

The Economic Future of Japan.

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Japan was made known to Europeans for the first time by the writings of the Venetian traveller, Marco Polo, in the Thirteenth Century. Regular relations, however, were only established between the Occidental Powers and the Empire of the Rising Sun three centuries later, towards the middle of the Sixteenth Century. In 1543, a Portugese adventurer navigating along the Chinese coast, was driven by a storm upon the coast of Japan, where he landed. Following the Portugese came the Spanish—masters of Manila—and then came the Hollanders and the English, each in turn seeking commerce with Japan. This traffic had, with difficulty, began to acquire some amplitude, when the Japanese Government brusquely closed its dominion to foreigners. The edict of 1638 interdicted them, with the exception of Chinese and Hollanders, from trading, and restricted these latter two to the small island of Desima, in the Bay of Nagasaki. Also, the Japanese were forbidder, under penalty of death, from leaving their country.

During two centuries Japan continued to live an isolated life. The ardent desire of Europeans for a renewal of commercial relations which they hoped would be profitable, menaced, from the commencement of the Nineteenth Century, this isolation. In 1824, the English appeared at Mito; and in 1846 an American squadron vainly attempted to open negotiations with the Japanese authorities. The Americans returned in 1853, and in the following year Commodore Perry obtained, by means of the fear which his cannon inspired, a treaty of peace and amity between Japan and the United States, together with the opening

of the ports of Shimoda and Hakodate to American commerce. A little while afterwards Great Britain and the other European powers compelled the signing of treaties giving them the same advantages. In July, 1858, the United States concluded a treaty of commerce which provided for the opening within three years of five additional ports, and limited the maximum tariff; the tariff of importation was not to exceed 20 per centum, *ad valorem*; and the tariff of exportation was not to exceed 5 per centum. By new conventions made in 1866, Japan engaged to limit to 5 per centum, *ad valorem*, the tariff of importation. By means of the insertion into all the treaties made by other powers with Japan of the clause of the most favored nation, the advantages obtained by any one of them becomes extended, *ipso facto*, to the others, and all Europeans are thus placed in an analogous situation.

The concluding of these treaties hastened a political revolution which ended in the destruction of the feudal system prevailing up to this time in Japan. The Emperor regained the power of which for more than three centuries the Shogun had dispossessed him. In 1881, an imperial ordinance established the representative system, and in 1889, the Emperor granted a constitution to his people, in which he remains the supreme authority, but delegates a part of his powers to a Diet, composed of two Chambers: the Ministers remain responsible to him alone.

Modernized Japan endured with discontent the treaties of the period between 1854 and 1866, which gave to foreigners the rights of extraterritoriality in the open ports, and made them answerable to only the Consular tribunals. In 1894, England, and, afterwards, the United States; then, Russia in the following year; Germany in 1896; and, then, France; consented to the substitution for the old treaties, of new ones satisfactory to the Japanese. After the making of these treaties, which became operative on the 4th of August, 1899, and which now actually regulate the relations of Japan with foreign powers, the latter abandoned their privilege of national jurisdiction; they also surrendered to Japan the elaboration of its own tariff with reservation of the conventional rights defined by these latter treaties. On the other side, Japan has opened its entire territory to foreigners.

Japan has not limited its innovations to the Europeanizing of its political institutions. It has with great boldness undertaken a profound economic transformation that has caused serious disquiet to the rest of the world.

What, then, are these efforts now being made by modernized Japan in the evolution of its economic system. What causes exist from which their success may be inferred in the future? Has Japan truly the necessary elements for becoming a great industrial power? Up to what point has other nations to fear the advent of this new competitor? Such are the questions which are proposed to be briefly answered in this paper.

I.

The Empire of Japan consists of a long chain of mountainous islands of volcanic origin, extending from mid-Kamtchatka to Formosa, which island was taken from China at the close of the war of 1894. It is formed, exclusive of Formosa, which is a colony, of four large islands, "Hokkaido," "Honshu," "Shikoku," and "Kiu-shu," and of 600 small islands. Its surface is about 147,500 square miles. Excepting "Hokkaido" and the north of "Honshu," which, because of their latitude, are subjected to rigorous cold, the rest of the Empire has a temperate and humid climate.

