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(Illustrated articles are marked with an asterisk.)

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For the Week ending September 27, 1879.

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TECHNICAL SCIENCE IN NEW ZEALAND.

The SCIENTIFIC AMERICAN has been asked to solicit the kind offices of American inventors, manufacturers, and other friends of industrial education, on behalf of a worthy institution in far away New Zealand.

To provide "all classes and denominations" of the New Zealand population with facilities for pursuing a regular and liberal course of education, Canterbury College has been established at Christchurch, the principal town of the province of Canterbury, and is now in good working condition. In connection with this college there has been founded a scientific museum, housed in a handsome stone building erected at a cost of upward of \$100,000, and comprising a valuable collection of specimens of natural history, and type collections of minerals and fossils. An effort is being made to establish in this museum a department of technical science, for which contributions of models of machinery, implements, and the like, are now solicited. The reception of such contributions, and their shipment to New Zealand (freight charges to be paid there), will be undertaken by the publishers of this paper.

So much for the message committed to us. A word or two with respect to the reasons why the request should be cheerfully and abundantly met.

New Zealand is one of the most worthy and promising of the younger members of the Greater Britain made up of all the English speaking countries of the globe. As the youngest, too, among the rising nations allied to us by blood, and bound to us by rapidly strengthening commercial ties, New Zealand is in every way deserving of all the educational assistance we can give her; and it can be safely promised that her people will be duly grateful for anything we may do in this way.

There is a lower (possibly to some a more cogent) reason why this request should be granted: it will pay commercially. Already New Zealand is one of the most inviting of foreign markets for American manufactured products; and there is no way by which American manufacturers can place their machines, implements, and other wares more effectually before the New Zealanders than by having them thus favorably placed on perpetual exhibition at the chief center of intelligence in the colony.

It is not yet forty years since the first white settlers landed in New Zealand, and already the population numbers something like half a million of wide awake, active, and intelligent English people. The islands have an area of over 100,000 square miles; a trifle less than that of Great Britain and Ireland, and something more than twice that of the State of New York. About 12,000,000 acres are fit for agriculture; 50,000,000 acres are suitable for pasturage; 20,000,000 are forest lands. The climate is much like that of England, but more equable. There is more sunshine and a smaller range of temperature. The annual mean for the North Island is 57°, that of the South Island is 52°. The mean annual temperature of London and New York is 51°. The country is rich in minerals, and its resources are being developed rapidly. In 1876 the foreign commerce of New Zealand was equal to that of Norway. It was more than that of any of the South American states except Brazil; more than that of any African states except Egypt and Algeria; greater than that of Japan; and was exceeded in Asia only by China, Java, and the Straits Settlements. It was exceeded in Australasia only by Victoria and New South Wales. In 1875 its trade with the United States exceeded \$10,000,000. In 1876 the colony had 600 miles of railway, and in 1878 something like 1,000 miles. In 1875 there were in operation over 3,000 miles of telegraph lines, with a mileage of telegraph wire exceeding 7,000 miles. These are the latest statistics at hand; and the rate of progress is such that they must be largely increased to bring them up to the probable figures required to indicate the present condition of the colony.

It is to a country possessing such notable capacities for commercial developments, and offering so many inducements for the cultivation of friendly relations, that the asked for models and specimens of machinery and industrial appliances are to go, to be placed on view, as already said, under the most favorable conditions possible.

In very many instances, doubtless, the most efficient as well as most economical representation to send will be a perfect machine or implement of regular make. The photographs of the museum rooms—which may be seen at this office by any one who is interested—show an abundance of space for the proper display of contributions; and as the museum is a place of popular resort not only for the people of Christchurch, but for all visitors to that capital, a more attractive mode of exhibiting matters suitable for the markets of the colony could not be devised. We sincerely trust that our energetic, generous, and far-seeing manufacturers will take the matter in hand earnestly, and that while Canterbury College is enriched by specimens of high educational value, the industries of the United States will have in them a full and honorable presentation before the students of the institution and the public at large.

It may properly be suggested here that contributors should affix to each specimen a special tablet bearing the inscription: "Presented to the Technological Collection of Canterbury College Museum, Christchurch, New Zealand, by, etc., etc.," giving the donor's name and post office address.

An Amendment of the New South Wales Patent Law.

