The Economic Research of E. F. Penrose in Japan during 1925–30: The ‘Undelivered’ Message to Pre-war Japanese Society

Tadashi Ohtsuki
Tokyo University of Foreign Studies, Fuchū, Japan

ABSTRACT
This paper addresses the economic research conducted by Ernest Francis Penrose (1895–1984) in Nagoya, Japan, from 1925 to 1930. After graduating from Cambridge University, he relocated to Japan as a lecturer and began creating the first indices in Japanese history of the physical volume of production, the significance of which was only recognized in the world after the First World War. Penrose was a pioneer in his contribution to the development of quantitative analysis in Japan. His analysis also included practical critical remarks and significant perspectives on Japanese economic policy shortly before the war, although they had no actual influence on the Japanese government at the time. Utilizing his articles published during his stay in Japan, this study sheds light on his contributions, mostly unrecorded in the history of the development of economics in Japan.

1. Introduction

After the period of national seclusion from 1639 to 1854, known as the Edo period or the Tokugawa Shogunate period, Japan rapidly imported academic subjects, mainly from Europe and the USA, including economics and commercial studies. Until the Tokugawa period, it was generally regarded as despicable to pursue profits because of the religious beliefs of the Japanese people at the time. To change the situation and to promote international trade, the newly formed Japanese government began organizing a new higher educational system, including imperial universities, higher commercial schools, and private schools. In these schools, foreign lecturers were employed to teach foreign languages, economics, and commerce, all of which were almost alien to the Japanese. Most of the lecturers only gave lectures to students, while few engaged in economic research and education. One such person was Ernest Francis Penrose (1895–1984). His wife, Edith Penrose (1914–96), is known for her book The Theory of the Growth of the Firm, published in 1959.
Having been interested in the population problem from his days at Cambridge, Penrose took up employment as a lecturer at the Nagoya Higher Commercial School (now known as the School of Economics, Nagoya University) in Japan just after graduation from the university. He stayed there from late 1925 to 1930—a period that saw a population explosion in Japan. During his short stay in Japan, he studied the Japanese language and recorded the first Japanese index known as ‘An Index Number of the Physical Volume of Production in Japan’ (Penrose 1927). This kind of index had already been presented by William E. Leonard in 1913 as ‘An Index of Changes in Extractive Industries’ (Leonard 1913). However, the importance of the index of the physical volume of production had just come to be recognized because of the rapid price fluctuations after the outbreak of the First World War in 1914. As Penrose explained, after the First World War, considering the rapid fluctuations of the currency value, the actual volume of production decreased even though the nominal value dramatically increased. This situation directly created the necessity for the index. Furthermore, from the perspective of the economic problems such as industrial stagnation and unemployment, it was regarded as an urgent matter to have an accurate grasp of production (Penrose 1927, 461). Additionally, in Japan, ‘the rapid increase of the population in Japan also demands the physical index of the production’ (Penrose 1927, 461). For example, in 1921 Edmund E. Day presented An Index of the Physical Volume of Production, from the Statistical Service of the Harvard University Committee of Economic Research. In 1924, J. W. F. Rowe also published The Physical Volume of Production as a special memorandum of the London and Cambridge Economic Service. The index by Penrose also belonged to this early stage of these studies.

Penrose played a significant role in the introduction and the development of quantitative analysis in Japan, although his contributions have not been recorded in the history of the development of economics in Japan. Hitherto, a small number of studies have noted the existence of Penrose’s index. Furthermore, the significant messages to Japanese society which Penrose emphasized in the process of making the index have also remained mostly unrecognized. This article sheds light on this point by utilizing the papers that Penrose presented during his stay in Japan. These papers not only included his analysis of the agricultural conditions in Japan at the time, but also contained critical remarks on the economic policy of the Japanese government just before the start of the war. Considering that few Japanese economists at the time pointed out such problems, it can be regarded as quite remarkable that in the early stages he already foresaw the danger of the rise of Japanese military society. Unfortunately, none of these remarks came to be of any actual significance in Japanese society shortly before the war.

