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Keynote Address : Information and Communication in the Comparative Study of Civilizations

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Keynote Address: Information and Communication in the Comparative Study of Civilizations

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The fourteenth Taniguchi International Symposium of the Civilization Studies Division on "Japanese Civilization in the Modern World: Comparative Studies of Information and Communication" has been organized with the ultimate goal of clarifying the role that information and communication have played in shaping modern Japanese civilization. I look forward to the detailed discussion by the discussants assembled here on the multiple significance of information and communication. At the opening of this symposium, I am privileged to offer my own thoughts on the importance and the substance of information and communication.

1. THE FRAMEWORK FOR ASSESSING INFORMATION AND COMMUNICATION

The issue of information has been on my mind ever since I wrote a paper in 1963 entitled "*Jōhō Sangyō Ron*" (Theory of Information Industries). In that paper, I argued, from the viewpoint of evolution, that following the agricultural and industrial revolutions the third revolution in the history of human civilization would be brought about by information. That is to say, after the two revolutions that aspired towards fulfillment in materials and energy, searching for fulfillment for the human brain and the nervous system will catapult human society into the third revolution.

In retrospect, the discourse on information then had been started by the

mathematical information theories of Nobert Wiener (in his *Cybernetics*) and Claude Elwood Shannon (in his *A Mathematical Theory of Communication*) in 1948. These theories were touted as the theoretical underpinnings for computerized data communication and processing that had just come into being. It was such theories that helped dispel the dark image pertaining to the word "information" up to then in Japan.

The first usage of the word *jōhō*, Japanese equivalent for "information," is said to have been in an army textbook in the early Meiji era. Ever since then, information has been used as a military term denoting knowledge of the enemy, as evident in how *Vom Kriege* (On War) by Karl von Clausewitz was translated into Japanese by Mori Ōgai, a famous novelist as well as army doctor. In 1940, during the Pacific War, the two government functions of *Jōhō Inkaï* (Information Committee) and *Naikaku Jōhō Bu* (Cabinet Information Section) were merged into *Jōhō Kyoku* (Information Agency), empowered with the authority to control the mass media, deepening the nuance of secrecy associated with the word. To the generation that experienced the war, including myself, it was very hard to feel a positive connotation of the term *jōhō*.

However, as use of *jōhō* reemerged in a purely academic context, it was as if the word itself was purified and able to shed its negative image. The word *jōhō* appeared in numerous discourses in the 1960s. However, all the discussions were limited by the framework on which the information theories were based. That is, they all assumed information was associated with communication, which required both a sender and receiver. Even more limiting was the discussion that dealt with information as only what a computer could manage.

I advocated in my *Jōhō Sangyō Ron* that we move away from the precondition of a sender, because such a premise takes us away from fundamental human nature that seeks, enjoys, and even toys with information. Instead, I encouraged discussion that started with the brain and the nervous system as the consumers of information, in order to clarify the principle for determining the price of information. To my dismay, most subsequent discussion on information remained fixated on computer analysis and effectivity. "Information-ization" was a neologism heavily promoted at two periods; the late 1960s and the early 1980s, especially by the Ministry of International Trade and Industry (*Tsūsanshō*). These invariably aimed at industrial restructuring through computerization, or the development of computer-related industries. Even today, it seems that discussion about information is limited to the problems of technology and man that surround computers.

I am happy to see my proposal for discussing information comprehensively and not limited to a framework of communication reflected in the subject of this symposium, to deal with both information and communication together. However, it is evident that there is also a need to discuss information in the framework of communication where both sender and recipient exist.

The English word, "communication," originally meant the flow of both goods

and information. As the word "transportation" increasingly denoted distribution of goods, it is said that the word "communication" was typically allotted the meaning of distribution of information starting from the mid-nineteenth century.

Last year's symposium dealt with the issue of transportation and logistics, and we deliberately excluded information as an element in our discussion. As it were, the topic of information became our homework for this year, so that we could discuss the topic comprehensively here. I hope we can start to clarify its significance and the role it has played in the formation of modern Japan as a nation state.

