

of the treaty ports made the study of it possible in the land wherein it reached its highest development, was not originated within the empire of the Mikado, but was an importation from China. Owing to the unreliability of the early records, it is not known when the intercourse between the two countries began; but by the middle of the sixth century of our era the peculiar civilization of China, which had its roots in India, was flowing onward in a vast and steady stream, through Korea to the Land of the Day's Beginning. Buddhist missionaries were the pioneers, and their converts the active promoters, of this great movement. Buddhism was the vehicle which gave to Japan Chinese writing and literature, Chinese philosophy, Chinese art, Chinese medicine and jurisprudence, Chinese state polity, social customs and industrial methods. Before its civilization became crystallized, and its power diminished by the ravages of Tartar conquerors, the Middle Kingdom was a great fountain-head from whence wave after wave of influence spread over Korea and Japan, and stamped upon them characteristics which, their own development arrested in turn, they retained almost unchanged until the present day, when they are beginning to crumble away through contact with Western ideas and institutions.

It is difficult for us to realize now how little we knew about Japan prior to the expedition of Commodore Perry. Only thirty years ago Sir Rutherford Alcock, then on his way there as the representative of the British Government, had no clearer idea of the country to which he was accredited, than "a cluster of isles on the farthest verge of the horizon, apparently inhabited by a race grotesque and savage." After the downfall of the Tokugawa Shogunate a few years later, and the removal of restrictions upon foreign intercourse, there was revealed to the world a sociological phenomenon akin in its interest to that which would undoubtedly be presented if the supposition that the moon is inhabited by a race of men similar to ourselves should some day be proved to be true and a means be devised for placing us in communication with them. For the Chinese civilization is in many respects the antithesis of our own.

In response to the popular demand for information, it is not surprising that all classes of visitors to Japan—scholars and diplomats, merchants, government employees, and globe-trotters—should have hastened to print their impressions of this strange people, and with an

THE INDUSTRIES OF JAPAN.*

The unique position held by Japan among the nations of the world is perhaps more widely recognized than generally understood. Everybody is familiar with the fact that during two centuries and a half its inhabitants shut themselves out from all but occasional and superficial intercourse with foreign barbarians. It is also well, though not so widely known, that the system of civilization which has interested the rest of the world so deeply, since the opening

*THE INDUSTRIES OF JAPAN. Together with an Account of its Agriculture, Forestry, Arts, and Commerce. From Travels and Researches undertaken at the cost of the Prussian Government. By J. J. Rein, Professor of Geography in the University of Bonn. With forty-four illustrations and three maps. New York: A. C. Armstrong & Son.

alacrity often in inverse ratio to the worth of their remarks. Fortunately there were among those early upon the ground a number of men of marked ability, exceptionally well qualified for the work of investigation. To their untiring zeal are we indebted for nearly all of the good and reliable contributions to the rich literature about Japan. Many, however, as are the books on the various subjects included under the general head, the really valuable ones are comparatively few. Among them must be ranked the two volumes in which Prof. J. J. Rein has recorded the results of his researches. In conformity with a commission from the Prussian Minister of Commerce, he spent the years 1874 and 1875 in Japan, "for the purpose of studying and giving an account both of the trade of Japan and of the special branches of industry there carried to so high a degree of perfection." Six years after his return the volume of "Travels and Researches" was published in Germany; and an English edition was issued in 1884. The work contained the best accounts extant of the geology, physical geography, topography, climate, flora and fauna of Japan, and valuable chapters on the history, ethnography, and religions of the Japanese people. Now, after a further interval of five years, the second volume is given to the public. In it we have the results of Prof. Rein's study of the "Industries of Japan." How carefully this book has been prepared is indicated by the author, who states that since his return from Dai Nippon, fourteen years ago, he has devoted to the task of working up the material which he had collected, "the greater part of the time and strength left him by the duties of his profession."

Prof. Rein entered upon the discharge of his duties in Japan in the painstaking and methodical way characteristic of the German scientist. Considering the wide range over which his observations were extended, the fulness and accuracy of his report, comprising, as it does, a multitude of details in regard to almost every topic touched upon, is very remarkable. That it is not equally ample in all directions, is true; but of this he appears to be fully conscious, and it could hardly be otherwise. The faults are chiefly omissions, not errors. Taken together,—for although published with separate titles the two volumes really constitute a single book,—we have in them a treasury of well-arranged information, much of which cannot be found elsewhere. More than half of the volume is devoted to Agriculture and For-

estry, and Agricultural Industries. It is by far the most valuable portion of the book, most of the data having been derived from the author's personal observation. Japanese Agriculture in general, Food Plants, Plants of Commerce, Cattle Raising and Stock Growing, Forestry, the nature and use of the more important Forest Trees and other useful Japanese woods, and Gardening, are all considered in turn, and are followed by a chapter on the Acclimatization and Extension of Japanese Ornamental and Useful Plants in Europe. Contrary to the generally prevailing impression, Prof. Rein does not find that the soil of Japan is unusually fertile. Vegetation depends more upon climate than upon the nature of the soil; and thus it is that although less than twelve per cent of the entire surface of the Empire is used for the cultivation of field products, the food supply is ample for the population of 37,000,000. Compared with Germany, the area of cultivated arable land is to population as 11.5 to 47.2. This remarkable showing is attributed to the method of farming, and to the frequency and certainty of the rainfall, and the long uninterrupted summer heat. Although the Japanese peasant neither understands nor applies the principle of rotation, by most careful tillage, including subsoil working and repeated fertilization of the growing crops, the annual yield is kept from diminishing and the land from becoming exhausted. And yet Japanese agriculture is far less scientific than the methods followed in Europe and America.