The population has rapidly increased. From 33,000,000 in 1872, it rose in 1903 to 46,000,000.

The Japanese remain to the present time almost wholly an agricultural people, notwithstanding that the country is but little adapted for agriculture. The arable land is only 15.7 per centum of the whole surface of the Empire. Of this whole 45 per centum (the low flat ground) is utilized for the cultivation of rice; and 38 per centum (situated on the sides of the hills) serves principally for the tea plantations, and for the plantations of mulberry trees, the leaves of which are used as food for the silk worms.

The food of the Japanese is principally rice and fish.

The agricultural population is estimated at 23,000,000 of persons. The predominant character of the cultivation is the small scale on which it is practiced. The work is almost wholly done by hand. The implements are mediocre, and often not of metal.

The productive capacity of the worn-out soil is maintained by constant labor, a very careful irrigation, and the abundant use of manures. By these means, two, and sometimes even three, crops are obtained during the year from the same ground.

Notwithstanding all efforts, agriculture with difficulty supplies the needs of the population, the rapid increase of which is a most disquieting problem for the Japanese Government. The least deficit in the rice crop compels recourse to importation.

The agriculture of Japan, though still very backward, can hope for great improvement, to accomplish which the agriculturists, now entirely guided by tradition, must be properly instructed, and the necessary money for the desired ameliorations must be provided, because they are so ignorant and so poor.

The government is applying itself to this double task by supplying agricultural teaching, and by creating financial institutions for agricultural credit. But whatever may be the efforts made and the results obtained, the progress of agriculture will be fatally limited by the small extent of territory susceptible of cultivation. Doubtless, the sides of the hills having a moderate inclination are capable of cultivation, but they represent only 8 per centum of the total surface of the country, so that the most optimistic previsions cannot hope the Empire of Japan will ever be able to devote more than 25 per centum of its area to the production of food.

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The Japanese agriculture of the present day does not differ much from what it was before the Revolution; but the case is quite different with industrial Japan, for here the progress made in thirty years has been considerable. The Japan of 1870 knew only the industries that could be practiced by the household or in small workshops, and was ignorant of all the modern methods of production. The tools were rudimentary, and the only motor employed was water-power.

Industries on the great scale are to-day established in Japan. Their progress has been rapid. In 1894 only 1808 steam-engines developing an aggregate of 32,808 horse-power were employed. In 1902 the number of steam-engines returned was 4,057, developing an aggregate of 90,778 horse-power. In the suburbs of the large cities, "Tokyo," "Kyoto," "Osaka," etc.,

formerly dominated by the traditional low buildings of wood, now rise the vast brick constructions and the lofty chimneys of the modern factory.

Like the political transformation, the industrial transformation is the work of the statesmen who have made modern Japan. With that country remaining completely isolated from European movement, to count upon private initiative to introduce the modern methods of production, was impossible. The government of the Revolution, conscious of the task imposed upon it, sent to Europe and to the United States missions charged to study the industrial methods of those countries, and it also obtained from them experts for organizing such of those industries as seemed the most pressing.

Mining was on an ancient system. The government employed foreign engineers to introduce into this industry the modern processes of exploitation.

The ministers of war, of the navy, of the treasury, became ministers of the corresponding industries, and thus played the part of veritable educators. The first undertook the manufacture of powder for cannon, and of the material of war. The second created a dockyard and workshops for the construction of small vessels, and for the reparation of the large ones that during several years he was obliged to buy from foreigners. To furnish the castings for these purposes a foundry was put in operation.

The minister of the treasury needed a mint, and this required an establishment for making the assays. He desired to manufacture, according to the methods of Europe and America, the material for the paper money issued by the State, and for the notes issued by the banks, and for the postage stamps. For these purposes he was obliged to create a paper making factory, a manufactory of sulphuric acid, of soda, etc. The government having undertaken the construction of railroads, had to manufacture cement.

