

Opening of the New Croton Reservoir.

NEW YORK'S new Croton dam, one of the greatest engineering structures in the world, has just been opened,—or rather, as a writer in the *Scientific American* tells us, it has been closed; that is the gates through which the Croton River has been flowing during construction have been shut down, allowing the great basin behind to fill with water. This it is now doing, despite the predictions made during construction, that, owing to the slight excess of supply over demand, it would be many years before the dam would be up to its high water level. During the past winter, however, a record snowfall, over the whole watershed of 360 square miles melted by the sudden rise of temperature and the heavy rainstorms of March, caused an abnormal blow into the Croton Valley, amounting in a single day to 1,500,000,000 gallons. At the time when the accompanying picture was taken, the water stood 168 feet deep and was running out of the three "blow-off" pipes 70 feet below this level at the rate of 1,000,000 gallons daily, with a roar like that of Niagara. Says the writer of the article in the *Scientific American*:

"As one looks at the visible portion of the Croton dam, he is impressed with its immensity; yet it must never be forgotten that some two thirds of the masonry lies buried below the surface of the ground. Although the great wall extends, roughly, 160 feet above the ground, it has to be carried down 140 feet below the ground to find the firm rock footing upon which it stands so securely that its age must be as great as the rocks themselves. Moreover to secure a wide enough base to prevent the mass from being overturned by the pressure of water, its foundation had to be carried out over a space, measured transversely to the axis of the dam, of 206 feet. From the foundation the dam narrows to

about 100 feet in thickness at the ground level, and to about 20 feet at its crest.

"As the waters rose in the dam, they spread out far and wide over the Croton Valley, reaching back into the many valleys and canons and forming a lake of remarkable beauty. The waters have backed up over the crest of the old Croton dam, some three miles up the valley, which is at present entirely submerged. When the reservoir is full its surface will be 30 feet above the old structure. . . . The water is carried to New York by the new aqueduct, which opens out of the old reservoir, with its invert, or bottom, at elevation 140. The aqueduct is 14 feet in height; consequently, in order for this aqueduct to take its flow of about 280,000,000 gallons per day, the water must stand at elevation 154. Now, above elevation 154 when the reservoir is full there will be contained a total of 24,000,000,000 gallons of water, and above elevation 140, at which water would begin to trickle into the new aqueduct, there will be 27,600,000,000 gallons of water. As the reservoir now stands at elevation 168 there are about 7,000,000,000 gallons of water in the reservoir above elevation 140.

"It is a curious fact that there are 6,000,000,000 gallons of water contained in the new reservoir below elevation 140, which can never be available. Adding this to the 7,000,000,000 gallons available, because lying above 140, we have 13,000,000,000 gallons as the amount now stored in the reservoir. Elevation 140 was the lowest elevation that could be taken to allow of a sufficient fall or grade over the 30 miles from Croton to New York city, to insure the water flowing in sufficient volume. . . .

"The Croton dam, when it is completed, will have taken just thirteen years to build. Ground was broken in August, 1893."