

# THE BEET SUGAR INDUSTRY.

Promises Much For States Favored With Proper Climatic Conditions.

## NEW CASH CROP FOR FARMERS.

At Binghamton, Broome County, N. Y., is located a factory which manufactures each day during the working season from twelve to sixteen tons of pure granulated sugar. The popular notion usually associates sugar with sugar cane and with tropical climates. But this popular notion must change, for the sugar supply of the world will soon be manufactured from the beet. Two factories are now in operation in New York State, one at Binghamton and one at Rome. A large sugar factory is also located at Bay City, Mich. Other factories are being planned in New York and Michigan, and it will be but a short time before this industry of the manufacture of sugar from beets will come into wide prominence. So important is the industry likely to become that a description of the Binghamton factory and the methods of extracting the sugar from the beets will prove of interest.

The factory is located some three miles from the city of Binghamton on the Delaware, Lackawanna & Western Railroad. The main building is a substantial brick structure, and the storage room for the beets is partially provided for by four mammoth sheds, each 460 feet long, sixteen feet wide, and twelve feet high. It was thought that these sheds would furnish sufficient storage room for the beets, but, from the photograph, it will be seen that many carloads have been dumped upon the ground; indeed, there are apparently more upon the ground than in the sheds, and they are being received from the farmers at the rate of 100 carloads each day. In the spring of 1898 some 2000 acres of beets were contracted for; the farmers agreeing to raise the beets and the company agreeing to pay \$5 per ton for the same.

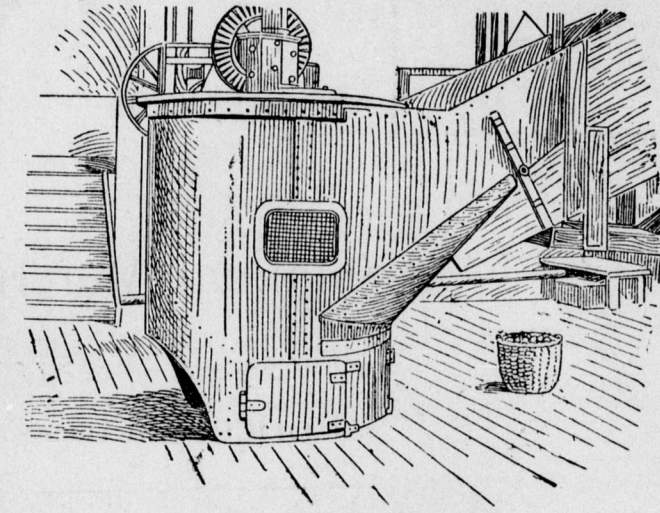
Upon the arrival at the factory the beets are unloaded from the cars into



PUTTING THE BEETS INTO SLUICE OF HOT WATER TO WASH.

the sheds or upon the ground in the yard. Underneath each shed, and running its entire length, is a sluiceway through which runs water which has been heated to the boiling point in the factory. The beets are rolled into this sluiceway and the current is sufficient to carry them to the factory. The warm water so soaks and loosens the dirt that it is easily removed when the beets get to the washing machine. When the beets are unloaded into the sheds the hand work upon them is completed, and from that time they are carried forward by water or by machinery. As they near the end of the sluiceway they are seized by a screw elevator and raised to the factory, where the first operation is the washing. They are dumped into large tanks where revolving arms attached to a horizontal axis thoroughly churn them around and constantly work them forward toward the clean water. They pass from the first washing tank into a second one, and here the process is repeated and the beets are thoroughly cleaned. From the washing tanks they go to the bucket elevators and are carried to the top of the building. The next operation (pulping the beets) is done by a system of knives or scoops fastened to a horizontal wheel. The knives have scalloped edges and are situated at the bottom of a large hopper. As the beets come down upon these rapidly revolving knives they are literally cut into shreds or pulp. This pulp is put into what is called the "diffusion bat-

