COMMODITY SCIENCE AND SCIENCE OF TECHNOLOGY IN COMMERCIAL EDUCATION

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I. *Introduction*

In German speaking countries and probably in them alone, Commodity Science and Science of Technology seem to have been fixed as paired concepts in the commercial education curricula. This fact can be considered as based upon a deep recognition of the inseparable relation between commodities and technology. Moreover, it is interesting to recall here that both sciences are said to have Professor J. Beckmann of Göttingen University in Germany as their common founder.

In commercial education in Japan, however, the process of development of commodity science has been made clear in recent years, but that of the science of technology has not yet been spelled out sufficiently. It is certain that an education system is affect by the development of a society or a nation and with resultant changes in curricula.

Here, I would like to outline and give some consideration to the historical development of commodity science and also the science of technology in Japan's commercial education.

II. *Emergence of Commodity Science and the Science of Technology in the Curricula*

Some articles have already been published on the outline of development of commodity science education in Japan.[1]

In this chapter I will review that development, especially stressing the context in which both commodity science and the science of technology have evolved as courses of study.

Japan started it's modernization with the creation of the new Meiji Government. In 1871 (Meiji 4) the Ministry of Education was established, and in the following year 1872 (Meiji 5) the Minister of Education enacted the school system, after having investigated and considered those systems in Western developed countries. It is said that the school system followed the example of centralism in France which was then increasing its national prestige, and depended upon American pragmatism in many of its concepts. With this, at any rate, the formation of a national education-system approved by the government was inaugurated.

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[1] Yoshirō Iijima: A View of the State and Significance of Waren-kunde (Commodity science) Education in Japan. FORUM WARE 5 (1977) No. 3–4, pp. 167–170.

With respect to commercial education, it was decided to set up commercial schools in several commercially prosperous places in Japan, and the curriculum of commercial schools was prescribed in 1873 (Meiji 6). There was a course of study in the curriculum called "Identification of commercial goods" (Shōyō Buppin Benshiki), which had such units as "material of commercial goods," "their uses, characteristics, categories, values, authenticity, and testing methods." It is understood that the course corresponds to our present-day commodity science. The actual conditions in Japan in those days, however, could not keep pace with a highly advanced school system and as no commercial school was eventually established the prescribed curriculum was not actually implemented.

Meanwhile, the term commodity (shōhin) was already in use in 1868 (Meiji 1). And, when did the term commodity science (shōhin gaku) appear for the first time in the literature of Japan's commercial education? The "Education Journal" (Kyōiku Zasshi) No. 24, issued by the Ministry of Education in 1877 (Meiji 10) included an article "On Commercial School Abstract from German Education Literature," in which we can find the term "commodity science" (shōhin gaku) as a translation from the original in German. In what context is the term used? First, it is referred to as a course of study in schools where professional instruction and moral education were given to apprentices of merchants; and the term appears when explanations are made about the objective and related courses of "commodity science." However, the article does not indicate the source book, accordingly we can not identify the original term. All we can do is to presume the word "WARENKUNDE" to be the original. It is not unreasonable that commodity science in Japan is often said to be the one discipline imported directly from Germany.

During half a generation was eventually recognized by the general public and the number of these who wanted to receive commercial education gradually increased. Therefore, in 1884 (Meiji 17), "General Regulation for Commercial Schools" was issued, and through the regulation the curricula, which had till then been decided independently by each school itself, were made uniform. In this uniform curriculum there appeared for the first time such subjects as "commodity," "machinery" and "story of industrial arts." That is a noteworthy development in the history of the commercial education curriculum.

Higher commercial education was initiated in 1884 (Meiji 17), but no general regulation existed for higher commercial education until 1903 (Meiji 36).

The Commercial Law Institute (Shōhō Kōshūjo) of Tokyo-Fu, which was the only higher commercial education institute during the early years of Meiji, had in its 1881 (Meiji 14) year curriculum a subject corresponding to commodity science, called "story of commercial goods" (Bussan-shi). The institute revised its regulations in 1887 (Meiji 20) and changed its name to Tokyo Commercial College (Tokyo Kōtō Shōgyō Gakkō) at the same time upgrading its academic achievements. At that time the subject above cited appeared as "commodity" instead of the earlier "story of commercial goods." And at last in 1903 (Meiji 36) the term "commodity science" emerged for the first time in the revised curriculum. It took about a quarter century to introduce the term "commodity science", which had existed as a translation from German, into an official education system. Since that time, such subjects as "commodity science" and "commodity physico-chemistry" (Shōhin Rikagaku) seem to have been included in commercial education.

