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Japanese Clocks and the History of Punctuality in Modern Japan

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Abstract Although punctuality is well attained in present Japan, many foreign engineers who arrived in Japan from the mid 19th century observed that Japanese were seemingly indifferent to the clock, which leads us to a question about the origin of punctuality in modern Japan. The present paper first explains the time system and clocks in the Edo period, and then follows the origin and the evolution of punctuality in various sectors of Japanese society. Introducing the historian Sakae Tsunoyama's two-layer theory to explain the origin of punctuality in modern Japan, the paper explores a question about when punctuality was attained and society accelerated in postwar Japan.

Japanese Abstract 時間規律は現代の日本社会ではよく確立されている。しかし、19世紀末に日本に到来した多くの外国人技術者にとっては日本人が時計には無関心であるように思えた。このことは、近代日本における時間規律の起源という歴史的問題に導かれる。本稿は、最初に江戸時代における時刻制度と和時計について説明し、続いて日本社会の各領域における時間規律の起源と発展について追いかける。近代日本における時間規律の起源に関する歴史家角山榮による2層理論を紹介した上で、戦後日本における時間規律の達成、社会の加速化について検討する。

Keywords Time · Punctuality · Clock · Modernization

Introduction

In his *Machines as a Measure of Man*, Michael Adas discusses Westerners' encounters with non-Westerners since the modern period and how Westerners have viewed themselves and others through the historical process (Adas 1990). In following closely their encounters in Africa, India, and China, he makes an

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interesting reference to their puzzling experiences concerning the different sense of time between cultures. While Westerners were concerned with schedules, clocks, and watches, non-Westerners seemed to Westerners to act as if they lacked a sense of punctuality, which gravely disrupted their schedules.

They had a similar experience when they came to Japan in the middle to late nineteenth century, when Japan started to negotiate with Western countries more substantially than before. This historical fact may puzzle many who know the punctual operation attained by Japanese social and technological systems such as home delivery services and superexpress trains, and the realization of this gap may make them wonder about the origin of punctuality in modern Japanese history. In the present paper, I will first begin by discussing such an episode in late Edo Japan, I will go on to discuss the historical implications of the change in Japanese attitudes towards punctuality through the process of its modernization, and I will finally discuss how and when the Japanese acquired and developed their concern with punctuality and speedy operation of social activities.

The Frustrations of Employed Engineers

After arriving in 1857, as the Edo period was drawing to a close, Willem van Kattendyke, a Dutchman, spent 2 years at the naval training center in Nagasaki, where he taught young Japanese the principles of Western navigation and scientific technology. In his published memoir, Kattendyke cited a series of events to illustrate the frustrating slowness of the Japanese. For example, the supplies necessary to make repairs, which he had specifically ordered to be delivered at high tide, did not arrive on time, one worker showed up just once and never returned, and a stableman spent two whole days going around to make his New Year's greetings. In his diary, Kattendyke lamented that, while the Japanese were extraordinarily polite and modest, they had disappointed him in various respects, and he despaired that he would leave the country having accomplished much less than he had hoped (van Kattendyke 1869).

Kattendyke's frustrations were in fact shared by most of the foreign engineers in Japan in the latter half of the nineteenth century. They often found themselves vexed by the work habits of the Japanese, and the main reason for their vexation was the apparent lack of any sense of time. To these foreigners, the Japanese worked with an apparent indifference to the clock.

Despite Kattendyke's concerns, today in Japan, trains depart and arrive punctually, factories economize their use of time and supplies to the absolute limits, and clocks that are precisely synchronized to the official time via radio signals are now sold. We now take it for granted that we and others act punctually, and we know that this is the fundamental premise for the smooth and safe operation of modern society. However, nothing like this common behavior existed in Meiji Japan. The fact of this lack of punctuality in nineteenth century Japan leads us to wonder: when and how did Japanese citizens come to acquire modern time discipline over the course of the past century and a half?

