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SUGAR BEETS
IN NEW ENGLAND AND THE
FREE SUGAR BILL OF THE
HOUSE OF REPRESENTATIVES

SB 221
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LETTER OF

TRUMAN G. PALMER TO HON. HENRY CABOT LODGE
CONCERNING THE PRODUCTION IN 1837 AT
NORTHAMPTON, MASS., OF THE FIRST BEET
SUGAR PRODUCED IN AMERICA, AND THE
ADAPTABILITY OF NEW ENGLAND CONDI-
TIONS TO THE PRODUCTION OF BEET SUGAR



PRESENTED BY MR. LODGE
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SUGAR BEETS IN NEW ENGLAND.

WASHINGTON, D. C., *August 10, 1912.*

HON. HENRY CABOT LODGE,
United States Senate, Washington, D. C.

MY DEAR SENATOR: The country needed no new evidence of the fact that your views on national economy are not bounded by State lines or colored by the New England hills. Nevertheless, when, without a cane or beet sugar factory within 500 miles of your State, you espoused the cause of the domestic sugar industry of Louisiana, the Middle West, and arid America, you gave the country fresh evidence of your interest in the welfare of all the people.

Although now producing maple sugar only, the State of Massachusetts has the distinction of being the first in the Union to produce sugar from beets, since grown to an industry of such proportions that American farmers and other toilers of the Middle and far West depend upon it for \$45,000,000 of their annual income. And so, when your political opponents proposed to blot out this industry and transfer it to foreign lands and a handful of New York refiners, it seemed fitting that it should be defended by the senior Senator from the State which gave it birth 73 years ago.

While in the early days the industry did not thrive in New England or elsewhere in America, permit me to suggest that no climatic or other natural obstacle prevents its successful establishment throughout New England. Also allow me to observe that the most effective manner in which to obliterate the term "abandoned New England farms" is by establishing the beet-sugar industry in their midst, for wherever sugar beets are planted, worn-out soils become rejuvenated and fallow and abandoned fields become fertile.

In 1839 Mr. David Lee Child erected a small beet-sugar factory at Northampton, Mass., in which was produced the first beet sugar made in America. Following is an extract from the 1839 report of the second exposition of the Massachusetts Charitable Mechanic Association:

D. L. Child, Northampton. Beet-root sugar, crude and refined. Manufactured by the improved process of Schutzenbach. The crude or raw sugar is well made, dry, and of good grain. The refined shows that this article can be made of as good quality as sugar from the cane. Of the extent of the manufacture by the exhibitor the committee are not informed. A silver medal.

The medal bore the following inscription:

The Massachusetts Charitable Mechanic Association. Award to David Lee Child, for the first beet sugar made in America. Exhibition of 1839.

The same year the Massachusetts Agricultural Society awarded Child's company a cash premium of \$100. The language of the society was as follows:

Premium of the Massachusetts Agricultural Society, 1839. To the person, persons, or corporation who shall manufacture from the sugar beet, sugar in the greatest quantity and of the best quality in the year 1839, giving a full and particular account of the process of manufacturing it, a premium of \$100.

This premium was awarded on the 5th of December, 1839, to the Northampton Beet Sugar Co.

Mr. Edward Church was associated with Child in this enterprise. Church, an American, lived in France for many years, where he made a careful study of the sugar industry, with a view to erecting a factory on his property near Paris, but because of the chaotic conditions which succeeded the French Revolution he returned to Northampton and joined Child in his enterprise.

In 1837 Church issued a 54-page book, *Notice on the Beet Sugar*, from which I quote:

We look with confidence to our Legislature for every support and encouragement which our infant enterprise can fairly ask. The liberality extended to the indigenous silk producers will not, surely, be withheld from us, for if there is any one undertaking which deserves the special patronage of a wise and paternal Government it is one like ours, which eminently promotes our first, best, and most permanent source of wealth and comfort—agriculture. * * *

It is proper here to remark that by the beet culture a new and important article of food is created without in any manner diminishing the usual production of grain or the feed for stock, but, on the contrary, materially increasing them both, as it is peculiarly fitted to take the place of the fallow or to alternate with crops of grain, and thus essentially facilitate a good system of farming.

In this anticipation of increased prosperity to our country in general from the production of indigenous sugar there is nothing fanciful or exaggerated, and it is especially applicable to our own New England, whose hardy and enterprising sons are yearly and daily deserting their firesides in pursuit of fortune in the far West, whilst their own native soil, endeared by so many associations, contains mines of wealth which only requires to be sought to be found. * * *

To conclude, no doubt can possibly remain on a thorough and candid investigation of the subject that the introduction of the beet culture and its manufacture into sugar is destined to create a memorable epoch in the prosperity of our Republic, not inferior, probably, to the cotton culture, and having over that some preeminent advantages, therefore to consider it only as a means of replacing a foreign product by one of our own growth would be to take a very narrow and inadequate view of the subject.