The remainder of this paper is organized as follows. Section 2 examines the importance of Penrose’s encounter with two Japanese scholars. Section 3 observes the process of making the first index of the physical volume of agricultural products in Japan, which was presented in 1927. Section 4 reviews Penrose’s critical remarks on the economic policies just before the war in Japan. Section 5 retraces Penrose’s contributions to the development of economics in Japan before and after the war. Section 6 considers the overall achievements of Penrose’s research during his stay in Japan, and provides scope for future studies on him.
In his later years, looking back on his memories of Japan, Penrose wrote as follows:

I think it must have been D. H. Robertson, who suggested to a younger economist, Mr. Austin Robinson, that I, as one of his students, might be interested in a request that he had received for a Cambridge man to fill a position in Japan in a commercial college at Nagoya ... The suggestion attracted me at once. (Penrose 1987, 6)

Matriculating at Fitzwilliam College, Cambridge in 1922, and after the completion of the Economic Tripos of the University of Cambridge, with a handwritten recommendation from Professor A. C. Pigou, Penrose came to Nagoya in Japan on Christmas Day 1925. Early in his student days, having become interested in the population problem, he hoped that in Japan 'there would be an opportunity to study the population problem further'. Before his arrival there, Penrose had known through the works of Harold Wright, that in Japan, the Malthusian theory of population was being exemplified in practice. It was assured that birth control was not being practised in Japan at the time, so 'Here was my subject for research, I felt' (Penrose 1975, 323).

The academic environment created by two Japanese scholars at Nagoya Higher Commercial School was 'particularly fortunate' for Penrose (Penrose 1987, 7), and also made his research possible. One was Kaname Akamatsu (1896–1974), while the other was Ryusei Watanabe. At the time, Akamatsu, who was almost the same age as Penrose, worked as a lecturer at the school. Akamatsu later became internationally known for his 'Wild Flying-Geese Pattern Theory' or 'Gankou Keitai Ron' in Japanese, which explains the pattern of development of an industry imported from a developed country into a developing country. From 1924 to 1926, he studied in Germany and then at Harvard Business School, and introduced the concepts of the empirical studies practised at Harvard University into Japan.

Akamatsu’s study at Harvard was made possible by Dr Watanabe, the principal of the school. Dr Watanabe had received a Doctorate of Philosophy from the Graduate School of Cornell University in 1894 and was interested in the newly fashioned academics in the USA. Penrose described him as an ‘outstanding personality, progressive and open to new ideas. I have always thought him as being in line of descent of the great pioneers of the Meiji era who brought Japan into the modern world’ (Penrose 1975, 324).

Upon his return to Japan in July 1926, Akamatsu suggested that a bureau of business research should be established. Dr Watanabe accepted Professor Akamatsu’s project with interest and supported it in the Ministry of Education (Akamatsu 1975, 34; Penrose 1975, 324). In the same year, the 'Bureau of Business Research, Nagoya College Commerce' ('Sangyou Cyousa-shitsu' in Japanese), attached to Nagoya Higher Commercial School, was established. Penrose described the bureau as follows:

Not long after I arrived, and I can still remember the little Bureau, the main working part of which consisted in a large room furnished very sparsely with some chairs and large tables. And then there was the electrically operated calculating machine. It was much less thoroughly mechanised than those of today, but was a great advance in its time. (Penrose 1975, 324)
He also wrote the following:

Dr Akamatsu’s séjour abroad was particularly fortunate for me because he had brought back with him to Japan an electric calculating machine. Today it would be thought rather primitive, but without it I could not have produced those first index numbers of production using a geometric average. (Penrose 1987, 7)

It is therefore clear that without Akamatsu and Watanabe, it would not have been possible for Penrose to begin his research at Nagoya.

3. The First Index in 1927: The Early Difficulties and the Result

Before coming to Japan, Penrose discovered J. M. Keynes’s Economic Consequences of the Peace, published in 1919, which focused on the population problem. According to Penrose, Keynes had argued that the terms of exchange between countries overseas that could export grains and animal foodstuffs were becoming increasingly unfavourable to the industrial countries of Europe who depend on such imports for a large part of the food supplies essential for the support of growing populations. Keynes dramatised this with his unrivalled eloquence on the printed page, but it has not stood up to competent quantitative history.11 (Penrose 1987, 7–8).

