
Residues, as fertilizers	200
Total	£20,470
Deducting annual expenses and interest as above	13,980
Leaves net annual profit of	£6,490

There is every reason to believe that, with careful management, the quantity of sugar obtained will range as high as 10 per cent. instead of 8 per cent., which we have taken as our basis.

In such a case the net income would be £24,470, and the net annual profit £10,090.

Mr. Baruchson, making his calculations on an entirely different basis, arrives at the following results:—

Expenses and Returns in Manufacturing 2,000 Tons of Beet-root.

Expenses.

20,000 tons roots, at 16s.		£16,000
General expenses (charcoal), wages, and management		7,000
Interest on capital invested in buildings and machinery, say 5 per cent. on £20,000		1,000
Interest on outlay during six months' season of purchase, manufacture and sale, say £24,000 at 5 per cent.		600
Wear and tear of buildings and machinery, 10 per cent. on £20,000		2,000
Ground rent of land (or interest), taxes, insurance, lighting, &c.		1,000
Bags and cartage to store, rail or canal, say carting 1,900 tons of sugar and molasses, at 2s.	£190	
Bags for 1,300 tons sugar, at 6s.	390	
Barrels for 600 tons molasses, at 15s.	450	
		1,030
Profit		7,570
		£38,200

Returns.

1,300 tons sugar (at 6½ per cent.), at 24s. per cwt.	£31,200
600 tons molasses in casks, at 5s. per cwt.	3,000
4,000 tons pulp (20 per cent. of root), at 20s. per cwt.	4,000
Total	£38,200

(*a.*) The spent charcoal and scum of the syrup are not estimated, though they have some value.
(*b.*) If the molasses be distilled on the premises, a further profit will accrue.
(*c.*) By growing his own roots the manufacturer will save the farmer's profit on them.
(*d.*) 6½ per cent. is named only as a basis for calculation. More may be confidently looked for.

The profit thus shown will be 24¾ per cent. on the outlay (£30,630). Each additional ½ per cent. of sugar will add to it £2,400, about 7½ per cent. additional. Thus, if 8 per cent. of sugar is extracted, the profit will be 48 per cent.

Cost of production, and return therefrom.

That this is not too sanguine a view to take of the probable yield, is shown by the fact that during the season 1868-69, in the Zollverein, 2,500,000 tons of beet-root produced 207,500 tons of sugar—a return of 8·40 per cent.

(Best beet climate, soil, and culture.)

The following particulars as to the best description of beet for sugar-making, and the most suitable climate and soil, with suggestions as to culture, will probably be found interesting :—

BEST BEETS FOR SUGAR-MAKING.

All authorities consulted concur in the opinion that the best sugar-making beet is the White Silesian, thus described :—

"Root fusiform, sixteen inches in length, six or seven inches in its greatest diameter, contracted towards the crown, thickest just below the surface of the soil, but nearly retaining its size for half the depth, and thence tapering regularly to a point. Skin white, washed with green or rose red at the crown. Flesh white, crisp, and very sugary. Leaves green; the leaf-stems clear green, or green stained with bright red, according to the variety."

"Of the two sub-varieties (the Long White Green-top, and the Long White Red-top), some cultivators prefer the green-top; others the rose-coloured or red-top. The latter is the larger, more productive, and the better keeper; but the former is the more sugary. It is, however, very difficult to preserve the varieties in a pure state, much of the seed usually sown containing, in some degree, a mixture of both."

"If we take a beet-root and cut it across, we shall see that it is composed of concentric zones or layers, differing in colour more or less, according to the variety. The exterior or skin is composed of compact cellular tissue. Next will be seen concentric zones, the number of which corresponds with that of the several circles of leaves forming the tops, and the breadth of which depends upon the stage of development of the leaves. If the leaves of a beet-root are very large and luxuriant, the concentric rings of the root with which they communicate will also be found very large and filled with sap that is comparatively speaking watery and poor in sugar. On the other hand, the less luxuriant and smaller tops of well-grown moderate-sized beets will be found to correspond with concentric layers of cells of smaller dimensions, to be filled with a denser sap, richer in sugar than we find it in roots with large tops."

"The best roots for the manufacture of sugar are those in which the size of these concentric layers of cells does not exceed one-eighth to one-fourth of an inch. As a rule such roots do not weigh more than two pounds each; their flesh is more firm and less transparent than that of the big heavy roots, which exhibit on a cross section large concentric zones or layers of cells, filled with a liquid much poorer in sugar. It does not hold good, however, that small roots invariably contain more sugar than large beets. In the course of his investigations Dr. Voelcker frequently found beets weighing above 2 lbs., and not exceeding 3 lbs., richer in sugar than roots weighing only 1 lb. and under."—(*Dr. A. Voelcker.*)

"First. Its root must have neither the form of a carrot, nor of a tuber, but be shaped more like a Bartlett pear. It must be long and slender, gradually tapering, and free from large lateral roots.

"Second. It must not grow above the surface of the soil.

"Third. It must have a smooth white surface, and the flesh be white and hard.

"Fourth. Its size must not be too large, and its weight not exceeding five to eight pounds."
—(*E. B. Grant.*)

"Formerly the field beet, with rose-coloured skin, and presenting, on being cut, alternate layers or zones of a white and red colour, was much more extensively grown in Germany and France than it is at present. Preference is now given to the white Silesian beet. The latter gives a larger percentage of sugar, and contains less water; saline matters, and nitrogenized substances than the former. It is also less liable to mechanical injuries, and is not so easily affected by frost or wet."—(*Cyclopædia of Agriculture*, 1875.)

"*French or Belgian Sugar-Beet.*—Excellent sugar beet, and recommends itself by producing little waste.

"*Quedlinburg (German) Sugar-Beet.*—Rich in sugar, and gets ripe about fourteen days before any of the other sorts.

"*Siberian Beet.*—Resembles Silesian in appearance, and yields a large weight of roots per acre, but a smaller percentage of sugar than the Silesian.

"*Imperial Beet.*—Does not yield so well as the Silesian beet, but is considered very rich in sugar."
—(*Dr. A. Voelcker.*)

CLIMATE.

"It is grown in Europe from the shores of the Mediterranean to very near the Arctic Circle, and from the Atlantic to the Caspian Sea."—(*Crookes.*)

"It succeeds well in every country of Europe, from Italy to Norway and from Spain to Russia. In the United States it has been successfully cultivated in most of the States from Missouri to Maine, and would doubtless thrive in all. The northern limit of the successful culture of sugar-beet on this continent (America) is probably to be found at about latitude 50° to 52°, which is in Canada. In Europe it is successfully cultivated as far north as 60°."—(*E. B. Grant.*)

"It is not so much heat as a dry and unclouded sky which is needed during the autumnal months, and which makes the sugar in the beet. Voelcker, speaking of England, says that the more rain that falls on the land during the first two months of the growth of the beet, the better the crop is likely to turn out if a dry autumn follows."—(*Report of Commissioner of Agriculture, Washington*, 1870.)

"Very cold or very dry localities will alone prove antagonistic to its profitable production as a sugar plant; but beet does not need a brilliant sky, or much light and heat. A moist climate with moderate sun is what it requires."—(*Crookes.*)

SOIL.

"Sugar-beet, though not equally well adapted for every kind of soil, is nevertheless grown on land varying greatly as regards depth, texture, and general physical and chemical properties. It may, however, be observed at once, that all soils incapable of being cultivated to a depth of at least sixteen inches are unsuited for the growth of sugar-beet, which grows almost entirely underground, and therefore cannot be cultivated with advantage on very shallow soils. Peaty soils are not suited for beets, nor stiff clay soils, and, more or less, all soils in a bad state of cultivation. . . . . A good friable deep turnip loam, and all soils in which potatoes grow to perfection, are perhaps the most eligible for the growth of beet-roots. . . . . There is no soil so well suited for beets as a good, well-worked, deeply-cultivated, and thoroughly drained clay loam." (Cost of production, and return therefrom. (Best beet climate, soil, and culture.)

CULTURE.

"On the Continent beet is always looked upon as a fallow crop. . . . . Beet succeeds best after winter wheat, well decayed. Clover or seeds, on the contrary, should not precede beets, for, although the roots grow to a large size, they remain poor in sugar. . . . . If possible, beets should not be grown in newly manured soils. If the soil, however, is very poor, it is impossible to grow anything like a crop without manure; in that case farmyard manure must be applied to the land in autumn, or 3 or 4 cwts. of guano, or a mixture of guano, bone-dust, and superphosphate and sulphate of potash. Peruvian guano has been used with advantage for beets on naturally poor soils, and when used in moderate quantities in autumn it greatly benefits the crop. Sulphate of ammonia is also used on such land with considerable advantage to the beets. . . . . All nitrogenous manures require to be used with discrimination, for their tendency is to encourage the luxuriant growth of tops, and to diminish the percentage of sugar in the roots. . . . . Common salt and nitrate of soda act injuriously on sugar-beets.

"Sown too early in spring the roots are apt to run to seed during growth, and if delayed too long the crop may not get fully ripe before it has to be taken up. . . . . In the North of Germany beet-growers sow not less than 15 lbs. of seed to the English acre. . . . . Speaking generally, the distance between the rows and from plant to plant should not be less than 12 inches, nor greater than 18 inches."—("On the Chemistry of Silesian Sugar-Beets," *Dr. A. Voelcker*, "Journal of the Royal Agricultural Society." See also "Manufacture of Beet-root Sugar," *Crookes;* "Beet-root Sugar," *E. B. Grant;* and "Cyclopædia of Agriculture, 1875.")

I now beg to call your special attention to the information which Mr. Rattray has obligingly placed in my possession. Soon after his return from the Continent he wrote to me,— (Mr. Rattray's report.)

Both at the Embassy in Paris and at that in Brussels they paid marked attention to the letters you procured for me from the Foreign Office, and I was soon in possession of introductions to various beet sugar manufacturers. I visited three—one in Belgium, two in France. At this season the factories were not in work, but I got a great deal of information from the proprietors and their managers. Their invariable answer to the question, What is the best kind of beet to cultivate? was, "La betterave blanche de Silésie à collet rose." In their loose soils it produces from twenty-two to thirty tons per acre, and the manufacturers give 17s. per ton for the roots delivered at the factory. The sugar manufacturers do not themselves cultivate the root: they contract with farmers near their doors to grow it, and often supply the seed. It is reckoned that the farmer grosses by the crop £20 per acre; that the cost of sowing, tending, digging, and delivering is £6 per acre; of manuring, £6 (but the same manuring suffices also for the two succeeding crops of cereals); of rent, £4; and that the farmer's net profit is £4 per acre—very good for the farmer.

The factories which I saw are capable of making 1,000 tons of sugar in the season, that is, from 25th September to 25th January. During that time about twenty skilled hands and 200 unskilled hands are employed within the factory, half of them working twelve hours in the day, half twelve hours in the night. Wages, 3s. to 4s. per day of twelve hours. There are other labourers employed also occasionally outside the factory on the pile of roots.

A yellow crystal sugar of 88° (calling the purest refined white sugar 100°) cost last year, per ton,—

	£	s.	d.
In beet, at 17s. per ton	14	16	8
Coals, at 20s. per ton	3	10	0
Wages, at 3s. per day	2	11	6
Charcoal, limestone, coke, &c.	0	12	6
	£21	10	8

and was sold to a Paris refinery at £23 15s. per ton. The manufacturers had, however, besides the sugar, pulp and molasses to sell for £3 or £4.

In these countries they have longer and more severe frosts than we have, but manufacturers do not fear them much. They cover their piles of beets with meadow-hay. The frosts come with December. Farmers take care to have their roots delivered long before.

I was struck with the high duties prevailing:—In Belgium, £18 15s. per ton; in France, £27 to £30 per ton. We seem in New Zealand moderate, by comparison, with our £9 6s. 8d.

A factory capable of making 1,000 tons of sugar costs in Belgium about £28,000. There bricks are 12s. per 1,000, and masons' wages 4s. per day of twelve hours. This price includes all machinery and plant.

I could get no information to guide me in judging how far New Zealand would suit for growing beet with a sufficient proportion of saccharine. There are places in the North of France which have

Cost of production, and return therefrom. (Mr. Rattray's report.)

ruined the local manufacturers, because the beets gave only a percentage of 3 or 4 of sugar, instead of 6 or 7. Upon the whole, the information I got makes me disinclined to commit myself at present to this manufacture.

In reply to some questions I put to Mr. Rattray, since his return to Dunedin, he wrote to me under date the 12th April last,—

This industry would be a highly desirable one to introduce in the colony, because nearly the whole price of the sugar we consume would then be paid to our own labour, instead of being wholly transmitted to other countries as at present. A ton of brown beet sugar, costing in Belgium £21 10s., included in that cost £14 16s. 8d. paid to the farmer for beet, £3 10s. to the coalminer, and £2 11s. 6d. to the factory labourers.

But, in my opinion, it will be necessary to offer special inducements, equal to £5 or £6 per ton, before any company will undertake the industry. Further, I do not believe beet sugar manufacturers here will ever be able to compete with cane sugars on even terms until the labour on farms, mines, and factories is greatly reduced.

You know best whether it will suit the colony to give an advantage in duty to beet sugar. If it is to be done, I have an idea that it will be best to make the Excise duty 1d. per lb., or £9 6s. 8d. per ton, as at present, and increase the import duty by so much as you wish to make the advantage to the beet sugar. By this mode of treating the duty you would protect the revenue.

I agree with you that it would be better to make the terms of encouragement open to all comers. I learned that no factory had paid in France which had aimed at making more than 1,000 tons of sugar per season. New Zealand would require five or six of these; and, as it is a necessity that each factory be placed in the centre of the farms which supply it with beet, the factories or companies here would naturally take up districts widely apart, and would have to be managed quite independently. In France about 1,000 acres beet are required to produce 1,000 tons of sugar.

My inquiries on the Continent disappointed me in some respects. I found that a great deal more capital was required for a 1,000-ton factory than I had supposed.

I telegraphed, asking,—

1st. Is sugar referred to in your letter, cost £21, fit for consumption without refining? 2nd. What would be additional cost of refining and loss, and what value when refined? 3rd. What would be its value in bond here, as produced in Belgium? 4th. What would be its value here, refined, in bond? 5th. What can cane sugar be imported for here, unrefined and refined, of relatively similar quantities? 6th. At what price could such sugar, unrefined and refined, be produced here from beet? 7th. Would you advise refinery attached to each factory? If you cannot reply precisely, give approximate answers.

Mr. Rattray replied,—

Unfortunately my investigation stopped short of refining process; therefore some questions I cannot answer at all, others approximately. 1st. It is unfit for consumption—has an offensive taste. 2nd. Cannot tell cost of refining, nor loss in weight. Sells, refined, in France and Belgium about £32. 3rd. Unrefined would have no market value here at present for want of refineries, though refined would be worth here at this time about £37. 5th. Similar yellow cane sugar, unrefined, is fit for consumption, and would cost here about £30; refined, £40. 6th. Cannot conjecture. Wages, coal, and interest on capital about double here. 7th. Refineries are often attached to factories and answer well; but it happened the factories I visited did not refine. Their connection would be advisable here. Finally, the prices named above are pounds sterling per ton, in bond. Cane sugar is always worth £3 or £4 per ton more than beet sugar.

Conclusions drawn from ascertained facts. (Cost in New Zealand.)

I have already said that it will be some time before good sugar-beet can be produced in New Zealand for much less than 20s. per ton. Considering the difference in the rate of labour and the expense of management, and allowing for lower taxes and rent of land, I am of opinion that for a few years beet sugar will cost, here, from £7 to £8 per ton more than in France, Belgium, or Germany.

(Duties.)

I believe, then, that, in order to make the producion of sugar profitable in New Zealand, a large difference must, for some time to come, be made between the import duty on cane sugar and the Excise duty on that from beet. It will be well worth our while to give such an encouragement for a stated number of years, with a view to the introduction and establishment of an industry which will be of immense importance to the colony: tending, as it must, not only to keep in the country a large sum yearly, which otherwise must be sent elsewhere in payment for imported sugar, but also to give employment in various ways which would be otherwise not possible. I wish to avoid controversial questions, but I may point out that there is a wide difference between offering, in

a crowded country, a bonus for the production of an article which would but take the place, as regards the employment of labour and the use of land, of some other more or less profitable article, and stimulating, in a new country, the production of a commodity which would involve the employment of lands that, but for the bonus, would remain unproductive. I am convinced that, in New Zealand, the question is not between producing £300,000 worth of sugar yearly or an equal value of some other necessary of life, but whether £300,000 worth of sugar shall be added to the other products with which the people of the colony directly supply themselves. In all probability, if the beet industry were introduced here, it would add to the quantity of land brought under cultivation, and give employment and profit to a great number of persons who would, but for it, not come to New Zealand. Conclusions drawn from ascertained facts. (Advantages of introduction into New Zealand.)

I feel sure that this question is one to which we may fairly give consideration; and also that there is no reason to doubt we might make New Zealand profitably produce sugar, with an ultimate large increase to the revenue.

The conclusion at which I have arrived is that, for seven years, an advantage equal to one penny per pound, in the way of a difference between the import and Excise duties on beet sugar, should be given; that, for the next four years, $\frac{3}{4}$d. should be allowed; and for a second four years, $\frac{1}{2}$d. Admitting that this would to some extent affect the revenue, unless the Excise duty were fixed at the present rate of import duty, I am of opinion that as years pass, and the production of beet sugar becomes a settled industry, the revenue would be well able to afford to dispense with a larger return from sugar, in consideration of the immense advantage of the industry, especially when it is regarded from the European point of view of its value. I am also of opinion that the consumers of sugar would, within a not very long time, certainly gain by being enabled to purchase the article cheaper than they can at present. (How industry to be fostered.)

I have said that, for some years, beet sugar would probably cost, here, £7 to £8 per ton more than it does in Europe. But this must not, by any means, be regarded as all an additional cost to consumers. Belgian or French sugar cannot be put down in New Zealand at the prices ruling in Belgium or France. As nearly as I can ascertain, duty, shipping charges, and expenses to New Zealand amount to about £12 10s. per ton. Speaking generally, the sugar sent here is, in Victoria, valued at something like £30 per ton f.o.b.; and the cost to the consumer, with duty added—the merchant and the retailer respectively making but little profit—is about £45 per ton, or, in small quantities, 5d. per lb. Taking the Customs entries as a guide (Appendix B), the average value of sugar landed here is £37 17s.; but, as the duty is not *ad valorem*, care may not be taken to give accurate statements of value. Exclusive of duty, good sugar goes into consumption in this colony at about £36 per ton. I repeat that, for some years, beet sugar of equal quality may not be produced at that price. Therefore, as an inducement to persons to invest capital, subject to the risks attendant on a new industry, such a difference between Excise and import duty as I have suggested will be necessary. But I have no doubt that this concession would pave the way to an enormous industry, which will eventually not only hold its own without any assistance, but yield a large revenue, and in other ways tend directly to promote the prosperity of the colony. If it should seem that the inducements I suggest are large, I would ask that it be remembered that the Joint Committee on Colonial Industries, in the report presented during the session of 1871, recommended that, in order to aid the

(Conclusions drawn from ascertained facts.)

formation of a company, 3,000 acres of land should be selected and sold "at reasonable rates;" that settlers, with practical knowledge of the cultivation of the root, &c., should be offered free or assisted passages from Germany; that seed should be bought; that a bonus of £2,000 should be offered for the first 250 tons of sugar produced from such seed; and that, "for a period of four years from the date of the settlement of the people on the land, the sugar produced by them should be exempt from Excise duty."

(Comparative consumption in New Zealand, and other countries.)

The consumption of sugar in New Zealand is largely in excess of that in any European country. Indeed, while in 1873 (the latest year available for comparison) the consumption here was 64¾ lb. per head, including the Maoris, and 74½ lb. excluding them, in Great Britain it was only 38 lb.; in the United States, 27 lb.; and in France, 13 lb. Appendix B contains some interesting details as to the import of sugar into New Zealand, the duty paid, and the consumption per head of population over a series of years; also exports from the United Kingdom for the years 1870 to 1874, with rate of Excise duty. Figures from M. Block's work are added giving, as far as possible, similar information as to European countries.

(Comparative duties.)

As to the rate of duty which such a difference as I have proposed would involve, it will perhaps be sufficient to say that there are very few countries which have not a higher rate to contend against. In England it has been very much higher, and it is only of late that the duty has been abolished. Indeed, there is at present charged in England a duty of 11s. 6d. per cwt. on sugar used by brewers.

The present duties in France are from £27 to £30 per ton, and in Belgium about £18 15s. per ton.

In Appendix C will be found a statement of the net revenue yielded by sugar in Great Britain from 1801 to 1864, together with the average rate of duty and average price. This table is taken from Mr. Reed's "History of Sugar," and is supplemented, as far as possible, for subsequent years to 1874, from official returns, &c.

(Plan proposed preferable to bonus.)

By adopting the system I have proposed, opportunity would be afforded to all who might be so disposed to enter upon the business. To give a bonus would be to confine the occupation to very few. If beet sugar production is to become a valuable industry in New Zealand, several factories should be established in different parts, each capable of producing a moderate quantity annually. All should be placed on an equal footing; and that can only be done by a uniform system of encouragement, or perhaps I should rather say of abstaining from discouragement, extending over a stated number of years. Of course, provision could be made in the Bill relating to the duties, that, if a certain quantity was not produced in the colony within a fixed period, the Act would be repealed; but there can scarcely be a question—looking at the great anxiety shown in many different parts of the world to embark in the industry—that, if adequate encouragement were offered, beet-root cultivation, and the manufacture of sugar from it, would soon be thoroughly established in New Zealand.

(Question should be referred to special Select Committeee.)

I do not suggest that there should be legislation without giving full opportunity for consideration. As a first step, I think it would be best to refer the question generally to a Select Committee. Anything in the nature of State encouragement to industry is rightly to be looked upon with jealousy by the great body of consumers; and the experience of a neighbouring colony has shown how very

unwise it is for a State to offer inducements to the establishment of a great variety of industries. But there is a wide difference between meddling with many industries and offering substantial encouragement to one which there is reason for hoping may be made of vast importance and self-supporting.

It must not be assumed that I am proposing that which is new in its nature to New Zealand, or indeed to any of these colonies. The legislation may be new, but that which it would provide exists without it. We have no system of Excise here, nor, I think, have any of the adjacent colonies. Wine and tobacco are articles bearing high duties, but they are produced in the colonies without being charged with Excise duties. In this country brewing is a large industry, and there is a considerable import duty on ale, but no Excise duty on its home production. In all reasonable probability, if any one had the courage to establish a beet sugar factory, he would go on for years without an Excise duty: perhaps he would do better than my suggested legislation proposes. But he would run a risk such as the introducers of so new an industry would not care to run. The producers of wine in Australia enjoy a remission of duty which, compared with the value of the article produced, is enormous. Yet no one regards it as protection, and in no respect does the freedom from Excise duty upon wine differ from a freedom from Excise duty upon sugar. New South Wales is considered the model of a free-trade-loving country, but no one hints that it gives protection because it does not levy Excise duties on wine, tobacco, and ale. But the producers of these have not required legislation, whilst I propose it for sugar. The reason is obvious. In these industries the capital employed by each person is comparatively small, and a large number of people follow the pursuit. Even where in some cases the capital employed is large, it has grown to be so from small beginnings, as success has increased the sense of security.

Supposing an Excise duty were imposed, it would never, it is felt, be sufficiently heavy to impoverish the industry to which it related; and so, in these colonies, industries have grown up under the fostering influence of large import duties and no Excise duty, without legal guarantee that such a condition will continue. It can hardly be expected that a few individuals, probably strangers to the colony, will commence to embark the large capital beet-sugar-producing would require without more substantial assurance. It is not in the nature of things they should, although they might be quite safe in doing so. They would have too much at stake to care to run the risk that each Session of Parliament would have in store for them. I suggest only to secure to them in part that which in all probability they would otherwise more largely enjoy. There is no likelihood of the duty on sugar being reduced, or of an Excise duty of equal amount being imposed. Without legislation, the factories established here would, perhaps, enjoy an advantage of a penny a pound duty much longer than I propose. In this light, the Act would be only declaratory in its nature; and are we, for fear of theoretical objections, to shut out from the colony an industry of enormous value, which would probably be more beneficial to New Zealand than wine-producing to the neighbouring colonies, whilst we should be really doing no more to encourage it than they have done to encourage wine-producing, or than we have already done to encourage brewing? Indeed, in proportion to its value, beer, notwithstanding the duty-paying articles employed in its manufacture, enjoys in remission from Excise duty a much larger advantage than that I propose for beet sugar.

Whatever may be the decision of the Government and of Parliament, I feel assured that the question is so large and interesting as to make it unnecessary for me to offer excuses for the length of this letter and its appendices.

I have, &c.,

The Hon. the Colonial Secretary. JULIUS VOGEL.

APPENDICES.

APPENDIX A.

No. 1.

The Hon. Sir J. VOGEL to the Earl of CARNARVON.

7, Westminster Chambers, Victoria-street, Westminster, S.W.,
5th November, 1875.

MY LORD,—

I have the honor to ask your Lordship to move the Board of Trade to furnish, for the information of the Government of New Zealand, some particulars as to the manufacture of beet-root sugar.

2. I venture to indicate below the particulars which I think would be useful; but, should they not be obtainable, it is desirable that information as nearly as possible in the same direction should be furnished. It will, I think, be useful not only to New Zealand, but also to other colonies.

3. The inquiry I am making does not refer to the processes employed. Its object is to ascertain whether, when the manufacture of beet-root sugar is established in a country, it can compete with imported cane sugar without any protection or bonus.

I have, &c.,

The Right Hon. the Earl of Carnarvon, &c. JULIUS VOGEL.

SUGGESTED PARTICULARS.

STATISTICS of the production of beet-root sugar in the various countries of Europe, over as long a series of years as possible.

Statements of the protective duties or bonuses that have been paid in the past to promote the production of beet as against cane sugar.

Details of the quantities of beet sugar produced at present in the various countries of Europe; of the quantities of cane sugar imported into each of such countries; and of the protective duty or bonus (if any) in favour of beet sugar; also details as to the bonus (if any) paid by any such country on beet sugar exported.

Statement of the quantity of beet sugar imported into Great Britain during each year for the last twenty years.

No. 2.

The Earl of CARNARVON to the Marquis of NORMANBY.

SIR,— Downing Street, 8th December, 1875.