CAUSES OF EARLY FAILURES.

As with other pioneers, the causes which led to Child's lack of success were numerous. The beets in France contained but 10 to 10½ per cent of sugar, Child's even less; machinery was crude, the entire plant representing an investment of but a few thousand dollars; much of the work was performed by hand, making it expensive to operate; technical knowledge was limited, and but one-half to two-thirds of the sugar was recovered. The price of beets was but \$2.75 per ton in France, while Child, with his crude plant, paid \$4 per ton. Child knew what the culture would do for the farmers, but the farmers did not. They demanded more for their beets than he could afford to pay, and, like other pioneers in the industry, he was compelled to give up the struggle.

To-day the average sugar content of American beets is 16.35 per cent; the investment in the factory buildings and machinery is from \$500,000 up; the smallest plant slices 400 tons per day. They extract

the maximum amount of sugar; all the labor is done by machinery, the hand of man never touching either the beet or its product from the time the beets are plowed and topped in the field until the retail grocer opens the sack to weigh out the sugar. No product could be more cleanly and sanitary. To-day the price of beets in the United States ranges from \$5.50 to \$7 per ton, depending upon the situation of the factory and the sugar content of the beets, and some factories, having contracts for all the beets they can slice, are compelled to refuse offers for thousands of additional acres.

ERRONEOUS CONCLUSIONS.

Because of early failures in Maine, Massachusetts, New Jersey, Pennsylvania, Illinois, and Wisconsin, followed by success in California, the belief became general that sugar beets only would thrive in that State. Later, the Department of Agriculture determined that in a northerly belt which extends from the Atlantic to the Pacific, there are 274,000,000 acres of well-defined sugar-beet land, and if but one of these acres out of each 200 were cultivated to sugar beets, the \$100,000,000 which we now send abroad annually for the purchase of sugar, would be paid to American farmers and other toilers. After the enactment of the Dingley tariff bill in 1897, capital rushed into the industry and plants were erected as far east as Binghamton and Rome, N. Y. Through lack of capital and technical knowledge, discouragement overtook some of the managements before success crowned their efforts and several modern plants were removed from New York and Michigan to the far West. To-day the farmers and tradespeople and the capitalists who sunk their fortunes, regret the hasty action which deprived them of an industry which now would be a success and add prosperity to the entire community. Beet sugar now is produced in 70 factories, situated in 16 States.

RICHER BEETS IN NEW ENGLAND THAN IN THE WEST.

Not only have we an abundance of sugar-beet land in the United States, but you have it in New England and there is far less reason for your people to send away \$20,000,000 a year for the purchase of the sugar they consume, than there would be to go elsewhere for the purchase of cotton cloth, machinery, silverware, or brass goods. They can not grow the cotton or mine the metals, but they can both grow the sugar beets and extract the sugar, thereby becoming producers instead of merely finishers.

As you perhaps are aware some years ago both the Department of Agriculture and the State agricultural experiment stations made many thousand tests of sugar beets grown in various parts of the country, in order to determine what territory was best adapted for their culture, and it is within the territory where these beets gave favorable results that factories since have been located, which now annually distribute \$45,000,000 to neighboring farmers and laborers. Some of the New England States showed remarkable results, but that fact was lost sight of, and the \$100,000,000 which has been invested in the industry during the past 17 years has been placed in the West, where 70 factories now turn out an annual product valued at \$60,000,000.

In 1900 I tabulated the results of 30,430 analyses made by the Department of Agriculture and State experiment stations, classifying and averaging them by States, and the significant fact was disclosed that the New England tests outranked those made in the West. My interests at that time being confined to the far West I also lost sight of these eastern tests until they were called to my mind in 1906, and they then were laid before Senator Gallinger, of New Hampshire, and the Secretary of Agriculture, both of whom were enthusiastic over the prospect of establishing the industry in New England. But for the illness and final death of the department field official who was delegated by the Secretary to conduct an exhaustive line of new experiments, the probabilities are that to-day New England would be producing a portion if not all of her sugar requirements.

