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IS THE BEET SUGAR INDUSTRY DESIRABLE?

In a recent issue of the Forum, Mr. Edwin F. Atkins, the able economist and statistician, has published an article which seems to be in the nature of a protest against the introduction and extension of the beet root industry in this country. Mr. Atkins' article comes at a time when much earnest thought is being given to the production of this staple. It is only within the last month that the establishment of a large plant for treating this product has been opened in this State, the first we believe that has been established in the East. A number of such plants have been established in various parts of the West, and several of them have been described in detail in the SCIENTIFIC AMERICAN.

Mr. Atkins' protest, if such it may be called, for the questions he propounds are put rather in the interrogative form than as a positive assertion of fact, may be divided naturally into three principal parts. He begins by pointing out that most of the advocates of the beet root industry base their arguments upon the fact that our imports of foreign sugars amount to $80,000,000 annually. It is the aim of our economists to try and save the country the burden of having to pay out this large sum. Mr. Atkins goes on to show that the crops of Germany, Austria, France, Russia, Belgium and Netherlands combined exceed some 2,300,000 tons, but that this enormous production is the result of an artificial stimulation, which in the way of bounties has imposed a heavy burden upon the governments of these countries. These products are sold at a price less than the average cost of production, only the best equipped and most favorably located factories being able to make any profit upon their capital and operating expenses. He then asks whether it is wise for us to enter into competition with these countries. We can hardly look at this matter in this faint-hearted light. We believe that although in certain localities the price obtained may not exceed the cost of production, it should be borne in mind that protected by our high tariff the American producer can look to a margin of profit which does not exist in the case of his foreign brother, and that therefore, assuming he may be able to produce at the same cost as the European farmer, he may be still able to sell at the current market price and yet make a comfortable profit over the cost of production. This we can readily follow without touching upon that vexed question of federal or state bounties.

The question of revenue is next taken up, and it is pointed out that under normal conditions, Uncle Sam derives about $50,000,000 of revenue from the sugar tax, taking last year's importation of 1,450,000 tons as a basis of computation. It is then asked, what is going to become of Uncle Sam if this large revenue should be cut off? Our understanding of the objects and aims of our system of import duties is not that they are imposed with the object of hindering or curbing the development of any established industry or product, but rather of fostering such enterprises. We cannot see, therefore, how such an argument can be allowed to stand in the way of our internal development. It might be stated, with equal propriety, that it is a disadvantage for our people to grow wool or produce wines because of the enormous revenues which the government would receive in case all such articles had to be imported from abroad.

The third argument advanced by Mr. Atkins touches the question of the mode of payment of these large indebtednesses. He goes on to show that these sugars are not paid for in cash, but with our own commodities, which are sent in enormous quantities in exchange therefor. He publishes a table in which he shows that to the fifteen countries furnishing us with sugar valued at $82,554,183 we have exported merchandise reaching the enormous sum of $219,708,653, the major part of which exports were agricultural products.

About twenty-five per cent of the total imports from the countries mentioned consisted of sugar. He then states that these countries would be involved in ruin were it not for this export trade, and that they would not be able to pay us for such purchases as they might wish to make, and that the European countries, not being able to sell us sugar, would turn their attention largely to the production of the agricultural products they are now taking from us. It seems as if it were a somewhat false position for us to assume, that we must curtail our home productions and industries in order to maintain foreign trade relations. Were such a theory carried to its legitimate practical conclusion, we should ever be on our guard in developing our home industries for fear that by so doing we should jeopardize the market for the exportation of our own products. On general principles there is no more reason why we should take measures to prevent the production of the beet root than we should to prevent the establishment of woolen or cotton mills, through fear that by so doing we should not be able to hold our export trade with some foreign nation with whom we now have reciprocal trade relations.

We believe it is to our advantage to produce as much as possible of the various articles which it is now necessary for us to import from abroad, and we believe that any system of restriction in order to maintain foreign trade relations would be distinctly a retrograde movement and harmful to our industrial development.

