

## MONEY IN SUGAR AND GOLD.

How Fortunes are Being Made in Utah Out of Beets and Mines—A Visit to a Beet Sugar Factory—How the Planting is Done and What the Farmers Make—Beet Sugar versus Cane Sugar—Utah's Gold Mines—How Samuel Newhouse Made Millions Out of Copper—The Wonderful Silver Mines of Park City and the Rich Low Grade Ores of Mercur.

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Salt Lake City, Utah, Jan. 11.—I visited today one of the largest beet sugar centers in the United States. It is in the valley of the Great Salt Lake, within a few hours' ride of Salt Lake City, and the company which owns it will make in the neighborhood of 15,000,000 pounds of white sugar this year. The beet sugar industry is increasing enormously. There are now immense factories in a dozen different States, and twenty new ones have been erected this year. In Michigan alone eight beet sugar factories have been constructed; there are new factories in Idaho, and there are two very large ones in Utah. California alone will produce more than 30,000,000 pounds of beet sugar in 1899. Michigan expects to produce about 60,000,000 pounds, and Nebraska, Minnesota, Illinois and New York will each turn out sugar by the millions of pounds. The industry is springing up in Oregon and also in New Mexico, and it will be within a short time a profitable industry in half of the States of the Union.

It is estimated that more than 200,000,000 pounds of beet sugar will be made this year, and that this amount will be considerably increased in 1900. We are now paying out about \$100,000,000 annually to foreign countries for sugar. Our teeth get sweeter and every year. In 1880 the average man ate only forty pounds per capita, or about four-fifths of a pound per week for a forty-two pounds, and it is now estimated that on the average every man, woman and child in the United States eats at least one and one-half pounds of sugar every week.

### MONEY IN THE SUGAR BUSINESS.

There is lots of money in the sugar business. The Utah company have been paying regular cash dividends of 10 per cent. for the last two years, and in addition to a number of stock dividends. Last year, I think, they paid about 50 per cent. Their stock is now worth about 100 per cent. It is the same with many of the other sugar companies. The business has no doubt, and is coming to stay. Many of the factories belong to the beet sugar trust. Others, like those of Utah, are run independently, and some of them say that they intend to continue to do so.

### HOW THE BEETS ARE RAISED.

It was in company with Bishop Thomas A. Cutler and a crowd of "Mormons" that I took the train to visit the big sugar beet factory at Lehi. We rode about forty miles from Salt Lake down the valley, and then by railroads of cars filled with white beets, now going by great fields in which the green-top beets were being plowed out of the ground by the farmers, and now seeing long lines of the carrying of the beets to the railroad or the chief industry of this section. The company controls the product. It allots to each farmer just so many acres of his own land for beets every year and that is a fixed price. The usual amount is from five to six acres. The company furnishes the seed and plants the land for the farmer, and agrees to take the beets of him when they are raised. The charge for seed and planting is about \$2.75 an acre, and it costs the farmer in labor about \$1.25 per acre to raise the crop. This includes pay for his own labor and that of his family, so that the actual money outlay the cost is low. From each acre he can raise from thirteen to fifteen tons of beets for which he can get cash at the factory to the amount of \$150 to \$200 per acre, and at the same time has big pay for the labor of himself and his children.

### NOT EASY WORK.

I asked Bishop Cutler to tell me how sugar beets are raised. He replied: "The ground must first be thoroughly prepared. Then the seeds are planted in rows about eighteen inches apart. We have a drill that puts in four rows at a time. After the beets have come up we have them thinned out so they stand six or eight inches apart in the row. They have to be hoed and kept clear from weeds, and within five months they are ready for making sugar. The beets are then cut into eighteen inches long, about four or five inches thick at the top and they weigh from a pound to a pound and a half. We don't want large beets. The small beets have the sweetest juice and make the best sugar. We try to have them run as near to a pound and a quarter as possible."