2. THE ROLES OF INFORMATION AND COMMUNICATION IN ESTABLISHING THE MODERN STATE

How have information and communication in modern Japan developed? The Meiji government was quite deliberate in modernizing the nation and saw to it that military and educational institutions would be established to unify national sentiment under the slogans of "wealth and military power of our nation," "production develops industries," and "civilization through enlightenment." Transportation and communication networks were developed as the infrastructure to such institutions. The postal service founded by Maejima Hisoka was the first such nationwide communication network.

Maejima, who became Principle Officer of Posts (*ekitei gonnokami*) in 1870, became frustrated at the high costs and slow speed of the private mail services (*jō-bikyaku don'ya*) that were then entrusted with the official express mail. He proposed a government-run postal service to cut rates and expedite official communication. Starting with express mail between Tokyo and Kyoto, he transferred official mail from private to government service and then enlarged this to handle ordinary mail, thereby eclipsing the *hikyaku* (mail courier) business that dated from the Edo period. Major cities were connected by postal service by 1872. In 1873, the postal rates were standardized and the government monopolized the postal service. This was the reflection of Maejima's thinking that a nationally integrated infrastructure was tantamount to building a modern nation.

Maejima put his numerous ideas on the postal business to work. "*Yūbin*" was his term for the new pattern. The issuing of postage stamps, setting up mail boxes, founding the postal savings and money order systems, and joining the Universal Postal Union were all initiated by Maejima. He was ingenious in developing the nationwide postal network. Besides the government creating its own postal offices, he had local dignitaries such as former community heads and landlords appointed as *yūbin toriatsukainin* (postal handlers). In return for a commission amounting to less than 10% of a regular salary, these officers were authorized to open a *yūbin toriatsukaijo* (postal handling office) at their homes, which helped further the postal network with much speed and little investment. These offices were the original *tokutei yūbin kyoku* (designated post offices), which exist to this day. When postal

offices were ranked in 1886, the government-run offices, ranked as first- and second-class, numbered only 78, whereas there were more than 4000 of the former *yūbin toriatsukaijo*, which were ranked as third-class. The Japanese postal network thus expanded, cleverly scrapping the established communication business by the *hikyaku don'ya*, then building a new organization at low-cost.

However, in so far as the postal service is a distribution system for delivering mail, expediting service was limited by the development of transportation. Until the railroad network was expanded, delivery depended on human runners as in the old days, although they did experiment with specially designed rickshaws and horse-wagons for long distance. However, these fared little better than runners in negotiating unpaved and hilly roads in terms of speed. Communication speed had to wait for the development of telecommunication to overcome this obstacle.

In Europe and America at that time, in the mid- to late-nineteenth century, new inventions and discoveries were making telecommunication feasible (e.g., Samuel Finley Breese Morse's telegraph, Alexander Graham Bell's telephone, and James Clerk Maxwell's electromagnetic equations). Just prior to the Meiji Restoration, a trans-Atlantic undersea cable had enabled international telecommunications. The Meiji government established the *Denshinkyoku* (Telecommunication Agency) in *Kōbushō* (Ministry of Industry) as early as 1870 to start government-run communications. The same year, the Great Northern Telegraph Company, with its headquarters in Denmark, was given permission to construct an undersea cable connecting Nagasaki and Yokohama by the Meiji government. The Meiji government felt the urgency of completing a land communication network for establishing domestic communication rights. Most technology was still dependent on foreign engineers, and local communities obstructed the construction due to various rumors. Even with such difficulties, in 1875, Sapporo and Nagasaki were connected with a main-cable.

The Seinan War of 1877 highlighted the importance of communication and a nationwide telecommunication network connected the major cities around 1882. In 1877 the *Kōbushō* imported two telephones one year after Bell's invention. Japan was thus the first nation to purchase telephones! After numerous experiments, domestic telephones were manufactured, but the ensuing development met with difficulty due to the debate on whether to nationalize or privatize the telephone service.

