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- III. ELECTRICITY, LIGHT. ETC.—Influence of Pressure on Spectra. New Thermo-Electric Battery. The invention of M. Sudre, Paris.
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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 institation 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 that the same uniform scale of prices shall be maintained to (freight charges to be paid there), will be undertaken by the publishers of this paper.

two with respect to the reasons why the request should be would be \$10 per ton; if five were idle the tax on product 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 pany of St. Louis, whose capital is about \$1,500,000 (?). The 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 income of \$3,500,000. Zealand is in every way deserving of all the educational as sistance we can give her; and it can be safely promised that of rails in England is \$25, and 15,000 tons were recently 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 built in the United States they have all the improvements in foreign markets for American manufactured products; and the process, 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 duty on steel rails? Are not these steel plants standing in 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; to be informed. 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 the Straits Settlements. It was exceeded in Australasia only lows: by Victoria and New South Wales. In 1875 its trade with the United States exceeded \$10,000,000. In 1876 the colony the present condition of the colony.

ments for the cultivation of friendly relations, that the asked command Shên Pao-chên to devise means for providing the for models and specimens of machinery and industrial appli- 3,000 taels required to carry the invention into execution. ances are to go, to be placed on view, as already said, under He is further commanded, in conjunction with Li Hung-chang the most favorable conditions possible.

that our energetic, generous, and far-seeing manufacturers decree to the several officials concerned. 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 Sept. 10, with an address by President Hayes. The Govof the institution and the public at large.

affix to each specimen a special tablet bearing the inscrip- President Hayes said: tion: "Presented to the Technological Collection of Canterbury College Museum, Christchurch, New Zealand, by, etc., a most auspicious period in the commercial history of our etc.," giving the donor's name and post office address.

# ----

patented inventions at any International Exhibition within all values measured and made steadier by a currency which

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 the public; that any plant from necessity or choice remaining idle shall receive a bounty of \$5 upon each ton produced So much for the message committed to us. A word or by the plants in operation. If two plants were idle the tax would be \$25 per ton.

But one plant is now idle, the Vulcan Iron and Steel Comproduct of the ten plants in operation is 700,000 tons per annum. A tax of \$5 per ton would give the Vulcan Works an

The price of rails in the United States is \$45. The price 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

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 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

# 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. in minerals, and its resources are being developed rapidly. That the stimulus of western civilization has made great in-In 1876 the foreign commerce of New Zealand was equal to roads upon this particular phase of Chinese character, is apthat of Norway. It was more than that of any of the South parent on all sides. We are inclined to think, however, that American states except Brazil; more than that of any Afri- nothing quite so significant has appeared in this connection can states except Egypt and Algeria; greater than that of as the following imperial decree published in the Pekin Japan; and was exceeded in Asia only by China, Java, and Gazette, and bearing date June 13, 1879. It reads as fol-

The Censorate has memorialized us to the effect that Tung Yü-ch'i, an expectant sub-prefect in the province of Anhwui, had 600 miles of railway, and in 1878 something like 1,000 proposes to construct a steamboat to be impelled by steam miles. In 1875 there were in operation over 3,000 miles of generated without the use of fire, which shall be so superior telegraph lines, with a mileage of telegraph wire exceeding as to supplant the one using fire. Its construction is already 7,000 miles. These are the latest statistics at hand; and the well nigh completed, and it is estimated that 3,000 taels will rate of progress is such that they must be largely increased suffice to finish it. A diagram with illustrations of the invento bring them up to the probable figures required to indicate tion has been presented to the memorialists for their inspection. Should the steamer invented by the officer in question It is to a country possessing such notable capacities for be found capable of quick motion and adapted to practical commercial developments, and offering so many induce- use, it will, of course, be proper to adopt it. We, therefore, and Ting Jih ch'ang, to examine the diagram and the illustra-In very many instances, doubtless, the most efficient as tions, and to give the matter his most careful consideration. well as most economical representation to send will be a per. As soon as the invention has been carried to completion it fect machine or implement of regular make. The photo- will be the duty of Shên Pao-chên and the high officials asgraphs of the museum rooms-which may be seen at this sociated with him to put it to the test of an experiment and office by any one who is interested—show an abundance of to report in a memorial to us whether it has been found, space for the proper display of contributions; and as the after all, to be adapted to practical use. We have this same museum is a place of popular resort not only for the people day commanded the Censorate to instruct Tung Yü-ch'i to of Christchurch, but for all visitors to that capital, a more accompany Shên Pao-chên to Nanking. We have also comattractive mode of exhibiting matters suitable for the mar- manded the Censorate to hand the diagram and illustrations kets of the colony could not be devised. We sincerely trust to Shén Pao-chên for his perusal, and to communicate this

## The Cincinnati Exhibition.

The Cincinnati Industrial Exhibition was formally opened ernors of Ohio, Kentucky, and Indiana, with their staffs and It may properly be suggested here that contributors should a number of military organizations, also participated.

"The seventh Cincinnati Industrial Exhibition is held at country. The great business depression which followed the financial crisis of 1873, after five long and anxious years of An Amendment of the New South Wales Patent Law. distress, embarrassment, and bankruptcy, has at last been The conditions of the patent law of New South Wales succeeded by a revival of prosperity, which is surely and have been amended (June 19, 1879) so that exhibitors of un-rapidly extending to every branch of useful industry, with