Next, I will discuss the science of technology. As above mentioned, such subjects as "machinery" (Kikai) and "story of industrial arts" were seen in 1884 (Meiji 17), and some

private commercial education schools of western style had already in 1877 (Meiji 10) such a course of study as "mechanics" (Kikaigaku).

On the other hand, in the area of higher commercial education a curriculum revision was made in 1896 (Meiji 29), and there appeared in the revised curriculum of Tokyo Commercial College the course of "mechanical engineering" (Kikai Kōgaku), although lectures in the subject were given by a part-time teacher. The outline of instruction in mechanical engineering in 1911 (Meiji 44) was as follows:

characteristics of various industrial materials and their testing methods;
work and delivery of driving power;
heat and heat-engines;
cooling methods and heating equipment;
hydraulic power and hydraulic machines;
manufacturing methods of machine and machine tools and instruments;
spinning, dyeing and weaving industrial machines;
chemical-engineering industrial machines;
mining and metallurgic machines;

Although it is not certain why the course "mechanical engineering" was started, we can understand the reason if we look back at the situation in which Japan's industrial system began to be modernized in the 1890s and Japan's export and import of industrial products also began to increase in those years. It can be said that recognition of the importance of industrial knowledge commercial education was prevalent among Japanese leaders.

After the introduction of the subject "mechanical engineering," in the curriculum of higher commercial education, those other subjects as "engineering," "outline of industry," etc. appeared along with "commodity science."

With respect to secondary commercial education, after the emergence of "machinery" and "industrial arts study" in 1884 (Meiji 17), there appeared the subject "outline of industry" in the Commercial School Regulation in 1921 (Taishō 10), and some private schools already the course "chemical industry" earlier than this, in 1914 (Taishō 3).

As discussed above, we can find that the commercial education curricula in Japan has had since relatively earlier times some subjects of a technical category other than commodity science in accordance with the development of industries. Therefore, it can be said that "commodity science" and "science of technology" have long been part of Japan's commercial education. However, they have not existed in tandem. For example, when technical education was emphasized from the requirement of expansion of military production in wartime years, commodity science faded out: in 1943 (Shōwa 18) the course "commodity" in secondary commercial shcools was changed to "industries and materials" (Kōgyō oyobi shizai), and some public commercial colleges were forced to be transformed into technical colleges.

After World War II, the School Education Law was enacted in 1947 (Shōwa 22), and in the curriculum of commercial high schools under the new system the subject "commodity" replaced "industries and materials." In commercial colleges "commodity science" has continued, while the "science of technology" has disappeared completely. Recent surveys, however, find that some, but not many universities have such subject as "outline of industry," "history of science and technology," etc. under the heading of studies on industry.[2]

[2] Japan Society for Commodity Science: A Report on Commodity Education (at university and college) of Japan by the committee of commodity education. Studies on Commodities No. 116–117 (1979).

III. *Commodity Science in a Technological Context, and Technical Education*

Among the substantial changes in commodity science during the postwar period, we can refer to the following tendencies: as a critical review to previous one-sided emphasis on the description of commodity characteristics and the aspects of a natural science, it has been aimed to establish commodity science as a social science and stress has been put on the construction of theories for that; although traditional commodity science has had material goods as its main object, putting greater importance on basic, industrial products than to those displayed in retail shops, critics of this tradition have begun to emphasize consumer goods as the object of commodity science.

On the other hand, Japan's industrial activities after the war have achieved well-known hyper-rapid growth resulting in a quite radical increase in mining and industrial production. Such an expansion of mining and industrial production and of the scale of production has been completed under the conditions of technological innovation called the second industrial revolution and on the basis of development of nuclear energy and electronics industries as well as of the prevalence of automation. And it is also well-known that the growth of mining and industrial production has resulted in destruction of the environment and pollution of air and rivers. Such a situation ought to be reflected in the commodity science.