I have the honor to transmit to your Lordship a copy of a letter from Sir Julius Vogel requesting to be furnished, for the information of the Government of New Zealand, with certain particulars in regard to the manufacture of beet-root sugar.

I also enclose a copy of a letter from the Board of Trade, to which department I caused Sir Julius Vogel's application to be referred; and I have to inform you that I have requested the Secretary of State for Foreign Affairs, should he see no objection, to give instructions, in accordance with the suggestion of the Board of Trade, with a view of procuring the information desired by the New Zealand Government.

I have, &c.,

The Most. Hon. the Marquis of Normanby, K.C.M.G. CARNARVON.

Enclosure in No. 2.

The BOARD of TRADE to the COLONIAL OFFICE.

Office of Committee of Privy Council for Trade,
2nd December, 1875.

SIR,—

I am directed by the Board of Trade to acknowledge the receipt of your letter of the 16th ultimo, transmitting, by direction of the Earl of Carnarvon, copy of a letter from Sir J. Vogel asking for certain information respecting the manufacture of beet-root sugar, and asking for the assistance of this Board to supply the desired information.

In reply, I am to request that you will inform Lord Carnarvon that this Board has endeavoured to obtain the required particulars, but unsuccessfully; and, as only a portion of what is asked for can be furnished, and that not without some inconvenience, my Lords would suggest that an application should be made to the Foreign Office for the information to be obtained by the Secretary of Legation in each country producing beet-root sugar.

I have, &c.,

The Under Secretary of State for the Colonies. R. VALPY.

No. 3.

The Earl of CARNARVON to the Marquis of NORMANBY.

MY LORD,— Downing Street, 1st January, 1876.

With reference to the concluding paragraph of the enclosure to Sir Julius Vogel's letter of the 5th of November last, a copy of which was enclosed in my Despatch No. 65, of the 8th ultimo, and with reference to my despatch of the 18th of December, I have the honor to transmit to you a copy of a letter from the Board of Trade on the subject of the information desired by the Government of New Zealand in regard to the quantity of beet-root sugar imported into Great Britain.

I have, &c.,

Governor the Most Hon. the Marquis of Normanby, K.C.M.G. CARNARVON.

Enclosure in No. 3.

The BOARD of TRADE to the COLONIAL OFFICE.

Office of Committee of Privy Council for Trade,

SIR,— 28th December, 1875.

I am directed by the Board of Trade to acknowledge the receipt of your letter of the 18th instant, and, in reply, to request that you will inform the Earl of Carnarvon that the imports into the United Kingdom of sugar produced from beet-root are not distinguished in the entries at the Custom House from the imports of other descriptions of sugar.

I have, &c.,

The Under Secretary of State for the Colonies. R. VALPY.

No. 4.

The Earl of CARNARVON to the Marquis of NORMANBY.

MY LORD,— Downing Street, 18th December, 1875.

With reference to my Despatch No. 65, of the 8th instant, I have the honor to transmit to you, for the information of your Government, an extract from a letter from the Foreign Office showing the steps taken by the Earl of Derby with the view of procuring the information desired by the New Zealand Government respecting the manufacture of beet-root sugar.

I have, &c.,

Governor the Most Hon. the Marquis of Normanby, K.C.M.G. CARNARVON.

Enclosure in No. 4.

The FOREIGN OFFICE to the COLONIAL OFFICE.

Extract of a Letter from the Foreign Office to the Colonial Office, dated 14th December, 1875.

I HAVE laid before the Earl of Derby your letter, with its enclosures, of the 8th instant, containing an application on behalf of the Government of New Zealand for information on certain points connected with the production of, and trade in, beet-root sugar; and I am now directed by his Lordship to state to you, for the information of the Earl of Carnarvon, that Lord Derby will forward copies of the list of queries enclosed in your letter to Her Majesty's Representatives in Europe, with instructions to procure and send Home such statistical works on the subject in question as they may be able to obtain so far as foreign countries are concerned.

No. 5.

The Earl of CARNARVON to the Marquis of NORMANBY.

MY LORD,— Downing Street, 9th February, 1876.

With reference to my despatches noted in the margin, I transmit to you, for your information and for communication to your Government, a copy of a letter from the Foreign Office, enclosing despatches from the British Representatives at Paris, the Hague, Berne, Darmstadt, Brussels, and Rome, containing the particulars which they have been able to obtain respecting the production of, and trade in, beet-root sugar in France, Holland, Switzerland, Baden, Belgium, and Italy.

With respect to the sum of £1 19s. 2d. which has been expended by the British Ambassador at Paris in procuring the documents enclosed in his despatch, I shall cause application to be made to the Agent-General for New Zealand in this country for repayment thereof.

I have, &c.,

Governor the Most Hon. the Marquis of Normanby, K.C.M.G. CARNARVON.

Enclosure 1 in No. 5.

The FOREIGN OFFICE to the COLONIAL OFFICE.

SIR,— Foreign Office, 3rd February, 1876.

I am directed by the Earl of Derby to transmit to you the despatches, with their enclosures, noted in the margin, which have been received from Her Majesty's Representatives abroad, containing

the particulars respecting the production of, and trade in, beet-root sugar, desired by the Government of New Zealand, as stated in your letter of the 8th of December last; and I am to request that, in laying these papers before the Earl of Carnarvon, you will move his Lordship to cause application to be made to the New Zealand Government for repayment of the sum of 49 francs, or £1 19s. 2d., expended by Her Majesty's Ambassador at Paris in procuring the documents now forwarded by his Excellency on the above-named subject.

I have, &c.,

The Under Secretary of State, Colonial Office. T. V. LISTER.

Sub-Enclosure 1 to Enclosure 1 in No. 5.

Lord LYONS to the Earl of DERBY.

MY LORD,— Paris, 5th January, 1876.

In execution of the instruction contained in your Lordship's commercial despatch of the 16th ultimo, marked "Circular," I have the honor to transmit, herewith, to your Lordship the statistical documents enumerated in the enclosed list, which contain information respecting the production of, and trade in, beet-root sugar, for the use of the Government of New Zealand.

In procuring these documents I have incurred an expense of 49 francs, which I request your Lordship to authorize me to charge in my next account of extraordinary disbursements.

I have, &c.,

The Right Honorable the Earl of Derby, &c. LYONS.

LIST OF DOCUMENTS.

Statistique de la France: par Maurice Block. Deuxième Edition. 2 volumes. Paris, 1875. (See particularly Vol. I., page 458; Vol. II., pages 215 and 409.)

Sugar Return in Manuscript: 1812 to 1874.

Printed Tables—Importation of Sugar: 1874.

Exportation of Sugar: 1874.

The returns for 1875 will not be completed till the autumn of 1876.

FRANCE.

[Extracts from *Statistique de la France.*]

NOTE.—The £ English is taken at 25 francs.

Franc=$\frac{4}{5}$ of a shilling, or 10d. nearly.
Centime=About $\frac{1}{10}$d.
Kilogramme=2·2055 lbs. English, or 2$\frac{1}{5}$ lbs. nearly.

(The calculations in the annexed tables are made on the basis of the kilogramme, being equal to 2$\frac{1}{7}$ lbs. English.)

Litre=1·76077 pints, or 1$\frac{3}{4}$ pints nearly. Therefore,
Hectolitre=176 pints nearly.
Quintal=50 kilogrammes, or 110 lbs. English nearly.
Collier=15 quintals, or 1,650 lbs. English nearly.
Hectare=2·47114 acres, or 2$\frac{1}{2}$ acres nearly.
Metre=39·37079 inches, or $\frac{1}{11}$ yard English nearly.

PRODUCTION.

IN the question of sugars, many interests are in view: the interest of the consumption, the interest of the native manufacture (from which can be separated the interest of the refining), the colonial interest, and the interest of the Treasury. Sugar is an article at once useful and agreeable for alimentation, and the mass of the population is interested in its prices not being excessive. On another side, the native industry of beet-root sugar, created at the time of the Continental blockade, has increased under the shield of a protection, the maintenance of which it has always demanded. In the third place, the production of cane sugar constitutes the principal wealth of our colonies, which have not without regret seen escape from them the privileges they formerly had of provisioning the metropolis. Finally, sugar is for the Treasury the source of considerable revenues, collected in the form of Customs duties and imposts on consumption. Successive Governments in France have at all times seriously devoted their attention to the means of reconciling these different interests, and various combinations have been successively adopted. We shall not here retrace the history of these difficulties, the interest of which is lost for new generations. Beet-root sugar has implanted itself firmly in the country, and the colonies are no longer compelled to send all their production to the metropolis; and, likewise, cane and beet-root are now treated on a footing of equality by the Treasury. The actual difficulties—for it seems understood that there shall always be a question as to sugars—arise from the assessment of the impost. The international treaty of the 8th November, 1864, with England, Belgium, and the Netherlands, promulgated the 8th July, 1865 (*Moniteur Officiel*, 9th July, 1865), moreover does not permit a change of legislation before 1875. This treaty, and the French law connected with it, tend to put an impost on sugar according to the proportion of pure saccharine matter which it contains. Unfortunately people do not agree as to the value of the means employed for determining that proportion, and the manufacturers of sugar maintain that they are sacrificed to the profit of the refiners. We are not called upon to take part in this quarrel: let us say only that, at the sitting of the 12th March, 1874, the principle of the inspection of refineries was voted, so that soon all privilege will have ceased.

Since the war of 1870–71 the duties on sugar have been increased to the extent of 54 per cent. by the laws of the 8th July, 1871; 22nd January, 1872; 29th December, 1873: so that since 1874 the tax is graduated as follows by the 100 kilogrammes [220 lbs. nearly]:—Candy, 82 francs 10 centimes [65s. 7d.]; refined, in loaf, 76 francs 80 centimes [61s. 5d.]; white crystals, 76 francs 80 centimes

[61s. 5d.]; above No. 18, 73 francs 75 centimes [59s.]; Nos. 15 to 18, 72 francs 20 centimes [57s. 7d.]; 11 to 14, 67 francs 60 centimes [54s.]; 7 to 10, 61 francs 45 centimes [49s. 2d.]; below 7, 51 francs 50 centimes [41s. 2d.].

According to the *Journal des Fabricants de Sucre* (28th November, 1873), there would be, taking one year with another, great variations in the proportions between the different qualities or types of sugar produced. According to that publication, whose calculations moreover can be verified by the monthly tables inserted in the *Journal Officiel*, the development, by sorts, of manufactured sugars, admits of the following comparison:—

	1871–72.	1872–73.
Below No. 7	1 ...	2·38
Nos. 7 to 9	6 ...	12·17
„ 10 to 12	26 ...	22·77
„ 13 and 14	4 ...	20·82
„ 17 and 18	14 ...	2·44
„ 19 and 20	2 ...	0·15
White powdered	46 ...	38·88
Refined, in loaves	1 ...	0·39
Totals	100 ...	100·00

These variations are attributed to the mechanism of the law, which favours the inferior qualities (or at least the qualities which are of inferior appearance).

The manufacture of beet-root sugar owes, as we have said, its origin to the Continental blockade, which had, so to say, closed the ports of France to cane sugar. But is only since 1822 that this industry has commenced to show a serious development: up to that time it only had an altogether secondary *rôle*. In 1828 only a hundred factories could still be counted in active work; in 1858 there were 349; in 1873, 508, and the dimensions of the establishments had been greatly increased. But the quantities produced have been increased in a very much greater proportion still, for in 1826 they did not reach 7,000,000 kilogrammes [15,400,000 lbs. nearly]; thirty years after they had reached 150,000,000 kilogrammes [330,000,000 lbs. nearly]; and in the period 1872–73, 372,000,000 kilogrammes [818,400,000 lbs. nearly].

Below is an abstract of the total figures showing the production of native sugar from 1828, the date of the first regular abstracts, together with the quantities for which the duties have been paid, in tons of 1,000 kilogrammes [2,200 lbs. nearly]. The annual period commences on the 1st September, and finishes on the 31st August following:—

Period.	Quantity Manufactured.		Quantity Duty-paid.		Period.	Quantity Manufactured.		Quantity Duty-paid.	
	Tons of 1,000 kil.	Tons Eng.	Tons of 1,000 kil.	Tons Eng.		Tons of 1,000 kil.	Tons Eng.	Tons of 1,000 kil.	Tons Eng.
1828	6,665	6,546	2,600	2,554	1850–51	76,151	74,791	66,280	65,097
1829	4,381	4,303	4,400	4,322	1851–52	68,573	67,351	57,477	56,451
1830	6,900	6,777	5,500	4,402	1852–53	75,275	73,931	70,347	70,091
1831	9,000	8,840	7,000	6,875	1853–54	76,951	75,577	68,100	66,866
1832	12,000	11,786	9,000	8,840	1854–55	44,744	43,944	58,986	57,933
1833	19,000	18,661	12,000	11,786	1855–56	92,198	90,552	79,687	78,282
1834	26,000	25,518	20,000	19,643	1856–57	89,573	87,973	81,000	79,554
1835	35,000	34,375	30,000	29,464	1857–58	151,514	148,809	123,919	121,705
1836	49,000	48,125	40,000	39,286	1858–59	132,651	130,283	111,666	109,672
1836–37	46,107	45,284	48,969	48,095	1859–60	131,763	129,393	110,266	109,280
1837–38	49,266	48,387	49,236	48,357	1860–61	108,782	106,840	106,078	104,184
1838–39	39,199	38,500	38,216	37,534	1861–62	140,903	138,387	109,069	107,104
1839–40	22,749	22,343	27,536	27,045	1862–63	161,566	158,681	132,511	130,145
1840–41	26,939	26,458	26,925	26,457	1863–64	142,934	140,382	144,599	142,017
1841–42	31,235	30,678	32,465	31,886	1864–65	135,150	132,737	51,912	50,985
1842–43	29,561	29,035	30,632	30,084	1865–66	209,648	205,083	115,282	113,124
1843–44	28,660	28,148	30,991	30,438	1866–67	246,808	242,401	127,587	125,309
1844–45	36,458	35,807	37,244	36,579	1867–68	236,901	232,671	136,594	134,155
1845–46	40,547	39,825	42,394	41,637	1868–69	238,116	233,864	142,620	140,074
1846–47	53,795	52,835	51,718	50,795	1869–70	242,150	237,822	147,866	145,226
1847–48	64,795	63,638	44,824	44,024	1870–71	277,731	272,771	126,242	123,988
1848–49	38,639	37,950	49,078	48,202	1871–72	309,993	204,458	335,603	229,610
1849–50	62,175	61,065	59,035	57,181	1872–73	372,852	366,194	404,511	397,286

The manufactories of native sugar have been almost exclusively concentrated in the five Departments of Aisne, Nord, Oise, Pas de Calais, and Somme. Of 508 establishments in active work during the period 1872–73, 181 were situated in the single Department of Nord. The Department of Pas de Calais counted 92; there were 60 in Somme, 39 in Oise, 89 in Aisne; and 47 were distributed amongst eight other Departments. It can be seen by the preceding table that the manufacture of sugar, after having been increased from 1828 to 1838, fell off during the following years: the small establishments, working with the imperfect means of an industry in its infancy, could not bear the impost which was established from 1836. The proceeds were not, however, long in improving, and from 1849 the

development of the manufacture has been rapid and continuous, the diminutions being only caused by bad harvests.

Independently of the manufacture of beet-root sugar, the refining of sugar is besides of sufficiently great importance in France. According to the official statistics of 1852, there were then 89 establishments devoted to this industry, in which 3,349 workmen were employed. The value of the manufactured products annually amounted to 139,892,082 francs [£5,595,683 nearly], and that of the raw material to 122,198,092 francs [£4,887,924 nearly]; the extra value resulting from refining thus amounted to 17,693,990 francs [£707,759 nearly], or 12·6 per cent. The number of establishments has not perhaps sensibly increased, but the works have become larger, the material has been perfected, and the production has been very much enhanced.

The colonies and foreign countries, which before 1828 furnished us with almost the whole of the sugar that we consumed, have since that time seen the total of their contingent increase very considerably, notwithstanding the increase which the native production has experienced. Since 1864 there appears to have been a falling off in the colonial production. We give below the movements of the colonial and foreign totals since 1812, indicating the quantities re-exported in the form of refined sugar, and those which have remained for interior consumption.

Sugars exported after refining cause the restitution by the Treasury of the duties collected on the entry: this drawback has been often rehandled, being actually based on the Treaty of 1864 and the law of the 3rd July, 1840. The figures in this table are for the civil year, commencing the 1st January; therefore they do not agree with the preceding table:—

Years.	Total Importation.		Re-exportation as Refined Sugar.		Quantity Consumed.	
	Tons of 1000 kil.	Tons Eng.	Tons of 1000 kil.	Tons Eng.	Tons of 1000 kil.	Tons Eng.
1812	8,035	7,892	...	...	8,035	7,892
1813	6,925	6,802	...	...	6,925	6,802
1814	27,106	26,622	...	...	27,106	26,622
1815	16,919	16,617	...	...	16,919	16,617
1816	24,590	24,148	...	...	24,590	24,148
1817	36,537	35,885	91	89	36,416	35,796
1818	36,019	35,376	116	116	35,901	35,260
1819	39,761	39,061	153	150	39,608	38,911
1820	48,616	47,748	520	511	48,096	47,237
1821	46,439	45,610	2,366	2,324	44,073	43,286
1822	55,481	54,490	2,801	2,751	52,679	51,739
1823	41,542	40,800	732	719	40,810	40,081
1824	60,031	58,959	2,147	2,109	57,884	56,850
1825	56,080	55,080	4,381	4,303	51,688	50,777
1826	71,463	70,187	4,744	4,658	66,719	65,529
1827	60,317	59,240	6,086	5,978	54,231	53,262
1828	71,602	70,324	6,816	6,694	64,786	63,630
1829	74,539	73,208	9,536	9,368	65,003	63,840
1830	69,661	68,417	12,028	11,814	57,633	56,603
1831	81,735	80,276	13,827	13,579	67,908	66,697
1832	82,594	81,119	22,112	21,716	60,482	79,403
1833	71,506	70,228	15,007	14,739	56,499	55,489
1834	70,842	69,577	3,923	3,853	66,919	65,724
1835	72,268	79,978	5,999	5,892	66,632	65,086
1836	67,201	66,001	10,605	10,415	56,596	55,586
1837	69,832	68,583	5,901	5,796	63,931	62,787
1838	71,456	70,180	7,982	7,840	63,474	62,340
1839	72,268	70,978	9,872	9,696	62,396	61,282
1840	85,111	83,591	5,242	5,148	79,869	58,443
1841	86,556	85,011	11,581	11,374	74,975	73,637
1842	85,652	84,122	8,071	7,829	77,581	76,293
1843	89,060	87,470	9,631	9,459	79,429	78,011
1844	97,650	95,906	9,622	9,450	88,028	86,456
1845	102,500	100,670	20,337	19,974	82,163	80,696
1846	93,816	92,141	12,598	12,373	81,218	79,768
1847	97,452	95,712	18,401	18,071	79,651	77,641
1848	57,910	56,876	8,258	8,111	49,652	48,765
1849	84,333	82,827	12,985	12,753	71,348	70,074
1850	75,029	74,689	20,563	20,196	54,466	54,193
1851	71,839	70,557	20,389	20,025	51,450	50,532
1852	93,786	92,112	21,871	21,481	71,915	70,631
1853	96,560	94,836	25,812	25,349	70,738	69,487
1854	120,279	118,132	35,577	34,924	84,702	83,208
1855	150,406	147,540	46,078	45,255	104,320	102,285
1856	126,430	124,173	49,773	48,885	76,657	75,288
1857	136,240	133,707	45,241	44,433	90,999	89,274
1858	155,761	152,980	55,970	54,971	99,791	98,009

Years.	Total Importation.		Re-exportation as Refined Sugar.		Quantity Consumed.	
	Tons of 1000 kil.	Tons Eng.	Tons of 1000 kil.	Tons Eng.	Tons of 1000 kil.	Tons Eng.
1859	152,949	150,218	69,922	68,673	185,181	181,874
1860	161,866	158,976	66,727	65,536	198,311	194,770
1861	198,358	194,816	68,223	67,005	235,617	231,410
1862	213,159	111,139	103,867	104,013	235,705	231,496
1863	237,445	233,205	134,302	131,902	248,117	243,669
1864	213,195	209,388	118,133	116,024	193,041	189,415
1865	210,195	206,453	149,639	146,967	191,520	188,100
1866	167,669	164,675	120,084	117,940	205,864	202,188
1867	176,265	173,118	116,400	114,320	193,774	190,314
1868	189,320	185,940	109,456	107,502	222,389	218,400
1869	201,574	197,974	130,116	127,775	203,646	200,010
1870	122,210	119,928	96,306	94,586	243,920	239,565
1871	157,223	154,416	79,666	78,244	283,892	278,823
1872	166,952	163,971	138,593	136,118	257,139	252,546
1873	186,145	182,643	149,601	146,930	157,474	154,662

We now give some general information as to the manufacture of foreign sugar.

The production of cane sugar, estimated at 2,079,000 tons of 1,000 kilos. [2,041,874 tons English nearly], is thus divided amongst the different countries:—English colonies (America, Mauritius, India), 961,500 tons [934,509 tons Eng. nearly]; Spanish colonies (Cuba, Porto Rico, Philippines), 325,000 tons [319,196 tons Eng. nearly]; Brazil, 200,000 tons [196,429 tons Eng. nearly]; Dutch colonies (Java, Surinam), 65,000 tons [63,839 tons Eng. nearly]; French colonies, 70,000 tons [68,750 tons Eng. nearly]; Danish colonies (Sainte-Croix, Saint Thomas), 7,000 tons [6,875 tons Eng. nearly]; United States (Louisiana principally), 440,000 tons [432,143 tons Eng. nearly]; Spain (Andalusia), 20,000 tons [19,643 tons Eng. nearly]. Of this production, 900,000 tons [883,928 tons Eng. nearly] does not come into the international commerce. The consumption of India is estimated at 600,000 tons [589,286 tons Eng. nearly].

We must next take into consideration palm sugar, which is manufactured principally in the Kingdom of Siam, in the northern part of the Island of Sumatra, in the Island of Java, and at Ceylon, about 100,000 tons [98,214 tons Eng. nearly]; and maple sugar, produced in the United States and Canada (3,000) about 20,000 tons [about 19,643 tons Eng.]

With regard to beet-root sugar, it is in France and Germany that the manufacture is of the greatest importance; then follow Belgium, Austria, and Russia. In England, this industry is almost *nil*. The production of beet-root sugar in the different countries of Europe may be thus estimated:—

	Kilos.		Tons Eng. nearly.
France, 1872–73	372,835,000	=	366,177
Germany,* 1871–72	186,374,700		183,046
Austria–Hungary, 1870	95,000,000		93,303
Belgium, 1871	57,535,000		56,508
Russia, Poland,† 1870	131,040,000		128,700
Other European States	15,000,000		14,732
Total	857,784,700	=	842,466

If the production continues to increase it will soon reach a milliard—a marvellous result, if one remembers that this industry was barely born at the beginning of this century. Persons do not perhaps grasp the greatness of this total: we shall, therefore, come to the aid of the reader's imagination. To carry a milliard of kilogrammes it requires a thousand large vessels, each measuring a thousand tons; if it were necessary to seek the beet-roots, it would require still further 13,000 other vessels; and then how many for the coal, lime, &c., &c.? For a cargo of 6,000 kilos. it would have required more than 2,500,000 wagons for nothing but the beet-root. On the other hand, in estimating the production at 20,000 kilos. of beet-roots per hectare [2½ acres nearly], it would have required 650,000 hectares or say the whole territory of two Departments of medium size.

Consumption.

Up to 1812 the sugar consumed in France consisted exclusively of colonial sugar, but from that epoch the manufacture of beet-root sugar, born under the influence of the Continental blockade, has continually increased, and has gradually taken an equal part with that of colonial sugar, and in fact a greater part, in the victualling of our country.

We indicate separately, in the chapter on industries, the quantities of native sugar and colonial or foreign sugar delivered for consumption during the last forty years. We can do no better than refer the reader to that chapter for the total figures (see above). We shall confine ourselves now to

* In Germany the impost is assessed on the beet-root. 8·28 per cent. is the quantity of raw sugar estimated to be extracted from the beet-root.

† The impost is assessed on the presses and reaches 12fr. 40c. per 100 kilos.

indicating the mean quantity of sugar of all descriptions consumed by each individual in France from 1812 to 1872:—

Years.	Kilos.	Lbs. Eng.	Years.	Kilos.	Lbs. Eng.
1812–16	0·500	1·100	1842–46	2·330	5·126
1817–21	1·330	2·926	1847–51	2·209	4·860
1822–26	1·730	3·806	1852–56	2·300	5·060
1827–31	1·905	4·191	1857–61	4·380	9·636
1832–36	1·800	3·960	1862–66	5·730	12·606
1737–41	2·027	4·459	1867–73	6·030	13·266

As may have been seen by the chapter on finance, the duties on sugar have been almost constantly increasing up to December, 1873. We believe that the tax has now arrived at its maximum, and that it would not be wise to go farther. If the consumption has not fallen off up to the present time, it is due to a double cause:—1. The price of sugar has sensibly decreased, so that in 1874, for example, with a very high tax, sugar is sold cheaper than eight or ten years before. 2. The use of coffee and tea is not so general in France among the lower classes as in many other countries, and the higher classes are not so sensible of a slight increase of expense.

It has been seen above what is the figure of individual consumption for the whole of our country. Below is some information as to the special consumption of the city of Paris:—

According to the estimates contained in the work of M. Husson, the total quantity of sugar used in Paris in 1854 would be 13 millions of kilogrammes [28,600,000 lbs. English]. Of this quantity 7,500,000 kilogrammes [16,500,000 lbs. English] would serve for domestic consumption, and 5,500,000 kilogrammes [12,100,000 lbs. English] would be transformed by industries into products of different kinds. But from this last quantity M. Husson deducts 1,700,000 kilogrammes [3,740,000 lbs. English] for the portion of these products manufactured in Paris and carried elsewhere.

The real consumption would then be as follows:—

	Kilos.	Lbs. Eng.		Kilos.	Lbs. Eng.
For domestic use ...	7,500,000	= 16,500,000	; or, per head ...	7·500	= 16·500
In form of manufactured products ...	3,800,000	8,360,000	; or, per head ...	3·800	8·360
	11,300,000	= 24,860,000		11·300	= 24·860

We can only reproduce these figures, which, as we have pointed out, do not rest on official statements, but only on estimates. At all events the individual consumption does not appear to have sensibly increased since then. If it was 11½ kilos. [25·3 lbs. English] in 1854, it is at most 13 kilos. [28·6 lbs. English] in 1874.