However, Penrose observed,

Keynes’s mistakes, as Austin Robinson once remarked to me, were often more profitable than Pigou’s correct analysis on many matters. Some of Tripos students seized on them and found excitement in working out new solutions for old problems and difficulties. My interest in population … received one of its strongest impulse from Keynes’s challenging, but not very profound excursions into the subject.

Penrose soon became dissatisfied with the analysis of Malthus’s own writings and those of his followers by writers both at Cambridge and overseas. As this subject was crucially relevant to the Japanese food and population problem, it became one of the leading topics in my earlier writings. (Penrose 1987, 8)

Upon arrival in Japan, Penrose found that ‘Malthus and Marx were frequently cited, the former in more conservative and the latter in socialistic circles. But both carried on their arguments in general terms’ (Penrose 1975, 323). It seemed to Penrose that more facts were needed before any general theory could be applied to the Japanese context, which led him to think, ‘What kind of facts were needed and what could they show?’ (Penrose 1975, 323). He observed:

Malthus had maintained that an unregulated population occupying a land would increase to the limits of subsistence. Ricardo and the two Mills made use of this theory in their own theories of value. Japan, it was believed, maintained a fairy stationary population in the Tokugawa period: during the Meiji and Taisho periods numbers had increased greatly.12 (Penrose 1975, 323–4)

First, Penrose thought that the most useful facts ‘would be quantitative evidence showing whether or not the means of subsistence had increased as fast as population in the more recent period in which the latter had undoubtedly risen rather rapidly’
In fact, the population of Japan from 1872 to 1922, which includes most of the Meiji and Taisho periods, increased by 78% (Penrose 1934, 99).

According to Penrose, however, ‘the early difficulties were formidable’ with regard to obtaining the statistical raw material needed on production (Penrose 1975, 325). Therefore, he decided to concentrate on agricultural production for both food and industrial crops. Diving quickly into linguistic studies, he worked on the Chinese characters (in this case, the Japanese ruled Kanji) to quickly identify the ideographs regarding the research. He had to teach for four hours every day from Monday to Friday, and all his work in the bureau had to be done in the afternoons, on weekends, and during holiday periods. Therefore, during every spare minute between classes, he slipped into the library, with a dictionary of Chinese characters in one pocket and another of colloquial Japanese in the other pocket. According to Yasuji Koide (née Yamada, 1907–85), one of his assistants, Penrose learned to write the Chinese characters (Koide 1975, 286). He soon found appropriate publications of ministries (Penrose 1975, 325). However, many problems still remained as he pondered about how far back he would have to go, and how he could judge the reliability of the statistics and the validity of the methods used to compile them? (Penrose 1975, 325). During that time in Japan, private companies respectively recorded the volume of production every year. Surprisingly, though, the index of production in Japan as a whole had not yet been calculated (Penrose 1927, 462). Fortunately, with the help of those associated with the League of Nations, Professor Siroshi Nasu of the Tokyo Imperial University, a specialist on certain agricultural products, and Dr Amemiya of the Ministry of Agriculture and Forestry, Penrose was finally able to collect raw material dating back to 1879 (Koide 1975, 286; Penrose 1975, 325).

Approximately two years after his arrival at Nagoya, his first article was published in 1927,14 which was devoted to creating an index of the physical volume of agricultural products in Japan. Penrose selected the following 11 agricultural goods: rice, cocoon, rye, wheat, sweet potato, barley, soybean, Japanese white radish, leaf tobacco, taro (a kind of a potato popular in Asia and the South Pacific area), and potato. This was because the value of these products comprised approximately 89.2% of all the value of agricultural goods in Japan in 1925, based on Penrose’s calculation (Penrose 1927, 465–7).

