[*For the New York American.*]

CROTON AQUEDUCT.

The criticism of measures involving the expenditure of millions of public money for important public objects, requires no apology, and least of all, an apology conceived in the spirit in which the writer of an article in Friday's American, on the Croton Aqueduct, introduces that subject to the attention of the public. The following remarks on that communication are written by a friend of the present Chief Engineer, who feels that he may, with confidence, leave the professional reputation of that gentleman to take care of itself, but who, from a knowledge of his private character, cannot pass unnoticed the unfenerous insinuation that he has been under an unfavorable bias towards certain plans, merely beause they had been favored by a former Engineer. No one who knows that gentleman *could* have formed such an idea, and no one who did not know him, *ought* to have uttered it; for such an aspersion on what is more rare and more valuable than professional talent or attainment, can only be warranted by a personal knowledge of its truth

Let us now see how far the communication alluded to will bear criticism. It commences with the idea, that the plan of crossing the valley of Harlem river by pipes, (or by syphons, as it has been misnamed,) is something "unusual and extraordinary," and one not sanctioned by the predecessor of the present Chief Engineer. By reference to the reports of Major Douglass, it appears that one of the plans which he submitted for the consideration of the Water Commissioners, was this very plan of pipes, only on not so efficient a scale; and in such a manner was the subject then presented, that the Commissioners, in their report, made after they were in possession of Major Douglass' views, plainly consider that both plans were submitted to them as practicable, and they say, "that unless there should appear more serious objections than they have as yet heard," they would incline to select the plan by pipes, not only on the score of less cost, but also of greater facility of maintenance. I have said on a less efficient scale; this is evident from the fact, that his plan adopted 4 pipes of 30 inches diameter, 1500 feet long, whereas the present plan provides 4 of 36 inches diameter, 1480 feet long. The water discharged by the 36 inch pipes being taken at 2,000,000 cubic feet per 24 hours, the discharge of the 30 inch pipes, on the same principles of calculation, would be less than 1,300,000 cubic feet for the same time, a difference of more than 50 per cent. in favor of the 36 inch pipes. These and other comparisons, that may come from my pen, are not intended in the remotest degree to present unfavorably the plans of that able Engineer, but simply to meet the assertion, that propositions of an "extraordinary and unusual character" have followed the change in the direction of the work.

The next paragraph assumes "that the expense of graduation of the inclined planes on the plan of pipes has been lost sight of," and asserts that the reports show "that $381,000 will be the necessary additional expenditure." A reference to the reports does not substantiate either position, in proof of which, see page 406 of Mr. Jervis' Report, which, not only alludes to the extent to which the grade is affected, but also mentions what has been intentionally "lost sight of," as will be seen from the following extract: "But in order that the estimate should not be presented in a manner to do injustice to the high bridge, nothing has been added for contingencies, which I believe, from a careful review of the estimates, quite as much required for the bridge, as for the pipes." And it happens unfortunately for the accuracy of the reference to the $381,000, that it is derived from a comparison made by Major Douglass, (see page 418 of his Report,) in reference to the general question of rates of inclination, in which rates of 12 inches to the mile and 8 inches to the mile are contrasted, and a difference ascertained of $381,000 in favor of the 12 inch grade; the fact is the more than nation now in progress of construction is it is precisely the inclination recommended by Major Douglass, on which his location was made, which location has been mainly followed.

The writer next brands this plan as "an experiment," and had previously asserted that it was "an experiment never before attempted on a commensurate scale." It is to be regretted that the research which made him acquainted with so many of the interesting aqueducts of Italy and Spain, had not embraced the "Pont à Siphon," which traversing the valley of the torrent Gaetano, conveys the water on its way to Genoa. This manner of crossing the valley is strictly analogous; its scale is more than commensurate, and its success since the year 1782, with a *single* line of pipes, fully sustains the entire practicability of the plan under consideration.

The length of the line of pipes which has been in use for more than fifty years on this Pont à Siphon, is 2194 feet—that proposed for the Harlem line is 1480; the lowest depression of the Genoese pipe below the level of the influent current, is 163 feet—that of the Harlem pipe would be 125 feet; the diameter of the Genoese pipe is 15 inches—that of the Harlem pipe would be 36 inches. And, as a piece of information interesting to those who are making up their opinions on this subject, I will add, that the formula of calculation which determines that the discharge of the Genoese syphon ought to be 590,000 cubic feet in 24 hours, when the actual flow of water is by measurement 591,000 cubic feet, applied to the more favorable proportions of the Harlem syphon, gives a discharge of 2,136,000 cubic feet. The discharge calculated in Mr. Jervis' report is 2,000,000 cubic feet. Before leaving the subject of the capabilities of an inverted syphon arrangement, I would pass to the remark, that "the principle of the syphon, however theoretically true, will not answer for large masses." Without dwelling on the oversight of alluding to the principle of the syphon, which, in fact, is not involved in the question at all, and taking the remark in the sense in which alone the writer must have intended it, viz. that large masses cannot be conveyed through a line of pipes, when placed in the form of an inverted syphon—I must observe, that the fact is directly the reverse. The difficulties attending such an arrangement can only arise from the smallness of the pipes; and they can readily be made so small as to be quite inefficient: but the larger the pipes, in consequence of the greater amount to be transmitted, the greater the certainty, as far as any principles of hydraulics are concerned.