The *Kōbushō* wanted nationalization because it feared leaks of ministerial and police information to the public if the service was privatized. In contrast, *Dajōkan*, the cabinet at that time, was for privatization, to ease the public financial burden and to help the former samurai class become economically independent. With the establishment of the Cabinet in 1885, the *Kōbushō* was abolished, and the *Teishinshō* (Ministry of Communications) took over telegraph, postal, lighthouse, and maritime services. This fuelled the pro-nationalization argument within the government.

Maejima Hisoka entered the political arena once again, as the Postal and

Communication Vice Minister from the pro-nationalization camp. This worked advantageously for nationalization, which was finalized in 1889. Telephone application had not idly waited for the decision. All the while, Kōbushō had constructed hotlines for the police, army, and navy. In Tokyo, the police telegraph network was more advanced than the telephone network, but in other areas, it was the other way around. Osaka, in particular, is said to have had significantly advanced police telephone hotlines. As railroad operation required communication between stations, both the national and private railroad companies developed their own telegraph and telephone lines.

Nationalization of telephone service led to the establishment of telephone exchanges, first in the major cities, and then in smaller localities. Soon, the convenience of the service came to be widely known, and the registration fee, which was equal to or even double the starting salary for a police officer, did not deter commercial and manufacturing businesses from signing up. The Ministry of Communications itself was more interested in developing the official network, which became all the more evident during the Sino-Japanese War and Russo-Japanese War. When the telephone service could not meet demand, and a waiting period had to be endured, the word "*sekitai*," or stacked delay, was coined to describe the situation. This was the norm from the time the service was instituted. The ministry sought to improve the situation by introducing a user-pays principle in 1902. The high cost of capital investment for the cables and equipment heavily burdened the government for funding procurement. Dismayed by the perpetual stacked delays, calls for privatization of the service often surfaced. But the government stood firm against these, citing fear of disclosure and uneven development, especially in uneconomical areas. At its peak in 1912, some 130,000 orders were on stacked delay, and the problem was never finally resolved until 1978! As if this signaled the completion of the infrastructure, the national monopoly in telecommunication ended seven years later, with the founding of NTT (Nippon Telegraph and Telephone Corporation) as a private company.

3. THE EDO SYSTEM THAT HERALDED THE MODERN SYSTEM

I have outlined the history of the communication system in modern Japan. Here, I would like to turn to the preceding Edo period. At that time, the communication system mainly consisted of the *shukueki* (post-station) and *hikyaku* systems. Tokugawa Ieyasu first built post-stations between Edo and Kyoto along the Tokaido, and developed the *tenma* (mail courier horse relay) system along the other roads across the nation. This system was near completion by the time the alternate residence system for domain lords was institutionalized in 1635. The *Bakufu* required each *shukueki* to post a certain number of men and horses, which for Tokaido stations were 100 men and 100 horses. The local residents, usually farmers, were responsible for the manpower and fit horses in time of need. *Shukueki* were also responsible for relaying official papers as *tsugi-bikyaku*. In the

beginning, the residents were given this duty too, but increasing burdens led to a professional hire relay system. Thus, *tsugi-bikyaku* for a fee came into being. It is said that these men traveled from Edo to Osaka in four to five days. Also, the domains created their own *daimyo-bikyaku* to connect their home castle and Edo Mansion as well as *kurayashiki* in Osaka.

Parallel to the *hikyaku*, who were commissioned with official communication, the *machi-bikyaku* delivered mail for the farmers and townfolk. As the commercial economy gradually developed and distribution became nationwide, the demand for communication increased. This growing business led the *machi-bikyaku* to form guilds. The *machi-bikyaku* guilds of the three major cities were typical examples: in Edo, they called themselves *jō-bikyaku*, in Osaka, *sando-bikyaku*, and in Kyoto, *junban-bikyaku*. Eventually, official communication was also delegated to these guilds. Quite significant here is that the *shukueki* and *hikyaku* systems not only delivered information, but also cash and goods, such as silk and agricultural produce. The *machi-bikyaku*, with a double basket filled with mail and packages on horseback led by an *umakata* (road-horse man), are depicted in the series of "*Tokaido Meisho Zue*" (Scenic Places of Tokaido) and in other artworks. These men traveled extensively, hiring and replacing manpower and *umakata* at each post-station.

