

DAMMING THE HUDSON RIVER TO OBTAIN ELECTRIC POWER IS A BOLD PROJECT, BUT IT IS BEING ACCOMPLISHED

HARNESSING THE HUDSON

The Big Dam at Spier Falls Completed.

The upper Hudson River, after wasting its strength for years in useless grinding into the granite of the lower slopes of the Adirondacks, is about to begin working for man in earnest, and to the extent of 50,000 horsepower. By midsummer the mighty granite dam which the Hudson River Water Power Company has been throwing across the State's greatest stream, will be so nearly completed that electric power can be delivered to neighboring manufacturing towns. The dam is ten miles above Glens Falls, and the cataract which will be created is called Spier Falls, after the late William E. Spier, of this city.

The Spier Falls power plant is only one of three which will be placed on the upper river and its tributaries. It means a complete harnessing of the mighty stream, and the total power derived will be not less than 150,000 horsepower when the river is running at full stage. One of the dams will cross the upper Hudson a few miles below Spier Falls, and will be called Gay's Falls, after the secretary of the company. The third dam, which will cross the Saugerties at Ashley Falls, will create, in the valley of that river, a beautiful lake of larger area than Lake George.

The dam at Spier Falls, which is nearing completion, is an enormous structure—1,570 feet in length from shore to shore, 157 feet deep at its lowest dip of the river bed, 115 feet broad at its base and 22 feet thick at a point eight feet below its rounded top. It will rank with some of the greatest dams the world has ever known, and in point of time of construction surpasses nearly all of them. The city of New-York has been since 1884 engaged in the construction of the Cornell dam for the enlargement of the Croton reservoir. It is 2,189 feet in length and nearly 300 feet high. The Assen dam, across the River Nile, occupied four years in spite of the fact that the resources of the British Government were back of it. The Hudson dam will be complete in three years from the time work began. It has been built by up-State men and largely with their own capital.

Ten miles west of Glens Falls there is a great gap in the mountains where the Hudson debouches upon lower levels, with a natural fall of eighty or more feet in a distance of five miles. The legislature of the State granted the necessary riparian rights, and the company purchased land on both sides of the river to the extent of eight thousand acres. Then at the point where the mountains most nearly approach each other the construction of the dam was begun, ground being broken on June 23, 1890.

The river banks were first excavated, that the dam might be solidly anchored to the granite hills. Then the course of the river was changed in order to lay bare its bed, which was scraped clean to the underlying rock. This was done by building coffer dams, first on one side, and then, as the work advanced, on the other side of the river. The work began on the west side, and was continued until the masonry construction had been carried 350 feet into the river.

Suddenly the workmen came upon a peculiar depression, similar to the sort which caused the engineers of the big Egyptian dam so much trouble. The Hudson, through some strange freak, had scooped out an immense hole in the river bed. It extended sixty-four feet below the rock bed of the river, with an area of about 150 by 350 feet. It was filled to the ordinary level with muck and refuse, but it was not solid, and the engineers said the dam could not cross it. It took time to excavate this depression, and it took more time to fill it up again with solid masonry, but the dam is more secure for this being done.