Mr. Atkins, we think, is somewhat inconsistent in his following inquiry: What would be the gain to American farmers should they produce beets at the sacrifice of their market for wheat, grain and other products? With wheat selling at $1 a bushel, he believes that Europe will probably decrease its sugar sowings and increase its sowings of the wheat which had been neglected. He points out that with a policy of extreme protection, it will probably react upon us abroad another year, especially in view of the present high prices, and that the production of grain may be excessive at a time when our producers will be most in need of a foreign market. From our point of view, this states the very reason why it is possible, and even probable, that we should forward as much as possible the growth of the beet. If it is believed that Europe shall be induced to extend her planting of cereals and decrease her sugar growth, certainly this is the time for us to choose to take a step in the direction of establishing ourselves more firmly in the production of the sugar beet.

In another column may be found an account by an expert on the present growth and condition of the beet sugar industry in the United States.

THE APPLICATION OF ELECTRICITY TO STEAM RAILROADS.

One of the most important papers that has recently appeared on the subject of electrical traction was read by Colonel N. H. Heft, chief of the electrical department of the New York, New Haven and Hartford Railroad, at the convention of the American Street Railway Association at Niagara. Our readers will remember that the author of the paper has had charge of the costly experimental work which the New Haven Railroad Company has been carrying out to determine the applicability of electric traction to standard steam railroads. The roadbed, equipment and power plant of the new system was very fully described and illustrated in two articles in the SCIENTIFIC AMERICAN of June 12 and 26. Briefly stated, the experiments consisted in the electrical equipment of seven miles of track between Nantasket Junction and Pemberton, where the overhead trolley was used; and later the equipment with the third-rail system of three and a half miles on the Plymouth Division, and twelve and a half miles on a line running from Berlin to Hartford. The last of these lines (from Berlin to Hartford) has now been running for half a year, and in the paper read at the convention Colonel Heft was able to give the results of what is undoubtedly the most important and reliable test of electrical traction on steam railroads that has yet been made.

The paper, which is too lengthy for reproduction in the columns of the SCIENTIFIC AMERICAN, will be found in the current issue of the SUPPLEMENT. We give, however, some of the more important facts which were mentioned by the author. In the first place, the company are more than ever convinced of the importance to any transportation agency working in a thickly populated territory of uniform fares and a frequent and regular train service—one which requires no printed schedule. On the Nantasket Beach line, before the advent of electricity, the fare for a certain distance was twenty-eight cents; when it was electrically equipped, a half-hourly service was given and the fare was cut down to ten cents. The result has been that the first summer, 1895, showed an increase of 92·6 per cent in the number of passengers carried: the following summer showed an increase of 45·1 per cent over 1895, and the summer just passed showed an increase of 300 per cent over the number carried in the last year of steam traction.

The line between New Britain and Hartford, 9·3 miles in length, runs in direct competition with a trolley line between the same points. The time by the latter is fifty-five minutes and the fare fifteen cents as against less than twenty minutes by the third-rail line and a fare of ten cents The trains were run on a half-hourly schedule, and the sound financial policy of the reduction of the fare from twenty-three cents to ten cents is shown by the fact that during the three summer months 400 per cent more passengers were carried than during the corresponding months of last year, when steam was yet in use on this line.

In the matter of practical operation the electric motor has again demonstrated its special adaptability to a service in which stops are frequent and rapid accelerating power is at a premium. On the Nantasket Beach line, 10·6 miles in length, there are no less than seventeen stations, the average distance between which is about 0·6 of a mile, yet the whole distance is run at an average speed of 24·6 miles per hour, including the sixteen stops—a feat that is entirely beyond the power of steam locomotives. The 9·3 miles between Hartford and New Britain were covered regularly by motor cars with two trailers in from 18 to 20 minutes at an average speed of about 30 miles per hour, and with a special high geared motor a maximum speed of over

60 miles per hour has been made; the entire distance of 9·3 miles being covered in ten minutes.