### BEET SUGAR VS CANE SUGAR.

"How does beet sugar compare with cane sugar, Mr. Cutler? I have heard it said that cane sugar is the sweeter." "That is not true," was the reply. "A sugar crystal is a sugar crystal the world over. Pure sugar made from cane is just as sweet and no sweeter than pure sugar made from beets."

### BEET SUGAR VS CANE SUGAR.

"By the way," continued Bishop Cutler, "have you noticed how the beet sugar consumption is increasing. A few years ago the world ate nothing but cane sugar. In 1860 the consumption was 25,000,000 tons of beet sugar and 1,025,000 tons of cane. In 1880 the world used 34,000,000 tons of beet sugar and 1,311,000 tons of cane sugar. Last year alone 40,000,000 tons of beet sugar were used and not quite 3,000,000 tons of cane. The world will come to us. They have found the cane sugar out of the market."

### BEET SUGAR VS CANE SUGAR.

"How about the cane fields of our new possessions? I understand that they can raise sugar very cheaply in Porto Rico and the Philippines. That may be so," said Bishop Cutler, "but we are now utilizing the

product of our beet sugar factories, so that we can make sugar cheaper than ever. It now sells for about 5 cents a pound. I won't tell you just how cheaply we can make it, for that is a business secret, but I will say it does not cost us 4 cents per pound. After we take the sugar out of the beet we use the pulp for feeding cattle. It makes excellent feed and fattens the animals very quickly. The pulp will keep indefinitely, and we can use it a year after the sugar has been taken out of it. It grows sour, but the animals seem to like it. We will be feeding over 2,000 cattle during the coming year."

### AT A BEET SUGAR FACTORY.

By this time we had reached the factory, a big three-story building filled with curious machinery. On one side of it were two sheds, each of which it seemed to me was half a mile long. To these came long lines of teams dragging wagon loads of beets. Each team brought two or more tons. The beets were weighed on the wagons before they were unloaded, and the heaviest paid cash according to the weight. From the sheds the beets were carried by water into the factory, elevated by machinery in great buckets on endless chains to the top floor, being washed by machinery as they went. The next process was cutting them to pieces. This was done by little knives, which sliced them into pieces about the length and thickness of a slate pencil. The pieces looked very much like little shreds of mashed potatoes when squeezed through a colander. Each shred was full of juice. I picked up one and bit into it. It tasted sweet, but it had also a sharp bitter taste much like that of a raw beet.

### GETTING OUT THE JUICE.

The cut beets are next run through great cauldrons or cells comprising a diffusion battery. As they go from one to the other the sugar comes out. Every bit of sweetness is extracted, and at the end without squeezing the sugar has been taken from the beet and is now mixed up in the form of a dirty black liquid, which looks not unlike ink. The refuse or pulp is carried off by machinery and is piled up in vats out of doors for the feeding of stock.

### A PIPE LINE OF SUGAR WATER.

The factory where I saw this done was twenty-two miles away from the factory in which the sugar juice is turned into sugar. The juice is pumped from one factory to the other through a three-inch pipe, a continuous stream of sugar water flowing from one to the other. This pipe line has just been opened. It is a twenty-two miles long, and is the longest sugar water pipe line in the United States. The pipe enables the juice to be extracted almost from the beets in the fields, and saves an enormous amount of money in the transportation of the beets.

