REFLECTIONS ON URBAN, REGIONAL AND NATIONAL SPACE

Nishiyama Uzō, educated as an architect between 1930 and 1933, was a key figure in Japanese urban planning. He was a prolific writer who influenced a whole generation of Japanese urban planners and his interpretations of foreign planning and local practice still influence Japanese planning theory and practice today.

Nishiyama's first publications date to the 1930s, and his last ones appeared in the 1990s, spanning a period of enormous political and spatial changes. The three articles translated here, originally published in the 1940s in professional magazines, show how Nishiyama developed his theoretical models based on a social approach to architecture and planning, focusing on land use and land control rather than aesthetic preferences. They provide insight into Nishiyama's early thinking, his analysis of foreign examples, his reflection on large-scale regional and national spatial organization, and his architectural and urban visions, providing a remarkable and fascinating insight into the state of planning in Japan.

These texts call scholarly attention to the writing of a global planning history and invite the reader to engage with a major figure in planning who is largely unknown outside Japan; to reconsider Japanese planning history; and to work towards a truly global planning history. How does Nishiyama compare to the great urban planners of the past in the West, such as Patrick Geddes, Lewis Mumford, or Werner Hegemann? Many more translations will be necessary to answer this question.

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Three Essays
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REFLECTIONS ON URBAN, REGIONAL AND NATIONAL SPACE

Three Essays

Nishiyama Uzō
Introduction by Carola Hein

Translations by Norman Hu

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PREFACE AND ACKNOWLEDGMENT

I first encountered the works of Nishiyama Uzō in 1995. I had arrived in Japan to research the rebuilding of Japan after World War II, with a grant from the Japanese Ministry of Education (Mombusho); my advisor, Professor Ishida Yorifusa from Tokyo Metropolitan University, showed me several of Nishiyama's key publications. Nishiyama had unfortunately passed away a year earlier, but I was lucky to have access to his fascinating and extensive works. I have discussed Nishiyama's writings in several of my publications on rebuilding urban Japan. It would take a few more years until the opportunity arose to present the works themselves to a broader English-speaking audience. I am very grateful to Helen Meller and the staff of Routledge for the opportunity to introduce a selection of writings by Nishiyama through reprints and translations.

Funding from the Chair History of Architecture and Urban Planning at TU Delft made the translation of the essays possible. I am thankful to Norman Hu, who expertly translated the text, and to Laura Helper-Ferris, who edited the introduction. Various travel grants and funds (including from Kyoto Institute of Technology) have supported my research over the years. During my five-year stay in Japan, I was lucky to attend the opening of the Uzō Nishiyama Memorial Library. Since then, I have been repeatedly in touch with the staff of the Library and board members. I am very grateful to all of them for their kind support during the whole duration of the research. Special thanks go to Professor Nakabayashi Hiroshi from Kobe Shoin University, who supported me during a research stay in 2016 and provided comments on the introduction. The Uzō Nishiyama Memorial Library contains an enormous amount of rich material and I look forward to continuing my research and building upon the current volume.

Note: In keeping with Japanese custom, Japanese proper names appear in this volume with surname followed by the given or first name. Long vowels are indicated by macrons, but well-known place names, such as Tokyo, are written without macrons as is conventional in English.

Carola Hein, Delft, 01.02.2017

NISHIYAMA UZŌ

A Key Figure in Modern Japanese Planning History

Formal urban planning emerged in Japan almost simultaneously with planning practice in Europe and the United States. Japanese leaders carefully studied foreign developments in diverse fields, including law and design, and at different scales, from regional planning to architecture. Their findings, combined with traditional Japanese approaches, influenced urban planning practice in the Japanese islands and in the colonies.

Among the professionals who brought foreign planning concepts to Japan was Nishiyama Uzō (1911–1994). A key figure in Japanese planning debates in the 20th century, Nishiyama was active mostly from his home base in Kyoto, forming a counter-pole to Tokyo and its prominent debates. He spoke multiple languages and introduced foreign thought to Japan on multiple occasions, and his works highlight the position of Japan as a node in the global exchange of planning ideas. The difficulties of the Japanese language have prevented a broad recognition of his work beyond his home country, but his multiple contributions as translator of foreign practices, as educator, author, practitioner and activist deserve more attention.

Introduced by Carola Hein, this volume comprises three essays from *Chiiki Kūkan Ron* [*Reflections on Urban, Regional and National Space*], one of four books with collected works edited by Nishiyama in 1968, with English translations.

NISHIYAMA UZŌ

Leading Japanese Planner and Theorist

Carola Hein

Japanese planning emerged in the mid-19th century, at almost the same time as planning in Europe and America and in response to similar challenges. Yet the different groups of planners did not enter into a balanced exchange. Japanese practitioners and scholars observed foreign practices, commenting on them and occasionally integrating some aspects of them into their own work, while also carefully building on long-standing Japanese traditions of urban form, and testing their knowledge in colonial and post-colonial settings. In contrast, only a few foreign practitioners observed Japanese urban planning efforts, and most of them did so with the goal of proposing their own ideas for improvement—at least until after World War II. During the reconstruction period in the early 1950s, foreigners paid little attention to Japanese planning, whereas Japanese architects were part of the European and American modernist architectural scene, notably Tange Kenzo, who designed the Hiroshima Peace Memorial Centre and Park to commemorate the first atomic bombing of a city, and his immediate colleagues.[1]

By the 1960s, scholars were starting to write the first histories of planning, in Europe and America and also in Japan. Tracing the global exchange of ideas, non-Japanese scholars connected European with American, colonial, and post-colonial places. In particular, they sought to identify new planning paradigms. Japanese practice became part of this canon through the works of Tange, who had by then become the leading architect in Japan, commissioned to design numerous iconic structures, including two consecutive Tokyo City Hall buildings, the gymnasium and swimming pool for the 1964 Olympics in Tokyo, and the master plan for the 1970 World Expo in Osaka.[2] Foreign historians mostly considered Japanese urban planning to be a practice and a tradition almost entirely separate from their own. Their limited engagement with Japanese practice, culture, and language meant that their histories focused on architectural and design questions that were in line with Western practices. This focus on commonalities overshadowed attempts to understand Japanese planning history in its own right or specific geographical, regional, cultural, and historical context. Their partial reading of Japanese planning history impeded later scholars from fully integrating Japanese work into global planning history.

Other major figures of Japanese urban planning, particularly those who had made their marks through writing, remained all but unknown outside the island nation. Among them is the architect-planner, historian-theorist, humanist and avowed Marxist Nishiyama Uzō (1911–1994), who had collaborated with Tange on the master plan for the 1970 Osaka World Expo (Figure 1). Nishiyama made his contribution mainly through his teaching and his many writings rather than his few architectural works.[3] Though his writings and projects have only barely been studied either in Japan or outside of it, Nishiyama's reading and interpretation of planning practices—historical and contemporary, in Japan and internationally—influenced Japanese urban planning theory and practice. Notably through his writings, he connected Japanese practitioners to global debates, and his analysis of traditional Japanese urban structures and housing as well as his design proposals helped shape post-World War II Japanese planning. Nishiyama was also a keen observer of the changing Japanese built environment, making an enormous number of sketches, drawings, and photos (Figure 2).

The following discussion briefly introduces Nishiyama's life and work and then focuses on his urban ideas through the lens of the three articles and their translation that form the core of this book. These articles document Nishiyama's

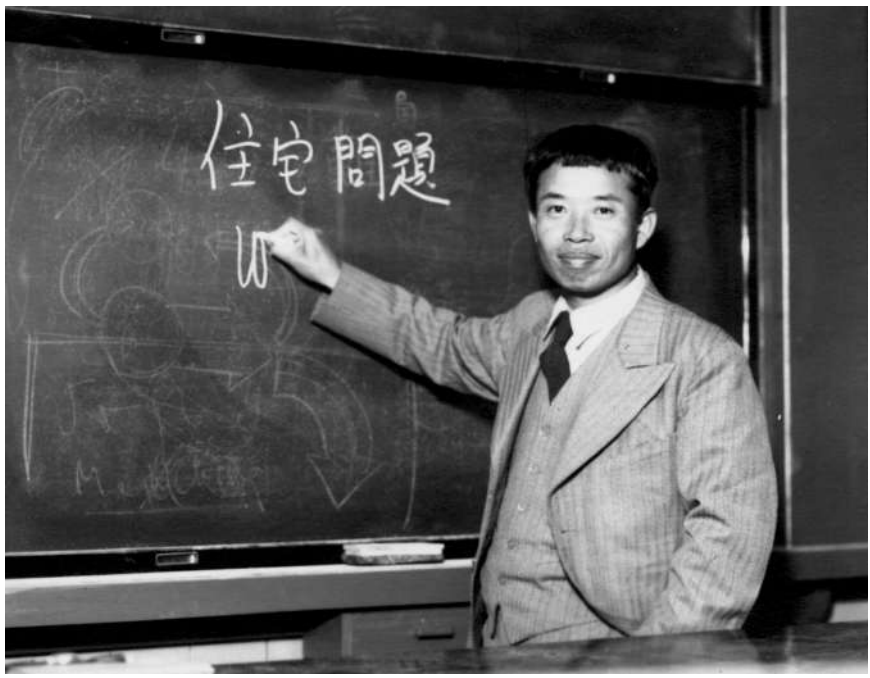


Figure 1 Nishiyama's main concern was housing. This photograph shows him as a young man, writing the term Jutaku Mondai ("Housing Problem") on a blackboard (Source: Uzō Nishiyama Memorial Library)

Figure 2 Nishiyama carefully observed the changing Japanese environment and left a large number of photographs as well as sketches. Here he is depicted in traditional Japanese dress with a camera in 1935 in Osaka (Source: Uzō Nishiyama Memorial Library)

particular approach to analysing planning history, international examples, and the specifics of the Japanese geography, topography, and urban form. This introduction places the three texts in the context of their time and examines them as a foundation of Nishiyama's later work, which is then discussed briefly. This introduction therewith takes a first step towards integrating his multiple contributions into Japanese and world urban planning history.

Nishiyama's first publications date to the 1930s, and his last ones appeared in the 1990s, spanning a period of enormous political and spatial changes. In the 1930s, when Nishiyama studied in Kyoto, Japan had its own approach to architecture and urbanism, no longer depending on direct interventions from foreigners. The country relied on its own architecture schools (the Imperial College of Engineering was founded in Tokyo in 1873) and developed expertise in urban planning. Professionals had been developing local planning practices at least since rebuilding after the 1923 Kanto earthquake. In particular, they established land readjustment (*kukakuseiri*), a technique creating continuous land parcels for development while sharing project costs among

landowners. This became the dominant Japanese planning technique, often called *the mother of Japanese planning*.[4] In this period, Japanese architects and planners partnered with Western colleagues.[5] For example, Ishikawa Hideaki, then an engineer in the Ministry of Home Affairs assigned to plan the town of Nagoya (and later the head planner of Tokyo before, during and after the war), consulted the British architect and town planner Raymond Unwin on his city's master plan during a 1923 trip to Europe. He went on to produce extensive writings that cited foreign thinkers.[6]

In the 1930s and 40s, Japanese planners continued to look to the West for inspiration, but they did not include any concept unconditionally. When Nishiyama graduated from the architecture department of Kyoto Imperial University in 1933, imperial practices guided urban planning on the mainland and in the Japanese colonies throughout Asia; occasionally Western plans found their way via Japanese planners into Manchuria and other Japanese colonies.[7] By the time he earned his PhD in 1947, the majority of Japanese cities lay in ruins and the country had become a constitutional monarchy. In Germany, similarly devastated, planning principles were associated with political ideology, so planners discarded or at least disavowed them in the post-war period. But Nishiyama, who had studied European practices of urban and large-scale regional planning—including in fascist Germany and Italy—was able to detach projects from their politics and use them in the post-war period.[8]

As professor at Kyoto University from 1961 to 1974 (and vice president of the Architecture Institute of Japan in 1959), Nishiyama influenced a whole generation of Japanese urban planners and actively participated in developing Japanese architecture and cities (Figure 3). That period saw important urban

Figure 3 Nishiyama as a honorary professor after retirement from Kyoto University (Source: Uzō Nishiyama Memorial Library)

changes: the reconstruction and high growth period of the 1950s and 1960s included urban extension and redevelopment; and the 1968 New City Planning Act rethought urban practice, aiming to direct rapid urban growth with control areas and promotion areas. His influence was particularly strong in Western Japan, the so-called Kansai area.[9] At the height of his career, in the late 1960s, major shifts were occurring in Japan: new towns were built and comprehensive national plans established, both themes that Nishiyama had discussed throughout his career.[10] This period coincided with the country's shift to community planning (*machizukuri*), in which he was an active player.

At this time, Nishiyama compiled his works into four volumes. The three articles translated here, originally published in the 1940s in professional magazines, were chapters 1, 9, and 10 of volume three of the compilation, entitled *Reflections on Urban, Regional and National Space* [*Chiiki Kūkan Ron*]. Each text (as all the articles included in the compilations) was briefly introduced by Nishiyama himself, placing it in its context of writing, identifying where it was published, and describing how it fitted into the arc of his thinking—this volume also includes those introductions. These articles have been chosen as an introduction to the early planning-related works of this major figure, whose work helped shape Japanese housing and planning in the 20th century, though they cannot do justice to his extensive works. These pre- and early post-war texts provide a foundation for understanding his career as well as the context of Japanese planning history beyond well-known figures such as Tange. (These texts precede the extensive urban changes of the later 20th century.) In particular, the three texts provide insights into Nishiyama's activity as a theorist, commentator, and translator of foreign practices and also as a visionary whose concepts were based on a comprehensive and long-term understanding of Japanese society and history.

The three texts are only a tiny section of one of the four thematic volumes, each of which was more than 600 pages long and included texts from the 1930s and several decades after. The four books speak to his core interests. He dedicated two volumes to themes in housing—housing planning (*Jūtaku keikaku*) and theory on housing (*Jūkyo ron*)—and one each to theories on urban, regional and national space (*Chiiki kūkan ron*) and architecture (*Kenchiku ron*).[11] As a compilation of original works, some of which were published in war-time architectural journals that are not readily available—sometimes even Nishiyama's own archives do not hold a copy—these books provide unique insight into his life achievement.

Before discussing the volume on urban, regional, and national space, and the articles chosen from it and translated in this volume, it is worthwhile to briefly describe the other volumes on housing and architecture. Throughout his life, Nishiyama maintained an abiding interest in the development of housing. Through abundant, detailed sketches of buildings and innovative analytical drawings and maps he created a careful analysis of Japan's changing housing types over the centuries.[12] His unique drawings offer detailed accounts

of neighborhoods, floorplans, sections, and construction details of traditional Japanese town houses, row houses, apartments, and mansions, in the large metropolises and villages alike. He also carefully examined changing lifestyles and everyday objects of traditional Japanese people from the earliest times of Japanese construction to post-war practices (Figures 4–7). As such, Nishiyama provided detailed and carefully documented insight into changing lifestyles, as through his drawings and photographs of traditional Japanese row houses, the *nagaya* (Figures 8–15).

Nishiyama also translated his findings from history into housing proposals for the future. Looking at the traditional separation of spaces in Japanese houses of hard surfaces (pounded earth) from those with soft ones (tatami), he argued for further dividing tatami rooms for sleeping from living/dining/kitchen areas (LDK) with wooden floors.[13] The new organization of housing led to characteristic post-war housing projects: *n*LDK apartments, with *n* indicating the number of bedrooms added to the core of Living and Dining-Kitchen[14] (Figure 16). Questions of aesthetics, the design and the scale of buildings, were also a key interest. But Nishiyama resisted the idea that architecture was an elitist medium and instead focused on its social aspects, particularly in the architectural magazine *DEZAM*. Humanist approaches were at the core of his practice, as is clear as early as a 1948 article, "The Architecture of Humanism."[15]

Figure 4 Photograph taken by Nishiyama in 1939 of traditional thatched roof housing in Nara's Horenchō (Source: Uzō Nishiyama Memorial Library)

Figure 5 Drawing by Nishiyama of the interior of a traditional *machiya* townhouse in Kyoto in 1936 showing the narrow and deep corridor used for multiple purposes including as kitchen, and providing access to the rooms (Source: Uzō Nishiyama Memorial Library)

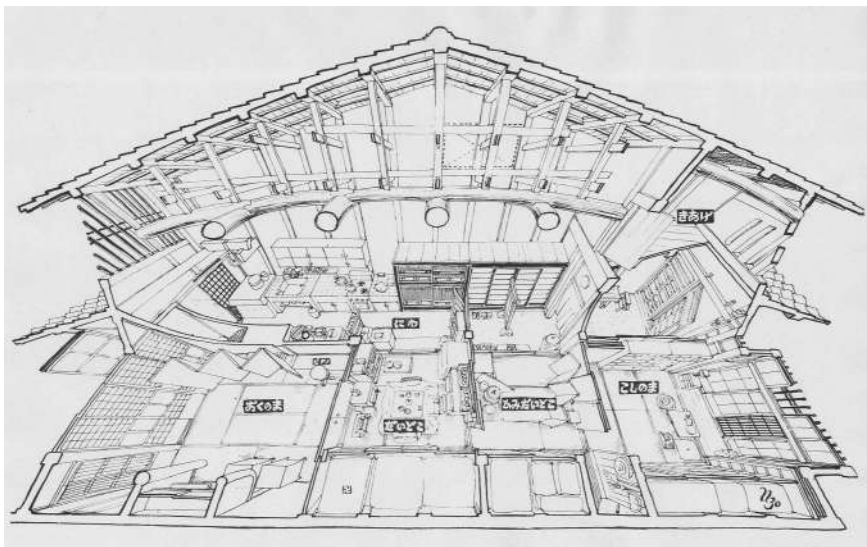


Figure 6 Nishiyama's innovative depiction of a traditional Japanese house from above, depicting both the architectural structure as well as the use of the various spaces. Transforming lifestyles are captured through the presence of a piano in the room at the lower left (Source: Uzō Nishiyama Memorial Library)

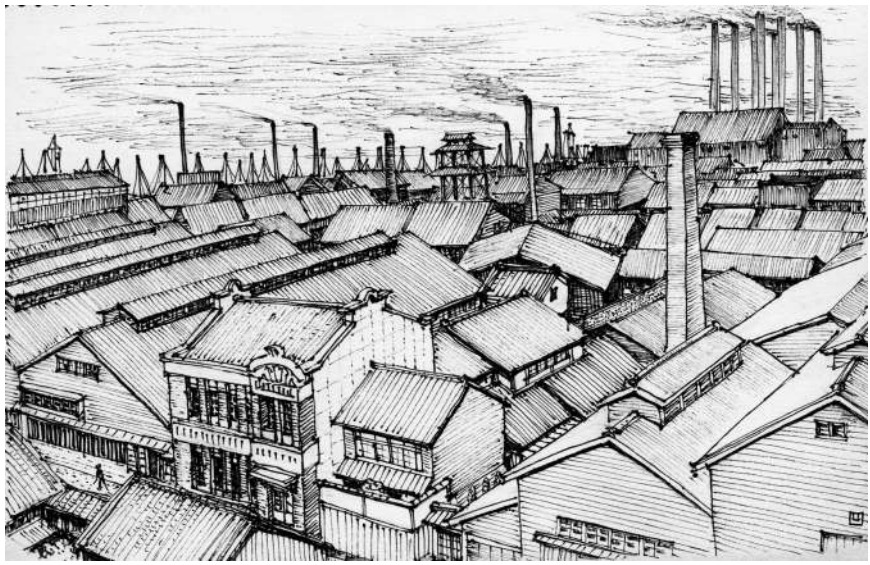


Figure 7 Nishiyama's sketch of industrializing Osaka shows numerous chimneys over the traditionally horizontal pre-war city, including his father's iron work factory extended in 1919. The European-style house in the front was their residence (Source: Uzō Nishiyama Memorial Library)

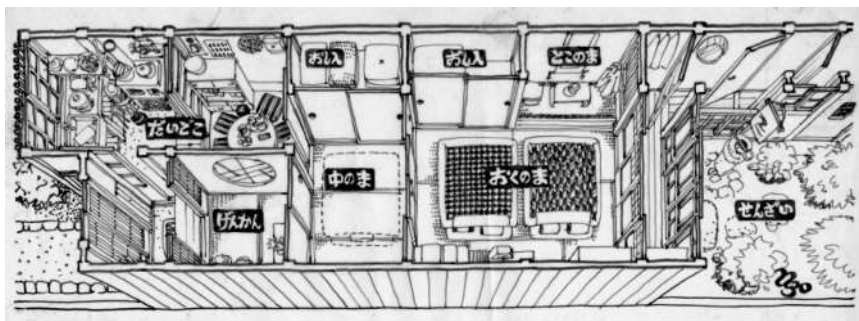


Figure 8 Depiction of the interior of a traditional row house (*nagaya*) in Osaka (Higashi Noda) and the use of its rooms drawn by Nishiyama before the war (Source: Uzō Nishiyama Memorial Library)

Figure 9 Photo of a pre-war row house lane in Osaka (Higashi Noda) taken in 1936 by Nishiyama (Source: Uzō Nishiyama Memorial Library)

Figure 10 Photo of then recently built row houses in Osaka's Sumiyoshi ward (Kagaya) taken in 1935 by Nishiyama (Source: Uzō Nishiyama Memorial Library)

Figure 11 Photo taken in 1936 of the rear side of row house lanes (back alley) in Osaka's Nishikujo area by Nishiyama (Source: Uzō Nishiyama Memorial Library)

The three texts translated here have been selected as bridges that provide insight into multiple topics, including Japanese knowledge and appropriation of foreign urban practice. These texts document continuity in urban theory without the ideological characteristics typical of German and other post-war reconstruction. They also reveal the famous post-war works of Tange Kenzo and his colleagues as only one element of the Japanese urban planning debate.

While Nishiyama's introductions to these pieces acknowledged the war and post-war context of these writings, he, surprisingly, did not address the war as a political issue. While personally he took a clear anti-capitalist stance, he also accepted the contemporary situation of uncontrolled urban development that contradicted his ideals and was ready to foreground a pragmatic attitude.

Text 1: Perspectives on Urban and Regional Planning Internationally: Chapter 1: The Base of Life

Nishiyama spoke several languages, including German and Russian. Like other Japanese planners, he carefully analysed and critiqued foreign ideas. This knowledge allowed him to engage with practices that were both within and outside the canon of Western planning. His observations on the applicability of these practices in Japan are of particular interest. In contrast to standard Western histories, which focused on aesthetic or stylistic principles such as modernism, Nishiyama classified foreign concepts along the lines of capitalist

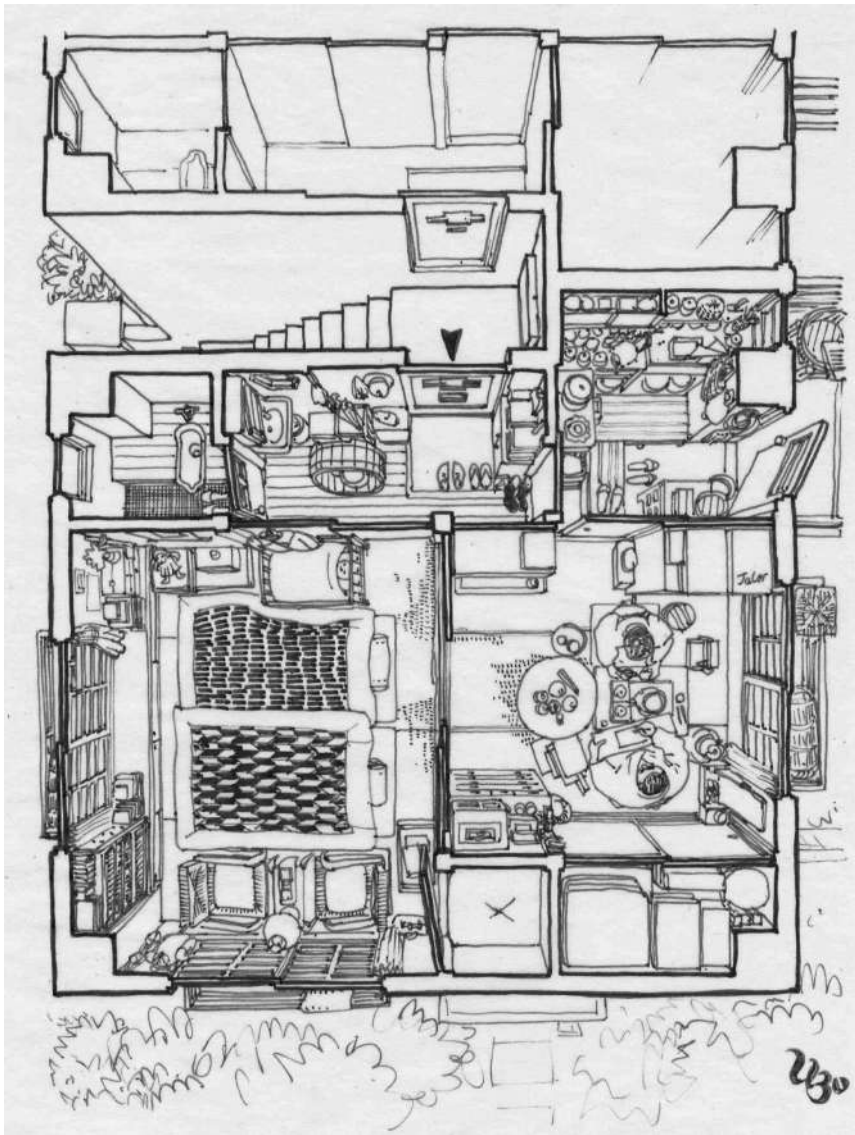


Figure 12 Floor plan of an apartment in the Daikanyama Dojunkai housing complex in Tokyo where Nishiyama's family lived in 1942. This housing complex was erected after the 1923 Great Kanto earthquake that destroyed large parts of Tokyo and Yokohama. (Source: Uzō Nishiyama Memorial Library)

Figure 13 Drawing by Nishiyama of his cluttered architect's workspace in 1942 where he tried to design buildings, but an accident happened… (Source: Uzō Nishiyama Memorial Library)

Figure 14 Photo of Nishiyama eating with his wife at a traditional Japanese low table (with coals) in 1941, at his apartment in the Daikanyama Dojunkai housing complex (Source: Uzō Nishiyama Memorial Library)

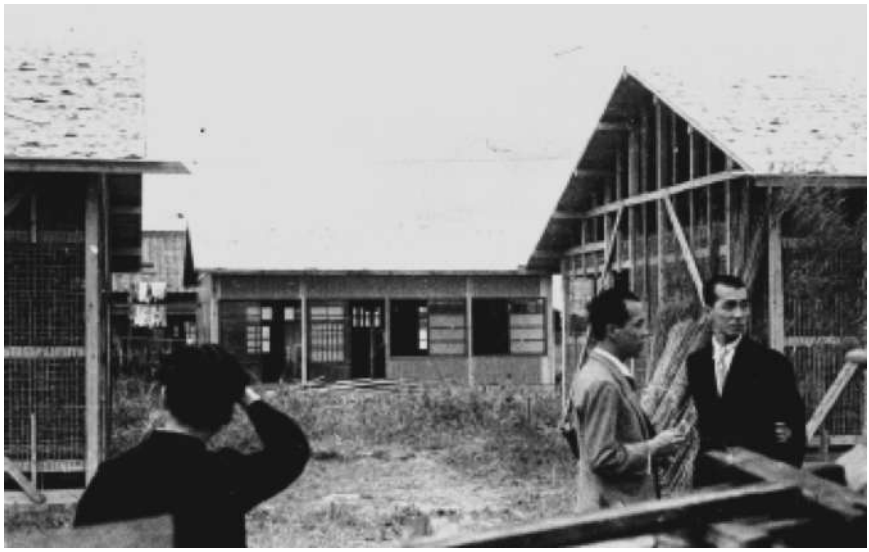


Figure 15 Nishiyama's plans for mass produced housing couldn't be implemented; he left the housing corporation (Eidan) and returned to Kyoto University in 1942 (Source: Uzō Nishiyama Memorial Library)

versus socialist. He introduced Japanese academics and practitioners to foreign ideas with these texts, and infused his own interpretations into the writing of planning history. These texts exemplify a distinctively Japanese perspective on European, American, and global developments and record Japanese planners' extensive knowledge of foreign practices.

The first text reprinted here, "Seikatsu kichi no kōzō"[16] [The structure of the base of life],[17] sets the foundation for Nishiyama's urban thinking and reflections and demonstrates the close relationships that he saw between society and housing and between housing and urban planning. When Nishiyama wrote the original text, he was examining the problem of the big city as a locale for a largescale, modern, concentrated workforce, trying to find a new organizational form for the Japanese city. The text explores the organization of cities through urban units that cater to specific needs of the population in terms of work, housing, education, culture, and transportation, hence the title "The Base of Life."