First, Penrose compiled the tables of the actual quantities of these products from 1879 to 1925. Second, based on the tables, he calculated the index of these products from 1879 to 1925, using the average productivity from 1921 to 1925 as a criterion. Third, to create the combined index of these 11 agricultural goods, he adopted the geometric average method of E. Day (Penrose 1927, 465–78).15 He noted that ‘the calculating machine that Professor Akamatsu’s foresight had provided was worked intensively: at times I had to stop and cool it off after using it for hours with little pause’ (Penrose 1975, 326). To compare the index of these products with the increase in the population of Japan, he also made an index of population, setting the population in 1879 as a criterion.

Finally, in order to compare the two indices, Penrose recalculated the index of the agricultural products, setting 1879 as the base year (Penrose 1927, 482). Graph 1 below is the result of his research.
He noted the following important points: First, the quantity of the agricultural goods seemed to be increasing. This was because of the rapid increase in cocoon production, an inedible agricultural good. Limited to the agricultural foodstuffs, the quantity was likely to stop increasing. Second, particularly during the last period of the graph, the increase in edible agricultural goods was likely to stall, while the population in Japan was still increasing (Penrose 1927, 486). As Penrose pointed out, there was some hope for the future of Japanese agriculture that cultivating lands would bring about an increase in agricultural foodstuffs. However, he continued on to note that it was doubtful that farmers would earn enough to cover the cost of living and profits after cultivation (Penrose 1927, 487).

As he had imagined at Cambridge, Penrose was able to empirically show the relationship between the increasing population and agricultural production in Japan, but with many difficulties in collecting raw material for the index.

4. The ‘Undelivered’ Message by Penrose to Japanese Society

In the making of the first index, Penrose also questioned the conditions of both agriculture and industry in Japan and planned ‘to state thoroughly his opinion about the conditions of production in Japan’ (Penrose 1927, 488). In the works of Penrose that followed, his important messages against the Japanese government’s economic policies
were strengthened, although most were not actually delivered to the society leading up to the war. The ‘undelivered’ message by Penrose to Japanese society can be summarized as his strong assertion of the necessity for a free trade policy, or the abolition of tariffs in Japan, especially on agricultural goods and mineral products. According to Penrose, the strengthening of protectionism in Japan made possible the creation of big financial groups called ‘Zaibatsu’, which had a great influence on Japanese society in the Great Depression.

First, in 1928, Penrose presented a summarized version of his 1927 publication, pointing out that ‘if the development of the agricultural product stops … Japan will increasingly depend on the international trade. As a result of this, Japan will have to change the fiscal policy. If it changes so, the only way to choose is free trade policy’ (Penrose 1928, 118). He did not make use of direct statements against the Japanese government, but the document apparently included direct critical remarks on the protectionist trade policy of Japan. This was published in the next article.

Second, in 1929, Penrose presented an article on the index of animal food products (Penrose 1929a), utilizing the same statistical method adopted in his 1927 publication. In this article (Penrose 1929a), as with his 1928 article, Penrose opposed imposing a tax on animal food products. This was because the Japanese people needed more protein in their diet. In particular, infants in Japan at the time were not fed high-quality milk (Penrose 1929a, 197). In Japan, 141,000 people, including 87,000 children, died of intestinal catarrh in 1926, while in Britain, 8400 died in that year. Not all the children’s deaths were due to the dearth of food, but the shortage of high-quality milk was the prime factor related to bowel disease. As a conclusion to the article, he objected to the import tax not only on animal food products but also on all imported foodstuffs, stating directly his ‘complete disagreement with such attitudes of the Japanese government as to permit the imposition of a tax on all the imported foodstuffs’ (Penrose 1929a, 198).

In 1929, he also published an article with an index of mineral products in Japan (Penrose 1929b). In this article, he pointed out the increase in mineral products in Japan and regarded it in a positive light. At the same time, however, he was also critical, stating that Japan’s protectionism was ‘profitable to certain limited groups, but surely harmful to the industry and the whole nation’ (Penrose 1929b, 183). Indeed, the rise in the price of mineral products due to protectionism by certain limited groups, or Zaibatsu, did not represent a symptom of economic development, but was an impediment to the whole industry (Penrose 1929b, 183).