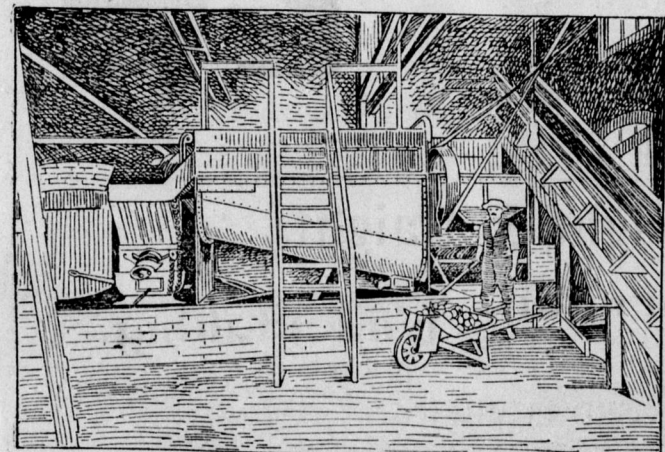
hausted of its sugar content. The waste pulp is carted out of the building and is almost entirely a waste product. It is relished by stock, and no doubt will soon be prized as stock food. The juice is drawn from the battery and a measured quantity is passed on to the lime tanks. Here it comes in contact with the milk of lime, which removes certain impurities. Carbon dioxide, which has been stored from the burning limestone, is forced into the mixture of milk of lime and the juices from the diffusion battery, and the



THE MACHINE FOR SLICING THE BEETS.

lime is precipitated with the impurities which it has absorbed. After passing through various mixing tanks, the juice passes to the filter presses. Here the juice is forced through cloth and comes out almost as clear as water. After passing through two sets of these filter presses, the juice goes to the bleaching process. This is done by means of fumes of sulphur. The juice is made to drip slowly over a board filled with holes, and the sulphur dioxide is brought into intimate contact with every drop. All of these processes are preliminary to the "boiling down." After bleaching, the juice goes to what is called the "triple effect vacuum pans." These pans are simply large upright boilers which have had the air partially exhausted by means of pumps. The liquid boils violently in them at a temperature of seventy degrees Fahrenheit, and the "boiling down" is greatly hastened. From the first boiling the juice goes to the sulphuration tanks, where it is again bleached. After passing again through the filter presses, all traces of sulphur and other impurities are removed. The "boiling down" is then completed in vacuum pans. The next operation is performed by the centrifugals. In these rapidly revolving cylinders the molasses is thrown off from the particles of sugar. The principle is the same as in the common milk separator, where the cream is thrown out from the milk. The sugar is very damp after being separated from the molasses, and is dried by being passed through a long, slowly revolving cylinder. This cylinder is raised at one end and the sugar is slowly moved along, passing over heated steam pipes until finally it comes out of the other end of the cylinder as crystallized sugar.

The most troublesome product to handle is the molasses, which is separated from the sugar by the centrifugals. It is stored in large tanks in a room heated to a temperature of about 115 degrees Fahrenheit. After remaining there for three weeks, it becomes partially crystallized and is then taken out and run through the mill again, and a portion of the sugar is extracted. It is believed that American inventive genius will devise machinery by which



THE MACHINE THAT COMPLETES THE WASHING OF THE BEETS.

tery." This battery is really a system of great tanks so connected that the water can pass from one to the other. The water is put in upon the beet pulp and the sugar is soaked out, the water being passed from one tank to another until it has become saturated, when it is drawn off. The fresh water is always put in upon the pulp, which is most nearly ex-

hausted of its sugar content. this molasses can all be treated at once without the necessity of storing, and the sugar all removed. Indeed, it is said that the factory at Bay City, Mich., is so equipped that all the sugar is extracted within twenty-four hours.

Not all the sugar contained in the beets can be extracted. From a ton of beets analyzing fifteen per cent.

sugar, about 250 pounds of sugar can be secured. The importance of high grade beets is very great, and the difference between beets containing twelve per cent. sugar and beets containing fifteen per cent. sugar may mean the difference between profit and loss. To illustrate this point, the Binghamton factory has a capacity of 300 tons of beets per day, and the working season consists of about 100 days. If the 30,000 tons of beets used contain fifteen per cent. sugar, the output will be about 7,500,000 pounds of sugar. If the beets contain only twelve per cent. sugar, the product will be only some 5,400,000 pounds. This difference of 2,100,000 pounds of sugar is an important consideration and accounts for the desire of factories to secure high grade beets.

The new industry promises much for those States which are favored with proper climatic conditions. It makes a new cash crop for the farmers, who are able to net from \$25 to \$50 per acre. It opens a new channel for capital and the investment under proper management is a safe one. The important problem now is to secure

men trained in the business who are capable of managing American labor. It is found that foreigners, while they may have been successful in their home country, are not entirely adapted to the conditions which prevail here. To American youths who will prepare themselves for the work of managers of factories there is promise of lucrative employment. Several of our large universities are considering the organization of "sugar" courses. There has been no industry introduced in recent years which has offered greater inducements for young men, or for the American farmer, or for the investment of capital, than the beet sugar industry.—Scientific American.