The tabulation of early experiments conducted in New England and in Michigan, Colorado, and California, the three States which since have become our greatest sugar producers, is as follows:

	Size of beets.	Sugar content.	Purity.
	<i>Ounces.</i>	<i>Per cent.</i>	
Massachusetts, 1890, 6 tests; 1898, 4 tests; 1899, 9 tests.....	21.0	13.2	82.2
New Hampshire, 1891, 1 test; 1898, 2 tests; 1899, 4 tests.....	22.0	14.3	84.4
Vermont, 1897, 8 tests; 1898, 68 tests; 1899, 16 tests.....	22.0	13.2	82.3
California, 93 tests, covering 7 years.....	21.3	13.6	83.9
Colorado, 536 tests, covering 7 years.....	20.5	13.9	80.0
Michigan, 959 tests, covering 7 years.....	22.0	13.9	80.8
Average of Massachusetts, New Hampshire, and Vermont.....	21.6	13.5	82.9
Average of California, Colorado, and Michigan.....	21.2	13.8	81.5

As will be observed, New England excelled in both tonnage and purity and was but fractionally lower in sugar content. A sugar beet of 13.5 per cent sugar and 82.9 purity will yield considerably more sugar than a beet of 13.8 per cent sugar and 81.5 purity, and hence the advantage was with the New England States, rather than with the three Western States in which the industry since has become one of the most important wealth producers they possess; 290,000 acres of beets yielding them a product valued at \$35,000,000. Had the industry developed in accordance with these tests, New England would have added her quota to our domestic production of sugar, and her farm lands also would have doubled in productivity and value.

New England has the soil, the climate, the capital, the people, the home market and practically there would be no freight charges in distributing the product. If, as the cotton industry moves South to get closer to the cotton fields, your operatives could be given remunerative employment in beet fields and sugar factories and gradually become land owners, as do the laborers and renters in the West, their condition would be improved instead of injured by the change. The West is thankful for the New England capital and brains which have helped to develop its sugar and other industries, but here are green fields with wealth-producing possibilities, right at their doors.

NEW ENGLAND HAS THE AREA.

Some have said that there is not a sufficient area of cultivable land in New England to establish such an industry, but in 1910, New England had 568,000 acres in corn, wheat, barley, rye, and buckwheat,

and nearly one-half as much more in potatoes. As 5,000 acres of beets is sufficient to supply the average modern beet-sugar factory, New England has an abundant acreage with which to build up an extensive sugar factory. The land need not adjoin or lie close to a factory. In the West, the major portion of the beets are shipped in by rail, sometimes as far as 100, and even 200 miles, but the usual area is that covered by a freight rate of 50 cents per ton, which generally covers a distance of 40 to 50 miles, giving an 80 to 100 mile radius from whence to draw the supply.

NEW ENGLAND CROP YIELDS ABOVE THE AVERAGE.

Others have said that the soils of New England are too poor to produce beets, but this opinion is not well grounded. New England farmers have nothing of which to be ashamed and everything of which to be proud when comparing their yields with the average for the United States, for of wheat, rye, barley, oats, corn, potatoes, and other crops their average yield far exceeds the average for the United States. Denmark, with the poorest soil and agricultural climate in Europe, not only supplies its people with the sugar they consume, but is building new factories and preparing to export sugar. Establish the beet-sugar industry in New England and soon some of her 4,000,000 acres which have gone down to hay will be brought back to tillage, as were grasslands in Europe.

NEW ENGLAND NOT TOO FAR NORTH.

Others have said that New England, and especially Maine, is too far north to produce sugar-beets, but the sugar-beet areas of both Denmark and Sweden are 600 miles farther north than is the northernmost point of Maine, and in Sweden the farmers are so anxious to grow beets that the factories have a greater supply than they can use. They are compelled to employ inspectors, whose business it is to see that farmers do not deliver beets from a greater acreage than their contracts with the factories call for. The Canadian factory in Alberta is far north of Maine, as also are the two factories recently erected in Manchuria. The general belief has been that sugarbeets would not thrive in the northerly damp, cloudy climate of Great Britain, but they produce richer beets and more of them to the acre than are produced in Germany, and now are constructing their first modern factory. The richest sugar beets produced in the United States are grown in the vicinity of Billings, Mont., to supply the huge factory recently erected at that point, where so anxious are the farmers to grow beets that they offer contracts for thousands of acres beyond the capacity of the plant.

EFFECT OF THE BEET-SUGAR INDUSTRY ON EUROPEAN AGRICULTURE.

When this industry was introduced into Europe, one-third of the level lands were regarded as worthless, one-fourth of the fields were fallow, and the yield of cereals from the remaining fields was but 12 bushels per acre. To-day rich and poor lands are under the plow, less than 5 per cent of the fields are fallowed, and the average yields

are far in excess of those which are secured in the Mississippi Valley, the most fertile area of like extent in the world.