The consumption of sugar has not as yet reached its maximum in the greatest number of countries. The mean per head (in 1873) may be estimated in about the following figures:—

	Kilos.	Lbs. Eng.
Great Britain	17·40	38·28
United States	12·50	27·50
Hanseatic Towns	9·10	20·02
Netherlands	7·43	16·35
Denmark	6·25	13·75
Belgium	5·	11·
Germany	5·	11·
Switzerland	4·80	10·56
Portugal	4·50	9·90
Italy	4·45	9·79
Spain	4·29	9·44
Norway	4·25	9·35
Sweden	4·	8·80
Greece	2·70	5·94
Russia	2·61	5·74
Austria	2·50	5·50
Turkey	1·50	3·30

FRANCE.

Importations, 1874.

Raw Sugars.

Producing Countries.	General Commerce.				Special Commerce.					
	Quantities Imported.		Actual Value.		Quantities put in Consumption.		Actual Value.		Duties Collected.	
	Kilos.	Lbs. Eng.	Fr.	£	Kilos.	Lbs. Eng.	Fr.	£	Fr.	£
French colonies	52,312,944	115,088,477	29,473,927	1,178,957	53,154,406	116,939,693	30,085,367	1,203,414	13,301,080	532,043
England	244,412	527,706	42,527,099	1,701,083	177,360	390,192	44,031,723	1,761,268	11,499,714	459,988
Other countries	74,404,395	163,689,669			77,905,438	171,391,963				
Totals	126,961,751	279,305,852	72,001,026	2,880,030	131,237,204	288,721,848	74,117,090	2,964,682	24,801,034	992,031

Refined Sugars.

French colonies	28,865,685	63,504,507	19,051,352	762,054	27,678,201	60,891,042	18,267,613	730,704	19,435,604	777,424
England	35,135	77,297	1,934,384	77,375	8,778	19,311	962,546	38,501	874,427	34,977
Other countries	2,411,027	5,313,156			954,634	2,100,194				
Totals	31,311,847	68,894,960	20,985,736	739,429	28,641,613	63,010,547	19,230,159	769,205	20,310,031	812,401
Grand totals... ...	158,273,598	348,200,812	92,986,762	3,619,459	159,878,817	351,732,395	93,347,249	3,733,887	45,111,065	1,804,432

FRANCE.

Exportations, 1874.

Raw Sugars.

Where Produced.	Destination.	General Commerce.				Special Commerce.			
		Quantities Exported.		Actual Value.		Quantities Exported.		Actual Value.	
		Kilos.	Lbs. Eng.	Fr.	£	Kilos.	Lbs. Eng.	Fr.	£
French colonies	England	398,973	877,043	2,666,504	106,660	248	545	819	33
	Other countries	3,904,977	8,590,929			1,237	2,721		
Foreign	England	1,618,191	3,560,020	3,157,146	126,285	43,198	95,035	31,012	1,240
	Other countries	3,571,362	7,856,996			13,961	30,714		
Native...	England	81,197,832	178,635,230	65,853,245	2,634,129	81,197,832	178,635,230	65,853,245	2,634,129
	Other countries	30,050,012	66,110,066			30,050,012	66,110,026		
	Totals	120,741,347	265,630,284	71,676,895	2,867,074	111,306,488	244,874,271	65,885,076	2,635,402

Refined Sugars.

	England	70,413,070	154,908,754	139,232,274	5,569,290	70,409,088	154,899,993	138,593,738	5,543,749
	Other countries	115,229,962	242,505,916			114,382,563	251,641,638		
	Totals	185,643,032	397,414,670	139,232,274	5,569,290	184,791,651	406,541,631	138,593,738	5,543,749
	Grand totals ...	306,384,379	663,044,954	210,909,169	8,436,364	296,098,139	651,415,902	204,478,814	8,179,151

Enclosure 2 in No. 5.

NETHERLANDS.

Sir E. A. J. HARRIS to the Earl of DERBY.

MY LORD,— The Hague, 7th January, 1876.

With reference to your Lordship's despatch of the 16th ultimo, marked "Circular Commercial," I have the honor to transmit herewith the statistics connected with the production of, and the trade in, beet-root sugar in Holland, applied for by the Government of New Zealand.

I have, &c.,

The Earl of Derby, &c. E. A. J. HARRIS.

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1. For statistics of the production of beet-root sugar in the Netherlands, see the enclosed tables A and B, in consulting which the following particulars should be observed:—Until 1867 all sugar factories were taxed for the Excise duty in proportion of a fixed quantity of sugar per hectolitre of juice brought into fabrication, and per degree of density of these juices. Since 1867 factory owners are free to choose being taxed either according to the aforesaid method (not bonded factories), or in proportion to the actual amount of their production (bonded factories). Except in a very few cases, they have all chosen the method first mentioned. The real amount of production of these latter factories being unknown, the figures on record only represent the quantity of sugar for which they have been taxed in proportion to the juice brought into fabrication.

2. No duties have ever been levied in the Netherlands, nor have any bonuses been paid, tending to protect beet sugar against cane sugar. Nevertheless, in the sugar factories taxed according to the juices, the produce has generally, more or less, exceeded the quantities evaluated, and the surplus may be disposed of without the Excise duty being paid for it. The exact amount of the untaxed sugar is unknown, but for the last years it may be evaluated at about 5 per cent.

3. The present production of beet sugar will likewise be found in tables A and B, under the same reserve as mentioned par. 1.

For the quantities of cane sugar imported, see tables C, D, and E.

The export of beet sugar is favoured by no particular bonus.

A.—QUANTITIES* of BEET-ROOT SUGAR for which the Not Bonded Factories have been taxed for Duty.

Period.	Kilogrammes.	Lbs. English.	Period.	Kilogrammes.	Lbs. English.
1858–59	354,958	780,907	1867–68	6,622,210	14,568,862
1859–60	627,987	1,381,571	1868–69	7,511,490	16,525,278
1860–61	521,584	1,147,484	1869–70	9,384,462	20,645,816
1861–62	871,537	1,916,281	1870–71	11,765,779	25,584,713
1862–63	1,670,536	3,675,179	1871–72	13,127,936	28,881,448
1863–64	2,711,700	5,965,740	1872–73	18,460,632	40,613,390
1864–65	3,217,584	7,078,684	1873–74	21,824,113	48,013,048
1865–66	4,341,266	9,550,785	1874–75	15,735,773	34,618,700
1866–67	5,080,157	11,176,345			

B.—QUANTITIES* of BEET-ROOT SUGAR produced in the Bonded Factories.

Period.	Kilogrammes.	Lbs. English.	Period.	Kilogrammes.	Lbs. English.
1867–68	708,364	1,558,400	1871–72	209,950	471,890
1868–69	1,250,066	2,750,134	1872–73	217,941	479,470
1869–70	254,056	558,923	1873–74	650,503	1,431,104
1870–71	136,734	300,814			

* The quantities are expressed in dry white loaf sugar, the basis for calculating the duty. By elevating these quantities in the proportion of 88 to 100, the corresponding quantities of ordinary raw sugar (Nos. 10–14) are obtained.

C.—General Import of Sugar and Treacle.

Period.	Raw Sugar.		Loaves and Lumps.		Treacle.	
	Kilogrammes.	Lbs. English.	Kilogrammes.	Lbs. English.	Kilogrammes.	Lbs. English.
1860	97,367,673	214,208,880	239,205	526,251	2,842,664	6,253,860
1861	114,982,232	252,960,910	185,307	407,675	9,422,991	20,730,580
1862	104,966,259	230,925,769	109,074	239,962	3,645,078	8,019,171
1863	119,015,861	261,834,894	152,238	334,923	590,943	1,300,074
1864	117,287,458	258,032,407	89,578	197,071	2,625,367	5,775,807
1865	132,001,876	290,404,127	122,009	268,419	2,720,022	5,984,048
1866	132,124,789	290,674,535	51,587	113,491	4,411,172	9,704,578
1867	125,900,426	276,980,937	77,912	171,406	3,861,139	8,494,505
1868	147,054,854	323,520,678	39,727	87,399	5,948,778	13,087,311
1869	143,181,930	315,000,246	222,538	488,483	3,991,081	8,780,378
1870	157,561,381	346,635,038	273,451	491,592	3,061,771	6,735,896
1871	157,815,760	347,194,672	1,067,455	2,348,401	4,979,705	10,955,351
1872	147,011,460	323,425,212*	1,346,516	2,962,335	3,987,851	8,773,272
1873	140,078,784	308,173,324*	2,233,267	4,933,068	4,715,007	10,373,015
1874	127,127,941	279,681,470*	4,985,238	10,967,523	3,792,488	8,343,473
1875 (first half).	37,521,000	82,546,200*	2,563,000	5,638,600	871,000	1,916,200

D.—Special Import of Sugar and Treacle.

Period.	Raw Sugar.		Loaves and Lumps.		Treacle.	
	Kilogrammes.	Lbs. English.	Kilogrammes.	Lbs. English.	Kilogrammes.	Lbs. English.
1860	78,561,842	172,836,052	883	1,972	1,805,858	3,972,887
1861	85,730,412	188,606,900	20,225	44,495	4,851,854	10,674,078
1862	85,761,747	188,675,843	1,110	2,442	2,728,468	6,002,629
1863	91,152,370	200,535,214	506	1,113	1,476,513	3,248,328
1864	93,600,702	205,921,544	41,631	91,588	2,265,972	4,985,138
1865	99,692,526	219,323,557	4,027	8,859	2,677,571	5,890,656
1866	108,738,401	239,224,482	39,758	87,467	2,052,973	4,516,540
1867	105,487,489	232,072,475	11,116	24,455	1,296,484	2,852,264
1868	108,353,487	238,377,671	18,804	41,368	1,673,713	3,682,168
1869	116,404,959	256,090,909	49,019	107,841	1,270,264	2,794,580
1870	120,560,143	265,232,314	158,381	348,438	1,579,747	3,475,443
1871	126,318,917	277,901,617	823,545	1,811,799	2,101,914	4,624,210
1872	120,093,675	264,206,085	671,496	1,477,291	1,652,604	3,635,728
1873	108,223,310	238,091,282	385,982	849,160	1,443,542	3,175,792
1874	103,163,913	226,960,608	144,440	317,768	1,134,596	2,496,111
1875 (1st half)	41,925,000	92,235,000	...	...	272,000	598,400

E.—Special Import of Raw Sugar.

Period.	Extraordinary. No. 19 to 20.		First. No. 15 to 18.		Second. No. 10 to 14.		Third. No. 7 to 9.		Fourth. Inferior to No. 7.	
	Kilos.	Lbs. Eng.	Kilos.	Lbs. Eng.	Kilos.	Lbs. Eng.	Kilos.	Lbs. Eng.	Kilos.	Lbs. Eng.
†1865	1,855,166	4,081,365	19,032,035	41,870,477	13,437,620	29,562,764	4,184,964	9,206,920	1,502,416	3,305,315
1866	4,591,134	10,100,494	43,088,358	94,794,387	46,215,761	101,674,674	9,893,549	21,765,807	4,949,599	10,889,117
1867	4,732,258	10,410,967	38,245,232	84,139,510	45,558,257	100,228,165	10,329,568	22,724,049	6,622,174	14,568,782
1868	3,627,362	7,980,196	32,455,650	71,402,430	56,162,841	123,558,250	11,401,550	25,083,429	4,706,075	10,353,365
1869	9,208,303	20,258,266	27,682,095	60,900,609	58,908,576	129,598,867	11,989,202	25,376,244	8,616,783	18,956,922
1870	9,539,032	20,985,870	22,670,747	49,875,643	71,530,429	157,366,943	8,602,139	18,924,705	8,217,796	18,079,151
1871	9,810,423	21,688,230	23,196,092	51,031,402	78,320,166	172,304,365	7,885,875	17,348,925	7,106,361	15,633,994
1872	8,336,663	18,340,658	20,473,367	45,941,407	71,604,101	157,529,022	12,904,243	28,389,334	6,775,301	15,005,662
1873	4,864,089	10,700,995	11,758,355	25,868,381	71,398,585	157,176,887	12,663,172	27,858,978	7,539,109	16,586,039
1874	1,575,036	3,465,079	5,474,506	13,143,913	73,250,558	161,151,227	15,866,918	34,907,219	6,996,895	15,393,169
1875 1st half	679,000	1,493,800	2,520,000	5,544,000	31,328,000	68,921,600	5,896,000	12,971,200	1,502,000	3,304,400

Separate tables for cane and for beet sugar cannot be procured; but it may be admitted that the import from Prussia, Belgium, and France consisted mainly of beet sugar, and the remaining part of cane sugar.

* Candy and bastard included. † From August, 1865.

SWITZERLAND.

Mr. CORBETT to the Earl of DERBY.

MY LORD,— Berne, 21st January, 1876.

On receipt of your Lordship's despatch of this series, marked "Circular," of the 16th ultimo, Mr. Sandford applied to the Federal Government to furnish him with information on certain points connected with the production of, and trade in, beet-root sugar in Switzerland, as set forth in the list of queries enclosed in your Lordship's despatch.

I have now the honor to enclose copy of the answer of the President to Mr. Sandford, containing such information as can be given on the subject.

I have, &c.,
EDWIN CORBETT.

The Earl of Derby, &c.

Berne, 17th January, 1876.

IN reply to the queries which Mr. Sandford, H.B.M. Chargé d' Affaires, addressed to him on the 12th instant with respect to the manufacture of sugar, the Federal Consul has the honor to forward to him the following information:—

1. There do not exist any official data on the subject of the production of beet-root sugar in Switzerland, inasmuch as that production is not subjected to a special impost. Indeed, this product is only manufactured in very small quantity, such that it can have no sensible influence on the general total of imports and exports.

2. As a general thing, the Confederation knows nothing of prohibitive duties and bonuses, and less in the case of sugar than of any other article.

3. In regard to the quantity of cane sugar imported into Switzerland, the only data that the Federal authorities can furnish to the British Legation are contained in the tables of tolls from 1869 to 1874, attached to this (memorandum).

The Federal Consul, &c.,
WETTE.

IMPORTATIONS.

Sugar and Purified Syrups.

Years.	Quantities Imported.		Tax per Quintal.	
	Quintals.	Lbs. English.	Cents.	s. d.
1869	240,298	26,432,780	350	2 9¾
1870	265,633	29,219,630	,,	,,
1871	301,379	33,151,690	,,	,,
1872	308,249	33,907,390	,,	,,
1873	365,022	40,152,420	,,	,,
1874	394,043	43,344,730	,,	,,

EXPORTATIONS.

Sugars of all Kinds.

Years.	Quantities Exported.		Tax per Quintal.	
	Quintals.	Lbs. English.	Cents.	d.
1869	3,631	400,510	10	4/25
1870	10,555	1,161,050	,,	,,
1871	14,296	1,572,560	,,	,,
1872	6,036	663,850	,,	,,
1873	1,886	207,460	,,	,,
1874	2,381	262,910	,,	,,

DARMSTADT.

Mr. JERNINGHAM to the Earl of DERBY.

MY LORD,— Darmstadt, 19th January, 1876.

With reference to your Lordship's despatch, marked "Circular Commercial," of the 16th of December last, I have the honor to inform you that, as regards the Grand Duchies of Hesse and Baden, it is not possible to answer the queries which you enclosed on the part of the New Zealand Government, inasmuch as the duties imposed upon, or the bonuses paid for, the promotion of the production of beet-root sugar were within the competency of the German Zollverein, and not within that of individual States in that Customs Union.

The Imperial statistics at Berlin would now afford the required statistics.

There exists in the Grand Duchy of Baden one of the best sugar manufactories on the Continent, viz. at Waghaensel, and there is also an important sugar refinery at Manheim.

Your Lordship will find at pages 91 and 92 of the accompanying volume, which has been sent to me by the Baron de Trezdorf, all the information which the Baden Government is able to afford in its desire to reply to your Lordship's queries.

I have, &c.,

The Earl of Derby, &c. HUBERT J. H. JERNINGHAM.

REPORT on the MANUFACTORY of BEET-ROOT SUGAR, from the Annual Publication made by the Minister of Commerce in the Grand Duchy of Baden for the year 1874.

ON the manufactory of beet-root sugar in Waghaensel for the year 1874, we have received the following information:—

The factory used 671,729 cwt. of green beet-root. The contract supply amounted to 485,127 cwt., of which 186,602 cwt. were produced on the factory farm, excluding 83,758 cwt. of raw sugar imported from the North of Germany, Austria, Luxemburg, and other places, which were used in addition to the above for manufacturing. The coals and coke used amounted to 22,576 tons 17 cwt.

The expenditure in connection with the factory is as follows:—

	£	s.	d.
Taxes and duties	40,589	13	9
Raw stuff	173,542	9	6
Materials	37,987	3	0
Wages for factory	19,261	8	0½
Farm labour	8,448	19	9
Cattle	20,749	5	6
Freight	17,422	6	5
Rent for farm	11,736	11	10
Interest	9,142	5	6
Repairs	7,679	8	3
General expenditure, postage, insurance, travel allowance, offices, tolls, schools, &c.	5,813	9	0
Salaries	5,427	1	1
Additional plant	4,389	12	8
Compensations	2,458	1	5
Forage and purchase of manure	1,728	5	0
Aid granted and hospitals	575	6	9
Pensions	319	1	9
Total	£367,270	9	2½

Income for the same year:—

	£	s.	d.
Out of 118,863 cwt. of various manufacture	£315,776	8	3
Charred bones and leavings	3,524	18	5
Spirits	18,910	19	9
Fruit and other farm produce	19,081	10	7
Cattle	16,095	18	3
Milk	3,279	19	6
Sheep and wool	5,709	2	2
Shlempcoal	2,472	4	6
Diverse material and offal	1,680	7	6
Total	£386,531	10	11

The progress of the manufactory has not been thought satisfactory. This may be accounted for partly through the great scarcity of employment, which acted detrimentally on the demand for sugar; the depressed prices realized through the French and Austrian Convention, which was in favour of increasing freight and duties. The unfavourable state of the weather during the summer of 1873 caused the beet-root crop in the factory farm to be inferior in quantity, and especially in quality. It proved far below the most modest expectations. Whilst the price of 1 cwt. of sugar in 1873 fell from £3 to £2 14s., it retrograded in the second quarter of 1874 to £2 13s. 6d., in the third to £2 13s., and in the fourth quarter to £2 12s.

The manufactory for refining sugar in Manheim produced, during the campaign of 1873–74, beet-root sugar from German, Austrian, and Bohemian sources, 49,604 cwt., and employed from eighty-five to ninety workmen.

BELGIUM.

Sir H. BARRON to the Earl of DERBY.

MY LORD,— British Legation, Brussels, 29th January, 1876.

I have applied to the Belgian Government for the information requested by your Lordship's circular of the 16th of December, on behalf of the New Zealand Government, concerning the production of, and trade in, beet-root sugar.

I have the honor to transmit herewith answers obligingly furnished to the paper of queries enclosed in your Lordship's despatch, together with two statistical returns—one of the "*prises en*

charge" ["charges for duty"] since the year 1843–44 (A); the other of the duties levied on sugar since 1831 (B).

I think it right to observe that the Customs duties include beet-root and cane sugar indistinctly, whereas the Excise duty is raised from beet-root sugar alone, grown in Belgium.

Much further information on this matter will be found in my two reports of 31st January, 1863, and 30th December, 1873, printed in the Reports of Her Majesty's Secretaries of Embassy and Legation.

I have, &c.,

The Right Hon. the Earl of Derby, &c. H. BARRON.

Question.

1. Statistics of the production of beet-root sugar in the different countries of Europe for as long a series of years as possible.

Answer.

1. The Table A attached shows the "charges for duty" verified per period since the establishment of an Excise on beet-root sugar in Belgium, together with the number of sugar manufactories set to work in each period. The impost being collected according to the volume and density of the juice submitted to defecation, without control over the quantity of sugar manufactured, it is impossible to give the total of the *actual production* of sugar.

Question.

2. Abstract of the protective duties or bonuses which have been paid in the past to encourage the production of beet-root sugar to the detriment of cane sugar.

Answer.

2. Before 1843, the beet-root sugar manufactured in Belgium bore no Excise duty. From 1843, a duty was established of 20 francs per 100 kilogrammes of sugar charged for duty in the factories. If this duty is compared with the duty of 45 francs to which cane sugar was subjected, it will be seen that there was thus a sufficiently strong protection in favour of native sugar. But it must not be lost sight of that this law succeeded a complete liberty of manufacture of beet-root sugar, and that the means for the extraction and the treatment of the beet-root juice were, so to speak, in their infancy.

It always has been the case that, in proportion as the manufacture of beet-root sugar became perfect, the duty on native sugar has not ceased to increase in Belgium until it has reached the same rate as that on cane sugar. From 20 francs, which it was in 1843, the duty on beet-root sugar was increased successively to 30 francs in 1846, to 34 francs in 1847, to 40 francs in 1848; falling back to 37 francs in 1849, it was increased to 38 francs and 39 francs in 1856—the duty on cane sugar always remaining fixed at 45 francs.

In 1860 the duty on cane sugar was raised to 48 francs, and the duty on beet-root sugar to 42 francs. In 1861 the duty on the two sugars was fixed at 45 francs; and at last, in 1865, the entry-duty of 1·20 francs the 100 kilogrammes on foreign sugar (cane and beet-root) was abolished. (See Table B.)

Up to 1856 the importation of foreign raw beet-root sugar was prohibited in Belgium; from that year (law of the 19th June, 1856) it was assimilated to the import duty on raw cane sugar.

The exportation, with remission of excise, of raw beet-root sugar was prohibited up to 1847. The law of the 2nd January of that year authorized this exportation.

In Belgium bonuses have never been paid to favour the production of beet-root sugar, for the reason that, on the exportation of the sugar, whether raw or refined, a reimbursement in the shape of drawback has never been granted, but simply a discharge to the open account of the manufacturer or refiner. Each time that the Government has been able to recognize that, in consequence of the progress of the manufacture and the improvement in the beet-roots used, the "charge for duty" at the purifying gave an indirect bonus in the form of excess, it has proposed to the Legislature to increase the proportion of that "charge for duty." It is thus that, from 1,200 grammes, to which it amounted from 1843, that "charge for duty" has been successively increased to 1,400 grammes in 1847, afterwards to 1,475 grammes in 1865, and 1,500 grammes in 1866. The Convention of the 11th August, 1875, which has to-day been submitted to the approbation of the Chambers, raises the "charge for duty" in the sugar factories to 1,550 grammes from the period 1876–77, and to 1,600 grammes from the following period. Thus, dating from the period 1877-78, the "charge for duty" will be one-third higher than it was at the commencement (1,600—1,200=400=$\frac{1}{3}^{00}$).

Question.

3. Details of the quantities of beet-root sugar now produced in the different countries of Europe, of the quantities of cane sugar imported into each of these countries, and of the protective duty or bonus (if any exists) in favour of beet-root sugar. Also, details concerning the bonus (if any exists) paid by each of these countries on raw beet-root sugar exported.

Answer.

3. The table joined to the answer given to the first question gives, for the period 1874-75 (the last which can be complete), the quantity of sugar charged for duty in the manufactories of beet-root sugar in Belgium. As for the importations of cane sugar, they rose for the year 1874 (the last for which statistics can be made) to 17,219,155 kilos. (37,882,141 lbs. English).

As has been shown in the answer to the second question, there does not exist in Belgium either a protective duty or a *paid* bonus in favour of native beet-root sugar; and if there is at the present time an indirect bonus on that sugar, resulting from the excess of manufacture over the legal "charge for duty," it is not possible to estimate it exactly, and it will soon disappear when the "charge for duty" has been raised to 1,600 grammes.

A.—Quantities Charged for Duty, verified, in the Beet-root Sugar Factories of Belgium.

Period.	No. of Factories.	Charged for Duty.		Period.	No. of Factories.	Charged for Duty.	
		Kilos.	Lbs. English.			Kilos.	Lbs. English.
1843–44	31	2,851,238	6,272,723	1859–60	63	20,642,661	45,413,854
1844–45	27	2,498,423	5,496,530	1860–61	65	13,669,212	30,072,266
1845–46	27	2,439,351	5,366,572	1861–62	69	17,322,709	38,109,959
1846–47	25	4,299,719	5,059,381	1862–63	74	22,661,446	49,855,181
1847–48	25	5,700,268	12,540,589	1863–64	79	18,742,363	41,233,198
1848–49	24	4,698,932	10,337,650	1864–65	84	21,894,809	48,168,579
1849–50	24	5,600,367	11,320,807	1865–66	100	41,551,834	91,414,034
1850–51	28	6,164,087	13,560,991	1866–67	106	39,132,879	86,092,333
1851–52	40	7,143,803	15,716,366	1867–68	104	31,093,093	68,404,804
1852–53	44	9,455,769	20,802,690	1868–69	107	37,078,463	81,572,618
1853–54	45	10,498,937	23,097,661	1869–70	115	43,552,052	95,814,514
1854–55	48	8,074,949	17,764,887	1870–71	131	55,739,218	122,626,279
1855–56	45	10,723,165	23,590,963	1871–72	152	72,546,421	159,602,126
1856–57	46	13,300,909	29,261,999	1872–73	174	76,250,942	167,752,072
1857–58	52	18,564,413	40,841,708	1873–74	173	70,776,696	155,708,731
1858–59	60	17,115,999	37,655,197	1874–75	173	71,819,473	158,002,840

B.—Table showing, for the Years 1831 to 1874, the Duties collected on Sugars, together with the Rate of Excise.