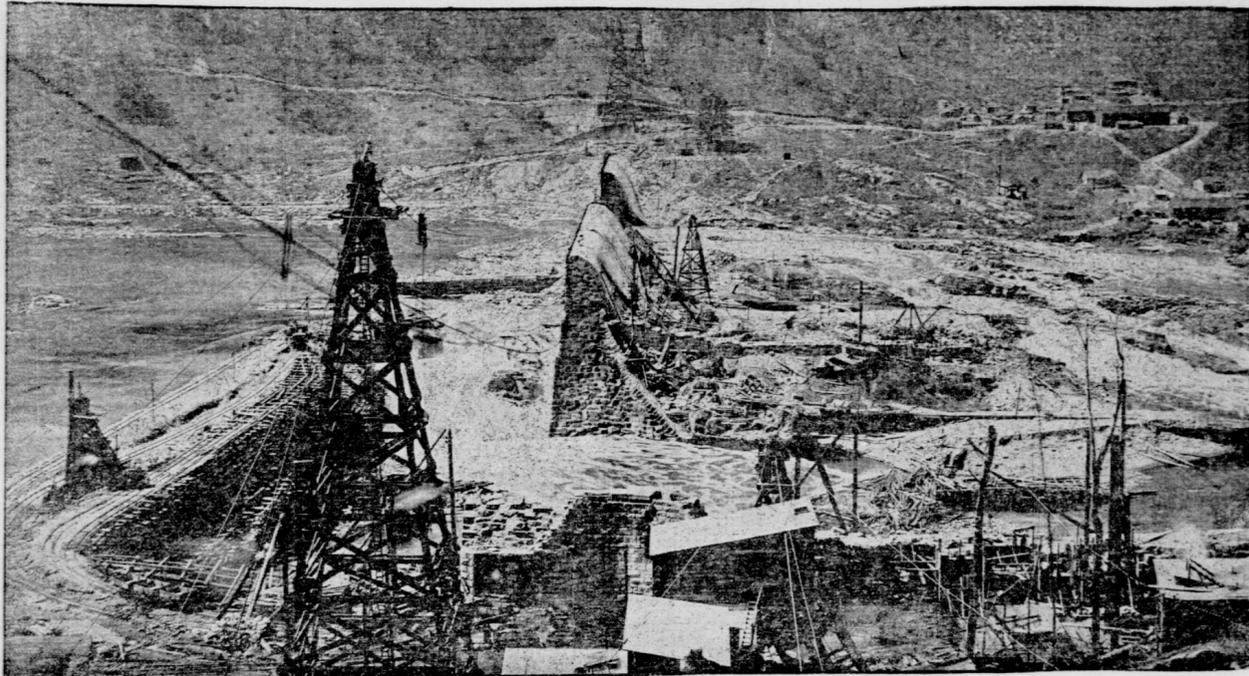
When the time came to begin work on the east side of the river a coffer dam of six hundred feet was required. Its construction was one of the hardest pieces of engineering the problem developed. It was built of logs laid in hollow squares, the log ends being dovetailed and spiked firmly in place, and these squares filled with bowlders from the neighboring hills. It was raised to a height of one hundred feet, and was strong enough not only to turn the river, but also to sustain a railway and the excavation engines. The earth and rock were brought up in iron buckets and dumped in front of the cribwork, making a dam in itself of no inconsiderable strength.

The dam creates a pond five miles long and one-third of a mile in width. Over this miniature lake a steamer travels to Corinth station, on the Delaware and Hudson Railway, and transports the heavy machinery for the power house. The speed of construction was increased and the cost of the dam lessened by the presence of fine granite quarries within a thousand feet of the east side of the dam. The cut stone was easily transported from the company's quarries at Hadley, a few miles away.

So much for the first factor in harnessing the Hudson; the second is the intake canal, which leads the water gathered by the dam to the power house. It is on the east side of the river, and is large enough to carry a current of water twenty feet deep. The water enters through ten head-gates, each ten feet wide, and rushes into ten penstocks twelve feet in diameter, which deliver it to the same number of turbine wheels in the power house below. The power goes on to the great generators on the floor below, and from them that modern power, electricity, springs to the transmitting wires and over them to distant towns where it is needed.

The equipment of the power house is extensive. Each of the ten water wheels is capable of 6,500 horsepower under an eighty-foot head of water. The generator room is directly west of the wheel room, and will be divided from the same by a brick partition. In the generator room will be located eight 2,500 kilowatt and two 2,000 kilowatt, three phase, 2,000 volt, forty cycle generators, each directly connected to a pair of waterwheels. There will also be located in the same room, between the generators, two 150 kilowatt and one 200 kilowatt, 250 volt exciters, each directly connected to its own water wheel. At the south end of the building will be located the transformer room, which will be 40 by 70 feet. In this room will be located thirty 62 kilowatt and six 570 kilowatt air blast step-up transformers, necessary motors and blowers for cooling transformers, and the high and low potential switchboards.