In 1872, he established at Tourioka (Gummakin) a model spinning mill, with the view of introducing machine-spinning in the silk industry. In 1877, he created at Senju, near Tokyo, a weaving mill for wool. In 1881, he erected model spinning mills for cotton at Nukada-Gun and at Aki-Gun; and he sold, on credit, looms bought in England, to private persons living in

different cities in order to spread this new industry. In 1876, he founded a glass-making factory at Shinagander.

The government having thus given the impulse, abandoned the part of initiator which circumstances had compelled it to assume, as soon as private interests in their turn commenced to follow in the way shown by it and in which it still guided them. Commencing in 1880, it sold, one after another, its model establishments to private industry; but it retained, nevertheless, the workshops necessary for the needs of the army, and of the navy, and of some other departments of the State.

At the same time that the government was creating modern industries by the aid of foreigners, it commenced the creation of technical education for its own people.

The efforts of the Japanese government have been crowned with success. Without doubt the old industrial methods still exist; the family industry has not ceased, and numerous industries are operated in an incomplete manner; but the great modern industries, using mechanical tools, and steam-engines for driving them, together with their scientific methods, have taken firm root in Japan, and are extending farther and farther every year.

In 1902, there were 2,427 manufacturing companies, with an aggregate capital of \$86,500,000; and in 1898, establishments employing over thirty persons each, had an aggregate personnel of 506,912.

The following statistics enable an idea to be formed of the industrial development during the last decade, and of the actual situation.

PRODUCTION OF SOME MINERAL MATTERS.

	Coal tons.	Iron. tons.	Copper. lbs.	Petroleum. gallons.
1892	3,200,000	18,500	248,400	4,491,400
1902	9,700,000	31,400	350,400	41,743,600

WORKSHOPS AND FACTORIES WITH MOTIVE POWER.

	Steam Power		Water Power		Steam and Water Power	
	Number	Horsepowers	Number	Horsepowers	Number	Horsepowers
1894	1098	32,858	1090	2,429	221	5,744
1902	2449	90,778	497	5,298	45	4,825

PRODUCTION OF THE PRINCIPAL INDUSTRIAL ARTICLES.

	Raw Silk. Pounds	Waste Silk. Pounds	Tissues. Dollars	For Exportation Straw Goods. Dollars	Porcelain and Faience. Dollars
1892	9,064,700	4,320,700	24,500,000	282,000	1,881,000
1902	14,827,500	6,303,800	75,500,000	2,631,000	3,455,000

	Lacquered Articles. Dollars	Beer. Gallons	Chemical matches. Dollars	Japanese paper Dollars	European paper Dollars
1892		333,500	2,500,000	2,500,000	500,000
1902	2,769,000	3,702,000	4,300,000	7,000,000	3,500,000

The greatest development has been in the spinning of cotton-thread industry, which has become a really great modern manufacture.

COTTON-THREAD.

	Number of factories	Capital engaged. Dollars	Mean daily number of employees	Raw Cotton used. Pounds	Cotton-thread manufactured. Pounds
1892	39	4,500,000	403,314	100,900,000	82,700,000
1902	80	17,200,000	1,301,118	365,500,000	317,600,000

Certain of the above industries have worked solely for the home market, but now they have commenced to work for the foreign market also, and exportation has made sensible progress.

EXPORTATION VALUE IN DOLLARS.

	1890.	1903.
Cotton goods	28,000	19,029,000
Silk goods	1,662,500	15,724,500
Coal	1,549,500	9,603,000
Chemical matches.....	744,500	4,236,500
Straw goods	173,500	2,325,500
Porcelain and faience.....	622,500	1,584,500
Cigarettes	4,000	1,023,500

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The imperial government became occupied at an early date with the means of communication and of transportation.

In March, 1871, the postal system, organized in imitation of those of Western nations, was inaugurated between the cities of Tokyo, Osaka, and Kyoto, and was rapidly extended. In June, 1874, Japan joined "The International Postal Union." In 1879, it became a member of "The Universal Telegraphic System."

The first line of railroad was opened in 1872. It connected the cities of Tokyo and Yokohama, and was a governmental initiative. In 1883, private companies commenced the construction of railroads. In 1903, the extent of the system was 4,495 miles, of which 1,344 miles were built by the State. In the last decade the number of passengers has nearly quintupled, and the freight has more than decupled.

