

# The Canadian Engineer

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## Principal Contents of this Issue

	PAGE
High Voltage Transmission Line Has Mile Span, by Romeo Morrisette	239
Schedule of Charges for Engineering Services	240
Filter Alums Used in Ontario, by G. E. Gallinger, A. V. DeLaporte and F. A. Dallyn	241
Sewage Treatment and Disposal, by G. Bertram Kershaw	243
Board of Energy Commissioners Recommended	246
Traffic Regulations in Relation to Road Construction and Maintenance, by W. A. McLean	247
Thawing Water Pipes by Electricity, by H. D. Rothwell	249
Co-operation and Road Building, by John G. D. Mack	250
W. J. Francis Heads Montreal Branch	251
Popular Objections to Water Metering and How to Overcome Them	251
First General Professional Meeting of Canadian Society of Civil Engineers	254
Construction News	48

## USE FUEL EFFICIENTLY!

FUEL is a subject which is engaging the minds of thousands of people in each of many countries. It is the fundamental basis of industrial development and social amenity. Hydro-electricity has changed our requirements to some extent, but—considering Canada as a whole—fuel is the prime necessary of the hour. Fuel is the metaphorical reef upon which Canada could possibly be wrecked more easily than many other countries; therefore it is highly essential to develop the conservation of the various classes of fuel, especially that which is imported.

If each consumer of fuel were to make an intensive study of the present efficiency—or, more correctly sometimes, the inefficiency—of his plant, it might be found that thousands of tons of fuel could be saved. Apart from the patriotism that is displayed by economizing in the consumption of fuel, such economy is good business. It enhances the credit of the country. It is not by the amount that we spend, but by the amount we save that our credit is measured.

Fuel has been obtained previously without much difficulty, but this winter and the war have caused engineers to consider how they could meet even more aggravated conditions such as might materialize another winter. Steps taken now to improve the methods of consumption, might help to prevent a worse plight than any we have so far experienced—and every little bit helps! Even a quarter ton of coal saved the situation at times for thousands of Canadian families this winter.

Not only the conservation of fuel, but also the problem of how to eliminate waste of the article produced, should be carefully considered. For example, some municipalities complacently allow the waterworks pumps to deliver water in quantities far exceeding the legitimate require-

ments of the community, thus using fuel or power which must be bought and which should be available for other and more justifiable purposes.

Conservation of fuel and power should be the fixed policy of all public authorities; because, if they are wasteful, how can the private citizen be consistently urged to economize?

## "SCIENTIFIC" AND "PRACTICAL"

THE terms "scientific" and "practical" are often considered to be diametrically opposed, and there is too great a tendency on the part of individuals in either category to depreciate the other. It must be realized that the two terms are complementary, not opposed, and that both in many instances seek the same end by diverse roads.

Professor Marshall, in his "Economics of Industry," thus states the essential divergence between practical and scientific method: "It would indeed be a mistake to be always thinking of the practical purposes of our work, and planning it out with direct reference to them. For, by so doing we are tempted to break off each line of thought as soon as it ceases to have immediate bearing on that particular aim which we have in view at the time: the direct pursuit of practical aims leads us to group together bits of all sorts of knowledge, which have no connection with one another except for the immediate purposes of the moment, and throw but little light on one another. Our mental energy is spent in going from one to another; nothing is thoroughly thought out; no real purpose is made. The grouping, therefore, which is best for the purposes of science is that which collects together all those facts and reasonings which are similar to one another in nature: so that the study of each may throw light on its neighbor."

In other words, as one great thinker has said, "Superior mentality consists in a large development of the faculty of association by similarity."

The meaning of the word "practical," as applied to engineering affairs, has yet another alternative rendering. Essentially, it means experienced. The main difference between the scientific and the practical mind is that the first is concerned with fact and theory while the interest of the latter is confined to useful application of knowledge. Technicality stands, perhaps, midway between the two extremes since it is science in a more practical dress applied to industrial issues.

The scientific mind desires to enlarge the boundaries of human knowledge without reference to practical ends, the practical mind desires to achieve results in a particular and limited direction only.

The past separation between science and practice is to be deplored,—the scientist despising commercial gain, the practical man having experience is not overfond of abstruse theory unless directly applicable to a practical end. It is, however, certain that a more practical spirit in scientific research, together with more science in practice, would better serve industrial ends.

Despite Professor Marshall's dictum, practical knowledge is not altogether a hotch-potch of unrelated items of knowledge. It has taken a lot of first-class reasoning to elucidate why certain processes and methods have given practical results. Practice as often leads science as the reverse. A freer spirit of exchange and closer association which is now happily visible, is going to benefit industry in a marked manner. There is more understanding both sides than was previously the case.