

## SOME FALLACIES AND FACTS CONCERNING ENGINEERING WORKS IN GREAT BRITAIN.

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During the past winter I paid a visit of some three months to England looking into the question of the sale of British-made engineering appliances and raw materials in this country, and while there was afforded an opportunity of going over a number of engineering works in the United Kingdom. As a result, my ideas of the methods and general practice adopted in these works have undergone a complete change.

I had always understood, in common, I believe, with the majority of Canadians who have not visited British engineering works, that English methods were old-fashioned and out of date. I pictured to myself old and badly lighted shops crowded with obsolete machinery, a large proportion of which I had anticipated would be standing idle owing to general shortage of work.

I had always been given to understand that the principals of British engineering works were generally very conservative and unapproachable men, and that they were more or less indifferent as to the trade conditions with Canada, and looked upon our market as belonging, for the most part, to our neighbors of the United States.

All these ideas I have found to be entirely fallacious.

At every works visited I received a most hearty welcome from the principals, whom I found to be broad-gauge business-men, showing the keenest interest in the prospects of trade with Canada. The works were, in practically all cases, well laid out and fully equipped with such modern tools and machinery as to secure the maximum output combined with the greatest accuracy, and what surprised me most of all was, that many of the buildings were of comparatively recent construction, thoroughly up-to-date, and in many cases new buildings were being erected to provide for extensions of the plants, owing to the immense amount of work in hand and the constantly increasing orders coming from practically all parts of the world. I saw plant of various kinds in course of construction for South America, South Africa, India, Australia, New Zealand, Japan, China, France, Spain, Italy and the United States and Canada.

New and improved tools were being installed in practically every factory visited, either to replace less efficient tools or otherwise increase the output of the factory. I saw very few tools standing idle, and in many factories day and night shifts were being run, in order to keep pace with the work in hand.

Standardizing of all parts is carried to the highest pitch and a most rigid system of inspection of individual parts is the invariable rule, with the result that the various parts of machines of similar sizes are absolutely interchangeable.

This inspection of parts is rather a fetish with the British engineer, and almost appears to be carried to excess in some cases. There is no doubt, however, that it is this care and accuracy which has established for the British manufacturer the high reputation for quality he has the world over.

The system of cost-keeping appears to be very complete in all cases, and the general system of keeping track of labor and stores to be very thorough and up-to-date.

The most striking feature of British practice is the extent to which practically all engineering firms concentrate their entire energies and attention upon the perfecting of one of a few specialties. The very large market to which

manufacturers in the United Kingdom cater, permits of such specializing in a manner that would obviously not be possible in countries where manufacturers cater almost exclusively for home consumption.

Factories operating with from 300 to 600 employees are usually engaged in the manufacture of only one line of machinery, and although the larger works employing many thousands of hands, may specialize in, perhaps, half a dozen different lines, the manufacture of each specialty is confined to a distinct branch or department of the works, under the direct management and control of experts in that particular line of manufacture.

One direct result of this specializing has been that certain manufacturers have been able to establish the highest possible reputation as makers of the particular line of apparatus for which they have become noted, and this reputation is so jealously guarded that the makers' name on an appliance is the best possible guarantee of its high quality.

The name some of these makers have acquired enables them to secure orders for their products even from countries protected by a very high tariff wall.

In several of the works I visited my attention was, for instance, drawn to work in course of construction for shipment to the United States.

### Sir W. G. Armstrong Whitworth & Co.

One of the most interesting works it was my good fortune to visit was that of Sir W. G. Armstrong-Whitworth & Co., Limited, of Newcastle and Manchester. This firm employs in its various departments over 20,000 men. Their shops and yards cover a ground area of over 270 acres.

Sir W. G. Armstrong Whitworth & Co.'s name is, perhaps, the best known in connection with their extensive ordnance work and shipbuilding yards, but a very important branch of their manufacture is the hydraulic and electric crane and dock and harbor equipment department. Here are to be seen in course of construction massive hydraulic appliances of a variety of descriptions, including enormous dock gates, swing bridges, cranes of carrying capacities ranging from 30 cwt. up to 250 tons, and hydraulic presses, which for many purposes are now taking the place of steam hammers for every large work. One of these presses in course of construction at the time of my visit, was stated to be of a capacity of 1,000 tons.

Although there are some cases for which Sir W. G. Armstrong Whitworth & Co., recommend and supply electrically operated appliances, as being more suitable than Hydraulic appliances, the latter are, for many reasons, generally preferred for this class of work. While Armstrong & Whitworth make a specialty of traveling cranes for shop and other uses—both electrically and hydraulically operated—they have devoted special attention to the construction of hydraulic cranes for the rapid loading and unloading of vessels. At their Elswick works at Newcastle-on-Tyne, they have an enormous crane erected on the river bank alongside of the building where they carry on the manufacture of ordnance, etc. This crane is capable of handling 150-ton lifts, and is so arranged that it can be swung over the building in question and through openings in the roof; can pick up huge cannon gun mountings and other equipment for the war vessels they build, and lift them bodily on to the vessel, which is brought alongside for that purpose.

Whilst fully realizing the advantages of hydraulic power for heavy work such as the above, it struck me that the severe winter conditions in Canada would make it impracticable to use such power here, and I brought this question up. I was met with the statement that Sir W. G. Armstrong-