The heavy electric cables stretch away from the power house like a family of monstrous, endless snakes from pole to pole, passing over a spur of Mount McGregor, just south of Cottage Park, to Glens Falls, Sandy Hill, Fort Edward, Saratoga, Ballston, Schenectady, Troy and Albany. For the protection of the pole line a corps of riders has



THE GREAT SPIER FALLS DAM IN COURSE OF CONSTRUCTION.

been organized under command of "Bronco Charlie," otherwise Charles Miller. Each man will be responsible for a certain stretch of territory which he traverses each day, making needed repairs, looking out for impending dangers of overhanging limbs, broken insulators and the like.

The man behind all this vast improvement is the president of the company, Eugene L. Ashley, who before he became a capitalist was a lawyer at Glens Falls. He studied the power problem in the most practical way imaginable—by taking hold of a small water power near Fort Ann and developing it successfully. When he proposed harnessing the great river itself river men shook their heads.

"I'll go along all right," they drawled, "until high water comes, and then there won't be nothing left of the dam but the stones." Mr. Ashley knew that the fight with the waters at flood stage would be no easy one. He brought to his assistance the best engineering knowledge he had and built solidly as he went. The floods came, but the uncompleted dam withstood them, and now that the "impossible" is a completed fact these same doubting river men are to the fore with, "I always told you the river might be deamed if one went about it right."

The falls are named after one of Mr. Ashley's intimate friends in life, William E. Spier, of this city. Mr. Spier made his start in business at Glens Falls and later a fortune out of paper mills and Western mines.

The officers of the company are: Eugene L. Ashley, president; Walter H. Trumbull, vice-president; F. J. West, secretary; E. H. Gray, treasurer; C. E. Peddick, Jr., auditor; C. E. Parsons, chief engineer; W. Barclay Parsons, chief architect; and G. F. Evans, of Boston, are acting as consulting engineers.

A DRAMATIC SUCCESS AT BARNARD.

The third annual play given by the Undergraduate Association of Barnard College was presented at the Brinckerhoff Theatre yesterday and the day before with great success. The four act comedy, "The Maneuvers of Jane," by Sir Henry Arthur Jones, was acted with much humor and spirit by the following students in the following impersonations: Philbert, Lord Bapchild, Ethel Manter Pool, '03; Jane Nangle, Alice Bamberger, '03; George Langton, Romola Lyon, '04; Constantia Gage, May A. Johnson, '03; Jervis Punshon, Clara Howard, '03; Mrs. Beechnor, Anita Cahn, '03; Lady Bapchild, Jeannette Wick, '04; Mr. Nangle, Anna Ware, '03; Pamela Beechnor, Edwin Levy, '05; Presbyterial Bostock, Lisette Metcalf, '04; Mrs. Bostock, Florence Bokman, '05; Miss Bostock, Edith Dietz, '05; Pawsey, Mary Colt, '03; Mrs. Pawsey, Helen King, '03; Miss Dodd, Alice Draper, '05; Sir Robert Bowater, Clara Applegate, '04; Miss Holden, '06; and Trendell, Hope Purden, '05. Helen Miles Rogers, '02, was the stage manager in charge of the performance, and Eugene Sanger was the coach. At the Saturday performance the class of '02 appeared in a body, after a luncheon at the college. Many other alumni and visitors filled the theatre on both days with one of the most enthusiastic audiences that the building has contained. After the Saturday performance supper was served in the theatre to the members of the cast and the play committee.

The prices for board and lodging at Whittier Hall, the dormitory of Teachers College, and the temporary sleeping place of these Barnard undergraduates who were turned out of Fluke Hall this year to make way for the enlargement of the science department, will be raised 10 per cent next fall. The extension of the college year will bring two weeks more board for every student, and the reality company in charge of the hall has found that the moderate rates charged this year could not cover expenses. It was also desirable to improve the fare at the table. For these reasons the price of board at the dormitory is to be raised, and it will be required hereafter that every student shall pay for her laundry, board and lodging in advance at the beginning of every term.