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**Jefferson's Alma Mater.**  
In Goochland County, Virginia, about thirteen miles from the capital, on Tuckahoe Creek, is the historic home of the Randolphs. On the east, directly opposite the door of the salon hallway, and at the edge of the expansive old flower garden, with its boxed walks and queer-shaped beds,



THE SCHOOLHOUSE IN WHICH THOMAS JEFFERSON STUDIED.

stands the small building where Thomas Jefferson, third President of the United States, and Thomas Mann Randolph, as children together, received the rudiments of education and discipline, which finally raised them to the proud political and social elevation of their later years.

**An Aged Woman's Scrap With a Possum.**  
Mrs. A. Doolittle, an aged Streetboro Township lady, who lives alone, heard a fearful uproar in her chicken house a few nights ago. She arose, grabbed a poker and started for the scene. She was convinced that some wild animal was among the chickens, judging from the noise, but was unable to distinguish it in the dark. She struck at the animal when it sprang at her. A fierce battle ensued, lasting fully a half hour, during which the aged lady was terribly lacerated about the face, hands and body. She found her way to her house, where neighbors discovered her the next morning. Near the chicken house was found a huge opossum lying dead in the mud and snow. Mrs. Doolittle is eighty years of age.—Cincinnati Enquirer.

**When He Hears the News.**  
In France, when a convict is sentenced to death by the guillotine the day of his execution is not named in his presence, and he knows not when he is to be led forth until within fifteen minutes of the fatal moment.

**Panion Flowers.**  
The passion flower, which grows in the South American forests, can only be enjoyed where it grows as it fades almost as soon as it is picked.

## FRENCH PRETENDERS.

Victor Napoleon or Louis of Orleans—Which Will Win a Throne?

Victor Napoleon or Louis of Orleans? Which will be chosen to govern France in case the Republic is overthrown. The former represents



DUC D'ORLEANS PRINCE VICTOR NAPOLEON

the imperial family as its heir to the throne; the latter the royal family. Prince Victor has recently declared that the story relating how he had "abdicated" in favor of his brother Louis is by no means true. He is, he says, the rightful heir to the imperial throne, and he has not given up, nor will give up his right for anyone. He is the son of the late Prince Victor Louis Napoleon, better known as Plon-Plon, and the Princess Clotilde of Savoy. He has been living in various places throughout Europe except in France, and his party is by no means a weak organization. Prince of Orleans is the eldest son of the late Count of Paris and is thirty years old. At twenty-one he entered Paris and expressed his desire of doing military service, but he was conducted to the Swiss frontier with the advice to remain away from France in the future. This affair won for him the title of the "premier concert." The young prince makes his headquarters in Brussels and has a very powerful following in his own country among the old nobility of France. If the Republic falls these two factions—royalists and imperialists—will have a pretty problem to settle the question of government between themselves. How the tide of public opinion will go in case the revolution comes there is no saying.

**Lucky Dredging For a Diamond.**  
Dredging has been successfully resorted to in recovering a valuable diamond ring that was lost in Petaluma Creek. Recently the owner of the ring was standing on a bridge just below Petaluma, across an arm of the creek, when his diamond ring slipped from his finger and fell through a crack in the bridge and into about eight feet of water. The stone in the ring cost, without the mounting, \$800. The owner hated to give it up, yet he did not know how to go to work to get it out. In his perplexity he applied to Captain John Hackett, a man of experience in dredging, though on a somewhat larger scale than hunting for so small a thing as a ring. The loser of the ring had been thoughtful enough to mark the place in the bridge where the ring fell through. Hackett rigged a small clamshell bucket, to be operated by hand. With a rope this was dropped through the bridge at the place marked, and a bucket of mud was brought from the bottom of the bayou. It was taken to the bank and washed out. A second and then a third was tried, and in the third was found the ring.—Stockton (Cal.) Independent.

**Street Golf.**  
Within the past few weeks a mania for playing golf on the streets has taken full possession of the small boys in every part of town. How the so-called game originated can no more be told than can the ancient beginning of the child's play of "London Bridge is Falling Down." The only resemblance of golf as played by the gamins of the street and the "real thing," as executed by the fashionable on the golf links, seems to be that in both games clubs and a ball are used. Instead of putters, brasses, niblicks and lofters the street archers arm themselves with any old kind of clubs and drive the ball furiously back and forth between the two opposing sides. In its general features the street game resembles hockey, but it has been dubbed "golf," and by that name it will probably continue to be known to every small boy in town.—Philadelphia Record.