I have mentioned earlier that the word communication originally meant the flow of both information and goods, and this was exactly the case in Japan. The Meiji government took the delivery of information from the *hikyaku* business, nationalized it, and created the postal service. The *hikyaku* businesses were motivated to move into and specialize in the delivery of goods, the trucking business. In the early days of the postal service, they sometimes subcontracted mail delivery. In some areas, the head of *hikyaku don'ya* was appointed as the *yūbin toriatsukainin*. In other words, the Meiji postal service was started by ingeniously utilizing the existing *hikyaku* system. The Sagawa Express Delivery Company (*Sagawa Kyūbin*) is widely known for its trademark *hikyaku* runner symbol with a small mail box at the end of a pole on his shoulder. It is emblematic of the transformation of the *hikyaku* business into the delivery business.

Hikyaku manpower was still in service as "*hikyaku-ya*" until about 1950, along railroads in the Kansai area, which purchased and delivered goods for clients. It is said that *hikyaku-ya* were clustered around the Minatomachi Station of the Kansai Line, mainly delivering goods to and from the Nara area. In some places, one only needed to hang a wooden sign with the letters "*hikyaku-ya-san*" in front of one's house to utilize the service of such men, who delivered goods to and from the station on bicycle. I also remember around then a small delivery service called *hikyaku-ya-san*, which was always stationed at Nijō Station in Kyoto. These men delivered not only goods and mail to and from Mineyama, indispensable to Kyoto for its Tango crepe fabric, but even little children.

I would like to point to one other significant factor in the Edo Japan communication system, that is, the existence of stamps. The world's first stamps

are said to be the black one penny stamp, called the Penny Black, and the blue two pence stamp, called the Pence Blue, issued in Great Britain in 1840. However, these were for a nationally unified postage, and even before this, there were stamps issued in various localities. The same situation existed in Japan. It is often believed that a postage system based on the British one was created after the founding of the Meiji postal service. Actually, under the Bakufu, stamps were already in use; they were even called stamps (*kitte*). The most famous of these were the "*muraokuri kitte*" of the Tosa fiefdom, but other fiefdoms are said to have used similar stamps. I believe that these facts, along with other systems that served as precursors to the Meiji postal service, will be discussed by Professor Abe Akio, so that I shall stop here. I do want to emphasize though that the case of stamps is one more instance of parallel phenomena in Western and Japanese civilizations. I believe that Edo Japan developed similar institutions to the West, and based on these, the rapid modernization after Meiji was facilitated, as it were, by grafting the newly introduced Western civilization. Such is my working hypothesis on the civilization study of modern Japan.

4. THOUGHTS ON INFORMATION AND COMMUNICATION IN CIVILIZATION

I have pointed out time and again that the commonly accepted thinking that the modernization of Japan was achieved after the Meiji period by imitating the West was erroneous. I would like to apply this in evaluating the equipment systems for information and communication. My hypothesis is that modernization after the Meiji period had been determined already in the Edo period. In other words, the infrastructure of civilization, such as architecture, institutions, technology, and organization, were not all borrowed from the West in the Meiji period. As I have shown above, the Meiji government, in establishing the Japanese postal service, almost wholly inherited what had developed before as *shukueki* and *hikyaku* in the Edo period. This enabled the postal service to expand nationwide. It was indeed an example of truly smooth graft-transition.

It has been argued that graft-transition was possible for software such as institutions and organizations, but that the hardware of technology and goods was copied from Western imports. This is true for publishing as an equipment system, because Japanese publication in Edo lacked movable type technology, and was transformed in the Meiji period through the introduction of movable type. However, it cannot be overlooked that it was possible to rapidly incorporate the printing and plate-making technique for movable type printing only because there was already a technological reserve to accept and improve new technology.