DRAWBACKS TO TRUTHFULNESS.

Washington had just informed his father that he couldn't tell a lie. "My poor boy!" he exclaimed. "Then you can never go fishing or meet the tax assessors!" Weeping bitterly for his son's infirmity, he led him tenderly into the house.

SIGNIFICANCE OF THE LOUISIANA PURCHASE.

HAD NAPOLEON I RETAINED THE REGION MONROE DOCTRINE WOULD BE OF LITTLE MOMENT TO-DAY.

France rendered invaluable service to the colonies in the Revolution, and Napoleon I. in need of funds and ceding the vast territory of Louisiana to the United States for a mere pittance, contributed to a great degree to the effectiveness of the Monroe Doctrine.

Had Napoleon possessed the same greatness in colonization that he possessed in commanding military bodies of men, had he seen fit he might have made out of the immense Louisiana territory an empire greater, larger, more productive, more magnificent than the temporary empire which he es-

quished of Louisiana was not at first contemplated by the American Government. Louisiana at the beginning of the last century had for more than thirty years been under Spanish dominion. When Napoleon's star was well in its ascendancy vague rumors came to this country that France was about to regain her lost colony. These rumors carried the information also that a great army was to be sent, which, as long as it remained in Louisiana, would be a standing menace to the peace of our Western border. The possession of the mouth of the Mississippi was also a matter of vital importance.

territory, Mr. Livingston hinted to one of the French ministers that a means existed of paying their debts, to which the reply was made, "None but spendthrifts satisfy their debts by selling their lands." Nevertheless, when the efforts of the United States to effect the purchase became successful, these claims were included in the terms of settlement.

From 1801 to 1803 efforts to induce Napoleon to part with his recently acquired colony were constantly made. But the failure of the Treaty of Amiens to restore a permanent peace induced Napoleon to determine to transfer all the Louisianas to the United States. He consulted Berthier and Marbois. The conference lasted far into the night. Berthier opposed the cession, Marbois favored it. Early the next morning Napoleon called Marbois and said: "I renounce Louisiana. It is not New Orleans only that I wish to cede; it is all the colony, reserving nothing."

The interview took place on April 10; the decision was made on the morning of the 11th. On the afternoon of the same day the negotiations were opened by an abrupt question from Talleyrand to Robert R. Livingston, the American Minister, whether the United States wished for the whole of Louisiana. Livingston, who had been instructed to negotiate only for New-Orleans, and the Mississippi as a boundary line, said, "No, we only want New-Orleans and the Floridas." But he soon found that he was dealing with a much larger question, and James Monroe arrived the same day from America with fresh instructions to aid in its disposition. Napoleon empowered Marbois to negotiate for France, and instructed him to consent to the transfer, provided he could secure \$5,000,000 francs. He did secure \$3,000,000, 20,000,000 of which were to be applicable to the extinguishment of claims against France, and \$2,000,000 were payable in cash to France. When it was concluded, Napoleon said: "This accession of territory consolidates forever the power of the United States, and I have just given to England a maritime rival who sooner or later will launch her pride."

On April 23, 1803, a treaty was entered into between the United States and the French Republic. On the one hand, the First Consul, "desiring to give the United States a strong proof of his friendship, and to cement the friendship between the two nations, the French Republic, forever and in full sovereignty, the said territory, while, on the other hand, the French Government sixty millions of francs, exclusive of the United States interest in the said territory, which is commonly referred to as the French calendar of that time the tenth day of the month of April, 1803, the French Republic, for the payment of this sixty millions of francs the United States was required to create a stock of \$12,500,000, bearing an interest of 5 per cent, and payable half yearly in London, Amsterdam or Paris. The principal of the stock was to be repaid at the Treasury of the United States in annual payments of not less than \$3,000,000 a year, of which the payment was to begin fifteen years after the date of the exchange of ratifications. It was agreed that the dollar of the United States should be fixed at 5.3333 francs, or five livres, eight sous, four deniers.

