ELECTRICITY IN GOLD MINING.

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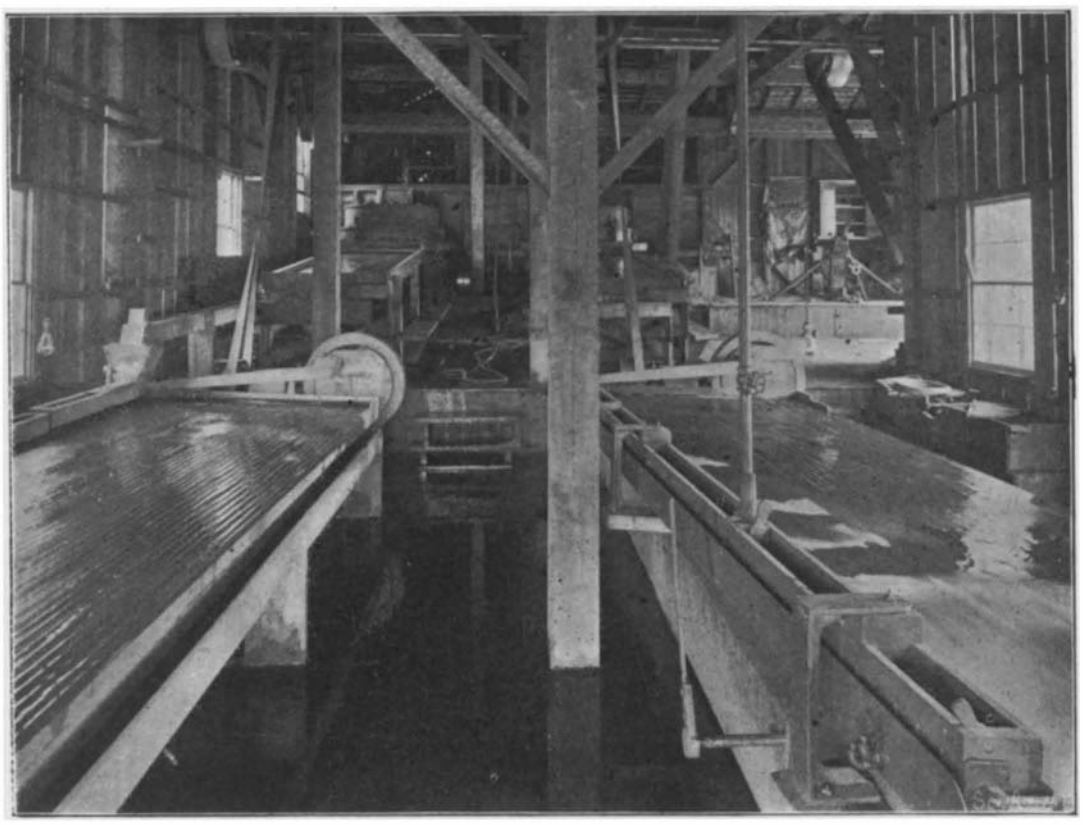
The Crown Mountain Gold Mining Company, of Dahlonega, Ga., has just put into operation a gold mining plant that differs much in many features from anything ever before undertaken in the South. Electricity is the motive power throughout, and is even used to provide the water for washing the ore from the mountain side, and for sluicing it down to the mills; and this electricity is conveyed by wire a distance of over twelve miles from the electric power plant.

The entire plant consists of the power plant for generating the electricity, the pump station for elevating water from the Chestatee River to a reservoir near the top of Crown Mountain, a large stamp mill and a mill fitted with Huntington mills, concentrators, giant hydraulics, flume lines, tram-cars and tracks, electric lines, motors, and other appurtenances.

The ore deposits of both saprolite and sulphuret gold ore are found on the sides of Crown Mountain and Findley Ridge, a mountain and ridge from 500 to 800 feet high, and within the corporate limits of Dahlonega, Ga. The gold deposits are both abundant and rich.

The mill is near the foot of the ridge on the side next to the town, and near a lake formed by throwing a dam across the narrow valley of Tanyard Branch. The mill plant consists of the Huntington mills for soft ore, and a 50-stamp mill for hard ore. The stamps are of 950 pounds weight, and have chrome steel shoes, dies and cams. The mill is so



CONCENTRATORS, HUNTINGTON MILLS.

located on the hillside that the ore enters at the top, goes through a Dodge crusher, and moves by gravity to the stamps, and thence to the tables and concentrators. There are ten Wilfley concentrators. The mill is most substantially and perfectly constructed throughout. Water for the stamps and tables is furnished from the lake just mentioned.