Driven by his desire to connect work and life, Nishiyama argued that the structural elements of the city, conceptualized as life spheres or life units, should be organized around elementary schools and workplaces, as argued by many other planners. They needed to be carefully organized, separated by green areas, and connected by transportation. He thus affirmed the organization of cities in small units. The text originally appeared in *Kenchikugaku Kenkyū* [Research on Architecture] in 1942. Introducing the text in the 1968 compilation, Nishiyama acknowledged the original context of the text, to

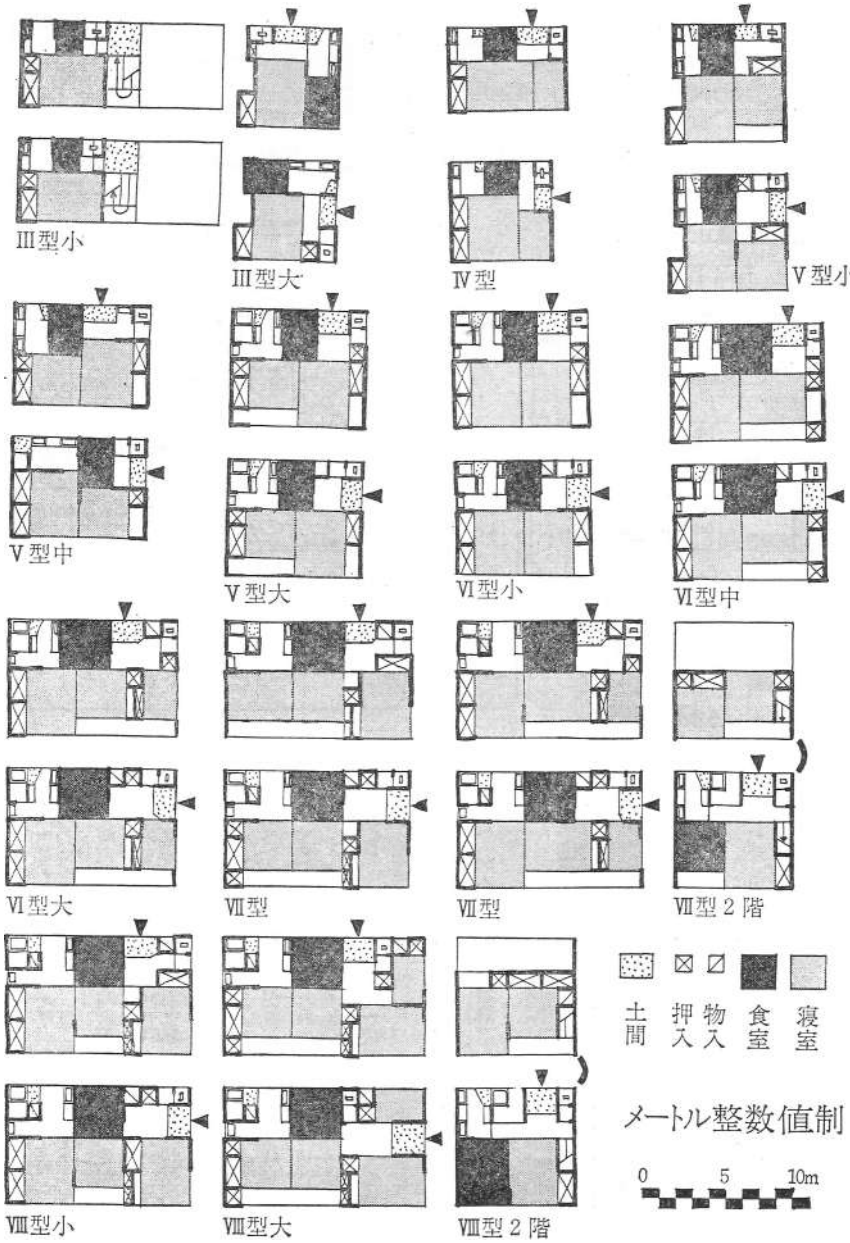


Figure 16 Apartment floor plans for mass-produced housing with depiction of tatami rooms and other spaces, drawing by Nishiyama (Source: Uzō Nishiyama Memorial Library)

explain the then-typical references to Japanese aspirations of leadership in Asia, and assessments of the needs of wartime defense. But Nishiyama did not either reference the politics of Imperial Japan, or distance himself from it; instead, he focused primarily on cities and society as a modern challenge.

The article speaks to the ways in which Nishiyama served as an interpreter of foreign concepts for Japanese practice. It also demonstrates his critical distance from foreign practices. Nishiyama's goal was a qualitative reform of cities for an industrialized society, with a new social life. He rejected what he perceived as purely aesthetic or economic choices and social concerns and instead argued for rethinking the modern metropolis and its capitalist and chaotic form. This approach and his own political affiliation could have led him to embrace urban planning ideas applied in the Soviet Union. But while Nishiyama explored and discussed those ideas throughout the article, he chose yet another perspective: taking up the contemporary idea of a necessary, legally proscribed space that provides all the functions of daily life, he proposed a *life space*, the life units mentioned above, and argued that it would engage traditional Japanese practices (samsara, meaning "the circle of life") and leading ideas of contemporary urban planning.

Nishiyama also presented and critiqued plans by Ebenezer Howard, Le Corbusier and Ludwig Hilberseimer in capitalist Britain, France, and Germany, discarding them for simply reorganizing the city without solving the density problem and for merely transposing capitalist American cities into Europe, more on aesthetic grounds than in response to social needs. Plans by the Soviet planner Milyutin for a linear city, in contrast, appeared to him conceptually as an attempt to build a "comprehensive whole," but he did not agree with its separation of work and home. Nishiyama remained unsatisfied with many foreign proposals, and instead searched for a way to make city life meaningful as a whole in both new and existing cities. He thus promoted proposals by the Nazi-era planner Gottfried Feder. His book *The New City* (*Die Neue Stadt*) was published in 1939 and six months later was already on the shelves of the administrative library of Tokyo, showing the rapidity of intellectual exchange at the time.[18]

Feder's book was based on a lengthy survey of cities, including Anglo-Saxon concepts. His suggestion of urban units for 20,000 inhabitants, divided in nine autonomous units and surrounded by agricultural areas, appealed particularly to Nishiyama. He built upon this concept and translated it to the Japanese national scale, proposing units of medium-sized cities of 100,000 (or between 50 and 100,000 people), an idea he developed further in his essay on national structure—the second article here. Nishiyama was attempting to build upon traditional urban form and to develop a theory that was more applicable and more organized than Ebenezer Howard's proposal for garden cities. Ignoring the political context and Nazi ideology of Feder's original introduction, he saw it as a manual for making cities. Since many of the other planners did not read the original texts, the analysis of international examples made by Nishiyama, and a handful of other scholars, was essential. Many other planners drew on his history of urban form and planning as a tool for teaching planning as a discipline and

training future planners. Rejected in post-war Germany for the author's association with the Nazi Party, Feder's urban concepts would become a standard reference in textbooks on planning history for decades to come in Japan.[19]

Text 2: Reflections on the Urbanization of Postwar Japan: Chapter 9: An Essay on the National Structure

Nishiyama's proposal for planned urban space accompanied a concept for national urbanization that he published after the war, in June 1946, when Japanese cities were still in ruins. Originally entitled "Atarashiki kokudo kensetsu" [The new national construction], it appeared in June 1946 in *Shin Kenchiku* as the second in a series of three commentaries. Nishiyama believed that national planning ought to create the foundation for controlled development with an eye to long-term viability. Other colleagues agreed; their opinions differed as to how this should be done. In "Constructing the City for the Empire" [*Kōkoku toshi no kensetsu*], his colleague, Ishikawa, the head of Tokyo capital city planning, proposed a decentralization of the capital. In contrast to Ishikawa, Nishiyama did not criticize the big city itself. Engaging Ishikawa's argument for decentralization, Nishiyama argued that his approach was not feasible given the limited Japanese buildable space, notably in the Kanto area (the Eastern part of the Honshu island around Tokyo). Nishiyama also argued that a decentralization of capital city functions, discussed in Japan over decades, would not work, as corporations and other functions would follow them into their new spaces.

Continuing his point from Chapter 1, reprinted here, Nishiyama argued for maintaining mega-cities. Moreover, he proposed that such cities be planned rather than left to capitalist development. Specifically, he built upon historical practices of Japanese cities and contemporary urban theory, including the ideas of the German geographer Walter Christaller, to propose an organized distribution of cities throughout the Japanese mainland. Christaller, whose writings were first introduced in Japan in the 1930s, analysed urban services in regional contexts. He developed a theory about the distribution, number, size, and location of specific urban functions (such as housing, working, education, leisure) that planners could use in locating and planning new cities. Such an organization of cities into basic life units was in line with the historic development of Tokyo, or Edo as the city used to be called. One of the largest cities in history, Edo had historically housed up to 1 million inhabitants, traditionally organized in different neighborhoods and wards.[20]

In Chapter 9, the second article presented here, Nishiyama outlined an organization close to Western concepts of zoning: most of the city would be a network of small monofunctional urban units (industrial, cultural, and harbor facilities) located along major lines of transportation, principally railway lines, and separated from other urban areas by green strips. Exclusively residential districts were located at a larger distance, themselves centers for surrounding villages. Nishiyama's plan reserved the city center for administrative, economic, financial and commercial central functions. According to him, cities and particularly megacities had to have

a working city center. (This is a surprising statement, as Japanese cities did not traditionally have a center—in Tokyo, the center was the shogunal palace that was not accessible to the public—and also the idea of the center was an aspect that Western modernists had largely ignored in the pre-war era.)

Nishiyama calculated distances between the different units in temporal terms, not the spatial terms that Ishikawa used. Distances between large cities of between 100 and 500 kilometers could be traveled by high speed trains and planes, whereas highways and trains connected smaller cities over distances of between 30 and 50 kilometers for the same length of time. Ordinary streets and trains led to villages, and it took a person about an hour to travel 20 kilometers. Even the villages, however, should be at a maximum traveling time of three hours from the capital.

Nishiyama also allocated room for recreational leisure and vacations (fig. 73), a universal demand in an urbanized world. The notion of day-trips gets a new meaning here. What was originally conceived as a way to organize trips to work, now provided structures to facilitate times on and off work. Nishiyama argued that, with the possibility of day trips anywhere in Japan, the capital should expand rather than remain small, while the urban units separated by green belts, the life units, would ensure that nature would be embedded in the metropolis. (For Nishiyama, the green zones were furthermore an important element in guaranteeing the urban food supply.) The idea of day trips from the capital to any place in the country is virtually a reality today. It has effectively led to further concentration, even though some had argued it could help to promote decentralization.[21]

Nishiyama thus tried to maintain the multifunctionality of big cities while making them more liveable. He stressed the need for balanced growth with an appropriate number of workplaces, welfare facilities, and the like, in order to prevent sprawl.[22] Nishiyama was keenly aware that cities would not be able to grow endlessly. He essentially proposed to urbanize national space, and to structure the various scales of settlements, from rural populations in hamlets to regional hubs to mega-cities. He imagined mega-cities of 7.5 million with appropriate green spaces, or 18.7 million at 100 people per hectare.[23] Nishiyama correctly assessed the fact that the Tokyo area would grow, although he under-estimated its population growth and over-estimated the density: In 2016, the Tokyo Metropolis was about 13.6 million people with a density 6,158 people per square kilometer, while the larger metropolitan area stood at approximately 37 million inhabitants and 2,662 people per square kilometer (thus approximately 62 or 26 per hectare).[24] His predictions were based on a peak population of about 122 million, which is close to Japan's population of 126 million today.[25]

Nishiyama acknowledges (in his introduction) that some of the key features of his plan, particularly the organization of life units, were not realized after the war, mostly due to what he identified as capitalist tendencies for agglomeration that did not necessarily acknowledge the everyday needs of citizens.[26] He knew that his plans had become outdated, but insisted that the need for planning remained.

Nishiyama's arguments are today of renewed importance. While his experience was intimately related to the food deficiency of post-World War II, his argument also relates to ongoing debates on sustainability, autonomous cities, and circular economies, demonstrating the importance of reflecting on the past for future practice.

Text 3: Visionary Planning: Chapter 10: Mountain Cities

Nishiyama took a very pragmatic approach to urban change. From the beginning, his reading of the past was oriented towards the future of the city and its design at all scales. He was also one of the rare Japanese planners to reflect on the term *vision*. In his text "Bijon kara kōsō keikaku e" (From vision to conceptual plan), he pointed out that the Japanese word for vision, *bijon*, has often been used as a catch phrase and needs to be analysed with care.[27] A beautiful presentation called a vision, aimed at making people dream, he wrote, was often based on lies or inaccuracies and even sought to hide the real intentions of its authors or the negative impacts of a project. Futuristic visions lacked concrete directions for realization and a basic set of human values to orient them. Nishiyama cited the "vision" of motorization that brought cars to Japan, which did not separate traffic functions or have an appropriate street network, and where people simply used traditional roads that before had been also a place for community activities. Streets were another room to play and to meet, like an extension of the home. But no one discussed the negative effects of car traffic: noise, air pollution, the need for parking spaces, etc. In spite of this negative take on the word *bijon*, Nishiyama strongly recommended that planners develop a vision mapping out basic principles and giving an overall aim to individual initiatives.

Nishiyama's ideas overlapped but also differed from those of Tange Kenzo. Both architect planners were from the same generation, with Tange being only two years younger than Nishiyama. Their careers coincided on several occasions. In 1942, Nishiyama, like Tange, entered the competition for a monument for the Japanese imperialist area of control, the so-called Greater East Asia Co-Prosperity Sphere. The remit of the competition gave participants four sites to choose from. In contrast to Tange, whose project for a location close to Mount Fuji is better known, Nishiyama situated his proposal in Asuka, in Nara Prefecture in Western Japan, where he was based. Nishiyama's approach to this topic differed from that of the other competitors. Whereas the competition title seemed to call for a monument, Nishiyama proposed a new city closely connected with a nearby village. He created a kind of permanent Olympic village, sketching out a meeting and festival capital offering cultural and sports facilities for all the different people who had come under Japanese authority. Nishiyama's proposal thus already hinted at the urban organization he was proposing. The proposal may also have reflected his simultaneous study of plazas of ancient Greece and Rome.[28] The design he proposed for the Greater East Asia Co-Prosperity Sphere combined

monumental and modern elements, with a compact infrastructure connected by green routes, an organization that connects to that of the life units he proposed.[29]

In later years, both Tange and Nishiyama aimed to solve the same problem: overpopulation on the limited land of Japan. Nishiyama addressed the problem through strategic planning, Tange through technology. In 1946, reacting to the real and the planned increase in inhabitants as well as the hardship and the need for food after World War II, and based on the idea of self-reliance in food production, Nishiyama argued that further land was needed for cultivation. At a time when people were barely surviving, he raised the question of the relationship between population and land availability. Conscious of the need for space, Nishiyama argued for a careful use of arable land, which, notably during the war, had been used for defensive and other military purposes. Specifically, he proposed building cities on mountainsides (which comprised ¾ of Japanese territory), keeping the plains free for agriculture.[30]

Nishiyama's proposal, "*Sangaku toshi*" or "Mountain Cities," reprinted here, built on the preceding concept of the organization of national space. It emerged out of a radio contribution, "Broadcast on 'Our Words'"—*Watashitachi no kotoba*—on the morning of December 9, 1945. Nishiyama had earlier called for large-scale national land reform, which was partly attempted after the war but not in the direction that Nishiyama considered.[31] Nishiyama argued that some 20 new cities for 50,000 inhabitants could be created each year. After demonstrating that inclined skyscrapers allow for better insulation of neighboring houses, he proposed erecting high-rise buildings on south-facing slopes. Nishiyama thought that landscape preservation was less important than feeding people. For all their problematic elements, these proposals are an important example of individual ideas made public for discussion and thus starting points for reimagining Japanese cities.

Again, Nishiyama's writings are relevant to current debates on sustainability and circular energy. He wrote: "In other words, we must manage our residential sphere on the surface of the earth where the land meets the sky, but transform this contact area into a three-dimensional, optimally rich environment; without wastage, use all the blessings provided from the sky (especially the emission of solar energy) and natural resources from the ground; and create the best residential configuration on the earth's surface."[32]

Nishiyama and Post-war Development in Japan

In the post-war period Nishiyama continued to observe changes in housing and urban space. He also added his own voice and observations to changing modern living, from the post-war temporary living in old train cars to low- and high-rise modern housing. His observations on tatami living and the need to separate different functions within the house—already spelled out in 1942— are yet another indication of the continuity of his thinking since the 1940s and the impact of his work on Japanese housing. The projects for high-rise housing with tatami equipped apartments illustrate the changing Japanese lifestyle (Figures 17–22).

Figure 17 Photo of war-destroyed Kobe taken by Nishiyama in 1945 (Source: Uzō Nishiyama Memorial Library)

Figure 18 Emergency post-war housing in former railway carriages (so-called streetcar housing) for fatherless families in Fushimi, Kyoto (1957) in a picture taken by Nishiyama (Source: Uzō Nishiyama Memorial Library)

Figure 19 Rows of newly built low-rise public postwar housing on the site of a former military base in North Himeji in 1955 (Source: Uzō Nishiyama Memorial Library)

Figure 20 Municipal apartment housing in Osaka in 1956 (Source: Uzō Nishiyama Memorial Library)

Figure 21 Drawing of a post-war apartment high-rise in Tokyo by Nishiyama in 1971 and published in his three-volume series on housing in Japan (Nihon no Sumai) (Source: Uzō Nishiyama Memorial Library)

The 1960s were a crucial period, when Japan became a key player on the global stage in general and in urban planning in particular. Major international events—the 1964 Olympics and the 1970 Osaka World Expo—were firsts in Asia, and they played a major role in putting Japan on the world stage of planning and architecture. Indeed, these texts set the stage for debates in the post-war years. The close connection between Nishiyama's theories, reflections, and historical studies of the pre-war/war period and the plans and visions of the 1960s is visible in the publication of the material after the war. The principles that he developed in these early years—on national planning, spatial distribution, careful organization of cities, control of sprawl/spread—would become the foundation for his proposals in the 1960s and 70s. Conceptual references to urban structure in separate units that cater to everyday demands, surrounded by green areas that also serve for food production or the

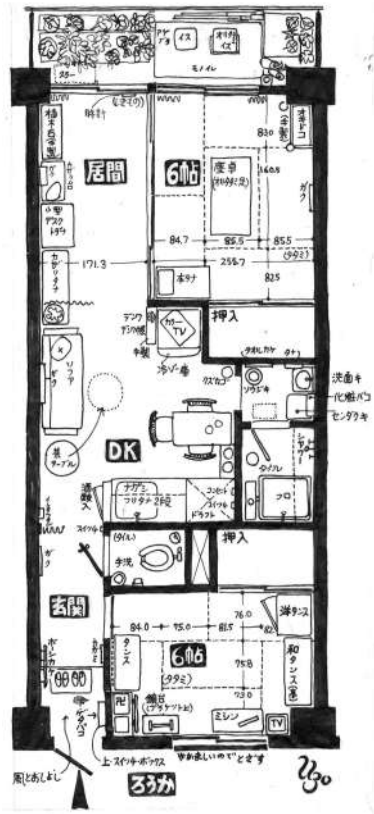


Figure 22 Drawing of the floor plan of a post-war high-rise apartment (47m^2) that belonged to Nishiyama's friend K in 1967, featuring two tatami rooms and the use of each space, published in his series on housing in Japan (Source: Uzō Nishiyama Memorial Library)

development of urban cores, were largely already defined in the 1940s and continued to shape his work in the 1960s. This continuity is also visible in his terminology. The term "kombinaato," an industrial complex, appears in his writings of the 1940s and then again in his plans for Osaka Expo '70.

The 1960s were an important decade for Nishiyama. He was involved as an advisor in national projects, including since 1963 in the master planning for the Osaka Expo '70; his urban design project for Kyoto, featuring a high-rise axis through the center of the ancient city, published in 1965, created a lot of controversy.[33] Nishiyama continued to work on visionary proposals, following up on his theoretical analysis. He continued to argue for a specifically Japanese approach that took into account the particularities of hilly geography and population increase. Together with his students he therefore launched the

concept of "Image Planning" (*Kōsō Keikaku*) and suggested a model core of a future city at the Tokyo World Design Conference in 1960.[34] His goal in these visionary proposals was to show the contradictions in urban living space, including potentially negative features or what he termed "inferno."[35] In his desire to respond to the particular needs of the Japanese cities, he also proposed "*Iepolis*" (Home City),[36] a city limited to pedestrian traffic and mechanized public transportation. The car had to stay on the outskirts, reflecting Nishiyama's way of meeting modern needs while maintaining housing traditions, such as the practice of inhabitants and visitors removing their shoes on entering from outside.

Both proposals, Image Planning and Home City, thus build upon the traditional structure of Japanese cities, and on the concept of a network of compact cities with central cores and market places. Both concepts were at the heart of his 1965 integrated plan for Kyoto, consisting of an analysis of the current conditions of the former Japanese capital and a proposal for an extension (Figure 23).[37] Land control, including the division of land into autonomous units and the construction of a central plaza, as he had proposed in the 1940s, was another key feature of his plans. He suggested a skyscraper axis in the ancient city that

Figure 23 Nishiyama with members from his research group discussing a model of the Kyoto axis plan (Source: Uzō Nishiyama Memorial Library)

strangely echoes Le Corbusier's proposal for a city of 3 million inhabitants, the Cité Voisin, to be built over the center of Paris, destroying a central North–South area of the existing urban structure. As such, it surprisingly contrasted with Nishiyama's earlier negative assessment of Le Corbusier's work and other aspects of his own writings while also incorporating his notion of displaying "inferno" to the masses.[38] The Kyoto plan perhaps also showed that Nishiyama's strength lay more in planning and analysis than architectural design.

Both Nishiyama and Tange aimed to translate their assessment and solutions for Japan's urban growth problems into architectural and urban designs, and Nishiyama's project was specifically set up as a counterpart to Tange's Tokyo Bay plan. Nishiyama had anticipated the transformations that would occur if motorized traffic entered the city. His proposal is thus a consequent continuation of both the opportunities and dangers of motorization. Nishiyama's vision appears more destructive than Tange's as it involved the oldest and most traditional city and one of the very few ones that was not destroyed in the war, and it received extensive critiques. Tange's vision for Tokyo, which had seen major destruction twice in the 20th century, first through the 1923 earthquake and then again through the bombings of 1945, had projected his internationally known 1960 megastructure onto the water of Tokyo Bay without touching the remnants of Tokyo, and as such continued to inspire visionaries worldwide.

Nishiyama continued to focus on the development of urban centers, the topic that also led to Tange's post-war fame. In the 1960s, as Japan aimed to bring international events to its homeland, opportunities arose for large scale planning. The Tokyo Olympics brought the country a lot of attention, and also public funding for the capital. The Osaka area, a long-time second in receiving funding, pleaded for the second big event, the Expo. Osaka '70 was a unique opportunity for intellectuals from the Kansai area to engage the public sector and to counter the prominence of the Tokyo group (Figure 24). As Andrea Urushima has shown, Nishiyama proposed to make the Osaka site a model city core, and suggested erecting buildings that could be used after the event as the heart of a new city area.[39] This was a unique opportunity to invest public money into urban construction as Nishiyama had been advocating, and the ultimate confirmation of the ideas he had elaborated in the 1940s. Nonetheless, the final exhibition project was built by Tange Kenzo. Instead of Nishiyama's organized construction, the country saw urban sprawl of a haphazard nature, and the large-scale projects that he could have led were largely assigned to and identified with the work of Tange.[40]

Nishiyama's intervention in favor of the neighborhood, *machi*, was not a direct reaction to wartime destruction; it transcended this period and had a strong influence on *machizukuri*, the movement for neighborhood or community planning, which includes social as much as physical aspects. As Nishiyama had pointed out earlier, there is a special quality to the neighborhood, its social and functional diversity, and its meaning for the Japanese in terms of identity that is distinctive of the traditional *machi*. *Machizukuri,* as local participation in

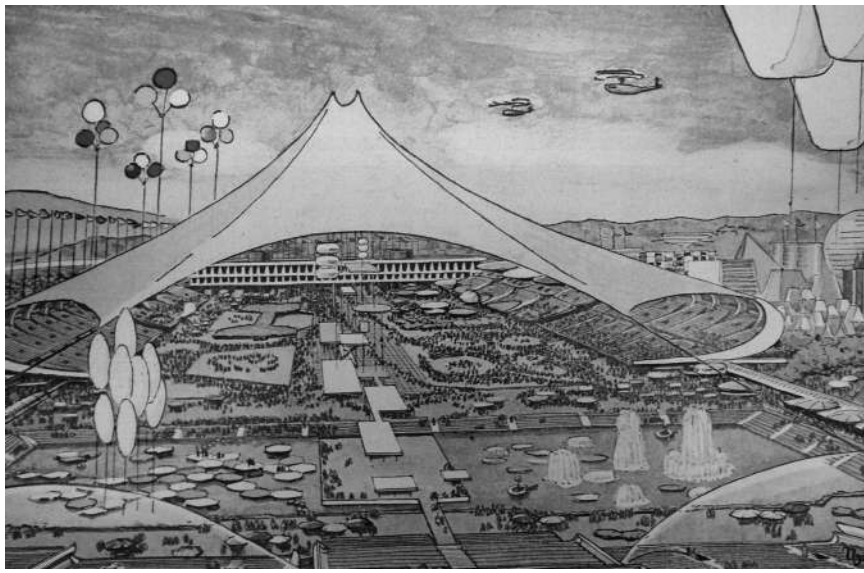


Figure 24 Nishiyama's proposal for the festival square (Omatsuri Hiroba) for the 1970 Osaka World Expo published in the Japanese newspaper *Asahi Shimbun* on 1.1. 1967 Showa 42 (Source: Uzō Nishiyama Memorial Library)

decision-making or small-scale urban amelioration programs, was a first step towards a more humanized planning. It does not, however, replace Nishiyama's central project: a comprehensive vision based not only on economic concepts but on a set of social and political ideas for a balanced society.

In later years, Nishiyama remained engaged with planning practice and pragmatically adapted his writing, shifting from a top-down planning approach focused on national policies to a more bottom-up one. His disappointment with urban planning practice characterized by proximity between government officials and the construction sector led him to support grass-roots initiatives. Over time, he came to support movements against high-rise construction and expressways and for the preservation of traditional houses in both urban and rural contexts. As Nakabayashi Hiroshi has emphasized, Nishiyama's reflections on urban and regional planning were published in 1968, but he continued to work into the 1990s and that period needs further research.[41] In particular, his role in pushing for the preservation of historic Japanese cities through the *Santo Shimin* Forum (Nara, Kyoto, and Kamakura residents planning movement) deserves further investigation.

The three texts translated and reproduced here are evidence of transnational and cross-cultural exchanges in conjunction with local practices and the potential role of an individual in such dialogues.[42] They demonstrate how ideas can cross a border and stay there, even if conditions in its original home change. Thus, while ideas were exchanged in the Nazi period, when the two

countries fought on the same side, only one interlocutor, the Germans, discarded these approaches after the war. They also show how global history can be written in very different ways, depending on the viewpoint of the author: Nishiyama compiled and analysed different practices from the US to the Soviet Union, Europe, and Japan. Furthermore, these texts call scholarly attention to the writing of a global planning history and the need to assess the role of major characters not only through the lens of originally translated publications—such as those of Tange—but also with an eye to the translation of works in the local language, in this case in Japanese. These three early works of Nishiyama thus invite the reader to engage with a major figure in planning who is largely unknown outside Japan; to reconsider Japanese planning history; and to work towards a truly global planning history.

Notes

1 Carola Hein, "Idioms of Japanese Planning Historiography," in *Planning History Handbook*, ed. Carola Hein (New York, London: Routledge, 2017).
2 Tange Kenzo and Udo Kultermann, *Kenzo Tange, 1946–1969; Architecture and Urban Design* (New York: Praeger Publishers, 1970); Seng Kuan and Yukio Lippit, eds., *Kenzo Tange. Architecture for the World* (Lars Müller Publishers, 2012); Zhongjie Lin, *Kenzo Tange and the Metabolist Movement: Urban Utopias of Modern Japan* (London, New York: Routledge, 2010).
3 The Uzō Nishiyama Memorial Library holds the archives of Nishiyama. For an overview see: Uzō Nishiyama Memorial Library, ed. *Nishiyama Uzō to Sono Jidai* [Uzō-Nishiyama and His Time] (2000). For reflections on his work see: Shōji Sumita and Nishiyama Uzō Kinen Sumai Machizukuri Bunko, eds., *Nishiyama Uzō no jūtaku, toshiron: sono gendaiteki kenshō* [Nishiyama Uzō's Reflections on Housing and Cities: A contemporary verification] (Tokyo: Nihon Keizai Hyōronsha, 2008).
4 Yasuo Nishiyama, *Japanese Town Planning in a Comparative Perspective: Land Readjustment Is the Mother of Town Planning in Japan* (1988). Shun-ichi Watanabe and Kensetsushō Kenchiku Kenkyūjo (Japan), *Planning History in Japan: A State of the Art Survey*, vol. B R I research paper, no 86, Planning History in Japan: A State of the Art Survey (Tokyo: Building Research Institute, Ministry of Construction, 1980). Shun'ichi Watanabe, *Toshikeikaku no tanjo: Kokusai hikaku kara mita nihon kindai toshi keikaku* [The Birth of Urban Planning: Japan's Urban Planning in International Comparison] (Tokyo: Kashiwa Shobo, 1993).
5 As Kazuto Kasahara has pointed out, the *International Architectural Association of Japan*, founded in 1927 in Kyoto, had close contacts with foreign designers, including members from The Netherlands, Germany, Austria, France and America (notably Walter Gropius, Bruno Taut, G. Th. Rietveld, J.J.P. Oud, Andre Lurçat and Richard Neutra).
6 Sumie Shoji, "The Life of Hideaki Ishikawa," *Toshikeikaku/City Planning Review (special issue)*, no. 182 (1993).
7 Carola Hein, "Imperial Visions and City Planning: Visions for Datong in the 1930s," in *Cartographic Japan: A History in Maps*, ed. Kären Wigen, Sugimoto Fumiko, and Cary Karacas (Chicago: University of Chicago Press, 2016); Eika Takayama, "Datong toshikeikakuan" [The Datong Town] *Gendai Kenchiku* 8 (1940).
8 Uzō Nishiyama, *Sensō to jūtaku* (Tokyo: Keisō Shobō, 1983); Shōji Sumita, "Ch. 1: Nishiyama Jūtaku-Gaku Ronkō," in *Nishiyama Uzō no jūtaku, toshiron: sono gendaiteki kenshō* [Nishiyama Uzō's Reflections on Housing and Cities: A contemporary verification], ed. Shōji Sumita and Nishiyama Uzō Kinen Sumai Machizukuri Bunko (Tokyo: Nihon Keizai Hyōronsha, 2008).

