

may and will, no doubt, in many cases, be found irksome. He must, however, remember that no matter how trivial his employment may seem to be, the precept of "whatever your hand findeth to do, do it with all your might," is one which applies to the young engineer with peculiar force, for accuracy in detail is a most essential faculty to cultivate. An illustration of this may be found in a recent number of the *Engineering News* (December 19, 1895), where, in a report on an anticipated deficiency of supply by an almost-completed new water-main for Newark, N.J., the engineer, Mr. Herschel, states that although the pipe in question was in accordance with the most reliable hydraulic formulæ, correctly proportioned to deliver the required quantity of water, it will not do so, as he has ascertained since designing the pipe that all the formulæ for the discharge of long pipes published during the last fourteen years are inaccurate, as they are based upon experiments made to ascertain the actual discharge of a long pipe at Rochester in 1877. The discharge from this pipe, it now appears, was so loosely recorded as to render the result quite unreliable, and, as a consequence, all formulæ based upon it. The duty of recording the height of water in the reservoir at stated intervals was, apparently, too trivial a matter for the person assigned to the task; the result, however, of his neglect has been far-reaching. Secluded from public observation and working in the shade of obscurity, with the knowledge perhaps that others are obtaining the credit for his achievements, the beginner must yet continue to discharge his duties faithfully, in the full assurance that his opportunity will come. Then prepared in every way for the higher responsibilities of his profession, he may avail himself of that "tide in the affairs of man which, taken at the flood, leads on to fortune," and emerging from the obscurity of his early surroundings, assume the position which his ability and his application entitle him to receive.

#### THE CANADIAN PIG IRON INDUSTRY.

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To review the young and growing Canadian iron industry, without "taking stock" of rival markets, is an impossibility in these days of close competition. The American iron masters especially must be reckoned with, for they have succeeded in displacing the iron and steel producers of Great Britain in the Canadian market, and have now narrowed down the fight for supremacy to a question of the product of American labor as against the product of Canadian labor. The British iron masters frankly admit that they are out of the fight in so far as the trade of Western Canada is concerned. The splendid equipment of the American furnaces, together with their close proximity to the Canadian market, puts the Scotch and English furnace men at a great disadvantage, and it is an acknowledged fact that the competition for the iron trade of Canada must now and for the future be solely and alone between American and Canadian producers. It has been said that our neighbors to the south "want the earth," and if one is to judge by the opinion of so eminent an American authority as Mr. Andrew Carnegie, it would seem that in so far as the Canadian iron market is concerned, they imagine they have it. Mr. Carnegie, in a glowing article recently contributed to the "40th Anniversary" number of the *Iron Age*, in writing of the Iron Producers of the United States, of which body he will be termed "King," says, they "have be-

come the largest and best disciplined and most effective army of iron masters in the world. They have wrested their home market from the grasp of the foreigner, they supply the Canadian market upon equal terms with him, and are beginning to conquer territory which never before was theirs."

The "foreigner" referred to so aggressively by Mr. Carnegie is the British ironmaster, for no other competitor of consequence, aside from the Canadian, ever fought for the iron trade of these British North American provinces. It is quite true that the British makers have been driven out of the greatest and most desirable portion of the market, and they have been driven out, to a large extent, by American makers. In that Mr. Carnegie is right. Our Canadian ocean steamship owners can bear testimony to this by the consequent loss of tonnage for their steamers plying between British and Canadian ports. The British ironmaster has passed away, probably never to be reinstated, in so far as the Western Canadian market (the greatest we possess) is concerned, but Mr. Carnegie is mistaken if he imagines that American ironmasters are left in sole possession of the field. If he will glance at the statistics of the imports of pig iron into Canada, *versus* the domestic production for the fiscal year ending 1893-4, he will be convinced that Canadian-made pig iron is making a steady and sure headway. Quoting from a late number of the *Canadian Manufacturer*, in which figures taken from official sources are given, the increase of output from Canadian furnaces for the fiscal year ending June, 1894, was 200 per cent. over that of the fiscal year ending June, 1891 (three years).

The period of 1893-4 marked an epoch in the history of the Canadian iron industry, because the domestic production for that year, 62,522 tons, meant that Canadian workmen were producing from purely Canadian material 58 per cent. of all the pig iron consumed in the country. The official statistical year book gives the percentage of home-produced iron to the total consumed as 45.4 per cent., but this is incorrect, inasmuch as the imports group together the following material: pig iron, iron Kentledge, scrap iron, and steel, giving the total as 75,275 tons. The total quantity of iron imported for that year was 45,282 tons, the Canadian iron exceeding the importations by 17,240 tons. The statistics down to the close of the last fiscal year, June, 1895, will show (the ebb and flow of trade being allowed for) a proportionate steady advance, and this will still be more marked in the coming year, when it is probable that the output of the new coke furnace at Hamilton, Ont., will be sufficiently large to replace what is now imported from the United States, and to a very large extent may be calculated upon to do so. The *Canadian Manufacturer* places the value of the pig iron production of 1893-4 at \$965,968.77, and when it is considered that almost nine-tenths of this has been paid out for labor to Canadian workmen, the value of the industry will perhaps be better appreciated. A continued encouragement of the industry will mean that Canadian pig iron will yet form a base for many articles of finished iron and steel not now produced in this country. It has been well said that the production of pig iron is one of the best tests of a country's metallurgical greatness. This has been particularly true of Great Britain and the United States. If so, then the statistics referred to above evidence the fact that Canada is on the "right track." The Dominion may rank low as yet in the scale of iron-producing