Allow me to clarify this in more detail. Mass printing is said to have started with Gutenberg's movable type in Germany around 1445. However, in those regions using Chinese characters, various printing methods other than hand-writing had existed for more than a century before Gutenberg. The world's oldest known

printed document is the “*Hyakuman-tō Darani*” mantra kept in Hōryūji Temple, with the time of printing specified as 764 through 770 A.D. It is said that 1,000,000 small copies were made of the mantra in woodblock and molded copper plate. It is also known that in tenth century China, during the Sung Dynasty, woodblock printing technology had achieved its apex, as the numerous Confucian books of the period attest. Woodblock printing with plates also became highly developed in Edo Japan, which was greatly influenced by Chinese civilization. As for type printing, *Keichō Chokuhan* was printed on orders from Emperor Goyōzei using copper print blocks, invented in 1227 during the Koryo Dynasty under the reign of Choson, and brought back to Japan at the time of the Japanese invasion of Korea in 1592. This is said to have been the first work using movable type in Japan. A Catholic missionary, Alexandro Valignano, who accompanied the Tensho Mission to Europe, returned to Japan with print blocks and a printing machine. Christian papers were printed in Kyūshū with these, but perished in the anti-Christian suppression that followed. Thus, printing with movable type ended as a temporary phenomenon, and I trust that this will be the topic of Professor Konta Yōzō.

Later, during the Kan’ei period of 1624 to 1644, plate printing became mainstream. The main reason for this was that there were so many Japanese characters. There were more characters then than now, and even the kana characters had numerous variations. It was a great waste, then, to have to make a few print blocks using many molds, and then to use most of them only once, especially when metal was so precious. In contrast, woodblocks were simple, requiring only that characters be directly carved out for printing. What was more important was that pictures could be carved alongside the characters for pictorial printing. This technique is connected to contemporary desk-top-publishing and electronic typesetting. Recently, publication using print blocks has declined, and more and more computer graphics are used to incorporate letters and graphics. The superior advantage of the woodblocks to be able to handle graphics as well as letters has returned through advanced technology. Using the above characteristic of woodblocks, not only numerous books for the educated were printed, but also light reading material and children’s textbooks with more pictures and fewer hiragana.

There was already a high literacy rate in Japan then to commercially support such mass publication. Many studies have estimated the literacy rate in Edo Japan. The well-known study by Herbert Passin in his *Society and Education in Japan* estimated the adult male literacy rate at 40 to 50%. This had no parallel elsewhere in the world, and the Edo period saw a boom in sophisticated publishing culture. The apex of this culture was the multi-colored woodblock prints known as *nishiki-e*. Originally, it used about three colors, and developed into using several tens of colors in the nineteenth century. Multiple coloring required multiple printing plates, which had to be correctly and exactly aligned to prevent color erosion. A device called “*kentō*” was invented, as a marker for this alignment. Contemporary color printing uses the three basic colors yellow, magenta, and cyan, plus black.

Printers call the process of aligning the four color plates, "matching the kentō." Also, each color plate is called, "*ki* (yellow) *han*," "*aka* (red) *han*," "*ai* (indigo) *han*," and "*sumi* (black) *han*," words used in making the nishiki-e. This attests greatly to the fact that the technology developed in the Edo period lives to this day.

The division of labor that supported the complex processes of multiple coloring was developed then as well. The printing system was modernized in the Meiji period, owing greatly to Motoki Shōzō. Motoki, a Dutch translator in Nagasaki during the last years of Edo, became interested in Western movable printing through his work. After some trial and error, he studied the molding method for lead print blocks under William Gamble, an American missionary and director of Meihua Library in Shanghai. Motoki was able to make the "*minchō*-type" print blocks, and went on to develop a system called "*gōsū katsuji*" (point system) for different-sized letters. He tried to reflect the aesthetic of Japanese characters in the matrices, creating the basics of a Japanese font. In 1870, Motoki opened his print shop. The same year, his disciples opened shops in Yokohama and Osaka, as well as selling print blocks, which were used to print the first Japanese daily newspaper, *Yokohama Mainichi Shinbun*.