Of wheat, rye, barley, and oats, Europe, without Russia, sowed 156,000,000 acres in 1907 and harvested 4,000,000,000 bushels, while we sowed 85,500,000 acres to the same crops and harvested but 1,500,000,000 bushels, our virgin soils returning but $18\frac{1}{2}$ bushels per acre, while the average yield from Europe's 100,000,000 acres of rejuvenated soil and 50,000,000 acres of soil which was regarded as worthless prior to the advent of sugar-beet culture, was $26\frac{1}{2}$ bushels per acre.

By reason of the introduction of sugar-beet culture and the scientific system of rotation which it demanded, the combined yield per acre of these four cereal crops in Germany has reached $39\frac{1}{2}$ bushels, an increase of 80 per cent in bushels per acre during the past 30 years, during which time the increase in the United States has amounted to but 6.6 per cent. This is what the introduction of sugar-beet culture has accomplished.

WHY SUGAR-BEET CULTURE IMPROVES THE SOIL.

Important as is the \$60,000,000 annual product of the beet-sugar factories of the West, it is of minor account when compared to the rejuvenating effect which the culture of sugar beets has on the soil. The reason is simple. Consider the conditions in Europe. When sugar-beet culture was introduced their farmers were practicing what is known as the "three-crop system" of rotation—three successive cereal crops, followed by one year of fallowing, in order to rest the soil and to enable them to pull out the dense growth of weeds by hand. They were plowing but 3 to 4 inches deep, and the fertility of the thin layer of loose surface soil was all but exhausted. The grain roots were unable to penetrate the hard soil underneath, and could they have done so it would have been of no avail, for, containing no humus and not having been aerated, it was not fertile. Being a deep rooter, a prerequisite to sugar-beet culture was that the soil be stirred to a depth of 8 to 10 inches. At the outset farmers in northern Europe rebelled at deep plowing, which each year turned up a new and abundant crop of stones to be carted off the fields, just as it would in New England. But once they saw the revolution produced in their yields of other crops, factories could not be erected rapidly enough to treat the beets they would grow.

As in order to leave but one beet in a place, the tender beetlet has to undergo the shock of thinning soon after it comes up, the sugar beet demanded a well-prepared, mellow seed bed. Gathering the sugar in its leaves from the atmosphere by the aid of the light and storing it up in the root, it would not gather the maximum amount of sugar if the light were cut off through being shaded by weeds, and the eradication of the weeds meant not only a further stirring of the soil by cultivation and hoeing, but that they were removed before going to seed, thus leaving weedless fields for succeeding crops.

Being plowed out in the autumn gave an extra fall plowing, which left the land in condition to absorb instead of shed the fall and

winter rains and store up the moisture for the following season's crop.

With the removal of the main root, myriads of fibrous roots are broken off and left in the soil to an average of a ton to the acre, and in rotting they not only deposited humus in the lower strata of soil, but left minute channels through which it became aerated, and hence fertile. The roots of subsequent crops followed these interstices and drew nutriment from two and three times the depth of soil formerly reached, and hence the farmers doubled and trebled their soil without increasing their acreage. It all seems very simple, but it has taken us a long time to realize it, and some of our farmers still are in ignorance.

A large portion of Germany is but a sandy plain, and her enormous crop yields are due to the fact that for each 3 acres of cereals grown her farmers raise 1 acre of hood crops, thus producing a root crop on each field every fourth year. They grow sugar beets wherever possible, and are the greatest producers of this vegetable in the world. So thoroughly do they appreciate the influence of a root crop on the yield of other crops that in sections where there are no factories to which they can sell their sugar beets they grow beets or other root crops and feed them to stock, as they do in Great Britain. But where there are sugar factories, the farmers secure the double advantage of first selling the crop for sugar, and then hauling its full feeding value back to the farm in the residue. For this reason, farm lands and rents are much higher in the vicinity of sugar factories than they are elsewhere.

One of the many advantages of this industry, one which even yet is not fully appreciated in the West, was thoroughly appreciated 73 years ago by David Lee Child. In his book, *Culture of the Beet and Manufacture of Beet Sugar*, published in Boston in 1840, Mr. Child said:

It is supposed that the soil of the West is peculiarly adapted to the beet. We have no doubt of the fact, and that the beet sugar, as a manufacturing concern, will be more profitable there for some time than in any other portion of the country, partly from the distance of the great markets and partly from the cheapness of land and fuel; but we doubt whether any part of our territory is destined to be more benefited by it than the New England and other States, which have hard and poor lands and a lack of manure. In the West, as we are informed, manure is not an object of importance to the farmer except as creating a nuisance and causing expense and trouble to move it out of the way. Nay, we have heard that farmers in that region often abandon their log barns and build new ones rather than remove the manure to the gulleys; but in New England manure is the life and soul of agriculture. If the beet-sugar business can boast of any advantage more particularly preeminent, it is the multiplication and improvement of live stock and manure. This will be in a great measure lost upon the West, while it will be precious beyond calculation to the North, and very valuable to some portions of the South.