From an economic point of view, the organization of a national monetary system was not less important than the creation of the means of rapid transport. The imperial gov-

ernment was obliged to consider this problem several times before it reached a solution.

A law of November, 1869, decided to adopt the metric measures and with silver for the standard metal, as the basis of the imperial monetary system. The law of May 10th, 1871, modified this system by substituting the gold standard for the silver standard. The change was premature, and embarrassed the government, which was obliged to have recourse to paper money, and this both drove the metallic money out of, and prevented it from passing into, circulation. Previous to the failure of the law of 1871, the ordinance of the 11th of May, 1878, legalized the silver "yen," and without restriction of coinage. Theoretically, Japan passed into bimetalism; practically, it remained under an exclusively paper-money regime. In 1886, the return to specie payment was realized and became definitive; but the country remaining subjected, in fact, to an exclusively silver standard, suffered all the consequences of a gradual diminution in the price of that metal.

The war indemnity obtained from China in 1895, enabled Japan to adopt the gold standard. The law of the 26th of March, 1897, prescribed for the monetary unit the "yen" of the weight of two *fun* (0.75 grammes, centigrade) of pure gold, and, consequently, of an intrinsic value of 2.50 francs.

There is not in circulation any more paper money issued by the State. The sole existing paper money is the notes of the Bank of Japan, which bank was created in 1882 with the exclusive privilege of emitting them. It has an entirely paid up capital of \$15,000,000, and issues notes payable in gold on demand, which notes have the quality of legal money.

Foreign commerce has had a rapid development. The aggregate of importations and exportations in 1872, was only \$16,500,000; but in 1888, it surpassed \$50,000,000. In 1894, it exceeded \$100,000,000; and in 1903, it rose to \$303,000,000.

More than 30 per centum of the total importations of Japan is food stuffs, which the insufficiency of its own agricultural productions compels it to obtain abroad; and 23 per centum is of material in the raw state; the cotton, wool and hemp necessary for its newly developed industries. The remainder is composed of articles of European manufacture, the consumption of which rapidly increases. Among these articles are

prime motors and power tools to the annual amount of \$2,500,000.

About 34 per centum of the exports consists of agricultural products: raw silk, tea, camphor (from Formosa); and 11 per centum of mineral products, copper ore and coal. The surplus consists of manufactured products, of which the two principal ones are articles of silk and articles of cotton (for the major part of the cotton is in the state of thread), representing altogether about 23 per centum of the total exportation.

The greatest part of the commerce of Japan is with Asiatic nations—about 50 per centum of its importations and of its exportations. Its greatest sources for supplies are as follows: Great Britain, the United States, Germany; then, but a long way after, Belgium and France. Its best clients among the western powers, are: the United States, France, then Great Britain, Italy and Germany.

The Japanese Government is strongly endeavoring to create a national merchant marine. Since 1870, it has subsidized marine construction. The laws of 1896, which regulated anew the bounties for construction and for navigation, have been largely increased. The results obtained are important. The total tonnage of the merchant fleet (steamers and sailing vessels) of the European type, has risen from 77,000 tons in 1879 to 225,000 tons in 1893, and to 919,000 tons in 1901. At this latter date, the number of steamers was 1395, measuring an aggregate of 583,000 tons, of which number 969 measured in the aggregate 577,000 tons, counting among them 67 which measured between 2000 and 5000 tons each, and 22 among them which exceeded 5000 tons each.

Following the example of the western powers, Japan desired a Postal Company, with rapid steamers, and for that purpose subventioned the "Nippon Yousen-Kaisha." This company, just previous to the war with Russia, which disorganized its service, had made six regular departures per month; once a fortnight for Europe and for America, and once every four weeks for Bombay and for Oceanica.

Up to 1883, the part taken by the Japanese flag in the foreign commerce of the country was nearly nothing. Since then, it has increased rapidly, rising to 10 per centum in 1890, and to 30 per centum in 1900.

II.