### MAKING SUGAR.

We took the train and followed the pipe line to the factory where the juice was turned into sugar. First, it flows into great tanks each of which holds 3,500 gallons. Here the juice is heated; it is mixed with lime to precipitate the dirt. Carbonic acid gas is introduced, and by various processes the sugar water is so clarified that it becomes as clear as water. It is now ready to be boiled into sugar. This is done in great tanks, through which run steam pipes, which keep the liquid at a boiling point. It grows thicker and thicker, and soon becomes a creamy yellow. It is cleaned again by running sulphurous fumes through it, and then reboiled until it becomes a granulated mixture of sugar and molasses. This mixture is as brown as the brownest New Orleans molasses you have ever seen. As you look at it you wonder how white sugar can ever come from it. If you wait a moment you can see. The molasses is washed, and this not only cleans it but rapidly whirling it about in a sort of steel tub, which has walls of such a fine network that all the molasses molecules will fly through and the granules of sugar be kept back. As you look, the tub is revolving at the rate of 1,000 revolutions per minute. The molasses and sugar stick to its walls. As it continues to revolve, the color of the walls becomes pale yellow and then as white as snow. The molasses has all gone through the net and the white sugar is left. It is then white to the wall while the tub is still revolving, a light spray of water from a tube is dusted over it, and within a few moments it is as white and clean as the sugar on your dinner table. The white sugar is then packed in sacks and taken to the market. The drying is done in an immense cylinder, through which a steam pipe runs. As it dries it is sifted, and from the cylinder it falls down into a pipe, and from there into one of the great sacks which you see in every wholesale grocery store.

### UTAH'S NEW GOLD MINES.

During this trip to the sugar works I had a chance to visit the new gold mines of the present condition of mining in Utah. The miners of the State have never been more prosperous than they are now. There are thousands of men prospecting, and every year or so new territory is discovered. Some of the old territory is developing new mines.

### ONE OF THE MOST REMARKABLE STRIKES WE HAVE HAD RECENTLY.

"One of the most remarkable strikes we have had recently," said Governor Wells, "was that made by Samuel Newhouse, a man from Pennsylvania. He came to Utah about two years ago and bought the Highland Boy, in the Bingham district. He thought he was buying a low-grade gold mine, and put up a cyanide mill to work it. As he went down, however, he struck one of the richest deposits of copper known to the world. At first he did not say anything about the copper. He did not consider it worth working, and covered it up and went on with his gold. Later on, however, he discovered its value, and since then he has capitalized that mine at \$12,000,000 in 11 shares and sold it to Eastern parties. The stock is now worth about \$1.50, so that the real value of the mine is about \$18,000,000."

### "WHERE IS THE BINGHAM DISTRICT, GOVERNOR WELLS?" I ASKED.

"It is just about twenty miles from the city of Salt Lake," he replied. "It is very rich in silver and gold and copper. It is an old camp, but it has produced a great deal in the past."

### EASTERN CAPITALISTS AFTER UTAH MINES.

"You speak about the mine being sold to Eastern men," said Dr. Geo. M. Edwards, "and I am sure that there is much Eastern capital coming to Utah."

### "YES, A GREAT DEAL. THE EASTERN PEOPLE SEEM CRAZY FOR OUR MINES. WE USED TO HAVE TO GO DOWN ON OUR KNEES AND ASK THEM TO COME OUT AND LOOK AT THEM."

"But we are now utilizing the

## NOTABLE UTAH WOMEN.



BLANCHE POWERS TAYLOR.

MRS. A. V. TAYLOR takes rank amongst the most eminent of Utah club women. Her intellectual gifts and energy have brought her into enviable prominence in affairs pertaining to the wide interests included in local club activities, and her name has become a synonym with club-women for bright and incisive thought and clever achievement both in the way of personal literary effort and assistance in the various progressive movements instituted under club auspices.

Mrs. Taylor was born at Durand, Wisconsin, in 1870. Her parents were both actively connected with newspaper work so that she grew up in a distinctively journalistic atmosphere. The greater part of her youth was spent with her parents in Baraboo, Wisconsin, after which she entered the University of Wisconsin, graduating from that institution in 1891, as valedictorian in a class of ninety-one collegiate members. In the year following she married Mr. Alvin V. Taylor, the well known lawyer of this city, and has since resided in Salt Lake.

She became associated with the Woman's club at its organization and in 1897 was elected president of the club. Two years later she was elected president of the Council of Women's clubs, a position which she still holds.