A second convention was entered into on the same day with respect to the debts due citizens of the United States. The amount of these claims was estimated at \$2,000,000, but as a result of the negotiations only \$2,750,000 was set aside for reimbursement. Redemption of the stock began in 1812 and by 1823 the whole amount was repaid. No stock was issued for the portion repaid in money, except the sum of \$1,125,000, carried to the surplus fund June 30, 1823.

The Louisiana Purchase, achievement as it was, brought a host of troubles to the new republic. Some were of a domestic character, but the chief ones related to the limits of the newly acquired territory. The boundary between the United States and Texas was the subject of contention. So firm were the United States authorities in their belief that the Louisiana Purchase also covered West Florida that in 1811 troops were ordered to take possession. Mr. Livingston was destined to confide his work to Europe, the same Providence destined the United States to become the greatest of the nations of the earth by buying from Napoleon that which had within itself the making of the great-

ness of a nation, and of being the refuge for the oppressed of the nations of the earth. This same Louisiana which Napoleon sold is greater to-day than Europe dreamed. It is greater than the people of the Louisiana Purchase yet know. It is not developed, it is hardly settled, it has unexplored areas, it has enormous values in agriculture, timber and minerals, and all only half developed. Though a century has passed since the Louisiana Purchase became a part of the great republic. Of all the purchases made by the nations in the history of the world none can be regarded as so signally for the benefit of mankind, and for the extension of civilization, as has been that of Louisiana.

ON THE PACIFIC COAST.

San Francisco, April 24.—The promise of great changes in transportation methods in California is seen in the plans of Henry E. Huntington to connect the chief cities of Northern and Southern California by electric railways. H. E. Huntington, as the favorite nephew of the old millionaire financier of the Southern Pacific company, received a large part of his uncle's big estate. He has invested several millions in the electric railways of Los Angeles, and has gridded with electric lines all the country around that city within a radius of thirty miles. He has secured a large share of the tourist travel to many of the colonies around Los Angeles, and now he has decided to issue five hundred mile ticket books, which bring the rate down to 14 cents a mile. Recently he acquired the electric streetcar systems in Fresno and Stockton, as well as the big San Joaquin power plant in the Fresno foothills, which will furnish enough electricity to operate lines all through the San Joaquin Valley. His purpose is said to be to join Stockton, Fresno, Bakersfield and Los Angeles with an electric road which will run through Tejon Pass, in the Tehachapi Mountains. The right of way through this pass was eagerly sought by both the Southern Pacific and the Santa Fe, but General Beale, the father of Truxton Beale, who owns all the land in the pass, refused to grant a right of way. Mr. Huntington is understood to have secured the privilege of building through Tejon Pass, which is the only route for an electric road by way of the San Joaquin Valley between Fresno and Los Angeles. Mr. Huntington has resigned as vice-president and director of the Southern Pacific company because of the active hostility shown by President Harriman toward his electric roads in Los Angeles. Mr. Harriman is now on his way to this city, and one of the main purposes of his visit is reported to be to devise means of checking the dangerous competition of Mr. Huntington's electric lines. One of his schemes, in which Senator Clark, of Montana, is a partner, is to build a rival electric railroad system in Los Angeles and enter upon ruinous competition with Mr. Huntington, in an effort to drive the latter from that field.

One of the features of the rapid growth of San Francisco is the building of a large number of big private hotels and apartment houses in Sutter, Bush and Pine sts. Sutter-st. has always been a favorite avenue for such houses, but neither Bush nor Pine has any street railroads for more than a few blocks. Yet on these streets, between Stockton-st. and Van Ness-ave., fully a score of these hotels have been recently built or are now in process of construction. From the windows of these houses a superb view may be had of San Francisco and the bay. Despite high wages, increased cost of materials and troubles with labor unions, there is no decrease in building operations, and what proves the rapid growth of the city, none of the new houses remain vacant, nor are there many "To let" signs on old houses.

