

Relationship between the Cultural History of Modern Japan and Rooftop Gardens

Hiroyuki Yamada · Shinobu Yabu

Faculty of Systems Engineering, Wakayama University

ABSTRACT

Full-scale ferro-concrete building technology came was introduced in Japan in Meiji 35~40(1902~1907) and heralding the beginning of urban modernization. On the roofs of these new architectural constructions, full-scale rooftop gardens were also developed. We consider that gardens established on the roofs of hotel and department stores created a new, modernized garden culture, which greatly influenced the early modern urban culture of Japan, the drama of which it conceived based on the impression in a rooftop garden is made. In this paper, we discuss the influence of Meiji-Era cultural and technological advances on rooftop gardens constructed during the Taisho Era(1912~1926), as represented by the gardens of Kobe's Oriental Hotel, Tokyo's Mitsukoshi Department Store and Shimonoseki City's Akita Company. Photographic and print sources are utilized to analyze the design features and temporal changes of these pioneering rooftop gardens, as well as their influence on urban culture.

Key Words: Modern Architecture, Rooftop Garden, Kobe Oriental Hotel, Mitsukoshi Department Store, Akita Company Building

1. History of Rooftop Gardens in Japan

1. Development of Rooftop Gardening Technology

It is not clear exactly when rooftop gardening in Japan started. If we can consider *shibamune*, a type of ridge structure on *Kayabuki* roofs, as roof greening, its origins may go as far back as the Yayoi(AD 300~BC 400) or Jomon periods(BC 400~BC 11000). However, as roofs are considered architecturally integral to ferro-concrete buildings, rooftop gardens are generally thought of as modern creations. Due to the Great Kanto Earthquake(1926) ferro-concrete buildings were soon exclusively used(Architectural Institute of Japan, 1976), and the construction of rooftop gardens is considered a parallel development. However, although it is a very unique example, the existence of a rooftop garden on an early Showa Era timber building(Yamada, 2003), indicates the possibility of small-scale rooftop garden construction in the first half of the Meiji Era or the late Edo Period. In addition, there is a

record of rooftop garden in a private residence in the early 1900s, although this was not discovered until after a full examination of the building structure. In this chapter, changes in plant-based reclamation technology in rooftop gardens are clarified by examinations of Meiji and Taisho Era constructions and from the investigations of contemporary gardening engineers(Yamada, 2003). The results are chronologically summarized in Table 1.

2. Early Rooftop Gardens

As the first full-scale ferro-concrete construction in Japan was built in Meiji 39(1906), the rooftop garden of the Kobe Oriental Hotel, completed the following year, ranks as one of the oldest on record. From detailed records, including a large advertisement proclaiming the construction of a rooftop garden with 'grounds of 100 *shaku*(about 30m)', Tokyo's Mitsukoshi Department Store, completed in Taisho 3(1914), should also be considered a pioneer in rooftop gardens'.

Table 1. Chronology about a rooftop gardening example and technical changes

| A.D. | Name of era | The topics in Japanese history | The example of rooftop garden | The topics on greening technology |
|---------------|-------------------|---|---|---|
| Meiji 30-1906 | Meiji 39 | | Mitsuhei Iwaya's residence | Completion of the first full-scale RC building in Japan |
| 1907 | Meiji 40 | | Kobe oriental hotel | |
| 1909 | Meiji 42 | First publication of a magazine "rooftop garden" | Yamato hotel (Dallan) | |
| 1912 | Meiji 45=Taisho 1 | | | |
| 1914 | Taisho 3 | | MITSUKOSHI department store Akita company (Shimonoseki) | |
| 1915 | Taisho 4 | | | |
| 1921 | Taisho 10 | | MITSUKOSHI department store (New) | |
| 1923 | Taisho 12 | | Dojima building (Osaka) | |
| 1926 | Taisho 15=Showa 1 | Great Kanto Earthquake The collection of dramas "rooftop garden" is announced by Kunio Kishida | Igetaya department store (Nishio) | Le Corbusier "five principles of modern architecture" |
| 1931 | Showa 6 | Manchurian Incident | | |
| 1939 | Showa 14 | The outbreak of war of World War II | Daikoku-ya (Nishio) | |
| 1941 | Showa 16 | Japan-U.S. outbreak of war | Asakura Choso Museum (Tokyo) | |
| 1945 | Showa 20 | End of the war | | |
| 1955 | Showa 30 | | | |
| 1959 | Showa 34 | | Marunouchi hotel (Tokyo) | The start of production of perlite in Japan |
| 1963 | Showa 38 | | New Dai-building (Osaka) | |
| 1964 | Showa 39 | Tokyo Olympic Games | | |
| 1965 | Showa 40 | | Komatsu building (Tokyo) | |
| 1966 | Showa 41 | | | |
| 1968 | Showa 43 | | Takashimaya department store (Tokyo) | The beginning of an artificial soil construction method The beginning of an improvement soil construction method |
| 1970 | Showa 45 | Osaka expo | | |
| 1972 | Showa 47 | | Daiwa-Shoken building (Tokyo) | |
| 1975 | Showa 50 | | | |
| 1976 | Showa 51 | | | |
| 1978 | Showa 53 | | | |
| 1985 | Showa 60 | | | |
| 1989 | Showa 64=Heisei 1 | | | The full-scale spread of artificial lightweight soil |
| 1990 | Heisei 2 | An international flower and a green exposition | ACROS building (Fukuoka) | |
| 1995 | Heisei 7 | | | |
| 2003 | Heisei 15 | | Roppongi hills building NANBA parks | |