The present paper cannot and will not, however, provide an analytical argument on this large historical question about Japanese history. It will, rather, provide a

summary of the current scholastic arguments in addition to an opening footnote on the time system and clocks developed in the period prior to the Meiji Restoration.

Wadokei and the Seasonal Time System in the Edo Period

Until 1873, 5 years after the Meiji Restoration, daily life was framed by the variable hour system of seasonal time (Okada 1994). In contrast to the system of fixed hours, which follows the movements of the clock and divides the entire day into hours of equal length, seasonal time divides the day into day and night and divides each of these separately into equal time units. In the Edo period, daytime and nighttime were divided into six partitions called *koku*, and each of these partitions was marked by the ringing of the official gong (Hashimoto 1966).

Prior to the spread of mechanical clocks in the fifteenth century, seasonal time was also the standard in Europe. However, the emergence of the mechanical clock in the fifteenth century gradually and radically changed European society and their fundamental attitude toward time. However, the introduction of the mechanical clock to Japan in the late sixteenth century did not lead to the same reorganization of its time system or change its society. On the contrary, the mechanical clock was adapted to the Japanese seasonal time system.

Known now as *wadokei*, or Japanese clock, the mechanical clock in the Edo period was ingeniously crafted to designate seasonal time (Mody 1932; Yamaguchi 1950; Tsukada 1960; Fernandez and Fernandez 1996). There are several types of wadokei in existence today, of which I refer to the following three basic types: the first type with two variable foliots, the second with movable plates on the face, and the third with a graphical plate and a descending indicator. The first type has two oscillating foliots, or horizontal bars, on the top of the clock, each of which moves and stops alternately during the daytime and nighttime (see Fig. 1). Pallets are hung in a position on the teeth of each foliot such that their oscillating period is tuned to the variable hour of the seasonal time system. The hand on the face of the clock rotates at different speeds in the daytime and the nighttime. The second type has a face with movable plates, and these movable plates are adjusted fortnightly to such that their positions indicate the seasonal time. In most clocks of this type, these plates are manually repositioned, although in a few exceptional cases, they are automatically moved by an internal mechanism (Sasaki et al. 2005). The third type is furnished with a replaceable plate of indicating lines showing the seasonal time. Its mechanism is simple and its price is generally much lower than other types, presumably several *ryo*, or several hundred thousand yen. Most mechanical clocks were only available to the rich and powerful, but the emergence of the economical and less decorative type indicates that there was some demand for mechanical clocks in the general society, possibly by merchants for their practical use in knowing the precise time.

However, even people possessing a mechanical clock that indicated seasonal time could have known only a much less precise measure of time than contemporary Western citizens. Average citizens who reckoned time through hearing gongs every 2 h had a still more crude sense of time. However, as the systems of modern social organization were introduced during the Meiji period, this crude sense of time underwent radical change.

Fig. 1 The type with two foliots (*Nicho Tempu* type) [from Sachiko Oda ed., *SEIKO Tokei Shiryokan Zo Wadokei Zuroku (Illustrative Catalogue of Japanese Clocks Preserved at the SEIKO Clock Museum)* (Tokyo: SEIKO Clock Museum, 1994), p. 25]

Enforcement of Punctuality at Modern Institutions

How, then, did the Japanese come to acquire a sharper sense of time over the past century and a half? How did they come to acquire and take-for-granted punctuality? How did they come to pursue efficiency and productivity? To investigate this broad

problem, a collaborative and interdisciplinary study was organized for the academic year of 1999 and 2000 at the International Center for Japanese Studies in Kyoto. The study resulted in a collection of papers titled *Chikoku no Tanjo (the Birth of Tardiness)* (Hashimoto and Kuriyama 2001; Kuriyama and Hashimoto 2002).

Prior to the launch of this collaborative research project, the organizers had naturally assumed that several modern institutions introduced from the West must have worked to facilitate the implementation of punctual and efficient behavior. Of them, three key institutions – schools, factories, and railroads – were investigated. Since the early Meiji period, punctuality has been strongly encouraged at these institutions. For new primary school students, for instance, the Ministry of Education issued the *Seito Kokoroe (Direction to Elementary School Children)* in 1873 with the following precepts:

> Make sure that you are at school ten minutes before the start of class every day. If you are late for school, do not enter the classroom without permission; explain the reason for your tardiness and wait for your teacher's instructions (Kaigo 1961; Nishimoto 2001).