An effort has been made to exaggerate the danger of a typhoid fever epidemic at Stanford University, and to show that it is as dangerous as the recent epidemic at Cornell University. In all, a trifle over one hundred cases of fever have been noted, most of them in the small university town of Palo Alto, one mile from the campus. Those cases were all traced to impure milk sold by two Portuguese dairies that watered their cows and washed milk cans with water infected by the discharge from stables and pig pens. The water system and sewerage of both Stanford University and Palo Alto are excellent. The best experts declare the epidemic is subsiding. Many students have received telegrams to return home, but they have replied that the danger isn't serious. Only one student has died from fever.

An address on "The Modern Newspaper" was delivered by Whitelaw Reid at an assembly of students and faculty on Tuesday. After the lecture Mr. Reid planted a tree on the campus beside Encina Hall. Some trouble is expected in the removal of the older Indians from Warner's Ranch, in San Diego County, to the Palo Verde Reservation, which the government recently bought for them. These Palo Verde lands were selected by a commission, of which Charles F. Lummis, of Los Angeles, was the head, and the government will plough the lands for the Indians and help them to put in crops. The younger Indians recognize the necessity of removal, as the Supreme Court has decided against their claim to the mineral springs and ranch. They also appreciate the superiority of the Palo lands, but the older Indians are suspicious, and they have been made discontented by several lawyers, who have actually advised them to resist eviction. The latest plan is said to be to take refuge in the hills near Warner's Ranch, and then send a delegation to see President Roosevelt and appeal to him for permission to remain on the lands where they were born.

WOULD HAVE BEEN A CARNEGIE.

Cromwell had just been made Lord Protector of the Commonwealth. "It's pretty good," he mused, "but I would rather be the boss of uncommon men, than be a few thousand libraries, he was consoling by the fact that he would not die rich."



THE LATE WILLIAM E. SPIER. For whom the Falls are named.



EUGENE L. ASHLEY, President of the Hudson River Water Power Company.

established in Europe; and had he succeeded in that undertaking he would thereby have erected an almost insurmountable barrier against the Monroe Doctrine.

The chances are that this now famous and abroad much dreaded American dogma would never have assumed the same importance and become the cause of so much anxiety and concern on the part of foreign diplomatic chancelleries had the European powers at the beginning of the last century subjected themselves to the will and ambition of the First Napoleon. He and his enemies therefore helped to lay the foundation upon which in later years was to be erected the Monroe Doctrine.

In view of these historical facts one is apparently justified in saying that the festivities and ceremonies which will take place in St. Louis on April 30 mark not only the 100th anniversary of the purchase of Louisiana, but also the event which gave substantial strength and support to the ideas later promulgated by President Monroe in his annual message to Congress, and known ever since as the Monroe Doctrine.

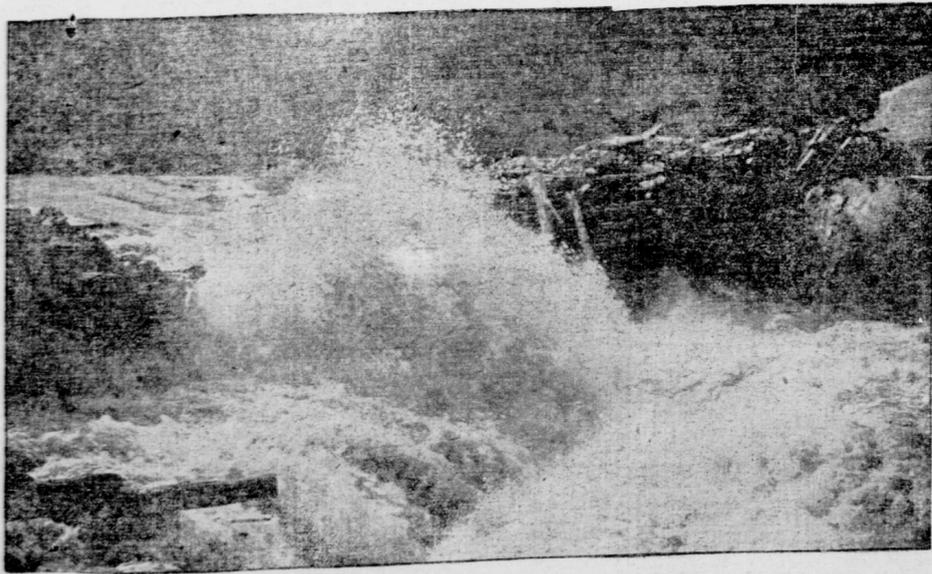
On October 1, 1803, a secret treaty was concluded at St. Ildefonso between France and Spain which came to be of importance to the United States. This was the treaty by which Louisiana was restored to France. In consideration of the elevation of the Duke of Parma to the rank of King, and the enlargement of his territory, it was agreed that "his Catholic majesty will give the necessary orders so that France may occupy Louisiana the moment when his royal highness the Duke of Parma shall be put in possession of his new State."