The rooftop garden of the Akita Company Building in Shimonoseki City, which still survives today, was completed in Taisho 4(1915), while the Japanese-style rooftop garden of the Dojima Building(Dobiru Hotel) in Osaka was finished in Taisho 12(1923). The Igetaya Department Store in Nishio City, Aichi, a ferro-concrete store completed in Taisho 14(1925), appeared to have added rooftop garden in Showa 1(1926), although this was the beginning ferro-concrete department store in local area of Japan. The ruins of this rooftop garden could still be seen until Heisei 18(2006). From the planting base of the Igetaya Department Store rooftop garden, the development of an construction method can be elucidated. The base was a simple structure comprised of a layer of natural soil as shown in Figure 1: a partition wall was constructed using natural stone extracted from the surrounding fields.

3. Modern Rooftop Garden

Between Showa 40~45(1965~1970) perlite, a lightweight

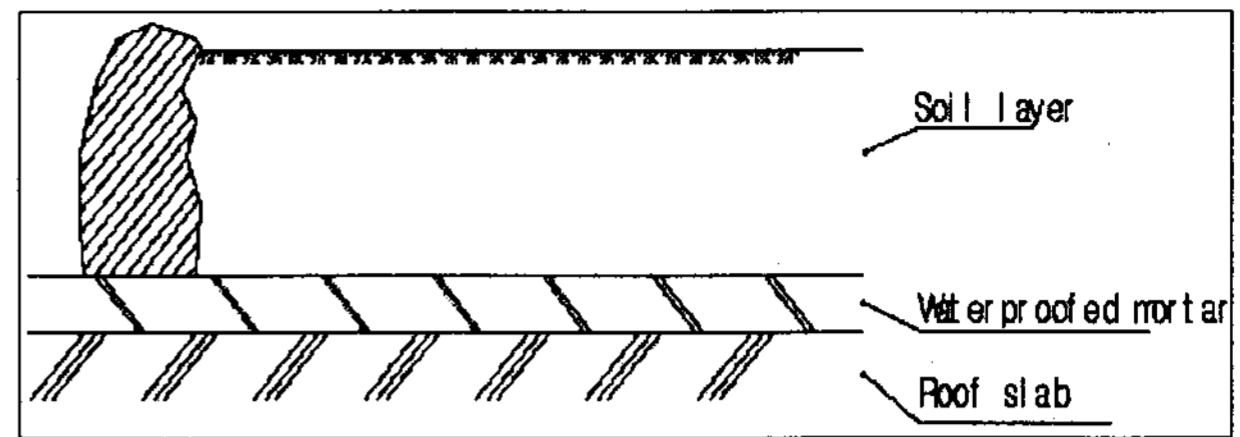


Figure 1. Sectional view of a planting base

aggregate used for engineering works, began to be used as a planting base. This planting base design, which is considered a 100% artificial, was used in the 1968 reconstruction of the rooftop garden of Nihonbashi(Tokyo) Takashimaya Department Store. The use of this lightweight aggregate as a planting base material was surprising, and is considered to be the first such example in Japan. In subsequent rooftop gardens, an improved planting soil mix of 20~30% perlite with natural soil came to be used in Japan; improvements in soil construction and artificial soil construction methods were developed almost simultaneously, and continue to be used today.