The electric motor compressed air brake (Westinghouse type) has given excellent satisfaction. With regard to the third-rail transmission, it is stated that the contact shoes have proved satisfactory, though they have occasionally been carried away by the approach blocks at grade crossings. The system of insulation adopted has also given good results, as shown by the fact that when the ties have been two inches under water, as has frequently happened, it has been possible to operate the road without the slightest difficulty, the electrical output at such times, as recorded by the wattmeter, being normal. The bonding of the service rails with four copper leaf bonds, having a combined conductivity equal to that of the rail, has shown on careful test that the joints have slightly greater conductivity than the rails themselves.

The dangers of the third rail have proved to be lighter than anticipated, if, indeed, they can be stated to exist. People have stepped from the ground to the third rail without feeling the current. Many employes have at times received, through carelessness, the heaviest shock possible with little inconvenience, and those who are highly susceptible to electric shock have recovered fully in a few minutes after receiving the current.

On the score of economy of operation, it is difficult to give comparative figures, for the reason that the company is burning "sparks" (half consumed coal from the locomotives) in the boiler furnaces of the power house. At the Berlin power station, which is not being worked at anything like its full capacity, the cost of fuel, with the use of coal, has been nine mills per horse power hour, or twelve mills per kilowatt hour. When sparks are used the cost is three mills per horse power hour, or four mills per kilowatt hour.

STILL ANOTHER DODGE TO DEFRAUD PATENTEES.

The allurements held out to patentees by the many so-called "Patent Brokers" to put inventions in their hands for sale are now pretty well known, and it is only the unwary, unfamiliar with their many ingenious methods, that suffer loss.

Our attention has been called to a dodge which for plausibility and smallness of expected results is somewhat remarkable. The usual typewritten form is avoided; but instead a letter in the handwriting of the broker is sent to the patentee, assuring him that he has parties anxiously waiting to purchase the patent at the price the patentee asks, but, like every prudent purchaser of real estate, will not pay over the money until an abstract of the title of the patent is furnished. He (the broker) must have this abstract of title before his party will be prepared to close the bargain, and the patentee is recommended to employ some confederate in the same or some other place to secure the abstract, as he (the broker) has nothing to do with the soliciting of patents. The patentee generally has not sold any part of the patent and his title is good, but, being confused by the statement presented and attracted by the prospect of a quick sale, writes to the confederate for terms to secure the abstract of title.

The latter replies, quoting a stiff fee, and, if the remittance comes from the patentee, secures the abstract and sends it to him. The patentee then forwards the abstract to the patent broker and asks for a prompt closing up of the business, but either fails to get a reply or, if he does, one at least that is evasive. In the meantime the confederate divides the profit in the transaction, perhaps four dollars, with the patent broker who wrote the first letter. If, however, the patentee secures his own abstract of title and sends it to the patent broker, the latter replies that his prospective buyer became tired of waiting and went home, but had telegraphed him to come to his place, if all was straight, and close the sale. The broker also informs the patentee that he will be glad to visit the prospective purchaser if he (the patentee) will remit a sum (naming it) sufficient to cover his railroad fare, or instead of the money he may send a railroad ticket, which of course the patent broker could sell and secure the money therefor. Thus the patentee pays well to secure the abstract and at the same time is chagrined to find the supposed sale on which the abstract is based is bogus. Abstracts of title can be readily secured at small expense, either by the patentee himself or a reliable attorney.

Another form of fraud comes from an alleged finance company in London, who are acquainted with many large English manufacturers contemplating the purchase of factory sites in the United States in consequence of the new tariff. Numerous inquiries are made concerning rights to manufacture under American patents, and the American patentee is asked what is the lowest figure he will take for his invention.