In the case of coal, for instance, the coal-mining coalition in Japan intentionally restricted the import of high-quality coal from Manchuria and increased domestic production, defending their own profits against social profits. According to the calculation by Penrose, coal production comprised more than 71% of all mineral products for the period from 1921 to 1925 (Penrose 1929b, 178–9).

Penrose also analysed the production of copper. The weight of the production of copper accounted for more than 62% of all the metals mined in the same period as coal; high tariffs were imposed on it, and the decrease in its production was prevented. In the case of 1922, the tariff increased approximately 5.8 times per 100 kin (Penrose 1929b, 180). According to Penrose, ‘it was possible that in the near future in Japan, the
amount of production of copper would strongly depend on not a geographical, but a managerial and political element’ (Penrose 1929b).

At the end of the article, Penrose asserted that the Japanese government should use their authority to engage in the reconstruction of such industries for the profit of the Japanese people and not in the suppression of thoughts and speech (Penrose 1929b, 183). In fact, during this period in Japan, thoughts and speech indeed came to be suppressed or controlled. Penrose was not arrested for his critical views on Japanese economic policy, although censorship was gradually intensified during the period and he was working at a government-run school. Additionally, some of the Japanese military caused an incident in Manchuria in June 1928, the details of which non-military people were not informed of. Wartime was indeed approaching.

In 1929, to report the actual situation of Japan’s production worldwide, based on his research, Penrose presented the English publication *Agricultural and Mineral Production in Japan* (Penrose 1929c) at the third conference of the Institute of Asia Pacific Relations, held in Kyoto18 (Kori 1930, 19–20). A total of 218 people participated in the conference, most of whom were from seven national councils: Japan (48), the United States (45), China (31), Canada (29), the UK (15), Australia (11), and New Zealand (6). According to Wright (1930), the 72 individuals from universities constituted the largest professional interest, followed by bankers and businessmen (44), journalists (18), religious workers (17), and so on. Moreover, in the following year, this presentation was also published by Chicago University Press as *Food Supply and Raw Materials in Japan: An Index of the Physical Volume of Production of Foodstuffs, Industrial Crops, and Minerals, 1894–1927*.

In the spring of 1930, Penrose moved to Stanford University in California and joined the Food Research Institute. The research at Nagoya was primarily continued by his assistant Koide. The members of the school made an effort to realize Penrose’s intentions. In September 1930, the research was partly presented at the 19th conference of the International Statistical Institute held in Tokyo, as the article in English, ‘The Quantity Index of Foodstuff Production in Japan’ under the name of Nagoya Commercial College (Koide 1975, 287; Kori 1930, 20; Nagoya Commercial College 1930). The article was also printed in the *Bulletin de l’Institut international de statistique* (Bulletin of the International Statistical Institute), published from 1931 to 1932.19 Finally in 1933, the research was completed, and was published as *Honpo Seisan Suryou Shisu Souran* (Koide 1933), or in English, *The Index of Physical Volume of Products in Japan, from 1894 to 1931*, including all the products in Japan except for industrial products. During the war, it was difficult to collect raw data on the production of industrial products (Koide 1951, 103–7). As Penrose emphasized at an early stage in his papers, the social situation in Japan was worsening due to the war.

5. The Contributions of Penrose to the Development of Economics in Japan

The contribution of Penrose’s study during his five-year stay in Japan can be summarized as the following two points: first, pioneering the introduction of quantitative
analysis in Japan, and second, his critical remarks on the economic policy just before wartime in Japan.

With regard to the first contribution, just after the publication of his article in 1927, Penrose’s research highlighted the necessity of the index of the physical volume of production to the Japanese government and society as well as the academe. For example, in 1932 the Kokusei-Sya (a private company which means ‘census’) constructed the quantitative index spanning the period from 1912 to 1930, which was printed in Kokusei Graph. In 1936, the Ryoyu-Kai, supported by Viscount Eiichi Shibusawa and nationally, published Honpo Syokuryou Seisan Hatten-sou no Kenkyu, or in English, Studies on the Phases of the Development of Food Production in Japan. This included the index of the physical volume of food production in Japan from 1894 to 1933. In 1933 and 1934, the Ministry of Agriculture and Forestry published an index covering the period 1878–1932 (Koide 1951, 102–3).