In 1898 Mrs. Taylor was appointed chairman of the educational committee of the Utah Federation of Women's clubs, and at the convention of the Federation last October was chosen to make the address of welcome at the opening meeting. The Federation at this convention paid a tribute to the ability of Mrs. Taylor in electing her delegate to the biennial meeting of the National Federation of Women's clubs which takes place in Milwaukee early this spring.

for good things. It is no trouble to sell

"Among the men who have been buying many properties in Utah," Governor Wells went on, "are the Guggenheims.

This is a very wealthy family. Here is an old man and his seven sons. They are engaged in smelting and mining. They have recently formed an exploration company to purchase mining property, and among others, have been buying largely in Utah. They have a large number of smelters which they run independently of the smelter trust."

"How about the mines of Mercur and Tintic?"

"The ore is doing very well, indeed," replied Governor Wells. "At Mercur the ore lies in a great blanket not far from the surface. It is a low-grade ore, but it is paying enormously. De La Mar has an enormous property there. The old Mercur mine used to pay as well as ever, and there are other properties which are steady dividend payers."

"The Tintic district is about ninety miles southwest of Salt Lake, right in the mountains. It is highly mineralized, containing gold, silver, lead and copper. Among other mines the Bullion-Beck continues to pay. The Centennial Eureka was recently sold for \$5,000,000. I think Boston parties bought it."

"Another region that is paying well in the silver district is about Park City. The Ontario has already produced about \$30,000,000 of silver and lead. The Daly-West mines are big producers, and the Silver King, which was discovered about 1890, has, it is said, \$60,000,000 in sight. Altogether, Utah is developing new riches in all classes of mines every year. The State has hardly been scratched, and we really don't know what we have."

FRANK G. CARPENTER.

### SCIENTIFIC MISCELLANY.

The electric organ of the Malapterurus electricus, the formidable electric fish of the Nile, is situated in the skin enclosing the entire body, and consists of rows of compartments, each having a peculiarly shaped, projecting disc with projecting spines. The total number of these leaf-like discs is 2,000,000. Each half of the organ is connected to a single nerve fiber, and late investigations show that the power of the shock-reaching a maximum of 200 volts in a fish eight inches long—is due to the simultaneous development of similar electro-motive changes in all the discs. The electrical disturbance in a single disc is about the same as that in ordinary nerves. The shock consists of a rhythmic series of rapid impulses, and the interval between the shocks increases from a tenth of a second to several seconds as the animal becomes fatigued. The organ as a weapon is likened to a self-loading and self-discharging automatic gun.

The early history of appendicitis cannot be traced, but Dr. Geo. M. Edwards believes the first reference to it to have been in 1642. The first recorded operation on the appendix was performed Aug. 24, 1833. The first successful removal of the appendix was carried out on May 4, 1886, and since that time the percentage of successful operations has been slowly increasing. The obstructive bodies found include a great variety of articles, pins being very common. About four per cent of all women are said to have appendicitis, the male victims being fewer.

The mollusca collected by the Jackson-Harmsworth expedition are found to include 34 species from Kolguev and 66 from Franz Joseph Land, these be-

ing the most northerly points from which molluscs have been obtained. The total number of species known from the coast of Norway is 460.

A peculiar property of the water of Lake Titicaca—attributed to contained salts—is said to be the lack of action on immersed metals. Chains and anchors continue for weeks as bright and free from rust as they were originally.

The physiological effect of alcohol still attracts much attention. Speaking to a British temperance society, Mr. Victor Horsely stated that, though himself a rabid teetotaler, he could not endorse the assertions on this subject often made on temperance platforms. Both the harmful tendency of even small doses of alcohol has been definitely proven in recent experiments. The nervous system is injuriously affected by having, when layers of cloth, clay or plaster are laid on it, and on reversing the rotation the folds are shown gradually growing with the contraction.