Years.	Duties collected on Sugars.								Rate of Excise per 100 Kilos.			
	Customs.				Excise.		Total.		Foreign.		Native.	
	Raw Sugar.		Refined Sugar.							English.		English.
	Francs.	£	Francs.	£	Francs.	£	Francs.	£	Fr. c.	£ s. d.	Fr. c.	£ s. d.
1831	114,472	4,578	45,936	1,837	1,085,858	43,434	1,246,266	49,850	37·02	1 9 7½	...	...
1832	252,685	10,107	12,124	485	2,023,378	80,935	2,288,187	91,527	...	...	...	...
1833	231,109	9,244	121,142	4,845	2,079,485	83,179	2,431,736	97,269	...	...	...	...
1834	286,229	11,449	48,367	1,934	1,669,730	66,789	2,004,326	80,173	...	...	...	...
1835	211,647	8,465	1,262	48	1,714,623	68,585	1,927,532	77,101	...	...	...	...
1836	231,227	9,249	177	7	205,579	8,223	436,983	17,479	...	...	...	...
1837	229,256	9,170	649	26	509,565	20,382	739,470	29,578	...	...	...	...
1838	199,782	7,391	206	8	1,306,964	52,278	1,506,952	60,278	...	...	...	...
1839	184,304	7,372	810	32	1,206,850	48,274	1,391,964	55,678	...	...	...	...
1840	294,927	11,797	4,205	168	974,584	38,983	1,273,716	50,948	...	...	...	...
1841	244,724	9,789	1,917	77	780,854	31,234	1,027,495	41,099	...	...	...	...
1842	258,150	10,326	712	28	815,273	32,611	1,074,135	42,965	...	...	...	...
1843	173,758	6,950	269	11	930,235	37,209	1,104,262	44,170	45·00	1 16 0	20·00	0 16 0
1844	178,334	7,133	508	20	3,663,111	146,524	3,841,953	153,678	...	...	...	...
1845	111,568	4,462	2,089	83	2,612,665	104,506	2,726,322	109,053	...	...	...	...
1846	294,768	11,790	4,541	182	2,843,380	113,735	3,142,689	125,717	...	...	30·00	1 4 0
1847	256,353	10,254	3,019	121	1,410,529	56,421	1,669,901	66,796	...	...	34·00	1 7 2½
1848	270,077	10,803	4,249	170	3,072,488	122,899	3,346,814	133,872	...	...	40·00	1 12 0
1849	292,506	11,700	10,960	438	3,810,428	152,417	4,113,894	164,555	...	...	37·00	1 9 7½
1850	305,687	12,227	13,332	533	3,158,935	126,357	3,477,954	139,118	...	...	...	...
1851	146,988	5,879	8,101	324	3,058,702	122,348	3,213,791	128,551	...	...	...	...
1852	340,267	13,610	8,340	333	3,500,000	140,000	3,848,607	153,944	...	...	...	...
1853	347,261	13,890	7,847	314	3,651,858	146,074	4,006,966	160,278	...	...	...	...
1854	272,385	10,895	6,487	259	3,655,670	146,226	3,934,542	157,381	...	...	...	...
1855	328,663	13,146	6,308	252	3,837,922	153,517	4,172,893	166,915	...	...	...	...
1856	253,735	10,149	5,981	239	4,350,278	174,011	4,609,994	184,399	...	...	38·00	1 10 4½
1857	206,206	8,248	14,474	578	4,500,500	180,020	4,721,180	188,847	...	...	39·00	1 11 2½
1858	287,352	11,494	2,385	95	4,786,349	191,454	5,076,086	203,043	...	...	...	...
1859	241,295	9,652	1,396	66	4,761,646	190,467	5,004,337	200,173	...	...	...	...
1860	246,244	9,849	1,308	52	5,589,528	223,581	5,837,080	233,483	48·00	1 18 5½	42·00	1 13 7½
1861	322,204	12,888	35,277	1,411	5,573,298	222,932	5,930,779	237,231	45·00	1 16 0	45·00	1 16 0
1862	258,821	10,352	60,271	2,411	5,941,147	237,646	6,260,239	250,409	...	...	...	...
1863	235,988	9,439	46,157	1,846	5,954,920	238,196	6,237,065	249,482	...	...	...	...
1864	174,047	6,961	1,395	56	5,487,401	219,496	5,662,843	226,513	...	...	...	...
1865	165,825	6,633	110,551	4,422	5,927,757	237,110	6,204,133	248,165	1 class 46·00 2 „ 45·00 3 „ 43·00 4 „ 40·50	1 16 9½ 1 16 0 1 14 4¾ 1 12 4¾	*45·00.	1 16 0
1866	...	...	212,616	8,504	6,003,593	240,143	6,216,209	248,648	...	...	...	...
1867	...	...	448,810	17,952	6,808,624	272,345	7,257,434	290,297	1 class 48·07 2 „ 45·00 3 „ 40·91 4 „ 34·26	1 18 5¼ 1 16 0 1 12 9½ 1 7 4¾	...	...
1868	...	...	605,651	24,226	5,835,049	233,402	6,440,700	257,628	...	...	...	...
1869	...	...	974,790	38,991	6,204,213	248,184	7,179,403	287,176	...	...	...	...
1870	...	...	989,185	39,567	5,581,284	223,251	6,570,469	262,818	...	...	...	...
1871	...	...	2,053,407	82,136	4,466,087	178,643	6,519,494	260,779	...	...	...	...
1872	...	...	2,746,879	109,875	4,769,509	190,780	7,516,388	300,655	...	...	...	...
1873	...	...	1,700,778	68,031	4,776,566	191,062	6,477,344	259,093	...	...	...	...
1874	...	...	1,846,644	73,865	4,862,380	194,495	6,709,024	268,361	...	...	...	...

* This duty being collected by agreement upon the quantity of sugar of the second class liable to charge at the ...cation, the equality of the impost between the two sugars is maintained.

ITALY.

NOTE.—Lira of 100 centisimi = 25 to the £1 sterling = 1 franc.
Kilogramme = 2·20 lbs. avoirdupois.
Quintal = 220 lbs. avoirdupois.

Sir A. PAGET to the Earl of DERBY.

MY LORD,— Rome, 29th January, 1876.

With reference to your Lordship's circular of this series of the 16th ultimo, requesting me to forward to your Lordship's office, for the information of the Government of New Zealand, copies of any statistical documents on the subject of the production of, and trade in, beet-root sugar in Italy, I have the honor to transmit herewith copy and translation of a note which, in answer to my application, has been addressed to me by Chevalier Visconti Venosta, and in which His Excellency states that the production of beet-root sugar is most restricted in Italy, and that no statistical documents have as yet been published on this subject.

I have, &c.,
A. PAGET.

The Earl of Derby, &c.

MR. LE MINISTRE,— Rome, 26th January, 1876.

In conformity with the wish expressed to me in your note of the 10th instant, I have the honor to read to you the following answers to the queries regarding the production of beet-root sugar, which were formulated in the printed enclosure:—

1. In Italy the production of beet-root sugar is most restricted: there only exist three factories—the first established at Anagni, in the Province of Rome; the second at Rieti, Province of Perugia; and the third at Cesa, Province of Arezzo. Of the above, the one at Anagni is old-established; but it can be stated that it began to give a certain production only in 1873. The other two were only opened in the same year of 1873. The producing capacity of the three establishments is of about 10,000 quintals a year; but, in fact, they only produce 5,000 or 6,000.

2. The Government gives no bonus [*premio*], or help towards the encouragement of this industry. On sugar generally, without distinction between cane and beet sugar, there is an import duty of 28.25 lire per quintal for refined, and of 20.80 lire per quintal for unrefined. Refined sugars are those showing a degree of purity superior to the type No. 20, Dutch, whilst those of equal or inferior purity are classified as unrefined.

3. The following table gives the results of the importation into Italy of sugar from 1867 to 1874:—

SUGAR.	1867.	1868.	1869.	1870.	1871.	1872.	1873.	1874.
Refined ... quintals	487,708	543,183	540,189	537,978	569,720	538,174	510,140	450,922
Unrefined ... „	96,618	135,275	141,381	146,211	141,457	164,011	297,523	343,021
Total ... quintals	584,326	678,458	681,550	684,189	711,177	702,185	807,663	793,943

It would not be possible for me to furnish your Excellency with other information respecting this branch of industry, because sugar-canes are not imported into Italy; nor have to my knowledge any statistical documents been published in Italy on this subject, excepting of course those general tables of the commercial movement from which the figures given above respecting importations were taken.

I have, &c.,
A. PEIROLERI,
(for the Minister).

Sir A. Paget, &c., Rome.

REPORT by Mr. J. G. KENNEDY on the SUGAR INDUSTRY in ITALY.

Mr. J. G. KENNEDY to Sir A. PAGET.

SIR,— Rome, 24th February, 1876.

In submitting to you the following report on the sugar industry in Italy, in obedience to the instructions contained in the Earl of Derby's "Commercial" despatch of the 21st December last, I venture to state that owing to the restricted nature of the sugar industry in Italy, and to the absence of all statistical publications on the subject, I have not been able in the preparation of the report to conform to the arrangement prescribed in the above-mentioned despatch from the Foreign Office.

The importation into Italy of sugar is still regulated by the Sardinian Tariff, which was approved by Royal decree of 9th July, 1855.

Sugars are divided into two categories, refined and unrefined, and on importation into Italy are taxed thus:*—

* These duties, being payable in gold, represent about 31 lire and 23 lire in paper currency.

	Lire.
Refined	25 per 100 kilog.
Unrefined	18 „

By adding these sums the so-called accessory duties, viz., 5 per cent. "expédition" and the "war décime," the following figures representing the duties really levied are obtained:—

	Lire. c.
Refined	28 87 per 100 kilog.
Unrefined	20 79 „

These duties, stated in round numbers as 28·85 and 20·80, were confirmed by the Franco-Italian Treaty of 1863, and Austro-Italian Treaty of 1867.

Previous to the adoption of the law of 1872 on "financial measures," the duties on sugar were levied according to the legal net weight, *i.e.* according to the gross weight with deduction of a tare calculated according to the different quality of the covering or packing-case. This law having raised from 20 to 30 lire the limit below which the amount of duties could be assessed on the gross weight, a tare on sugar was no longer allowed, and a surplus of receipts of about 6 per cent. was expected. The Government, however, did not obtain the expected result, and sugar is almost invariably brought to the Custom-house packed in sacks.

All sugars of lighter colour than that known as No. 20 Dutch are classed in Italy as refined.

All other sugars without distinction are classed as unrefined, and taxed accordingly.

In Italy the production of beet-root sugar is very restricted. There only exist three factories—one at Anagni, in the Province of Rome; another at Rieti; in the Province of Perugia, and the third at Cesa, in the Province of Arezzo.

The factory of Anagni, established in 1869, enjoyed great protection under the Papal Government, which granted it an exemption of duty on machinery imported from abroad, and conceded a reduction of the octroi duty on sugar brought into walled cities. This factory works for about four months in the year, during which period it consumes on the average 55 tons of beet-root per day, extracting about 3,000 quintals of sugar.

The factory of Rieti, when completely finished, will be able to consume 10,000 tons of beet a year. In 1873 it only produced 281 quintals of sugar. In 1874 the production fell to 197 quintals, but for 1875 the Administration reckoned 2,000 quintals.

The factory of Cesa, in the Val di Chiana, was founded in 1872, and has a producing power of 5,000 or 6,000 quintals of sugar. The outcome of 1872 was 600 quintals; of 1873, 1,000; and 2,000 in 1874, comprising in the last amount 500 quintals of unrefined sugar imported from abroad for refinement. In 1875 the Cesa factory reckoned on producing 3,000 quintals of native sugar.

Owing to the difficulty of obtaining beet-root, which will not grow freely in Italy, the three above-named factories do not produce on an average more than 7,000 quintals of sugar a year.

There is no special tax levied on this production.

Sugar Refinery.—Previous to the year 1872 there were no sugar refineries in Italy.* Indeed the possibility of the existence in Italy of this industry was doubted, when, in the above-named year, a sugar refinery on a large scale was established at Sanpierdarena, near Genoa, under the name of the "Raffineria Lombarda Company."

This establishment, which, after three years of struggling existence, now begins to prosper, contains, besides the sugar refinery, an "animal charcoal" factory,† a molasses distillery, and a gas factory, and employs about 500 hands.

Ten steam engines, with an aggregate of 350 horse-power, and a daily consumption of more than 30 tons of coal, supply motive power for the four workshops of the factory, in which are fourteen steam boilers of 1,120 horse-power.

The distillery produced 12 hectolitres of alcohol daily, and could have yielded more, but at present it is not working on account of a difficulty which has arisen between the factory-owners and the Government with respect to the method of application of the duty. The owners affirm that by accepting this method they could not compete with factories which extract alcohol from corn.

This factory is now (February) turning out 90 tons of sugar daily, and is also making for its own use about 200 tons of coke a year, 90 to 100 cubic metres of gas a day, and 15 to 20 tons of "nero animale" a day.

The refinery of Sanpierdarena is the only one now working in Italy; another was established at Rivarolo, but the building is now for sale unfinished.

The Italian Tariff grants no drawback on the exportation of sugar.

Candied fruits and chocolate are the only exports for which drawbacks are allowed on account of the sugar used in their preparation.

On candied fruits there is a drawback of 15 lire 50 c. per 100 kilog. On chocolate with cinnamon, 27 lire per 100 kilog; without cinnamon 24 lire.

During 1874 the amount of exportation and drawback was,—

	Kilog.	Lire.
Chocolate	2,320	218,236
Candied fruits	1,393,820	

As stated above, the "Raffineria Lombarda," near Genoa, is the only refinery in Italy. It has affected the market very considerably, being able to undersell English, French, and Dutch refiners, not

* The sugar industry existed in the Lombardo-Venetian Kingdom of Austria, but it was a State-supported industry, which was extinguished by the fiscal changes following the political events of 1859 and 1866.

† "Nero animale," stuff made from bones.

on account of any bounty, for there is none, but because the foreigner must add freight to the cost of production. This refinery does not export a pound of sugar, the whole of its produce being consumed in Italy, which would absorb many times the amount if the factory could turn it out.

The recent increased production of the Raffineria Lombarda may be chiefly attributed to an improved refining process—that of Schröder—which is said to combine rapidity of action with economy of fuel and labour. The quality of the sugar chiefly produced is that known by the name of "pilé." It is imported from Egypt, and owing to its dark colour is classed as unrefined; after crushing, however, it assumes a lighter shade, and enters the trade as refined sugar, packed in sacks of 100 kilog.

The Raffineria Lombarda Company draw their cane sugar from Egypt, England, and the Mauritius, their beet from France and Germany. They supply one-fourth of the entire consumption of Italy, which is estimated at 80,000,000 kilog., one-tenth of which may be considered contraband. This gives a consumption of little more than 3 kilog. per head of the entire population of Italy, a very low average as compared with some other countries of Europe, and especially England, where the average per head is estimated at 30 kilog.

There is no doubt that as yet the cultivation of beet-root has not established itself in Italy. Its supporters urge the many familiar arguments of cheap labour, advantage to agriculture, &c., while its opponents affirm that the right sort of beet can only with difficulty be grown in Italy, and that its cultivation would cause a displacement of crops more congenial to the soil and climate of this country. Both parties agree in the wish that the fiscal laws of the country may be modified in a protective sense by a system of bounties and drawbacks.

But with respect to the intentions of the Government little or nothing is known. The Committee of the Italian Industry Inquiry Commission has proposed to the Government a new Customs régime for sugars, and the Government is still undecided whether to retain the present system of two categories, or to adopt the saccharometer system of taxation according to quality. It is also probable that an increased import duty will be levied; but in this case a tax on native sugar will be imposed, so as not to place foreign importers in a worse position than they now are.

I have, &c.,
Sir A. Paget. J. G. Kennedy.

WURTEMBERG.

Mr. Petre to the Earl of Derby.

My Lord,— Stuttgart, 9th February, 1876.

I have the honor to enclose the translation of a note which I have received from the Wurtemberg Minister for Foreign Affairs, in answer to an application made during my absence in England by Mr. Saurin, for the information relative to the production of, and trade in, beet-root sugar, which your Lordship instructed me to obtain in your circular despatch, "Commercial," of the 16th of December last.

His Excellency informs me that the latest statistical information on these points, as regards Wurtemberg, is to be found in the "Statistik des Deutschen Reichs" (Second Annual Series, 1874), published by the Imperial Statistical Office at Berlin.

Should your Lordship think it advisable, I would procure the volume in question, and translate that portion of the Imperial Statistics of the production of, and trade in, beet-root sugars, which relates to Wurtemberg alone.

I have, &c.,
The Earl of Derby, &c. George Petre.

Sir,— Stuttgart, 3rd February, 1876.

In his note of the 17th ultimo, Mr. Saurin applied for information respecting the production of and trade in sugar in Wurtemberg. In answer to this note I have the honor to inform you that the whole of the statistical details bearing upon the production and trade, the import and export, of sugar in Wurtemberg are to be found in the "Statistik des Deutschen Reichs," published yearly by the Imperial Statistical Bureau at Berlin.

The last statistics which appeared on the subject of the German and Wurtemberg production and consumption of sugar were for the period from September 1, 1872, to August 31, 1873, and will be found in the Second Annual Series (1874) of the "Statistik des Reichs," published by the Imperial Statistical Bureau, p. 40, ff. [See extracts in despatch from Berlin.]

In adding that this work can be got through booksellers from the Statistical Bureau at Berlin, where it was published, I avail myself, &c.

(For the Minister,)
George Petre, Esq. Uxhull.

DENMARK.

Sir C. Wyke to the Earl of Derby.

My Lord,— Copenhagen, 1st February, 1876.

With reference to your Lordship's despatch of this series, marked "Circular," of the 16th

December last, containing a set of queries on the subject of the production of beet-root sugar, I have now the honor to enclose a statement thereupon which has been drawn up by Mr. Pakenham, and from which it will be seen that, owing to the recent date of the introduction of this branch of sugar manufacture into Denmark, no detailed statistics are procurable.

The information herewith furnished has therefore been obtained from private sources alone.

I have, &c.,

The Right Hon. the Earl of Derby, &c., CHARLES L. WYKE.

THE cultivation of beet-root and the production of beet sugar are of so recent a date in this country that it is impossible as yet to procure any detailed statistics on the subject.

The largest sugar refinery in Denmark, which used until lately to refine cane sugar only, a few years ago built a manufactory for the production of beet-sugar, and another company was started with the object of promoting the cultivation of beet-root, which hitherto has not been viewed with favour by the farmers. This company has bought and rented land on the Island of Lolland, one of the most fertile provinces of Denmark, and here the beet-root is cultivated, and a refinery has been built for working the roots, the refuse from the sugar being used for fattening cattle. It is hoped that in this way the farmers may gradually become convinced of the benefit arising from the cultivation of this plant.

It seems that the Government has not as yet seen its way very clearly with respect to this new industry, and in the Legislature very opposite opinions have been given, some claiming protection for the beet sugar manufacture on account of the supposed benefit to agriculture, and others wishing to class it with the cane sugar refining, and further averring that the protection of beet sugar would interfere with the interest of the cane sugar planters in the Danish West Indian colonies.

As yet, beet sugar has been taxed exactly the same as cane sugar, and the manufactured sugar leaving the beet refineries pays the same duty as sugar imported from abroad.

Possibly the duty on beet sugar may be abolished or reduced, but there seems no reason to expect the introduction of a protective duty to promote the production of the article.

The import duty on sugar, whether beet or cane, varies according to its quality, and is approximately—

	d.	
On refined sugar	1·81	per lb.
On raw sugar of a lighter colour than the Dutch standard, No. 9.	1·32	„
Raw sugar darker than No. 9	1·17	„
Molasses, syrup, &c.	0·64	„

On exportation, the duty is repaid to the exporter after the above scale. The quantity of sugar of all descriptions and molasses imported into this country was—in the year 1873, 56,211,577 Danish pounds; in 1874, 49,234,211; and the export during the same years amounted to 8,982,969 and 7,046,701 Danish pounds respectively.

Copenhagen, 31st January, 1876. J. PAKENHAM.

GERMANY.

NOTE.—Thaler of 30 groschen = 3s.
Gulden or florin of 60 kreuzers = 1s. 8d.
Mark, of 100 pfenning = 1s.
Kilogramme = 2·20 lbs. avoirdupois.
Centner = 110 lbs. avoirdupois.

Lord ODO RUSSELL to the Earl of DERBY.

MY LORD,— Berlin, 19th February, 1876.

With reference to your Lordship's "Circular Commercial" despatch of 16th December, 1875, I have the honor to transmit herewith a table giving full statistics of the production and taxation of the beet-root sugar in Germany, from the year 1840, and also a copy of the statistics published by the Statistical Office, which gives the details respecting the importation of foreign sugar into Germany (see pages ix., 58 and 59).

As regards the bonuses paid on beet-root sugar when exported, the law of 26th June, 1869, contains the following provisions:—

On the export of home sugar and of foreign sugar across the Customs Union territory, if the exported quantity amounts to at least 10 centners, a compensation is allowed on every centner—1. For raw sugar of at least 88 per cent. polarization, 3 thalers 4 sgs. (9s. 4d.). 2. For candied, and for sugar in full white hard loaves up to 25 lbs. gross weight, or if triturated in presence of the Custom House officers, 3 thalers 25 sgs. (11s. 6d.). 3. For all other hard sugar and for all dry white sugar (not containing more than 1 per cent. of water), in crystallized or powdered form, of at least 98 per cent. polarization, 3 thalers 18 sgs. (10s. 8d.).

I have, &c.,

The Earl of Derby, &c. ODO RUSSELL.

Production and Taxation of Beet-root Sugar in Germany.

Campaign.	Number of Manufactories	Quantity of Worked-up Beet-root.	Quantity of Raw Sugar extracted.	Average quantity of Beet-roots necessary for 1 cwt. Raw Sugar.	Gross Receipts of Tax.			
					Thalers. 1 Thaler=3/	£	s.	d.
		Cwts.	Cwts.	Cwts.				
1840–41	145	4,829,734	284,102	17·	40,248	6,037	4	0
1841–42	135	5,131,516	314,817	16·3	85,425	12,813	15	0
1842–43	98	2,475,745	154,734	16·	41,262	6,189	6	0
1843–44	105	4,349,667	286,162	15·2	72,494	10,874	2	0
1844–45	98	3,890,404	259,360	15·	194,520	29,178	0	0
1845–46	96	4,455,092	303,068	14·7	222,755	33,413	5	0
1846–47	107	5,633,848	402,418	14·	281,692	42,253	16	0
1847–48	127	7,676,772	536,837	14·3	383,839	57,575	17	0
1848–49	145	9,896,718	717,154	13·8	494,836	74,225	8	0
1849–50	148	11,525,671	847,475	13·6	576,284	86,442	12	0
1850–51	184	14,724,309	1,066,979	13·8	1,472,431	220,864	13	0
1851–52	234	18,289,901	1,261,372	14·5	1,828,990	274,348	10	0
1852–53	238	21,717,096	1,696,648	12·8	2,171,710	325,756	10	0
1853–54	227	18,469,890	1,420,761	13·	3,693,978	554,096	14	0
1854–55	222	19,188,402	1,572,820	12·2	3,837,680	575,652	0	0
1855–56	216	21,839,799	1,747,184	12·5	4,369,960	655,494	0	0
1856–57	233	27,551,208	2,071,519	13·3	5,510,242	826,536	6	0
1857–58	249	28,915,134	2,409,594	12·	5,783,027	867,454	1	0
1858–59	257	36,668,557	2,887,288	12·7	6,167,139	925,070	7	0
1859–60	256	34,399,317	2,915,196	11·8	8,599,829	1,289,974	7	0
1860–61	247	29,354,032	2,530,520	11·6	7,338,508	1,100,776	4	0
1861–62	247	31,692,394	2,515,269	12·6	7,923,099	1,188,464	17	0
1862–63	247	36,719,259	2,760,847	13·3	9,179,815	1,376,972	5	0
1863–64	253	39,911,520	3,023,600	12·3	9,977,880	1,496,682	0	0
1864–65	270	41,641,204	3,413,214	12·2	10,410,301	1,561,545	3	0
1865–66	295	43,452,773	3,713,912	11·7	10,863,193	1,629,478	19	0
1866–67	296	50,712,709	4,024,818	12·6	12,678,177	1,901,726	11	0
1867–68	293	40,593,392	3,300,276	12·3	10,148,348	1,522,252	4	0
1868–69	295	49,953,656	4,162,805	12·	12,488,412	1,873,261	16	0
1869–70	296	51,697,733	4,307,645	12·	18,786,062	2,067,909	6	0
1870–71	304	61,012,912	5,257,734	11·6	16,270,110	2,440,516	10	0
1871–72	311	45,018,363	3,728,838	12·08	12,004,897	1,800,734	11	0
1872–73	324	63,631,015	5,251,021	12·11	10,968,271	1,645,240	13	0
1873–74	337	70,575,077	5,820,813	12·12	18,820,074	2,823,011	2	0
1874–75	...	...	...	...	1,,704,640	2,205,396	0	0

Production, Importation, Export, and Consumption per head of Raw Sugar in Germany.

Calendar Year.	Production of Raw Sugar.	Importation of Raw Sugar.	Export of Raw Sugar.	Sugar Consumption per head of population.
	Cwts.	Cwts.	Cwts.	Lbs.
1841	303,016	1,016,490	59,281	4·64
1842	225,137	1,147,577	49,064	4·75
1843	197,289	1,263,691	42,419	5·03
1844	296,728	1,347,469	55,905	5·57
1845	296,724	1,413,836	97,785	5·60
1846	331,011	1,361,927	200,370	5·13
1847	446,878	1,414,210	140,169	5·84
1848	665,853	1,287,797	178,963	6·00
1849	814,592	1,214,416	245,820	6·01
1850	931,267	1,074,730	195,697	6·01
1851	1,202,871	784,297	185,821	6·00
1852	1,586,139	811,832	156,304	7·42
1853	1,565,429	779,831	220,323	6·97
1854	1,507,647	773,971	220,203	6·31
1855	1,588,210	934,052	190,895	7·10
1856	1,807,974	713,699	204,423	7·02
1857	2,342,123	358,010	161,474	7·65
1858	2,596,693	549,820	80,590	9·16
1859	3,050,953	250,530	87,282	9·58
1860	2,790,362	107,739	77,257	8·32
1861	2,574,887	168,479	50,966	7·85
1862	2,553,826	506,452	74,830	8·61
1863	2,863,163	468,592	172,859	9·01
1864	3,193,123	288,269	158,776	9·37
1865	3,683,744	284,554	130,292	10·69
1866	3,940,518	129,425	859,504	9·00
1867	3,925,944	92,957	733,000	9·02
1868	3,479,833	217,132	234,126	9·39
1869	4,123,567	59,307	509,699	9·59
1870	4,135,154	85,524	463,865	9·88
Campaign.				
1871–72	3,728,363	995,106	288,086	10·9
1872–73	5,251,021	548,827	369,443	13·3
1873–74	5,820,813	594,203	456,932	14·7
1874–75	...	...	...	13·4

TAX and BONUS on BEET-ROOT SUGAR.