The conditions of the patent law of New South Wales have been amended (June 19, 1879) so that exhibitors of unpatented inventions at any International Exhibition within

the colony, or any other agricultural or industrial exhibition declared to be such by the governor with the advice of the executive council, shall not prejudice the right of the exhibitor, if he be the author or designer of the invention, to apply for letters of registration for such invention under the patents act. Neither will the publication of any description of the invention during the holding of the Exhibition, nor the user of the invention elsewhere without the privity or consent of the inventor, prejudice his right to a patent on application.

THE BESSEMER STEEL INTEREST.

A correspondent calls attention to the present workings of the Bessemer steel industry in the United States, with the remark that the patent Bessemer process is owned by eleven steel plants, who have an association for mutual protection, which prevents the establishment of any more plants in the United States. The agreement of this association is also that the same uniform scale of prices shall be maintained to the public; that any plant from necessity or choice remaining idle shall receive a bounty of \$5 upon each ton produced by the plants in operation. If two plants were idle the tax would be \$10 per ton; if five were idle the tax on product would be \$25 per ton.

But one plant is now idle, the Vulcan Iron and Steel Company of St. Louis, whose capital is about \$1,500,000 (?). The product of the ten plants in operation is 700,000 tons per annum. A tax of \$5 per ton would give the Vulcan Works an income of \$3,500,000.

The price of rails in the United States is \$45. The price of rails in England is \$25, and 15,000 tons were recently sold to go to Canada at \$22.50 per ton. If the Vulcan Works were running the product would probably be increased by 100,000 tons, as these works have two of the largest converters in the world, and as they were the last built in the United States they have all the improvements in the process.

The cost of steel rails in America is less than \$20 per ton. Is it not time that there were more converters, or a lower duty on steel rails? Are not these steel plants standing in their own light and inviting opposition to the present high duty? Is it strange that large railroad men should seek to punish these companies by purchasing in England?

It is reported that the present plants are driven to their utmost double turn to supply the demand, and that there is less attention paid to the character of the product, and that many rails break in laying. This is our correspondent's complaint; how far it can be contradicted we shall be happy to be informed.

INVENTIONS IN CHINA.

For a long period the Chinese Government directly discouraged invention and all other innovations upon established conditions and customs. The result was a fixedness in social and industrial affairs which has made China proverbial. That the stimulus of western civilization has made great inroads upon this particular phase of Chinese character, is apparent on all sides. We are inclined to think, however, that nothing quite so significant has appeared in this connection as the following imperial decree published in the Pekin Gazette, and bearing date June 13, 1879. It reads as follows:

The Censorate has memorialized us to the effect that Tung Yü-ch'i, an expectant sub-prefect in the province of Anhwei, proposes to construct a steamboat to be impelled by steam generated without the use of fire, which shall be so superior as to supplant the one using fire. Its construction is already well nigh completed, and it is estimated that 3,000 taels will suffice to finish it. A diagram with illustrations of the invention has been presented to the memorialists for their inspection. Should the steamer invented by the officer in question be found capable of quick motion and adapted to practical use, it will, of course, be proper to adopt it. We, therefore, command Shên Pao-chên to devise means for providing the 3,000 taels required to carry the invention into execution. He is further commanded, in conjunction with Li Hung-chang and Ting Jih ch'ang, to examine the diagram and the illustrations, and to give the matter his most careful consideration. As soon as the invention has been carried to completion it will be the duty of Shên Pao-chên and the high officials associated with him to put it to the test of an experiment and to report in a memorial to us whether it has been found, after all, to be adapted to practical use. We have this same day commanded the Censorate to instruct Tung Yü-ch'i to accompany Shên Pao-chên to Nanking. We have also commanded the Censorate to hand the diagram and illustrations to Shên Pao-chên for his perusal, and to communicate this decree to the several officials concerned.

The Cincinnati Exhibition.

The Cincinnati Industrial Exhibition was formally opened Sept. 10, with an address by President Hayes. The Governors of Ohio, Kentucky, and Indiana, with their staffs and a number of military organizations, also participated. President Hayes said:

"The seventh Cincinnati Industrial Exhibition is held at a most auspicious period in the commercial history of our country. The great business depression which followed the financial crisis of 1873, after five long and anxious years of distress, embarrassment, and bankruptcy, has at last been succeeded by a revival of prosperity, which is surely and rapidly extending to every branch of useful industry, with all values measured and made steadier by a currency which