What Child wrote about the value of barnyard manure 73 years ago is true to-day, as it was then, since with all the advance in agriculture and chemistry no satisfactory substitute has been found for barnyard manure.

BENEFICENT AGRICULTURAL EFFECTS ARE IMMEDIATE.

It does not require a century in which to rejuvenate worn-out soils. Results quickly follow the establishment of a beet-sugar factory and have from the beginning of the industry. Child cited M. Crespel, one

of the foremost French agriculturists of his day, who was knighted by the French King and several foreign sovereigns for his contributions to agricultural science. He was the owner of numerous farms in northern France, and, testifying before the Chamber of Deputies in 1837, he said:

The culture of the beet has increased remarkably the value of real estate. I lately purchased, at the rate of \$152 per acre, some lands which were let at \$3.80 an acre. Since I have cultivated these lands with beets in a rotation of crops, the number of sheep kept thereon has doubled and the neat stock has trebled. The rents of leasehold property has doubled where the land was of middling quality, and in some cases they have quadrupled.

These results have been duplicated in the United States wherever the beet-sugar industry has been established. The Department of Agriculture conducted an inquiry which covered the increase in farm values from 1900 to 1905. The inquiry reached every township in the United States and the results showed that where sugar-beet culture had been introduced land values had risen to a much greater extent than in other sections, and that in sections where sugar beets were produced the increase in the value of the farms on which sugar beets were grown was much in excess of those in the same locality on which sugar beets had not been grown.

In California, Colorado, Utah, Oregon, Michigan, and Nebraska, the average increase in the value of nonbeet-producing farms from 1900 to 1905, was \$13.90 per acre, while the average increase in the value of farms in the same States on which sugar beets were grown, was \$32.97 per acre or nearly three times as great. In discussing the influence of sugar-beet culture, the Secretary of Agriculture says:

From the best information I have it may be stated: The beet-sugar industry, where installed, has been one of the most potent factors developing agricultural conditions, not only in sugar production, but in all agricultural features associated. Especially is this true in the semiarid West. In this section the ordinary beet-sugar plant necessitates an investment of at least a million dollars for buying the land, erecting the building, procuring equipment, producing the facilities for irrigation, transportation, and other features necessary for successful work.

The capitalization of such a plant and the building of the same is the incentive for projecting many other improvements, subsidiary, but important to agricultural development, such as the dairy, creamery, breeding of animals, feeding and preparing the same for market, also the fruit industry, cereal and alfalfa production, the alfalfa-mill, canneries, preserving fruit, and many other things made possible by the existence of an enterprise capable of capitalizing all farm productive conditions and promoting extensive farm cooperation in many ways.

As this industry develops in the West, it is the main feature attracting and supporting many things and uniting them in an intensive agricultural husbandry. As it works out in the West, it is the "mother lode" of agricultural development. It is and will continue to be the most important medium developing the benefits and promoting the success of our national reclamation act.

Through its by-products in the older States it has asserted a strong influence on agricultural interests. It has stimulated the animal industry and the consequent products of the same.

Its effect on the value of lands is quite varied, according to places and conditions. In all places of the United States its favorable influence in this respect has been quite marked. Examine conditions in mountain States where crops are grown by irrigation, formerly used for grazing, lands worth from \$3 to \$5 per acre. A sugar factory, the means and incentive of an irrigation ditch, has made these lands available for producing sugar beets, the finest fruits, the products of dairy and creamery, the fattened animal for the block; and when thoroughly equipped for these purposes lands are worth from \$100 to \$300 per acre. * * *

In the old farm districts of the Mississippi Valley and farther east, Ohio, Wisconsin, Michigan, etc., rent charges have generally doubled, quite often trebled with the introduction of the sugar factory. It must be presumed that land values would follow such influences in a like degree.

The effect of the beet-sugar industry "on local business generally" has been very pronounced. Where installed, it has remarkably recouped and energized all kinds of local business. It has revived and made over towns already established. In places where towns did not exist it has made new ones which have become important centers of trade. * * *

The sugar industry has had a remarkable influence in the stimulation, elevation, and improvement generally of the live-stock interests. This has occurred in bettering the breeds, increasing the number of stock, and multiplying the productive resources of the stock industry. It has turned vast areas from simple grazing to stock production for all purposes; from producing the "stocker" to producing a good quality of meat for consumption; also dairy and creamery products and breeding fine blooded animals of different kinds.