Hydraulic mining is a distinctive feature of the work of this company; and it is the most economical kind when conditions permit. This company has made the conditions to fit the circumstances. It has supplied the heretofore lack of water by elevating water from the Chestatee River through a 12-inch iron pipe, 4,400 feet long, to a reservoir on the side of Crown Mountain, 560 feet above the river. This reservoir has a capacity of 750,000 gallons, and water is elevated and poured into it at the rate of 1,500 gallons per minute.

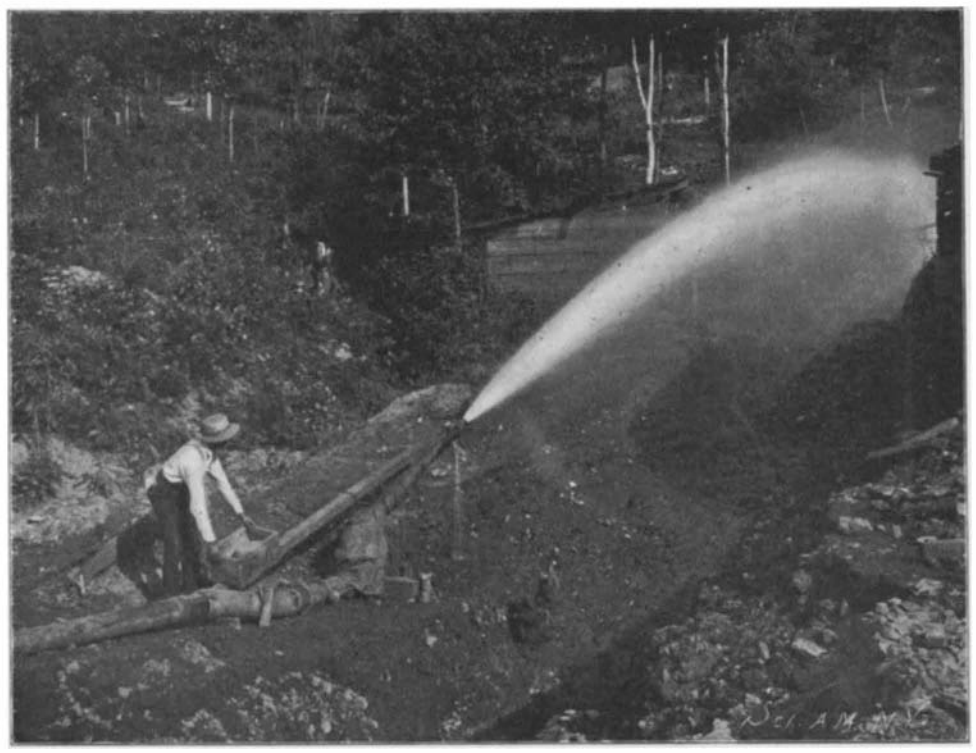
The pump station is located on the bank of the Chestatee River. The pump is a large Deane triplex, and is operated by a Westinghouse 300-horse power two-phase induction motor, constant speed, connected by steel cut gearing to the pump, the reduction being 20 to 1.

From the reservoir the water is conducted through 6-inch pipes to four giant hydraulics, with from 1½ to 2½-inch nozzles. The gold ore on Crown Mountain is found diffused through a large saprolite belt several hundred feet wide, and at least 300 feet deep, before a formation too hard to sluice is reached. This enormous body of ore has heretofore been untouched for the reason that water could not be had on the mountain at any reasonable cost, until this feat of modern electrical engineering made it possible to profitably work it.

These giants are used, first to sluice material from the saprolite belt; and, second, to cut out ore from the veins where it is not too hard to be worked by hydraulic cutting.

There are millions of tons of these saprolites, carrying from 50 cents to $2 a ton, exclusive of the quartz stringers scattered through it, which run from $5 to $50 a ton, on the top and sides of the mountain and ridge, which it will take many years to sluice down. And this work will then uncover the veins for deeper mining, which the company is preparing to do. The average cost of sluicing the matter to the mill is about 10 cents per ton. The flume lines connecting the saprolite belt with the mills aggregate over 4,000 feet in length, and are supplied with racks or riffles throughout their entire length to catch the free gold, which, being liberated by the sluicing, settles in the riffles.