Regarding the second contribution, Penrose’s thoughts were not inherited in any way. At the beginning of the 1940s, in Japan, the role of the index changed drastically. Studies of the index came to be adopted into colonial studies with the territorial expansion of Japan. At the time, Japan aimed to spread its territory under the ideal of the ‘Greater East Asia Co-Prosperity Sphere’. One of the well-known indexes created in this period was that by Isamu Yamada (1906–86), presented in 1941. He was then a researcher at ‘Toua Keizai Kenkyu-sho’ (the Research Institute of East Asia Economies), attached to Tokyo University of Commerce, now known as the ‘Keizai Kenkyu-sho’ of Hitotsubashi University. Influenced by Penrose and planned by Akamatsu,20 Yamada engaged in studies on agricultural production in Korea and Taiwan, the then Japanese colonial area, as well as mainland Japan, and published in Japanese as Toua Nougyou Seisan Shisu no Kenkyu: Naichi, Cyousen, Taiwan no bu (Yamada 1941), or, A Study on the Index of the Physical Volume of Agricultural Production in Mainland Japan, Korea, and Taiwan. Yamada emphasized the importance of the index as a tool to grasp agricultural production in the Japanese territory for national defence and economic policy (Yamada 1941, 3). In the book, however, the ‘undelivered’ message by Penrose was not included at all. The quantitative analysis method was the only thing that was used.

After the end of the Second World War, the index again assumed importance. It was used to measure the postwar reconstruction process and economic welfare in Japan. As part of the postwar reconstruction studies, for instance, Japanese Economic Statistics was published in 1949 by the General Headquarters, Supreme Commander for the Allied Powers, Economic and Scientific Section, Research and Programs Division, located in Tokyo. Regarding economic welfare, some companies such as Toyokeizai Shinpo-sha and Diamond-Sha published the index, especially for the mining and manufacturing industries (Koide 1951, 103). Thus, the indices continued to be used while the name of Penrose ceased to be recognized.

In the latter half of the 1970s and the beginning of the 1980s, when a research project on the historical development of statistics in Japan was carried out, interviewees such as Kori, who was a colleague of Penrose at Nagoya, and Isamu Yamada, did not comment on the studies by Penrose before the war (Kori 1977; Yamada 1982). This might indicate a kind of guilty conscience of Japanese economists that they had not
taken notice of Penrose’s remarks against the economic policy prior to wartime. It may be said that Penrose’s message was deleted from the history of the development of economics in Japan.

6. Conclusions
After he left for Stanford University, Penrose ‘watched with alarm the take-over in Japan by the military in 1931’ and denounced Japan’s invasion of Manchuria. He also stated that he ‘followed with sadness the increasing consolidation of military government in the following years’ (Penrose 1987, 12). During this period, being an expert on the Japanese economy, he continued to present some articles in English to share the Japanese economic situation with the world. This included ‘Japan, 1920–1936’, included in the book *The Industrialisation of Japan and Manchukuo, 1930–1940: Population, Raw Materials and Industry*, edited by E. B. Schumpeter in 1940, and ‘Japan’s Basic Economic Situation’, contributed to *The Annals of the American Academy of Political and Social Science*, in 1941 (Penrose 1940, 1941).

Unfortunately, his critical message for the colonial economic and political policy of wartime Japan was not delivered strongly enough in the end, although his publications written in Japanese and English were not banned. The indexes following Penrose’s style continued to be made and applied to studies of wartime economic policy in Japan. Undoubtedly, this was against Penrose’s original intentions. After the Second World War, Penrose became a professor of geography and international relations at Johns Hopkins University in 1948, and in 1953, he published *Economic Planning for the Peace*. The influence of his experience in Japan on his research activities after the war is a topic for future research.