9 Carola Hein, "Nishiyama Uzō and the Spread of Western Concepts in Japan," *10+1*, no. 20 (2000); Andrea Yuri Flores Urushima, "Genesis and Culmination of Uzō Nishiyama's Proposal of a 'Model Core of a Future City' for the Expo 70 Site (1960–73)," *Planning Perspectives* 22, no. 4 (2007); Andrea Yuri Flores Urushima, "The 1970 Osaka Expo: Local Planners, National Planning Processes and Mega Events," *Planning Perspectives* 26, no. 4 (2011); Carola Hein, "Machi: Neighborhood and Small Town—the Foundation for Urban Transformation in Japan," *Journal of Urban History* 35, no. 1 (2008); "The Transformation of Planning Ideas in Japan and Its Colonies," in *Urbanism – Imported or Exported? Foreign Plans and Native Aspirations*, ed. Joe Nasr and Mercedes Volait (Chichester: Wiley, 2003).
10 Kosei Hatsuda, *Toshi no Sengo* [Post-War City] (Tokyo: Tokyo University Publisher, 2011).
11 Uzō Nishiyama, *Chiiki Kūkan Ron* [Reflections on Urban, Regional and National Space] (Tokyo: Keisō Shobō, 1968); *Jūtaku Keikaku* [Housing Planning] (Tokyo: Keisō Shobō, 1967); *Kenchikuron* [Theories on Architecture] (Tokyo: Keisō Shobō, 1967); Nishiyama Uzō, ed. *Jūkyoron* [Theories on Housing] (Tokyo: Keisō Shobō, 1968).
12 Uzō Nishiyama, *Nihon no sumai* [Housing in Japan] (Tokyo: Keisō Shobō, 1987).
13 Uzō Nishiyama, "Jūkyo kūkan no yōto kōsei ni okeru shinshoku bunriron [Theory of Separation of Bedding in the Usage Structure of the Residential Space]," *Kenchiku gakkai ronbunshū* 25 (1942).
14 Carola Hein (2016) Tatami: Floor Cover, Building Block and Lifestyle, Het Nieuwe Instituut, http://platform.hetnieuweinstituut.nl/en/tatami-floor-cover-building-block-and-lifestyle-carola-hein
15 Uzō Nishiyama, "Hyumanizumu no kenchiku [The Architecture of Humanism]," in Uzō Nishiyama, ed., *Kenchikuron* [Theories on Architecture]. (Tokyo: Keiso Shobo, 1967).
16 *Chiiki Kūkan Ron* [Reflections on Urban, Regional and National Space] (Tokyo: Keisō Shobō, 1968).
17 In earlier writings I have translated it as "The structure of life-units."
18 Gottfried Feder, *Die Neue Stadt, Versuch der Begründung einer neuen Stadtplanungskunst aus der Sozialen Struktur der Bevölkerung* (Berlin: Julius Springer, 1939); Gottfried Feder and Fritz Rechenberg, "Shintoshi no kensetsu," [The Construction of New Towns] *Tōkyō Shōkō kaigisho* 5 (1942).
19 Hein, "Machi: Neighborhood and Small Town—the Foundation for Urban Transformation in Japan."
20 Nishiyama references the size of the Tokyo wards, Ch. 9, p. 243.
21 Carola Hein and Philippe Pelletier, *Cities, Autonomy and Decentralization in Japan* (London, New York: Routledge, 2006/2009).
22 Uzō Nishiyama, *Toshikeikaku to Machizukuri* [Urban Planning and Community Design], vol. 2 (Tōkyō and Kyōto: Chōbunsha, 1971).
23 Ch. 9, p. 252.
24 Tokyo Metropolitan Government: About Our City: Tokyo's History, Geography and Population http://www.metro.tokyo.jp/ENGLISH/ABOUT/HISTORY/history03.htm (accessed 28 December 2016); Tokyo 2020 東京都の人口（推計) [Population of Tokyo estimated] 22.12.2016 http://www.toukei.metro.tokyo.jp/jsuikei/2016/js16cf0000.pdf; World Population Review, Tokyo Population 2016 http://worldpopulationreview.com/world-cities/tokyo-population/ (accessed 28 December 2016).
25 Ch. 9, p. 244.
26 Ch. 1, p. 23.
27 Nishiyama Uzō, "Bijon kara kōsō keikaku e," in *Machizukuri no kōsō* [The Structure of Community Building], ed. Uzō Nishiyama (Toshi Bunkasha, 1990), p. 41–146.
28 Uzō Nishiyama, "Atarashii Hiroba [New Squares]," in *Chiiki Kūkan Ron* [Reflections on Urban, Regional and National Space], ed. Uzō Nishiyama (Tokyo: Keisō Shobō, 1968).

29 Uzō Nishiyama, "Dai tōa kensetsu kinen zōei butsu," *Shin Kenchiku* 1/1943 [Construction of the Greater East Asia Co-Prosperity Sphere memorial place]; "Dai tōa kensetsu kinen eizō keikaku," *Kenchiku Zasshi* 12/1942 [Design for the Greater East Asia Co-Prosperity Sphere memorial place]; Uzō Nishiyama, "Dai tōa seichi shukusai toshi keikaku an oboe-gaki [A plan for a holy and festival place for the Greater East Asia Co-Prosperity Sphere]," *Shin Kenchiku* 1/1943; Terunobu Fujimori, *Architecture et Design de 1910 à 1945,* in: Le Japon des Avant-Gardes 1910–1970, Centre Pompidou 1986.
30 Uzō Nishiyama, "Sangaku toshi [Cities on Mountain Slopes]," in *Chiiki Kūkan Ron* [Reflections on Urban, Regional and National Space], ed. Uzō Nishiyama, S. 267–259 (Tokyo: Keisō Shobō, 1978), Original: *Atarashiki kokudo kensetsu, dai 3 hen*, *sankaku toshi ron*, *Shin Kenchiku* 1946/6
31 Carola Hein, "Rebuilding Japanese Cities after 1945," in *Rebuilding Urban Japan after 1945*, ed. Carola Hein, Jeffry Diefendorf, and Yorifusa Ishida (London: Palgrave Macmillan, 2003).
32 Ch. 10, p. 286.
33 Uzō Nishiyama, "A Plan for Kyoto," *Japan Architect* 105, no. Feb. (1965).
34 The World Design Conference Organization, *World Design Conference 1960 in Tokyo* (Tokyo: Bijutsu Shuppansha, 1961).
35 Thanks to Professor Nakabayashi Hiroshi for pointing to the notion of "inferno." Andrea Yuri Flores Urushima has also addressed this theme: "Everyday unavoidable modernization and the image of hell: visual planning in the writings of Nishiyama Uzō," in *Alternative Visions of Postwar Reconstruction: Creating the Modern Townscape*, ed. John Pendlebury, Erdem Erten, and Peter Larkham (London: Routledge, 2014), pp. 90–107.
36 Uzō Nishiyama, H. Mimura, and T. Katayose, "Home City," *Kindai Kenchiku* 14 (1960).
37 Nishiyama, "A Plan for Kyoto."
38 Shinya Katagata, "Ch. 3: Kōsōkeikaku: kūkan no ronri to yosoku," in *Nishiyama Uzō no jūtaku, toshiron: sono gendaiteki kenshō* [Nishiyama Uzō's Reflections on Housing and Cities: A contemporary verification], ed. Shōji Sumita and Nishiyama Uzō Kinen Sumai Machizukuri Bunko (Tokyo: Nihon Keizai Hyōronsha, 2008).
39 Andrea Yuri Flores Urushima, "Genesis and Culmination of Uzō Nishiyama's Proposal of a 'Model Core of a Future City' for the Expo 70 Site (1960–73)," *Planning Perspectives* 22, no. 4 (2007).
40 André Sorensen, *The Making of Urban Japan. Cities and Planning from Edo to the 21st Century* (London: Routledge, 2002).
41 Hiroshi Nakabayashi, "Ch. 4: Chiiki seikatsu kūkan keikaku-ron to keikan keikaku-ron Nakabayashi Hiroshi," [Nishiyama Uzō's Reflections on Housing and Cities: A contemporary verification] in *Nishiyama Uzō no jūtaku, toshiron: sono gendaiteki kenshō*, ed. Shōji Sumita and Nishiyama Uzō Kinen Sumai Machizukuri Bunko (Tokyo: Nihon Keizai Hyōronsha, 2008).
42 Carola Hein. "Crossing Boundaries: The Global Exchange of Planning Ideas," in *Making Cities Global*, ed. Andrew Sandoval-Straus and Nancy Kwak (Philadelphia: UPenn Press, 2017).
43 Carola Hein, "Nishiyama Uzō and the Spread of Western Concepts in Japan," *10+1*, no. 20 (2000).

Bibliography

Feder, Gottfried. *Die Neue Stadt, Versuch der Begründung einer neuen Stadtplanungskunst aus der Sozialen Struktur der Bevölkerung*. Berlin: Julius Springer, 1939.

Feder, Gottfried, and Fritz Rechenberg. "Shintoshi No Kensetsu." [The Construction of New Towns] *Tōkyō Shōkō kaigisho* 5 (1942).

Hatsuda, Kosei. *Toshi no sengo* [Post-War City]. Tokyo: Tokyo University Publisher, 2011.
Hein, Carola. "Idioms of Japanese Planning Historiography." In *Planning History Handbook*, edited by Carola Hein. New York, London: Routledge, 2017.
———. "Crossing Boundaries: The Global Exchange of Planning Ideas." In *Making Cities Global*, edited by Andrew Sandoval-Straus and Nancy Kwak. Philadelphia: UPenn Press, 2017.
———. "Imperial Visions and City Planning: Visions for Datong in the 1930s." In *Cartographic Japan: A History in Maps*, edited by Kären Wigen, Sugimoto Fumiko and Cary Karacas. Chicago: University of Chicago Press, 2016.
———. "Machi: Neighborhood and Small Town—the Foundation for Urban Transformation in Japan." *Journal of Urban History* 35, no. 1 (2008): 75–107.
———. "Rebuilding Japanese Cities after 1945." In *Rebuilding Urban Japan after 1945*, edited by Carola Hein, Jeffry Diefendorf and Yorifusa Ishida, 1–16. London: Palgrave Macmillan, 2003.
———. "The Transformation of Planning Ideas in Japan and Its Colonies." In *Urbanism – Imported or Exported? Foreign Plans and Native Aspirations*, edited by Joe Nasr and Mercedes Volait, 51–82. Chichester: Wiley, 2003.
Hein, Carola, and Philippe Pelletier. *Cities, Autonomy and Decentralization in Japan*. London, New York: Routledge, 2006/2009.
Katagata, Shinya. "Ch. 3: Kōsōkeikaku: Kūkan no ronri to yosoku." In *Nishiyama Uzō no jūtaku, toshiron: sono gendaiteki kenshō* [Nishiyama Uzō's Reflections on Housing and Cities: A contemporary verification], edited by Shōji Sumita and Nishiyama Uzō Kinen Sumai Machizukuri Bunko. Tokyo: Nihon Keizai Hyōronsha, 2008.
Kenzo, Tange, and Udo Kultermann. *Kenzo Tange, 1946–1969; Architecture and Urban Design*. New York: Praeger Publishers, 1970.
Kuan, Seng, and Yukio Lippit, eds. *Kenzo Tange. Architecture for the World*: Lars Müller Publishers, 2012.
Lin, Zhongjie. *Kenzo Tange and the Metabolist Movement: Urban Utopias of Modern Japan*. London, New York: Routledge, 2010.
Nakabayashi, Hiroshi. "Ch. 4: Chiiki seikatsu kūkan keikaku-ron to keikan keikaku-ron Nakabayashi Hiroshi." In *Nishiyama Uzō no jūtaku, toshiron: sono gendaiteki kenshō* [Nishiyama Uzō's Reflections on Housing and Cities: A contemporary verification], edited by Shōji Sumita and Nishiyama Uzō Kinen Sumai Machizukuri Bunko, 257–99. Tokyo: Nihon Keizai Hyōronsha, 2008.
Nishiyama, Uzō. *Nihon no sumai* [Housing in Japan]. Tokyo: Keisō Shobō, 1987.
———. *Sensō to Jūtaku*. Tokyo: Keisō Shobō, 1983.
———. *Toshikeikaku to Machizukuri* [Urban Planning and Community Design]. Vol. 2, Tōkyō and Kyōto: Chōbunsha, 1971.
———. "Atarashii Hiroba [New Squares]." In *Chiiki Kūkan Ron* [Reflections on Urban, Regional and National Space], edited by Uzō Nishiyama, 115–32. Tokyo: Keisō Shobō, 1968.
———. *Chiiki Kūkan Ron* [Reflections on Urban, Regional and National Space]. Tokyo: Keisō Shobō, 1968.
———. ed. *Jūkyoron* [Theory of Housing]. Tokyo: Keisō Shobō, 1968.
———. "Humanism No Kenchiku (The Architecture of Humanism)." In *Kenchikuron* [Theories on Architecture], edited by Uzō Nishiyama. Tokyo: Keisō Shobō, 1967.
———, ed. *Jūtaku Keikaku* [Housing Planning]. Tokyo: Keisō Shobō, 1967.
———, ed. *Kenchikuron* [Theories on Architecture]. Tokyo: Keisō Shobō, 1967.

———. "A Plan for Kyoto." *Japan Architect* 105, no. Feb. (1965): 61–80.

———. "Jūkyo kūkan no yōto kōsei ni okeru shinshoku bunriron [Theory of Separation of Bedding in the Usage Structure of the Residential Space]." *Kenchiku gakkai ronbunshū* 25 (1942): 149–55.

Nishiyama, Uzō, H. Mimura, and T. Katayose. "Home City." *Kindai Kenchiku* 14 (1960).

Nishiyama, Yasuo. *Japanese Town Planning in a Comparative Perspective: Land Readjustment is the Mother of Town Planning in Japan*. 1988.

Shoji, Sumie. "The Life of Hideaki Ishikawa." *Toshikeikaku/City Planning Review (special issue)*, no. 182 (1993): 25–30.

Sorensen, André. *The Making of Urban Japan. Cities and Planning from Edo to the 21st Century*. London: Routledge, 2002.

Sumita, Shōji. "Ch. 1: Nishiyama jūtaku-gaku ronkō." In *Nishiyama Uzō no jūtaku, toshiron: sono gendaiteki kenshō* [Nishiyama Uzō's Reflections on Housing and Cities: A contemporary verification], edited by Shōji Sumita and Nishiyama Uzō Kinen Sumai Machizukuri Bunko. Tokyo: Nihon Keizai Hyōronsha, 2008.

Sumita, Shōji, and Nishiyama Uzō Kinen Sumai Machizukuri Bunko, eds., *Nishiyama Uzō no jūtaku, toshiron: sono gendaiteki kenshō* [Nishiyama Uzō's Reflections on Housing and Cities: A contemporary verification]. Tokyo: Nihon Keizai Hyōronsha, 2008.

Takayama, Eika. "Datong toshikeikakuan" [The Datong Town Plan]. *Gendai Kenchiku* 8 (1940): 48–57.

The World Design Conference Organization. *World Design Conference 1960 in Tokyo*. Tokyo: Bijutsu Shuppansha, 1961.

Urushima, Andrea Yuri Flores. "The 1970 Osaka Expo: Local Planners, National Planning Processes and Mega Events." *Planning Perspectives* 26, no. 4 (2011): 635–47.

———. "Genesis and Culmination of Uzō Nishiyama's Proposal of a 'Model Core of a Future City' for the Expo 70 Site (1960–73)." *Planning Perspectives* 22, no. 4 (2007): 391–416.

———. 2014. "Everyday unavoidable modernization and the image of hell: visual planning in the writings of Nishiyama Uzō." In *Alternative Visions of Postwar Reconstruction: Creating the Modern Townscape*, edited by John Pendlebury, Erdem Erten, and Peter Larkham. London: Routledge, pp. 90–107.

Uzō Nishiyama Memorial Library, ed. *Uzō Nishiyama and His Time [Nishiyama Uzō to sono jidai]*, 2000.

Watanabe, Shun'ichi. *Toshikeikaku no tanjo: kokusai hikaku kara mita nihon kindai toshi keikaku* [The Birth of Urban Planning: Japan's Urban Planning in International Comparison]. Tokyo: Kashiwa Shobo, 1993.

Watanabe, Shun-ichi, and Kensetsushō Kenchiku Kenkyūjo (Japan). *Planning History in Japan: A State of the Art Survey*. Planning History in Japan: A State of the Art Survey. Vol. B R I research paper, no 86: Tokyo: Building Research Institute, Ministry of Construction, 1980.

1

THE STRUCTURE OF THE BASE OF LIFE[1]

This essay was written early in the summer of 1942 during the war, and I stressed that the qualities housing had to possess could only be discussed when the structure of society as a whole had been clarified; but I also dealt with this issue in an article entitled "Jūkyo no shitsu ni tsuite" [On the quality of housing] published in *Kenchiku Zasshi* [Architecture magazine] in June the year before, as well as in a collection of essays entitled *Jūtaku Mondai* [Housing issues] in the beginning of that same year. Well then, if that was my way of thinking in this regard, in what way could I specify the qualities housing had to have? I kept asking myself what sort of concrete statement could be made on the matter, and this essay is the bringing together of those ideas on the structure of the overall life space. It was published in a small magazine called *Kenchikugaku Kenkyū* [Research on Architecture].

Because I had looked into the various conditions required for housing in the aforementioned article, in this essay I focused more on examining the space that lay beyond the structure of life as a whole, and the various types of housing built in response—this is called the "life base," but refers to the "local life base" in the particular area of space around where people take up permanent residence.

It is divided into four sections: the first discusses the examination of the structure of all life (*samsara* or cycle of life) and the overall structure of life space (the life base consisting of housing areas, city, and nation), to work out guiding standards and aims for the quality of housing; and setting goals to attain that ideal vision. Section 2 is an historical appendix that touches briefly on subjects such as the sorts of proposals made in the past on the development of the capitalist city and ideas about the structure of the life base viewed from that perspective (ideal vision of the local life base); the demand for the revival of the garden in urbanization; zoning systems; the garden city; the satellite city; proposals for big cities by Le Corbusier and Hilberseimer; the linear city of the Soviet Union; and Feder's proposal. Section 3 discusses the structure of the life base as a contemporary issue to squarely meet the demands of national defense and a strong military, but why this is impossible to settle due to wartime austerity. Section 4 investigates claims about: the placement, combined form,

and concentration and division of households that have become problems in the structure of space for housing zones, which include zones consisting of various households and communal or regional facilities, when these facilities are adopted for housing in ideal visions of this sort of life base and regional space; proposals for communal housing and the Socialist city in the Soviet Union; or the structure of neighborhood housing. And finally, it discusses not just the state of housing, but also that of places of production and labor that together make up the structure of the city and overall local space; in other words, how it must be pursued while considering the combination of work and relaxation, production and consumption, among the problems of how to systematically construct total life amenities.

In general, however, problems initially identified ended up not being properly solved because of labor shortages. Moreover, wartime slogans like *Dai Tō-A sensō kansui* (Successfully prosecute the Greater East Asian War) were heard everywhere, and although there was significant interest displayed regarding calls for "national planning" at the time, accounts about austerity were undeniable as I discussed in volumes 1 and 2 of my collected works [which deal with *urban* planning and housing, respectively. Trans.]. However, this is the first time the aspect of having to consider housing as life space for the individual or the family, or strictly speaking local space, has been discussed, and I think it is appropriate that it is included here in volume 3 of my collected works, which brings together studies on this sort of issue. Further, my article on "the quality of housing" from *Jūtaku Mondai* mentioned above is included in volume 2, and is the first chapter of section 5 "Housing designs" (Chapter 25). The present essay follows on from that, and with the reader's forbearance, I attempt to expand that argument. With regards to the diagrams, some explanations have been added to remedy simplifications made during the war due to printing constraints.

(Originally published as "Seikatsu no kōzō to seikatsu kichi" [Life structure and the life base], in *Kenchikugaku Kenkyū*, volumes 110–111, September-October 1942.)

1. The Quality of Housing and The Structure of the Life Base

1.1. The Quality of Housing

To obtain a (legally proscribed) basis to prevent the deterioration of the quality of housing, it is generally possible to demand minimum thresholds for the various conditions that regulate the quality of that housing. This is because, no matter how well other conditions are met, the drastic deterioration of one of those conditions will bring about the overall lowering of the quality of housing. Quality regulations in building codes and laws governing residences enacted in various countries around the world since the 19th

century have their logical foundation here. However, we now find ourselves facing the task of looking for proper national and social standards for housing. To find quality regulations for housing that can act as standards for guidance, the nature of the various conditions that define the quality of dwellings must be clarified through the separate fulfillment of each of those conditions.

1.2. Total Control over Life

In this case, "the quality of housing" means thinking about the totality of life (or *rin'ne*, the endless cycle of life and death), and must commence with how to rationally construct this. That is, considerations about the quality of housing are closely connected to consideration of the formation of the overall life base. All these things must be regulated according to "the structure of life."

This essay is an attempt at a few theoretical investigations from such points of view regarding the structure of life and methods to construct the life base.

1.3. The Need to Find Ideal Standards

It is easy to succumb to fanciful statements when discussing the structure of life or constructing the life base on the assumption that these are simply theoretical. Needless to say, the problem is solved through concretely building the life base by realizing methods based on such considerations, and by training and enlightening consumers themselves in the values that satisfy this. Nevertheless, we still mustn't neglect theoretical topics regarding how the life base is to be constructed. While the urgent subject of large-scale construction of housing to keep pace with boosting productivity during the Greater East Asian War remains to be solved, answers must also be provided for the pressing questions of methodically reorganizing the national spatial layout aimed at strengthening national defenses in order to establish the East Asia Co-Prosperity Sphere, and maintaining the industrial and economic system. And a great deal of work also lies ahead of us if we are to bring about our future aspirations for the long-term construction of Greater East Asia. Greater East Asia, and in particular Japan where the national lands for the life base of the Japanese people are located, must be reforged into a homeland for the Japanese race who provide the driving force behind this major construction project, and must be redeveloped to become strong and beautiful. To accomplish this great undertaking, the task facing us now is to describe the most complete ideal build for the homeland. Alongside its actual construction, the description of this ideal build in the most robust and sound way is also one of the urgent tasks we must carry out. The theoretical explorations into the construction of the life base in this essay are conducted with this purpose in mind.

2. Historical Review of Ideas for the Construction of the Life Base

2.1. Urban Life

Now, having established the issues, the first thing that presents itself when looking at actual reality is life today in big cities.

Rapid urban development, the evolution of urban life, and the absolute and relative growth of the urban population in our nation since the Meiji era, have been indispensible conditions politically and economically for building up Japan, the leader of Greater East Asia. Big cities have become the life environment where the majority of Japanese lead their daily lives and are nurtured. At the same time cities, in particular the big cities, are the locations which form the core of our nation's industries and economy. Even though cities now occupy an ever vital place in the structure of our homeland, it is becoming more apparent that, along with the evolution of urban life, the life environment over which most of our gradually burgeoning population is dispersed has become degraded, and the process which is fouling and distorting the homeland where we live and where the people lead their lives is an unconcealable fact.

Apart from urban life, our homeland also sustains life in farming, mountain and fishing villages. The reexamination of the people's life base must take both these elements into consideration. However, for the present, the issue we must tackle is life in the big cities as discussed above. We must reflect first upon urban life, and at the same time the urban industry and economy that forms the base upon which it has arisen, and think about how that must be restructured; in this sense, rural issues will be left out of consideration here for the time being.

Let us first reflect on how the structure of the life base associated with the system of living has been included in the historical development process of the city.

2.2. Development of the Modern City

After the Industrial Revolution, cities that emerged with the advance of factories and manufacturing became centers for industry, and as a result residential areas for the workers expanded rapidly. Further, due to the development of the capitalist economy and the explosive growth in commerce and trade, cities that were commercial and financial centers became increasingly prosperous. Regional cities were integrated into the world economy as centers for local commerce and industry, and became world cities that gradually grew. Cities formed the hub of the industrial economy, and at the same time became the center of the political culture. Urban life became the life environment that represented the new age.

2.3. Origins of Urban Life

However, the course of development of these modern cities was propelled forward by activities stemming from independent innovations by individual entrepreneurs, the driving force of the capitalist economy, in pursuit of profit, and cities were formed as the accumulation of these results. This was not achieved as an organic entity following a single plan, but rather was an agglomeration created following the rules of development characteristic of capitalist societies. Structure in the new life could be improved, rationalized, and put in order by those with analytical ability, but only if they used it; however, those without this ability, or those unable to realize this ability even if they possessed it, were only compelled to adapt to the new life to meet the needs of daily existence. Furthermore, urban life on the whole was a matter of spontaneously generated chaos. As might be expected this "chaos" was ignored, but soon became a threat to urban society itself. This disaster was keenly felt the earliest in England, the first country to pursue the Industrial Revolution. Social problems in the form of various societal evils appeared here. Social defects, such as problems with roads and transport, the unsanitary state of residential areas for workers, morality and law enforcement in these areas, and the role played by dangerous sources of radiation in urban life, gradually came to be recognized. To counter anti-social degradation of the life environment caused by the convergence of unchecked and unprincipled behavior by individuals, a series of public measures was launched including hygiene legislation and the undertaking to improve substandard housing.

2.4. Distorted Working Class Life

However, these were all so to speak palliative measures to counter the "results" of abuses and dangers that could no longer be ignored, and were obviously not planned actions to completely reorganize urban life. Life for factory workers alternated between damp, substandard housing, and back-breaking work in unsanitary factories. This monotonous grinding life that was repeated mechanically day in and day out was followed, like a shadow follows an object, by the growth of urban amusements, relaxation, and social intercourse (the various unhealthy pursuits to be found in red-light districts such as drinking and carnal pleasures). The places where the public thronged became hubs for social interaction, and people went shopping to alleviate their loneliness. However, these activities were all part of an unhealthy lifestyle conducted in a polluted environment.

2.5. Restoring the Garden

Every intolerable aspect of this crowded life became the focus of attention. The terrifying urban situation was compared to malignant skin eruptions. This

poisoned, unhealthy urban life in the early phase of the development of the modern city was criticized as a degenerate evil brought about by capitalism, and calls arose to return to the reactionary medieval garden or an imaginary city/garden amalgam, and some imaginative socialists even tried their hands at building some ideal villages. However, these attempts ran counter to the progress of the capitalist society, and all of them failed.

An emerging Germany trailing behind England ventured into the world market of monopolistic capitalism, and looked at the mistakes made by this predecessor; following the Franco-Prussian War, it adopted in succession pioneering urban planning legislation, such as zoning systems and building regulations covering frontage lines, and moved forward with national regulation of urban development. Zoning systems regulated the construction of various zones in cities according to type and intensity of usage, thereby adding further improvements to the overall spontaneous nature of urban development. However, this amounted to little more than rationalizing the mutual interference of various land-users when similar land usages were concentrated in a single zone, and the comprehensive formation of life amenities was still very far away.

2.6. Garden City Movement

The garden city movement in England from the end of the 19th century through the early part of the 20th century was an attempt to restore the garden by using novel technological methods that further aligned new social and economic relationships. The harmonizing of town and country meant putting together only the advantages of each. It was life that united a garden surrounded by green fields with a certain number of manufacturing facilities through moderate concentration, and the benefits of a degree of culture allowed in "towns."

In 1898 the proposer of the "garden city" Ebenezer Howard clearly laid out his proposals outlining the shape of ideal housing for the future of humanity in his publication *Garden Cities of To-Morrow*. His position was based directly upon three views advocated by those who came before him:

1) A new perspective on land, where land is owned by the people or by self-governing bodies;
2) Theories on the collective permanent residence of people who have formed into small societies completely on their own; and
3) The idea of the new model cities of [James. S.] Buckingham with proposed population of 25,000, surrounded by rural villages, and which integrated industry and agriculture.

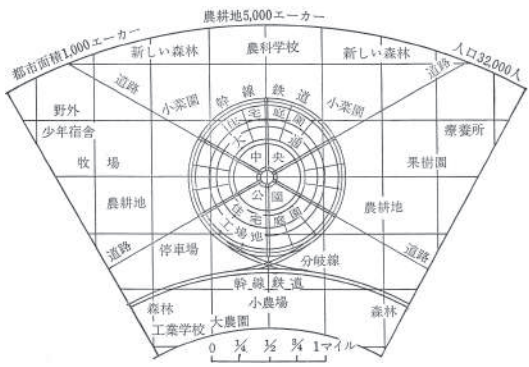
While Buckingham laid out his plan for the new city under regulations governing a cooperative, Howard believed it could be achieved by residents

self regulating in a free economy, that new methods would be employed only for the ownership and management of the land, and also that it would be a means to revolutionize society.

2.7. Howard's Proposals

His thoughts on the garden city are summarized below:

1) Self-sufficiency: Towns with small business and industry surrounded by rural areas; the integration of industry and agriculture; agriculture for industry, food production and other uses; commerce relating to that trade; education, entertainment and religious facilities; completely furnished buildings for self governance; fresh foodstuffs; fresh air; the reuse of waste products in agricultural areas, etc. The example he gives has a total area of 6,000 acres, of which 1,000 acres is set aside for municipal use with a population of 30,000, and the remaining 5,000 acres is for agricultural use with a population of 2,000. (See Figures 1 and 2.)