Meanwhile, the reason why commodity science is interested in technology, that is, why it has the recognition of close relations between commodities and technology, can be considered as follows: in these days many commodities are produced by technology and the level of technology is reflected in the quality of a commodity; as the quality of a commodity is an important object of commodity study, the study becomes inevitably associated with technology.

Although commodity science in the past took into account technology, only because of the requirement of technical comments on commodity production, or of the necessity of approaches in the manner of natural science as in commodity appraisal, the science of technology today has a broader scope of objects, including not only the area of technology proper, but also the social, political and humanistic implications of technology. Corresponding to these tendencies, traditional commodity science in technological context has changed its content. For example, increasing recognition of the fact that technology always has relations with capital, that is to say, it is a form of constant capital, and the introduction of concepts of the relation of production into commodity analysis are quite different features of commodity science today compared to that in prewar times. Prewar commodity science had played its particular role in the national policy to build up a wealthy, militarily strong nation and to encourage development and growth of industries. It can not be denied, however, that commodity science had been isolated from ideology under the ideology-control policy of the government since the Meiji Era. It would seem to be the reason why commodity science has had no value theory.

Now, I will express briefly my opinion about commodity tests, which have been recognized an important as part of instruction in commodity science and been actually conducted to date in many schools.

If we look back on human history, we can say that the monetary economy has changed the quality of human desires and products, that is, values in use have become objects of thus degenerated human desires, therefore, they could not be regarded as genuine value in use there. In these circumstances, it is important for us to try somehow to make an approach to genuine value in use. One of these approaches may be to buy in the market a commodity of good quality, at a proper price after selection. Therefore, it is necessary to develop consumers ability to select qualified goods. For this purpose, I think that technical education is the most effective means. For example, as a means to find genuine utility and to learn the reality of nature, J. J. Rousseau appreciated quite highly the effects of handicraft work.[3]

By learning the technique of manufacturing a product and that of using materials and instruments correctly, we can understand the structure and function of the product and can know the way to use it most appropriately and correctly. In such a way, if we learn the process and procedure of manufacturing a product, and identify the materials suitable for the product, we can acquire an ability to select qualified goods and use them properly, and can apply the ability to our daily life.

In instruction in commodity tests students or pupils are trained to do experiments in functions and characteristics of goods, using testing instruments themselves. During these lessons, by using testing instruments and working to achieve a target, they seem to learn much more than in other daylong lessons. The importance of commodity tests will never diminish.

IV. *Conclusion*

Not only in the area of commercial education, but also in that of broad industrial education in general, there has traditionally been the discrimination between so-called ordinary subjects and special subjects, but this discrimination is only a relative one and a completely historic product in education. For example, during the years when natural science did not develope, such subjects as physics and chemistry were placed completely outside the scope of ordinary subjects. Only in accordance with the remarkable progress of natural science and inventions of machines and others, corresponding to this progress, physics, chemistry and other subjects have come into the category of ordinary subjects.

Nowadays, with the development of science and technology, social productive power has been greatly increased thus bringing about an enormous flood of commodities in the market. On the other hand, however, genuine value in use of commodities has almost disappeared.

At the beginning of the first industrial revolution, technology was adopted as a course of study in the curricula of universities. Therefore, it is quite natural that technology was incorporated into university curricula when we were experiencing a series of innovations called the second industrial revolution.

[3] Toshio Hosoya: Gijutsu Kyōiku Gairon (An Outline of Technical Education) p. 42.

References

[1] Tokyo Kōtō Shōgyō Gakkō: Tokyo Kōtō Shōgyō Gakkō Ichiran Meiji 44–Taishō 4 (A school calendar of Tokyo Commercial College, from Meiji 44 to Taishō 4).
[2] Tokyo Shōka Daigaku: Nihon Shōgyō Kyōiku 50 nen Shi (A History of 50 years of Commercial Education in Japan).
[3] The Ministry of Education: Sangyō Kyōiku 80 nen Shi (A History of 80 years of Industrial Education).
[4] Hideo Suzuki: Tenkanki no Kyōikugaku (Pedagogy at the turning-point), Shakaigaku Kenkyū 13 (1974), Hitotsubashi University.