**The Last of the Miamis.**  
Gabriel Godfrey, the last lineal descendant of the Miamis, once the proudest and most powerful tribe of Indians that roamed the forests of this continent, is living the life of a prosperous farmer near Peru, Ind.

**Small Fruits and Ornamental Shrubbery.**  
No town lot should be so small and so farm should be so large that there is not room for some small fruit and at least a shrub or two in the way of ornamentation.

In the pioneer days of Illinois it was a rare thing to see a new farm opened up without a lilac bush and at least half a dozen currant bushes planted near the house. Now there are hosts of home buildings in both the older states and in newly settled regions that think it too much bother to fuss with berry plants or berry bushes, and as for a bit of shrubbery just for looks, that is out of the question. It should not be so. No matter how small the homestead let there be berries of some sort, and at least a few currants. The farm of forty acres or more should have at least a quarter of an acre devoted to small fruit, including grapes, blackberries, raspberries, currants, gooseberries and strawberries. These should all be planted in rows running the long way of the land devoted to the purpose, so as to do the cultivating as much as may be with horse and cultivator and save the labor of hoeing.

A southern exposure with rows running north and south is a good location. Let the grapes be on one side; if the rows are longer than the space you wish to devote to them fill out the row to blackberries. Continue the rows one after another far enough apart to allow of horse cultivation, as suggested, till the space on the side opposite the grapes is only as large as you wish to devote to strawberries, then plant them. If your rows are so long that you have only one row of strawberries, at least every third plant must be a staminate, or your crop will be a failure.

If one feels he cannot put out a full assortment of fruit this year, a beginning at least should be made, and we recommend the setting out of currants, gooseberries and strawberries, and it will be well to select the stock now, using the catalogue of some reliable nurseryman or dealer in small fruit plants as a guide, a nearby dealer having the preference, other things being equal.

As to shrubbery—if you have no preference as to what and how much you want, consult your wife or daughters, or if at the old home where mother is, consult her wishes. If, in addition to a bit of shrubbery, a plant or two is desired, get it. The pleasure and satisfaction given will more than repay the money outlay, and the look of added thrift and comfort about the place will enhance the money value of the farm or town home much more than the expenditure.



GABRIEL GODFREY.

## FOR FARM AND GARDEN.

### Green Bone for Hens.

The feed of sliced bone for hens is much more than so much grit in the gizzard to enable them to digest their food. It is itself food of the very best sort to make eggs, furnishing the gelatine for the eggs and lime for the shell. Dried, cooked or burned bones are not nearly so good, as the gelatine has been expelled from the bone, and its lime is also in less soluble condition than while it is in the green state. But a hen's gizzard is equal to the task of grinding up almost anything. A diet of green bone and whole wheat is probably the best of all for egg production.

### Keep Horses' Mangers Clean.

Much dust and soiled food is apt to accumulate in the horse's manger, and as he is all the time breathing over it, the manger quickly becomes so offensive that much food is wasted. Much of this feed will, however, be eaten by cattle, as they will eat freely after horses. Even the horse excrement is not so offensive to them as to prevent them from picking out bits of hay mixed with it. But the horse has a more delicate taste than any other farm animal except a sheep. When cows pick over the piles of horse manure for the hay, they are probably in need of salt, and are attracted by the saline taste of horse urine.

### Tagging Ewes.

As the time for lambing approaches the coarse, dirty wool about the ewe's buttocks and udder should be cut away and saved. This should always be done before any succulent feed is given to the ewes to make them give milk. Usually this tagging in the olden time was done just before the ewes were turned out to grass. But if the ewes have silage or roots it is important that the tagging be done early. In many ewes the wool grows over the udder, so that the lamb finds it almost impossible to reach the teat. We have seen many a lamb get hold of a piece of wool, often only a tag, and suck away until completely disgusted because it did not find the nutritious milk it was looking for.

### Hard and Soft Bristles.

There are few bristles on the hogs which all good American farmers keep, though sometimes an old boar will have some that will answer if none better can be had. The wild hogs of Russia and Germany furnish most of the bristles that the world uses. It is doubtless the cold climate of Russia that makes the bristles hard and stiff, for the wild hogs of Spain, in southern Europe, have bristles that are not much better than those of American hogs. We can well afford to let Russia keep the monopoly it has in growing bristles, for the hog, which has stout, hard bristles is very little good for making pork economically. Some of the southern wild hogs have quite good bristles, and when two or three years old they will not weigh more than a well-fed pig should do at seven or nine months old.