These were explicit and fairly strict instructions for innocent children. They were issued at the time that Japan changed from its traditional calendar using seasonal time to the Western calendar using clock time; it is certainly doubtful that students actually followed the rule and attended school in time. Some episodes tell us that the reality was far from this ideal (Nishimoto 2001). Even so, it can be conjectured that the emergence of the new school system officially emphasizing punctuality to students was highly significant in promoting punctuality in society through the creation of new generations of younger people who were at least conscious of the importance of punctuality.

Under the government's modernizing policy, the first railroad opened at the same time, and its lines were swiftly constructed with the assistance of British engineers. However, with the increase of railroad lines and complexity of their operation, the delay of trains became a problem. The following statement, made in 1901, vividly expresses the lamentable situation of the private railroad lines:

> Recently, trains belonging to privately owned railway companies depart or arrive late all the time. Almost all trains are behind schedule, with rare exceptions, and station staff who should give the first priority to maintaining time never seem concerned about delays, having given up on being punctual and acting as if delays were somehow inevitable. With some railways, almost no trains run on schedule, while others use timetables as a kind of hint indicating that trains will arrive behind schedule. Furthermore, delays are not a matter of a mere five or ten minutes, but rather it is unusual for them to extend up to thirty minutes or even an hour...The cause of the delays is that Japanese, both those running the railroads and the passengers, are, owing to bad old customs, lacking the turn of mind that observes time strictly... (Nakamura 2001).

To ameliorate the situation, railroad officials and engineers required stricter discipline from railroad workers. They constructed double-track lines, studied time

and motion, and changed to the automatic coupling system throughout the entire railroad network, which was entirely new even compared with the railroad in the West (Takemura 2001). Additionally, thanks to the engineer Okiie Yamashita, they succeeded in greatly reducing the time consumed for the inspection and repair of locomotives.

The factory, too, was a place where punctuality was strictly required. Punctuality has been demanded of all workers residing near the Yokosuka Arsenal since its foundation. A bird's eye view drawing of the arsenal in its early period shows a clock tower (Suzuki 1999). Workers living nearby knew the time from the ringing of the clock tower. Work at the Arsenal started at seven in the morning, except during the winter season, and all workers were expected to complete their preparations for work before that time (Suzuki 2001). Workers in factories of private corporations were also required to be punctual. In one episode, factory supervisors even delayed the clocks so that workers would work longer than the designated time (Ministry of Agriculture and Commerce 1903; Suzuki 1999; Hashimoto 2001).

In attempting to introduce the techniques of scientific management to Japan, some experts became sharply aware that the establishment of punctuality was essential to further modernize the management of Japanese factory systems. In his effort to introduce Taylorism to a naval arsenal, Takuo Godo explicitly stated that punctuality was a premise for the introduction of more advanced scientific management, and his words implicitly indicated that Japanese workers were, in reality, still unfamiliar with punctual working attitudes and Japanese managers were not yet ready to fully introduce the method of Taylorism (Godo 1924). Godo, however, subsequently succeeded in introducing Taylorism to Japanese naval arsenals, as well as in introducing the technologies of the limit gauge system.