Text: from top (excluding center circle)

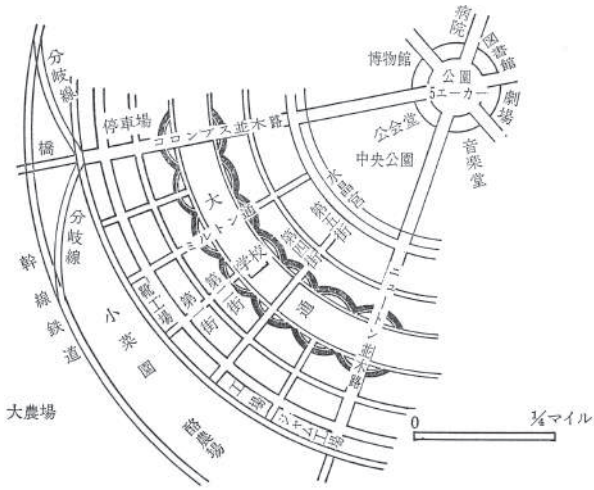
都市面積１０００エーカー	City 1,000 acres
農耕地５０００エーカー	Agricultural land 5,000 acres
人口３２０００	Population 32,000
新しい森林	New forests
農科学校	Agricultural college
新しい森林	New forests
道路	Road
道路	Road
少年宿舎	Children's cottage homes
小菜園	Allotments
小菜園	Allotments
療養所	Convalescent homes
牧場	Cow pastures
果樹園	Fruit farms
農耕地	Farmland
農耕地	Farmland
道路	Road
道路	Road
停車場	Car park
分岐線	Branch line
幹線鉄道	Railway trunk line
森林	New forest
小牧場	Small holdings
森林	New forest
工学学校	Industrial college
大農園	Large farms

Scale: 0, ¼, ½, ¾, 1 Miles

Text: center circle

幹線鉄道	Railway trunk line
住宅	Housing
庭園	Gardens
大道	Grand Avenue
中央公園	Central park
住宅	Housing
庭園	Gardens
工場地	Factory zone

Figure 1 Diagram of Howard's garden city (1)



Text: from left to right

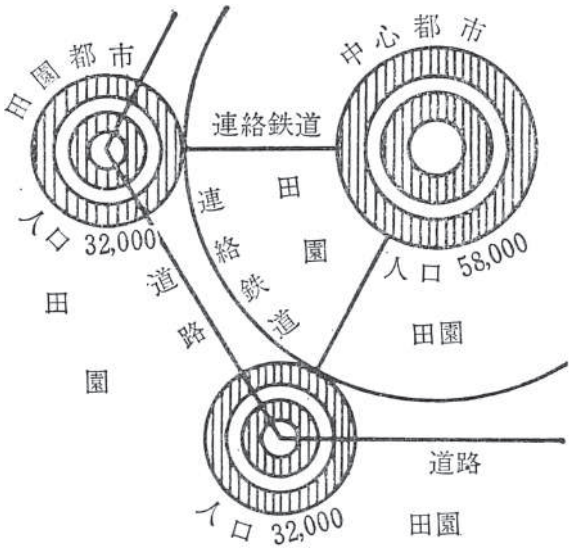
大農場	Large farms
幹線鉄道	Railway trunk line
分岐線	Branch line
橋	Bridge
分岐線	Branch line
小菜園	Allotments
酪農場	Dairy farms
停車場	Car park
靴工場	Boot factory
工場	Factory
ジャム工場	Jam factory
コロンブス並木路	Columbus Boulevard
ミルトン通	Milton Road
第一街	First Avenue
第二街	Second Avenue
大通	Grand Avenue
学校	School
ニュートン並木路	Newton Boulevard
第四街	Fourth Avenue
第五街	Fifth Avenue
水晶宮	Crystal Palace
中央公園	Central Park
博物館	Museum
公会堂	Town hall
音楽堂	Concert hall
公園５エーカー	Garden (5 acres)
病院	Hospital
図書館	Library
劇場	Theater

Figure 2 Diagram of Howard's garden city (2)

2) Public ownership of land: Collecting rents generated by the development of the city, and the burgeoning ability of city dwellers to contribute taxes as "public rent." Covering interest and sinking funds on investment in land purchased at an initially inexpensive price, and extracting sufficient expenses incurred in the maintenance and management of various public enterprises. Land use entirely at the systematic direction of self-regulating supervisory committee.
3) Limiting urban population: Building a small city composed of a well-organized society, with a city center, a series of commercial zones (called Crystal Palace, which also provides recreational areas for the people), closely connected to two rows of residential zones, surrounded externally by commercial and industrial workplaces, railroad, and rural areas. Because everything is within walking distance, the optimum population for a city this size is 32,000, and at most 58,000. Future development would occur by division in the new city as well as new builds, and the old city and new city are separated by rural areas but connected by high-speed rail. Each new city would gradually be built up like a satellite around the central city. (See Figure 3.)

2.8. Ideal of Constructing Small Self-Sufficient Societies

Notable subjects in this proposal included trying to create a small self-sufficient regional community confined to a small area in the form of a garden city, and



Text: from top

田園都市	Garden city
中心都市	Central city
連絡鉄道	Inter-municipal railway
人口３２０００	Population 32,000
連絡鉄道	Inter-municipal railway
田園	Countryside
人口５８０００	Population 58,000
田園	Countryside
道路	Road
田園	Countryside
道路	Road
人口３２０００	Population 32,000
田園	Countryside

Figure 3 Diagram of developed form of Howard's garden city

also the new doctrine for regional development to build the nation through the construction of these small cities one after another.

What form this would take—specialization on a larger regional or international scale, and tie-ins with various facilities not to be found in smaller communities but in larger ones—could not be achieved without considering association with a larger hub, but the plan would be for a self-sufficient society as a place where a group of people could produce and consume. Here, he reveals the first overall reconstruction plans for urban life facilities that try to bring about the total "fulfillment" of residents' lives through a small society. Therefore this also meant the overall constructing of the actual lives of the city's inhabitants. This focused on the idea of trying to realize a small city that improved the substandard living conditions of urban residents including laborers and located them close to workplaces, that embraced the countryside, and had well-ordered life facilities.

2.9. Working Models

Two noteworthy examples of this ideal were realized. They were Letchworth and Welwyn. (See Figures 4 and 5.)

These were the products of the extraordinary enthusiasm of certain interested parties, and the "entrepreneurial vision" that was possible in an advanced capitalist nation with vast colonies like England. This success stimulated great interest in the garden city. However, even this new life structure that had everyone's blessing was an extremely difficult undertaking in a free economy,

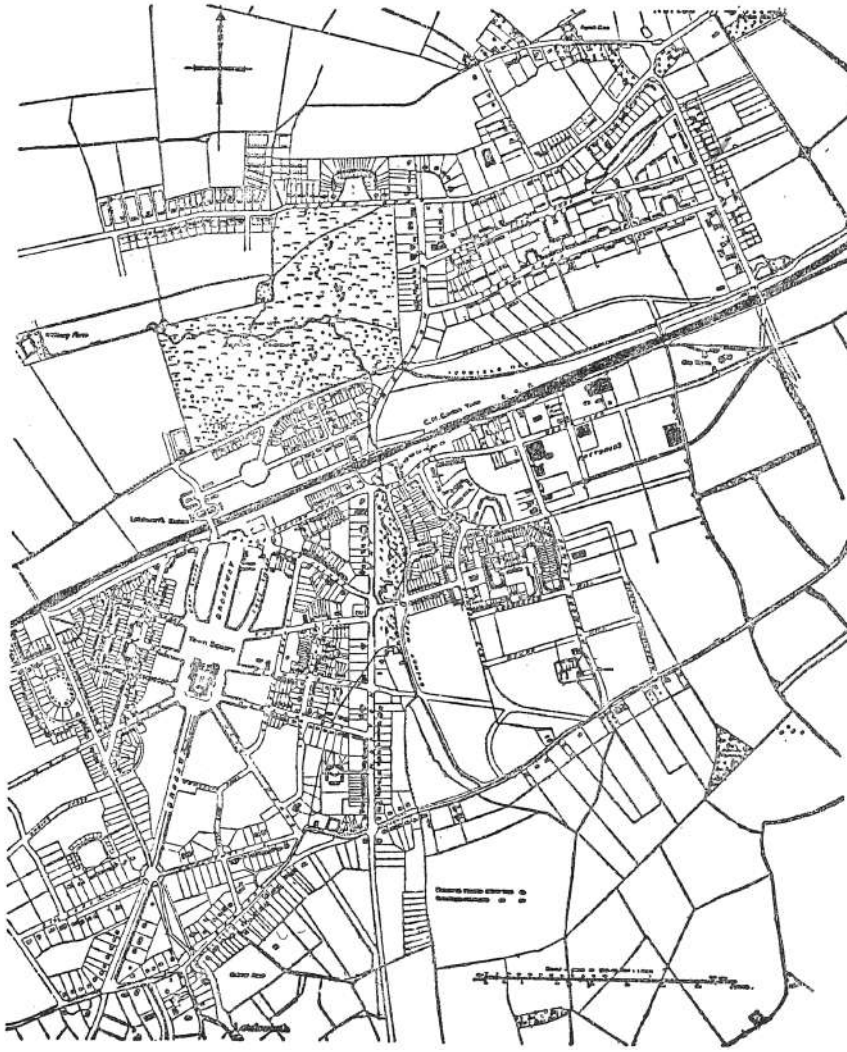


Figure 4 Garden city—Letchworth

where it was impossible to realize unless the interests of financiers, entrepreneurs, landowners and builders corresponded completely, and so no further progress was made. These efforts were pioneered by the urban planning movement in England, and ended with their contribution in enacting the English Town Planning Act of 1909. This aimed to bring about the systematic regulation of urban development, and the garden city was kept within a limited zone, but as the comprehensive construction of a perfected life base it was not a clear solution.

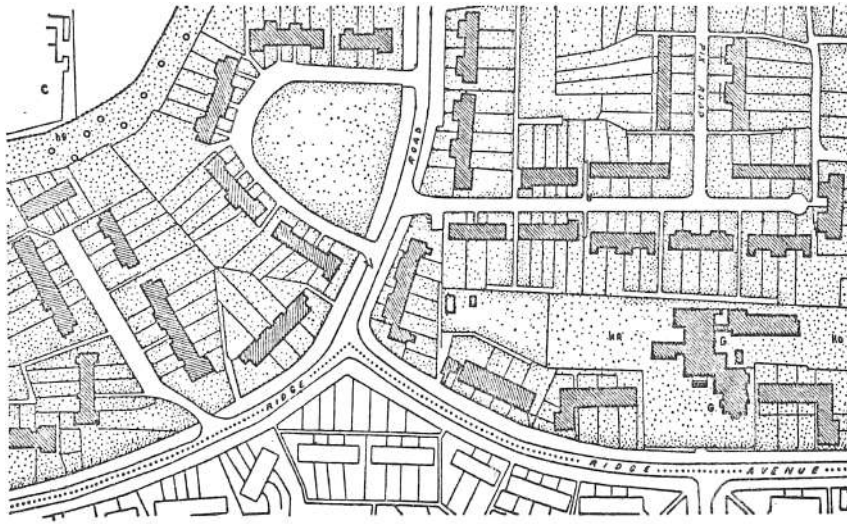


Figure 5 Example of cul-de-sac and "overhang" (Letchworth)

2.10. Garden City Suburbs

The complete and rational construction of life facilities first planned in the proposed garden city, ended in this way with extremely limited success; and although the ideal that was desired here and the actual content were completely different, a solution later became apparent that in form closely resembled it.

The experiment for "garden city suburbs" to build residential zones on sanitized lands surrounded by countryside, rather than small towns with proprietary workplaces (factories and so on), became possible in the 20th century thanks to developments in transport facilities. Of course, this only applied to a small coterie of people able to commute these long distances, but this residential arrangement liberated people from urban living while also securing a way of life where they could freely enjoy the consumer culture flourishing in the heart of big cities. This trend further stimulated the development of transportation; expanded the spatial separation of residential areas from cities that were now places of work; spurred forward the vertical and horizontal growth of big cities; and further encouraged the expansion of 20th century megacities. Villa-like places of refuge in these garden city suburbs soon became permanent places of residence, and before long suburban residential areas transformed into towns that surrounded the peripheries adjacent to large cities. This living arrangement created by separating the workplace from where people lived, along with the associated commercial environment, also spread to small commercial business owners and inner city residents who previously lived where they worked.

2.11. Separating the Workplace from the Place of Residence

However, changes of this nature did not ease the strain of life in big cities. Dense housing in inner city areas remained difficult for urban residents with low incomes to avoid; and the development of transportation, and the unrestricted growth of passenger numbers, brought about the new problem of commuter congestion. The unnecessary complications and irrationalities of a way of life that abandoned the benefits of high-density living were further exacerbated.

2.12. Satellite Cities

Despite proposals for the garden city as the ideal development for residential arrangements, big cities encroached further into the suburbs and continued to expand extensively and without interruption. This expansion was seen as an inevitable part of the development of capitalist society and impossible to avoid. This meant that the only option left was to eliminate as much as possible the chaos produced by limitless belt-like development, uninterrupted expansion, and the unnecessary complication of life. Building new concentrated centers located like satellites a certain distance away from a central mother city; focusing development in places away from existing cities and connecting each of them with high-speed transport facilities; and allowing residents in every small town to enjoy the advantages of the big city too—this was the so-called theory behind satellite cities.

In this manner, it was anticipated that the way of life for people living in all urban areas would consist of a combination of forms including town life, big city life, and life that alternated between town and city. However, like theories behind the garden city, realizing this proposal also faced many difficulties. To restrict the continuous and extensive expansion of the city, a few countries employed methods that provided for the entire periphery, or wedge-shaped areas, to be zones where building was prohibited (green land), but this type of methodical urban development in expanding urban areas failed to gain attention. More than likely, in countries where it was possible to thoroughly and positively carry out large urban planning in a systematic and comprehensive way, rampant urban development itself would naturally have emerged as something to be controlled; and theories on satellite cities, but also many others related to the formation of urban areas, would have been seen as rather idealistic in countries where such theories could not be realized. It was inevitable that countries that could realize them criticized these theories as being overly compromising and half-hearted.

2.13. Ideal City

However, it is not as though no systematic construction based on purely idealistic beliefs about the city took place at all. For instance, a city located in

the colonies such as Canberra in Australia was built according to a "plan" with a geometric layout (based on a 1911 prize-winning design). Nevertheless, looking at this from the perspective of how life amenities were constructed here, it could be argued that basic facilities were merely organized and arranged geometrically in the existing city.

After World War I, urban reform attracted the attention of many architects. However, many of their proposals merely called for the "architectural" reform of the city. For instance, even Le Corbusier's reform of Paris, a typical proposal for a large-scale urban area, merely resolves in an architectural sense the crowding and lack of hygiene in the central areas of an existing large city, but omits all mention of urban life amenities. In his project for a city of 3 million people, he drafted plans for urban development that included 24 skyscrapers 1 km apart, each 16 stories high, that housed between 10,000 and 50,000 workers and were located in the heart of the city, medium-rise housing complexes around the periphery, and industrial zones placed in distant surrounding areas. However, this was only "architecturalizing" the spontaneous form of the capital city of a modern country central to the financial capitalist society, by simply reforming building facilities that perpetuated all manner of criminality, contamination and disorder; the functional configuration of the city retained its American, spontaneous urban life, and not the slightest attempt was made at an "imaginative" solution.

Germany's [Ludwig] Hilberseimer also put forward a proposal for an ideal residential city based on considerations of the satellite city. (Figure 6.) This is a city of rectangular form connected to other major cities by a high-speed rail which transects the center; that is divided into six areas by roads crossing from one side to the other; has four commercial centers; and locates four schools and a hospital on either side that protrude into the rural areas outside the city.

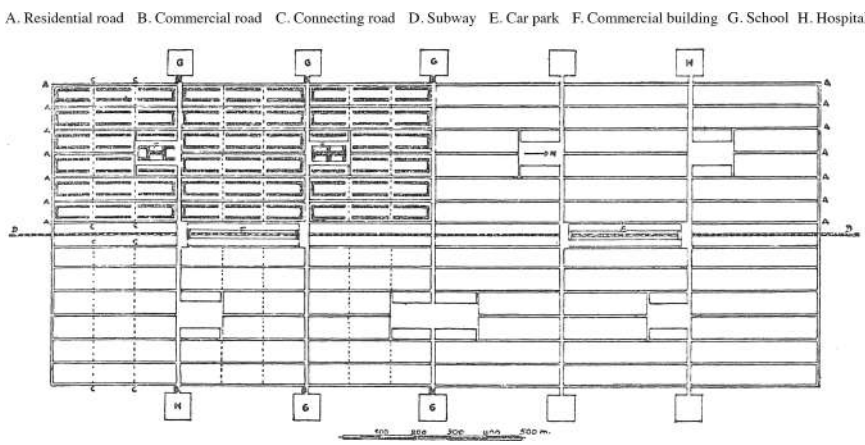


Figure 6 Hilberseimer's residential city plan

All accommodation consisted of 10-story high-rise buildings, with the upper floors for residences and the lower floors for shopping arcades. Here too, what is proposed was merely the partial separation of various constituent elements of a spontaneously formed city, including residences, schools, hospitals, shops, downtown area, and workplaces; from the perspective of reforming the function of the city, or the perspective of the structure of city life, it was insufficient and of doubtful effectiveness.

2.14. Experiments in the Soviet Union

In the many countries run under capitalist freedoms, there was a rigid belief it was inevitable that big cities would continue to expand, that no kind of order would ever be established in urban life, and that the complex interconnected relationships of urban life would uselessly only be of interest for sociological studies.

However, a new development regarding the ideal of the garden city came to light outside the British Islands.[2] This happened in the Soviet Union. Locating home and work adjacent to each other; rationally applying the time and energy lost traveling between both to the life process; and maintaining a moderate population collective to create a total life environment surrounded by rural areas and fully equipped with cultural and public facilities—the ideal of a garden city with healthier living and continually flourishing culture was developed into a completely different form in the Soviet Union with its different political and cultural foundation. It was the culmination of a new design concept called "belt-shaped cities."

2.15. Linear Cities

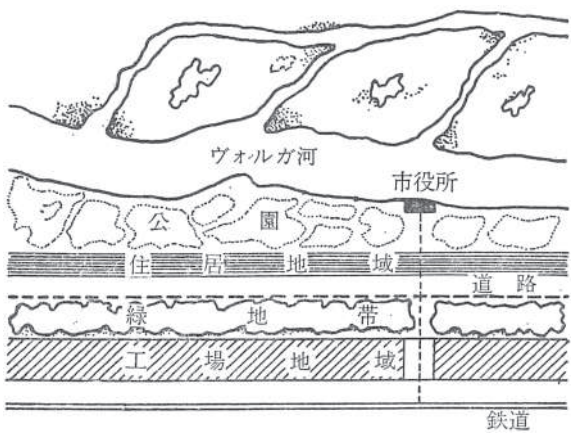
[Arturo] Soria y Mata's proposal for the linear city is sometimes cited as the forerunner to the belt city because of its shape. The city comprises narrow strips of housing located alongside vehicular roads that pass through rural areas, and this network of strips form a web of residential areas that eventually cover the green land, and residents use these roads to travel to factories located in predetermined locations. The one built in Madrid in 1882 was 22 km long and had a population of up to 30,000.

However, while the so-called belt city may somewhat resemble this in appearance, it is based on an entirely different hypothesis. Here, the production facilities themselves are placed linearly, and this system of production facilities is rationally located along transport lines (rail, road traffic, etc.) according to each one's place in the production process, with public and residential facilities, and green land, etc., located lengthways parallel to these. This uses green land to separate housing for urban residents from workplaces, and can be referred to as a particular type of linearly built garden city.

In his book *Sotsgorod* [Socialist City], [Nikolay Alexandrovich] Milyutin describes the belt city he advocated in the following way. First of all, to

eliminate the wastefulness and difficulties produced by the jumble of different facilities and multiple-usage roads seen in cities of the past that had uncontrolled development, he urged that residential areas must be systematically built as a "comprehensive whole" with respect to fundamental elements including industrial and agricultural production, transport, power, management, life processes, and education including further studies. His specific stipulations were as follows:

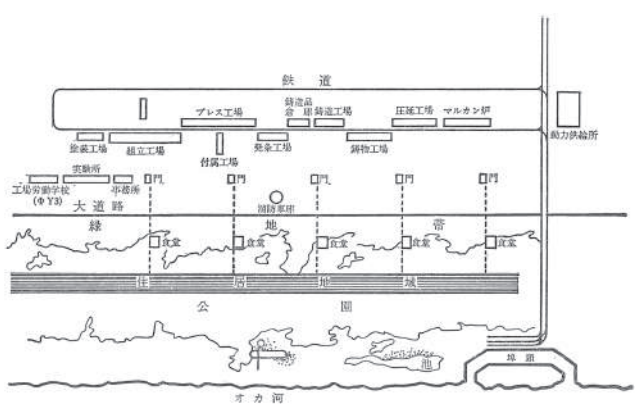
1) Optimal placement of each and every production facility and multiple-usage road; construct functional flows.
2) Although topographical conditions and industry type may vary, in principle the locations of workplaces and residential areas should be separated by 500 m of green land (protected area). Commute within 10–20 minutes walking distance. Benefit of fresh air, woods, and fields. Enjoy commuting.
3) Railroad to be placed to the rear of production facilities. Vehicular roads pass through green land. Provide parking lots in areas between facilities. Connected to cities by cars.
4) Optimal placement of agricultural areas. State-run farms, including dairy farms, market gardens, and horticultural farms. Irrigation with waste water.
5) Specialist (industrial, agricultural, economic, and medical) and mid-level education facilities with ties to production facilities (factories) and farms, government agencies, hospitals, etc. Integration of work and education. Through theoretical and experimental research facilities, workplaces, green land, libraries, and archives, etc., extend educational opportunities to all in the expectation of raising interest in education.



Text: from top

ヴォルガ河	Volga River
市役所	Town hall
公園	Park
住宅地域	Residential area
道路	Road
緑地帯	Green belt
工場地域	Factory area
鉄道	Railway

Figure 7 Model diagram of belt city, Soviet Union (Magnitogorsk)



Text: from top	
鉄道	Railway
プレス工場	Pressing plant
鋳造品倉庫	Castings warehouse
鋳造工場	Casting plant
圧延工場	Rolling mill
マルカン炉	Marquand furnace
動力供給所	Power supply plant
塗装工場	Paint factory
組立工場	Assembly plant
発条工場	Spring plant
鋳物工場	Foundry
付属工場	Attached factory
実験所	Laboratory
門	Gate
工場労働学校	Factory worker school
事務所	Office
大道路	Road
消防車庫	Fire house
緑地帯	Green belt
食堂	Canteen
住居地域	Residential area
公園	Park
池	Lake
埠頭	Wharf
オカ河	Oka River

Figure 8 Nizhegorod auto plant and residential area plan

6) Hospitals to become more like fixed institutions located in residential areas, and to include public health institute, teaching hospital, sanitarium, and research institute. The latter to be located within healthy green areas.
7) Seven-year public schools located in youth villages, with ties between general educational facilities (clubs, library) and factories, to integrate production and work with study and physical education. Parents not prevented from participating in education, but superior socialist enlightenment to be carried out.
8) Management and administration facilities in production areas, in the most convenient locations for management and distribution.
9) Storage and production areas close to railway and roads.
10) Completely prohibit and eliminate unclean areas.

The above principles give rise to the following zoning structure.

2.16. Structure of the Belt City

1) Railway zones.
2) Factory and management/administration facility zones: storage, parking and associated education and research organs.
3) Green zones: vehicular roads.
4) Residential zones:
   a) Public facilities—canteen, public health institute, urban and rural meeting halls;
   b) Housing;
   c) Youth village (Young Pioneers, kindergarten, nursery school).
5) Public park zones: areas for relaxation, athletic fields, swimming pools.

6) Agricultural zones: dairy farms, market gardens, horticultural farms, vegetable fields, irrigated land—the placement of state-operated farms and zones will be determined by factors such as river systems, topographical conditions, and prevailing winds.

2.17. Air Defense Advantages

The structure adopts a placement method based on the work processes of factory facilities relevant to each case; and when these urban zoning placement methods are used, this is arguably the most ideal urban formation, not only because there is self-sufficient "integration of city and farm," but also the usual city center disappears and there is no particular weak point in the transport network, or for air defense.

Putting this to one side for the time being, there are not a few new cities in the Soviet Union built on these principles, but it is sometimes said that the results are extremely unsatisfactory because of shortages of technical experts.

2.18. Reforming the Life Structure

For us though, among these theories no clear image has yet to emerge from earlier ideas on the garden city; and regarding the structure of life and the system of life amenities, we must not overlook what is revealed in the following sorts of considerations. That is to say:

1) Comprehensively grasp the working life of workers (these are people directly employed in work that this city must contribute to the national economy) and their other activities (including relaxation, amusement, exercise, and education), with the aim to realize a life cycle that satisfies the equilibrium within the entire life amenity system—this is obviously what is also sought by the "garden city." However, facilities for activities such as enlightenment, social interaction, and amusement, should precisely follow the example set by various forms of public facilities and shopping districts, etc. developed spontaneously (and profitably) in existing big cities; but it is proposed to take things a step further and design a "garden city" that is neatly organized merely by limiting the scale of things, while being aware that fundamental reform of these facilities overall will support and develop new social life and interaction.
2) Give traveling to and from work by employees a positive meaning in a life sense (cycle of life). Attach positive meaning to what can only be called "the karma of suffering" found in present urban life, and make it a part of the life process within the garden city environment that is absent in factory life.
3) Integrate education with production and labor, and in particular make the lives of students (young people), or the next generation of workers, living in the homes of [present] workers not merely subsidiary to urban life but

an important element of it; that is, comprehensively construct the city in its entirety, as a "homeland" or ideal environment to nurture residents who are growing all the time spiritually and physically.

2.19. The Issue of Remodeling Old Cities

Effort must be made to attain these principles also in the remodeling of old cities. Attention is focused on executing structural reform and integration of social life through the remodeling of large-scale residential areas and city center areas, and especially the construction of areas including those for relaxation inside and outside the city as well as nationally (integrated into educational facilities).

The subject of proposals for the belt city has mainly been the new manufacturing city. Systems of completely novel life amenities that anticipate this new life formation are sought after here. When the utmost effort can be expended to nationally regulate all types of social and economic phenomena, building a new city makes it possible to realize in physical form the creation of this type of ideal life structure (cycle of life). However, in many countries, problems arise almost entirely in big cities that already exist, and prevailing conditions restrict everything. Furthermore, the problem of reforming the structure of life and creating a new life pattern also means an entirely different form must take shape. On this point, attention should be paid to welfare movements in countries across the world, including experiments taking place in totalitarian states like Germany and Italy.

2.20. Welfare Movements

The welfare movement brought about the first notable settlements over life facilities: in tackling the distortion to youth life caused by uncontrolled urban development in the United States, the playground campaign provided them with "playing areas." However, what garnered more attention were halting attempts to kick-start the welfare movement through the reorganization of leisure activities. These included undertakings such as Italy's *Opera Nazionale Dopolavoro* [National Recreational Club], and the German *Kraft durch Freude* [Strength through Joy]. These activities of course still did not develop into a reformation of the total system of life amenities, but as ongoing experiments in the direct and rational reconstruction of life itself, ultimately (and based on their achievements) they could probably be used as a guide for a more fundamental reform of life amenities overall.

New perspectives like these on constructing the life base still lacked coherent form. However, by starting with beautifying the environment and organizing leisure life in the daily cycle of life—whether it be for a day or a year, or even as far as events that only happen once every few years—because they directly tackled the reform of life itself, they could be seen as harboring within them new ideas regarding the life structure and the life base.

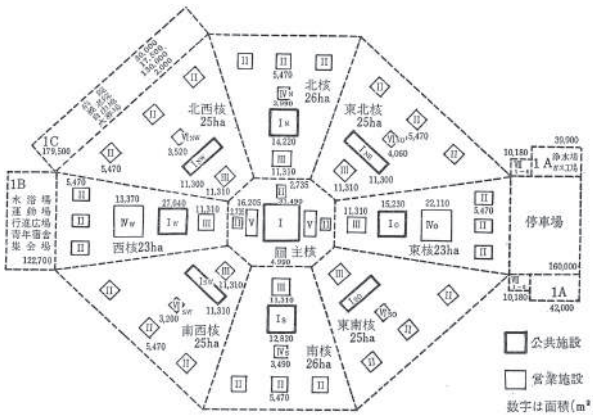
2.21. Housing with Gardens

Just as the pursuit of permanent rural housing largely in the eastern regions was an attempt to expand the homeland of the German people, the quest for permanent housing for urban workers in Nazi Germany was an attempt to nurture middle-aged support for the Reich by forcing workers to own their homes. While the main stated benefit was to provide workers with a healthy living environment and at the same time make evacuations possible during air raids, secondary benefits included improving labor resources by both supplementing family incomes during times of economic decline and [providing room for] relaxation, exercise, and food production during times of economic growth. This was something fraught with many uncertainties, in light of the aim of food self-sufficiency to provide relief for the unemployed inherited from before the Nazi era; however, organizing factory workers in their leisure time outside factory work to do farming linked with production activities as well as relaxation and exercise, was an ideal once advocated by theoreticians of a small-industry associative society, and it gained attention as a further step towards the positive restructuring of the life base.

2.22. Feder's Ideal City

All these experimental solutions devised by the Nazis began of course to appear in their concepts for the new city. Worthy of attention is the proposal for the ideal city devised by Professor [Gottfried] Feder, [a key figure involved in] drafting the party program for the Nazi Party. Feder clearly describes the process of his quest for the ideal city in his work *Die Neue Stadt* [The New City], and in the sample design proposals for the city (see Figures 9 and 10) he puts forward in conclusion, the following points stand out:

1) Self-sufficient small city with population of 200,000—Surrounded by agricultural areas, an industrial/agricultural city with factory zones and workplaces in close proximity along the sides. In devising the proposal for the structure of this city of 200,000, he surveyed the various facilities in existing cities, and based on this research he established the type, scale, and number of public and commercial facilities this ideal city should have.
2) Construction of the region in stages—The entire city would be divided into nine zones, each with three districts. Each zone (hub) would consist of five cells comprising commercial facilities focused on daily life, and the entire zone would in addition be the center for schools, churches and theaters, etc. Every zone would be made up of three districts (east, central, and west), and public facilities would be located within each district. In the central nucleus, key facilities would be built to service the entire city, but among these, cultural facilities would be separately located to the east, and factory facilities along with parking to the west. In more specific terms, along with



Text: 1A, 1B, 1C

	1A
浄水場	Water purification plant
ガス工場	Gas plant
停車場	Car park
	1B
水浴場	Swimming pool
運動場	Athletic field
行進広場	Parade ground
青年宿舎	Youth hostel
集会場	Meeting hall
	1C
病院	Hospital
養老院	Retirement home
自由地	Open spaces
火葬場	Crematorium

Text: clockwise, from top

North hub (北核)
Northeast hub
East hub
Southeast hub
South hub
Southwest hub
West hub
Northwest hub

Text: center

Main hub

Text: key, bottom right

Public facilities
Business facilities
Numbers refer to area, in m^2

Figure 9 Model diagram of Feder's city of 20,000

commercial facilities focused on daily life, the central zone would have various government agencies, assembly halls, banks, markets, libraries, cinemas, nursery schools, and specialized schools, etc.; located outside the city there would be water purification plants, gas plants, power distribution stations, farms, abattoirs, and waste treatment works, etc., associated with the parking zone (east side); exercise zones equipped with swimming pools, athletic grounds, public squares, youth hostels, and assembly halls (west side); and a convalescent zone with hospitals, retirement homes, open spaces, crematories, etc. (northwest side). The city as a whole would be surrounded by small market gardens, dairy farms, and agricultural zones.