Notes
1. In 1944, Penrose married a widow, Edith Denhardt (née Tilton), whom he had met at Johns Hopkins.
2. From 1884 to the middle of the 1920s, with the background of rapid industrial development in Japan, national higher commercial schools were also established in the following 13 cities: Tokyo (1884), Kobe (1902), Nagasaki and Yamaguchi (1905), Otaru (1910), Nagoya (1920), Fukushima and Oita (1921), Hikone and Wakayama (1922), Yokohama and Takamatsu (1923), and Takaoka (1924). All of them are now a part of national universities or independent universities of commerce. In addition, higher commercial schools were also established in the following then-colonial areas of Japan: Taipei and Tainan in 1919, Pyongyang in 1922, and Dalian (Dairen) in 1936.
3. Considering the fact that most lecturers of economics or commerce were educated under the influence of the German historical school or ‘L’Institut Supérieur de Commerce d’Anvers’ in Antwerp, Belgium, it was quite unusual at that time that a lecturer from Cambridge was employed in Japan. For details, see Ohtsuki (2017, 2018). Nagoya Higher Commercial School was looking for a lecturer of English, commercial studies, and the history of commerce because the former lecturer, George C. Allen (1900–82), had left the school. For details, see Allen (1983).
4. For example, Ikeo (2014, 30–1 and 82–3), Ohtsuki (2011, 295; 2017, 309), and Yasuba (1964).

5. Nagoya in the Aichi Prefecture was then rapidly expanding as the third largest city in Japan, after Tokyo and Osaka. This was due to the development of the textile, pottery and watchmaking industries. Currently, the Aichi Prefecture is internationally known for the Toyota Motor Corporation. The corporation had not yet been created in the 1920s, as it was not until 1933 that the company was founded there.

6. According to Penrose, ‘Some members of my family were opposed to my going, in particular my parents who were advanced in age and wanted me to take posts on offer in Britain rather than to disappear to the other side of the world.’ Reluctantly, he ‘agreed to apply for a post at Nottingham University College’, but ‘fortunately for me, a young Scotsman was finally selected. Never was I more pleased at being rejected, and I telegraphed my acceptance to Japan without further consultation’ (Penrose 1987, 6).

7. In this article, the names of Japanese people appear in Western order. First name is followed by family name.

8. He also introduced the following two methods from Harvard at Nagoya Higher Commercial School: the case method education system and the empirical analysis of business conditions conducted by the Harvard University Committee on Economic Research. For the details, see Ohtsuki (2011, 293–4).

9. The Meiji era was from 1868 to 1912.

10. The bureau is now the Economic Research Centre and is attached to the School of Economics, Nagoya University.

11. In another article, Penrose also said, ‘the Cambridge Economic Handbook on Population by Harold Wright, a disciple of Keynes, was in my opinion equally weak’ (Penrose 1975, 323).

12. The Taisho period was from 1912 to 1926.

13. In this respect, Penrose stated, ‘It is in fact little short of a national disgrace that this vital statistical measurement has not been supplied long ago’, as quoted in an article by J. W. F. Rowe in the Economic Journal in June 1927 on the question of an index number of physical production for Great Britain (Penrose 1927, 459).

14. This article was published in Japanese and was translated into English with the help of his assistant, Noriyuki Takegawa, and Professor Kikunosuke Kori (Penrose 1930, 5). The ‘excellent choices’ of the assistant were made by Akamatsu (Penrose 1975, 326).

15. This time, the author will not go more deeply into the statistical method of Penrose.

16. Penrose (1929a) was translated by Y. Koide (Penrose 1930, 5).

17. Penrose (1929b) was translated by Takegawa, and Professor K. Kori (Penrose 1930, 5).

18. Both the first and second conferences were held in Honolulu, Hawaii, in 1925 and 1927, respectively.

19. This was later regarded by the United States Bureau of Agricultural Economics as one of the ‘papers on vital statistics and population in Japan’ (United States, Department of Agriculture 1939, 48).
20. In the spring of 1939, Akamatsu moved from Nagoya Higher Commercial School to Tokyo University of Commerce.

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Notes on contributor

Tadashi Ohtsuki is a Visiting Researcher, Tokyo University of Foreign Studies.

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