Year.	Beet-root Sugar Tax.				Customs Revenue for Sugar and Syrups.				Bonus on Export of Beet-root Sugar.			
	Thalers.	£	s.	d.	Thalers.	£	s.	d.	Thalers.	£	s.	d.
1841	70,433	10,564	11	0	5,381,198	807,179	14	0	208,336	31,250	8	0
1842	60,805	9,134	5	0	5,864,506	879,689	8	0	145,225	21,783	15	0
1843	49,915	7,487	5	0	6,357,402	953,610	6	0	101,895	15,284	5	0
1844	160,532	24,079	16	0	6,748,109	1,012,216	7	0	173,006	25,950	18	0
1845	219,725	32,958	15	0	7,080,689	1,062,103	7	0	457,684	68,652	12	0
1846	233,440	35,016	0	0	6,813,404	1,022,010	12	0	851,062	127,659	6	0
1847	316,243	47,436	9	0	7,074,477	1,061,171	11	0	750,814	112,622	2	0
1848	464,271	69,640	13	0	6,441,770	966,265	10	0	852,931	127,939	13	0
1849	556,062	83,409	6	0	6,074,022	911,103	6	0	1,135,505	170,325	15	0
1850	1,039,913	155,986	19	0	5,278,349	791,752	7	0	1,108,831	166,324	13	0
1851	1,705,141	255,271	3	0	3,935,402	590,316	6	0	779,360	116,904	0	0
1852	2,128,457	319,268	11	0	4,104,987	615,748	1	0	668,768	100,315	4	0
1853	3,206,513	480,976	19	0	3,914,512	587,176	16	0	934,601	140,190	3	0
1854	3,745,863	561,879	9	0	3,933,293	589,989	9	0	648,558	97,283	14	0
1855	3,934,924	590,238	12	0	4,743,150	711,472	10	0	656,810	98,521	10	0
1856	4,684,236	702,635	8	0	3,610,370	541,555	10	0	899,174	134,876	2	0
1857	5,869,915	880,487	5	0	1,827,051	274,057	13	0	466,195	69,929	5	0
1858	7,416,682	1,112,502	6	0	2,803,471	420,520	13	0	330,099	49,514	17	0
1859	9,305,895	1,395,884	5	0	1,314,045	197,106	15	0	402,407	60,361	1	0
1860	8,157,801	1,223,670	3	0	625,649	93,847	7	0	183,600	27,540	0	0
1861	7,869,970	1,180,495	10	0	862,001	129,300	3	0	149,794	22,469	2	0
1862	8,044,899	1,206,734	17	0	2,250,419	337,562	17	0	208,771	31,315	13	0
1863	9,475,949	1,421,392	7	0	2,080,107	312,016	1	0	302,930	45,439	10	0
1864	10,053,023	1,507,953	9	0	1,311,435	196,715	5	0	384,291	57,643	13	0
1865	11,027,937	1,654,190	11	0	1,306,466	195,969	18	0	394,514	59,177	2	0
1866	12,053,132	1,807,969	16	0	635,513	95,326	19	0	2,296,936	344,540	8	0
1867	12,193,880	1,829,082	0	0	487,912	73,486	16	0	2,259,721	338,958	3	0
1868	10,874,442	1,631,166	6	0	1,268,645	190,296	15	0	238,714	35,807	2	0
1869	13,446,331	2,016,949	13	0	552,370	82,855	10	0	1,312,156	196,813	8	0
1870	13,783,849	2,067,577	7	0	610,029	91,504	7	0	1,233,505	185,025	15	0
1871–72	12,004,897	1,800,734	11	0	4,166,075	624,911	5	0	1,291,972	193,795	16	0
1872–73	16,968,271	2,545,240	13	0	2,375,823	356,373	9	0	1,067,050	160,057	10	0
1873–74	18,820,074	2,823,011	2	0	2,592,992	388,948	16	0	1,198,523	179,778	9	0
1874–75	14,702,640	2,205,396	0	0	...	...			547,262	82,089	6	0

ABSTRACT made from the STATISTICS issued by the GERMAN EMPIRE, from the 1st September, 1874, to 31st August, 1875, on the Production of Beet-root Sugar.

IN the principal beet-root districts of Central Germany, the harvest in the autumn of 1874 was in quantity below the average. The planting of beet in spring of the said year, aided by the moist temperature of the months of April and May, gave most favourable expectations, but the sudden cold and stormy atmosphere in the latter part of May and beginning of June considerably injured the growth of the young plants, and the immediately following tropical heat, with scarcity of rain, caused the harvest to be very indifferent. The best results were obtained in the low swampy lands, whilst the soil of a rich heavy nature, with percolating substrata, ordinarily best adapted for the growth of beet, gave the most unsatisfactory crops, so that the average of the harvest was calculated to be about 25 per cent. less than it had been in the preceding years.

The number of manufactories for the converting beet-root into sugar is 333, with 2,230 steam-engines of 22,699 horse-power.

There have been used for manufacture 2,756,746 tons of beet-root: 1,908,095 tons were grown on farms belonging to the factories, and the additional quantity of 848,651 tons was purchased from other farms.

The cost of producing 1 cwt. of raw sugar, and other substances gained thereby, including duty, &c., is from 30. to 33s., using about 10¾ cwts. of beet-root for that purpose.

Total amount of sugar produced is 256,441 tons, paying a revenue of £2,205,396 for the year 1874–75. The financial importance to the State of the growth of beet-root and the production of sugar therefrom will be better illustrated by the following duties paid to the Government:—

	£	s.	d.
1871–72	1,800,634	11	0
1872–73	2,545,240	13	0
1873–74	2,823,011	2	0
1874–75	2,205,396	0	0

From the report at hand up to date, it is reasonable to suppose that the manufacture of beet into sugar in 1876 will not amount to less than four million tons, and the total revenue might be confidently estimated as £3,187,500 showing an increase of £364,489 sterling on the previous year.

Report by Mr. Nicolson on the Sugar Industry in Germany.

Mr. Nicolson to Lord Odo Russell.

My Lord,— Berlin, 19th February, 1876.

In obedience to your Excellency's instructions, I have the honor to lay before you the following report on the sugar industry in Germany. I have divided the subject under two heads:—1. An historical and general survey of the sugar industry, showing the different duties levied on the importation of foreign sugar, and the system of levying the excise on home-manufactured beet-root sugar; and I have endeavoured to bring into relief the advantages which the beet-root sugar enjoys over its foreign rival. 2. Statistics respecting the taxation and production of the beet-root sugar, and the importation and the exportation of all kinds of sugar.

1. *Historical and General Survey.*

Till towards the end of the seventeenth century sugar in Germany was so dear that the middle and poorer classes consumed honey in place of colonial sugar. It was in 1749 that the first sugar refinery of colonial sugar was established in Germany at Berlin by Spillberger, a merchant of that town. Marggraf, an apothecary of Berlin, discovered at about the same time that the beet-root contained a quantity of sugar, but his discovery was then ignored, and it appears that he never sufficiently prosecuted his investigations so as to be able to find a process of extracting the sugar from the beet. It was not until fifty years later that Professor Achard, of Huguenot extraction and a chemist at Berlin, commenced to take the matter up seriously. He cultivated several kinds of beet, and found that the Silesian beet contained the largest quantity of saccharine matter, and he was able to extract therefrom crystallized sugar. In 1796 he was successful in obtaining the countenance and support of King Frederick William II. in establishing a beet-root sugar manufactory on his estate in Lower Silesia. As beet-roots were not subject to any tax whatsoever, the undertaking, thus highly protected, proved a great financial success. He was, naturally, not long without imitators, and beet-root sugar manufactories sprang up not only in Lower Silesia, but also in Bavaria, and especially at Augsburg. When Napoleon I. invaded Germany he saw the value of this new discovery, and it was owing to his encouragement and influence that the beet-root sugar manufacture was introduced into France. The Continental wars almost entirely destroyed the new industry in Germany, and it was not till the fourth decade of the present century that it began to revive and show signs of vigour. Up to 1836 the demand for sugar in Germany was chiefly supplied from the importation of colonial sugar, which was imported, as a rule, in its raw state, and then refined by the home refiners. In 1835 there were seventy-four refineries in Prussia, and twelve in the other States composing the Customs Union. Colonial sugar at present is used almost only by confectioners and distilleries, who require a purer and finer article, while the general public is satisfied with the beet-root sugar,

The beet-root sugar industry commenced to concentrate itself round Magdeburg and Halle, where the soil was found to be the most suitable for the cultivation of the root. It was now that the Government began to occupy themselves with the matter. It was found that the rapid rise and extension of this non-taxpaying branch of industry, and the consequent diminution in the importation of duty-paying colonial sugar, were seriously affecting the States' revenues. The necessity of levying, then, some kind of tax on the new industry was apparent. But the Prussian Government, unwilling to check an infant industry, were averse to tax it on the same scale as imported colonial sugar, and on March 21, 1840, the following Order was published, to come into force on September 1 of the same year:—

"Raw sugar extracted from beet-root will be taxed at the rate of $\frac{1}{6}$ thaler (6d.) for every centner, which tax is to be raised from the beet intended for sugar manufacture. The raw beet-root will, therefore, be taxed at the rate of $\frac{1}{4}$ silver groschen for every centner."

It is evident, from this Order, that 20 centners of raw beet-root were calculated to produce 1 centner of raw sugar.

In the next year it was found desirable to raise the tax on the raw beet to $\frac{1}{2}$ sgr. per centner, as not 20 centners, but 18 centners at the utmost were found necessary for obtaining 1 centner of raw sugar.

In the year 1843–44, there were in the Customs Union 105 manufactories, extracting 286,162 centners of raw sugar, from 4,349,667 centners of raw beet-root. The importation of foreign sugar during this year was 1,345,600 centners; and as the population of the Customs Union numbered near 28,000,000, the consumption of sugar per head averaged 5·25 lbs. The tax was raised at different periods, till it reached, in 1858, $7\frac{1}{2}$ sgr. per centner; but the manufacture of beet-root sugar was increasing in still greater proportions: in the year 1864–65, there were in the Customs Union 270 beet-root sugar manufactories, extracting 3,413,214 centners of raw sugar from 41,641,204 centners of beet-root. The importation of foreign sugar had fallen to 254,016 centners; and as the population in this year was somewhat over 34,000,000, the consumption of sugar per head amounted to 9·29 lbs., or about double of what it had been twenty years previously. It was found, too, that about 12 centners of beet-root were sufficient to produce 1 centner of raw sugar.

On 26th June, 1869, a law respecting the duties, &c., on sugar, was issued. The following are its principal points:—

From September, 1869, the Excise on home beet-root sugar will be 8 sgr. (little more than 9d.) per centner, to be raised on the red beet intended for sugar production. From September 1, 1869, the duty per centner on foreign sugar and syrup will be,—1. On sugar, refined sugar of every description, as also raw sugar, if it answers to the Dutch standard No. 19, and to the patterns which are laid down with respect to this standard, 5 thalers (15s.). 2. On raw sugar, which does not come under the above category, 4 thalers (12s.). 3. On syrup, 2 th. 15 sgr. (7s. 6d.). Liquefied sugar, which is recognized as such at the "Revision," comes under No. 2 category. 4. Molasses are admitted free when intended for the manufacture of brandy.

On every centner gross weight an allowance is made for packages as follows:—On the entry of bread sugar, loaf sugar, candied, lump sugar, 14 lbs. in casks with staves of oak or other hard wood,

10 lbs. in other casks, 13 lbs. in chests, 7 lbs. in baskets. On entry of raw sugar and powdered sugar and pounded sugar, 13 lbs. in casks with staves of oak or other hard wood, 10 lbs. in other casks, 13 lbs. in chests, 8 lbs. in reed baskets made out of Europe (Kanassers Krajans), 7 lbs. in other baskets, 4 lbs. in bales. On entry of syrup, 11 lbs. in casks.

On the export of home sugar or of foreign sugar over the Customs Union Territory, if the reported quantity amounts to at least 10 centners, a compensation is allowed on every centner, and for raw sugar of at least 88 per cent. polarization, 3 th. 4 sgr. (9s. 4d.). 2. For candied, and for sugar in white full hard wares up to 25 lbs. gross weight, or if triturated in presence of the Custom House officers, 3 th. 25 sgr. (11s. 6d.); for all other hard sugar, and for all dry white sugar (not containing more than 1 per cent. of water) in crystallized, crumby, or powdered form, of at least 98 per cent. polarization, 3 th. 18 sgr. (10s. 8d.).

The polarization test has, of late, not been so highly considered as it formerly was. Doubts have been thrown on its efficacy and accuracy. Dr. Scheibler has discovered a simple test to show the saccharine quality, viz. by dissolving the article in spirit, when the pure sugar is dissolved and the foreign matter remains as a residue.

By this law the protection which the home refineries of colonial sugar enjoyed was entirely done away with. Till this law was issued refined sugar imported from abroad paid 7 th. 10 sgr. per centner (22s.) duty, and colonial raw sugar, which came into immediate use, 6 thalers (18s.) duty, while the home refineries of colonial sugar had paid, according to the law of 1858, 4 th. 7½ sgr. (12s. 8d.). It will be seen that the new law reduced the duty on refined sugar to 15s., and placed the home refined sugar on the same footing. From 1740, the home refineries had enjoyed a large amount of protection: at first, owing to the importation of refined colonial sugar being prohibited, and, when this latter article was at length admitted, owing to the great differences in the duty which the two articles paid. The abolition of the protection came, however, too late, as the beet-root sugar was in almost entire possession of the market.

With regard to beet-root sugar, the new law raised the tax from 7½ to 8 sgr., and the export bonus on raw sugar from 2¾ to 3 th. 4 sgr., or 9 marks 40 pf. This increase of the bonus stands, however, in no proper proportion to the unimportant increase of the tax. Rightly calculated, the bonus should only have been raised to 2 th. 28⅔ sgr., or 8 marks 86 pf. As the process of extracting the sugar from the beet-root will, as time goes on, improve, this increase of the bonus will be transformed into a fixed and settled premium on export.

It is still an open question among sugar manufacturers and others in Germany, whether the abolition of all taxes and duties on both colonial and beet-root sugar, or the equalization of these taxes and duties, would or would not act disadvantageously on the beet-root industry. The opinion of those who take the former view seems to be founded on the following reasons:—

The saccharine matter, in the first place, contained in the beet-root amounts to about 16 per cent., while, at the lowest calculation, the cane contains 18 per cent. Then, again, there is a far greater difference in the harvests and in the quality of the beet-root itself than is to be met with in the cane. The sphere in which the beet-root can be cultivated is limited, and its cultivation is destructive to the soil. The process, too, by which the sugar is extracted from the beet-root is far more complicated and difficult than is the case with the sugar-cane. The great object of the manufacturers is, of course, to cultivate the beet-roots containing the greatest quantity of saccharine matter; and to do this they are obliged to look out for soil in which there is much potassic salt (kali salz). To obtain this a manure of guano and potassic salt is required. The potassic salt, however, prevents the manufacturers from obtaining, after refining, the syrup which is produced after the cane-sugar has been refined. They meet with a kind of molasses which, owing to its ingredient of potassic salt, is unpalatable, and is chiefly used in the preparation of brandy. The beet-root sugar cannot well be eaten, owing to the potassic salt, without a previous refining. One cause which has acted against the equalization of the duties on colonial sugar and the excise on beet-root sugar, as is the case in Holland, lies in the fact that Germany possesses no sugar-producing colonies.

As the law at present stands the beet-root sugar is still protected, notwithstanding the increase of the tax on beet-root from 7½ to 8 sgr. Taking the calculations which are laid down in the "motive" to the law, and agreeing that it requires 12½ centners of beet-root to produce 1 centner of raw sugar, the excise on a centner of raw beet-root sugars amounts then to 3 th. 10 sgr. = 10 marks; while the duty paid on raw colonial sugar = 12 marks. So here the beet-root sugar has an advantage of 2 marks per centner over the colonial sugar. This difference of 2 marks is, however, not called a protective, but a countervailing duty, as the difference between the excise on brandy in England and the duty on foreign brandy is considered. It would, however, be more correct to say that a centner of raw beet-root sugar can be extracted from less than 12½ centners of beet-root (about 11 centners at present, or even less), and the advantage gained by the beet-root sugar is, of course, then more striking.

For instance, the export bonus is, by the latest law laid down, as follows:—

	Per centner. Mks. pf.
For candy sugar, loaf sugar, and refined sugar, powdered under official supervision	11 50
For crystallized sugar, powdered crystallized sugar, and for powdered crystallized sugar of at least 98 per cent. polarization	10 80
For raw sugar of at least 88 per cent. polarization	9 40

This bonus remains, of course, the same whether the year has been rich or not in beet-roots containing large quantities of saccharine matter. The best German beet-roots have been found to contain 16 per cent. saccharine matter; and it is, therefore, quite possible that a producer may receive more bonus than he paid excise, and thus gain a premium. But to take such data as are given by the law of 1869, it appears that it is here assumed that 12½ centners of beet-root produce 1 centner of raw sugar. Now, notwithstanding the secrecy preserved by the Magdeburg manufacturers, it may safely

be accepted as a fact that 11 centners of beet-root are sufficient to produce 1 centner of raw sugar. According to law, an export bonus would be granted at the rate of 9 marks 40 pf. per centner; and, as only in this case 8 marks 80 pf. excise would be levied, it is evident that there is here a premium of 60 pf. the centner.* By the latest statisics, it appears that only $10\frac{3}{4}$ centners of beet-root are necessary for the production of 1 centner of raw sugar. It is therefore confessed that a premium of 80 pf. is now granted for the exportation of home-grown sugar. But it must be borne in mind that the Inland Revenue expenditure is less by a few per cent. than the expenditure on the Customs—*i.e.*, it costs less money to keep Excise officers than Custom-house officers.

If it ever happens, and this seems scarcely possible, owing to the great expense and trouble which would be entailed, that the full 16 per cent. of sugar can be extracted from the beet-root, then the beet-root sugar would only pay 5 marks per centner excise; and, as the export bonus is 9 marks 40 pf., there would in this case be a premium of 4 marks 40 pf.

It may here be of interest to explain the system of levying the excise on beet-root in Germany. The manufacturers must wash and dry the beet-root, and cut off that part of the plant (generally the head) which contains the least saccharine matter, before submitting it to the Excise officials. The beet-roots are then placed in baskets containing 250 kilog. before being weighed. After the beet-root has been weighed it is returned to the manufacturer, who can do what he likes with it. The officials are, as a rule, honest men, incapable of being bribed. Once inside the manufactory the Excise officials have nothing to do with the beet-root, but no beet-root can be brought into the manufactory without first having been weighed and taxed. The beet-root is not taxed according to the quantity of juice it contains, because it has been found in Germany that the plant always contains the same relative proportions of juice and fibrous hard matter—viz., 4 per cent. hard matter and 96 per cent. juice. It is, therefore, considered that the present mode of levying the tax is the easiest and surest. As regards the amount of juice which can be extracted from the plant, the general opinion among experts at Berlin is that, with the assistance of hydraulic presses and the damping process, juice in the proportion of about 90 per cent. to the weight can be extracted. But this is under the most favourable conditions, and, as the beet-root manufacturers are extremely reserved with regard to the results of their manufactures, it is almost impossible to arrive at any satisfactory calculations. It may, however, be remarked that in South Germany, where the beet-root contains less saccharine matter, and where the properties on which the root is cultivated are more subdivided, and the industry, therefore, less concentrated than in the Province of Saxony, the manufacturers are continually complaining of the present system of taxing the article. With respect to the quantity of saccharine matter which is contained in the juice, this depends on the quality of the beet-root, on the nature of the soil on which it was cultivated, and on the quality of the manure which was employed. It has been noticed that beet-root grown in the same field, and cultivated with the same manure, produces one year more saccharine matter and another year less. The industry is, therefore, an uncertain one.

If it is intended to equalize the duties on colonial sugar and the excise on beet-root sugar, it is considered by competent persons that this should be effected not so much by raising the excise as by gradually lowering the duty. The greater cheapness of sugar will then naturally increase the demand, and the benefits thus derived would prevent a recurrence to the system of protective duties. The simplest plan would be, perhaps, to abolish the duties and excise altogether, and place the sugar industry on the same footing as in England. The yearly consumption of sugar per head in Germany amounts to about 13 lbs., while in England it is about 60 lbs. The great consumption of brown sugar which exists in England is unknown in Germany, as brown sugar cannot be made of beet-root, and the comparatively high duty prevents the colonial article from being imported. Some people, and especially the free-traders, think that the beet-root industry cannot be kept permanently in its present highly successful position. It can only be brought artificially into life, and *à fortiori* kept artificially in existence. Its cultivation does not occupy a very large extent of country, and is confined chiefly to the triangle formed by Magdeburg, Halle, and Brunswick. It exhausts the best of soils, even that of the Saxon Province, where the black loam is over two feet deep. The dried and pressed root is, moreover, of little use, and, though attempts have been and are being made to feed cattle with it, the results have been anything but satisfactory.

2. *Statistics.*

In the year 1874–75 the production of beet-root was less than it had been in the previous year owing to the cold and stormy weather in the early summer. In the Saxon Province, for instance, 557 centners were produced per hectare in 1873–74, while in 1874–75 only 379; in the Duchy of Anhalt 553 centners in the year 1873–74; in 1874–75 only 332 centners. These were the two districts which showed the greatest difference.

In the whole Customs Territory there were 15,440,375 centners less beet-root cultivated in 1874–75 than was the case in 1873–74. In the Province of Saxony, Anhalt, Brunswick, and Hanover—the most important districts—the sugar is manufactured chiefly from beet-root grown in those districts; but in South Germany, Lower Rhine, Silesia, and Pomerania more beet is bought than grown.

But though the quantity of beet-root in the year 1874–75 was about 22 per cent. behind what it had been in the previous year, it was of a particularly good quality as regards the amount of saccharine matter which it contained; for, while the quantity of beet-root during the years 1873–74 and 1874–75 was respectively 70,575,277 centners and 55,134,902 centners, the total amount of sugar produced from this was 5,820,813 centners and 5,128,247 centners in the two years respectively, or scarcely 12 per cent. difference. This is no doubt owing in a great measure to the improvement in the process of extracting the juice. The following table will show the proportion during the four years 1871–75 in which the different processes were employed in the several manufactories:—

* An allowance should doubtless be made for waste, &c.; but owing to the reserve maintained by the manufacturers, it is impossible to calculate what this allowance should be.

Years.	Number of Manufactories.	Juice was extracted by							
		Pressing.		Macerating.		Grinding.		Diffusion.	
			Per ct.		Per ct.		Per ct.		Per ct.
1871–72	311	216	= 69·5	25	= 8·	18	= 5·8	52	= 16·7
1872–73	324	220	67·9	26	8·	15	4·6	63	19·5
1873–74	337	214	63·5	31	9·2	12	3·6	80	23·7
1874–75	335	181	54·3	30	9·	9	2·7	113	34·

There is a marked increase in the "diffusion" process. The advantages of this process are the saving of labour, and the greater quantity of beet-root which can be worked up at the same time; but a deficient supply of water prevents the process being introduced in some cases.

The total amount of sugar consumed in the German Customs Territory for the years 1874–75 was 5,457,927 centners. According to the census taken in 1871, this would amount to 13·42 lbs. per head. In the former year 5,958,084 centners of sugar were consumed, or about 14·65 lbs. per head. In the years 1861–66 there was an average consumption of sugar of 9·11 lbs. per head, and in 1866–70 an average consumption of 9·38 lbs.; so that within ten years the consumption of sugar in Germany has increased about 40 per cent.

	Marks.	£	s.	d.
The production here of beet-root sugar for the year 1874–75 gave a gross revenue of	44,107,920	= 2,205,396	0	0
In the year 1873–74 it yielded	54,460,222	2,723,011	2	0
„ 1872–73 „	50,904,813	2,545,240	13	0
„ 1871–72 „	36,012,691	1,800,634	11	0

There was, therefore, a diminution in the revenue for the year 1874–75 of 12,352,302 marks (£617,615 2s.), or 21·9 per cent. with respect to that of the previous year. After deducting the export bonifications, there remains a net revenue of 42,466,134 marks (£2,123,306 14s). Four per cent. of the gross revenue must also be deducted for administration expenses.

If to the net revenue we add the duties on the importation of foreign sugar, viz. 7,217,593 marks (£360,379 13s.), we have a grand total of 49,683,727 marks (£2,484,186 7s.), or a contribution of 1·22 marks from each individual in the Customs Territory.

	Marks.
In the year 1873–64 this contribution was	1·49
„ 1872–73 „	1·34
„ 1871–72 „	1·09

Every centner of raw sugar, both imported and of home manufacture, may be said to have paid a tax of 10s. As far as can be seen, it is calculated that for the year 1875–76 there will be about 80,000,000 centners of beet-root taxed, yielding a gross revenue of 63,750,000 marks (£3,187,500), an increase of about 19,500,000 marks (£975,000) over the previous year.

The following table gives details of the production and taxation of the home beet-root sugar for the year 1874–75:—

Places.	Beet-root.	Tax.	Produced—		
			Raw Sugar.	Loaf Sugar Juice.	Molasses.
	Centners.	Marks.	Centners.	Centners.	Centners.
Prussia	41,493,362	33,194,688	3,367,786	388,099	1,451,418
Bavaria	279,570	223,656	20,559	2,691	8,985
Wurtemberg	1,569,018	1,255,215	120,873	16,800	62,554
Baden	671,150	536,920	60,440	...	24,096
Mecklenburg	126,090	100,872	10,365	...	3,883
Thuringen	773,683	618,946	75,155	40	28,545
Brunswick	5,660,359	4,528,287	527,100	9,919	205,121
Anhalt	4,300,710	3,460,568	367,676	26,965	158,217
Luxemburg...	260,960	208,768	31,224	6,771	9,237
Total	55,134,902	44,107,920	4,564,140	451,285	1,925,056

TABLE showing the IMPORT and EXPORT of SUGAR, and the Duties levied thereon.

