

details and execution of the work which have occurred to me during the present examination."

Page 8 of the pamphlet.—"In plans of conduit furnished Mr. McAlpine by us, the form and size of the entrance were purposely omitted, as we intended leaving those open questions until sufficient data respecting frazil had been obtained, during the next few winters, to enable us to design an entrance that would effectually exclude it."

It will thus be seen that while my report was based upon dimensions, form and estimates, already before the Committee upon the plan which I recommended, that the form and size of entrance of the covered conduit plan was "purposely omitted" by its authors, and hence that they themselves could not have presented even an approximate estimate of the cost of their scheme.

On Page 10 they say—"He, Mr. McAlpine, now presumes to speak of our not having fully digested our project. As he was furnished with the fullest particulars of the conduit, it was a simple matter for him to point out any inaccuracies in our statements, had they existed. We now beg your Committee to notice that he has failed to do so."

In one place, the author says that he has furnished me with the "fullest particulars," and in another that it would require several years of more experience on his part, before he could design a proper plan of entrance for his conduit.

In submitting to me what they termed their plans, the parties distinctly stated (what was apparent,) that they were only intended to exhibit the general design of their scheme, and were very eager for me to point out any alterations that I thought necessary. I did suggest several necessary alterations, and they then expressed themselves very grateful to me therefor.

I would have pointed out to them many other necessary alterations to render the plan practicable if I had supposed that there was any possibility of the adoption of their scheme.

While I felt it my duty to report against their scheme in the following words:—"It is, therefore, evident that the plans of Messrs. Cooke and Plunkett, not only have no advantages over that of the enlarged canal, but are decidedly inferior to it. There are also so many practical difficulties and objections to this plan, that I am constrained to recommend that it should not be adopted." Yet I desired, as far as possible, to avoid the expression of any opinions which would injure the authors professionally.

Page 4—"Mr. McAlpine's reserve on the question of cost will be appreciated when the following facts respecting a former estimate of his are called to mind. In 1853 Mr. McAlpine stated in his report on Montreal Water Works, that they could be constructed for \$600,000. In 1857 Mr. Keefer,

the engineer reported to Council that the works actually cost \$1,144,945."

I stated in my previous letter that I had never visited the site of the Montreal Water Works prior to 1854, and that I submitted my report, as consulting engineer in 1853, entirely upon the plans and informations which Mr. Keefer sent me at Albany. Among other things, I endorsed his estimate of \$600,000 for certain works specified by him, which particular works, I have been informed, have cost about that sum. I have also been informed that Mr. Keefer had explained the reason why the works actually constructed have cost nearly twice as much as those originally designed by him.

Mr. Keefer is fully competent to defend himself, and I have only to add that it is not true, as alleged in the pamphlet, that the works which he estimated at \$600,000 and which I endorsed, have cost nearly twice that sum.

Page 4—"Now in regard to the formula (Eytelweins'), we beg to say it is not applicable to our covered conduit, and even for open channels it is intended to give the approximate superficial velocity, not the mean velocity from which the discharge should be calculated. What induced Mr. McAlpine to parade it in his report, instead of using some one of the simple practicable tables such as Neville, Beardmore, &c., we cannot imagine."

It is well known to the profession that Eytelweins' formula is the basis of a number which have been given by subsequent hydraulicians. In Beardmore's tables, page 13, this Eytelweins' formula is stated to be "the rule on which this table is constructed." It was stated in my report that it "was not strictly correct," but sufficiently so for the purposes for which it was used, viz:—that of comparison merely.

Applied to the covered conduit it gives a discharge of about four per cent. more than the results given on page 28 of the pamphlet, which is stated to be "according to the best authorities."

In fact, however, one of these parties asserted to me that this formula, or rather its equivalent, was strictly applicable to the conduit.

This approximate formula was sufficiently accurate for all the purposes for which I used it, and I stated it merely to prevent any person from supposing that it could be used when greater accuracy was desired.

As the "simple practical tables of Neville and Beardmore" are referred to, it is proper to remark that such tables are made up from well known formula, and are only used by young beginners, or for rough calculations. In all cases when great accuracy is required, these formulae have to be modified to suit the circumstances of each case. To make these modifications correctly requires study, experience and judgment.

Page 5. "We will now proceed to show