In the design proposal for Kirs, which appears among the various proposals for actual designs of this construction, cell, nucleus and city deal with daily, weekly and monthly usages respectively, and are also made to deal with party cell, regional group, and nucleus, respectively.

One could say that the proposal above recreated the various principles related to the ideal city that had emerged since the garden city, with respect to building a small yet completely self-sufficient society in the middle of green areas, and also in other respects, such as dividing the city into sub-districts that had public facilities including schools.

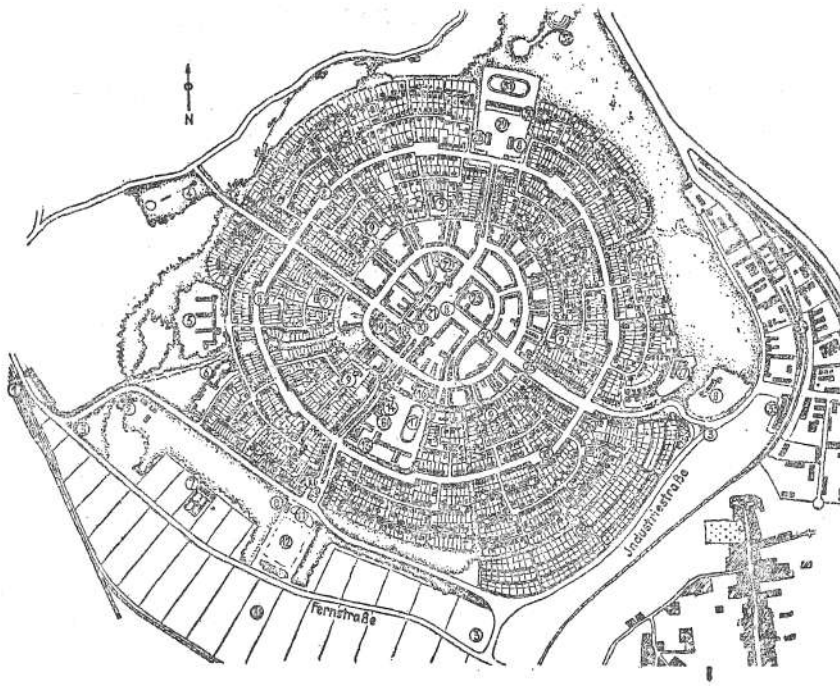


Figure 10 Feder's new city proposal

Also, things such as the integration of convalescence and exercise, and the nurturing of the youth, were supported by the Nazi experience; and the insertion of thoroughly realistic amenities, such as outdoor activities, group training, and exercise, into the city structure was particularly worthy of note.

By attempting to establish the scale and quality of these facilities based on surveys of existing cities, and organically linking these facilities to daily life (circle of life) and making them part of the daily, weekly and monthly tempo, it could be argued this was a theory for the garden city that was derived in a more realistic, more organized manner. On the other hand, though, this was not a proposal like the belt city that anticipated a social structure with completely new production and distribution elements, and combined these elements; it was closer to recreating a small medieval city, just by trying to bring order to all sorts of facilities in forms that existed previously.

2.23. The Life Structure Issue

The small number of historical experiments above have allowed us to look back at various tentative proposals for constructing a positive life base aimed at reexamining and rationally reforming daily life (circle of life), in light of the

spontaneous urban environment produced by the capitalist liberal economic society and the structure of urban life; and [also] at some important points that should be taken seriously. However, our theories on the structure of the life base, our ideal build; are they actually adequate?

3. Contemporary Themes on the Structure of the Life Base

3.1. Urban Problems

The development of capitalist society gave rise to the big city. As the heart of the industrial economy and culture, it was the foundation that made the development of capitalist society possible. However, its growth and development have brought about many ills. Problems with housing, transport, and public health are some of the most prominent issues.

The chronic hardships of life make it difficult for the working class, which constitutes a large part of the urban population, to acquire suitable housing, and as a result they are offered a supply of houses of shoddy quality that reflects their circumstances; sustained difficulty over affordable accommodation and the growth of anti-social substandard housing becomes unavoidable. Threats to public morals, law and order, and public health surge. On the other hand, while the city during the period of rapid development in manufacturing becomes a rich source for the supply of labor thanks to its presence as a focal point for potential manpower and existing housing facilities, this in itself brings about the concentration of the population in the city and absolute housing troubles, and casts a pall over industrial development. In a contemporary sense, housing troubles increase constantly along with the city.

3.2. The Evils of Uncontrolled Expansion

Moving industry to the city and concentrating the population were demanded by this unrestricted spatial expansion. The emergence of zonal growth was inevitable, and with the sustained elimination of housing from the central zone came the concentration of the manufacturing economy in the central zone, and factory zones that entered the city and were encircled by housing; daily life for urban workers now required repeated commuting out of the city, and back in again. These typical one-directional transport flows, and in this regard transport flows that caused intermittent conflicts because of a profusion of mixed-use zoning, threw urban traffic into chaos and caused extreme congestion, and in the end this spelled trouble for the normal operation of the city.

The exacerbation of this disorder posed a direct threat to capitalist society, but also an indirect threat by reducing the rate of profit, and demanded a solution. As a result, solutions were initially makeshift and only treated the symptoms, but gradually evolved into more comprehensive measures. At the

[development] stage of commercial capitalism or bureaucratic capitalism, arrangements became gradually clearer for the organs that could implement solutions reflecting these demands.

3.3. New Dangers

The aggravation of international conflicts between the Great Powers trying to secure economic blocs covering even greater territory, at this stage brought more clarity to the total-war nature of these conflicts. Not only militarily, it became necessary to mobilize the combined forces of industry, the economy, and human resources for the purpose of national defense; demands arose to configure the homeland, and produce arrangements in the most efficient format to reflect the needs of national defense, and the sublation of liberalism under the control of strong nations gained appeal. In other words, it was a demand for "homeland planning."

On the other hand, developments in the airplane drastically changed the way war was waged, and the transformation of the entire country into a battlefield demanded the homeland be structured for air defense; in particular, drastic change also came regarding the issue of urban structure that lay at its heart. This was the urban air-defense structure.

While the suitable location of a city and the distribution of its wealth and population gave rise to the need for regulation through homeland planning, the urban environment and urban life also became subjects for reconsideration, directly in terms of national defense and air defense, and indirectly in terms of the total war mobilization of human and material supply bases. Homeland planning and dispersing important facilities to the provinces became issues, and a reassessment of the friction between city and country had to be considered. Outdated ideas about homeland planning were critiqued through new eyes, and the reexamination of the urban environment as a life base became a pressing matter.

Let's consider these circumstances and take them a step further.

3.4. The Basic Question of National Defense

It is a fact that the broadening and deepening of the scale and nature of international conflicts has expanded visions to devise measures from political and national defense perspectives, where economic demands take precedence. But rather than merely considering this in the light of prevailing circumstances, why don't we now take things a step further? The ultimate goal of national defense must be to secure victory in the long term. Winning the war and the objective to secure an era of peace afterwards, are both evidence of the quantitative and qualitative prosperity of the people themselves, who are the greatest measure of the development of a nation. The prosperity of a race and a people, who are our ultimate purpose, is determined correctly through

the finest appreciation of the value of the people and the value of the labor force—applying this in terms of housing, it just means having the expectation to properly provide the people with a place where they can adequately live and grow. While housing maintains and nurtures a healthy labor force that is the source for increasing the value of the national economy, it must also be the breeding ground to nurture a strong military.

3.5. Homeland and Home Districts

This is an appeal to provide a national life base and home districts different from those the people have cultivated so far. The city cannot be an area squandered on "people" who are against the countryside. At the same time, the unsophisticated life environment as well as the semi-feudal undeveloped character of the countryside must not be held back and kept as an unreformed area just to maintain a few immediate "advantages."[3] Qualitative reformation of the national life to keep up with a highly developed manufacturing economy; the creation of a new social life; making home districts that nurture a people blessed with strong and abundant abilities throughout both urban and rural areas—these are our goals for rebuilding the national life base.

4. Housing Facilities as Constituent Elements of the Life Base

4.1. The Structure of Residential Areas

The ideal plan for housing in the city must of course involve considerations about collective construction. This makes an appearance first of all by way of issues such as how to arrange housing, and how to make housing estates.

4.2. Collective Housing

Quite early on, collective housing forms were developed to cope with crowded urban life. We know that in Roman times, multi-story buildings already existed to house people from the lower classes; and in the Middle Ages too, in cities enclosed by castle walls, this type of tightly packed housing was similarly built to keep in step with increases in population. The rapid growth of populations in modern cities has created a surge in high-density housing in urban areas, and collective housing started being built markedly in the middle of the 19th century. German barracks-style row houses, so-called flats in England, and American high-rise apartments are all typical of this. This housing format was developed with the support of factors including high-density construction on narrow plots; the advantage of being economical from savings on construction, maintenance and management costs thanks to the concentration [of housing]; the increasing numbers of small families including

single occupants; and the societal demand for simple housing to suit highly-mobile residents. Efforts in the quest for collective housing formats produced various experiments in the arrangement of dwellings, and the composition of the form of buildings, etc. However, this process was led by profit-seeking construction companies and rental firms, and as a result, rather than building desirable housing estates, sometimes it moved in the direction of renewed demands to reduce housing costs.

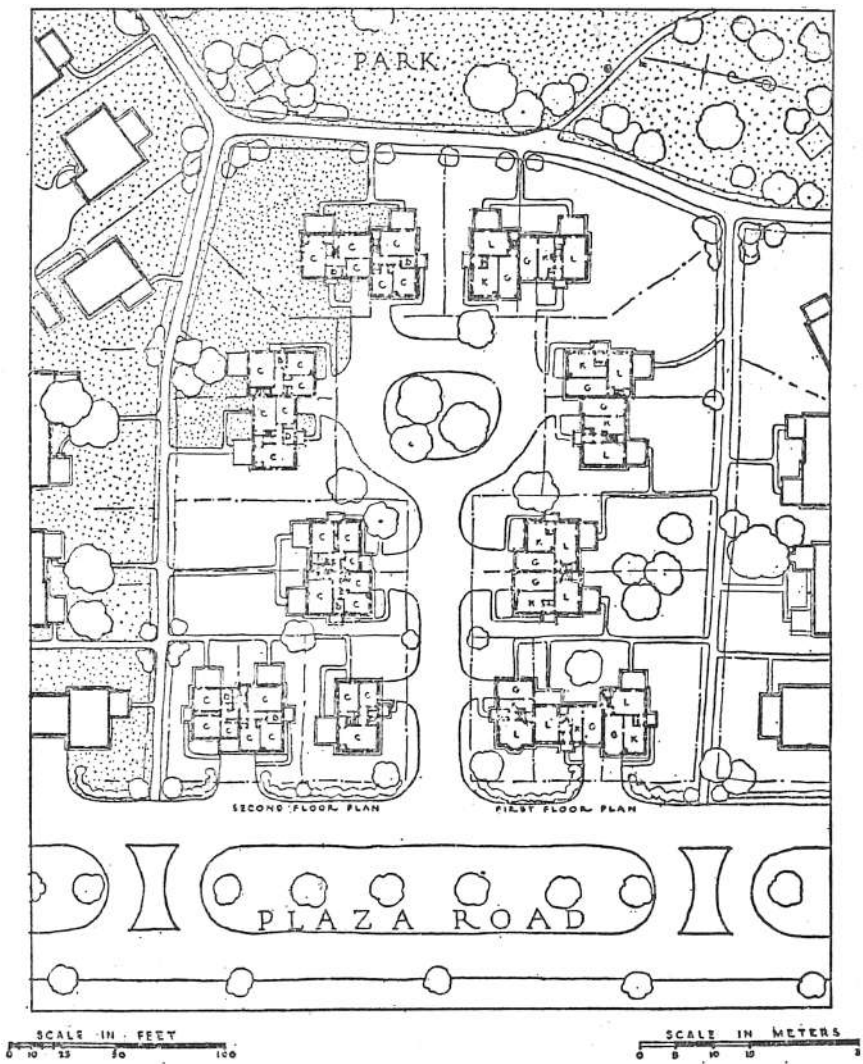


Figure 11 More relaxed cul-de-sac style residential roads, where cars can turn around (Burnham Place)

Japan saw early on the development of row-house-style urban housing, but beyond this not the development of communal or collective housing forms, because of restrictions on construction and materials that were based largely on lumber. With the escalation of the housing crisis after World War I came a rapid increase in semi-detached or communal dwellings known as so-called "Culture row houses"[4] or apartments. However, all of these were deliberately put forward to increase profitability through concentration and not intended to actively improve the quality of housing facilities, so deserved no praise with respect to the construction of housing estates.

4.3. The Placement of Open Housing Estates

During the period of relative stability after World War I, a series of large-scale mass housing construction projects took place in various countries in Western Europe. Naturally, this type of mass construction of housing led to much positive interest in the building of housing estates. In England detached houses that stand alone were the main objective, dispersed and rural-like placement became mainstream ever since the garden city, and limits on the density of dwellings were adopted based on this experience. Legislation in 1923 and 1924 regarding the state-assisted construction of housing determined that in urban areas 20 dwellings could be built per acre, and in the countryside 12 or less.

For this type of free-standing dispersed dwelling, the specific placement method for residences was in the main closely connected to the placement of roads, and of note was the recommendation to use roads such as the cul-de-sac and the "*overhang*."

Cul-de-sacs found in congested city housing zones should have been rejected due to sanitation issues and public security concerns during emergencies, but they were deemed especially useful in open construction because they reduced the road surface area and made housing more private and restful. Furthermore, beautification of the environment through curving roads and variations in the placement of houses was sought after; small garden allotments were possible in the open spaces provided by sufficiently open housing estates, and this brought about the development of ways to make use of recreational areas, including enclosed parks formed by grouping these garden allotments together.

4.4. The Quest in Europe

In Germany, where the development of housing forms had been pursued since the latter half of the [19th] century, there was broad discussion about what sort of housing format should be used in new construction after the Great War: dispersed, open style; concentrated style; or some other style. Naturally, it was decided that the once profitable "barracks-style row house" should be rejected. But sufficiently separated high-rise housing that properly accounted for

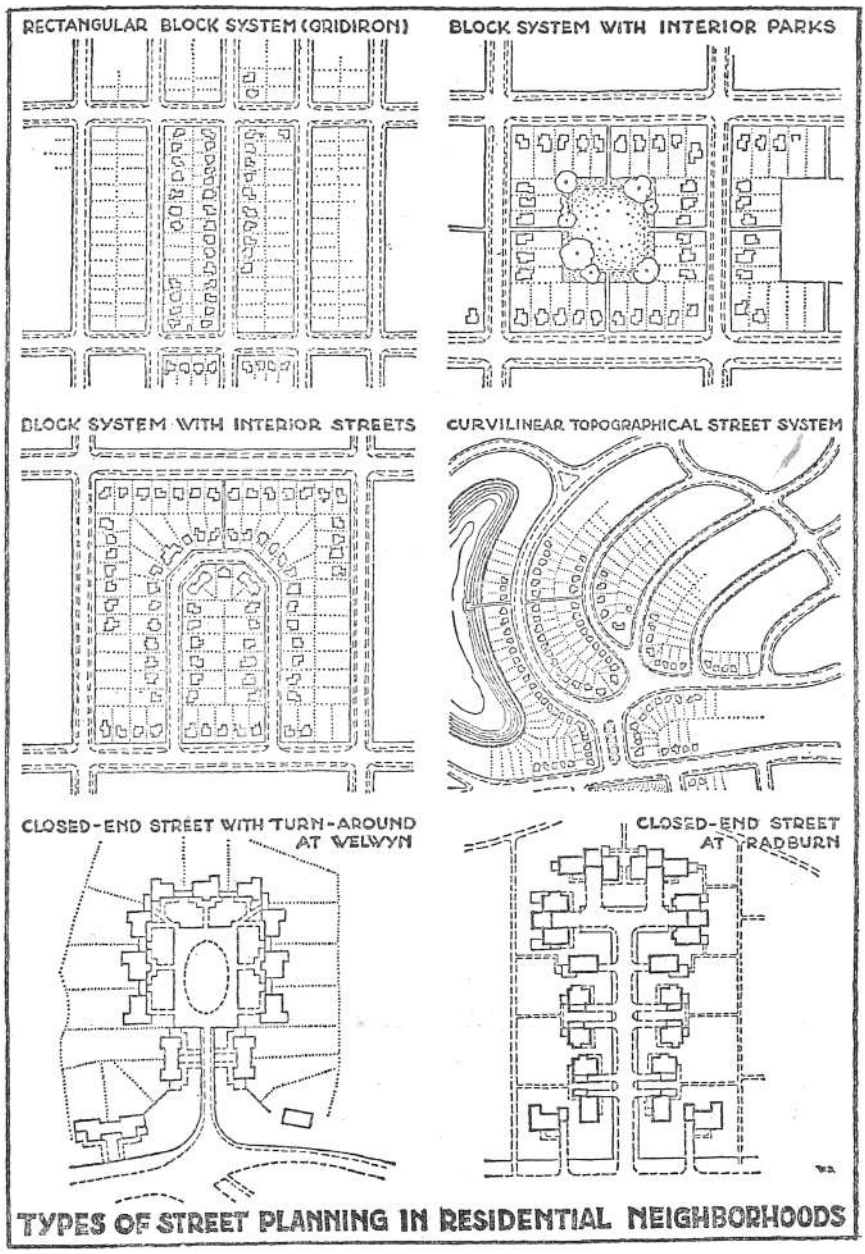


Figure 12 Types of street planning in residential neighborhoods (T. Adams, "The Design of Residential Areas," p. 151.)

legislation concerning placement was not necessarily rejected. And here, among the various principles concerning the placement of housing, the issue of low-rise versus high-rise became the focus of discussion. The most typical examples of this were the various disputes among CIAM (*Congrès internationaux d'architecture modern* or International Congresses of Modern Architecture) members [Walter] Gropius, [Ernst] May, [Ludwig Karl] Hilberseimer, and others; at the 3rd CIAM meeting the theme was "rational methods of placement," but discussions were mainly concerned with this issue.[5] This dispute deliberated over what significance there was in building up life in a new society using housing formations consisting of high-rise or low-rise buildings, but an offshoot to the main discussion dealt with which was the most economical overall (with respect to land, construction costs, and the tax burdens of residents).

4.5. High-Rise or Low-Rise

Purely from the perspective of economics, it is said that the economicity of construction can be found in the cost of land development and fixing minimum values by adjusting the number of stories to offset the expense of elevators. Gropius set this at 10 to 12 stories. In a low-rise building, it is easier to get closely involved with the garden, more convenient to watch over children, and easier to secure the building's privacy. But high-rise buildings can also be built with these qualities, and also be restful; they can be well-ventilated and sunny; they can have broad expanses of lawn and playgrounds; and collectivizing and concentrating facilities makes it more convenient and brings down management costs, so women can be liberated from their housework. According to Gropius, much of the opposition to high-rise buildings was a question of an emotional psychology and the force of habit, and this had to be resolved through politics and world view. However, while making politics and weltanschauung the problem, it could be argued on the one hand that questions had been posed and solutions proposed for things that needed attention—that the cost of housing, one of life's burdens, must be lowered, or the pros and cons of being faced with possible devaluation; in other words, the reflections of the sort of social democrat who would change the subject to "economicity"—but on the other hand, this was done under the sway of an extremely narrow-minded vision.

The actual conclusion drawn by the debate was the notion that a mid-rise building of four to five stories, which didn't need an elevator, was the most economical.[6]

4.6. The Layout of Housing Lots

This type of debate is merely of theoretical interest in our nation, where the structural forms for housing (wooden, single- or double-story) have completely different material and technical requirements. Also, the reality in our

nation is that it is not a problem to exclude construction on individual lots for sale separately, whether they are commercial in nature or managed publicly, when it comes to collective housing construction on a housing complex. The layout of housing there largely accommodates the taste of the customer, and land is subdivided with the target of even higher profits.

4.7. Allotting Land by Rezoning

A type of urban planning work that resembles this is found in land rezoning, which plays a useful role in the urbanization of the city periphery. However, the composition of housing areas here is based on assumptions derived from previous spontaneous allocations and a housing scale; and the size of land parcels is only decided according to the "estimated" standard of the zone, from Grade 1A through Grade 9.[7]

Moreover, it is extremely difficult to realize the designer's intent because the few planning considerations allowed here are based on trying to realize an estimated "size of allotment," and this is a fundamentally unreliable method.[8]

There are substantial contradictions between the planner's expectations and the interests of the landowner on the one hand, and the reality of urban development outside the control of the planner on the other; ultimately, like most "plans" in general, they are not developed according to expectations, and merely attempt to prevent the occurrence of chaotic, narrow and meandering roads.

4.8. New Housing Forms and the Structure of Housing Estates

The structure of housing estates in the Soviet Union is considered from a totally different perspective.

Here it is not merely a question of the placement of groups of buildings; rather, it is to present the objective of discovering a housing form that most conforms with the socialization of life, from the perspective of taking one step further in the promotion of the construction of Socialism through housing facilities that have the closest possible connection to social life.

4.9. Doma Kommunuy

There were extensive discussions on this issue in the 1930s, when Socialist construction started making great progress, about the construction and search for a new socialist-housing form called *Doma Kommunuy* or "community housing."[9] The old form of the detached house was linked to old family structures and individual household budgets, and presented an obstacle to the socialization of life. The Socialist way of life included maximum socialization of life amenities and meals, child-rearing, education and culture, and household management, etc.; and liberating women from the household economy was made a primary consideration. The new housing had to be something

which made possible a collective life that brought advancements in life culture, and gave rise to psychosocial associations and social interaction and customs, while respecting individual abilities. The family was the smallest independent life unit, but to combine these mutually and in an organized manner, housing was needed that socialized child-rearing and other activities in the most rational way possible under the direction of experts—based on the above premises, this was the so-called "community housing," housing consisting of a large construction complex that combined individual rooms for residents to sleep and relax, with shared cultural and commercial facilities.

4.10. Concentrated Format and Dispersed Format

Designs for community housing put forward in various forms by a number of architects could be divided roughly into three types.

The first was claimed to be a concentrated type, and many could accommodate on a scale of between 1,000 and 2,000 residents in a single communal dwelling. These dwellings consisted of individual rooms so everyone could lead their own private lives, and a communal section that was concentrated and differentiated to the greatest degree possible. Since this type was a concentrated format that could be both a building and a city, it was the most economical in terms of construction and operation; but because the individual no longer retained any sense of "self" among this collective of 1,000 or so people, it was little more than a "well-ordered hotel" and was considered unsuitable as a life facility to create the new society.

Diametrically opposed to this, the second claimed to be a dispersed type, and was composed of housing for families surrounded by small gardens; it attempted to organize these detached dwellings into a communal life through the full use of every form of modern mechanical technology including transport and communications systems. This proposal was extremely idealistic from an economic perspective, and even in terms of the development of social life, it was little different from the series of housing estates of the past; whether children were raised there by individual schooling in each home or were educated away from their parents, no rational outcome could be expected from either.

4.11. Proposal for Phased Format

Responding to these two types, the last one claimed to be a "phased" type. Its foundation was a cellular life collective consisting of defined individualistic associations, and it was a proposed cluster of housing facilities that could realize the phased construction of a life community that would build a progressively broader, high-quality lebensraum or living space; the form these individual rooms that comprised the foundation cells would take, would be built from groups of collectives in this gradually broadening living space where each life collective could access communal facilities.

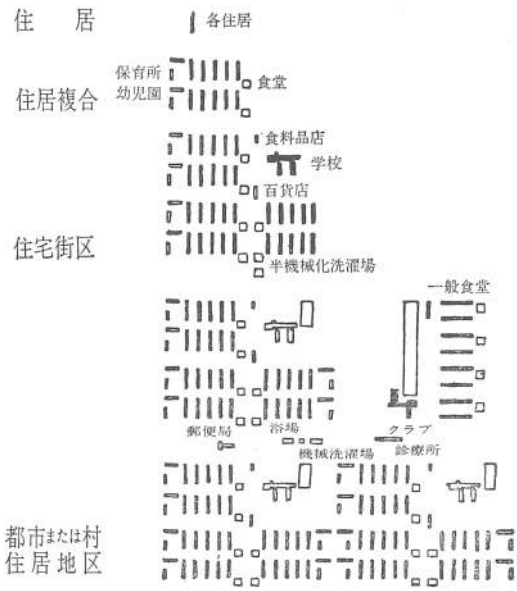
After much heated discussion and debate, it was decided in the end that the third type was the solution most suitable for constructing the material environment of this new social life. What follows next is an introduction to one variant for the proposed Socialist city based on this interpretation.

4.12. One Variant of the Socialist City

1) Communal cell (36 people)
   Single rooms (with built-in wardrobe, toilet, washbasin with shower attachment, telephone; single occupancy for 18 men and women); communal facilities; room for rest and relaxation (reading, listening to the radio, playing chess); recreation room; writing room.
2) Communal primary facilities (180 people)
   Workroom for noisy activities; collective office; assembly hall; social activity room; recreation room; solarium; meeting hall.
3) Communal secondary facilities (360 adults, 20 children)
   General rest rooms; library reading room; collective office; assembly hall; individual rooms for special uses; recreation room; dining hall; kiosk; infant nursery; exercise and recreation grounds for individual or group use; cloakroom; meeting hall.
4) 2,000 person collective
   Social center (assembly hall; cinema; meeting room; children's play center); recreational park (recreation rooms; amphitheater); dormitory school for 3–8 year olds with fitness center (sports center; swimming pool; kiosk); dormitory school for 8–16 year olds; outpatient department (with beds); workshops.
5) Communal collective
   Assembly plaza; cultural house (elegant assembly hall); sports center; school district; park avenues; cinema; library; local medical facility; shooting practice range.
6) Socialist city
   Central square; cultural hall; sports center; advanced specialist colleges; youth cultural hall; science and technology museum; park district (cultural and recreational parks; tree-lined avenues; zoo; botanical garden); radio broadcast station; airport; medical facilities (prevention and public health bureaus, hospitals); etc.

4.13. Standards in Typical City Planning Bureau

Furthermore, according to 1931–1932 standards in a typical city planning bureau, created to meet the needs of rapid construction of collective housing areas in industrial zones, the construction of housing zones established the following type of stages of zonal composition that must coincide exactly with actual demands based on similar principles.[10]



Text: from top

住居	Residence
各住居	Each residence
住居複合	Cluster of residences
保育所	Daycare center
幼稚園	Kindergarten
食堂	Canteen
住宅街区	Residential neighborhood zone
食料品店	Grocery store
学校	School
百貨店	Department store
半機械化洗濯場	Semi-mechanized laundry
都市または村住居地区	City or village residential zone
一般食堂	General canteen
郵便局	Post office
浴場	Bathhouse
クラブ	Clubhouse
機械洗濯場	Mechanized laundry
診療所	Medical clinic

Figure 13 Phased construction of the city's internal structure, according to Soviet Union standard city planning bureau

Construction system for permanent residence areas:

1) Housing cells—Basic housing facilities (bedroom; private restroom; room for reading and grooming; kitchen and dining room for families); homes for individual families and rooms for boarding.
2) Housing—Combining housing cells; communal residents access communal dining hall and rest rooms.
3) Housing compound—Housing collective; dining hall; day care for pre-school children (nursery school for infants; kindergarten for 3–8 year olds); gymnasium.
4) Housing block—School; laundry facility; facilities of a general urban and local nature (bathhouse; department store; grocery store).
5) Local area—Administrative; public facilities (post office; public health bureaus; clubs; restaurants; sports ground).

4.14. Plans for Adjacent Land in the U.S.

In the liberal capitalist United States, which is worlds apart from any Socialist nation, progress on these issues has been made through solutions that reflect its special circumstances, in particular the development of motor traffic. The development of high-speed road traffic, along with rapid urban growth, pushed people off the roads and increasingly distorted the pattern of urban life.

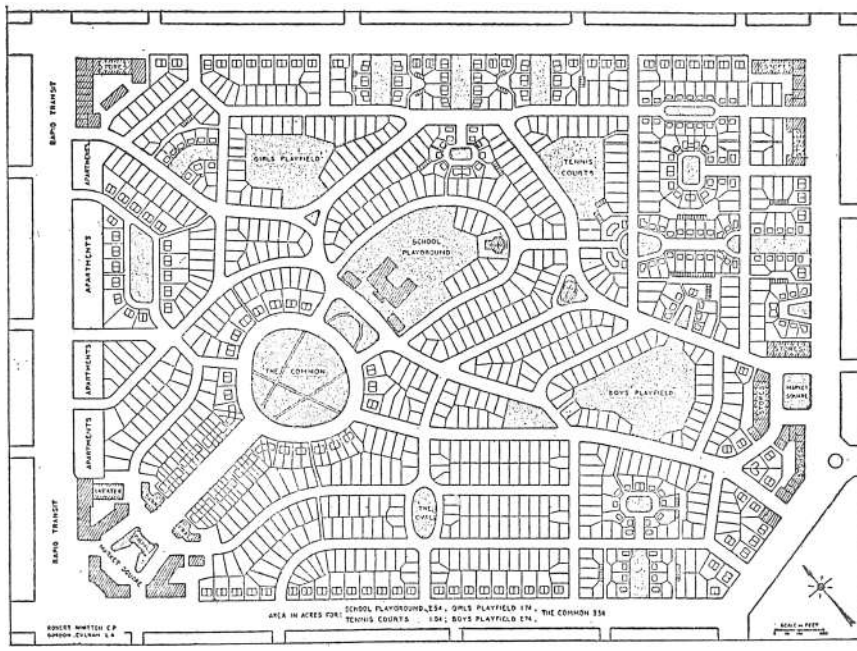


Figure 14 Unit division plans for 160-acre residential estate (R. Whitman)

This dire situation brought about progress in the public health movement as seen in the campaign for playgrounds, but as to where in the city to locate the various types of public health facilities that were planned as a result of this process, views were gradually cultivated on the systematic development of adjacent areas. On the other hand, demands to construct zones separated from trunk roads and their busy motor traffic, to make residential areas peaceful and quiet locations for relaxation and raising children, gave rise to numerous designs for residential estates with cul-de-sacs, park roads and small parks, etc., in adjacent areas. (See Figure 14–17.)