IMPORT.							EXPORT.				
							With Export Bonification.				
Refined Sugar, at 15s. Duty.	Raw Sugar, at 12s. Duty.	Syrup, at 7s. 6d. Duty.	Molasses (for Brandy, free).	Duty levied from Sept. 1 to Dec. 31, 1874.	Duty levied from Jan. 31 to Aug. 31, 1875.	Total.	Candied Sugar, at 11s. 6d.	Hard Sugar, at 10s. 8d.	Raw Sugar, at 9s. 4d.	Without Export Bonification.	Molasses.
Centners.	Centners.	Centners.	Centners.	Marks.	Marks.	Marks.	Centners.	Centners.	Centners.	Centners.	Centners.
282,019	178,266	113,174	100,670	2,651,305	4,566,288	7,217,593	78,903	30,718	57,676	33,061	159,657

The different places to which this export took place are given, but though a considerable quantity went to Hamburg, Bremen, and the North Sea Provinces, it does not appear if from there it was shipped to England; and it must also be borne in mind that some of this export is merely a transport of Austrian beet-root sugar. In any case the exportation is not very considerable. From January 1 to August 31, 1875, 1,130,788 marks (£56,539 8s.) were paid in export premiums, a considerable diminution from the previous year.

I shall not fail to acquaint your Excellency with any further information I may obtain on the German sugar industry; but though there is extreme difficulty in thoroughly examining the question,—owing, as I have stated before, to the strict secrecy maintained by the manufacturers,—the authorities whom I have consulted are unable to add at present to what I have now the honour of submitting.

I have, &c.,

Lord Odo Russell. A. NICOLSON.

AUSTRIA.

NOTE.—Florin or gulden of 100 neu-kreutzer = about 2s.
The legal standard of the Empire is silver, but practically the chief medium of exchange is a paper currency, convertible only at a large discount into gold and silver.
Centner = 100 pfund = 123½ lbs. avoirdupois.

REPORT by Mr. J. P. HARRISS-GASTRELL on the BEET-ROOT SUGAR INDUSTRY of AUSTRIA.

As a report upon the beet-root sugar of Austria, with a view to show its bearings upon British interests, is required, it will be desirable, so far as the existing published data will admit, to inquire into the position of the home industry itself, its share in international trade, and then to group together any remarks which such inquiries may suggest as to its bearings, directly or indirectly, upon British trade, and the corresponding British industries.

(A.)—*The Position of the Industry itself.*

(*a.*) *The Excise System.*—The so-called tax on consumption in Austria is levied, with a few minor deviations, on a regular system throughout the Austrian-Hungarian territories. The larger towns, for instance, levy under the excise system rather a higher rate, for municipal or other reasons. But, as the sugar factories seem to be mainly outside of such towns, or in the open country, as in North Germany, such a deviation in the rate of taxation does not materially affect the industry.

Owing mainly, it is said, to the financial crisis of three years ago, and the general depression of all industry, the Excise produced, in 1874, nearly £650,000 less than in 1873; and of this amount more than one-half represented a diminution in the returns from the excise on sugar. These returns, which, in 1850, amounted to only 153,377 florins, were,—

	Fl.
In 1860–61	5,707,829
1870–71	13,556,039
1871–72	11,783,409
1872–73	14,931,330
1873–74	11,825,797

The tax is levied upon the beet-root by the unit of 100 Vienna pounds; and for this purpose both the freshly-grown and dry roots are returned at certain times for taxation, and eventually the tax is paid on the quantity actually manufactured into sugar. The difference between the two quantities is sometimes large, and is mainly owing to interruptions or failures in the industry, for which reasons unmanufactured roots are written off before levying the tax.

This excise on raw material is calculated to amount to an average of 4·55 kreutzers, Austrian currency, for raw sugars, and of 5·59 kreutzers for refined sugars, per Zollcentner net. It is this amount which is returned as drawback to the manufacturer on all sugars exported, in order to place him on an equal footing abroad with his competitors. This drawback would now be in sterling about 8s. or 9s. 10d. respectively per 120 lbs. sugar. The drawback granted in 1874, amounted to nearly 7,600,000 florins, or £690,000 sterling.

(*b.*) *Statistics of the Industry.*—The beet-root sugar has been developed within the last quarter of a century, and especially since 1860. Thus:—

—	Number of Factories.	Centners of Roots returned for Excise.
In 1830–31	100	4,905,677
1860–61	125	14,317,890
1870–71	215	33,057,457
1871–72	251	28,732,365
1872–73	256	36,444,046
1873–74	244	28,878,625

In 1873–74 only about 25,600,000 centners were eventually taxed.

The appended table gives the chief data at hand in connection with the industry, and is based upon the "Returns of the Consumption Tax," presented to the Reichsrath, with a copy of which I have been favoured:—

	Raw Materials.					Labourers.				Amount of Taxation for the Manufacturing Year.	
	Roots.		Syrup.			Men.		Women.			
	According to Return.	According to Taxation.	Average Price of a Centner of Fresh Roots.	Raw Sugar Bought.*	Wiener Centner.	Number.	Daily Wages per Head.	Number.	Daily Wages per Head.	According to Returns.	Tax really levied, after all allowance to Failure of Factories.
	Vienna Centner.	Vienna Centner.	Krs.	No. of Centner.			Krs.		Krs.	Fl.	Fl.
Lower Austria	473,612	412,522	83	45,000	...	918	70 to 140	489	50 to 80	193,944	168,928
Bohemia ...	18,367,624	15,690,040	54 to 135	187,555	...	25,957	40 „ 195	12,368	20 „ 120	7,521,542	6,425,071
Moravia ...	6,171,848	5,259,664	60 „ 120	103,863	30,115	7,638	40 „ 280	6,245	20 „ 90	2,527,290	2,153,832
Silesia ...	1,307,771	1,109,086	75 „ 100	...	...	1,567	50 „ 120	960	36 „ 80	535,532	454,171
Galicia ...	453,015	367,753	75 „ 95	...	...	1,630	40 „ 100	1,030	20 „ 42	185,510	150,595
Total ...	26,773,670	22,839,065	54 to 135	336,418	30,115	37,710	40 to 1·95	21,092	20 to 120	10,963,818	9,352,579
Hungary ...	2,104,955	1,757,147	45 „ 90	...	...	4,072	37 „ 200	2,608	40 „ 90	861,979	719,552
Grand total	28,878,625	24,596,212	45 to 135	336,418	30,115	41,072	37 to 200	23,700	20 to 120	11,825,797	10,072,149

I regret that it is not within my power to attempt to deduce from the statistics arranged in that table the actual position of the sugar industry in Austria, but I hope they will be sufficient to enable experts to draw satisfactory inferences.

It will, however, be noticed that the price of beet-roots varied from 45 to 135 kr. per centner, that coal varied from 21 to 100 kr. per centner, and wages varied for men from 40 to 200, and women from 20 to 120 kr. per day. But, as in none of these cases are the necessary additional particulars given, it is impossible to calculate the proportion of the cost of wages and raw material included in the cost of manufacturing. I understand that the average selling price of beet-root sugars is at the factories about—

Fl. kr.	Fl.					
27 60	... ...	per 100 kilog.	for 93	per cent.	crystallized;
27 80 to 90	... ...	„	„ 96	„	moist sugar;
28 60 „ 70	... ...	„	„ 88	„	"rendement;"

all free at Colin, Bohemia, the drawback being repayable to the seller.

(B.) *Foreign Trade.*

(*a.*) *Duties on Sugar.*—The following table shows the existing and proposed import duties on sugar:—

Tariff Position.	Description.	Government Proposal.	Present Duties.	Vienna Proposal.	Brünn Proposal.
		Fl. kr.	Fl. kr. Fl. kr.	Fl. kr.	
6	Sugar—				
	a. To No. 16 and Grape ...	6 00	9 45 to 6 30	To No. 19 ... 6 00	Same as Vienna proposal.
	b. No. 16 to 20	7 50	9 45 „ 6 30	From No. 19 . 8 00	Ditto.
	c. From No. 20	10 00	13 15 „ 9 45		Fl. kr.
	d. Molasses	3 00	6 30 „ 3 15	... ...	*d.* Molasses ... 2 00

* Raw sugar bought as primary material by refiners.

As regards the duties suggested by the Chamber of Commerce, they were based upon opinions which are herewith reproduced.

The Prague Chamber restricted its comment to molasses, mainly as the primary material for the distillation of spirit. The law of 1868 places upon the molasses spirit an excise duty of 33 per cent. more than that on spirit from other primary materials as potatoes, corn, &c. Hence the distilleries cannot offer as high a price for molasses as the foreigner can, who does not appear in any country to suffer from such a differential duty, and consequently an export for molasses has since 1869 been developed, as the following statistics for the frontier into South Germany, Saxony, and Prussia show:—

	Price of Molasses at Factory, in buyer's casks.	Price of Molasses Spirit per Degree.	Export.
	Fl. kr.	Kr.	Centners.
1867	...	...	...
1868	2 71	51	11·34
1869	2 14	45	65·626
1870	2 6	47	207·245
1871	1 97	49	190·639
1872	2 70	55	119·401
1873	3 2	54	·16
1874	2 98	51	...

Whenever therefore the price of molasses and the produced spirit fell, export of molasses took place. The quantity exported averaged one-half of the total production of molasses. In the beginning of 1875 the price of molasses spirit fell to 39 kr. per degree, at which price the distiller could only give at the most 1·90 fl. for molasses. A fear that exporting would raise the prices, led to a demand for an an export duty on molasses of one florin per centner. In further support of this claim, the fact was stated that out of distillers' wash potash was made, and the anomaly was mentioned that the import duty of 3·15 kr. on molasses (sugar, syrup, Position 7 *d*) prevented any import from abroad, whereas the export to the foreigner was free.

The sugar manufacturer and the exporter of molasses declared against this export duty, for, being equal to 33 to 50 per cent. *ad valorem*, it would have been a prohibition of export. But the potato distiller, being favoured by a lesser excise of 33 per cent., had not so much reason to oppose the molasses distiller, for a lowering of the price of molasses spirit would not have affected him, inasmuch as the price of spirit is not determined by the molasses distilleries but by the Galician potato distilleries, and still more by the more profitable Indian-corn distilleries of Hungary. The evil is in the irrational system of taxing molasses spirit: if this be removed, there is no need of an export duty. If, however, this did not succeed, the Chamber would recommend an export duty of 30 kr., which would be about 10 per cent. *ad valorem*, and would represent the usual difference in prices between molasses over the frontier and within Austria. And the Chamber considers that this would not be injurious to the sugar manufacturer, for it would not hinder export whenever the demand for distillation was not good enough.

The Troppau Chamber recites similar reasons for an export duty on molasses, and also mentions that, when exported, on the one hand the State loses 1·40 kr. per centner of excise, *i.e.* 14 kr. per degree of the ten of spirit produced in a home distillery, and on the other hand agriculture loses a valuable manure, as well as industry its potash. But the Silesian manufacturers, who generally make beet-root sugar, distil molasses spirits, and grow on large estates their roots, and who are therefore impartial and competent to judge, oppose any export duty, for if all molasses were distilled into spirits in home distilleries it could do great harm to the general industry. Moreover, the agricultural use of molasses is practically very small, and in Silesia the molasses distilleries do not suffer. The Chamber consequently opposes the introduction of an export duty, and the abolition of an import duty on molasses.

The Vienna Chamber enters into the classification and taxation of sugar, as well as with the question of an export duty on molasses. On this latter point the Chamber refers to the reasons, above mentioned, in support of an export duty; and then opposes it on the double ground that it would be prejudicial to the sugar manufacturer and eventually to the distiller.

As regards sugars, the Vienna Chamber recommends, as it recommended in 1869, the simpler classification by two positions, instead of the existing three proposed by the Government, and is pleased that since then the Zollverein had adopted such a classification. The Chamber proposes to divide the sugars at No. 19, taxing all under No. 19 at 6 fl., and all at and above No. 19 at 8·50 kr. The standard of No. 19 is chosen, as allowing raw, and especially colonial, sugars to partly come into ordinary consumption. The duty of 6 fl. is considered an ample protection to the home industry. The drawback on sugar is 4·55 kr. on its export; whence 4·55 out of the 6·00 represents a duty from the foreigner equal to the excise from the home manufacturer. The difference of 1·45 is a sufficient protection, whatever the agio may be on the lower sugars. The proposed duty on the higher sugars represents the excise, this protection on the raw sugar, and also a further protection of 2½ fl. on the refining, which is sufficient for the best equipped refineries, and corresponds also to the increased value, usually 38 to 40 per cent. of the higher qualities of sugar. It had been proposed to suggest a duty of 7·50 kr., equivalent to that in the Zollverein. But this was rejected; for the Austrian factories and refineries are in several respects at a disadvantage compared with those of the Zollverein, especially in respect of dearness of fuel and distance from markets. The export of sugar arises from an over-production, and cannot be quoted as a proof that the Austrian industry is in as good a position as that of the Zollverein.

The Chamber proposes the following classification:—

(*a.*) Raw sugar under sample No. 19, and liquid sugar, also fruit sugar. Proposed duty, 6 fl. per centner.
(*b.*) Raw sugar from sample No. 19 upwards, also sugar in loaves, &c., and sugar candy. Proposed duty, 8·50 kr. per centner.
(*c.*) Sugar syrup—*i.e.*, waste syrup of the refineries, and not crystallized sugar. Proposed duty, 3 fl. per centner.

These duties are based upon an excise equal to 4·55 kr. per centner of sugar, but should be altered in proportion to any alteration in the excise duty.

The following is an extract from the Report of the Brünn Chamber respecting the sugar duties, as recently printed in translation by the Foreign Office :—

"With reference to the taxation of sugar, a desire for a new classification has for a long time since reached us from the whole circle of our manufacturers.

"The ordinary American Customs tariff classifies sugar according to the form in which it exists, whilst it is more exact, and also long since customary with the leading European States, to graduate theirs according to the more or less whiteness of the sugars, which quality represents the grade of its purity.

"The proposal of the new Customs tariff in its principal idea includes these alterations; it goes, however, further than needful or is desirable in the interest of a simple and swift examination at the Custom House.

"The project has three classes, one for raw sugar under sample No. 16, one for raw sugar from Nos. 16 to 20, and one for the same from sample No. 20 upwards. We have, in concert with the other Commercial Chambers interested in the sugar duty, and the Unions of the sugar manufacturers, to recommend a counter plan :—

"1. That these three categories be converted into two, and raw sugar only be divided into such as are under and such as are over sample 19.

"That the duty for the former be regulated at 6 florins per cwt., and for the others, as well as for all refined sugars, at 8 fl. 50 kr.

"We may express the wish, with reference to the samples themselves, that they shall not represent a repetition of the sample types of other goods—*i.e.*, form a formal secret of the head Custom Houses—but that such samples should be distributed to all Custom Houses (those Custom Houses which are empowered in general to deal with the sugar duties), and to all Chambers of Commerce, and be there preserved, in order that the manufacturers and merchants can inspect the same in a convenient manner, and protect themselves from expensive yet innocent blunders.

"As concerns the duties, it is affirmed from several quarters that the extra duties for sugar are not necessary, and even very extended reductions of the same have not the power of prejudicing the Austrian sugar industry.

"We cannot, however, assent to these views, whilst the conditions of the sugar manufacture and of the consumption are both such that foreign competition cannot operate in the same proportion or method as in other industrial directions. There are, however, a few subjects of importance which must be considered at the same time as the sugar duties, and of which neglect might lead to grave danger for the Austrian industry.

"The railway tariffs play, in this case, the most important *rôle*, and we must take the same the more seriously into account, as it is unfortunately notorious that we never enjoy equal facilities for the export of Austrian produce which foreign importers, in their business with Austria, often enjoy for exactly the same distance and the same goods.

"Taking into consideration present native and foreign raw sugar prices, the question of its supply is a question so far outweighed by the high railway tariff that we must, therefore, very strongly desire, especially as regards those foreign factories advantageously situated, that our sugar industry should be protected from the possibilities of the incalculable changes of railway policy by a moderate duty.

"The State, indeed, is entitled and even obliged on financial grounds to demand a tax on foreign production of raw sugar, as compensation for the octroi existing in Austria.

"If this is neglected, each abatement of the foreign taxes on sugar production, or each increase in those countries of the allowed rebate, would, on the sugar being exported, immediately influence the Austrian market, and change the conditions of the Austrian manufacture to its disadvantage.

"Finally, the 'agio' is a factor, the least fluctuation of which, in presence of the enormous quantities in which the sugar trade deals, would at once turn the scale, so that the native sugar industry must be secured to some degree against the disadvantages of money fluctuations.

"The import duties for sugar proposed by us are, therefore, nothing more than a compensation of the excise, and of the tariff and 'agio' differences. They are, on the raw sugar, according to samples 16 to 20, only higher by a few florins than the Government proposals; whereas on the raw sugar, according to samples over 20, they are 1½ florins lower than the Government proposition.

"Our proposals correspond in general with those in force in the Zollverein; they are, indeed, for refined sugars, a little lower.

"With the Government proposal regarding the duty on treacle—*i.e.*, waste treacle of refineries and not crystallized treacle—we declare ourselves in so far agreed that by it should be meant real treacle, which is directly or indirectly destined for consumption. Inasmuch, however, as even molasses should, as hitherto, be treated according to this tariff heading, we hold a duty of 3 fl. to be far too high.

"Molasses serves either for the manufacture of spirits, or it is used for the purpose of extracting the remaining saccharine elements according to a system which is only recent and not thoroughly tested. In both cases molasses forms a new product, or rather a half-manufacture, which should, to the manufacturer who has in view its further working, be as cheap as possible, and should not be made dearer by a disproportionate duty of 3 fl. per cwt.

"The Zollverein has likewise charged a duty upon treacle to the extent of 2 th. 15 gr. It has, however, taken care that molasses, which is imported for the manufacture of spirits and the further working up of the same, should be imported, under certain precautionary conditions, free.

"We consider this regulation a just one, and would not hesitate to recommend to the Government that the same, in its spirit, should be adopted in the Austrian Customs law, should it happen that means can be found by which molasses could be so completely changed from its nature as only to be useable for the manufacture of spirits, and net for the purpose of extracting its saccharine matter.

"It is a recognized fact that molasses, as the third product, is able to contain up to 30 per cent. of sugar, without this fact being directly evident or discovered during the examination for duty. Should it thus be avoided that the import of molasses could help the defraudation of the sugar duties, and the inland tax on consumption, it should not even then be permitted to enter free; but neither should a higher duty than would correspond to its probable saccharine matter, and the duty for raw sugar under No. 19, be imposed upon it.

"As the latter would amount to 6 fl., according to our proposal, it would result that the corresponding tax for the duty on molasses would be 2 fl. per cwt., in lieu of the 3 fl. proposed by the Government.

"By this proposal we stand in opposition to the opinions of those who, some time ago, demanded even the increase of the export duty on molasses, yet had not evidently taken into account that the effect would be but for a moment, and by way of exception favourable to the export of Austrian molasses, and that thereby a portion of those products used in former years would be withdrawn from the manufacturers of spirit.

"We could, even on other grounds, declare ourselves as dissenting from the re-establishment of export duties from any motive whatever, least of all in this case, where probably even the opposite result to that desired would be attained. Molasses would, indeed, not be exported, but it is by no means clear that they must necessarily be worked up by the Austrian spirit manufactories, because the prices of spirits would so far recede that the working up of molasses into spirit would not be profitable, even if they were held in hand at very low prices."

Some other Chambers of Commerce made similar representations respecting the sugar duties.

(B.)—*Statistics of Foreign Trade.*

The statistics of the international trade in sugar are as follows:—

	Export.		Difference.
	1874.	1873.	
	Centners.	Centners.	Centners.
a. Sugars (refined)—			
Without drawback ...	483	1,492	— 1,009
With „ ...	501,419	595,561	— 94,142
b. Raw sugars, &c.—			
Without drawback ...	1,478	78	+ 1,400
With „ ...	727,374	1,144,059	— 416,685
d. Sugar syrup	28,735	535	+ 28,000

The following is a comparison of imports and exports of sugar for 1874:—

	Quantity.		Value.	
	Import.	Export.	Import.	Export.
	Centners.	Centners.	Florins.	Florins.
Austria	29,776	1,204,646	189,034	17,694,549
Hungary ...	470	54,843	5,498	987,174
Totals ...	30,246	1,259,489	194,532	18,681,722

It is considered that, although the sugar industry is not altogether on a sound basis, the diminution in the exports is owing more to the general depression of industry than to special causes. The importation of sugar is evidently of small importance compared with the exportation; but why the sugars imported are at a lower average price than those exported is not clear.

(C.)—*Remarks as to British Interests.*

It is not possible, unfortunately, from the Custom returns to discover or estimate the quantity of sugar exported to each country. But I am informed that the bulk of the export in sugars is to the east, and it appears that nothing is known here of any important export beyond Germany westward.

The excise duty being 44 kr. per 100 Vienna pounds of beet-roots, it follows that the drawbacks of 4.50 on raw sugars and of 5.59 on refined sugars, are based upon the assumption of 10.25 and 12.70½ respectively of Vienna pounds to the Zoll centner of sugar. This average is struck for the whole Empire, and on the mean yield of saccharine matter for a series of years. The intention is that the

drawbacks should not become a bounty on exportation, but remain in the long run a *bonâ fide* return of the direct excise duties. But it is obvious that whenever the year is good for beet-root, *i.e.* that the yield of saccharine matter exceeds the assumed mean, the drawback practically becomes a bounty, unless the manufacturers have to make good a countervailing loss in excise on former years of bad yield of saccharine matter.

If the statistics of the foregoing parts of this report be examined, it will be seen that in 1874 the drawback amounted to nearly 7,600,000 gulden, whereas the excise yielded for 1873–74 nearly 11,800,000 gulden. The annual period for the Customs does not run with that for the excise. But as, probably, the falling-off was even greater in 1874 than in 1873–74, it may, for the present, be assumed with some fairness that the drawback and the Excise above mentioned can be compared. In this case the Excise, remaining to represent home consumption, is only 4,200,000 gulden, indicating, at an average drawback of 5 fl. 15 kr., about 825,000 Zoll centners of sugar consumed.

Again, if it be assumed that a fair average of the 1.025 and 1.275½ Vienna pounds per Zoll centner be 11 times 100 lbs. of roots per Zoll centner of the aggregate mean of all sugars, then the 24,600,000 Vienna centners of roots should in 1873–75 have yielded about 2,238,000 Zoll centners of sugar, of which there remain, after deducting an export in 1874 of 1,260,000, only 978,000 centners. If, however, the fair average be twelve instead of eleven times 100 pounds of roots, then the resulting remainder for home consumption will be less than 800,000 Zoll centners. The truth probably lies between the two, and nearer the eleven times average, for the home consumption will be mainly in the lower qualities of sugar, whereas the export is about 45 per cent. in refined sugars and 55 per cent. in raw sugars.

If the results of 825,000 Zoll centners, from a comparison of the drawback with the Excise, and of 978,000 Zoll centners from a comparison of the export were exact, the difference of 153,000 Zoll centners would, I presume, represent freedom of the home consumption to that degree from taxation, and consequently a bounty of some 800,000 gulden, or of over 63 kr. per Zoll centner of export.

Whether or not these figures indicate that in 1874 the drawback became in some degree a bounty, I am not competent to say, especially as there can be so little exactness in the terms of the comparison.

It would appear from the opinions of the Austrian Chambers of Commerce that little change is likely to be made in the Customs duties. But if, as against Germany, a protection of 1.45 for raw sugars, and 3.95 for refined per Zoll centner is still needed by the Austrian manufacturer, it is scarcely possiblethat any large export trade through Germany westward could take place unless the higher price ofthe Austrian sugar, plus the transit freight be not set off by the Austrian drawback and by some disadvantage to the German exporter of German sugars.

16th January, 1876. J. P. Harriss-Gastrell.

Further Report by Mr. J. P. Harriss-Gastrell on the Beet-root Sugar Industry of Austria.

With reference to my report of the 16th ultimo with respect to the beet-reot industry of Austria, I beg now to add thereunto the following abstract of the information contained in an official paper about to be published in the fourth part of the third volume of the "Nachrichten über Industrie, Handel und Verkehr," and I purpose arranging that information under the same headings as in my previous report.

(A).—*Position of the Industry.*

(*a.*) *Excise Duty.*—The beet-root sugar industry was from its beginning in 1830 to 1849 only subject to the moderate general industrial tax (Erwerbsteuer), and in 1849 to the income-tax also. But by a law of 1849 a consumption-tax (Verbrauchsabgabe) was laid upon the sugar industry at the rate of 1 fl. 40 kr. (Conventions Münze) for every net Vienna hundredweight of raw sugar produced. Accordingly, the tax was thus arranged in currency for these three categories: 2 fl. for refined and lump sugar; 2 fl. 12 kr. for sugar candy, &c.; 20 kr. for molasses. But the manufacturer could elect to have the tax levied on the beet-roots, and in this case paid 5 kr. (Conventions Münze) for fresh, and 27½ kr. for dried roots per Vienna cwt. It was soon discovered that it was more simple to raise the tax upon the raw material rather than upon the product; and a decree of 1850 abolished tbe basis of sugar in favour of that of the beet-roots.

In 1853 the tax was increased to 8 and 44 kr. (Conventions Münze), in 1855 to 12 and 106 kr., and in 1857 to 18 and 139 kr. (Conventions Münze), respectively. And in 1852 the credit of four four months for half the tax was extended to the whole amount.

The rates of 18 and 139 kr. of Conventions Münze were converted into 31½ and 1.73½ kr. currency, and are still in principle the same; but an addition of 20 per cent. in 1859, increased in 1862 to 30 per cent. as an extra war tax, raised the tax to 40.95 and $2{\cdot}25\frac{45}{100}$ respectively. In 1858 a credit of six months to one year was given, but in 1862 it was reduced to six months for paying the tax.

In 1865 a radical change was made in the mode of levying the tax, which was henceforth to be calculated on the capacity of the plant and the period of its being in operation.

In 1866 the rates of 5·5 to 1 for fresh and dried roots was changed to 5 to 1, reducing the $2{\cdot}25\frac{55}{100}$ to $2{\cdot}04\frac{75}{100}$.

The introduction of the French system of weights in 1875, has led to the consumption tax being calculated on kilogrammes, thus 73 kr. on every 100 kilog. of fresh and fivefold on dried roots.

As regards a drawback, it seems that in 1870 one called an "export bonus" was established for repaying to the exporter the Customs or Excise duties already paid on the sugar, at the rate of 4·30 kr. on refined, and 3·50 kr. on raw, which was raised by the additional war tax to 5·16 kr.; 24·20 kr. per Zoll centner, and in 1862 to 5·59 and 4·55 respectively, at which rates it is now, after having from 1864 to 1868 been raised to 6·51 kr. and 3·30 kr. respectively. In consequence of the introduction of the French system of weights, it is now calculated on the 100 kilog. at 9·10 kr. and 11·18 kr. respectively.