How largely the transportation question enters into the profitable cultivation of land is strikingly demonstrated by the fact cited by Prof. Rein that the cost of carrying rice, which is the highest priced agricultural product of Japan, amounts to the market price of the grain itself by the time it has been carried only twenty miles, and on the poorer highways it does not bear a transportation of five miles. To a similar state of things may be attributed the preservation of the forests, which cover about forty-one per cent of the entire area of Japan; and in estimating the probable effect of the introduction of railways and other modern facilities for building up commerce and despoiling nature of her beauty, this should not be overlooked. Eighteen per cent of the whole, or nearly one-half of this woodland area, is under cultivation, principally to supply the necessary building material, the mountain forests being too difficult of access on account of the lack of good roads, though other

conditions of traffic have their influence also. It is significant that the bare ridges of hill country and mountain side classed as desert land amount to more than a third of the total area. These, too, it is thought, were once covered with forests; but having been denuded of them, the heavy rains had free course, and robbed them of their compost matter, so that neither natural nor cultivated forests are likely to cover them again. With these facts in view, Prof. Rein does not hesitate to say that he considers the protection and cultivation of the forests of the utmost importance to the welfare of the Japanese nation.

The chapter on Silk-growing is among the most valuable in the volume; but it is beyond the scope of this review to follow the author in the consideration of the many topics with which he deals. The second section of the book is devoted to a brief account of the Mining industries, which are much less important than might appear from the fanciful statements of early travellers. In the third section, which treats of the "Art Industry and Related Occupations," Prof. Rein ventures on ground much better explored than that which is the subject of the first part of the volume. Many of the topics have been more extensively and adequately treated by other writers. Of this fact he is not unaware, and therefore confines his observations principally to the scientific side, and to the description of the technical and manipulatory processes. There is a preliminary chapter on Japanese Art Industry in general, in which occurs the following: "In all surface decoration the use of arabesques and other ideal curved ornamentation falls far behind the conventionalizing of straight lines." The German edition of the book is not at hand for comparison, but it is fair to presume that this novel use of a much-abused word is chargeable to the translator. Even Walter Crane or Lewis F. Day would probably "fall backward with surprise" if asked to conventionalize a straight line.

The first five months of Prof. Rein's stay in Japan were spent principally in the study of lacquer work, and the forty pages which he devotes to this industry are especially valuable, and contain much information that is new. Having set up a chemical laboratory at Tokio, he engaged the services of two experienced lacquerers, arranged a workshop under their direction, and kept a journal giving an account of all the work, in which he took an active part himself, for the purpose of gaining a

practical knowledge of the various processes. This incident is mentioned to show the thoroughness with which his investigations were prosecuted. At the same time all the materials used were carefully examined and analyzed, and afterward during his travels in the interior considerable time was given to observing the methods used in cultivating the lac tree and gathering the raw product. As a result of this patient care we have a treatise which is more complete than the best previous account—the Parliamentary Blue-book by Consul Quin. Of the four pages devoted to historical facts concerning the Japanese lacquer industry, it may be stated that this branch of the subject and also the artistic qualities of the work have been much more fully treated by other writers.

Considering its importance, the Textile industry receives far less than its proportionate share of attention, and the chapter on the subject appears to be mainly a compilation from other works. No mention is made of printed fabrics and the peculiar processes employed in their manufacture. Nor is anything said about the use of stencils, by means of which the Japanese contrive to produce very complicated effects, rivalling free brush-work. Information in regard to the manipulation of these, and also as to the method of mounting the loom for the production of intricate patterns for brocades and damasks, would have been very welcome. Embroidery may be said not to be considered at all, since it is dismissed in less than thirty lines. Wood and ivory carving also are but cursorily treated. In the artistic use of metals the Japanese have no superiors, and many interesting details are given concerning materials and processes. One of the most curious of these is an account of a peculiar decarburising process, by which the surface of a cast-iron kettle or pot receives a structure like that of soft iron or steel, and can then be worked upon with the hammer, chisel, and burin. Inlaid vases executed by this method, by Komai of Kioto, have been described by Audsley and other writers, who erroneously speak of them as made of wrought iron, believing inlaid work on cast iron to be an impossibility. Anything more than a mere outline of a subject so extensive was of course impossible in a single chapter; but there are some rather singular omissions. Much of the beauty of Japanese cast-iron ware is due to the fact that instead of multiplying the objects by the use of patterns formed to "draw," wax models are employed as in bronze casting.

This is not mentioned, however; nor is any account given of the method termed *kata-kiri-bori*, by which the makers of iron sword-guards achieve such marvellous results. The chapter on Ceramics gives a general sketch of this widely-extended industry, and of some of the numerous processes employed. There is also a chapter on Cloisonné Enamel, and one containing miscellaneous information and statistics relating to trade and commerce.

The illustrations, which are executed by a number of different processes, are unusually good. A combination of heliotype with chromolithography is used in several plates with excellent effect. Especially noteworthy are the illustrations of lacquer work on which the full measure of realistic possibility in the representation is very nearly attained; but the very success achieved is only another proof that lacquer is incapable of satisfactory mechanical reproduction. A confusing mistake has been made in mounting plate V upside down, thereby reversing the relative positions of the illustrations of Tsugaru and Wakasa lacquer with regard to the marginal notation.

The work of translation is for the most part well done. There are a few minor slips, such as "consulate" for "consul." More serious is the neglect, in the directions for pronouncing the Japanese names according to the prevailing phonetic method, to give the English equivalents instead of the German. On the whole, however, the faults of the work are too slight to be weighed against its merits, and it must take a leading place as a work of reference on Japan.

F. W. GOOKIN.