4.15. Research on Housing Estates in Our Nation

Due to limitations arising from actual conditions as previously explained, plans in our nation for residential estates, the basic unit of urban construction, have yet to be seen as an actual issue. However, inspired by plans in a number of foreign countries, especially the United States, for adjoining housing estates, this sort of subject has already gained the attention of experts in the form of theoretical studies into the construction of housing estates.

What happens in a purely theoretical sense to single units of housing that make up a city? If we look at Keisuke Yamaoka's study *Toshi kōsei no tan'i kugaku* [Unit division in urban construction] presented at the 6th

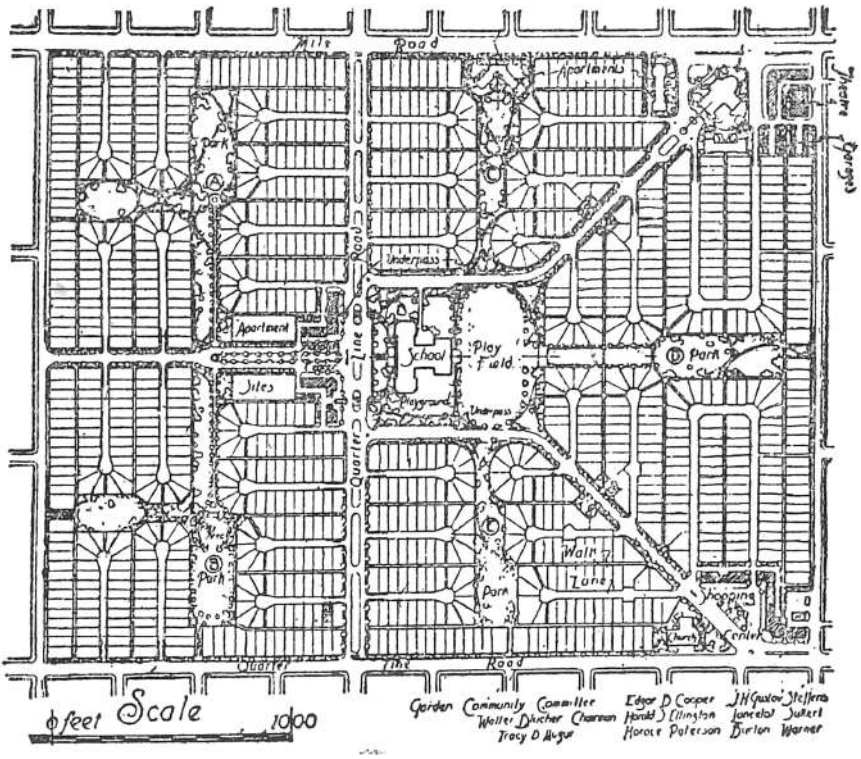


Figure 15 Residential estate proposal

Urban Issues Conference [1938], based on Ministry of Home Affairs road planning standards the author supposed he had a 500 square-meter housing estate unit ringed by trunk roads, and closely scrutinized the point of placement of public facilities such as transport (trams and buses), parks, elementary schools, public markets, air-raid shelters, water mains, and fire hydrants; he proposed placing elementary schools, parks, and markets in the center of this 500 square meters, and concluded that this was generally acceptable, even if there might be slight adjustments to the size due to the level of population density.

4.16. Architectural Institute's Competition

In 1939, the Architectural Institute of Japan held a prize competition, with the theme "Plans for Collective Housing for Workers," aimed at reforming life on the home front for workers in the flourishing industrial sector. The rules called for designs of groups of wooden dwellings to accommodate 3,000 residents including roughly 700 single persons, and associated communal facilities; to be

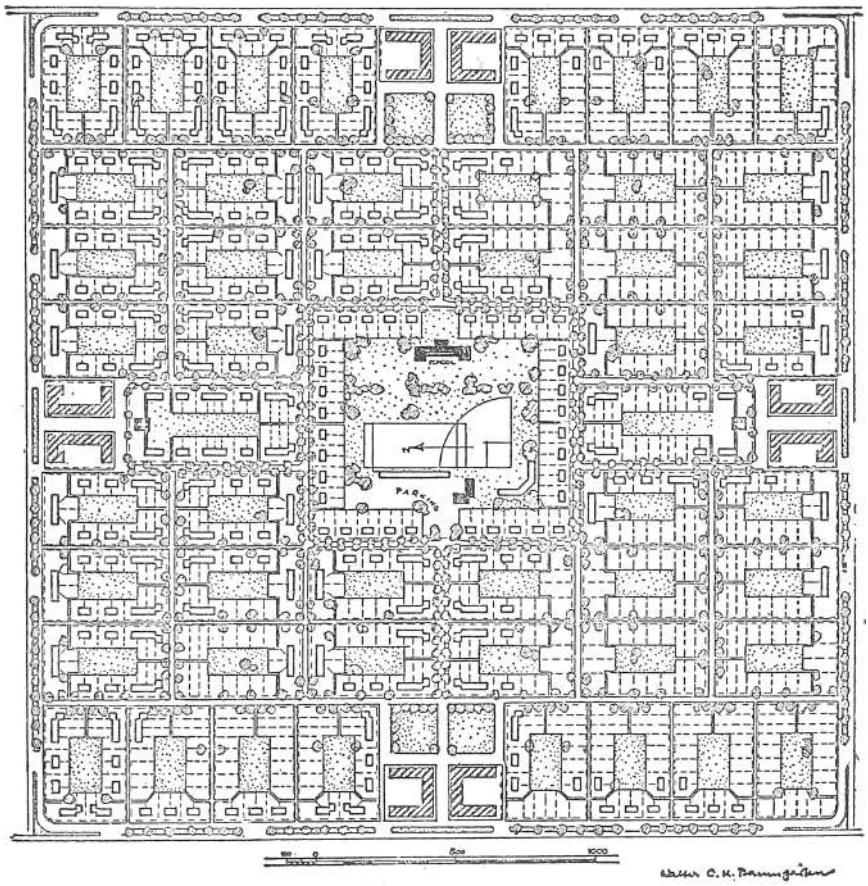


Figure 16 Residential estate proposal (rectangular and crossroad pattern); Thomas Adams, "The Design of Residential Areas" (1934), pp. 210–211

contained in a space with sides of 1,000 m.; to build a main 200 square-meter focal point in the center for an elementary school, post office, and park, etc.; and to divide the surrounding area into four zones measuring 400 by 600 meters, and give each zone a central feature such as a bathhouse, daycare center, market for daily items, or children's park. The winning proposal included elements such as housing clusters for multiple households, communal use of wells and clothes-drying areas, and town meeting halls.[11]

4.17. Elementary School as District Focal Point

The approaches of the two examples given above were completely identical in that their zone formation (or more-specialized incremental zone formation)

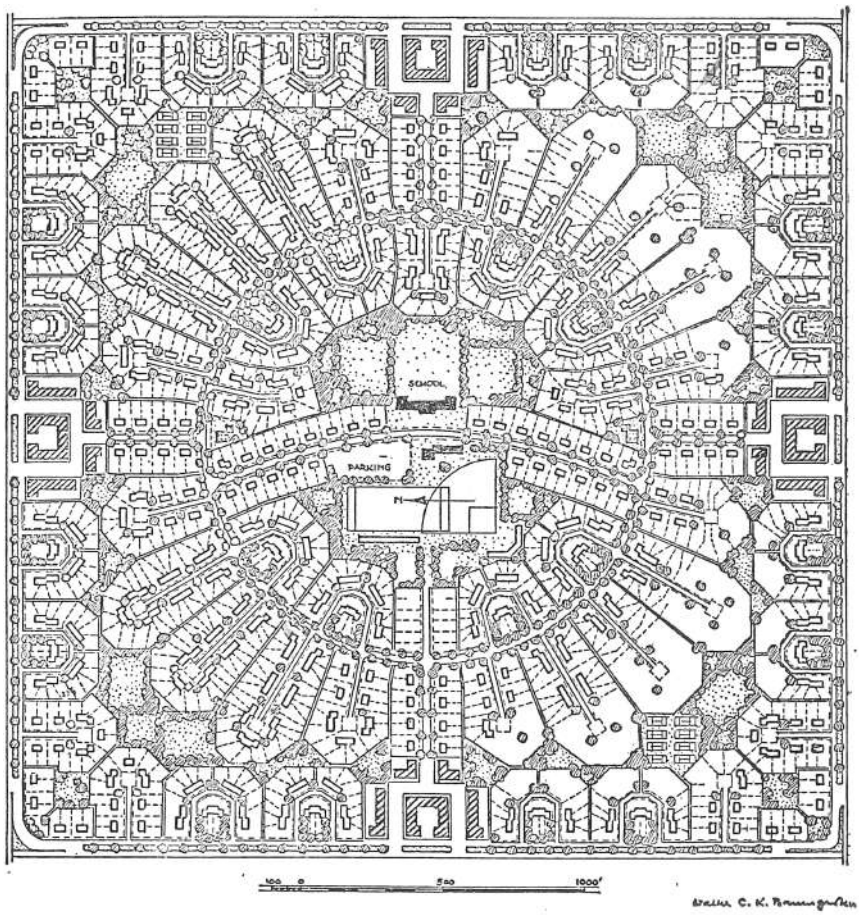


Figure 17 Residential estate proposal (cul-de-sac and circular pattern)

had elementary schools and other public facilities at their center, except that size of zone unit was increased in the latter. With respect to this increase, Tatsuo Yoshimura,[12] in his study into "adjoining units," stated that 100 hectares would ensure that housing would be at the proper distance from railways and shopping districts to remain undisturbed, and there would be less inconvenience when using transport facilities to go shopping or commute to work, and traveling to school, etc.

4.18. Sociological Research

Research into this sort of adjoining unit had to be adopted since the design for the collective housing estate would construct a new social collective; but it

also enlightened the research of sociologists regarding, firstly, a sense of public order and convenience in life, as well as the social character of housing zones where sociability and comfort were necessary. Thoughts on the sociological significance of "adjoining units" were mainly spurred on by studies done in large American cities, and here the discussion was about the need to establish regional communities and protect local character. Individuals wanted to see themselves reflected in their surroundings, in their society. To do that, they needed a sense of intimacy and attachment. A small community built in this way would be an extension of one's own family. A housing zone would first preserve its local character and be built as a small society in this sense, and for the resident it would become a true "hometown."[13]

As a result of this sort of research, sociologists found that a housing zone with an elementary school as its focal point was of course the most suitable. It was only right that an elementary school would be at the heart of a small society with a secluded, local character; however, as an amenity it was not only useful simply for educating young citizens, it also had the advantage that it could be used as a public facility in the middle of the district for many other purposes including meetings, public services, recreation, and sports.

4.19. Incremental Construction of Zones

On the other hand, in response to the reinforcement of national defense and administrative organization since the outbreak of war between Japan and China, the *tonarigumi* or neighborhood association was a regional civilian defense cell, the local bonded group adopted as the lowest unit in a civilian organization, that handled and coordinated practical life matters, such as the control of consumption where it distributed and rationed daily items; as this became increasingly important, gradually people began to advocate that collectives like these *tonarigumi* must be adopted as unit cells in regional structures. As a result, the lowest communal facilities were attached to *tonarigumi* units, and gradually higher-level public facilities were appended to higher-level regional collectives; the theory for "phased" housing zone construction to build up the region overall gained more momentum. The essay "Kinrin jūku no kōsei" [The construction of neighborhood units] appeared in *Shomin jūtaku no gijutsuteki kenkyū* [Technical research on ordinary houses], written by the Architectural Institute's Committee on Housing Problems[14]; it gained notice as having taken this sort of research as far as it could go. A simple outline of this phased construction appears below.

4.20. Proposal by Institute's Housing Problem Committee

1) *Tonarigumi* units (10–20 households, 0.5–1.0 hectares): *tonarigumi* public square (also serves as recreation park for preschool children); air-raid

shelter; well; swimming pool; sandpit (to be used for fire fighting and evacuations during emergencies).

2) *Keibō* [civil defense] units (60–80 households, 3–6 hectares): use children's park in cases where *tonarigumi* unit doesn't have a public square; "communal facility for providing meals" if this is to be done; surround the periphery with roads (wider than 6 meters) accessible by fire engines.
3) *Kōbai* [purchasing] units (400–500 households, 12–25 hectares): market (or distribution center); small park; daycare center; bathhouse; neighborhood association office; police box, etc.
4) *Kinrin* [neighborhood] units (1,600–2,000 households, 60–100 hectares): elementary school (evacuation area in the basement; lecture hall and gymnasium also serve as a civic hall); library; ward office; civil defense office; life guidance bureau; neighborhood park; hospital (clinic); post office.

4.21. Example in Manchukuo

With regards to the collective housing system that must be considered the basic unit for urban construction, proposals in Manchukuo for housing for residents of Japanese descent are based on exactly the same considerations. The exception is that, here, the smallest measure for unit housing corresponds to that given in Point (2) above, and the design standards for *rinho* (neighborhood) housing and *shūdan* (collective) housing are given below as examples.[15]

1) Unit housing (50 households, 250 people, 22,500 m^2); toddlers' park.
2) *Rinho* (neighborhood) housing (300 households, 1,500 people, 157,500 m^2); housing management office (offices; central heating; rubbish disposal); kindergarten; children's park; police box.
3) *Shūdan* (collective) housing (1,200 households, 6,000 people, 810,000 m^2; 900m x 900m square); state-run school; ward government office; housing agency; public health institute; consumer association; shopping district; housing park.

4.22. Housing Zone Completion

The above systems for neighborhood and collective housing are both intended for average workers and ordinary people living in cities (the question posed in the Institute's 1939 competition, which became the basis for their proposal, was more restrictive and only allowed workers); and it is possible to argue that they were theoretical draft constructions for the most idealistic and conceivable unit to build a form of permanent housing for groups of people working at various places of employment located outside the residential area. In terms of solutions previously presented, they match almost entirely the intermediate unit

of urban construction in phased-form solutions presented by Soviet architects in their community housing (*Doma Kommunuy*).

4.23. Two Aspects of Life

However, even if we can realize facilities here with this sort of systematic organization for housing, we must consider the fact that we cannot then declare that similarly our lives will immediately be organized systematically as we would wish. In other words, in addition to our "life in the home" that these solutions address, we also have our lives in the workplace that make up the other important half of living, as well as the various secondary life processes when these two are connected; these two aspects of our lives have a reciprocal and structural relationship. In order to do this we are trying to make this homeland into a more appealing place—surely a realistic process in developing our race—and we must not divide "life" strictly along lines of work and home, nor consider each in isolation.

4.24. The Issue of Overall Construction of Life Amenities

When the decision is made to try to construct a perfected system just by divorcing housing from life in general, especially lives spent in production and labor, this means setting out initially from an idealistic or incomplete and narrow outlook.

This is based on the fixed premise that a society is where enterprises construct workplaces to suit themselves, and build housing with a different intent, namely to derive a part of their income which they extract from it; it is an approach from times past (but also the present day) where urban planning only considers that "work is work, and home is home" and maintains a strict separation between the two. What makes this unrealistic is that, as long as it is based on the aforementioned premise, this kind of theoretical plan is a dream that can never actually be realized. What makes this less than satisfactory is that, if we assume the conditions needed to realize the sorts of ideals we now hold have been secured, it would be time to evolve into a form of systematic structure for *total life amenities*,[16] on a foundation where problems are dealt with more comprehensively rather than just examining the basics, or in other words where *total life*[17] is systematically reconstructed all the way from work to home; moreover, there would be a sense that this had to be done.

In the discussion above we have only taken an extremely brief glimpse at previous research into the construction of housing zones. However, the housing problem is linked, in the sense indicated above, in the first place to life in the workplace, and secondly to the city overall as a life base that combines work and home, in other words the issue of constructing the entire nation.

These various issues must in future become the focus of our consideration.

(Clean copy, July 7, 1942.)

Notes

1 Translated from *Nishiyama Uzō chosakushū 3* [The collected works of Uzō Nishiyama, volume 3], *Chiiki Kūkan Ron* [Reflections on Urban, Regional and National Space] (Tokyo: Keisō Shobō, 1968). "Dai 1 shō, Seikatsu kichi no kōzō" [Chapter 1, The Structure of the Base of Life], pp. 19–56. The English version of this chapter, and of Chapters 9 and 10, provided by Norman Hu Translation.

2 Translator's note: The author uses the contemporary term 英本国 (*Ei-honkoku*), instead of 英国 (*Eikoku*) which is used everywhere else when referring to England. Presumably he is emphasizing here that he means only the British (home) Islands rather than 英帝国 (*Ei-teikoku*), or Britain's extensive empire.

3 Nishiyama's note: This refers to the known wartime slogan "*minzoku taibō*" [national austerity], where a simple environment promotes a strong race.

4 Translator's note: *Bunka nagaya* or "Culture row houses" refers to the buildings that were constructed in the *Bunkamura* or "Culture Village" at the Peace Commemorative Tokyo Exposition of 1922.

5 Nishiyama's note: "Rationelle Bebauungsweisen" Ergebnisse des 3 Internationalen Kongresses für Neues Bauen, Brüssel Nov. 1930.

6 Nishiyama's note: Thirty years later, in the construction of apartments in our nation after World War II, these conclusions were followed virtually unchanged; however, the reciprocal relationship between the appraisal and the condition of highrisification has changed greatly, due to productivity developments, technological advances, and the progression of urbanization and densification.

7 Nishiyama's note: Land Rezoning Design Standards, July 1933.

8 Nishiyama's note: Sadakichi Ibe, *"Jūtaku no hyōjun kakuchi"* [Standard allotments for housing], *Toshi Mondai* [Urban issues], May 1940.

9 DOMA-КОММУНЫ, строительство Москвы 1929–1931 [DOMA-KOMMUNY] stroitel'stvo Moskvy 1929–1931]

10 P. N Blokhin, Tipizatsiia zhilishch, Obshchestvennykh zdannii pri planirovke nasselennykh mest, 1933.

П. Н Блохин, Типизация жилищ, Общественных зданий при планировке населенных мест, 1933

11 Nishiyama's note: *Kenchiku Zasshi* [Architecture magazine], Dec. 1939.

12 Nishiyama's note: Yoshimura Tatsuo, "Kinrin tan'i" [Adjacent units], *Toshi kōron* [Urban opinion], May 1940.

13 Nishiyama's note: Okui Fukutarō, "Gendai daitoshi ron" [Theories on the contemporary city], and "Jūtaku ron no shakaiteki seikaku" [Sociological nature of housing theories], *Kensetsu to Shakai* [Buildings and society], June 1940.

14 Architectural Institute's Committee on Housing Problems Report: *Shomin jūtaku no gijutsuteki kenkyū* [Technical research on ordinary houses], *Kenchiku zasshi* [Architecture magazine], January 1941.

15 Nishiyama's note: "Manshu ni okeru toshi keikaku to shūdan jūku sei" [Urban planning and collective housing system in Manchuria], *Jūtaku* [Housing], January 1941.

16 Translator's note: This is Nishiyama's original emphasis.

17 Translator's note: This is Nishiyama's original emphasis.

9

AN ESSAY ON THE NATIONAL STRUCTURE[1]

This chapter is a tentative proposal for urban configuration in Japan, and adopts a position critical of the "urban sprawl theory" widely promoted during and immediately after World War II. Following on from the previous chapter, this essay, although slightly abridged, brings together the theme of "gradated construction of state and city."

Large cities facing overpopulation and high-density industry are condemned for various reasons; conceivably, small residential zones could be dispersed throughout the countryside if physically urban enlargement merely involved a merging of the manmade environment; however, this is impossible in Japan due to limitations regarding land and population. With this in mind, I critique the theory of urban structure Ishikawa Hideaki developed in works including the wartime "Constructing the City for the Empire" [*Kōkoku toshi no kensetsu*]; I focus on medium-sized cities of between 100,000 and 200,000 people with residential and urban structure units of fixed populations, where work and home are intimately connected and support a cultural life, and I propose this as the fundamental unit for the national structure. Accordingly, rural areas are composed of carefully positioned medium-sized cities that residents of the entire region routinely use as cultural and economic centers; meanwhile very large urban city complexes serve as regional and national hubs, and are created by locating together medium-sized specialized-function cities or a group of such cities in a coordinated organization that rationally allocates functions. In each case, these urban units are separated by rural zones or at the very least by green belts, and this prevents the formation of sprawling megacities. Even if not everyone knows each other, a completely stable regional community of at most 200,000 is created. This evaluates from a certain critical perspective theories proposed by Ishikawa to develop Japan that ignore urban lives and press ahead with urbanization and the devastation of the regions—theories that call for gradated formation of urban areas to bring together daily, weekly, monthly, seasonal and annual rhythms of life, by investigating first of all the "bustling city center" and then emphasizing functionality revolving around business, economics and culture; it could be said that [my] tentative proposal builds on this, yet adds revisions to accommodate Japanese conditions which

demand a more concentrated national structure. This proposal in principle has been devised based on conditions that meet the rhythm of daily living, or of that over slightly longer periods, in economic and cultural centers that can support a certain population size; but the slightly less important conditions for urban formation—industry location and transport structure—are generally left somewhat abstract. Not that these conditions are ignored. Rather, the fact is that to counter overconcentration, ever more urban sprawl, chaos, and congestion in a growing city when these conditions are left to develop unchecked, stress has been placed on trying to meet the condition of restoring prosperity to people's lives when striving for [urban] reconstruction. Moreover, this tentative proposal is a broad attempt to sketch out the parameters for the all-important large cities in regional areas throughout the long and narrow Japanese archipelago, based on the model that was studied.

Incidentally, there is a marked difference when comparing this tentative proposal for the reconstruction of the nation, and the actual state of national development that occurred in the following two decades. This is obviously because several important conditions upon which this plan was based, things such as transport technology and agricultural problems, developed in a completely different direction. Uncertainty also arises as to whether this difference fundamentally undermines the framework of the pattern for national reconstruction presented here, so it cannot simply be set aside.

For instance, modes of transport are determined by the underlying factor of the size of local configurations, so this plan only allows for foot traffic or bicycles in the lowest ranked hamlets (C1) and villages (C2). Therefore hamlet size is designated at a maximum radius of 4 km. If motorcycles or four-wheeled vehicles are considered, then a local configuration of a much larger scale must be adopted, and constructs at the C1 and C2 level must be enlarged. Moreover, if high-speed transportation systems such as aircraft and super express trains come into consideration, projections that anywhere in Japan can now be within one day's travel from, or a return day-trip to, the nation's capital, will become a distinct possibility; so rather than the proposed layout for 12 regional urban centers, a configuration is also conceivable where the capital becomes more concentrated, more centralized. Also with regards to people's lives, rather than nodal points in the form of central facilities (plazas) being successively developed to create a piled-up pyramid formation, if more emphasis is placed on creating national-level flows, perhaps the expansion of residential areas and urban facilities will follow along traffic axes, and the national formation will be more of a network configuration instead of a nodal-point configuration. And with respect to agriculture, when integrating the perspective of linking the urban environment to the countryside with that of industrial agriculture being based on boosting systems of food self-sufficiency, what comes to mind in any case is to produce fresh foodstuffs in the periphery of large cities; but in reality this depends on the development of specialized

production localities and rapid transport systems, and the trend is to reject that way of thinking.

Saying this though does not mean simply accepting the present reality, and some points made in this tentative proposal are somewhat unrealistic and require fundamental revision. At present further study is being made of these points, and while slightly overlooked elements of these new ideas have been added, this chapter is being included in these collected works largely as originally published.

Furthermore, what has largely been omitted at this time of publication is the problem of where to settle the future growing populace, in this network of cities arranged in a regional formation to handle expansion of industry and population. In this regard, to keep pace with industrial construction the original publication considers only the required number of new builds specified in yearly plans, of standard cities of 100,000 to 200,000 people which are integrated into surrounding agricultural areas. This will be impossible unless the structure of society is advanced further by the overall economy through national plans, but it must be noted that even if such conditions are fully met, it will be quite difficult.

In any case, this tentative proposal is somewhat outdated with regard to specifics. However, since some of the issues raised here are conditions that must be considered in future conceptual planning for the national structure, I decided to include it in my collected works.

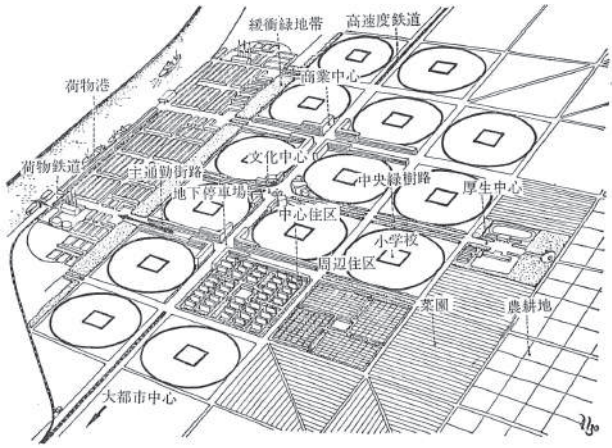
(Originally published as "Atarashiki kokudo kensetsu" [The New National Construction], in *Shin Kenchiku*, June 1946.)

1. Control over the Planar and Contiguous Urban Environment

The theory of the so-called megacity was closely examined in the previous chapter, and was clearly found to be lacking. However, the fact that peripheries surrounding large cities are merging into conurbations, as seen in regions such as the Tokyo–Yokohama and Kyoto–Osaka–Kobe areas where this is becoming a reality, does not mean we should accept this situation as valid. Rather, we should point out conditions that are gradually stifling the people's lives, from every angle including the growing gap between city and countryside, and in the lifestyle, culture, and material prosperity of urban residents, and quickly uncover ways of concrete reform.

In order to clarify the facts, let's start by trying to discuss what is actually happening.

The reality is that, of the nation's major cities, four regions including the Tokyo–Yokohama and Osaka–Kobe area, and Nagoya–Kitakyushu have enormous concentrations of people (for instance: Tokyo–Yokohama, 10 million, Osaka–Kobe, 5 million), and are clearly out of balance when compared to our national population of 70 million; as a result these regions overall are



Text: from top

緩衝緑地帯	Buffered greenbelt
高速度鉄道	High-speed rail
荷物港	Cargo harbor
商業中心	Commercial center
荷物鉄道	Cargo rail
主通勤街路	Main commuting road
文化中心	Cultural center
中央緑樹路	Central boulevard
厚生中心	Public welfare center
地下停車場	Underground carpark
中心住居	Central residential zone
小学校	Primary school
周辺住区	Peripheral residential zones
菜園	Vegetable gardens
農耕地	Farmlands
大都市中心	Large city hub

Figure 57 Model plan for unitary single-function industrial city (example of 16 residential zone configuration)

urbanizing contiguously and completely overrunning the administrative boundaries of surrounding districts and municipalities; they are completely filling this space and establishing massive continuous urban environments that transcend existing concepts of the city; and the creation of very unfavorable circumstances for industry and national defense is an indictment of the so-called megacity.

However, as we have already seen, certain conditions are required to bring about the establishment of a megacity, and not all these must necessarily be rejected. There is an aspect to concentration that means progress and raising productivity. Also, in order to abandon concentration, given that population capacity in rural areas is already approaching saturation, we must return to fundamental principles: unless we curb further growth of our population itself, this mass of people must be moved to existing big cities, or other cities, or even new cities. Even if this is carried out in partial stages, and limited by the extent to which we prevent further growth of our nation's megacities, it will be impossible in practice to build new cities that offer a rich rural environment.

So what aspects of the development of the megacity environment must we reject?

These may be summarized by the following two points:

A. Creating a "continuous" urban environment; and
B. Hectic lifestyles (congested traffic) occurring in vast residential zones.

Urbanization and a tightly crammed life environment are not desirable for urban living. The low-rise, high-density residential configuration seen particularly in Japan's cities must be improved upon by restoring easy access to

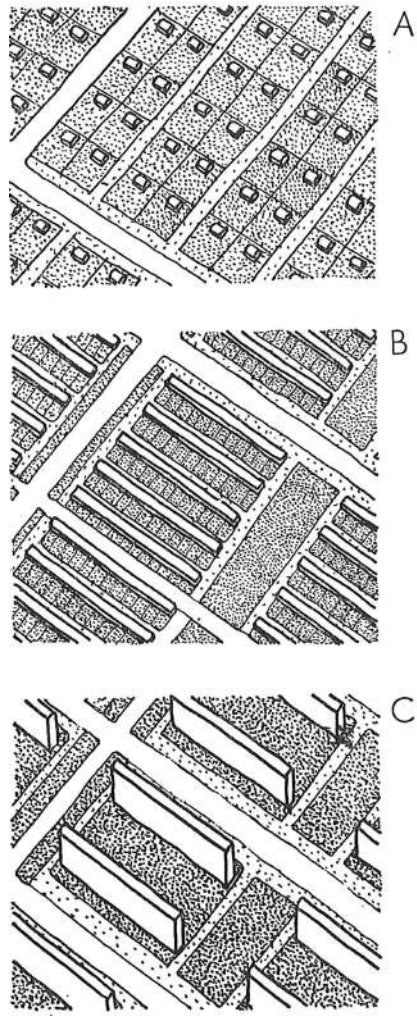


Figure 58 Various styles of pastoralizing the residential environment

The simplest method to pastoralize the residential environment is to locate housing in the middle of the countryside. However, this makes urban life impractical. To make urban life viable while recreating the same conditions, each residence must be enclosed by a broad green space, in other words method A. In the first place, though, this method requires each residence to have an extremely large yard, and therefore a large plot, and the burden placed on road surface area and traffic facilities, etc. to satisfy these enlarged plots is ludicrous and out of the question. Ultimately, only a small number of extravagant and self-indulgent, luxurious residences in the past could realize this style; the geographical and economic conditions our nation faces at present mean that even in the future, realizing this as the people's housing is impossible. Conceivably, an alternative method would be not to provide each residence with a rural setting, but to concentrate residences together in groups and apply it to these. By doing this, groups of residences produce a high residential density on small plots, and also allow sufficient space to be enclosed by green areas, and would probably make life in a rural environment possible. This is the only method that would pastoralize the residential environment for the people's housing. In other words, methods B or C.

nature. There are two ways to do this. One involves moving our lives into the countryside (Figure 58 A), the other is to moderate the spread of urban areas, divide up each urban tract, and insert these throughout the countryside. The first "easy-going" method brings about unwanted expansion of city size, and is simply not desirable. What is needed is to simply rearrange the haphazard placement of uncontrolled small-scale low-rise houses, and with a flexibility afforded by reforming them into a more reasonable format, introduce even more of these more-rural elements (Figure 58 B, C). However, there are of course limits to this method. In which case, when employing the second method, namely further dividing up the rural environment while placing certain limits on these urban areas, we must consider avoiding the formation of continuous urbanization.