The progress made by Japan in the short time of thirty years, has indeed been very considerable. She surprises us simultaneously by the importance of that progress, and by the decision and spirit with which her government commenced and continued the economic transformation of the once merely agricultural Japan into the present industrial Japan, equipped with western knowledge, and eager to compete with western nations in the markets of the world. The statesmen of the Revolution had the intelligence to perceive promptly and clearly that a pressing economic necessity compelled Japan to become, and at once, a great industrial power, and that only under this condition could she achieve the political destiny for which she was ambitious.

With its agricultural territory narrowly limited by the physical configuration of its soil, Japan already could not feed its population; and to become an industrial nation was a vital necessity. Only in the development of its manufacturing industries could be found the lacking elements of wealth. And to become a great political power; to play the role that it wished to play in the Extreme-Orient; to make itself the guide in the path of western material civilization for the Oriental peoples; to substitute its protectorate for those which European nations were attempting to impose on them; there was an equal necessity for Japan to become a great industrial power.

But has Japan truly the many indispensable elements for becoming a great industrial power? Will it not encounter obstacles that will obstruct or arrest its course? Is the competition with which it menaces the industries of the Occident as redoubtable and as near as has been proclaimed by many European publicists?

To form an opinion on that point, an examination must be made of the conditions of Japan relatively to the abundance of its prime motors and raw materials, and to the facility with which it could find the necessary capital for the erection of so vast an edifice. Finally, there must be known the personal qualities and defects of the captains and of the troops of its industrial army.

The subsoil of the Japanese Empire is not yet sufficiently

known to appreciate with any degree of exactness its deposits of coal; but the basins of Kyushu, of Hokkaido, and of Hitachi-Iwaki, the exploitation of which is still far from being complete, assures a sufficient quantity of fuel for a long period. Should this be an error, coal from the Chinese mines can be cheaply **procured**, and would add considerable resources. Petroleum is another fuel which nature seems to have as liberally bestowed. There is thus a nearly inexhaustible reserve of motive power. Also, the numerous waterfalls along the coasts of Japan will become a precious advantage to its industries.

Japan is less favored in the matter of raw materials. In that respect, there is abundance only of silk; but the location of the country permits it to cheaply procure all the others it may need. Well endowed as regards copper, it appears to be less so as regards iron; but of the latter it could obtain large quantities in China.

The southern islands of Japan still cultivate cotton, but this crop, little remunerative, is diminishing instead of increasing. The Japanese industries import their cotton ordinarily and cheaply from British India and from China. Formosa will, without doubt, be in a few years the center of an important production. As to American cotton, the completion in two or three decades of the Panama Canal, will enable it to be imported under excellent commercial conditions.

As regards wool, the difficulty of raising sheep, notwithstanding the attempts hitherto made, seems insurmountable. But, on the other hand, the Japanese are no farther than the Europeans from the great producing centers of Australia and of South America.

Thus, in what concerns motive power and raw materials, Japan will encounter no extraordinary obstacles. It has not to fear any impediments that could long arrest its progress.

The question of capital offers a more delicate problem. Japan cannot find among its own people sufficient resources for the building of factories with which to create large industrial enterprise still in embryo, much less can it progress rapidly. The paucity of capital for such purposes is a serious matter, and the money will have to be obtained abroad. Now, it will have to overcome among the capitalists of the

West, an apprehension that exists there at present with regard to such loans, and which nothing has thus far lessened.

It ought, if it does not wish to cripple its industrial progress, to facilitate the coming of capital into the country by granting to foreign capitalists guarantees which the Japanese Legislature has, up to the present time, refused to do.

The question of the personnel—captains of industry, leaders of enterprises, agents, superintendents and foremen, the mass of workmen—is the gravest that confronts Japan in what concerns its development. Herein it will encounter the most serious obstacle, if not the stumbling-block, capable of arresting, or, at the least, of sufficiently hindering, the course of its economic transformation to prevent the accomplishment of its grandiose projects.