In reference to the *practicability* of elevated aqueducts, little need be said, as the practicability has never been called in question; and the appeal made to those of other lands and times may be found rather to sustain, than to invalidate, the preference expressed in the report in favor of the pipes. Neither would it enlighten us much, had the practicability been called in question, to be referred to structures, which, though formed in the very "ocean itself," were brought into existence by the simple addition of load after load of large masses of stone. Much more to the point, have been the "long discursive remarks" of the report in bringing clearly before the Commissioners, and, through them, the public, the real difficulties of the undertaking, by reference to exactly similar works in progress of successful execution; not to create alarm by their magnitude, but to apprise those interested of the nature of those difficulties, of the plans devised to meet them, and, what is perhaps equally important, to enable them to "count the cost" of the undertaking.

The limited durability of pipes is a point strongly put, perhaps too strongly, when it is reduced to four or five years! A reference to the best sources of information will not throw much doubt on the statement, taken from the account of the London and other water-works, which fixes on a century as within the limit of "their remaining sufficiently sound to perform their functions." But the extent of durability becomes one of less importance when it is considered that this is, in a great measure, a question of comparison. It has long since been found, by the practical and scientific engineers of Great Britain, that so great was the difficulty of making the masonry of aqueducts perfectly water tight, and so ruinous were the consequences of even a small amount of leakage in elevated aqueducts, that they have been compelled to give the water a channel way of cast iron. Such is the case with that great work, the aqueduct which crosses the valley of Llangollen, in Wales, constructed under Telford, one of England's ablest engineers.—Wisely following such an example, and taught by his own observation the indispensable and peculiar necessity of such a precaution in our climate, the present Chief Engineer includes in his plan a cast iron channel. If, then, the durability of the material is to affect the character of the two plans, which should we select? The one in which three-fourths of the channel-way may be kept *continually* in use; or that in which, when the period of replacing arrives, the entire channel of transmission must be broken up? And what alternative have we if that period returns *every four or five years?*

The next objection made is, that even the high aqueduct is not also a viaduct. The propriety of the structure's being also a viaduct, necessarily depends on considerations entirely unconnected with its use as an aqueduct. It may here be remarked that the fact of the present Chief Engineer having confined his estimate to the aqueduct simply, is an unanswerable refutation of the insinuation that there existed a wish to present the high bridge unfavorably, since, if the aqueduct be enlarged to make it a viaduct, there must be added to the estimate, as presented, at least $300,000, to cover the cost of additional width. In which case, the comparative estimate will be, for aqueduct bridge $1,236,000, and for the plan by pipes, $426,000; giving a difference of more than $800,000 in favor of the plan by pipes.

The only point of importance not yet referred to is the injury apprehended to the navigable capabilities of Harlem river. But before entering on that subject, it may be well to take a single view of the principles on which the present Chief Engineer appears to have based his decision. His report places before the Commissioners the two plans so often mentioned: one, that of an aqueduct elevated 160 feet above the rock on which its piers are to be based—the plans and details of which are given, the practicability of its construction established, and unusual measures of precaution to ensure its permanence, recommended; the other, that by pipes, the practicability of which had been sanctioned by preceding Engineers, and such proportions are adopted as increase their capacity of discharge more than 50 per cent. On what ground, then, do we learn from the report that a preference has been given to the plan of pipes? Not that scientific knowledge or mechanical skill are wanting to carry through either plan; on that point not a doubt is expressed; but that while *equal* efficiency can be given to either channel as regards the amount of water transmitted, no skill can ensure an *equal* liability to derangement in the supporting structure, or consequences of the same character and *importance*, if such derangement should occur. The impossibility of totally preventing leakage, the ruinous effects that must follow the admission of even a small quantity of water in the masonry of so elevated a structure when exposed to the severity of our winter climate, are justly considered grounds of serious apprehension when the aqueduct bridge is under consideration; but similar circumstances occurring to the structure supporting the line of pipes, are perceived to be of comparatively little consequence. Must we not, then, acknowledge the soundness of that practical judgment, which, not led away by the exciting magnificence of a structure on which to see one's name would be a justifiable object of ambition, wisely prefers a more humble, but more substantial, more certain, and more durable plan. But when, after a professional decision, made on these principles, the subject comes before the Commissioners as representatives of those whose money is to be expended, with the additional important consideration that the least certain plan, (speaking relatively,) is burdened with an additional expenditure of more than $800,000, and the not unimportant one, that the completion will be postponed at least a year, can a doubt of the correctness of their recommendation be entertained?

