Ken-Ichi IIDA: *Nippon Tekkō Gijutsushi Ron* (Technology of Iron and Steel in Japan) San-Ichi Shobō, 1973, 466 pp.

Baien MIURA, a prominent 18th century Japanese scholor and thinker, wrote that of all the world's metals "iron is the greatest treasure ... because it is moderate in price but varied in its uses. Man cannot live without iron." The Japanese people, like other peoples of the world, have a long history of iron- and steelmaking. Steel and technology have always had an important place in man's life combined with the native wisdom of the people. The history of steel is a history that has evolved with and around people.

From the above point of view is described Part I, "Course of Iron Industry in the World and Japan." In the 1850's about 20 years prior to the Restoration of 1868, an idea that "iron is the basis of industrial economics" was common in Japan as well as in advanced European countries, which is one of the most important keynotes when considering modernization of Japan, *i.e.*, the so-called take-off from the traditional community, so emphasizes the author.

When the Imperial Japanese Government Steel Works had started at Yawata in 1901, Erwin Bälz (1849–1913) pointed out educational and cultural deficiency in Japan and sent out the following warning to the Japanese at the banquet in celebration of his stay in Japan for 25 years. "When the Western arts and sciences had been transplanted into Japan, the Japanese was simply satisfied with receiving fresh fruit, without learning its root which brings a new harvest ...." The author indicates the reason why Japan has developed and headed the list of the iron and steel field in an output for 100 years as dragging such deficiency is because of peace economy but not war economy after World War II.

In addition to the above, Part I describes the characteristics of Japanese steelmaking technology by comparing classics of mining and metallurgy, *De re metallica* (1556) by Georgius Agricola, with "The Steel Age" in Europe and in Japan viewed from the world's history. A supplement to this book, "Course of the General Idea of Technics in Japan," is a very interesting article, but the course of specializing art into technics and technology is not sufficiently clarified. If the 1930's idea that technics is grasped as a system of the labor means is not clarified, a relation between the Japanese capitalism and technics, technology or technical sciences cannot be clarified.

Part II entitled "Various Cross Sections of Technology of Iron and Steel in Japan" takes the most principal part of this book, and deals with the period

from the traditionally formed ironmaking technology, *i.e.*, *Tatara* method, from the 18th century to the 19th century even in the absence of a modern European-type system of natural science through a German-type system to an American-type system for 100 years.

The most exciting are labor calamities at the Yawata Works, where the overwhelmingly higher rate of sufferers is recorded than the army arsenal and shows 70% of casulties in all the government-managed works in 1906 in the midst of the Russo-Japanese War. This book does not fully clarify the problems of unbalanced technical development under the imperialism and aggravation of working conditions in Japan. Even though the pre-treatment of iron ores, coke furnaces for saving fuel, large-sized blast furnaces, electric steelmaking process, *etc.*, had originally been developed in Japan, self-supporting economy of the Japanese own technology was prevented by the double structure of industry, rationalization of selfish enterprises, industrial rationalization on a national scale, and the spread of an aggressive war. What we wish to know in detail is this long hard process. Concerning LD converter as a star at the time of 1950, the writer only explains on the basis of creative spirit of Dr. R. Durrer, but how does he explain our Japanese dependency upon foreign technics in future?

Part III entitled "Engineers of Iron and Steel in Modern Japan," consists of critical biographies of Takato OHSHIMA, Adolf LEDEBUR, Kageyoshi NORO, Kaichiro IMAIZUMI, Kuniichi TAWARA and Chobei TANAKA. Conducted by the late Dr. Hiroto SAIGUSA, the author succeeded in presentation of the pioneers who burnt with their creative spirits for modern science.

This book was made by compiling many articles issued in various magazines and series and by touching up by the author himself, so that it is rather impossible to avoid duplication and omission. However, I cannot help paying my respects to the author's effort while working as a documentarist at Nippon Steel Corporation. This opportunity is a springboard for the author to improve his study on the technology in Japan. I would like to finish this book review with H. Norman's remark which is often quoted by the author; namely, it means that "a history is to select the originally related facts and to evaluate thier mutual relation. The most important things in the history are the whole outline and essential details."

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