Hirano Tomiji, who took over Motoki's business, went on to establish a division of labor in the printing process, and opened a print shop in Tokyo in 1872. In 1873, he succeeded in the first domestically manufactured full-fledged printing machine. Thus, Japanese printing was rapidly modernized through Motoki's efforts, bringing an end to woodblock printing. It is evident that such rapid development could not have taken place without the division of labor system and technology that supported Edo publishing, and the large reading population. The above shows that the acceptance and rapid development of Western civilization, in the latter nineteenth century, including that pertaining to the information and communication equipment system, was only possible because the system had developed and matured even before that.

5. THE THEORY OF INFORMATION IN THE FUTURE IN JAPAN

So far, I have dealt with the history of information and communication equipment systems. What lies ahead? The year 1995 is said to have been the First Year of the Internet in Japan. Tools have been developed using computer networks for facilitating the flow of information with overseas countries. It is now possible for organizations and individuals to exchange information. Just yesterday, our National Museum of Ethnology held a press conference to announce that we will make exhibits and studies available through the Internet.

As information sending is made easier through various tools, I am not sure how much of the information sent from Japan is received by the world. One survey found that the rate of the information Japanese internationally receive and send is 20 to 1. That is a remarkable trade deficit! The imbalance in areas of science and technology has been a target of American criticism toward Japan from

the 1980s, together with the overall trade imbalance.

Why Japan cannot efficiently send out information stems, in my opinion, partly from the problem of the Japanese language. That is, I fear that the Japanese language, with both Chinese characters and kana characters, is at a disadvantage for information exchange. There is a merit in the Chinese characters in that they are ideograms. However, there are demerits as well, such as the sheer number of the characters, complex ciphering, and the number of homonyms. These problems have always made it difficult to consult dictionaries, to index, and to do word processing via computer. The word processor that became widely used in the West was not applicable in Japan due to the difficulty in typing the characters. In China so far, more than about 500 systems of character input have been proposed, all of which have been loaded onto computers for assessment, and now there is said to be a process of singling out the best methods. These methods could be roughly grouped into three types: those based on the shape of the characters, those based on their sound, and those which try to combine the two.

The shape system utilizes "Wubifa," "Sijiao Haoma" (used in the indexing in *Daikanwa Jiten* compiled by Morohashi Tetsuji). Wubifa is a way of grouping characters into five types, and then listing them according to stroke order. Sijiao Haoma categorizes the shape of characters at the four corners, allotting numbers 0 to 9, and giving each character four digit numbers. In the system that uses sounds, syllabic sound characteristics, including the four tones, are allotted letters, a good example being the "pinyin." The general public seem to like the pinyin system, but programmers are said to favor the Wubifa system which enables faster input.

The pinyin system is comparable with romanization, and there have been historical efforts to romanize Chinese characters. In China, this was called the "*ladinghua*," the Latinization movement, and Mao Zedong was a fervent supporter. He mulled over this during the Long March and after he reached Yanan, and in 1957, he established the pinyin system. It has been taught in grade school since then and greatly popularized. The pinyin is a system of standardizing the Chinese language, and designating letters for indexing and computer input. It does not change the Chinese language in itself. In contrast, there were, among other Asian countries that use Chinese characters, attempts to change the characters at the time of modernization. Vietnam's Quốc ngữ and the Hangul of both South and North Korea are such examples, changing Chinese characters from original ideographs to phonetic letters.

There were also arguments in Japan for a long time that using the Chinese characters hampers modernization, especially around the time of the Meiji Restoration. These can be grouped into three camps: kanamojization, romanization, and new letter invention. What they all had in common was opposition to the way Japanese was written, using both Chinese characters and kana. The founding father of the modern postal service, Maejima Hisoka, was in the first camp. He proposed to Shogun Tokugawa Yoshinobu in his "*Kanji Ohaishi-no-gi*" that Chinese characters were irrational and that kana should be

made the national script.