An imperfect knowledge of the navigable capabilities of Harlem river prevents any satisfactory examination of the apprehension expressed of the injury threatened by the plan recommended.

How far those dimensions will leave unimpaired the natural advantages of that stream, can only be obtained by accurate local knowledge, not possessed by the writer of these remarks. He would, however, strongly contend for the plain principle, that full and adequate provision should be made to secure the most favorable conditions for all probable navigation.

A French fleet is said to be on its way from Havana to Vera Cruz, to compel the Mexicans to give the apology required by the King of the French.

UNITED STATES CIRCUIT COURT—*Before Judge Betts.*—The crew of the packet ship Shakspeare, Captain Collins, consisting of 24 men, were yesterday examined in this court on a charge of having mutinied on the late voyage from Liverpool to this port.

It appeared from the statement of Captain Collins, that about the middle of last month, while at sea, the watch on deck came aft and made complaint to him of the bad quality of bread served out to them. Captain C. replied that the bread complained of was the last of a locker, and at 12 that day a new locker would be broached, when the bread would be found good, and he cautioned them to be careful and not waste it. This ended here, and Captain Collins thought no more of it until 12 M. when on the watch being called, all hands refused to come on deck to do their duty—as it was blowing heavily at the time, and the men refused to work, Captain C. sent aloft the cooks, stewards and mates, to furl the foresail, and Captain C. himself assisted in doing that. After sail was taken in, and the ship hove to, Captain C. went to the steerage, and ordered all hands on deck, threatening if they did not obey that he would fire into them. As his orders were not obeyed, he discharged three pistols among them, one with a blank cartridge and the other loaded with balls. The last pistol brought all hands on deck, when the three ringleaders were seized up and flogged, after which most of the men went to their duty; some who refused were ironed and kept on bread and water, until they made up their minds to go to work, when they were released.

The prisoners in their behalf produced as a witness one of the seamen, who testified that the bread complained of was mouldy and unfit to eat, but he admitted that their breakfast that morning was excellent.

Judge Betts, after hearing the above facts, said that the conduct of the men was unjustifiable in the extreme, inasmuch as it was in their power when arrived in port, to seek redress at law, if improper food had been served out to them during the voyage. The case appeared to him one of a very flagrant nature, for the refusal of the crew to do duty when it was blowing so heavily, endangered not only the safety of the ship, but the lives of all on board. They were ordered to find bail in $200 for their appearance at trial, and in default thereof, were fully committed.—[Courier.]

REVENUE OF 1837.—The statement of the Register of the Treasury, recently presented to Congress, shows the amount of gross revenue which accrued from duties on imports and tonnage in the ports of the United States to be $31,690,356. Of this amount $17,176,908 accrued in the city of New York; 4,489,472 in Boston; in Philadelphia 3,195,339; New Orleans 2,291,544; Baltimore 1,492,424; Charleston 698,339; Savannah 158,223; Richmond 152,575; Mobile 140,762; Portland 134,837, and Salem 128,081.

The amount of duties on imports which accrued in the city of New York in the year ending Sept. 30, 1837; was $10,855,201. The amount which accrued in the same period in Boston was 2,960,109; in Philadelphia, 2,073,778; Baltimore, 1,220,751; New Orleans, 1,670,758; Salem, 151,237.

The amount of debentures, bounties, &c., was $4,722,663, of which $1,376,844 was for expenses of collection. The amount of debentures and other deductions in New York was 1,467,782.

Some further particulars of the melancholy fate of the late Dr. Leitner, have been communicated to us. Information had reached St. Augustine that Dr. L. was taken alive by the Indians but very severely wounded—they came to the determination to preserve his life, in order to avail themselves of his professional services, and therefore provided a litter for him, and carried him with them about 30 miles, taking the greatest care to make his situation as comfortable as possible. After they had proceeded this distance, however, a young Indian, who had lost a brother in the battle with Col. Taylor's command, rushed upon Dr. Leitner as he lay on a blanket, and sending up a hellish yell, shot him dead with his rifle.

DEATH OF JUDGE WINGATE.—We learn from the Portsmouth Journal, that Paine Wingate died at Stratham, N. H., on Wednesday last, aged XCIX. The Journal says: "He was a Senator in the first Congress, and was probably the last survivor of that body. He was a graduate of Harvard College, and when he graduated was the youngest of his class. He has been for several years (since the death of Dr. Holyoke) the oldest graduate of that institution. He was appointed Judge of the Supreme Court in New Hampshire in 1798, and held the office till 1809, being then 70 years of age. Mr. Wingate was originally a Congregational Clergyman, having preached for some time for the North Church in Portsmouth, and was, we learn, settled at North Hampton. He was a highly esteemed man by his own generation, and has been venerated by the new race which has grown up around him. His wife, a sister of Hon. Timothy Pickering, survives him, at the advanced age of 96.