

I. Mechanical Clocks and the Origin of Punctuality

Japanese Clocks and the Origin of Punctuality in Modern Japan

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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.¹ In following closely their encounters in Africa, India, and China, he makes an 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 mid 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 service and super-express train, and the realization of this gap make them wonder about the origin of punctuality in modern Japanese history. In this chapter, I will first begin by discussing such an episode in late Edo Japan, will go on to discuss the historical implications of the change in Japanese attitudes towards punctuality through the process of its modernization, and will finally discuss how and when the Japanese have acquired and developed their concern with punctuality and speedy operation of social activities.

1. Michael Adas, *Machines as the Measure of Men: Science, Technology, and Ideologies of Western Dominance* (Ithaca: Cornell University Press, 1990), pp. 241–258.

1. *The Frustrations of Employed Engineers*

After arriving in 1857, as the Edo period was drawing to a close, Willem van Kattendyke, a Dutchman, spent two 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, didn't 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.²

Kattendyke's frustrations were in fact shared by many 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 this is the fundamental premise for the smooth and safe operation of modern society. But 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?

This chapter cannot and will not, however, provide an analytical

2. Willem J.C.H. van Kattendyke, *Uittreksel uit het dagboek; gedurende zijn verblijf in Japan in 1857, 1858 en 1859* ('s Gravenhage: W.P. van Stockum, 1860), trans by Nobutoshi Mizuta, *Nagasaki Kaigun Denshujo no Hibi* (Tokyo: Heibonsha, 1964), chapter 8.

argument on this large question about Japanese history. It will rather provide a summary of the current scholarly arguments in addition to an opening footnote on the time system and clocks developed in the period prior to the Meiji Restoration.

2. *Wadokei and the Seasonal Time System in the Edo Period*

Until 1873, five years after the Meiji Restoration, daily life was framed by the variable hour system of seasonal time.³ 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.⁴

Prior to the spread of mechanical clocks in the fifteenth century, seasonal time was also the standard in Europe. But 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 the change of 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.⁵

3. On calendar reform in Meiji Japan, see Yoshiro Okada, *Meiji Kaireki: "Toki" no Bunmei Kaika (The Meiji Reform of the Calendar: "Time" and the Movement for Civilization and Enlightenment)* (Tokyo: Taishukan Shoten, 1994).

4. On the history of systems of tracking time from ancient Japan to the present, see Manpei Hashimoto, *Nihon no Jikoku Seido (The Japanese System of Hours)* (Tokyo: Hanawa Shobō, 1966).

5. On Japanese clocks, see N.H.N. Mody, *A Collection of Japanese Clocks* (London: Kegan Paul, 1932); Ryuji Yamaguchi, *Nihon no Tokei (Clocks in Japan)* (Tokyo: Hyōronsha, 1950); Taizaburo Tsukada, *Wadokei (Japanese Clocks)* (Tokyo: Tohō Shoten, 1960); and, for a more recent scholarly article, M.P. Fernandez and P.C. Fernandez, "Precision Timekeepers of Tokugawa Japan and the Evolution of the Japanese Domestic Clock,"

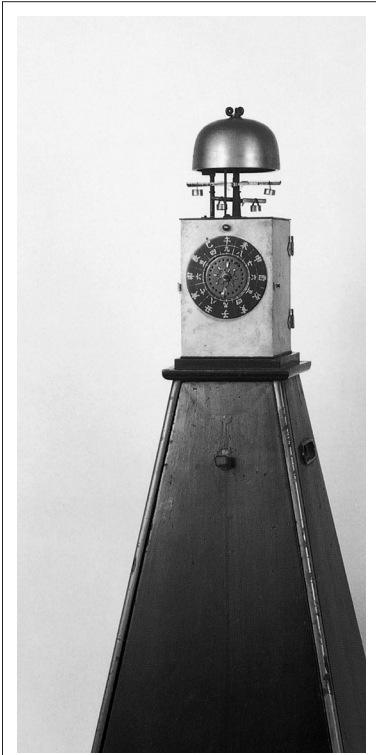


Figure 1.1

A Japanese clock of the type with two foliots (*nichō tempu* type). This is also called “yagura dokei (tower clock),” because of its tall trapezoidal stand encasing its descending weights to drive the clock mechanism.

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 Figure 1.1). 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.⁶ The third

Technology and Culture, 37(1996): 221–248.