4. Present-day Rooftop Gardens

The artificial soil specialized for rooftop gardening was developed from the Showa 50(1975). Although a mix of improvement materials with perlite was in use at the beginning, various other materials appeared at the beginning of the Heisei Era(1989-present). Artificial soil was developed with weight saving as the most important consideration, with a density, under moist conditions, of 0.3g/cm³ or less. However, during construction it became clear that artificial soils with such extreme weight-saving densities allowed extensive soil loss from wind and rain. Soils used in rooftop gardens are now much denser, about 0.8~1.0g/cm³ in moist conditions.

Planting base materials have also become more complicated and diversified. Some succulent plants need no planting base: if a planting base is used, the material cannot be considered as soil.

Moreover, certain greening technology involve covering the roof with the parts which a planting base and plants unified comes to be used, and a planting base is sometimes unnecessary.

II. Examples of Rooftop Gardens

1. Kobe Oriental Hotel

The Kobe Oriental Hotel first opened in Meiji 3(1870). Its

reputation during the Meiji Era was boosted by a visiting foreign writer who rated it superior to the Raffles Hotel of Singapore, the Victoria Hotel of Hong Kong, and the Oriental Hotel of Penang Island(Malaysia). The Oriental Hotel moved to the Kobe waterfront in Meiji 40(1907), with the German architect George de Lalonde designing the new 4-storey structure. Lalonde is best known as the designer of the famous Old Thomas Residence, also known as the "Weathercock House", in the *Kobe Ijinkan* area. A photograph of the rooftop garden at the time of completion is shown as Figure 1. The conical structure visible in the background of photo was the pinnacle that faced the back of the hotel, and is a typical ornament of German baroque style. It seems that the rooftop garden was also used for guests to practice golf, as it was centered around an area of open lawn.

Since its relocation to Kobe's *Kaigan-dori* ('Waterfront Road'), the Oriental Hotel has prospered. The banquet hall is now extended to the top floor, and the rooftop garden will also be extended after removing pinnacles seen in the photograph. The possibility that the rooftop garden will be lost at this time is high.

2. Mitsukoshi Department Store

In Taisho 3(1914), Mitsukoshi built its corporate headquarters building in ferro-concrete. On the roof of the five-storey building, a tower rose as high and bright as a lighthouse. A newspaper at the time described it as the first large building east of the Suez Canal. Moreover, the rooftop garden was used as special space for entertaining a chief guest using the catchphrase of 'the rooftop garden of 100 *shaku* high'.