Arguments for romanization date back even further. Missionaries first used romanization after theology and prayers were translated into Japanese from Portuguese for proselytizing in Japan. The oldest existing publication was 1591. However, Christianity itself was later suppressed and the movement ceased.

After the Meiji period, many cultural elites became involved in the romanization movement. However, they became divided on the spelling system. One group upheld the Hepburn system and the other, the Japanese system. James Curtis Hepburn, an American doctor who came to Japan just before the Restoration, compiled a Japanese-English dictionary known as *Waei Gorin Shūsei*. His system of alphabetization came to be called the Hepburn system. In contrast, the system proposed in 1885 by Tanakadate Aikitsu, a physicist, matched the letters to the 50 sounds; it came to be called the Japanese system. Heated debates ensued, and finally, the matter was resolved by the introduction of yet another system, the *kun-rei* (order) system mandated in a Cabinet Order of 1937.

Defeat in WWII pushed back matters to the beginning, and for a time, all three systems were used. I, myself, was an ardent member of *Nippon Roomazikai* (Japan Romanization Association) that advocated the Japanese system, and propagated its use. However, the romanization debate soon became a part of the larger postwar debate on the improvement of the national language. In the larger debate, restriction of the number of characters and the standardization of contemporary kana usage were the focal points, rather than the phoneticizing problem, and the romanization debate has ebbed today.

All national language improvement debates have arisen at times of historical contact with the Western world, such as at the Meiji Restoration and in postwar Japan. This, to me, signifies that Japanese, which uses both Chinese and kana characters, is at a disadvantage as a tool for information exchange with the world. Of course, the several attempts to improve the national language have aimed inward at national morale stimulation, such as building the nation state, and education in democracy, science, and technology. This is exactly the reason the attempts have been found time and again to be up against the traditionalism of Japanese culture, and have only proceeded halfway.

I fear that as an equipment system of civilization, the disadvantage of the Japanese language will continue to grow. Civilization now holds mechanization and computerization at its core. Composed of both Chinese characters and kana syllabaries, inputting Japanese on the computer, indexing it, and then looking it up in the computer, are all dependent on the crucial knowledge one has of reading Japanese, because it is necessary to specify one character in order to call it up on the computer. However, reading the characters in the Japanese language is more complex than doing so in other character-using languages. In China, both Koreas, and Vietnam, one character is only read one way. Therefore it was rather easy to phoneticize their languages. The Japanese language often uses multiple “*on*” and “*kun*” readings for one character. In addition, there are many homonyms that

render it even more difficult to specify words.

As I have been involved in the romanization movement, I have written several papers using the system. Writing Japanese without the help of Chinese characters that reveal meaning through their shape forced me to choose words and sentences simple enough and unambiguous even to the ears. I had to avoid homonyms and seek out words that have no discrepancy in reading and meaning. Looking back, I am still convinced that romanization is among the most effective ways to mechanize the Japanese language. I must also add that it would be of positive significance in advancing information exchange in the Japanese language.

I am unhappy that the innovative romanization movement has completely disappeared, with none of the problems of the transcription system of contemporary Japanese solved. Through a device called "Kana-Kanji conversion," the mechanization of Japanese has been achieved. But I fear that the Japanese language itself is becoming reactionary and conservative. Through the language problem, I cannot foresee a bright future for Japanese civilization in the world. As great changes in communication hardware, such as multimedia and networks, are taking place, I am not sure that the Japanese language, as software utilizing these tools, can stay the way it is. Changes that surpass the magnitude of what took place from the Edo to the modern periods in the arena of information and communication are about to take place. In order to grapple with this issue, I feel that it is significant to assess the meaning of information and communication in civilization.

I look forward to this symposium because it not only deals with a broad expanse of history, from the Edo period through contemporary times and even into the future, but it also includes issues of various information and communication equipment systems and their problematics. The word "communication" comes from the Latin, "*communis*," which denoted a communal action or its focus. This symposium is exactly that. I eagerly expect a meaningful and lively exchange here that will enable us to share awareness of the related problems.