It is remarked that only a very small quantity of sugar has been exported without profiting by this drawback.

(B.)—*Foreign Sugar.*

As the beet-root sugar industry began in Austria in 1830, it will be desirable to mention the Customs duties since that year to the present time.

	1830.	1836.	1849.	1852.	1856.
	F. k.	F. k.	F. k.	F. k.	F. k.
Refined sugar, C.M. per Vienna cwt. ...	21 00	18 00	16 00	14 00	12 30
Raw sugar for commerce „ ...	21 00	15 00	12 40	11 00	9 00
Ditto for refiners „ ...	7 00	7 30	8 00	7 00	6 00
Molasses ... „ ...	6 00	5 00	5 00	5 00	3 00

The Customs duties of 1856, were in 1858 converted into Austrian silver currency from the "Convention coin," and became—

	F.	k.
Refined	13	15
Raw for consumer	2	45
Raw for refiners	6	30
Molasses	3	15

It will be noticed that the refiners enjoyed at the beginning a very large advantage in a lower duty on the raw sugar imported, which has been gradually reduced to the existing difference of 33⅓ per cent. in their favour.

Thirty years sufficed to destroy the import of raw sugar for refining, and to reduce to insignificance the importation of sugars for consumption. The increase in the importation of molasses followed the development of the beet-root sugar industry; for, as the beet-root sugar syrup cannot be used except for the distillation of spirit, Colonial sugar syrup must be used.

Before the drawbacks scarcely any exportation of sugar existed. A drawback was established, as already mentioned, in 1860.

The raising of the drawback has had an important influence in 1864 in increasing the exportation.

The exportation has become larger than ever was the importation, and the struggle of fifty years between the home producer and the importer has ended advantageously for the former. The Austrian charterer can now export sugar instead of importing it.

The bulk of the refined sugars goes to the East, but that of raw sugar to Germany, and perhaps further westward. This year a a considerable quantity is, as I have just heard, being sent to England.

(C.)—*Remarks as to British Interests.*

So far as colonial sugar is concerned. it is evident that the beet-root sugar industry is so well established in Austria that no revival of its importation can be expected. And as regards competition in England with refiners, it does not appear probable that any important quantity of Austrian refined sugar finds its way into England except by the operation of the drawback, for there is little difference of opinion that the beet-root sugar industry is not in an altogether sound condition.

It will have been noticed that the basis of the excise tax was in 1865 changed from the quantity of beet-roots consumed to the capacity of the plant for consuming in a given time a given quantity of beet-roots. It will also have been observed, that it is acknowledged that the quantity of beet-roots returned for taxation as manufactured into sugar is "notoriously" less than the actual quantity. Moreover, the statistics—after due allowance for the large exports of beet-root sugar and the insignificant importation of sugar—show so small a consumption of sugar per head in the Austrian Empire (from a half to three-quarters of a pound per head per annum), that there must be a larger manufacture of sugar than the statistics record. If these three facts, together with the fact of the moderate cost of beet-root sugar in North Germany and the larger export into Germany be taken into consideration, it is sufficiently obvious that the drawback, although otherwise intended, does act as a direct bounty, and probably is to nearly half its amount a real bounty on export. Hence the Austrian manufacturer can send his surplus sugar abroad at a very low price. Since I wrote my former report I have been informed that a yearly increasing quantity of sugar has been exported to England *via* Hamburg. It is evident that this can only give a profit when the exporting price at Hamburg is less than the competing price of North German sugar, and such a low price can only arise from something abnormal in the taxation of sugar in the Empire, for I cannot hear of any great advantages of the beet-root sugar producer over his competitor in Northern Germany.

The higher drawback of 1864, and the change of basis of the excise in 1865, have evidently favoured the exportation. The way in which the drawback becomes a bounty is, that the capacity of the plant is taken at a low average for excise, and is for manufacturing much greater and even doubled. Hence, as the drawback is the equivalent of the excise thus estimated, it becomes a bounty in the proportion in which the actual capacity of the plant is greater than the estimated capacity.

I had the privilege in 1869 of becoming acquainted with the position of the beet-root sugar industry in North Germany, and have therefore hazarded a few comparisons in my own mind; but I know nothing practically of the position of the industry in Austria, and cannot therefore venture to hazard an opinion as to the proportion of bounty that the drawback may cover. I fancy, however, from what I hear, that it may be not far short of 50 per cent. of the drawback.

But, even if this drawback had not proved on inquiry to act as a bounty to a certain degree, it seems to me that a return of duty on an exported article may conceal more often than is suspected a

real bounty on exportation. Some ten years ago I ventured, in dealing with another question, to call this point of view that of the desirability of an "Equity of International Taxation." Subsequent experience has, rightly or wrongly, confirmed the idea that this point was sometimes overlooked. If, for instance, to put the least complicated case, all other things being equal, the incidence of taxation in two countries should be equal on a given article, then the country granting a drawback equivalent to any part of such taxation would practically grant a bounty on exportation.

February 6, 1876. J. P. HARRISS-GASTRELL.

GREECE.

Mr. STUART to the Earl of DERBY.

MY LORD,— Athens, 17th February, 1876.

With reference to your Lordship's despatch, marked "Circular Commercial," of the 16th of December last, making inquiries, on behalf of the Government of New Zealand, respecting the production of beet-root sugar in the various countries of Europe, I have the honor to report that there is no manufacture of beet-root sugar in Greece, and that beet-root appears to be only grown in gardens in small quantities, for salads and such-like purposes.

I have, &c.,

The Right Hon. the Earl of Derby, &c., &c. W. STUART.

SWEDEN AND NORWAY.

Mr. C. M. ERSKINE to the Earl of DERBY.

MY LORD,— Stockholm, 25th February, 1876.

In obedience to instructions contained in your Lordship's circular despatch of the 16th December last (received here on the 9th January), I have the honor to transmit herewith copy of a note from General Bjornstjerna, forwarding a memorandum (sent in translation) on the production of beet-root sugar in Sweden, as well as a table showing the export and import of sugar during a series of years.

I applied also to the Norwegian Government, but was told that no beet-root for the manufacture of sugar is grown in Norway.

I have, &c.,

The Right Hon. the Earl of Derby, &c., &c. C. M. ERSKINE.

General BJORNSTJERNA to Mr. ERSKINE.

SIR,— Stockholm, 1st February, 1876.

Referring to your letter of the 11th January last, I have the honor to forward herewith a memorandum containing answers to the series of questions by the New Zealand Government concerning the manufacture of beet-root sugar which accompanied your letter.

You will also find attached a table showing the importation and exportation of sugar of late years. The Customs statistics make no distinction between cane sugar and beet-root sugar, but there is no doubt that the quantity of sugar imported consists entirely of cane sugar.

I have, &c.,

Mr. C. M. Erskine. O. M. BJORNSTJERNA.

MEMORANDUM with regard to the Production of BEET-ROOT SUGAR in Sweden.

THE manufacture of beet-root sugar did not exist in Sweden before the year 1854, when, although on a limited scale, it began to be produced in the manufactory expressly built for the purpose at Landskrona, in the most southern province of the country. It was only in 1870 that one was erected at Stockholm, and during the following years after that date four others were established—namely, one at Arlöf, in the Province of Malmö; one at Halmstad; and two in the Province of East Götland, at Vadstena and Ljung. Three of these are, however, now closed, so that during the present season there are but three at work—namely, two in the Province of Malmö, and one in the Province of East Götland.

At first these manufactories were not subjected to any other taxation beyond what is levied throughout the country on all those engaged in manufacturing alimentary products, and consequently they worked under the protection afforded by the import duties, which were fixed at the time both for raw and refined sugar, and up to the year 1867 amounted to 8 crowns (8s. 10½d.) for the former and 12 crowns (13s. 4d.) for the latter on every Swedish centner (42·5 kilogrammes). In the year 1867 the above-mentioned duties were raised respectively to 10 (11s. 1¼d.) and 14 (15s. 6½d.) crowns, but in 1872 were again lowered to 8 crowns (8s. 10½d.) and 11 crowns 60 öre (12s. 10½d.), at which amount they have ever since remained unchanged.

It is only since the production in the southern part of the country—probably the only one in which it can be carried on with real advantage—has increased to a somewhat important extent that it has been subjected to a small and slowly-increasing tax. A Royal Ordinance of the 30th May, 1873, prescribes that on all the beet-root sugar produced after the 1st of July of that year there is to be levied a tax amounting to one-fifth of the (import) duties on sugar at any time in force, which after three years is to be raised to two-fifths, after a further lapse of three years to three-fifths, and finally,

after three years more, to four-fifths. The tax is assessed on the basis of the weight of beet-root employed, and on the calculation that a centner—100 Swedish pounds (42·5 kilogrammes)—of raw beet-root yields 6¼ lbs. (2·66 kilogrammes), and a centner of dried beet-root 31¼ lbs. (13·3 kilogrammes) of raw sugar, of a darker colour than No. 18, according to the Dutch standard universally adopted in trade.

For the protection of the rights of the State, the manufactories are placed under the inspection of special controllers, who weigh the beet-root intended for consumption, whilst the manufacturers are bound to furnish information as to the yield, quantity refined, number of hands employed, &c.

The production during the first years, and until the cultivation of the beet-root had been more fully developed, was very limited.

Years.	No. of Manufactories.	Raw Sugar. Lbs.	Molasses. Lbs.
1854 to 1855	1	302,782	171,743
1855 „ 1856	1	546,121	160,472
1856 „ 1857	1	351,190	133,984
1857 „ 1858	1	290,705	122,077
1858 „ 1859	1	637,936	197,632
1859 „ 1860	1	881,656	321,197
1860 „ 1861	1	959,227	329,253
1861 „ 1862	1	1,098,030	349,179
1862 „ 1863	1	1,102,488	375,802
1863 „ 1864	1	1,197,079	506,704
1864 „ 1865	1	1,615,654	600,407
1865 „ 1866	1	1,831,064	593,406
1866 „ 1867	1	2,335,885	932,537
1867 „ 1868	1	1,810,787	617,540
1868 „ 1869	1	1,934,903	642,756
1869 „ 1870	1	2,303,572	766,703
1870 „ 1871	2	2,433,235	897,646
1871 „ 1872	4	4,551,400	2,000,000
1872 „ 1873	4	4,585,400	1,736,400
1873 „ 1874	5	5,104,798	2,287,256
1874 „ 1875	3	2,947,943	1,500,456

The quantity of beet-root which was employed during the last two years of production, on which the control is chiefly exercised, came to, in 1873–74, 731,355 centners, producing a tax of 73,135 crowns 50 öre (£4,063 1s. 8d.); and in 1874–75, 411,755 centners, yielding 41,175 crowns 50 öre (£2,287 10s. 6½d.).

The important decrease in the production during the last year is considered to arise in a great measure partly from a less abundant crop of beet-root, partly from the fact that the manufactories have been established in places by no means fitted for the prosecution of this branch of industry, especially since it has been subjected to taxation.

Stockholm, 15th February, 1876. OTT FOCH.

IMPORTATIONS.

	1870. Lbs.	1871. Lbs.	1872. Lbs.	1873. Lbs.	1874. Lbs.	1875. Lbs.
Sugar refined, of all kinds, such as loaf candies, cake, crushed, and powdered ...	8,200,000	16,200,000	13,800,000	25,500,000	22,150,000	29,290,670
Sugar unrefined, without reference to colour	41,500,000	41,000,000	32,700,000	46,500,000	42,700,000	42,711,600
Totals	49,700,000	57,200,000	46,500,000	72,000,000	66,850,000	72,002,270

EXPORTATIONS.

	1870. Lbs.	1871. Lbs.	1872. Lbs.	1873. Lbs.	1874. Lbs.	1875. Lbs.
Sugar of every kind ...	205,500	200,000	460,000	560,000	623,000	483,200

SAXE-COBURG-GOTHA.

Mr. CHARLES T. BARNARD to the Earl of DERBY.

MY LORD,— Coburg, 3rd March, 1876.

In acknowledging receipt of circular despatch of 16th December, I have the honor to acquaint your Lordship that on its arrival I immediately addressed the Minister of State requesting full information respecting the quantities of beet-root produced and exported as sugar from Gotha.

In the Duchy of Coburg very little beet-root is cultivated. Notwithstanding several applications, I only received an answer two days ago, and now hasten to furnish all the information received on the subject.

I have, &c.,

The Right Hon. the Earl of Derby, &c. CHARLES T. BARNARD.

LAWS and REGULATIONS for DUTIES on SUGAR, 26th June, 1869, in the German Commercial Union, Duchies of Saxe-Coburg-Gotha.

I.

FROM 1st September, 1869, a duty of 8½d. is to be levied on inland raw sugar, to be used for making sugar.

II.

	£	s.	d.	
1. On imported sugar and syrup per cwt., also on refined sugar generally, or raw sugar when it is of equal quality as decreed by order of the Council of the Customs Union, and in conformity to the standard of Holland ...	0	15	0	per cwt.
2. Raw sugar, if not similar to No. 1.	0	12	0	„
3. Syrup and melted sugars, which are recognized as such by the Inspectors, are subject to a duty of	0	12	0	„

4. Molasses, which are only permitted to be used for making brandy, are free of duty.

For tare for the cwt. gross for import of loaf sugar, candy, and broken sugar, an allowance will be given of—

14 lb. in casks of oaken or other hard wood.
10 lb. in other casks.
13 lb. in boxes.
8 lb. in baskets, foreign reed (Kanassers Kranjans).
7 lb. in other baskets.
4 lb. bale goods.
11 lb. syrup in casks.

III.

The exported, as also the imported sugars, in passing the frontier of the Customs Union or when deposited in public warehouses in quantities of at least 10 per cent.:—

	£	s.	d.	
(*a.*) For raw sugar of at least 88 per cent. of polarization	0	9	0	per cwt.
(*b.*) For candy and sugar, in white, full, and hard loaves of 25lb., and broken in presence of the Customs officer	0	10	1	„
(*c.*) For all other hard sugars, as also for all white dry sugars containing not above 1 per cent. water, in crystal crumbs or flour, of at least 98 per cent. of polarization	0	10	1	„

The Council of the German Commercial Union has to decide in which way the export shall be effected, and to cause the necessary papers to be given, declaring that the sugar to be exported is entitled to indemnification, according to the polarization.

IV.

The export of sugar with false declaration of its contents and other qualities, has no other claim whatever to indemnification, and its owner is made accountable for one quarter of the amount of indemnification.

An incorrect declaration of the quality of sugar, in order to obtain a higher indemnification from the Excise, subjects the exporter to a fine of twice the amount of the difference between the real and the claimed sum.

If the declaration of the quality of the sugar does not exceed by more than ⅓ per cent., no fine is required. If, however, this amount is exceeded, but it is proved that no intention existed to defraud the Excise, the payment of 55 dollars (= £18 10s.) is required.

V.

The necessary steps for the completion of these laws will be taken by the Council of the German Excise Union.

ACCOUNT of the DUTIES paid in the years 1841 to 1867 by the Beet-root Sugar Factory in Gotha.

Year.	Beet-root.	Duties paid.			Year.	Beet-root.	Duties paid.		
	Cwt.	£	s.	d.		Cwt.	£	s.	d.
1841–42	25,828	63	6	1	1854–55	40,835	1,201	0	6
1842–43	17,349	42	10	1	1855–56	44,807	1,314	17	0
1843–44	29,644	72	13	0	1856–57	46,315	1,362	4	2
1844–45	21,489	158	0	0	1857–58	67,542	1,936	10	0
1845–46	23,004	183	17	1	1858–59	71,976	2,646	3	5
1846–47	26,336	193	12	0	1859–60	76,970	2,529	15	1
1847–48	43,857	322	9	7	1860–61	51,147	1,580	8	1
1848–49	40,238	591	14	7	1861–62	61,914	2,276	5	0
1849–50	54,945	526	1	1	1862–63	85,751	3,252	12	3
1850–51	57,585	846	16	9	1863–64	69,760	2,564	14	0
1851–52	46,985	690	19	0	1864–65	71,942	2,644	18	6
1852–53	70,938	1,043	4	3	1865–66	65,689	2,415	0	7
1853–54	46,799	1,376	8	10	1866–67	82,151	3,020	5	2

SAXONY.

Mr. G. Strachey to the Earl of Derby.

My Lord,— Dresden, 8th March, 1876.

I have the honor to state that beet-root is not cultivated in the Kingdom of Saxony for industrial purposes.

I have, &c.,

The Right Hon. the Earl of Derby, &c. G. Strachey.

RUSSIA.

Note.—*Silver Rouble* of 100 *Copecks*=about 2s. 10d., or 7 roubles to the £1.
Poud=36 lbs. avoirdupois.

Report by Mr. Michell on the Condition of the Sugar Industry in Russia. Compiled from Russian Official Sources.

The development of the sugar industry in Russia dates from the year 1840. At that period there were only 143 sugar factories in operation, producing in the aggregate about 150,000 pouds of raw beet sugar yearly. In 1848 the number of these works had increased to 340, with a production of 962,000 pouds. The successful establishment of this branch of industry is attributable, firstly, to the excellent properties of the soil of those districts in which the beet is cultivated, and which are chiefly situated in the fertile "black earth" zone; and secondly, to the high price of imported sugar which ruled in the Russian markets in consequence of the excessive rates of duty which were imposed on it. In 1841 the duty on foreign sugar was no less than 5 r. 80 c. per poud. Under this almost prohibitive rate, the native manufacturer of sugar realized large profits on his produce, in spite of the imperfect method of fabrication employed; and these profits were still further increased from the circumstance that the beet crops were grown on the lands belonging to him, and with the compulsory labour of his serfs. A still greater impetus was given to the development of the industry by the establishment of sugar refineries in the principal centres of production, which facilitated the profitable disposal of the raw material. Under these favourable circumstances the manufacture of beet sugar attained large proportions, causing, however, serious apprehensions to the Government at the same time. The increasing prosperity of the manufacture of sugar had the effect of undermining another branch of national industry seated for the greater part at the seaports of the Empire, and consisting in the refining of so-called colonial or imported sugar. It likewise produced a diminution in the importation of the latter, thus involving a serious loss of revenue in the shape of Customs dues to the Crown. The first serious decrease in the Customs receipts on foreign raw sugar occurred in 1847, when this item showed a decrease of 1,000,000 roubles, as compared with the receipts from the same source during the preceding year.

In view of such a serious loss of revenue, which it was expected would yearly become more and more palpable, the Government resolved on establishing an excise-tax on native sugar, which, while not arresting home production, would have the effect of counterbalancing the loss sustained by the Imperial Exchequer by the decreasing importation of foreign sugar, and at the same time beneficially affect the refiners of such sugar. Accordingly in 1848 an excise duty of 60 copecks per poud was imposed on sugar of native production. This rate was subsequently lowered to 30 copecks; increased in 1872 to 70 copecks; and finally augmented from August 1875 to 80 copecks.

The imposition, however, of the excise duty did not check the development of the native industry, which, on the contrary, has ever since shown signs of an increasing activity, fostered, as it is to the present day, by high rates of duty on foreign sugar, the effect of which is an artificial maintenance of high prices for the native commodity to the prejudice of the Russian consumer.

The duty on sugar imported into Russia, whether by land or sea, was established in 1872 on the following gradually diminishing scale:—

	On Raw.	On Refined.
	Per Poud.	Per Poud.
	R. cop.	R. cop.
For 1873	2 50	3 50
„ 1874	2 40	3 40
„ 1875	2 30	3 30
„ 1876	2 20	3 20
„ 1877	2 10	3 10
„ 1878	2 00	3 00

The rates of duty in the first column apply to raw sugar of every description, whether crushed or pounded, while those in the second are leviable on refined, lump, and sugar candy in loaves and pieces.

At the instance of the manufacturers and refiners of native sugar the Government was induced in 1872 to allow a drawback of 27 copecks per poud on all sugar exported out of the country. The results expected from this measure not having being realized, the following increased scale of drawbacks was established in 1875, subject to revision by the Minister of Finance at the expiration of every two years :—

	Copecks.	
White raw sugar	45	per poud.
Brown „	26	„
Refined „	47	„

In spite of the encouragement thus afforded to the native manufacturers to dispose of their produce abroad, only a very small quantity was exported out of the country, as will be seen from the following figures, extracted from the Annual Returns of the Customs Department :—

	To European Countries.	To Asiatic Countries.
	Pouds.	Pouds.
1873	1,243	1,460
1874	4	360

This insignificant importation arises from the creation of an artificial market price in Russia for native sugar by the maintenance of high Customs duties on the foreign commodity, the price of the former being almost entirely regulated by that of the latter at the sea ports. The Russian manufacturer is, therefore, well content to sell his produce in the Russian market, where he is able to command a much higher price for it than he could abroad. The general effect consequently of this encouragement of the native industry proves injurious not only to the whole body of Russian consumers, but likewise to the revenue of the country, by limiting the consumption of an article of almost vital necessity.

The following calculation, derived from an official source, shows the quantity of sugar consumed in Russia per head of the population :—

	Approximate Production of Sugar.	Population.	Consumption per Head.
	Pouds.		Lbs.
1848	2,000,000	58,000,000	1·4
1860	4,880,000	65,000,000	3
1870	10,000,000	75,000,000	5½

As compared with England, France, and Germany, the consumption of sugar does not appear to increase in a very rapid rate.

The following statement shows the number of factories of beet sugar in Russia and the amount of their annual produce :—

Where situated.	In 1873.		In 1874.	
	No. of Factories.	Amount of Produce in Pouds.	No. of Factories.	Amount of Produce in Pouds.
In Russia	197	6,972,186	211	7,869,588
In Poland	38	1,375,947	37	1,258,738
General total ...	235	8,348,133	248	9,128,326

There are in Russia thirty-one sugar refineries, and the estimated value of their production is 34,282,150 roubles.

JOHN MICHELL.

St. Petersburgh, March 14, 1876.

APPENDIX B.

1.—Estimated Quantity and Value of Sugar Imported into New Zealand, and the Quantity paid Duty upon, together with the Amount of Duty paid thereon, for the Ten Years ended 31st December, 1875.

Year.	Imported.		Paid Duty upon	
	Lbs.	Value.	Lbs.	Duty.
		£		£
1866	23,068,521	355,388	17,950,080	74,792
1867	14,491,680	311,401	16,836,960	70,154
1868	17,709,203	293,094	17,413,920	72,558
1869	23,028,052	394,414	18,928,080	78,867
1870	15,430,300	259,265	18,029,280	75,122
1871	19,500,972	331,265	19,404,000	80,850
1872	22,482,894	381,273	21,054,240	87,726
1873	22,063,408	372,882	22,505,040	93,771
1874	25,637,220	422,246	25,511,040	106,296
1875	22,764,222	364,612	27,730,560	115,544
	206,176,472	3,485,840	205,363,200	855,680

Customs, 29th April, 1876.

H. S. McKellar,
(for Secretary and Inspector).

Estimated Population, and Number of Pounds per Head of Population represented by Sugar imported, and Sugar paid Duty upon, in each year 1866 to 1875, inclusive.

Year.	Estimated Population 31st December.	Pounds of Sugar Imported per head.		Pounds Paid Duty upon per head.	
	Exclusive of Maoris.	Exclusive of Maoris.	Inclusive of Maoris.	Exclusive of Maoris.	Inclusive of Maoris.
1866	204,114	113¾	92½	88¾	71¾
1867	219,032	66¼	54¾	82¾	63½
1868	226,618	78¼	65¼	76¾	64
1869	237,249	97	81½	79½	66¾
1870	248,400	62	52½	72¾	61¼
1871	266,986	73	62½	72¾	62
1872	279,560	88¼	69	82½	64¾
1873	295,946	74½	64¾	76	66
1874	341,860	75	66¼	74¾	65¾
1875	375,856	60¾	54	73¾	65¾
Maoris...	45,470				

The calculations have been based upon the number of Maoris in 1874. In 1861 the Maoris were estimated at 55,336, in 1867 at 38,540, and in 1871 at 37,502; but the estimates were then admittedly very imperfect.

11th May, 1876.

Wm. R. E. Brown.

Exports from the United Kingdom, with Value, and Rate of Excise on Home-made Sugar and Sugar used in Brewing, for the Years 1870 to 1874.

Year.	Quantity.		Value.		Excise.	
	Home-made.	Foreign.	Home-made.	Foreign.	Home-made.	Used by Brewers.
	Cwt.	Cwt.	£	£	Per cwt.	Per cwt.
1870	579,253	395,596	934,110	488,474	4s. 0d. to 6s. 0d.	7s. 6d.
1871	778,435	315,437	1,239,702	518,038	"	"
1872	632,341	237,532	1,014,256	354,182	"	"
1873	696,784	175,630	1,045,751	240,219	2s. 0d. to 3s. 0d.	9s. 6d.
1874	922,342	526,046	1,221,891	641,467	Abolished 1st May.	11s. 6d.

CONSUMPTION of SUGAR per Head of Population in various Countries for the year 1873, according to the calculations of Maurice Block, author of *Statistique de la France.*

Countries.	Consumption.		Countries.	Consumption.	
	Kilos.	Lbs. Eng.		Kilos.	Lbs. Eng.
Great Britain	17·40	38¼	Portugal	4·50	10
United States	12·50	27½	Italy	4·45	9¾
Hanseatic Towns ...	9·10	20	Spain	4·29	9
Netherlands	7·43	16¼	Norway	4·25	9
Denmark	6·25	13¾	Sweden	4·	8¾
France	6·03	13¼	Greece	2·70	6
Belgium	5·	11	Russia	2·61	5¾
Germany	5·	11	Austria	2·50	5½
Switzerland	4·80	10½	Turkey	1·50	3¼

APPENDIX C.

STATEMENT, showing the NET REVENUE yielded by Sugar in the United Kingdom; also the Average Price, inclusive and exclusive of Duty, from 1801 to 1864 inclusive.