The United States were anxious concerning the effect of this upon their future, although the ac-

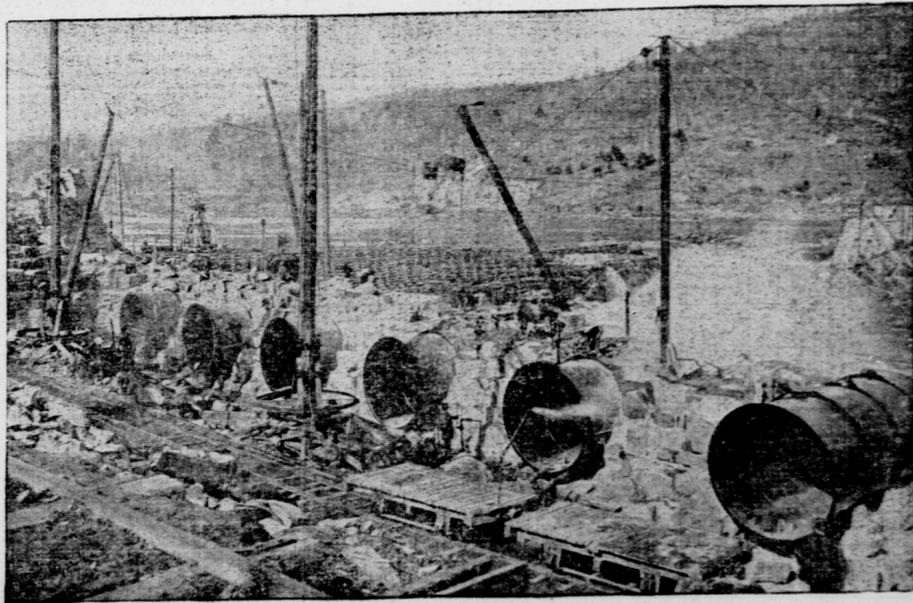
tion only by the great river was there an effective outlet for our products of the vast country west of the mountains. So long as Louisiana remained a province of Spain there was little occasion for worry among those charged with the conduct of affairs in that day, because, by the treaty with Spain, freedom of navigation on the Mississippi and a free outlet to the sea had been secured to the United States.

To add to the anxiety occasioned by rumors of a change, France had grown cold in her friendship for the United States, and many citizens of the latter were pressing claims against that country on account of the spoliation of commerce. All in all, the proposed recession of Louisiana to France was looked upon as being fraught with great danger to the welfare of this country. It followed that the first efforts made by the government were to defeat the treaty of recession.

The United States Minister to England took occasion to point out to British officials the danger Napoleon's possessions in the New World might mean to British interests. An attempt was made to induce Spain to withdraw the treaty. During all the months these efforts were being made it was not definitely known that the French were to regain possession of Louisiana. When, after many fruitless efforts, the American representatives were certain of the change, with admirable skill and tact they turned their attention to the question of purchase direct from France. Naturally enough the settlement of the claims of the citizens of this country who had suffered by reason of French spoliations was made a part of the negotiations. In fact as early as December, 1811, before it was yet definitely known whether Spain had receded



SPRING FRESHETS CAUSED NO END OF TROUBLE. An April flood thundering over the cofferdam.



THE PENSTOCKS THROUGH WHICH THE WATER ENTERS THE POWER HOUSE.