Changes in the rooftop garden of the Mitsukoshi Depart-

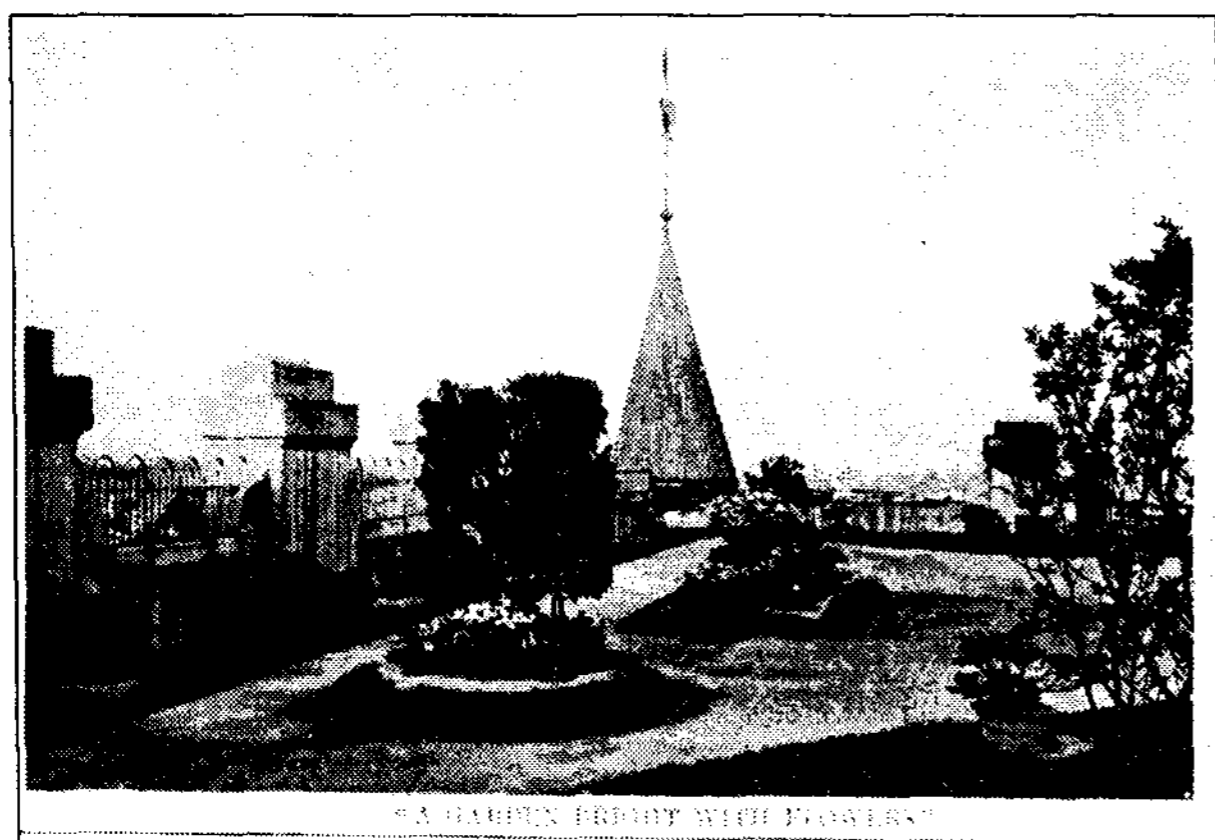


Figure 2. Kobe Oriental Hotel rooftop garden

ment Store from corporate literature(Mitsukoshi Corporation, 1954) and an old picture postcard(Yamada, 2007) are summarized below.

1) First Stage

The initial stage lasted from Taisho 3(1914) until Taisho 10(1921). The garden was comprised of a flower bed, an arbor, a concert hall, and a tearoom. Figure 3 shows the roof plan at this stage. However, it is clear from photographic data that another tearoom was located in the upper right corner and that trees were planted in a circle. The trees in the lower right corner surrounded a shrine(Sangoku-Inari), and, seen from the ground on Nihonbashi Street, appeared as a thicket enclosing this shrine. Although the section labeled 'rooftop garden' in Figure 3 is blank, it was actually taken up by a flower bed.

2) Second Stage

This stage lasted from Taisho 10(1921) to Taisho 12(1923). The rooftop garden was expanded and a west building extension was added. The horticulture greenhouse was installed in this term. Trees were planted at the perimeter of the roof, and were thus easily visible from the ground.