Pure science, vast hypotheses, seem repugnant to the Japanese mind. It lacks invention, and closely follows the European lead. But if the Japanese are deficient in genius, they have, on the contrary, the talent of imitation strongly developed, and they very quickly acquire the industrial methods originated by others. And, certainly, the directing classes among them have other qualities more important at the present era than formerly from the economic point of view by reason of the already great development of mechanism, namely, a concentrated power of observation, and the faculty of never becoming discouraged neither by the minutia of details nor by the length of preparation necessary to the successful execution of a preconceived plan. They have shown these two qualities in a rare degree in the organization of their late campaigns against Russia; and their success in them was due for the most part to the attention they had given during the preceding years to the preparations for that war. That they will show the same qualities in industrial pursuits is quite probable. They seem also to have remarkable talents for organization, one of the most important things demanded by modern industry where concentration is continually on the increase, and which places under the direction of the industrial chiefs large masses of workmen whose labor in order to be made efficient and remunerative must be coördinated in the most rigorous manner.

A great defect tarnishes the reputation of the industrial and commercial classes of the Japanese; it is their want of probity.

Notwithstanding, certainly, very numerous exceptions, this defect is so general that their dishonesty in business affairs has become a proverb in the extreme Orient; and many European houses which have traded directly with them have suffered heavy losses from this cause. The defect is so inveterate, that there should be created in their commercial schools courses of commercial morality. Such education, as a necessity of foreign commerce, will probably sooner or later come.

The question of labor presents still more serious difficulties than that of the education of those who direct it. The great modern industries need abundance of labor habituated to long hours of work; regular and attentive in the workshop; capable of continued effort; and sufficiently instructed to use in an intelligent manner, the implements and tools, often delicate, intrusted to them, and to understand the importance of keeping them in the good order which they require. This class of workmen Japan has barely commenced to form, and they are yet very far from reuniting the numerous qualities possessed by the workmen of western nations where the great industries flourish.

Carelessness, love of idling, want of application, are the most frequent faults found with the Japanese workman.

This working population, recently arrived from the rural districts, and drawn to the large cities by the hope of higher pay, and of an easier and, above all, more varied life, often deceived by the fallacious promises of the agents sent from province to province to engage them, is of the most worthless kind.

In general, the Japanese workman understands badly the machine placed in his hands; it is still for him a strange thing for which he continues to feel a stupid antipathy. He has not yet acquired a comprehension of its utility or of the numerous advantages to be obtained from its use.

The many deficiencies and insufficiencies of his workmen, nullify largely for the Japanese industrial the advantage of the small pay given by him relatively to the pay received by the European workman. Further, in these latter years, there has been so great an increase in the pay of labor, that an increase of its output does not seem justified, and which, under the influence of the general causes resulting from such an economic transformation and under the pressure of the labor unions, does not appear to be yet arrested. The increase of pay during the last seven years has varied between 50 and 70 per centum.

The increase of socialistic ideas, is also a menace, increasing the difficulties to be encountered by the Japanese industries, and which might signally retard their progress. The labor agitation commenced towards 1882. In 1889, was founded the syndicate of iron workers which to-day contains nearly 3000 members. In 1897, was created the Fraternal Union of Workmen, and in two years it had 6000 members. Then, in 1898, the railroad engineers and firemen formed a union, which, in 1900, engaged in a successful struggle with the companies. The syndicate movement at present very feeble and having only precarious funds at its disposal, is surely destined to follow, as in other countries, the development of the great industries.

Constrained by its economic necessities, and obliged, in order to realize its political ambitions, to become a great industrial power, Japan has no insurmountable obstacle to fear that could prevent its continued progress in the path in which it is so resolutely moving, but it will not realize its progress without halts. Of the numerous impediments, one of the most serious will be the labor question in slackening its speed. The war with Russia, by reason of the loss of men it caused, will have an analogous effect. The European industrials should, nevertheless, endeavor to maintain in the Japanese markets a more and more active competition on the part of their own national industries.

Will Japan, after the example of the Western nations, have recourse to political tariffs for hastening the development of its industries? Up to the making of the recent Japanese treaties it has not been at liberty to inaugurate a tariff protection system. These treaties have given this liberty, but they still limit its extent as regards numerous products, which, however, are the most important ones, and which have been made the objects of a special tariff. What will happen at the expiration of these treaties made to last a dozen years? Nothing in this respect can be foreseen, but if, in this case, Japan should follow the example of the Western nations, there would be no reason for astonishment.

