

*Engineer* we reviewed specifications for a new mechanical filter plant large enough to handle Toronto's entire requirements; and the name of the New York engineer who drew the \$72,000 for the old (two years old) Toronto plant is not connected in any way with the design of the new plant.

Mr. Macdonald's reference to the new intake pipe and aqueduct has recalled an instance which may or may not have been in the minds of the Ottawa City Council. An editorial observation in a previous issue of the journal referred to, that two previous supply schemes were voted down by Ottawa, presumably owing more or less directly to the fact that each had been worked up by a New York engineer, may or may not have had its weight. With the first instance, Mr. Macdonald associates the word "disastrous." In the second, an engineer referred to has designed and superintended the construction of a number of Canadian engineering enterprises, and if there is a single one that has been popularly pronounced satisfactory, we have yet to learn of it, and it is our belief that the City of Ottawa cannot outdo us in the enumeration of instances.

Ottawa has an excellent source of supply in the Gatineau Lakes. The city is sorely in need of it. A satisfactory job is essential to the scheme. It is a big undertaking and it is worth money to the city to know that the man to carry it out entertains no scruples in the matter of remuneration.

Ottawa's recognition of engineering ability is not to be depreciated but praised. Deduct, however, the \$75,000 which has been regarded as questionable, and who would care to undertake the work?

### EDITORIAL COMMENT.

The last of a series of eight articles by Reginald Trautschold, M.E., appears in this issue of *The Canadian Engineer*. The series entitled "The Mechanical Handling of Materials," has created a good deal of interest among manufacturers, engineering-contractors, mining and structural men. The separate instalments, with the date of issue of each, are as follows:—

- "Mechanical Handling of Materials," August 21st.
- "Spiral or Screw Conveyers," September 4th.
- "Belt Conveyers," September 18th.
- "Belt Conveyers" (Part II.), October 2nd.
- "Bucket Conveyers," October 16th.
- "Handling Materials by Bucket Carriers," Nov. 6th.
- "Skip Hoists," November 20th.
- "Automatic Railways," December 4th.
- "Suction Conveyers," December 18th.

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The piercing of Mount Royal within a few hours of the time at which it was estimated some months ago that the headings of the tunnel would meet, took place on the morning of Dec. 10th, and a train went through in the afternoon. How successfully this work has been carried out is indicated well in the extreme accuracy with which the headings were found to align. There was a difference of 0.75 inch in line and 0.25 inch in grade. The remarkable speed at which this accurate work was carried along shows that the undertaking was attended by clever supervision and excellent engineering skill throughout.

## LETTERS TO THE EDITOR.

### Fixed Carbon Limitation.

Sir,—In connection with the articles on the desirability of introducing a fixed carbon determination into specifications for the purchase of asphalt, I have only to add that, based on an experience of 25 years in the determination of this and other characteristics of the native bitumens, I believe it to be of the utmost value in several directions, and I may say that in the hands of a person of experience and enjoying daily practice in conducting the operation, there is no difficulty in obtaining results which are reliable within any error which is of importance.

The value of the determination of fixed carbon in any bitumen, and I should preferably denominate its residual coke, ash free, as involving less uncertainty as to the nature of this material, depends upon the direction in which it is applied and the manner in which the results are interpreted. Determinations of fixed carbon aid in differentiating bitumens of various characteristics or origin, and the requirement for such a determination in any specification may mean that under such specification bitumen of only a certain character is desired. If an engineer, in the light of service tests, prefers material which has been well proved to be satisfactory rather than residual pitch which has been a failure or is of an experimental nature, he will properly introduce into his specifications a provision that no bitumen would be acceptable under them which contains more than 15% of fixed carbon. In this direction a requirement of this nature is of the greatest value. On the other hand if he desires to purchase the cheaper and more experimental forms of bitumen, there would be no object in such a provision. In another direction, as Mr. Pullar has shown, the determination of fixed carbon in bitumens, representing any particular class of materials is most important in determining their uniformity, and the fact that they have not been overheated in the process of manufacture.

The value of the fixed carbon test, therefore, may be said to be based upon the care with which it is carried out, the objects for which it is used, and the intelligence with which the results are interpreted. We are certainly very much indebted to Messrs. Kirschbraun and Pullar for the efforts that they have made to show in what directions this determination is important and how it is to be interpreted.

If a city desires to use some of the cheaper and carelessly prepared residuals to the exclusion of the more expensive natural asphalts, there would be little object in introducing a fixed carbon clause in the specification, but if the highest grade of material is desired to the exclusion of the cheaper residual pitches made from oils which are unstable at the high temperatures used in their production, such a clause should certainly be one of those which should be provided.

CLIFFORD RICHARDSON.

New York, N.Y., Dec. 11th, 1913.

[NOTE—See issues of *The Canadian Engineer* for Nov. 13th, Nov. 20th, Nov. 27, Dec. 4th and Dec 11th for previous articles and discussions concerning the value of the "Fixed Carbon Test" in specifications for asphalt. This is an important subject for Canadian city engineers to consider, and the opinions which have already been expressed in these columns respecting the limitation of the percentage, being those of well-known engineering