The sugar industry in extending, promoting, and increasing the facilities for agriculture, in creating a demand for rotation, fertilization, a higher, better knowledge of conditions, resources, and application of methods, has very much extended and promoted the production of all other crops. * * *

From every consideration another potent influence due to sugar-beet culture is the fact that it requires rotation of crops. Wherever it is adapted it is not a rival of other farm productions. It adjusts itself to a systematic cycle of rotation, no matter what be the list of other natural crops. It is not only not a rival of these other productions, but logically it must have them, and promotes them for its own best success. In the older factory districts, this fact is one of the first observable benefits due to the culture of sugar beets.

Every sugar factory management in this country must necessarily call to its aid a thoroughly scientific and practical agriculturist, and under him a corps of assistants equipped and conversant, not only with cultivating sugar beets, but familiar with methods of culture, fertilization, drainage, rotation, and all the necessary scientific knowledge to produce successfully all kinds of crops indigenous to the particular locality. This agriculturist and his assistants are constantly traveling over the sugar-beet producing district of this particular factory, advising farmers particularly in the growth of sugar beets, and generally in the production of all other crops. They are as much interested incidentally in the handling of the lands producing other crops as they are particularly the one in charge. It is these other lands that will produce sugar beets next year.

A sugar-factory district is an "extension course" in agriculture to every farmer in the district, whether he be growing sugar beets or not. It could not be conceived, with such influence constantly in operation, that the sugar industry is not exerting a potent influence most favorable in production of all crops.

AVERAGE INCREASED YIELD OF OTHER CROPS AFTER BEING ROTATED WITH SUGAR BEETS.

During the past three years I have corresponded with hundreds of American farmers throughout the sugar-beet producing States of the West concerning their experience in growing this crop in rotation with cereal crops. Universal enthusiasm is expressed by them, and 115 of the number were able to state their acreage yields of other crops before and after rotating them with sugar beets. The average results obtained by these 115 farmers were as follows:

Average yield.

	Before beet culture.	After beet culture.	Per cent increase.
Wheat.....	28.88	43.07	49.1
Corn.....	41.00	53.10	27.6
Oats.....	40.90	50.60	48.1
Barley.....	38.97	59.40	52.0
Potatoes.....	151.97	222.20	46.0

In arid America the culture of sugar beets and alfalfa are agricultural necessities, for they scarcely can grow and transport low-priced products to eastern markets in competition with the Mississippi Valley; but turning their alfalfa into stock and their sugar beets into sugar, they have products of such value that the freight does not eat up the profit. The necessity in New England is for a crop which will rejuvenate its worn-out soils and bring them back into tillage. Europe accomplished it with sugar beets; New England can accomplish it in the same manner.

EARLY FAILURES IN THE UNITED STATES.

In view of the possibility of the sugar beet becoming the means of the revivifying of New England agriculture, allow me for a few sentences to call to your mind the truly strange career of this humble vegetable in this country, where half a century ago every investor in it sunk his fortune.

In 1835 it started on its serpentine course of disaster at Philadelphia, where two Germans, Vaughn and Ronaldson, built the first factory. From Philadelphia it wound its way up to Northampton, Mass., where David Lee Child erected a little factory and was assisted by the French consul at Boston, M. Isnard. As stated before, they also failed.

From Northampton it migrated to Portland, Me., where the factory failed because the farmers starting for the factory with a load of beets were offered more for them for cattle-feeding purposes than the factory, with its crude equipment, was able to pay. Since that time the sugar beet has been bred up to contain 16 to 20 per cent of sugar, and had they secured such beets as New England can produce to-day, and had they possessed the half million dollar equipment of machinery since invented, and with which all American beet-sugar factories now are equipped, they could have doubled the price paid for beets and thereby have secured an ample supply.

In 1852 this would-be industry wandered across the plains to Salt Lake City, where the Mormons imported the machinery from France and hauled it overland from Omaha by ox teams. From there it returned to the East, to Chatsworth Park, Ill., to Freeport, Ill., to Black Hawk, Wis., to Fond du Lac, Wis., east to New Jersey, and then headed west again, traveling across the continent to California, where it wandered up and down the coast for several years, and finally, at Alameda, Cal., in 1879, E. H. Dyer brought success out of 50 years of failure and losses of \$2,000,000 in seven different States.

From that time on, its course reminds one of the discovery of gold at Cripple Creek, where miners had tramped over the precious metal for years, in ignorance of its existence. The westward course of disaster in the beet-sugar industry was to be succeeded by an eastern course to be crowned with success.

The failure of 1852 in Utah became a success in 1891. Wisconsin's early failures turned into success in 1901. The Illinois failures of 1863 and 1870 became a success in 1905. The 418 recent tests made in Pennsylvania which showed an average sugar content of 12.66—a purity of 81.8—and a tonnage of 15.63—would have brought unlimited success to Vaughn and Ronaldson if they had possessed the necessary knowledge and equipment.