Before the patent can be placed, a legal investigation into its scope, validity, etc., will be necessary, for which a moderate fee is called for and asked to be remitted without delay, and a commission will also be deducted, should success attend a sale. Unless the terms proposed are fully complied with, the American patentee is requested not to reply. Here, as in the other case mentioned, the prospect for effecting a sale of the patent is the chief incentive set forth for the patentee to comply, and we imagine by many the motive will be easily discerned. It is to be hoped the exposition of these fraudulent schemes will result in their limitation and prevent many would-be patentees from being defrauded.

POST OFFICE FRAUD ORDER ISSUED AGAINST WEDDERBURN & COMPANY.

A fraud order has just been issued by the Post Office Department against John Wedderburn, John Wedderburn & Company and the National Recorder. An order of this kind deprives the parties against whom it is directed of all use of the United States mails. Hence all mail received for the parties mentioned at the Washington post office will be marked indicating that the business of these attorneys is fraudulent and will be returned to the senders. Money orders sent to the firm or the paper will be similarly dealt with.

It was stated at the conclusion of Assistant Commissioner Greeley's report on the Wedderburn case that the fact that the United States mail was being used by the respondent to promote schemes of fraud was called to the attention of the Post Office many months before the investigation. The report says, "The matter was placed in the hands of an official of that department who, for some reason, failed to do his duty. He has since, I am informed, been dismissed, and criminal proceedings against him for misconduct in office are pending."

About three weeks ago Gen. Tyner, Assistant Attorney-General for the Post Office Department, commenced an investigation in which he departed from the usual course in such cases by granting attorneys for Wedderburn & Company an extended hearing. The case was placed before the Postmaster-General, who, after careful consideration, decided that the fraud order should be issued.

The United States statutes under whose authority this action has been taken forbid the use of the mails by any persons conducting "schemes devised for the purpose of obtaining money or property under false pretenses," etc., and the Postmaster-General has authority to issue fraud orders "upon evidence satisfactory to him."

JAMES E. SIMPSON.

Mr. James E. Simpson died October 27, at Fall River, Massachusetts. Mr. Simpson is very widely known on both the Atlantic and Pacific coasts of the United States, among ship builders, ship owners and shipping merchants, he being the patentee and originator of timber graving docks. Mr. Simpson was born July 13, 1813, and was therefore in his eighty-fifth year. The earlier portion of his life was devoted to the building and repairing of vessels, and while so engaged the idea of timber graving docks was conceived by him, and with the courage and energy which characterize the man, he carried out successfully the Simpson system of timber dry dock construction, which system has gained a world-wide reputation. Our Atlantic coast is dotted with these monuments of his skill, and there are also docks of his construction in the British possessions northeast of our own territory. The United States government, as well as the Colonial government of Newfoundland, have, from time to time, commissioned him to build dry docks for public uses.

THE Commissioner of Patents, Hon. Benjamin Butterworth, was suddenly subjected to a severe attack of pneumonia the first part of last week, while he was stopping at the Hollenden Hotel, Cleveland, O. For two or three days his life was almost despaired of, and his family and near friends were called to his bedside. The latter part of the week, however, his condition greatly improved, and the advices as we go to press are to the effect that he will probably recover. This, it is to be hoped, will be speedily followed by his early restoration to complete health, as the Patent Office could ill afford at this time to be deprived of his services.

WHILE the pioneer work of exploration has been to a great extent accomplished in Africa, and the lines have been run in all directions, says the Popular Science Monthly, Mr. Scott Keltie speaks of the broad meshes between these lines as still needing to be filled in; and one or two regions yet remain that afford scope for the adventurous pioneer. One region of considerable extent, still practically unknown, is south of Abyssinia, and west and northwest of Lake Rudolf, on to the upper Nile. Another extensive area is in the western Sahara. All over the continent are regions that will repay special investigation. Even in northern Africa, an English traveler, Mr. Cowper, has found, not far from the Tripoli coast, miles of magnificent ruins, and much to correct on our maps; and but little is known of the interior of Morocco and the Atlas Mountains.

THE AMERICAN BEET SUGAR INDUSTRY.