Folds of rock, with allied phenomena, are reproduced for the instruction of geological students by a novel apparatus devised by Prof. G. A. Lebour, of the Durham College of Science. Two parallel wooden rollers, about four inches in diameter, are mounted about three feet apart, and are provided with gears and a crank to rotate them slowly in opposite directions. A sheet of rubber is firmly attached to both rollers. The rubber is stretched by rotating the rollers, when layers of cloth, clay or plaster are laid on it, and on reversing the rotation the folds are shown gradually growing with the contraction.

Crystallized naphthalene, Prof. S. P. Thompson points out, has sixty per cent greater effect in producing double refraction than Iceland spar. It is difficult to work into prisms, however, as it is extremely brittle, and worked surfaces must be covered with glass to prevent sublimation.

THE MANAGEMENT OF GEESSE.

Wherever there is a running stream on a farm, a flock of geese may be kept with profit. The feathers are saleable for pillows and beds, and manufacturing purposes, and if of the best quality will bring 50 cents per pound. A Toulouse goose will often yield a half-pound at a picking, while the Christmas geese often cost its consumer a higher price than any other kind of poultry. The Toulouse goose is the largest known, often weighing from 35 to 40 pounds per pair, while exceptional weights of 60 pounds have been obtained. Goslings weigh from 4 to 6 pounds when a month old. Their plumage is dark gray on the back, shading to light gray and almost white below. They are not so noisy, as some breeds, are hardy and easy to raise. Embden geese are not as large as Toulouse, but their flesh is of superior tenderness and delicacy. Their plumage is pure white and their feathers are in steady demand.

The geese begin to lay in late February or early March and will lay 20 to 25 eggs before coming broody. If the eggs are taken away she will lay again. A goose seldom lays over 40 eggs a year, beginning to lay when a year old and being profitable for several years. Goslings require plenty of water to drink, but must be kept out of it until three weeks old. At six weeks they may be allowed the run of a pasture, being fed once a day. At eight weeks, they will forage for their own living. Provide ample pasturage and keep growing fast until full size. Geese fattened to sell at six or eight weeks old sell well in any large market. Three geese to each gender is the usual rule for breeding stock. Geese kept over winter should be fed boiled oats and barley meal, boiled corn and cooked potatoes, and rowen cut fine and soaked in warm water. Dry grain is bad for them. They may be turned out in early spring and will forage well until autumn.—Exchange.

of tapes terminating in glass capillary tubes, and the collision is forced by a pressure of forty-five atmospheres from the reservoir through these pipes and the fine tubes. It hardens as it reaches the air, forming fine threads or silk. The threads are led to bobbins, from twelve to twenty to each bobbin, as in the case of natural silk. This silk being very inflammable, the product is reconverted into cellulose by a process of denaturation. A novel use of the material is for the making of incandescent gas lights, the rare metals mixing with the collision better than with any other thread.

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Folds of rock, with allied phenomena, are reproduced for the instruction of geological students by a novel apparatus devised by Prof. G. A. Lebour, of the Durham College of Science. Two parallel wooden rollers, about four inches in diameter, are mounted about three feet apart, and are provided with gears and a crank to rotate them slowly in opposite directions. A sheet of rubber is firmly attached to both rollers. The rubber is stretched by rotating the rollers, when layers of cloth, clay or plaster are laid on it, and on reversing the rotation the folds are shown gradually growing with the contraction.

Crystallized naphthalene, Prof. S. P. Thompson points out, has sixty per cent greater effect in producing double refraction than Iceland spar. It is difficult to work into prisms, however, as it is extremely brittle, and worked surfaces must be covered with glass to prevent sublimation.

THE MANAGEMENT OF GEESSE.

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## A FLINGING TRIP THROUGH SPAIN AND PORTUGAL.

Customs and Characteristics of the People—Portuguese Women of High and Low Degree—The Peasant Class by Far the More Interesting—Amiable Weaknesses of the Mis-called Stronger Sex.

Special Correspondence.