Who dare assert that Portland, Me., or Northampton, Mass., which latter produced the first beet sugar in the United States, shall not in the near future become the seat of a prosperous sugar industry and reap the reward which the pioneers deserved but failed to secure?

CONTRAST IN GOVERNMENT POLICIES.

The industry was not out of its swaddling cloths when our beet-sugar pioneers went down to defeat. But the rulers of Europe perceived its value to their national economy and nursed it, with the result that they now produce as much sugar as is supplied by the Tropics and, having doubled the supply, have lowered the price of sugar for the world.

While Europe's policy of encouragement to the beet-sugar industry has been steadfast, that of the United States, if it has had a policy, has been wavering and unstable, legislators seeming to be ignorant of the indirect agricultural advantages to be derived from producing our sugar supply from beets. Even in the present day when the high cost of living is absorbing the attention of every consumer, rich and poor, little or no heed is paid to the fact that the general introduction of this industry would double the yield of our fields and the stock-carrying capacity of our farms, and while enriching the farmer, would lower the price of food commodities, thereby benefiting every consumer in the land.

THE HIGH COST OF LIVING.

Our best western Government lands largely have been absorbed, and the country youth of the West, unable to secure attractive homesteads, is flocking to British America in ever-increasing numbers.

While the producing class of the West is being drained of its best blood, the consuming class of the country is being increased by the immigrants who land in New York and flock to the cities rather than to the country.

Our western ranges have been broken up, and as a result of the decline of the cattle-grazing industry, within the past week beef cattle on the hoof at Chicago sold at the highest figure reached since the Civil War.

Our agricultural imports in 1910 exceeded those of 1900 to the value of \$267,000,000, an increase of nearly one-third. During the same period the value of our exports of breadstuffs fell off \$130,000,000, or 50 per cent. The value of our exports of animals declined from \$43,000,000 in 1900 to \$17,000,000 in 1910, or 40 per cent, while the value of meat exports declined \$15,000,000. The value of our exports of all agricultural products except cotton has fallen from \$600,000,000 in 1900 to \$420,000,000 in 1910, which is \$266,000,000 less than the value of our agricultural imports. Not including cotton, the United States has become an importer instead of an exporter of agricultural products.

Our increase in the production of farm products is not keeping pace with the increase in the number of consumers. Unable to supply fresh lands to settlers and unable to attract people from the cities to the farms, to what must we have recourse? To an increase in the crop yields of the fields which already are under cultivation. And

how best can this increase be assured? By adopting a simple method which involves no expense, a method which never has been a failure, but on the contrary, has been an unqualified success in every country of Europe.

With all the agricultural science we have employed and all the virgin lands we have added to our cultivated area, our combined yield per acre of wheat, rye, barley, and oats has been increased but 6.6 per cent during the past 30 years, while Germany, through the introduction of sugar-beet culture, has increased its average yields of the same crops 80 per cent during the same period, and now of these crops secures an average yield of 39.45 bushels per acre from her rejuvenated soils, as compared to our average yield of 21.6 bushels from the virgin soils of the United States.

These results are not confined to Germany. The thinking men of Europe have accomplished their purpose through introducing and extending the beet-sugar industry to a point where not only does continental Europe supply its 400,000,000 people with all the sugar they consume, but with an annual surplus for export, valued at \$175,000,000, while the United States continues to import sugar to the value of \$100,000,000 a year and to cultivate 18 acres of land in order to secure as many bushels of grain as Germany harvests from 10 acres.

In this connection the fact is worthy of note that none of these nations encouraged the domestic production of sugar because of a belief that it could be produced at home more cheaply than it could be imported from the Tropics. The cost of the sugar was, and is, of secondary importance. One and all encourage and protect their domestic sugar industry, because of the incalculable benefit which comes from the increased yield of other crops through rotation with sugar beets.

While we have been speculating as to the wisdom of certain scientific treatments of the soil and how much this or that fertilizer would add to the yield and to what extent the farmer could employ it with profit, Europe has solved the problem of crop yield by merely adding a new crop to the rotation, a crop which more than pays for itself and hence involves no added expense. The experience of a century has demonstrated the fact that the general introduction of sugar-beet culture would solve the problem of the high cost of meat and breadstuffs.

Inasmuch as New England is in the sugar belt, inasmuch as her soils would be so greatly benefited by adopting beet culture, and inasmuch as her great dairying interests need the rich by-products for stock food, it seems little short of criminal that some of the New England capitalists who have invested in western beet-sugar factories should not have started the industry in their native States.