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These suggestions may come to the eye of the dweller upon a lot which contains less than the quarter acre mentioned as small enough for the farmer. In that case we suggest that a grape vine or two be trained against the lot fence; if not these, a few blackberry bushes. Set one-half dozen currant bushes, two or three gooseberry and a dozen raspberry bushes. Vary this selection as suits your taste, but put out some.—Farm Field and Fireside.

### A Cow Home.

I notice a disposition in the dairy districts toward a change in barn building and an avoidance of the huge half basement structure, with its massive underpinning and great hay mows. It is proposed to build so as to get sanitation as well as room. The advent of the silo has made it possible to eliminate the oldtime meadow hay, hence great storage capacity in the barns is not now imperative. Today the few acres in corn, rapidly put into the silo, is an economy recognized everywhere, and is generally being adopted. All that is needed now are a hay barrack for the clover hay and a silo. The cow stable can now take the place of the barn—a structure for cows alone. No overhead storage for hay and straw; wide so as to have two rows of cows with ample passages, possibly thirty-five feet in width, the double roof overhead being the ceiling as well. There should be cement floors; no cobbledup plank and timber floors; plenty of windows on the sides to admit sunlight, the stable being built north and south, so as to get the most sunshine possible. There is no need for wide alleys in which a horse sled may be driven; for a single overhead track, and a manure-box suspended, so that when filled it can be run out and overturned upon the sled or manure vehicle to be taken at once to the fields, are far better than a highway through the stables.

These stables should be fully 100 more feet in the clear inside, so as to give each cow 500 feet or more of air space. Ventilation is made ample by running two ten-inch shafts of galvanized iron from within a foot of the floor, up above the roof, and with a simple little wind wheel on the top of each, with pitcher pump valves in them and connected with the wheel. The floor air of the stable is then pumped out, and the nice warm air in the top of the stable left. The pumping will bring in air from the outside without the necessity of cutting cat holes in the sides. At one end of the stable two large round silos can be built, connecting with the feed alley, and at the other end of the stable a hay barrack can be put up, an old barn utilized or the like, and the stable will be complete at a total cost of a few hundred dollars, while the great barn—admitted to be most imposing—costs thousands. This long stable can be built of 2x8-inch stuff, and so covered as to make dead air-spaced walls and will be frost proof.

In the summer the glass windows can be taken out and fine netting of some sort substituted to make them fly proof. The sanitation of such barns can be made complete, because they are light and airy, and the sunlight covers the entire interior. The floors are always dry, with no chance to have pools of filth under them, and so can be kept clean. There is no chance for the odors, vitiated air, etc., to go up, add, being absorbed by the hay and fodder, be in turn consumed when this material is used as cow feed. This is too practical an age to build barns just for show when less money will give us a far better structure and one more in accordance with the 1899 wants of the cow and the economical production of milk.—New York Tribune.

### Turkeys Tracked by Dogs.

The wild turkey in the Ozarks is now hunted with a slow-tracking dog, and whole flocks are often killed in this way. Till the trained dog was employed to follow up the wary bird this game fowl could baffle the most skillful hunter. Now when a flock of turkeys is found the sportsman has little difficulty. A good dog will follow a turkey track that is three or four hours old, and set the birds when overtaken, just as the pointer does the quail. After the turkey has been chased awhile it hides in a tree or under a log, and stays there, until the hunter guided by his dog, comes within its range.

It is astonishing what fine instinct a good turkey dog will develop after a few months of training in the woods. He will follow a flock of turkeys for hours just ahead of the hunter, and indicate by unmistakable signs when the game is near. After a turkey has received a fatal shot it may fly half a mile or more. A trained dog will go straight to a wounded or dead turkey with the same precision with which he tracks the game.—Chicago Record

### In the Tap Root of an Oak.

I remember a curious incident connected with the tap-root of an oak, says Rider Haggard in Longman's Magazine. This oak, a good tree of perhaps 200 years' growth, was being felled at Bradenham Wood, when the woodman called attention to something peculiar on the tap-root. On clearing this of soil we found that the object was a horse shoe of ancient make. Obviously in the beginning an acorn must have fallen into the hollow of this cast shoe, and as it grew through the slow generations, the root filled up the circle, carrying it down into the earth in the process of its increase, till at length we found wood and iron thus strangely wedded. That tap-root is now or used to be a paper-weight in the vestibule at Bradenham Hall.

When you find a man chuckling because a neighbor has been caught in evil, watch him, and you'll catch him next.