The Japanese industries in order to render the services to their country which are expected from them, must seek foreign outlets. On the doors of what markets with the European products knock in this new competition? Naturally, on the

doors of the markets of the extreme Orient, as those will be the first encountered, and the Japanese consider that these markets will always and exclusively belong to them. A Japanese writer looking at the economic future of his country, concludes as follows: "The domination of the Pacific Ocean is now the object of all the commercial nations, and China is the El Dorado of the Orient." On to China! will, therefore, be the word of command given by the politics, the manufactures, and the commerce of modern Japan.

The struggle for these markets will be difficult for the western industrials against their Japanese competitors. The latter will have the great advantages of the proximate geography, and of the similarity of race and customs. They will be more apt to divine the needs of these Asiatic populations, to stimulate them, to create new wants, and to satisfy them in respect to their habits and even to their manias. The more so, as Japan has already commenced this commercial invasion of China.

Will Japanese competition be one day found in the markets of the West? This would be a disquietude which at the present time is without cause. If the industrial development and the commercial expansion of Japan be injurious to certain European industries, they will, on the contrary, be beneficial to certain others.

During a long time yet, Japan must obtain from Europe the greater part of its machinery and large tools; and, in measure as its people, in consequence of its economic development, become richer, they will consume a greater quantity of European products of superior quality to what the Japanese industries will be capable of manufacturing.

Examined closer, the Japanese peril singularly diminishes in importance. The Japanese industries could not progress with the rapidity assumed in the attempts that are sometimes made to frighten us with it. They will encounter more than one formidable obstacle which will diminish their speed. Their chiefs will have in the education of the different classes of their workmen a laborious and extremely difficult task, and they will not be able, in the course of their growth, to avoid economic and financial crises which will cause them serious perturbations. On the other hand, the field of their competition with European industries must necessarily be a limited one.

EXPLORATION OF THE CANADIAN ROCKIES.

The work of the expedition dispatched by the Smithsonian Institution of Washington, D. C., to the Canadian Rockies and Selkirks, under the direction of Prof. W. H. Sherzer, of the Michigan State Normal School, is described in the report of the late Dr. S. P. Langley for the year ending June 30, 1905. The expedition had a successful season's work on the glaciers along the line of the Canadian Pacific Railway. A selection was made of those five glaciers which are most accessible to the student of glacial geology, and these were found to exhibit the characteristics of glaciers throughout the world. Four or five days of comfortable railway travel places an investigator in the midst of snow-fields rivaling those of Switzerland, and the ice bodies descending from these fields may be studied from modern hotels as a base, and a horse may be ridden to the feet of the glaciers studied by the expedition. So far as is known, there is in this district the most magnificent development of glaciers of the Alpine type on the American continent, and the purpose of the survey was to gather as much information as possible concerning them. Many photographs illustrating the details of glacial structure were obtained, and a full report of the expedition may be expected later.—Nature.

SMOKE SUPPRESSION IN NEW YORK.

The Anti-smoke League recently formed in New York City, is not designed, its patrons say, to prevent the burning of soft coal, but to insist on proper firing and to abolish smoke as far as possible. One firm affiliated with the league says that formerly it was able to manufacture in New York City the most delicate silk fabrics, with a very small percentage of damaged goods. For the last three years, and particularly for the last two years, it has become almost impossible to manufacture delicate shades, on account of the impregnation of the air with soft coal smoke.

THE FIRST TURBINE STEAMSHIP built in the United States was launched at the Roach Shipyard, at Chester, Pa., on Saturday, April 21. The vessel is the Governor Cobb, and is intended for the Boston-New Brunswick trade of the Eastern steamship Company of Boston. Its length is 290 feet and the width 51 feet. The motive power is Parson's turbines, which were built by the W. & A. Fletcher Company, Hoboken, N. J.

AN IMMENSE DOCK nearly half a mile in length, 1000 feet in width, and covering an area of thirty-four acres, has recently been completed at Cardiff, Wales. It is designed to accommodate the largest vessels afloat. About 1500 workmen were employed for seven years in its construction.

MARCH EXPORTS of all kinds of merchandise totaled \$145,522,342, being the largest for March ever reached. The imports were valued at \$133,625,066, which is the largest total for any month in the country's history.