In the struggle to gain a foothold in the agricultural economy of this country the history of the sugar beet has simply repeated itself. Europe scoffed at the idea of extracting palatable sugar from such a common garden vegetable when in 1747 one Marggraf, a member of the Berlin Academy of Sciences, announced that, after experimenting with various plants, he found the sugar beet richest of all in saccharine matter, his analyses showing a content of six per cent. Her scoffing availed, Marggraf could not secure the aid necessary to the pursuit of his investigations and was consequently obliged to abandon his project. Half a century later a pupil of his, Acharot by name, who had followed up his master's theories, obtained such excellent results that in 1799 he called the attention of the French Institute to the possibilities of this new factor in agriculture. That body heard him willingly and found the discovery worthy of its profound attention. Later on the great Napoleon became interested in the subject, foresaw the value of the sugar beet to France and in 1811 issued an imperial decree in its behalf. When he was overthrown, the industry—for such it became under his fostering care—almost went down with him, only one factory surviving the general disaster, but it gradually recovered until at length France had hundreds of plants. Germany in the meantime had awakened to the fact that it was neglecting a matter of vital interest to the nation. The industry soon made rapid strides there, and to-day sugar factories dot the landscape all over the country. Austria-Hungary, Russia, the Netherlands and even Scandinavia followed the lead, and while in some of these countries the development has not been very great, whatever headway that has been made has been gained only after tedious difficulties in overcoming prejudice.

So it was in this country that the industry has become established here only after repeated setbacks, shipwrecks being strewn along its path for half a century. As far back as 1830, or about the time that it really obtained a permanent footing in France, the manufacture of sugar from beets was attempted near Philadelphia, with most disastrous results. Eight years later another experiment was made at Northampton, Massachusetts, but with no better outcome. Then interest lagged for twenty-five years or so, when a factory was put up at Chatsworth, Illinois. It was run unprofitably for a few seasons and then removed to Freeport, in the same State. Here again failure was encountered and a part of the machinery was taken to Black Hawk, Wisconsin. Meanwhile experiments had been made at Fond du Lac which attracted the attention of capitalists, with the result that the field of pioneer work was transferred to California, where at length—in Alvarado—the first successful beet sugar plant in this country was established. Later on a second one was built at Watsonville, near San Francisco, so that at the beginning of 1890 two factories were permanently located. In the fall of the same year the plant at Grand Island, Nebraska, began operations, and, responding to the provision for two cents a pound bounty on refined sugar in the McKinley act of October, 1890, three more plants were built the following year—one at Lehi, Utah, one at Norfolk, Nebraska, and one at Chino, California. Under the same act a factory also went up at Staunton, Virginia, which, however, was not long after destroyed by fire. A change of administration, followed by the repeal of the bounty in August, 1894, stopped further progress in the industry until 1896, when a plant located in Berthierville, Canada, was removed to Eddy, New Mexico, and operated there. Another one was also built at Menominee Falls, Wisconsin, but, not being completed in time to work the crop, the company erecting it failed. The past summer the second of the Canadian factories was removed from Farnham to Rome, New York, and will begin its first campaign there this fall. These two Canadian factories, by the way, were omitted from particular mention because they were not located in the United States. Their aggregate output for the past four years has been only 1,400 tons — a mere bagatelle. A new plant has also been installed this year at Los Alamitos, California, and within the past few years both the Watsonville and Chino factories have been enlarged to double their original capacity.

This fall, therefore, we shall have in operation nine beet sugar plants whose daily capacities in tons of beets per day of twenty-four hours each are approximately as follows:

Watsonville, Cal.	1,000
Chino, Cal	850
Alvarado, Cal.	400
Los Alamitos, Cal.	350
Lehi, Utah	400
Grand Island, Neb	400
Norfolk, Neb.	400
Eddy, N. M.	200
Rome, N. Y.	200
Total	4,200

Last year the seven of these plants that were then in operation produced about 40,000 tons of sugar. What the output of this season will be can only be estimated roughly at this date, but it ought to be between 45,000 and 50,000 tons.

(To be continued.)