Punctuality and Efficiency in Ordinary Life

Through these efforts, time discipline and punctuality became well established at railroads and at arsenals and private factories in prewar Japan. However, while people began to act punctually in the official spaces of these modern institutions, they did not necessarily behave so in other public and private spaces. However, there was an effort to do so. The movement to improve living conditions was organized and promoted by the Association of the Improvement of Living Conditions, and one of its purposes was to promote punctuality and the efficient use of time (Hashimoto 2001). The origin of this movement and this association was a series of educational exhibitions held at the Tokyo Educational Museum, the precursor of the present-day Science Museum. Exhibition topics included "The Prevention of Cholera," "The Great War (World War I) and Science," "Domestic Science," "Time," and "The Improvement of Domestic Life." They were all aimed at disseminating scientific knowledge among the wider public and emphasized the importance of precise measurement. At the same time, the promotion of the establishment of the metric system in Japan was occurring. At the exhibition of time, many posters were displayed showing how to measure the time consumed for daily activities and suggesting ways for spectators to economize their time. A poster showed, for instance, how long it took for school girls and ladies to fix up their hair; the time

Fig. 2 Time of hair dressing of women [from front illustrations of Naigai Kyoiku Shiryo Chosakai (The Committee of Investigation of Educational Materials in Japan and Abroad) ed., "Shijo Toki Tenrankai (Exhibition of Time on Journal)," a special issue of *Kyozai Shuroku*, vol. 9, no. 10 (1920)]

varied from 5 min for fixing a single plait to 55 min for wearing the formal *shimada* style of hair dressing (see Fig. 2).

The exhibition also led the Association to appeal for the establishment of a time day to promote punctuality and efficiency. The time day was established on June 10, 1920, the day selected to commemorate the first use of a water clock by Emperor Tenchi in 671. The Association further published a pamphlet of moral maxims of time discipline such as "Work time and rest time must be clearly separated, and time must not be wasted" (National Science Museum 1977). The publication of such maxims indicates that a group of experts did desire to implement discipline among the general public, but it also suggests that many people behaved in the manner eschewed by the maxim, taking rests during work time and frequently being late for meetings. The pamphlet also stated, "A precise clock is the first requirement for enforcing strict punctuality," and also "A good way to set a clock precisely is by the midday cannon, or by going to the nearest telegraphy office or railway station." Such was how clocks were adjusted in the 1920s.

In spite of all these efforts by the Association of Improving Living Conditions, it is considered that punctuality and modern time discipline was not well established in the daily lives of ordinary citizens before the war. Sakae Tsunoyama, an economic historian who has been working on the social history of time in Japan and abroad, suggests a two-layer structure on the process of the assimilation of time discipline into Japanese society. Punctuality was established in these modern institutions early on, but it was not so at other social spaces. Just when punctuality was attained at other public and private spaces is not clear.

Tsunoyama himself suggests that the assimilation of punctuality into general society took place long after the war. He speculates that the wide circulation of cheap and precise watches due to the development of quartz timekeepers was a key event in spreading punctual behavior among Japanese people (Tsunoyama 1998). Ichiro Oda, who writes extensively on the history of time and clocks, argues in his *When Have the Japanese Become Impatient* that people became punctual in their private lives after the Second World War through the comprehensive import of American social and cultural customs into Japanese society (Oda 1997). The Farmland Reform, he also speculates, may have made people realize the idea that "time is money." Ikuko Nishimoto, another expert in the social history of time, considers the emergence of Toyota's production system, which utilizes time with extreme efficiency, to be one of the key events in postwar history (Nishimoto 1999).

Sazae-san and Accelerated Japan

Concerning the postwar evolution of people's conception of time, I would like to refer to some cartoons. "Sazae-san" was a popular comic strip, which ran in the Asahi Newspaper for 25 years from 1949 to 1974 (Hasegawa 1995). The cartoon was the continuing story of a family of elderly parents and three children, of whom the eldest sister, *Sazae-san*, lived with her husband and baby. Hasty and careless Sazae-san, mischievous Katsuo, innocent Wakame, and other family members formed a comic episode each day.

Of about five thousand episodes, I identified 40 or 50 having to do with time, punctuality, and speed, and which are considered to reflect fairly well the ideas and perceptions of the day. Of them, I would like to discuss five strips that ran between 1952 and 1971. The first one, published in 1952, was about a new "fast weaving machine," which Sazae-san's neighbor had just purchased. Sazae-san was attracted to this new machine and visited the neighbor with her wool strings. However, she spent the time idly talking with her friend and came away with nothing done with her wool strings. A speedy machine was not usefully employed in a slow-going society.