6. The mechanism of a *warikoma* clock is quite simple and uses an eccentric circle and a comb-like sliding plate. See Katsuhiko Sasaki, et al., “Wadokei niokeru Futeijihō Jidō Hyojikikō (Automatic Mechanism to Indicate Seasonal Time in Japanese Clocks)” *Bulletin of the National Science Museum*, Tokyo, series E, 28(2005): 31–47. Another type of automatic mechanism for the *warikoma* clock was devised by the famous inventor of

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 *ryō*, or several hundreds 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.

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

3. 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 Tanjō (the Birth of Tardiness)*.⁷

Prior to the launch of this collaborative research project, the organizers had naturally assumed that several modern institutions introduced

automata, Hisashige Tanaka, who is also known as “Karakuri Giemon.”

7. Takehiko Hashimoto and Shigehisa Kuriyama, eds., *Chikoku no Tanjō: Kindai Nihon ni Okeru Jikan Ishiki no Keisei (The Birth of Tardiness: The Evolution of Time-Consciousness in Modern Japan)* (Tokyo: Sangensha, 2001). The book was translated by Shigehisa Kuriyama and James Baxter into English and published as a special issue of *Nichibunken Japan Review*, no. 14 (2002) with the title “The Birth of Tardiness: The Formation of Time Consciousness in Modern Japan.”

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.⁸

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.⁹ 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

8. Tokiomi Kaigo, ed. *Nihon Kyōkasho Taikei* (*The Collection of Japanese Textbooks*) (Tokyo: Kodansha, 1961), p. 561. The passage is cited in Ikuko Nishimoto, "Teaching Punctuality: Inside and Outside the Primary School," in *Birth of Tardiness*, op.cit., p. 123.

9. Nishimoto in her "Teaching Punctuality" cites an episode recollected by the poet Takuboku Ishikawa who had taught at a primary school in a local village of Iwate Prefecture. Ishikawa witnessed the clock in the teachers' room ran at least thirty minutes slower than the clock in the train station. *Ibid.*, p. 129.

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....¹⁰

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.¹¹ And 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.¹² Workers living nearby knew the time from the ringing of the clock tower. Work at

10. "Hacchaku Jikan no Seisei," p. 4 in *Tetsudō Jibō* (*Railroad Journal*), no. 117(1901); Cited in Naofumi Nakamura, "Railway Systems and Time Consciousness in Modern Japan," in *The Birth of Tardiness*, op.cit., p. 30.

11. Of these modernizing systems, the introduction of the automatic coupling system is discussed in Tamio Takemura, "The Time Revolution of the Railways in the 1920s: The Impact of the Changeover to Automatic Couplers," in *ibid.*: 39–62.

12. Jun Suzuki, "Tokei (the Clock)" in *idem*, *Shin Gijutsu no Shakaishi* (*A Social History of New Technologies*) (Tokyo: Chuo Korona Shinsha, 1999).

the Arsenal started at 7 in the morning, except during the winter season, and all workers were expected to complete their preparations for work before that time.¹³ 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.¹⁴

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 Godō 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 introduce fully the method of Taylorism.¹⁵ Godō, however, subsequently succeeded in introducing Taylorism to Japanese naval arsenals, as well as in introducing the technologies of the limit gauge system.

4. Punctuality and Efficiency in Ordinary Life

Through these efforts, time discipline and punctuality became well established at railroads as well as at arsenals and private factories in pre-war 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. But there was an effort to do so. The movement to improve living conditions was organized and

13. Jun Suzuki, "Two Time Systems, Three Patterns of Working Hours," in *The Birth of Tardiness*, op.cit., p. 81.

14. The Ministry of Agriculture and Commerce, *Shokkō Jijō (Conditions of Craft Workers)* (Tokyo, 1903), revised edition (Tokyo: Iwnami Shoten, 1998), p. 237. Takehiko Hashimoto, "Punctuality and the Introduction of Scientific Management to Japan," in *The Birth of Tardiness*, op.cit., pp. 100–101; and Suzuki, *Shin Gijutsu no Shakaishi*, op.cit., p. 110.

15. Takuo Godō, "Kagakuteki Kanriho no Jissai (Scientific Management in Practice)," *Sangyo Noritsu (Industrial Efficiency)*, 2 (1924), pp. 12–13.

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.¹⁶ 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 varied from five minutes of fixing a single plait to fifty five minutes of wearing the formal *shimada* style of hair dressing.