While the second objective also attacks the various theories on megacities, there is no problem with this criticism per se. What is problematic, however, is criticism of the conditions or qualities associated with the megacity.

Ishikawa raises functional alienation and traffic congestion as economic disadvantages of the megacity. Building a megacity environment at the heart of the big city is premised on creating a uniform living structure for each section; this increases traffic between each section, multiplies functionally unnecessary direct and other traffic between each, especially the central districts; and produces unnecessary congestion and alienation. However, this is not a defect of the "mega" nature of the megacity, but arises from the spontaneous and illogical placement configuration of each section's components. The problem is how to correct this illogical placement, and recommendations for urban decentralization merely increase distances, and probably exacerbate alienation and traffic difficulties. Therefore dispersing small urban areas is not a method to resolve this defect. To the contrary, if the structural elements of the megacity are tightly linked and configured as components with an ever closer bond to each other, the resultant unitary zone—that takes on the character of its structural elements, and probably acts as a specialized or single-skilled zone in the operation of the city as a whole—can reduce traffic congestion to a minimum even if it can't be eliminated altogether when placed to allow ever closer participation in the structure of the overall city's multifunctional tasks; moreover, relocation to small urban areas will probably secure unforeseen and highly efficient interconnecting traffic between components.

From this perspective, this author would like to propose three points for methods of handling the megacity: 1) Gradated construction of the life base; 2) Megacity created by association of single-skilled unitary life bases; and 3) Allocation of green land.

1.1. Gradated Construction of the Life Base

The most rational and comprehensive way to realize the viewpoint that things with the closest connection to urban residents' lives (in terms of frequency of

interaction and usage efficiency) be placed as close as possible to where they live, and those that are less connected be placed further away, is to conduct a gradated construction of the life base as a pyramid-shaped unitary collective.

This was clarified earlier with regards to constructing housing collectives (see *Collected Works*, Vol. 1, Chapter 26), but for the lowest (the most basic construction) unit at the urban scaling phase, we can look to the primary school residential area, namely an area where daily life facilities are brought together around a primary school. Within this area, residents carry out their daily consumption lives.

However, in order for residents to support their "spending" lives, they must maintain productive (social labor) lives. The daily commute to do so involves their most frequent and most important use of transportation. However, work places employ more than residents from merely a single primary school residential area. Generally, several residential areas are dependent upon a single place of employment (such as an industrial zone, or commercial business zone). As a result, occupational zones or the highest collective zone for housing become conceivable. What determines the scale of this unit is the scale of the workplace (production) facility collective.

This may depend on the type of business, but in industry a relatively well-organized production facility unit requires at least a central factory, or an industrial complex (Rus. *kombinat*), and associated subsidiary subcontracting factories or group of small workshop units; therefore the total number of employees can be upwards of several thousand, and at times there may be more than a few instances where it is several tens of thousands. Accordingly, if we assume that the population of a primary school residential area is between 5,000 and 10,000, then industrial zones can be constructed that support at least several or at times a dozen or so such residential areas.

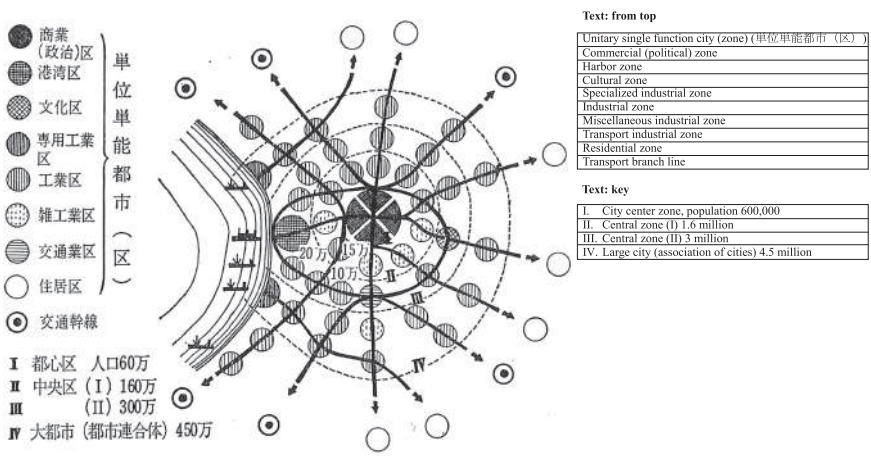


Figure 59 Structural model for a large city hub comprising an association of unitary cities

The number of people employed in commercial workplaces will vary according to the size of the city, but in the central district of a large city of one or several millions, this will of course probably mean constructing more than a dozen such areas.

This occupational unitary zone includes only facilities directly connected with carrying out a certain profession, so it may be considered as single-skilled. However, when this zone is of considerable size and made up of several or several dozen residential areas, cases may arise, depending on how it is connected to the city's central business district, where it may need to have its own independent commercial center, a secondary city center.

1.2. Megacity Created by Association of Single-Skilled Unitary Life Bases

The aforementioned unitary zones each have their own particular professions, and can be on the scale of a small to medium city with a population of several tens of thousands up to 100,000 or more; but it could be argued that a megacity is a premium collective made up of an association of these unitary zones.

However, the megacity is not merely an aggregation of these unitary zones. A special feature, as well as a mission, of the megacity with its vast congregation of people, is the focused and advanced development of its industrial, economic and cultural roles (i.e.: administrative hub). It becomes a focal point for the enterprises and people from every type of commercial and manufacturing business that depend on this. Therefore, within these unitary zones it must possess the various functions—downtown commercial district, high-quality entertainment district, commercial, financial and administrative centers, general industrial zones, as well as areas in charge of the special functions of this city, etc.—needed to realize on the whole the special features of the megacity. Of course, these functions can be sorted and put together according to their characteristics, and brought together into single-skilled zones. However, if the overall unitary life base, including residential areas for associated staff, is not to exceed desirable limits, unitary zones with some combination of these functions must be permitted; indeed it would be beneficial. Above all, special consideration is required when constructing the downtown unitary zone that combines the functions of an administrative hub: sophisticated downtown commercial, economic, and financial affairs center, as well as public administration center. The existence of this highly concentrated downtown area is probably the greatest feature of the "megacity."

Incidentally, what would be the suitable size for the unitary zone referred to here?

Commuter traffic is considered the most important limiting factor. A large and extremely disproportionate volume of traffic is concentrated in a short period of time (the so-called rush hour), so the use of public transport is uneconomical. Therefore foot traffic should be used where possible. This

means that if the distance, one-way, to the place of employment is at most around 1.5 km, then the maximum range housing may be placed is at a depth of two residential zones. It also means that the unitary zone size will be between a minimum of 6 and a maximum of 20 residential areas, varying slightly depending on the total extension of the workplace district, or the positioning of residential areas, in single-, double-, or multi-sided placement. (See Figure 60.)

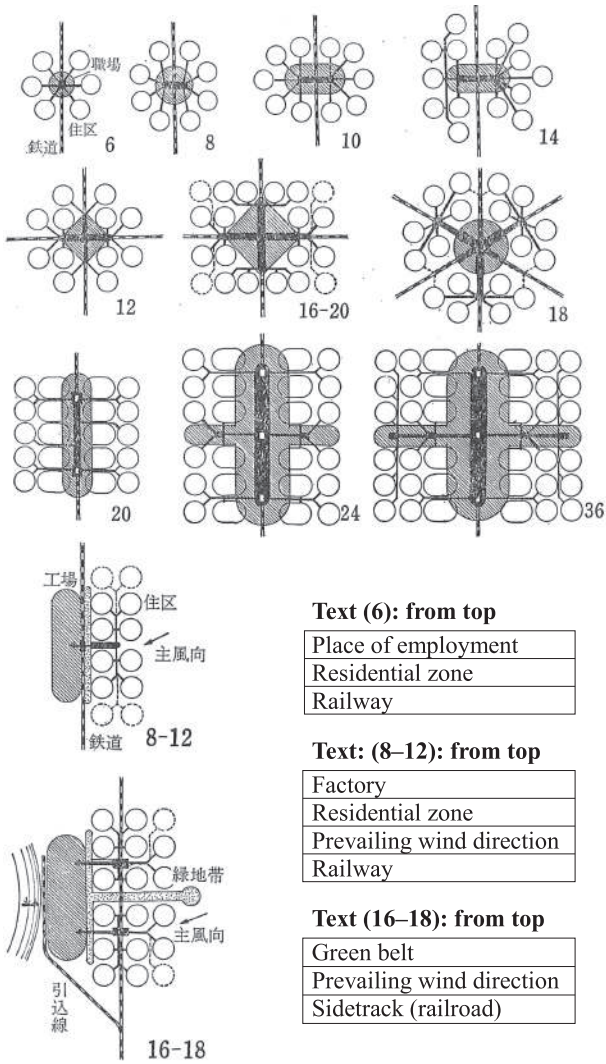
However, in a megacity the downtown district, described above, is likely to be rather large. In this case, two courses of action are conceivable: one is to subdivide the megacity's downtown area by function (for instance, a central administrative district, commercial business zone, entertainment district, etc.); and the other is to locate some workers in general *kombinat* areas to be discussed later, while placing residential areas at some distance from the workplace for other workers who can use long-distance rapid transit systems. No generalization can be made as to which of these to adopt. Therefore, various solutions are possible.

In addition to this, existing megacity zones all feature large-scale and rapidly developing manufacturing with dependent secondary cooperative industries. Securing adequate space for this wide variety of general industry is also an essential condition in building up a megacity. The growth of the megacity is made possible by the development of general industrial zones, and it can be anticipated that such zones will be needed in the future even though their setup may vary. Residential areas catering for workers in these general industrial zones, depending on the scale of the industry, are not necessarily limited to the aforementioned single-skilled unitary zones. As much as possible they should be reorganized and arranged together at the unitary-zone scale; but where this is not possible, for such areas only dedicated work zones (production facility area and residential area) should be detached and relocated, and it will become necessary to resolve this by placing rapid mass transit systems to connect the two. This zonal configuration that separates work and home will also become a particular aspect of the formation of the megacity.

From this investigation, it is possible for the megacity to be a single general life base collective that brings together constituent parts, namely specialized single-skill unitary zones like the city center, dedicated industrial (or general industrial) districts and dedicated residential districts. However, if each of these single-skilled unitary zones that make up the megacity are connected via rapid transit systems and heavy freight distribution systems tailored to suit every one of their particular specializations, it should be possible to have the megacity functioning at peak efficiency with no disruptions whatsoever and transfers with a minimum of effort.

1.3. Allocation of Green Land

A large city's functions are secured by establishing single-skill unitary zones which make up the city as well as transit systems that service and bind them



Text (6): from top

Place of employment
Residential zone
Railway

Text: (8–12): from top

Factory
Residential zone
Prevailing wind direction
Railway

Text (16–18): from top

Green belt
Prevailing wind direction
Sidetrack (railroad)

Figure 60 Structural model for a unitary single-function city

Numbers refer to the number of residential zones. The upper forms show residential zone placement in a capital-like city that fulfills, among other things, commercial, economic and administrative functions; while the lower two are for industrial single-function cities whose industry, etc. require housing to be completely separate. In addition, there are cases where it is possible that housing and place of employment are in the same building, and are connected vertically to each other, above and below. Oval-shaped residential areas shown in the bottom row of capital-like cities refer to overlapping forms. In these cases, it is possible that the number of residential zones will be greater than the number indicated.

together; however, another important factor which differentiates the form of the megacity made by this association of unitary zones from that of the conventional big city, is that its building blocks, namely the unitary zones, are each surrounded by green land, and each residential area is in easy reach of the rural environment. This resembles the previous installment of green belts often proposed as a way to improve the urban environment, except this is different from grid-like or radial forms of urbanization, because they serve as elements which set boundaries around independent unitary zones.

The precise shape of green lands, found between the city center unitary zone and the unitary zones surrounding it, should be of the narrowest possible width because of their mutual proximity and traffic, a green belt of trees so to speak; however, traffic has less impact the further away from the center it is, so a rather extensive and productive green belt can be put in place.

It is unclear to what degree the idea will prevail that the foodstuffs and agricultural products a city requires be supplied by local production; however, when it comes to issues of food self-sufficiency the notion of being able to supply at least fresh vegetables from neighboring suburban areas is a reasonable objective. In this case it is preferable that, transport conditions permitting, green land separating single-skill unitary zones be as large as possible; however, if for instance 60 m^2 is needed to provide fresh vegetables for one person, and population density in built-up areas is 100 persons per ha. or 1 per 100 m^2, the ratio of productive green land to built-up areas would be 10:6, i.e.: the area of productive green land must be 37.5% of the total city region.

2. Gradated Construction of Cities (Human Collectives)

Compared to various theories on forms for ideal cities noted so far, the construction guidelines discussed in the previous section appear to be relatively pragmatic. In order to clarify their relationship with current theories on the ideal city, let us examine two or three other issues.

2.1. Regarding Theory on Making the Single-Function City Smaller

During the war it was widely proposed to decentralize large cities out of concern for air raids; there would not be enough time to evacuate non-essential persons—for instance, those collecting pensions, and recognized mistresses—and calls were made to relocate the primary causes of densely populated districts, namely factories, schools, and government organs, etc., to the countryside. The so-called decentralization and reduction of large cities was advocated, whereby Tokyo and other cities would function solely as administrative centers, or they

would become industrial cities by relocating government organs and schools because of the difficulty in moving industrial facilities.

If the megacity is to be disavowed, then this assertion becomes even more justified.

However, are there no flaws to this assertion?

If small single-function cities are created to handle the limited roles arising from breaking up responsibilities concentrated in the megacity, firstly can these various single functions formed after the dispersion really exist independently? Secondly, as the result of "the decentralization of the megacity," and given how cramped our nation is, can these small single-function cities be dispersed and yet remain effectively useful while compensating for declines in efficiency?

Naturally, the function of government administrative center at present performed by Tokyo will exist as long as Japan exists, even if it is not located in that vast city. Therefore it would also be possible to relocate it to the mountainous region of Hakone. However, if this were to happen, even if there were slight changes in circumstances in the future, not only would government agencies need to be relocated, but the need would also arise to relocate commercial firms such as banks, trading companies, and industries. Furthermore, their employees would also have to move, along with their subsidiary companies and service industries, and the various secondary subsidiary employees.

Also, the decentralization and dispersal of the single-function city means the overlap of downtown business area with downtown district would no longer be the foundation of the single-function city; if functions are decentralized and connected to each single-function city, the "downtown area" that makes up the traditional Japanese city center will disappear.

Travel distances will not be significant if the city is decentralized and dispersed throughout Japan even to its steeply sloping forests; however, the negative effect of functional alienation caused by this dispersion is exacerbated, and there is probably no positive benefit at all other than the psychological effect of being close to the countryside. If a megacity with a population of 10 million were to be divided into small- to medium-sized cities with an average size of 100,000 people, 100 such cities would be needed. For instance, to spread these throughout the 3,200 km^2 of the Kanto region, each city would require an area of 32 km^2, and the distance between the center of each would be little more than just under a mere 6 km. If the size allocated to these cities of 100,000 were to be 10 km^2, the space between cities could only be in the scant 2.5 km range.

Ultimately though, this decentralization and dispersion by accentuating single function is only a pipe dream. This will clearly be impossible to realize unless, as proposed by this author, the large city is divided into medium and small-sized cities with single functions, which are then formed into a close association to reconstruct the megacity.

Nevertheless, the following is conceivable.

Regardless of how things are at present, if we assume Japan in future is to be a part of the world economy, our nation is likely to become East Asia's industrial center. In that case, at the very least several general industrial complexes will probably be needed within our territory. To bring these into existence, residential areas for large masses of people will of course be necessary. These residential areas or large cities must be made multi-functional, as is to be expected. These residential areas housing large populations will then be more comfortable, and can be managed more efficiently. Let us consider the large city in this light, and discover the positive benefits of this general multi-functional area.

2.2. Regarding the Theory of Dispersing the City

The argument for population dispersal, namely extensively reducing the population in megacities by spreading people throughout the nation, was one of several popular theories universally known during and after the war.

Two forms of this theory can be found.

The first is the idea to boost the rural population, in line with a short-lived trend following our defeat that Japan must be an agrarian nation. However, this idea is plainly unprogressive: Japan's agricultural sector has become dominated by intensive small-scale farms, and even if, for instance, there was sufficient capacity to expand arable land by 30%, in the event that plans are made to raise labor productivity, rural villages would have limited scope to absorb more population.

The second is not so much a matter of turning people into farmers, but simply returning them to the countryside. Various small- and medium-sized sideline industries, such as watchmaking, are being promoted in villages, and people are being urged to make a living from them. However, this is a mistaken view. Cramming the majority of these people being forced to work in inefficient small- and medium-sized industries into a semi-feudal rural environment feels purposefully reactionary. And there is also something irresponsible about this view, to suggest that starving people be forced out of sight into the countryside and the mountains because they are an eyesore in busy entertainment districts.

A more theoretical and systematic version of this second idea has been set out in a theory for dispersing the small city by rebuilding the life zone in the regions.

Let us critique the small city dispersion theory by its quintessential proponent Ishikawa Hideaki, who expanded upon construction methods for the rural life zone in his work "State Planning" [*Kokudo keikaku*].

According to Ishikawa's "Life Zone Placement of the City for the Empire" [*Kōkoku toshi no seikatsuken teki haichi Jinko mondai kenkyujo*] ("Constructing the City for the Empire" [*Kōkoku toshi no kensetsu*], p. 198), the main points for their life zone planning are:

Table 9.1 Life zone placement of the city, according to Ishikawa

(1) Hub function	*(2) Maximum travel time*	*(3) Transport means*	*(4) Distance*	*(5) Adjusted distance*	*(6) Administrative function*	*(7) Hub function*	*(8) Population limit (tentative)*
5. Daily	30 mins.	By foot	2	2	Village hub city	5	Smallest city, 20,000; average city,
4. Ditto		Bicycle	10	5	Town hub city	4+5	50,000 to 100,000; large city,
3. Weekend	1 hour	Bus	20	15	Local hub city	3+4+5	300,000
2. Monthly	1.5 hours	Car	50	50	Area hub city	2+3+4+5	
1. Seasonal	2 hours	Train	100	100	District hub city	1+2+3+4+5	

Source: Hideaki Ishikawa, "Constructing the City for the Empire" [*Kōkoku toshi no kensetsu*], p. 198, "Life zone placement of the city for the Empire." See Figure 61.

Table 9.2 Various factors for the life zone structure, according to Ishikawa

Hub function	*(1) Zone radius (km)*	*(2) Zone area (ha)*	*(3) Paddy field area, within zone (ha)*	*(4) Rice yield, (40* koku★*/ha) (*koku*)*	*(5) Max. population supported*	*(6) Acceptable number of farm households (1 household per* chō★*)*	*(7) Ditto, population (Col. 6 multiplied by 5)*	*(8) Non-agrarian population supported (Col. 5 minus col. 7)*
Daily	1.5	706	141	5,640	5,000	141	705	4,300
Ditto	5.0	7,854	1,570	62,800	63,000	1,570	7,850	54,000
Weekend	15.0	70,686	14,136	565,400	565,000	14,136	70,690	494,000
Monthly	45.0	639,174	127,834	5,112,360	5,112,000	127,838	639,170	4,473,000
Seasonal	135.0	5,725,666	1,145,132	45,805,280	45,805,000	1,145,132	5,725,600	40,079,000

(★Translator's note: 1 *koku* = 5.12 bushels; 1 *chō* = 9,917 sq. m.)

(9) Population needed in rural villages (equals rural population)	*(10) Population of hub city (tentative) (10,000)*	*(11) Population of cities within zone (10,000)*	*(12) Population needed for industry (Col. 11 minus col. 9) (10,000)*	*(13) Population for industry, in hub city (10,000)*	*(14) Max. population supported (Col. 5 minus col. 11) (10,000)*	*(15) Population of hub city, after distributing people from unplanned rural industry cities (10,000)*
705	–	–	–	–	–	–
7,850	2	2	1.2	1.0	3	1
70,690	5	17	10.0	3.0	32	3
639,170	20	134	70.0	10.0	313	15
5,735,666	100	1,018	444.0	70.0	2,882	80

Source: Hideaki Ishikawa, "State Planning—Designing the Life Zone" [*Kokudo keikaku—seikatsuken no sekkei*] (August 1942).

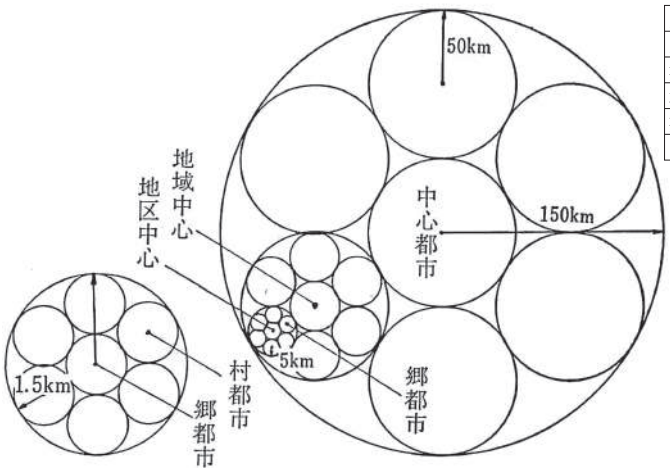
(a) Keeping people in their place of birth, while having them contribute to the nation's total industry [?][2]
(b) Allowing them also to enjoy the culture generated by the large city; and
(c) On a national level, having urban residents retain an awareness of the countryside, while integrating this as was previously done in the large city.

Putting aside arguments that have already been examined critically, those which apply to rural villages are little more than ostensibly cultured "humanistic" charity that in the end allow even those villages left behind by urban civilization to benefit from urban culture.

The structure of urban placement according to the life zone planning that brings together these arguments is basically shown in Figure 61; and the numerical data reflecting the relationship between hub city and regional layout are shown in Tables 9.1 and 9.2.

The inferences worthy of particular note in these tables are (9) where it is expected that the number of people from the non-agricultural sector needed in rural villages will equal the number from the agricultural sector, and (10) estimates for the population of the hub city. "Population needed in rural villages" and "Population supported by rural agricultural sector" are mentioned with respect to the former, but the people needed in other industries connected with the agricultural sector would be represented by something slightly larger than an ordinary hub small city or town.

Those inferences with respect to the latter are merely assumptions, but if the construction of the life zone were to be realized, the results would appear something like Table 9.3 below.



Text: from left to right

地区中心	Local hub
地域中心	Area hub
郷都市	Town city
村都市	Village city
郷都市	Town city
中心都市	Hub city

Figure 61 Ishikawa Hideaki's diagram of the life zone concept
Source: "Constructing the City for the Empire" [*Kōkoku toshi no kensetsu*], p. 253.

Table 9.3 Population distribution ratios, by city rank, in Ishikawa's life zone concept

	Unitary city population	*Number of cities within local zone*	*Allocated population (10,000)*	*Allocated population, as ratio (%)*
1. Village	–	–	573	40.7
2. Town hub city	20,000	216	432	30.8
3. Local hub city	50,000	36	180	12.9
4. Area hub city	200,000	6	120	8.5
5. Regional hub city	1,000,000	1	100	7.1
All regional zones		259	1,405	100.0

Notes: 1. The number of cities has been calculated whereby each zone includes those below it apart from the hub zone.
2. Although not indicated in the original source, the population in villages can be considered to be the total agrarian industry population. It is possible the original author [Ishikawa] intended that a considerable number of agrarian industry workers be included also in the hub city population, but because it is not explicitly stated, these are estimated.

That is, if for the moment we consider the subconstruct for the regional areas as it appears in standard drawings with a number of inscribed circles, the regional hub city would comprise 216 township hub cities with a population of 20,000 each; and if 40% from a total population of 14 million (if total area is calculated at 56,800 km^2, population density would be 247 per km^2) were in the agricultural sector, 30% would reside in township hub cities, and 71.5% of the total population would live in small towns and villages no larger than 50,000.

The following impressions may be gained from the overall results.

(1) First of all, overall population density in regional zones is low.

Regardless of cultural development throughout villages within the regional areas, the overall population density will be 247 per km^2. Nationally, our population density was 191 per km^2 in 1940, so there is only a 30% margin to reach the level designated in this plan on a national scale. Moreover, regions able to attain this type of development, statistically, will only be those so-called underdeveloped regions outside the Kanto, Tokai, and Kinki regions. In these three regions, for instance, no matter how much regional hub cities are expanded, they will be unable to absorb the population on the level of an advanced city as described in this life zone construct.

Therefore, the construction of these regional areas will be rather ineffective in solving the issue of overcrowded cities.

(2) Second, the priority for population distribution is biased towards the smallest cities of 20,000.

Combined with the rural population, 70% of the population lives in cities of 20,000 or less. However, according to statistics for Japan's population by type of

Table 9.4 Population density, by statistical zone

Census zone	*1930*	*1935*	*1940*
Hokkaido	35	35	37
Tohoku	98	104	107
Kanto	427	474	523
Hokuriku	163	166	170
Tosan	123	125	127
Tokai	297	321	343
Kinki	362	408	436
Chugoku	169	176	181
Shikoku	176	179	178
Kyushu	216	226	236
All Japan	169	181	191

municipality, in 1940 66% of the population lived in cities, towns or villages with 50,000 people or less, and overall 30% lived in cities of 100,000 or more.

While lower figures must be allowed for these statistics where the municipal unit is an administrative area, nevertheless compared to the aforementioned life zone construct, the population is markedly biased towards small towns and villages.

In other words, it shows that this population dispersion model, despite ensuring a relatively broad distribution, cannot absorb a lot of the population.

Therefore there are only two options available: to allow the development of the megacity regardless, based on this dispersion rationale (the placement of small cities); or to do away with the megacity altogether, and increase the number of city gradations to two or three to bring about complete dispersion. The former option is simply a repudiation of the small city dispersion theory. As for the latter option, dispersed city construction would result in difficulty providing suitable urban facilities for every person, would place an extremely heavy burden on transport facilities (for production and freight use, and of course consumption life) connecting these small centers roughly 10 km apart, and would cause grave concern this might lead to a retrogression of the people's economy.

In other words, even if small city dispersion is carried out while taking into consideration the introduction of urban culture into rural villages, the total capacity of hub cities to absorb population will not be great should they be limited to the range of one million inhabitants, therefore the megacity issue will not be resolved. Moreover, the inefficient dispersal and placement of this population will place a very heavy burden on the transport and urban infrastructure of the people's economy.

Frankly, this author believes the population of small cities must nonetheless be standardized at the 100,000 range. The priority for population placement must be medium-sized cities of 100,000 (or between 50,000 and 200,000). Furthermore, on the subject of these medium-sized cities, essentially they are not very different from single-function unitary areas (unitary cities, with a

population from tens of thousands to several hundreds of thousands, as previously stated) that constitute a megacity. In other words, in substance the megacity is composed of these medium-sized cities. The megacity (also could be called an association of large cities) was the overall designation for an area that had such characteristics—a rather densely packed concentration of these medium-sized cities, extremely closely tied to each other through their functional loads, and among which was an area that functioned as the city center, a distinctive element of the megacity of the past.

To put it another way, regardless of whether a city is large- or medium-sized, it would nonetheless be composed of single-function urban areas in the 100,000 range (50,000 to 200,000); and a group of medium-sized cities deemed an association whose relative density is determined by a placement reflecting their mutual functional loads, would be called a large city, while urban zones where areas are placed at some distance apart and retain a high level of independence, would be designated medium- and small-sized cities.

The nation would be composed of these single-function medium-sized cities placed in a varying pattern of density along transport lines.

Achieving this degree of city unit size would make it possible to provide extremely efficient urban cultural facilities; furthermore, the transport load would probably be kept within acceptable limits.

2.3. Reappraising the Ku

It may even be redundant, but I would like to propose a reexamination of the *ku* or administrative ward that currently exist in large cities.

The traditional *ku* or ward is little more than a division of land at the district level based on administrative procedures to deal with local factors and population spread; I would actively encourage adopting a *ku* imbued with a new meaning: a graded local unit that is combined with the concept of constructing the large city from an association of single-function medium-sized cities. In other words, clarify it as a life zone space that functions totally as an organic first stage, without terminating the existing *ku*. It would then possess the characteristics of the unitary single-function city described above. By so doing, the existing value of the *ku* would be made clear as the lowest constituent element of the large city that also functions as a highly independent unitary zone.

With regards to the composition of the megacity, on the one hand it is the gathering of a number of *ku* or medium-sized cities, but at the same time it also gives rise to areas such as the city central district or general industrial estates that vastly exceed the scale of standard unitary zones. In order to carry out construction and facility placement more systematically in these areas, it may also become necessary to consider these as *ku* that bring together several unitary zones, in other words a "*ku* association," and as a combination of units that form an intermediate stage before the large city.