Years.	Net Revenue.	Average Rate of Duty.	Average Price per cwt. in Bond.	Average Price per cwt., inclusive of Duty.
	£	£ s. d.	£ s. d.	£ s. d.
1801 to 1814 (Average)	3,362,702	1 6 2	2 8 1	3 14 3
1815	3,454,412	1 10 7	3 1 10	4 12 5
1816	3,612,715	1 9 2	2 8 7	3 17 9
1817	4,434,051	1 7 1	2 9 8	3 16 9
1818	2,751,169	1 10 1	2 10 0	4 0 1
1819	3,996,589	1 8 8	2 1 4	3 10 0
1820	3,925,481	1 7 3	1 16 2	3 3 5
1821	4,188,997	1 7 4	1 13 2	3 0 6
1822	4,060,544	1 7 5	1 11 0	2 18 5
1823	4,407,476	1 7 4	1 12 11	3 0 3
1824	4,641,997	1 7 5	1 11 6	2 18 11
1825	4,176,673	1 7 4	1 18 6	3 5 10
1826	4,951,071	1 7 5	1 10 7	2 18 0
1827	4,650,224	1 7 2	1 15 9	3 2 11
1828	5,002,338	1 7 3	1 11 8	2 18 11
1829	4,896,271	1 7 4	1 8 7	2 15 11
1830	4,767,374	1 5 10	1 4 11	2 10 9
1831	4,650,606	1 4 2	1 3 8	2 7 10
1832	4,394,352	1 4 2	1 7 8	2 11 10
1833	4,414,346	1 4 2	1 9 8	2 13 10
1834	4,559,418	1 4 3	1 9 5	2 13 8
1835	4,667,920	1 4 2	1 13 5	2 17 7
1836	4,184,209	1 4 1	2 0 10	3 4 11
1837	4,760,567	1 4 0	1 14 7	2 18 7
1838	4,656,912	1 4 0	1 13 8	2 17 8
1839	4,586,936	1 4 0	1 19 2	3 3 2
1840	4,449,070	1 5 2	2 9 1	3 14 3
1841	5,114,390	1 5 2	1 19 8	3 4 10
1842	4,874,812	1 5 2	1 16 11	3 2 1
1843	5,076,326	1 5 2	1 13 9	2 18 11
1844	5,203,270	1 5 2	1 13 8	2 18 10
1845	3,574,471	0 14 9	1 12 8	2 7 5
1846	3,896,780	0 14 11	1 13 2	2 8 1
1847	4,405,237	0 15 2	1 7 8	2 2 10
1848	4,557,337	0 14 9	1 3 5	1 18 2
1849	3,912,170	0 13 1	1 5 2	1 18 3
1850	3,884,441	0 12 6	1 5 2	1 17 8
1851	3,979,141	0 12 1	1 5 2	1 17 3
1852	3,893,656	0 10 10	1 2 10	1 13 8
1853	4,083,836	0 10 11	1 5 0	1 15 11
1854	4,741,757	0 11 5	1 1 5	1 12 10

STATEMENT, showing the NET REVENUE yielded by Sugar in the United Kingdom—*continued.*

Years.	Net Revenue.	Average Rate of Duty.	Average Price per cwt. in Bond.	Average Price per cwt. inclusive of Duty.
	£	£ s. d.	£ s. d.	£ s. d.
1855	5,058,500	0 13 5	1 6 9	2 0 2
1856	5,129,646	0 14 6	1 9 7	2 4 1
1857	5,055,034	0 13 8	1 15 7	2 9 3
1858	5,848,170	0 13 4	1 7 10	2 1 2
1859	5,935,909	0 13 4	1 6 3	1 19 7
1860	5,833,484	0 13 4	1 7 2	2 0 6
1861	6,104,325	0 13 4	1 3 8	1 17 0
1862	6,215,346	0 13 4	1 3 0	1 18 6
1863	6,249,815	0 13 4	1 5 2	2 0 9
1864*	5,157,083	0 11 1	1 6 3	1 19 4

* The diminution of the revenue in 1864, as compared with the years immediately preceding, is owing to the greatly reduced rates of duty which took effect in that year.

CUSTOMS DUTIES collected on SUGAR in the United Kingdom, together with AVERAGE PRICE, inclusive of Duty, for the Years 1865 to 1874.

Years.	Revenue.	Average Rate of Duty.	Average Price per Cwt.
	£	£ s. d.	
1865	5,362,907	0 10 6	Not ascertainable.
1866	5,552,838	0 10 6	" "
1867	5,764,460	0 10 $3\frac{1}{2}$	" "
1868	5,641,862	0 9 $1\frac{3}{4}$	" "
1869	5,642,859	0 9 $1\frac{3}{4}$	" "
1870	3,945,508	0 5 $1\frac{1}{2}$	" "
1871	3,348,324	0 5 $1\frac{1}{2}$	£1 5s. 6d. to £1 17s.
1872	3,412,573	0 5 $1\frac{1}{2}$	" "
1873	2,436,778	0 2 7	Not ascertainable.
1874	502,608*	*	18s. to £1 3s. 6d.

* The duties on sugar and molasses, and articles of which sugar is an ingredient, were repealed in May, 1874.

APPENDIX D.

No. 1.

Mr. J. NEVILLE to the Hon. J. VOGEL.

SIR,— 2, Walpole Terrace, Brighton, 9th April, 1875.

I had the honor of a personal interview with you some time ago in reference to the proposed beet-root sugar works which it is my intention, and that of those interested with me in the project, to erect in New Zealand.

After mature consideration, and guided by the "Official Handbook of New Zealand," I am of opinion that the Province of Otago would be the province most advantageously situated for our purpose, and it is therefore the object of this letter to inform you of this, and to solicit that the 10,000 acres be allotted to me in that province out of the available land the Government may have there.

If this solicitation meets with your approval, a few lines to this effect will be esteemed a favour. The grant will of course be conditionally given that the erection of the sugar works be commenced within a certain stated time, say within eighteen months; and that they must be completed say within three years. I will then send, or cause to be sent, one or two agriculturists to choose the most desirable spot both for the cultivation of the beet-root and the site of the works.

An engineer, of great practical experience in the erection of sugar works in Germany and Russia, is busily engaged with the plans of the works, which will be on a large scale, and probably involve the outlay of the sum of £300,000.

In view of this large sum, I think I will not be considered importune to remind you that my calculations for the prosperity of this undertaking are based upon two items—namely, the present import duty in the colony of 1d. per pound, and of course also the non-existence of a duty upon raw beet-root; and that if the Colonial Government were, on the one hand, to abolish the import duty on sugar, and on the other hand, after the works are erected, impose a duty on the consumption of beet-root upon the company, then it would undoubtedly have the most disastrous effect upon the prosperity of the works.

I need not remind you that there is scarcely any industry which has an equally beneficial influence upon agriculture and trade as that of the manufacture of beet-root sugar. It will encourage the cultivation of the root, and secure for it a ready sale, while a steady demand for coal, wood, metals, leather, linen, wool, paper, charcoal, grease, and chemicals may be relied upon; and that last, not least, the sugar works will furnish occupation for many artizans for whom otherwise there may be none or little to be met with. In view of these benefits to the colony, I humbly petition you to consider the expediency of giving us some assurance that no new steps on the part of the Colonial Government will be taken which would be detrimental to the prosperity of the proposed undertaking.

I have, &c.,

The Hon. Julius Vogel, Westminster Chambers. J. Neville.

No. 2.

The Hon. J. Vogel to Mr. Neville.

7, Westminster Chambers, Victoria Street, Westminster, S.W.,
20th April, 1875.

Sir,—

In reply to your letter of April 9th, respecting the manufacture of beet-root sugar in the Province of Otago, New Zealand, I have the honor to state that I am not in a position to give you any assurance upon the question of duties.

2. My impression is that arrangements might be made for your obtaining the grant of land to which you refer, if you are able to carry out the intentions you describe. The grant would, however, have to be approved of by the Superintendent of Otago; and I should be willing to telegraph to his Honor, if you desire it, provided you first satisfy me as to your means of carrying out that which you indicate in your letter.

I have, &c.,

J. Neville, Esq., Brighton. Julius Vogel.

No. 3.

Mr. F. Heritage to the Hon. J. Vogel.

28, Nicholas Lane, Lombard Street, E.C., 26th April, 1875.

Sir,—

Mr. J. Neville has consulted me with reference to his communications with you upon the subject of the manufacture of beet-root sugar in the Province of Otago, New Zealand; and he has requested me to ask you to be good enough to favour us with an interview at which the matter may be fully discussed. Thursday next would be the most convenient day for me, if it would be convenient to you.

I have, &c.,

Julius Vogel, Esq., 7 Sussex Chambers, Victoria Street. Frederick Heritage.

No. 4.

Mr. E. Fox to Mr. Heritage.

7, Westminster Chambers, Victoria Street, Westminster,
27th April, 1875.

Sir,—

Mr. Vogel has requested me to say, in reply to your letter of yesterday, that he is at present ill in bed; but that he hopes to be better by Monday next; and that he will be happy to see you at eleven o'clock on that day, at his house, 87, Gloucester Place, Portman Square, W.

I am, &c.,

F. Heritage, Esq. E. Fox.

No. 5.

Messrs. J. Mackrell and Co. to the Hon. J. Vogel.

21, Cannon Street, London, E.C., 25th May, 1875.

Dear Sir,— Re *Beet-root Cultivation.*

We have, as instructed, seen Mr. Heritage upon his letter to you [mislaid], and explained to him that before communicating with the colony you would be glad to be assured that, if you were authorized to enter into an arrangement with him and his friends, they would be in a position to give sufficient security for carrying out a contract. He explained that he did not wish the Government to be bound absolutely unless and until he could satisfy them that he had a sufficient amount of capital actually subscribed to carry out what they proposed to do; but he thought there might be a difficulty in depositing a sum of money by way of precaution money. In discussing the matter with him we found that their prospect of success depended upon their having land granted to them in close proximity to a railway, and near to some town, and that he was desirous that the Government should pledge themselves that the land to be granted should have these facilities and be of a certain value, and he seemed to think that it should not be of less value than £10 an acre.

We pointed out to him that this was a very important element in the question which he had not mentioned to you, and suggested to him that he had better reconsider the question, and place the matter in a more mature form before you.

He also objected to being bound to carry on the cultivation for any definite period, considering that, if the company expended £125,000 in the necessary works, they would carry it on as long as there was a chance of profit, for their own advantage. We pointed out to him that it might be even worth the company's while, if they could get a number of emigrants imported free on their land, to

abandon the beet-root cultivation, in order to secure a high price for some of the land, and that the interest of the colony would not be served unless a *bona fide* experiment for a certain number of years was entered upon.

He thought, upon consideration, that they might be willing to come under terms to carry on the cultivation for a period of five years. He has undertaken to consider the matter more fully with Mr. Neville, and to see us again at the end of the week, with a more definite proposal.

We have, &c.,

The Hon. Julius Vogel, C.M.G. JOHN MACKRELL AND CO.

No. 6.

Mr. HERITAGE to Mr. MACKRELL.

28, Nicholas Lane, Lombard Street, E.C., 10th July, 1875.

DEAR SIR,— *New Zealand Sugar Company.*

Referring to the conversation which I had with you some days since on the subject of the manufacture of beet sugar in the Province of Otago, I beg now to be permitted, for the information of Sir Julius Vogel, to present my views upon the matter.

I understand that Sir Julius is disposed to ask his Government, whether they would make a free grant of 10,000 acres of land in the province to a company which would undertake to expend, say, £125,000 in the erection of manufactories, labourers' cottages, machinery, plant, and implements of agriculture, and to continue the cultivation of beet-root during a period of seven years.

I think it is reasonable that the sum mentioned should be expended on the manufactories, &c., but I would submit that, with so considerable an expenditure, the undertaking to cultivate the lands might be restricted to five years, and that, with reference to the quantity of land to be put and kept in cultivation, it would be sufficient for all purposes to fix a minimum of 3,000 acres, though it is probable that the greater part of the 10,000 acres would be required, as beet-root can only be advantageously grown on the same land in every third year.

Over the period and with the quantity of land mentioned, the experiment would be, I think, quite sufficiently tried. If it were successful, then obviously the cultivation would be extended: if not successful, it would be no doubt abandoned in less than the time mentioned.

With reference to the position of the land, I would suggest that it should be as near the city of Dunedin as the land at the disposal of the Government will admit of, and that it should be on or near the banks of a river. I do not personally know the country, but I think it possible that the land near the River Taieri would be suitable for the purpose. It is of course of the highest importance that there should be easy communication with Dunedin, or with a railway in the vicinity.

If the Government should entertain the proposal favourably, we should ask them in the first instance to grant the use of a comparatively small quantity of land, in order that the experiment of growing the beet might be tried, for the solution of the problem seems to be in that. There can, I imagine, be no doubt that sugar can be manufactured as well in the colony as elsewhere, and that, if good beet can be produced at a moderate price, a market will be found for sugar at a profit, provided of course that the undertaking which it is proposed to ask of the Government with reference to duties be given.

Perhaps, when you have again consulted with Sir Julius Vogel on the matter, you will favour me with his views.

I have, &c.,

John Mackrell, Esq. FREDERICK HERITAGE.

No. 7.

Mr. HERITAGE to the Hon. Sir J. VOGEL.

SIR,— 28, Nicholas Lane, Lombard Street, 11th November, 1875.

In the month of May last I had the honor to communicate with you on the subject of the formation of an extensive beet-root sugar factory in the Province of Otago, in the Colony of New Zealand, and I at that time submitted to you my views upon the subject; but the negotiations with reference to the matter were suspended in consequence of your departure from England. I shall be glad to be informed whether you would still be prepared to receive proposals and suggestions from me on the subject, with a view to the business being carried out.

I have, &c.,

Sir J. Vogel, 7, Sussex Chambers, Victoria Street, Westminster. FREDERICK HERITAGE.

No. 8.

Mr. FOX to Mr. HERITAGE.

SIR,— 7, Westminster Chambers, Victoria Street, Westminster, 12th November, 1875.

I have the honor, by direction of Sir Julius Vogel, to acknowledge his receipt of your letter of November 11th, respecting the proposed formation of a beet-root sugar factory in Otago, N.Z., as to which you communicated with him in May last, and asking whether he is still prepared to receive from you proposals and suggestions, with a view to the business being carried out.

I am to inform you, in reply, that Sir Julius Vogel regrets that he is not now prepared to re-open the negotiation.

I have, &c.,

Frederick Heritage, Esq. E. FOX.

APPENDIX E.

Mr. A. Savile Grant's Report.

56, Avenue Lacuée, Paris, 24th December, 1875.

Beet-root for New Zealand.

"Qui veut la fin veut les moyens."

The following proposition is submitted on the assumption that the soil and climate of Otago, Canterbury, Wellington, Taranaki, and Auckland, are specially adapted to the cultivation of beet-root, as pointed out in "The Official Handbook of New Zealand," pp. 106, 132, 207, 235, and 253.

Page 106: "Sugar-making from beet-root has long been pointed to as one specially suited for Otago. The clayey loams of the plains are eminently fitted for producing the root of the quality and size which experience has proved yields most saccharine matter, and the climate is equally favourable for maturing. Beet sufficient to carry on a large export trade, as well as to supply the colonial demand, could easily be raised, and would prove a great source of profit to the agriculturist."

Page 132: "For the cultivation of beet-root for sugar, the climate and soil of Canterbury appear to be well adapted, and it is hoped that steps may soon be taken in this direction."

Page 207: "The cultivation of beet-root [in the province of Wellington], for the manufacture of sugar or spirit therefrom, would, in the opinion of competent judges, be a very profitable industry. A joint committee of both Houses of Parliament reported favourably, in 1871, on a proposal that the Government should aid a company in acquiring a block of land in the colony for the purpose of growing beet and manufacturing sugar, and should give a bonus for the production of the first 250 tons of sugar. It was then suggested that a block of 3,000 acres would be required, and that about 200 skilled labourers from Germany, with their families, should be introduced to carry on the cultivation and manufacture."

Page 235: "The soil of Taranaki is, as a rule, admirably adapted for root crops. The sugar beet might be cultivated with profit if a sugar factory were established."

Page 253: "For the manufacture of 250 tons of beet sugar in the colony, the Government have offered a bonus of £2,000, and, as this root flourishes in the Province of Auckland, there is a great inducement for any capitalist to embark in the industry. The Auckland farmers express their willingness to grow the necessary crops if a local market for their produce be guaranteed."

The immense advantages to a young country of introducing new industries, especially such an important one as the manufacture of sugar, do not require to be dwelt upon; and the desire to introduce into New Zealand the cultivation of beet-root with this object is most strongly expressed in the above quotations, and has proved sufficiently powerful to induce the Government to depart from the strict rule of non-interference in matters of trade, and to offer encouragement not only in the shape of a grant of land, but of a money bonus of £2,000.

Although, owing to the greatness of such an undertaking as the establishment of beet sugar factories on modern principles, these inducements have proved as yet insufficient to attract the notice of capitalists acquainted with the industry, still the favourable conditions of soil, climate, and of agriculture in many parts of New Zealand, and the profitable nature of the industry when once fairly started, are sufficient to invite the serious reconsideration of the question in all its bearings by the colonial authorities.

When it is notorious that the best corn districts in the North of France are now gradually given up to the cultivation of beet-root, as being the more profitable of the two, it must be apparent that land in a colony where cereals are cheaper than in France, and sugar dearer than it is produced in France, would be more remunerative if laid under sugar than corn.

There is, however, no reason why both grain and beet-root should not be cultivated together in the same districts, for they can be grown in rotation most beneficially, neither crop exhausting the soil for the other. The planting of beet-root would thus produce an almost net additional income to the farmer, by increasing the general amount of his returns by an item at present unknown.

But although, as thus shown, the cultivation of the root would add so greatly to the resources of farmers, the manufacture of beet sugar could not be carried out by mere agriculturists, both on account of the complexity of the processes, and of the large scale on which it must be carried out to be remunerative. The manufacture of sugar from the cane is most profitable on a large scale, and to a certain extent, on a small one; but beet-root sugar-making cannot be conducted practically on a small scale profitably.

The liquor from the beet-root is comparatively so much poorer in saccharine matters than the cane juice, and the impurities contained in it are so much more difficult to deal with, that the operations involved are more tedious and scientific in their nature, and the manufacture has to include a stage of refining before the produce is fit for consumption.

For these reasons beet-root sugar factories can only hope to succeed when carried on on a large scale by competent persons, and with the help of machinery and chemical appliances, requiring the command of considerable capital.

The creation of a market for the beet-root that the farmers would grow is thus seen to be dependent upon the advance of sufficient capital to establish a mill or mills on an extensive scale, complete in all its parts, including a distillery, and the means of making bone-black, &c., which are required in the manufacture.

The outlay for one mill, on the scale required to accomplish success, may be put, without including trading capital, at £50,000, which is probably a sum greatly in excess of what was contemplated as necessary for the venture when the offer of the most inadequate bonus of £2,000 was looked upon as a sufficient inducement to capitalists. The risks attending such an important undertaking in a new country are so great that capitalists will hardly be induced to embark in it without some guarantee that would either secure them against failure, or some advantage in the way of a bounty, premium, or monopoly, or, at least, protection for a term of years sufficient to enable them to establish their works in spite of the competition of trade in the old-established channels.

The necessity for the encouragement of private enterprise, whether in the arts, sciences, inventions, manufactures, agriculture, cattle and horse breeding, or even in emigration or immigration, according to national interests and requirements, has been recognized in every country and under any form of government. In proof of this, it is not necessary to point to absolute monopolies and protective duties, which flourished long after the necessity for their existence had ceased, and which it has latterly been the mission of the free-traders to abolish; but only to mention the patent laws, by which inventors are encouraged to risk the expenditure of time and money; the medals and money prizes given in different competitions whenever the object is considered of national importance; the numerous Queen's Plates granted by the British Government to encourage the breed of horses, &c. The free passages and grants to immigrants are instances of encouragement offered to individuals to meet the peculiar requirement of the colonies.

Whatever the object may be, if it is only of sufficient public importance in the circumstances in which a country is placed, the granting of bounties, or concessions, appropriate to encourage the enterprise in view (latest the buying of the shares of the Suez Canal), will always be considered laudable on the part of a Government. In this particular instance, the introduction of a great industry—the cultivation of beet-root for sugar-making—that would at the same time materially benefit the farmers, greatly increase the traffic of the railways, and ultimately lead to export trade (as it has done hitherto everywhere it has been introduced), has already appeared of sufficient importance to warrant the New Zealand Government in offering a direct money bonus, besides a concession in land.

Supposing we set aside all proposals for money bonuses, or guaranteed dividends, which are the usual means employed by Governments to encourage the investment of capital (and which would insure the immediate realization of the scheme), a concession might be made to the first sugar company established in the colony that would be simple in its nature. This proposal is,—

That the Colonial Government give an undertaking to the first company, and to them only, not to impose for a period of twenty-one years any excise duty which corresponds to the import duty of one penny per pound that is now levied and may be increased upon all sugar imported into New Zealand, for the sugar factories they might erect. A parallel measure to this proposal (amongst many) was successfully carried out by the French Government in 183—, to induce building in the Rue de Rivoli, Paris: an undertaking was given to the builders that no house tax would be levied upon them. Note the result.

In the event of this concession being rendered nul by the repeal of the import duty upon sugar, the Government, as compensation, would have to guarantee the company interest at 5 per cent. upon their capital, from the date of such repeal till the end of the twenty-one years, and special rates of railway traffic be applied to the carriage of beet-root, or any facilities that the Executive may have in their power to do to help so deserving an industry.

A bonus, in the shape of a grant of land for the purpose of beet-root cultivation and the establishment of a sugar mill, would complicate the operations of the company. The tract of land would require to be particularly advantageously situated with regard to railway and river carriage, as one of the chief difficulties in the beet sugar manufacture is the carriage of the root, which is exceedingly heavy and bulky, from the field to the mill; but land so conveniently situated on a railway must be now already settled, or too valuable to grant free of cost. Still, a grant of land would be so far useful as to be a further stimulant to capitalists, and a field for instructions. On the other hand, by establishing the factory alone on a railway, close to a river, and centrally situated in a good agricultural district, all the farms along the line would be able to forward their produce free from the enormous expense of carting the crop long distances; and in such places as could not enjoy such facilities, there could be adopted the excellent new system of pressing the beet-root juice through pipes from some miles distance, at moderate cost.

This proposal, carried out in this way, would enjoy the support of the farmers already established. This would not be the case if the company purposed growing the root on their own land instead of buying the crops from them; and a limited skilful staff would soon render the present settlers quite competent to manage their own affairs and be an example to others.

Sir J. Vogel, &c., &c. A. Savile Grant.

APPENDIX F.

Beet Seed issued to Superintendents, for Distribution, on 25th February, 1875.

Reports on Planting of Seed, in reply to Circular Telegram of 10th May, 1876.

12th May.—Auckland.—Distributed to farmers in vicinity of Auckland; but no information as to result of sowing can be obtained. Portion sent to Waikato germinated, and plants promised well.
12th May.—Taranaki.—Vegetated indifferently; roots not large.
11th May.—Napier.—Will shortly send specimens of sugar-beet grown from the seed. (Sent subsequently. See correspondence appended.)
16th May.—Wellington.—Not yet distributed; but instructions have been given for its distribution at once.
16th May.—Nelson.—No information to give respecting seed.
12th May.—Marlborough.—Was absent. Cannot learn who had the seed.
11th May.—Canterbury.—Pheasants and quail destroyed sowing of beet. Domain Board will sow fresh lot under netting.
11th May.—Westland.—Unsatisfactory. Out of a good-sized bed, only two plants came up.
11th May.—Otago.—Curator of Botanic Garden reports that the seed has done very well; was excellent. Similar account from private gardeners who have cultivated it.

His Honor J. D. Ormond to the Hon. Mr. Mantell.

Sir,— Superintendent's Office, Napier, 23rd May, 1876.

By the steamer I send four samples of sugar-beet grown by four different settlers, whose notes, describing the soil in which the beet was grown and the time at which the seed was planted, I enclose. I am glad to be able to report that the last lot of Californian and Indian seeds are turning out very good: those planted by my gardener in boxes in a greenhouse are nearly all coming up; *Cedrus deodara*, which has always failed in former lots of seeds, is especially good; also all the *Abies* are coming well.

I have, &c.,
J. D. Ormond,
Superintendent.

The Hon. W. B. D. Mantell, Colonial Museum, Wellington.

Enclosure 1.

Dear Sir,— Mount Vernon, 17th May, 1876.

I have sent by rail three samples of sugar-beet grown from the seed. It was sown on 22nd October, 1875, and taken up to-day. The soil, a quantity of which is enclosed with the beet, is a stiff, heavy mould, with hard clay subsoil.

I have, &c.,
R. Harding.

G. T. Fannin, Esq.

Enclosure 2.

Dear Sir,— West Clive, 20th May, 1876.

I herewith send you three roots of white Silesian sugar-beet, as you desired me to do. The roots have grown in medium stiff clayey soil, which has been cultivated for four years, but never manured; but I must state that they are not a fit sample for analyzation, being too old, but still better than the sample from Mr. Burton you showed me, which are entirely useless for the purpose you design them. The seed was sown the last week in November, 1875, but did not receive the proper cultivation. Last February or March they would have been more fit for analyzation, when they would have yielded a much larger percentage of saccharine.

I have, &c.,
F. W. C. Sturm.

G. T. Fannin, Esq.

Enclosure 3.

Sample of Sugar-beet grown by Mr. H. W. P. Smith, Aorangi, Napier, New Zealand.

Seed was sown August 20th, 1875; crop lifted April 14th, 1876. Soil, black and damp.

P.S.—Dried swamp land seems to be well adapted for the growth of sugar-beet.—H. W. P. Smith, April 19th, 1876.

Enclosure 4.

Sir,— Napier, 11th May, 1876.

This sugar-beet was sown the middle of December, 1875, on a rich sandy loam; was taken up on the 20th April, 1876. The samples I have sent are about the average size.

I have, &c.,
W. Burton, Botanical Gardens.

G. T. Fannin, Esq.

NEW ZEALAND GEOLOGICAL SURVEY.

Laboratory.

Class.

Result of Analysis of Specimen No. 1811, forwarded by the Hon. the Premier. Locality, Napier. Received, 6th June, 1876. Reported on 10th June, 1876.

(From Parcel of Beet for Sugar.)

No.	Mark on Sample.	Approximate Average Weight.	Sugar per cent.
1	"Botanical Gardens" ...	4 lbs.	4·9
2	"Mr. H. W. Smith" ...	4¼ lbs.	5·8
3	"G. Fannin, Esq."	2½ lbs.	8·4
4	"Harding"	3¼ lbs.	7·6

W. Skey.

By Authority: George Didsbury, Government Printer, Wellington.—1876.

Price 2s. 6d.]