About half way from the giants to the mills are grizzlies. The grizzlies separate the soft and hard ore in the following manner: The giant hydraulic, playing a stream of water upon the ore veins, cuts out and washes into the flume, earth and rocks of various sizes. The water running down the incline flume line washes and carries all this matter down by gravity to the grizzlies. First here there are iron plates



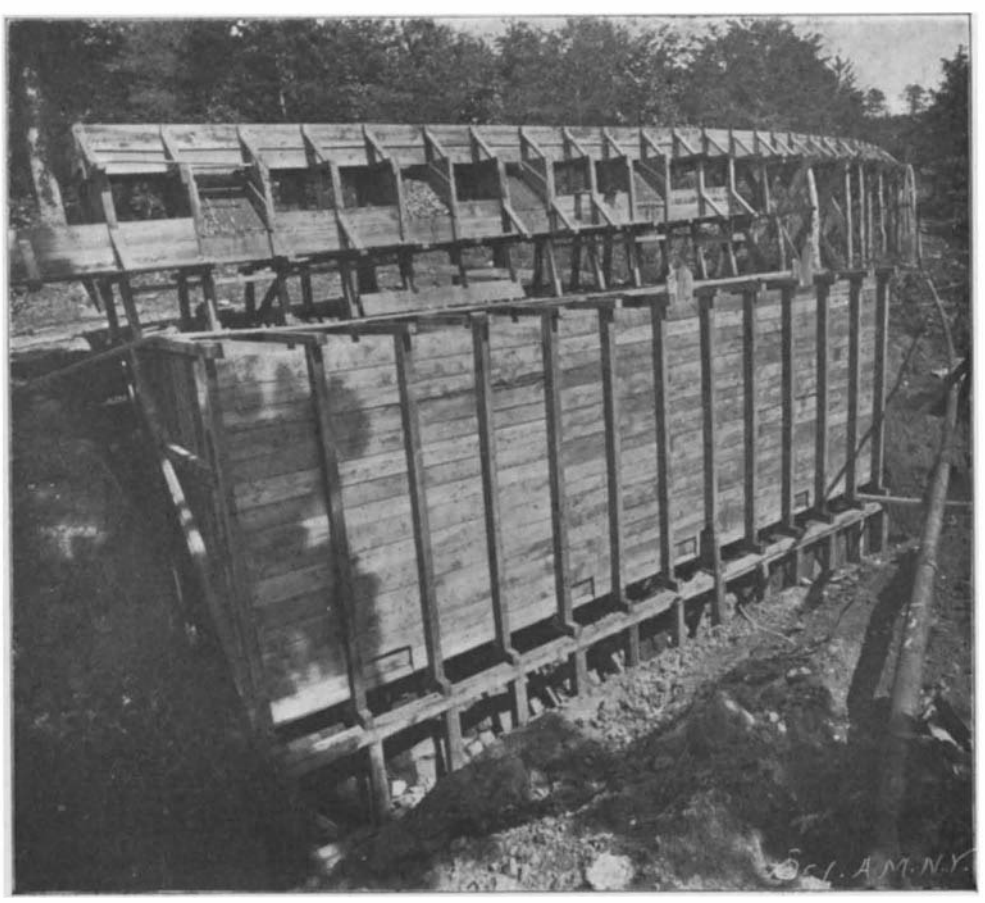
AN HYDRAULIC MONITOR AT WORK.

about 4 feet long in the bottom of the flume. These plates are full of round holes ⅝ inch in diameter; through these some of the water and finer matter fall about 4 feet to another flume beneath, that leads direct to the mills. A few feet beyond these perforated iron plates (in fact, some of the grizzlies omit these plates) there are iron gratings of ½-inch iron bars placed ½ inch apart. These gratings are inclined at an angle of 45 deg. across the direction of the flume line. Each grating is about 3 by 4 feet. The pieces of rock, ore, and matter too large to go through the holes in the iron plates are washed by the water and rolled by gravity over these gratings; the water and small pieces drop through, while the larger rocks roll down and off sideways into the ore bin and are ready to be carried by the tram-cars to the stamp-mill, while the finer matter that falls through is washed along the lower flume line, into which it has fallen, down to the Huntington mills.

The ore is dumped by gravity from the bottom of these bins into the tram-cars. One mule and a driver carry on these tram-cars 240 tons of ore from the bins to the stamp-mill per day. The mule-load or train is four 20-ton cars, and it makes thirty round trips per day.

