

I state these things because I fear that they indicate a serious imperfection of training, a carelessness about standards, and an unwillingness to surrender some of our fallacies, that may interfere with any effort to rouse our educational boards, our civic authorities, our cabinets and parliaments, to look on thoroughness and efficiency in education, labour and professional life, as absolutely essential to our Industrial success.

Complaints are made all through Canada that our schools do not fit the scholars for the factory, that apprentices are changeable and unreliable, that the apprenticeship system has broken down, that art as applied to Industry is not properly taught, and that writing in the schools is very bad. These are all marks of imperfection and poor training. What are the consequences of these things in the Industries? They are these:—The Employer and foreman are poor judges and poor purchasers of the material needed; the management of the offices and shops is careless; the quality of the labour is poor; the business as a whole is badly managed, and the waste is enormous.

These are the things which the people who know have been telling us all through Canada; and we are bound to say that in older countries, where custom is strong and communities are better established, the efficiency in industry is greater. An observing writer has said: "The Manufacturers have not been men educated in the knowledge of the schools, but are men who know practically nothing of applied science and who in consequence forced their way to success through sheer fighting manhood and through the application of principles which they did not understand."

Many of the manufacturers think it sufficient to have a so-called "practical man," one not instructed, but simply an expert mechanic, who serves as "guide, philosopher and friend."

1. Thus the Manufacturer does not value true expert advice.
2. He shuts his eyes to the waste.
3. He settles down to a career of non-progressiveness.
4. He agitates for a higher duty on his products.
5. Dissatisfied, he turns his thoughts to making a Combination or combine—which is illegal.

The real remedy for many of his difficulties is Scientific Research.

This is the solution of his difficulties, used by the German manufacturer. The following are the figures as to the employment of experts in Germany in 1897. They would be still more startling in 1912.

GERMAN MANUFACTURERS.

Description of Chemical Works.	Trained Chemists Employed.
Artificial Manures.	90