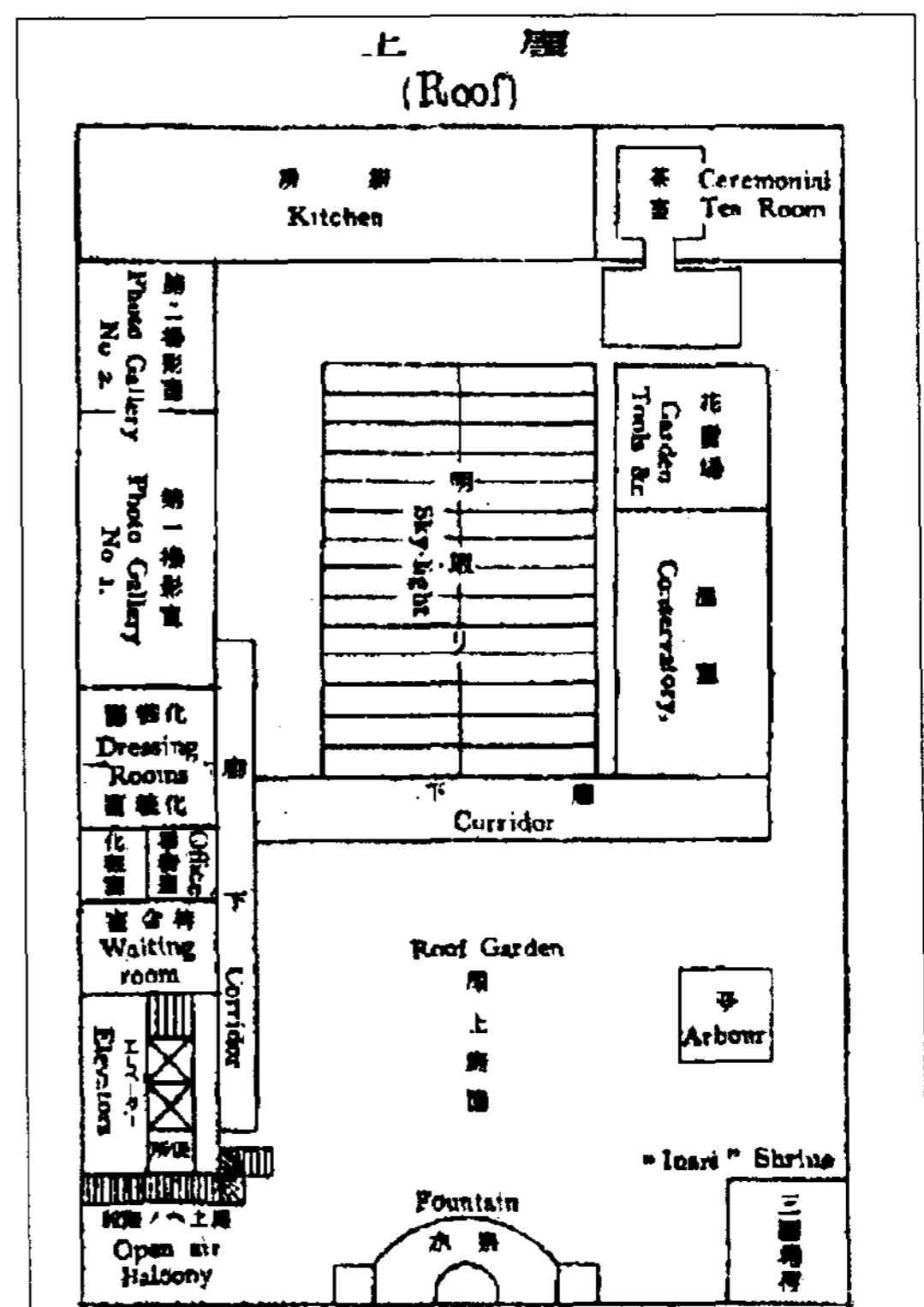


Figure 3. The plan view of the roof

The entire building, including the garden, was destroyed by fire in the Great Kanto Earthquake of September 1, Taisho 12(1923).

3) Third Stage

This covers the period Taisho 12(1923) to Showa 10 (1935). Although the building burned down in the earthquake disaster, the entire building was restored by Showa 2(1927), although it was not known whether the rooftop garden was also recovered during this time.

4) Fourth Stage

This cover the years Showa 10(1935) to Showa 20(1945). Extension repair was completed in Showa 10(1935). Even if seen from the ground, the extent of arboreal vegetation can be comprehended in a glance. The rooftop garden was at its maximum extent since its foundation. A pond, a flower bed, an arch, and an amusement center with a fountain were installed, and dozens of cherry trees were reportedly planted, inspiring the catchphrase 'going cherry blossom viewing by elevator'. From the photograph taken from the ground level, the garden appears as the forest on the roof.

5) Fifth Stage

Developments from Showa 20(1945). A large scale reduction of the garden under the influence of the partial delivery of a building under a war regime etc. In postwar photographs, although parts of garden remain, the arboreal vegetation seen from the ground was lost.

Additional changes in the rooftop garden of the Mitsukoshi Department Store followed. It appears that scale reductions were performed further, and it resulted in its disappearance soon after the fifth stage.