The finer ore is carried from the grizzlies in flumes to the Huntington mills.

Between each of the Huntington mills and the concentrators are ordinary mercury amalgamation plates over which the crushed ore pulp from the mills is washed. These plates catch the free gold. Thence the crushed ore pulp is conducted upon and over the



FLUME LINE, GRIZZLIES, ORE BINS, PIPE LINES.

Wilfley concentrators with tables about 3½ feet by 8 feet, slightly inclined; upon these tables, running lengthwise of them, are wooden strips about ½ inch wide and ⅛ inch thick. These tables have a vibratory motion; water trickles over them, and as the crushed ore pulp is washed over and across them, the heavier gold-bearing particles are caught against the strips and are carried to the catch basin, while the lighter non-gold-bearing particles are washed over and pass off as waste.

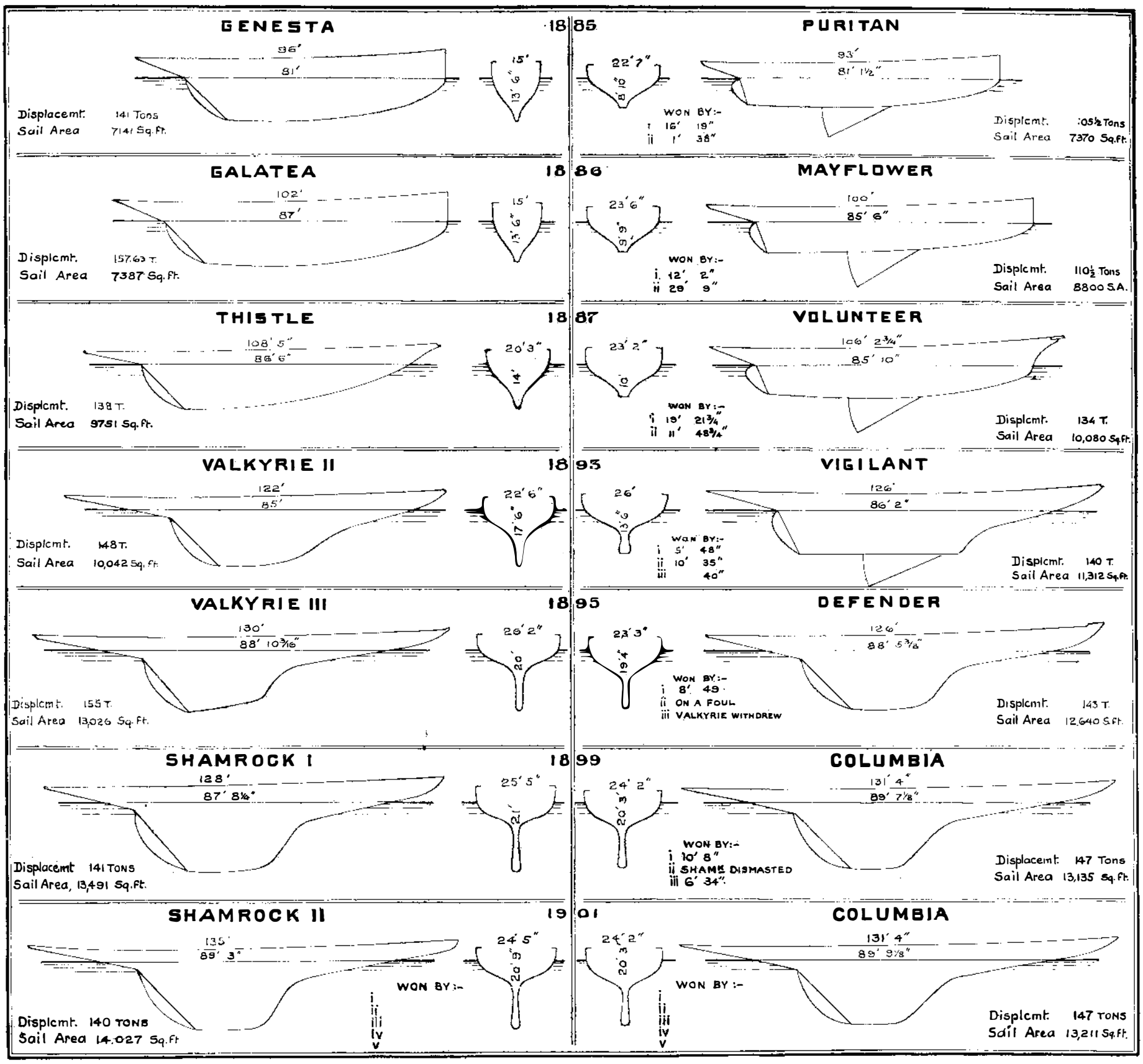
At the mill a 50 horse power motor runs the two Huntington mills; a 20 horse power motor the Dodge crusher; a 100 horse power motor the stamps; a 15 horse power motor the Wilfley concentrators, and a 10 horse power motor a rotary pump which supplies water from Tanyard Branch Lake to the stamp batteries. In addition to these there is a 125 horse power motor which operates an air compressor, that supplies air for drilling, pumping, and hoisting from two shafts that are being sunk on regular ore veins. All of these motors are Westinghouse, two-phase, constant-speed, induction type.