And now, if at last, by the aid of modern technical and agricultural science, the modest sugar beet can be made to reclaim the abandoned farms of New England, we will reverse the phrase and say, "Eastward the star of empire takes its course."

Your views on national economies embrace the struggling industries of the West and South, and if I have been of service in directing your attention to the economic importance of this industry for your section, or can be of assistance in its establishment therein, I shall be most happy.

Sincerely, yours,

TRUMAN G. PALMER.

DR. PAASCHE, VICE PRESIDENT OF THE GERMAN REICHSTAG, ON THE
INFLUENCE OF SUGAR-BEET CULTURE.

Herr H. Paasche, Vice President of the German Reichstag is one of Germany's foremost thinkers and is a recognized authority on sugar and sugar-beet culture. He is the author of *The World's Sugar Production*, a volume of 338 pages which for years has been considered a standard publication throughout the sugar world.

Dr. Paasche has visited the principal cane and beet sugar producing countries of the world, and in July last arrived in America on his fourth visit to this country. The Springfield (Mass.) Union of July 14 contained a full-page interview with Dr. Paasche. The following editorial is from the Augusta (Me.) Journal of August 5, 1912:

It will surprise the average American accustomed to consider that his country's claim to supremacy as a food-growing nation is based on its yield of wheat and corn to be told that the United States will soon lead the world in the output of another great food crop, namely sugar. Yet this is the prediction of no less an authority than Herr Paasche, former vice chairman of the German Reichstag and prominently identified with the development of the German beet-sugar industry, who is now in this country on a tour of inspection. "The United States has every condition necessary to a great and rapid development as a sugar producer," said Herr Paasche, "it is the only country, so far as I know, that can grow both beet and cane sugar within its borders. You have hundreds of millions of acres of land adapted to the growing of sugar beets. You have thoroughly up-to-date beet-sugar factories manned by experts, and you have here at home the greatest sugar market in the world. In a few years I expect to see you growing all the sugar required for your own use and possibly more besides."

It was pointed out to the German leader that Congress might decide that it would be wiser to purchase our sugar supply abroad instead of growing it at home and might pass a free sugar bill to bring this about, but he declined to take this possibility seriously. "From selfish motives we would be glad to see that happen," he explained, "but you Americans are too clever voluntarily to give up the advantages you will enjoy from the building up of this industry. The use of root crops, particularly the sugar beet, in rotation with cereals is at the foundation of the great improvement in agricultural conditions that has taken place in Germany and the adoption of the same plan here will result in a vast increase in your output of all your principal farm crops."

EXTRACT FROM "NOTES ON THE BEET SUGAR," BY EDWARD
CHURCH, NORTHAMPTON, MASS., 1837.

But an abundant supply at a cheap rate of a very essential article of consumption, important as it surely must be considered, is not the only advantage to which we are to look in the culture of the sugar beet. Every man who has the least knowledge of agriculture is aware how important to the improvement of the land is the introduction of a culture destructive to weeds; artificial meadows will not alone answer the desired object; weeded crops must form a part of a sound system, and it is to these that Flanders and some other countries owe their agricultural riches. The establishment of manufactories of beet-root sugar would unquestionably be the most effectual means of introducing this, with the best rotation of crops, and producing one of those rare and happy revolutions in the prosperity of a nation which, if not thoroughly understood by contemporaries, will nevertheless be noted by posterity as an epoch in its agricultural and commercial wealth. It must not be supposed that the benefits anticipated will be limited to the extent of territory necessary for the



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supply of the raw material for these manufactories; o
benefits of the root crops are clearly demonstrated, as they unquestionably must be by the wants of the sugar manufacturer, farmers will see that not only beets, but potatoes, carrots, and many other varieties cultivated as food for cattle, offer an easy and profitable means of varying their rotations and supplying at the same time the largest possible amount of nutriment for their stock, and as a consequence the best way of producing manure in abundance and therewith ample stocks. That this has been the constant result of the establishment of beet-root-sugar manufactories in France the surrounding country clearly shows; they not only confer a benefit on their neighborhood by the capital expended therein, but teach the inhabitants how they can employ this capital most usefully; the consequence is that a sentiment almost amounting to enthusiasm is now felt in that Kingdom in favor of these new undertakings. Russia, Prussia, Germany—indeed, the whole Continent of Europe—has awakened to the primary importance of indigenous sugar. With such examples before us can it be for a moment admitted that our country, with all its advantages of soil and climate and a people inferior to no other in enterprise and genius, should long remain behind the rest of the civilized world in the pursuit of an object so eminently important? I have no such fear, but on the contrary a firm belief that if she was not the first in the race she will not long lag behind.



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