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.”¹⁷ 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 rail-

16. On the activity of this organization and its promotion of punctuality, see Hashimoto, *op.cit.*, pp. 104–106.

17. Cited in The National Science Museum, ed., *Kokuritsu Kagaku Hakubutsukan Hyakunenshi (The Centennial History of the National Science Museum)* (Tokyo: Daiichi Hōki, 1977), p. 200.

way station.”¹⁸ 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 studied 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 time-keepers was a key event in spreading punctual behavior among Japanese people.¹⁹ Ichiro Oda, who writes extensively on the history of time and clocks, argues in his *When Did 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.²⁰ The Land Reform, he also speculates, may have made people sharply realize the significance of the idea that “time is money.” Ikuko Nishimoto, another expert in 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.²¹

5. *Sazae-san and Accelerated Japan*

Concerning the postwar evolution of people’s conception of time, I would like to refer to some cartoons. It is “Sazae-san,” a popular

18. Loc.cit.

19. Sakae Tsunoyama, *Jikan Kakumei (Revolution in Time)* (Tokyo: Shinshokan, 1998).

20. Ichiro Oda, *Nihonjin wa Itsukara Sekkachi ni Nattaka (Since When Did the Japanese Become Impatient?)* (Tokyo: PHP Research Institute, 1997).

21. Ikuko Nishimoto, “‘Harmony’ as Efficiency: Is ‘Just-in-Time’ a Product of Japanese Uniqueness?” *Time and Society*, 8 (1999): 119–140.

comic strip, which ran in the Asahi Newspaper for 25 years from 1949 to 1974. 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 forty or fifty 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 “speedy weaving machine” which Sazae-san’s neighbor had just purchased.²² Sazae-san was attracted to this new machine and visited the neighbor with her wool strings. But she spent the time idly talking with her friend and came back home 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.²³ But 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.²⁴ 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.²⁵ With free time

22. Machiko Hasegawa, *Sazae-san*, vol. 10 (Tokyo: Asahi Shimbunsha, 1995), p. 72. The comic strips of *Sazae-san* were first reproduced and published from Shimaisha, and later republished as small pocket-sized version from Asahi Shimbunsha. I have used the version of Asahi Shimbunsha.

23. *Sazae-san*, vol. 17, p. 55.

24. *Sazae-san*, vol. 24, p. 57.

25. *Sazae-san*, vol. 34, p. 1.

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 elderly persons 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.²⁶

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. It would be 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 income.

In her recent book on the social history of time in modern Japan, Nishimoto also discusses the acceleration of social activities in the 1960s.²⁷ Her attention particularly focuses on the production as well as 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

26. *Sazae-san*, vol. 42, p. 51.

27. Ikuko Nishimoto, *Jikan Ishiki no Kindai: "Toki wa Kanenari" no Shakaishi (Modernity in Time Consciousness: A Social History of "Time is Money")* (Tokyo: Hosei University Press, 2006), chapter 7.

of the highway in Tokyo were used in the 1972 Russian SF movie, “Solaris,” to represent a futuristic city.

6. Conclusion

This chapter began with the attention to the puzzling problem of punctuality in Japanese history. Many foreigners in the Edo and early Meiji period complained about the Japanese people’s apparent indifference to time as represented on the clock. But now in Japan, 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. As a possible explanatory answer to this question, I introduced 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, and railroads, 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 South-east Asia. Although I referred to Adas’ work at the opening of this chapter, works touching on the history of punctuality in Asia are very few, 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.²⁸ I believe the theme and

28. Liu Shaoli, *Shuiluo Xiangqi: Rizhi Shiji Taiwan Shehuide Shenghuo Zuoxi* (Sound of

related questions provide an interesting comparative perspective on the history of technology, culture, and society in Asian countries.

Steam Siren: Work and Leisure in Taiwan in the Period Occupied by Japan (Taipei: Yuan Liu, 1998). It was translated in Japanese by Kōryū Kyōkai as *Jikan to Kiritsu: Nihon Tōchiki Taiwan ni okeru Kindaiteki Jikan Seido Dōnyū to Seikatsu Rizumu no Henyō* (*Time and Discipline: The Introduction of Modern Time System and the Change of Rhythm of Life in Taiwan Occupied by Japan*) (Tokyo: Kōryū Kyōkai, 2006).