The next three strips were concerned with the introduction of electric appliances in the home. Of these three, the first piece, published in 1957, opened with Sazae-san's younger sister Wakame mistakenly saying that the family had purchased a vacuum cleaner, which intrigued their neighboring housewife. However, it turned out, to Sazae-san's shame, that they only had a hand-cleaner with a wiper. The next piece of interest, published in 1962, was about a neighboring couple who completed their collection of all the basic appliances by buying their final piece—an audio set. The four neighbors, including Sazae-san, were all envious and imagined a worn-out husband, which turned out to be true. The third piece, published in 1966, showed that electric appliances were furnished at Sazae-san's home and consequently freed her from much of her household work. With free time on her hands, she decided to work as a maid at a wealthy home. In this strip, labor-saving machines were usefully employed, thus letting their user spend the saved time earning a supplementary income.

The fifth piece of interest was published in 1971 and showed a scene where Sazae-san's father Namihei and three other family members gathered to form a Society of Slow Life, pasting on the wall their motto "Don't rush, Japanese!" The members heartily agreed on the policy, so they promptly volunteered for a job and ran away to get their job done.

The connotations expressed by these comical stories clearly and decisively changed from 1952 to 1971. The contexts within which these stories were told shifted from a slow- to a fast-moving society. I encounter comics picturing the need for punctuality, a preference for the economical use of time, and a growing concern about speed and stress. The period from the late 1950s to the late 1960s was the time when many electric appliances – refrigerators, vacuum cleaners, and TV sets – were added to Japanese homes. This was also the time when the Japanese constructed highways and Shinkansen. Finally, this was the time when the government planned and achieved the doubling of the average income of its citizens. Perhaps it is reasonable to suppose that time meant money to the Japanese more than ever in this period and that they were forced to be time-conscious to increase their incomes.

In her recent book on the social history of time in modern Japan, the historian Ikuko Nishimoto also discusses the acceleration of social activities in the 1960s (Nishimoto 2006). Her attention particularly focuses on the production and the use of automobiles. Toyota Automobile Company notably introduced its just-in-time system designed to minimize the stock of parts and maximize the economic efficiency of production. Images and words associated with high speed were used to make advertisements that attracted consumers. She reminds readers that the highway from Tokyo to Kobe was completed in 1969, and that scenes of the high-

way in Tokyo were used in the 1972 Russian SF movie "Solaris" to represent a futuristic city.

Conclusion

At the beginning of my paper, I called attention to the puzzling problem of punctuality in Japanese history. Many foreigners in the Edo and early Meiji periods complained about the Japanese people's apparent indifference to time as represented on the clock. Trains run and factories operate most punctually in the world. The observation of this radical difference from an early indifference to punctuality to the current strict adherence to it causes one to wonder about the origin of punctuality in Japanese history. For this historical question, I introduced, as a possible explanatory answer to this question, the two-layer structure of the assimilation of modern time discipline into Japanese society. Punctuality and attentiveness to efficiency were well established early on at such modern institutions as schools, factories, railroads, and the military, but the daily lives of ordinary people were different until after the war. This explanation, however, will leave another question as to when and how people started to behave punctually in their daily lives in postwar Japan. As I have shown through the comic strip *Sazae-san*, we would be able to recognize the change of attitude towards time occurring from the late 1950s to the mid 1960s when the government implemented its double-income policy. It may be interesting to see, from the standpoint of the social history of technology, how new engineering products transformed the perception of time among ordinary Japanese people in this age. Lastly, I would raise questions concerning similar and dissimilar situations in other countries in East and Southeast Asia. Although I referred to Adas' work at the opening of this paper, works touching on the history of punctuality in Asia are very few, perhaps with a notable exception of an excellent work by the Taiwanese historian Liu Shaoli, which discusses the history of punctuality in Taiwan during the time of Japanese occupation (Shaoli 1998). I believe the theme and related questions provide an interesting comparative perspective on the history of technology, culture, and society in Asian countries.

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