3. Akita Company

Upon completion in Taisho 4(1915), the Akita Company Building was the oldest ferro-concrete office structure in western Japan. Although it may be said that the rooftop garden of this building is the oldest in Japan, it is probably more correct to say that it is the oldest rooftop garden still in existence. In drawings at the time of completion, the roof is expressed only as a floor, thus raising the question of whether the garden was completed at the same time as the building, or whether it was completed at a later date. However, an

enlargement of a picture postcard published for the 10th anniversary of building completion exhibited in the hall of the Akita Company Building clearly show the rooftop garden, thus confirming that the garden existed by Taisho 14(1925). The garden was most likely completed 1~2 years after the building. The large stairs from the landing to the roof, which were usually positioned side-by-side in Meiji Era constructions, apparently facilitated the easy development of the garden. Although preservation state of this building is very good, the roof tearoom is now a dilapidated house.

An area thought to be unchanged since the initial construction was chosen and an excavation investigation was conducted. As a result, although the upper levels have not compacted but became tight, is similar to a natural earth surface, the lower layers are soft and the feel of artificial banking remains. The base composition is a monolayer structure, using the natural stone partition board and soil typically seen in early rooftop gardens. The soil used here is pit sand. Although it was appeared to be a completely uniform soil at first, the humus could be divided into two layers: an upper half with a large amount of humus and a strong black tint (A) and a lower half with little humus and a reddish tint (B). The separation of the soil into the A and B layers is thought to be due to humus piling up on the upper level by the deposition of years of fallen leaves. There is no drainage layer or drainage protection on the slab face. These features are common to early rooftop gardens.

III. Rooftop Gardens in Modern Japanese Culture

A book entitled 'Rooftop Garden' was published in Meiji 42



Figure 4. Akita Company rooftop garden

(1909). The publishers, Hakushuu Kitahara, Kinoshita Mokutarou and Hideo Nagata, known as the 'magnates of aestheticism', played an active part in late Meiji cultural developments. The book contained poetic works and a collection of dramas, and was hailed as 'the precious rare literature of the history of modern-style poetry' by the Meiji literary world. Hakushuu Kitahara, who chose the name, happened to have been inspired by the English words 'roof garden'. Since this was the time when the rooftop garden of the Kobe Oriental Hotel was completed, it is possible that these gardens were already a topic of conversation, thus influencing Kitahara's choice of title. It is also interesting to note that the word 'rooftop garden' may have been used as a popular cultural term of the time.

A collection of dramas entitled 'Rooftop Garden' was published by Kunio Kishida in November of Taisho 15(1926). Kunio Kishida, a literary man born in Tokyo (Yotsuya) in Meiji 23(1890), played an active part in the developments of the Taisho and Showa(1926~1989) eras, as an enthusiastic promoter of the theater. *Rooftop Garden* was supposedly staged the actual rooftop garden of a department store in the Ginza district of Tokyo at the end of the Taisho Era, and its opening scene depicts old school friends meeting unexpectedly on the roof of a certain department store. Kishida was thought to have based this dramatic setting on Mitsukoshi's rooftop garden to incorporate the spirit of innovation and novelty on

the stage, using the latest symbol of urban culture.

As these examples demonstrate, the rooftop gardens of the Taisho and Meiji eras symbolized the rise of a new urban Japanese culture that would soon supercede traditional garden culture. Although the Japanese garden has historically been a special construction reserved for the privileged and wealthy, the modern rooftop garden was widely available to the public. Thus, it could be said that the rooftop gardens of the early modern period functioned as a harbinger of a new era in the garden history of Japan, and are a feature which should be mentioned in studies of Japanese modernization.

References

1. Architectural Institute of Japan(1976) The collection of the history figures of modern architecture, Shokoku-sha, Tokyo, pp. 92-133.
2. Kishida, K.(1953) Rooftop garden, Sogen-sha, Tokyo, pp. 1-10.
3. Kitahara, K. *et al.*(1909) Rooftop garden Vol. 1, Rooftop Garden Publisher, Tokyo(Toujishobo Bookstore New Company, reproduced in 1979), pp. 1-32.
4. Mitsukoshi Corporation(1954) A history of Mitsukoshi, Mitsukoshi Corporation, Tokyo, pp. 1-78.
5. Tokyo Construction Industry Association Corporation(1989) Main building chronology(not for retail), Tokyo Construction Industry Association Corporation, Tokyo, pp. 9-15.
6. Yamada, H. *et al.*(2003) Progress of roof greening technology, Urban Green Tech No. 51, pp. 20-23.
7. Yamada, H.(2007) Photograph picture postcard collections published in Meiji, Taisho and early Showa Era.