The power plant is located near Seabolt Shoals, on the Chestatee River, about twelve miles from the mills. The waters of three mountain streams are united by two canals, each about two miles long, but no dams are required. A fall of 97 feet is secured. From the bulkhead of the canal a wooden tube 5 feet in diameter conveys the water to the wheel, a Stillwell-Bierce, Victor type, capacity 800 horse power. The generator is a Westinghouse, two-phase, 500-kilowatt, 440 volts, direct connection on the water wheel shaft, excited by a 7½-kilowatt, 110-volt exciter. The velocity of the wheel and dynamo is 514 revolutions per minute, delivering 568 amperes per phase. The current is generated at 440 volts, transformed to 12,000, three-phase, and transmitted over three No. 6 wires twelve miles to the mills, and thirteen miles to the pumping station; and at both the mills and the pumping station it is again transformed to two-phase, 400 volts, at which pressure it is used on all the motors. There are lightning arresters at the power plant, at the mills, and at the pumping station.

Portions of the plant have been running for several weeks, but since August 29 the entire plant has been in operation, and in every detail the equipment is working perfectly.

FIFTY YEARS OF "AMERICA" CUP CONTESTS.

Once more the waters of Sandy Hook are witnessing a friendly contest between the representative yachts of England and America for the possession of the "America" Cup—unquestionably the most famous trophy in the history of yachting. The Cup itself—for the possession of which so many millions have been spent, and over which, it is no exaggeration to say, the whole world is periodically aroused to enthusiasm—is a rather insignificant piece of plate, whose claims to distinction are certainly not based upon its artistic beauty. It was won in the year 1851, at the time of the great World's Fair in London, by the schooner-yacht "America," which was designed by George Steers for John C. Stevens and others of the New York Yacht Club, for the purpose of crossing the water and engaging in yachting contests with the British boats of that day. She was 88 feet on waterline; 94 feet over all; 22½ feet beam, and her draft was 11½ feet. She differed very widely, both in model and sail-plan, from the English yachts of that day, which were built on the "cod's head and mackerel tail" theories, according to which the greatest beam of a yacht was placed at a point considerably forward of amidships. The British designers of those days believed that a bluff entrance and a long, finely-drawn-out run and quarters were conducive to speed; and it is a remarkable fact that the challenger "Shamrock II.," after fifty years of development in yachting, should show, as a result of the tank experiments on which she is modeled, some of the features of the early model, her point of greatest beam being rather far forward, her forebody rather full, and her afterbody relatively long and fine. The "America" had a long, sharp bow, and those broad, flat quarters which for many a decade were destined to be a distinguishing feature of American yachts. The English yachts of fifty years ago were poorly canvased and the beautifully-setting sails of the "America"—which, in the case of the mainsail and jib, were laced to a boom—were a source of great admiration to the Cowes yachtsmen. The cup for which the "America" sailed was one offered by the Royal Yacht Squadron, and the race was sailed without time-allowance. The course of 60 miles was laid around the Isle of Wight, and the "America" defeated the fleet of competitors—which varied from the big three-masted schooner "Brilliant," of 392 tons, to the little 47-ton cutter, the "Aurora"—with the greatest ease, coming in 24 minutes ahead of the "Aurora," which was the second vessel in a race which lasted 10 hours and 34 minutes. Had the race been sailed according to the modern method, which allows time according to the



FROM CUTTER AND CENTERBOARD TO CUTTER-SLOOP.