3. Constructing the New Nation—Pattern of Population Dispersion and Concentration

In the previous two sections, I clarified my thoughts on proposals for the megacity and the reconstruction of the standard city. A simple summary of this is as follows:

(1) All non-agricultural industries make up the urban area, and this is where they are located. They are unitary life bases predominantly for a single function, including manufacturing, mining, and commercial businesses (either agricultural or urban).
(2) The size range for a unitary city is between 50,000 and 200,000, with the average being around 100,000.
(3) Housing areas in the city are made of primary school residential districts, and one city ward is made up of several or a dozen or so such collectives.
(4) Unitary city wards will vary according to whether there is a commercial district within public transport range, the character of that district, and how far away it is, but each will have its own business and cultural center to cater for life's essentials.
(5) For the nation as a whole, it is conceivable there will be several megacities: groups of associated unitary city wards that are located close together, each with a high degree of specialization, and inextricably linked to the location of general industrial complexes.
(6) The placement density of unitary city wards is thick around the central zone of the megacity area, and becomes sparser the greater the distance from the center. The upper threshold for this density is standardized at 60% productive green land per urbanized area; while the lower threshold for the degree of sparseness is limited by the need for inward transport from adjacent rural areas to the city—for instance, Ishikawa's so-called weekend center standard is an hour per one-way journey, or a 10 km radius.

The limits on unitary city placement are expressed fairly concretely in these six points, but within these upper and lower thresholds, what type of placement is in fact conceivable? This will depend on factors such as a region's previous development circumstances and geographical conditions, and the state of population distribution throughout the nation as a whole, so let us now carry out a more detailed numerical analysis.

3.1. Minimum Construction for City Placement, Viewed from the Village

C1 Hamlet or small village

Many farmers live in unitary population centers, namely dispersed rural settlements, and in order to bring about an improvement in residents'

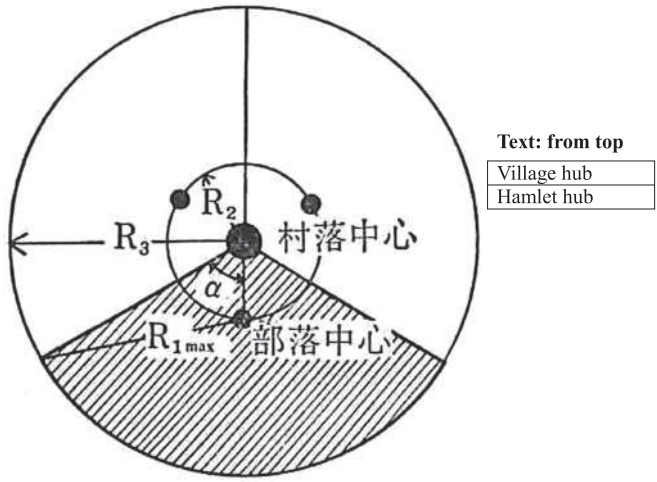


Figure 62 Radial view of village

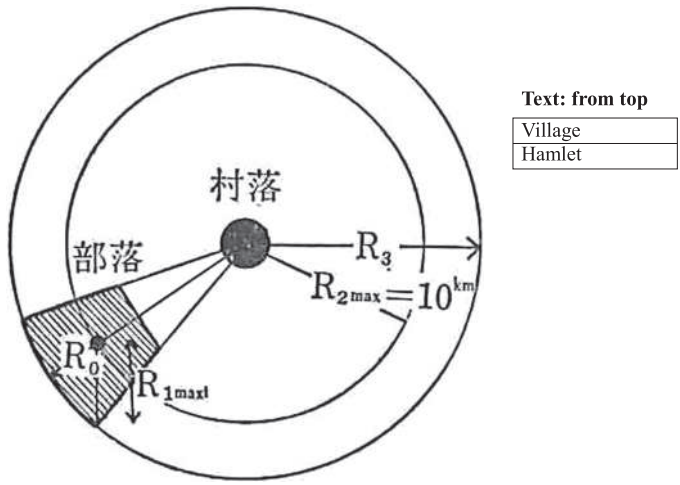


Figure 63 Radial view of village (largest case)

cooperation and life, clustering these settlements together is considered fundamental.

The scale of the village is determined by the "commuting" distance from the residences to the field.

The ideal is within 20 minutes one way, with a maximum of one hour, and an average walking distance of 1.5 km (max. 4.0 km).

C2 Village

A village is made up of several central facilities for daily life (primary school, distribution center, association office, etc.) that are clustered together.

From this "daily hub," all residential homes are ideally within 20 minutes one way, at most 30 minutes; a walking distance of 1.5 km (2.0 km); or a cycling distance of 6 km (10 km).

Calculations based on the above conditions for the area covered by a hamlet and its outer radius are as follows:

Commuting distance by foot:

R_1^2 max = $R_3^2 + R_2^2 - 2R_2R_3 \cos \alpha$, where
R_2 = 1.5 km, R_1 = max 4.0 km, $\alpha = 60°$, $\cos \alpha = 0.5$
Where the number of villages outside the central area is 3,
$\alpha = 60°$, R_3 = 4.61 km, area A_2 = 66.7 km^2.

Likewise:

4: $\alpha = 45°$, R_3 = 4.98 km, area A_2 = 77.9 km^2.
5: $\alpha = 36°$, R_3 = 5.16 km, area A_2 = 83.6 km^2.
6: $\alpha = 30°$, R_3 = 5.26 km, area A_2 = 86.9 km^2.
In other words, the outer radius of a hamlet is around the 5 km range.

In cases where usable land is in long and narrow strips such as in mountainous regions, if the average distance by bicycle to the daily hub is 10 km, R_3 is 14 km. As for the number of hamlets in a village, if each hamlet has an area of 50 km^2 (a circle with maximum outer radius of 4.0 km), an area A_2 = 615 km^2 (radius of 14 km) will have 12 hamlets; if each has an area of 28.6 km^2, there will be 22 hamlets. However, in mountainous regions with these long narrow strips, the land does not extend in all four directions, therefore if villages are 28 km long and 8 km wide with a total area of 224 km^2, and each hamlet has an area of 28.6 km^2, the number of hamlets per village will be 7.8. In other words, it is probably best to presume that villages in these long narrow mountainous regions will have at most around 15 hamlets, and an average of around eight.

Now what about the population capacity of these hamlets?

From a total area of 380,000 km^2, arable land in Japan accounts for six million ha. (about 60,000 km^2). If the maximum area of arable land is taken as 80,000 km^2 by adding a currently planned 1.7 million ha. of reclaimed land, the ratio of arable to total land will be 21%.

However, since this will be far lower in mountainous regions, if we assume it will be one-half to one-third of the overall average ratio, namely between 10% to 7% (the lowest national arable land ratio is in Wakayama Prefecture, with 10.2%), village populations calculated based on these three arable land ratios will be roughly between 1,000 to 2,500 people per hamlet, and roughly between 1,600 and 7,000 people per hub village.

The total population allocation for villages will be between 8,000 (4 hamlets) and 10,000 (7 hamlets) if the arable land ratio is 21%, and between 13,000 (4 hamlets) and 17,000 (7 hamlets) if the ratio is 35%; if people travel by bicycle, it will be a maximum of 24,000 if the arable land ratio is 7% and 35,000 if the ratio is 10%.

If the population of a favorably constructed daily hub is a minimum of 10,000 and an average of 15,000, a formation of 4 hamlets (hub hamlet and 3 adjacent hamlets) will be too small and unsuitable; however, this formation may be possible in areas on the plains where arable land is plentiful; and in regions with around 21% arable land, formations will need to be as large as 7 hamlets (1 hub and 6 adjacent). Furthermore, those with 10% arable land will have a maximum population of 13,000, and a hub village population of 3,700.

C3 City Ward

The village's weekend hub. One-way journey of 90 minutes, in other words one hour from the village center. If the distance is 12 km by bicycle, 20 km by bus, or 36 km by train, the traveling time from any village residence will be at most 90 minutes.

While being the hub for a considerable number of villages, and a regional hub city with a substantial level of cultural facilities, it is not just an agricultural center—an agricultural center alone cannot sustain the scale of population needed to support sufficient facilities—but is expected to be an independent single-function city for industry or other activity. To support this function, at the very least it ought to be on a rail trunk line.

In addition to rail, if supplementary traffic is taken into consideration, such as transport facilities including bus services (four direct lines to the center, in both directions) or bicycle routes, see Figure 64 for a schematic representation of a rural regional zone within one hour's traveling time from the center of such a city.

To summarize simply, it has a radius of around 25 km, and contains 20 villages (19 villages and one city). The formation of villages, based on previous tables (not shown here), are, for example, 7 (21% arable land, 7 hamlet formation); 10 (7% arable land, 7 hamlets); 2 (35% arable land, 4 hamlets); 8 (35% arable land, 7 hamlets); 18, 19 (transport by bicycle, 7% arable land, 16 hamlets); and 17, 20 (ditto, 10% arable land). Calculations for total regional populations and hub city populations can be found in Table 9.5.

However, since the village radius is between 10 and 14 km in examples below 17, it would be difficult to place 20 such villages within an hour's distance.

Accordingly, where a hub city has a population of 100,000, 50–70% of the region's total non-agricultural population live concentrated in the hub city, and the non-agricultural population ratio ranges from 45.5% in cities with 7 adjacent villages and 29.3% in those with 20 adjacent villages, or roughly 40%.

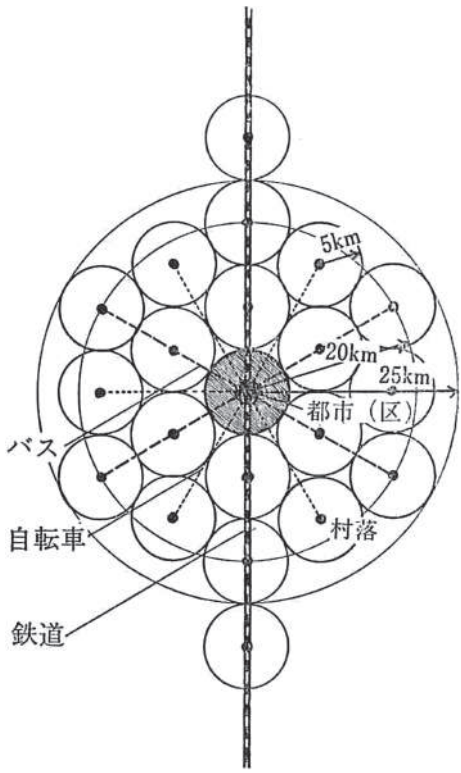
Table 9.5 City zone population structure

Village configuration	*Village agrarian industry population*	*Village hub population*	*Village total population*	*Total city zone population*	*Total city zone agrarian industry population*	*Hub city population (tentative)*	*Ditto, associated non-agrarian industry population*	*Village non-agrarian industry population*	*Total village non-agrarian industry population*	*Total city zone non-agrarian industry population*	*Total city zone population*	*Non-agrarian industry population, ratio*
7	8,270	3,252	10,340	206,800	165,400	100,000	96,748	2,070	41,400	138,148	303,548	45.5
10	10,180	3,684	12,725	254,500	203,600	100,000	96,316	2,545	50,000	147,216	350,816	41.1
2	10,600	5,300	13,250	265,000	212,000	100,000	94,700	2,650	53,000	147,700	359,700	41.0
8	13,820	5,436	17,280	345,000	276,000	100,000	94,564	3,460	69,200	163,764	440,164	37.2
17	14,280	3,993	17,850	357,000	285,600	100,000	96,007	3,570	71,400	167,407	453,007	36.9
18	14,360	4,017	17,950	259,000	287,200	100,000	95,983	3,590	71,800	167,783	454,983	36.9
19	19,550	5,570	24,438	488,760	391,000	100,000	94,446	4,888	97,760	192,226	583,226	32.9
20	27,960	6,992	24,950	699,000	559,200	100,000	92,088	6,990	139,500	231,588	791,088	29.3

Note: If one city zone comprises 19 villages and one city, and the city population is tentatively set at 100,000, of which those with the same character as those living in villages are designated as village population, then all others are non-agrarian industry population.

According to the National Census in 1930 the ratio of agricultural workers to total workforce in Japan was 47.7%, while census figures in 1920 showed the ratio of agricultural families as determined by the occupation of the head of household was 44.2% (accounting for 50% of the population); population policy drafted during the Pacific War adopted the fixed target of a 40% ratio for the agricultural population in the home islands, therefore apart from regional-hub single-function cities, the ratio shown here reveals how ample numbers of non-agricultural workers remained for general commercial and industrial bases, or megacities.

The non-agricultural sector population, excluding those tasked with key village functions, represent 9.5% of the total population of 100,000, and even an employment rate of 40% would yield 43,000 workers. If we assume that, of these, 50% are locally employed in services for that city's residents (see Table 9.2), then we are able to conclude that 22,000 workers can deliver the city's specialized function. Arguably, then, this is a reasonably adequate size to maintain an independent production base.



Text: from top

都市（区）	City (*ku*)
バス	Bus
自転車	Bicycle
村落	Village
鉄道	Railroad

Figure 64 Structural diagram of unitary single-function city zone

C4 Large City

Regional hub city. The most-densely populated regional, or at times national or even international, hub city—organized with advanced cultural, commercial, economic, and administrative functions—is connected to the city ward (that serves as a regional hub city) by rapid transit facilities (maximum 90 minutes one way, or 3 hours for the associated rural population, by adding 90 minutes to their travel time from rural residences to the city ward center).

This is Ishikawa's so-called "end of the month" city, or "end of the season" city. It is located within reach of the furthest flung rural residences around the nation, making even a day trip possible (3 hours into the city; visit of 3 hours; and 3 hours return journey).

If rapid transit facilities can attain 50 km per hour, the distance from this center to the C3 city ward will be 75 km. If the city ward's area of influence spreads to a radius of 25 km, this large city's total area of influence will have an external perimeter of 100 km. If the traveling time threshold is extended by one hour, this becomes 150 km. In cases where the center has complete influence over a 100 km radius, and no other large city, or in its stead a regional subsidiary center, is nearby within a 150 km radius, this becomes a secondary region within this area of influence. Let's refer to the former as a local sphere, and the latter as a complex local sphere. An area of 100 km radius will have slight protuberances, but 19 city wards are possible in a proscribed circle.

This is the minimum number of city wards (C3) a large city (C4) can have. A 150 km radius can have approximately 40 cities. A large city with around 30 subsidiary city wards could be considered an intermediate size.

However, this number of cities is the minimum threshold for rural regional centers in agricultural regions and their hinterland. *Ku*, or unitary cities that make up a large city, are not included in this number. Also, city wards will be broadly dispersed as the nation becomes industrialized, and will boost this number.

3.2. Component Levels in All Regional Areas

3.2.1. The Scale of Large Cities

By arranging a region's component levels from C1 hamlets to C4 large cities, the distribution by place of residence of the population of a regional area associated with one large city (namely, its total hinterland) is shown in Table 9.6, based on trial calculations in the previous section.

In other words, the rural population for one regional area is 7,262,000.

In comparison, how large is the population of the non-agricultural sector? Assuming the entire nation is composed of regional areas of the kind given here, then the distribution ratio by industry of the entire population can be thought to be the same as that for all regional areas. Therefore, changes to the

Table 9.6 Structure of regional zones

Level of residential area	*Population scale and range*	*Average*	*Of which, agrarian industry population*	*Average zone radius (maximum)*	*Lowest component*	*Number of, in 1 large city*	*Total population (1,000)*	*Of which, agrarian industry population*
C1 Hamlet	1,000-2,500	2,000	2,000	2.0(4.0)		$3{,}000C_1$	6,000	6,000
C2 Village	3,000-7,000	5,000	2,000	5.0(15.0)	C_1(4-7)	$600C_2$	3,000	1,200
C3 City (*ku*)	50,000-200,000	100,000	2,000	25.0(35.0)	$C_2\times20$	$30C_3$	3,000	60
C4 Large city	1,000,000-	x	2,000	100.0(150.0)	$C_3\times30$	C_4	X	2
All regional zones							X+12,000	7,262

Table 9.7 Changes in national population, population by industry type, and large city hub population

Year	*Number of years, when 1945 = 0*	*Forecast population (1,000)*	*Agrarian industry population (tentative)*	*Agrarian industry population, ratio (%)*	*Total population in 1 regional zone*	*Large city hub population*
1945	0	78,986	35,000	44.3	16,388	4,388
1955	10	90,107	35,000	38.8	18,696	6,696
1965	20	101,609	35,000	34.4	21,082	9,082
1975	30	111,453	35,000	33.0	23,125	11,125
1995	50	122,328	35,000	31.5	25,381	13,381
2015	70	118,493	35,000	29.6	24,585	12,585
2045	100	111,777	35,000	31.4	23,192	11,192

Note:
1. Population forecasts are National Institute of Population Research estimated values from 1941.
2. It is believed the current agrarian industry population of 26.5 million will increase by 8.5 million to 35 million, due to reclamation of 1.7 million hectares, but that there will be no expansion of arable land beyond this. Urban acreage will increase as urban population rises with this population growth, but it is thought that this will mostly make use of steeply sloping land in mountains and forests so as not to waste arable land acreage; and it is believed the agrarian industry population will not increase beyond 35 million, due to concentration of agrarian industry business.
3. Regional zone population is calculated by dividing the total agrarian industry population in all regional zones of 7.262 million by the agrarian industry population ratio.
4. Hub city population is calculated by subtracting the sum total of the population of C1, C2 and C3 of 12 million from this population.

population distribution over the next 100 years can be found in Table 9.7, assuming the estimated population in 1945 was 79,985,589, and arable land was 1.7 million ha. of cleared territory; and if the estimated total rural population is 35 million and remains at a fixed level thereafter; and also, in accordance with estimates from the National Institute of Population Research [*Jinkō mondai kenkyūjo*].

According to this, the rural population ratio in 1945 was 44.3%, and is projected to be 33.0% thirty years later. Using an inverse calculation of this ratio for X in Table 9.6, the total population for the regions according to the ratio in 1945 is 16 million; the large city population is 4.39 million if we assume medium-sized cities have a population of 100,000, or 2.89 million if they have 150,000. If large cities that perform as regional centers are made up of unitary single-function city wards each comprising around 100,000 people, then 30 or 40 of these will lead to an immense association of city wards. If five of these cities of 100,000 are amalgamated to form a combined *ku* of 500,000, then it follows that a large city can be made up of an association of 6 to 8 of these *ku*.

The above calculations are for the case where a regional area has 30 rural hub cities; but where there are 20 cities within a 100 km radius, the large city

Table 9.8 Designated population ratio, by level of city

Level of city	*Unitary city, where population is 100,000*		*Unitary city, where population is 150,000*	
	Population (10,000)	*Ratio (%)*	*Population (10,000)*	*Ratio (%)*
C1 Hamlet	600	37.5	600	37.5
C2 Village	300	18.7	300	18.7
C3 City (*ku*)	300	18.7	450	28.1
C4 Large city	400	25.0	250	15.6
Total	1,600	100.0	1,600	100.0

population is 4 million if the unitary city has 100,000 people, and 2.5 million if the unitary city has 150,000. Suppose now that the unitary city has 100,000, and the population of the large city is 4 million. Table 9.8 shows calculations for population ratios by designated city division; in those with more than 100,000 urban residents, the ratio is 43.7%, and in those with less than 250,000 hamlet and village residents, the ratio is 37.5%.

3.2.2. Limits to the Large City

In the above calculations, in order to work out the scale of the large city, it is assumed the size required to maintain the central facilities of the C3 city ward, the economic and cultural heart of the regional and rural area, is around 100,000 (or 150,000); the non-agricultural population, apart from those allocated to city wards in the regional centers, may be presumed to be located in the large city at its center. In fact it doesn't matter where the non-agricultural population belonging to this large city is situated; nevertheless, locating them in the large city creates a more concentrated population and thereby lifts the profitability of urban facility operations, and is also more beneficial to residents' consumer lives.

However, there are limits to the benefits that accompany such enormous urban expansion. I suspect there is probably some economic constraint at play.

First of all, ever-greater urban growth, regardless of what form the constructed city takes or how dense it is, will mean that each part becomes further separated from the others depending on the planar expansion, and it will be difficult for a specialized industry within the city to work as a unified functioning system; ultimately, the city ward will probably differ little from a chaotic amalgamation that spreads continuously throughout the entire regional area.

Moreover, if the scale itself of each division that operates a specialized function becomes too large, close mutual contact also becomes difficult, and the benefits of specialization diminish.

In other words, urban expansion on an extreme scale doesn't always mean concentration becomes a positive factor for running highly efficient urban businesses.

Also, even though coordination is needed to maintain a balance between each part (and type) of facilities that make the large city a multi-functional body, if the city expands without restraint, then parallel improvements to newly added facilities will be needed to match frequent improvements to existing facilities, and this will be close to impossible to achieve. Therefore, to what extent must the scale of the megacity be calculated? In other words, we need to examine target limits for the "large city."

Let us look at several of these conditions below.

3.2.2.1. CITY DIMENSIONS

No matter what form the architectural constructs of the city take, and even if there are high-density residential arrangements, increases in urban population will result in expansion of the city's dimensions; continuous expansion of this urbanized land will probably be unrealizable, because in the end the convenience arising from more concentration will not compensate for integrated transport difficulties. What is the nature of these limitations?

When considering rail as the transport system, if traveling time to the hub is within 30 minutes (or one hour if connection times and commuting to the station are added), and trains travel up to 50 km per hour, the urban zone will have a 25 km radius, and its area will be 1,870 km^2.

If the gross residential density in urbanized areas is 100 people per ha., the population will be 18.7 million, but taking into account that the integration of other elements such as productive green land to supply vegetables, and bodies of water, will account for 40% of the urbanized area, the total population will be 7.48 million or approximately 7.5 million.

3.2.2.2. LOAD ON TRANSPORT FACILITIES

From the number of cars per person and the capacity of major roads, Ishikawa has estimated the upper threshold of the population of Tokyo to be 2 million, using empirical relational expressions for traffic volume on major roads and the number of parked vehicles in the city. (See "Constructing the City for the Empire" [*Kōkoku toshi no kensetsu*], p. 62.) However, there are significant problems with this.

Aside from this, I examined how, due to special circumstances in Japan, rapid urban transit favors rail rather than auto transport.

I calculated volumes for travel by those from adjacent regional areas to the city center, and travel by residents of a large city into the city center, as follows:

The carriage carrying capacity per single rapid transit line per hour (5-carriage trains, each carriage holds 150, trains 3 minutes apart)—15,000.

If the volume per hour during rush hours is 25% of the volume over a 24-hour period, the daily carrying capacity—60,000.

If traffic into the city center is concentrated on weekends, with Sunday four times and Saturday three times that of normal times, then the total carrying capacity per week is multiplied by 12/4—180,000.

If 40% of residents (roughly the ratio of adults in employment) travel into the city center once per week, the passenger load on a single rail line is multiplied by 100/40—45,000.

Therefore, the ideal configuration for a radial rapid rail system requires seven lines in a large city of 3 million; 10 lines in one of 4.5 million; and 14 lines in one of 6 million.

However, this accounts only for residents within the large city; outside the city, there will be 12 million people in nearby regional areas (or 13.5 million, if each unitary city has 150,000 people.) If residents in the periphery travel at the rate of one trip per month into the city center (in other words, the equivalent to one quarter of that of the city's population), this converts to an urban population of 3 million, and will require a further 7 to 8 rail lines.

By combining these two components, a city of 3 million will require 15 rail lines, and one of 6 million, 21 rail lines. Furthermore, if each rail line has an hourly capacity during rush hour of 15,000, then the former will require open spaces and roads able to handle the flows of 225,000 people per hour. (Although basic calculations are made here, the widths of rapid rail lines and major roads are not determined by city size conditions, but to the contrary must be decided instead conceptually by the capacity of transport systems rather than city scale.)

3.2.2.3 SIZE OF THE CITY CENTER WARD

A megacity is made up of multi-functional elements, but it is desirable to concentrate those that handle commerce and economics in the city center ward.

When a city becomes huge, the city center ward that is packed with commercial industries itself becomes enormous, and there is a risk that this highly intensive function will become paralyzed. If the maximum size of the city center is restricted to one combined ward of 500,000 (i.e., five [unitary] cities of 100,000) to avoid falling into this predicament, then the total workforce participating in city center business will be 100,000, given a 40% ratio of employed workers and a 50% ratio of workers in external industries (500,000 X 0.40 X 0.50 = 100,000). On the other hand, applying figures from 1935, the ratio of the commercial industry workforce in large cities was 32% while that in medium-sized cities was 27%; if this difference of 5% is thought to correspond to the function of the large city, and this 5% represents 100,000 of a total workforce of 2 million, or an employment ratio[3] of 40%—then we can perform a reverse calculation to arrive at 5 million for the large city's total population.

The above calculations are all estimates based on the large city as a single concentrated center; however, there are at present other forms of independent centers such as the Kinki regional area, with Osaka as the focus for commerce and industry, Kobe as its center for port facilities and industry, and Kyoto as the hub for culture and welfare. In this case, the central functions are dispersed, so the above calculations probably produce higher values. However, what is needed is a transport system able to connect these spread-out centers, and some skillful planning for an integrated transport network to handle this dispersion of the center.

3.2.3. Population Growth and Urban Distribution of Population

If limits to the size of the large city are imposed according to the calculations in the previous section, how must we proceed to distribute these extra people across Japan's cities when the population grows? Naturally, this is determined by the placement throughout our nation of industries serviced by the non-agricultural workforce, so what happens if we make considerations excluding these conditions?

According to National Institute of Population Research estimates of future population forecasts, 50 years from now Japan's total population will reach a peak of 122.33 million. The rural population ratio will fall to 28.6%, and calculating with the same method used two paragraphs above, the population in all regional areas will be 25.38 million, and 13.38 million in medium-sized cities (or 11.88 million, in cities of 150,000). Compared to the examination conducted in the previous paragraph, this is clearly excessive.

If the population of the large city is held in check at the 6 million level, the remaining 7.38 million (or 5.88 million) will have to be placed somehow in places outside the hub city.

There are three conceivable methods of handling this.

First, don't keep the size of the unitary city at 100,000, but increase it further.

A solution based on this method will alter the size of the unitary city to 350,000. Enlarging cities that were originally devised to have 100,000 (or 150,000) will mean that urban facilities undergoing such drastic changes are unable to meet their assigned targets.

Second, raise the placement density of unitary cities.

It would be fine to increase the number of cities in an area from an initial 30, to 104 cities (increase by 74, or three and a half times). If the distance between cities is halved, in other words if new ones are created consecutively between existing cities until the total number is quadrupled, this method should resolve the matter.

If the city is considered to be a complete organism, and provisions are made to construct it as a unit, this method is the most suitable.

Third, construct ancillary hub cities, or subdivide regional areas.

There are instances where it is beneficial to create an ancillary hub city in a place that, while still in the same regional area, is somewhat distant from the large hub city for topographical or other reasons, or features a rather dense concentration of unitary cities. Also, there are regional areas with an existing large city at their center where [urban] dispersion is extremely sparse. New regional hub cities can be promoted in such places, and conceivably this might soon be a way to create a new regional area independent from a long-established regional sphere. The surplus non-agricultural workforce of 7.38 million (or 5.88 million) is clearly a sufficient number of people to build a new large city hub.

Of these three methods, I believe the latter two should be actively implemented. Which of these is used depends on factors such as: trends in locating industry throughout the nation; the layout of transport networks; geographical and historical circumstances in each regional area; and the relationship between the regional area and the nation as a whole. However, future population growth must be dealt with by one of these methods—further upgrading the hub city through concentration and accumulation; building ancillary hub cities; subdividing regional areas; or increasing the placement density of cities—to relocate the non-agricultural population, not by dispersing them throughout villages and hamlets, but as urban dwellers through the creation of unitary city wards.

3.2.4. Placement Density of Unitary Cities that are Large City Hubs

In the previous paragraph, the structure of the regional area has come to be thought of as the arrangement of an enormous large-city hub of unspecified size and 30 unitary cities within the regional zone; however, as has already been stated many times, the large city is merely constructed from unitary cities, except that they are arranged tightly together. Therefore, it is possible to reconsider the unitary city placement density in all regional areas.

Let us consider two cases for the unitary city: (a) population of 100,000; and (b) population of 150,000.

First, let us examine closest-possible placement distances when taking into account vegetable self-sufficiency.

If the population density for urbanized land is 100 persons per ha., the dimensions of the city (total urbanized area) will be 1,000 ha. (1,500 ha.), with a radius of 1,784 m (2,185 m). If available urbanized land, namely land available for effective use, is 50%, then this will be 20 km^2 (30 km^2), and its external diameter will be 5.05 km (6.18 km) if the land is circular, or 4.81 km (5.89 km) if it is hexagonal. Arable land needed for supplying fresh vegetables will be 20 *tsubo* (0.0066 ha.) per person, and if arable land represents 20% of the entire area, the city's total land needs will be 3,300 ha. (4,950 ha.), and the distance between cities will be 6.18 km (7.57 km).

Table 9.9.1 Designated population ratio, by level of city

City scale (10,000)	*Acreage (100 persons/ha) (ha)*	*City radius ($r=\sqrt{A/\pi}$)(m)*	*Vegetable gardens (66ha/10,000 persons) (ha)*	*Total city acreage*			*Distance between cities*		
				Arable land 12% (ha)	*20% (ha)*	*33% (ha)*	*Arable land 12% (km)*	*20% (km)*	*33.3% (km)*
5	500	1,261	330	2,750	1,650	990	5.64	4.37	3.88
10	1,000	1,784	660	5,500	3,300	1,980	7.79	6.17	4.73
15	1,500	2,185	990	8,250	4,950	2,970	9.76	7.56	5.86
20	2,000	2,523	1,320	11,000	6,600	3,960	11.28	8.73	6.76

Note:
1. The required acreage for urbanization is 100 persons per hectare, and for vegetable gardens is 66 hectares per 10,000 persons, or 20 *tsubo* per person [1 *tsubo* = 3.3 sq. m.].
2. Regarding distance between cities, the city is assumed to be a perfect hexagon and connected with one another; $D^2 = (2/\sqrt{3})A$, from which the formula $D = 1.075\sqrt{A}$ was calculated. (See Figure 68, p. 258.)

Table 9.9.2 Width of green belt between cities, when vegetable self-sufficiency is attained

Total effective land acreage ratio		*80%*	*50%*	*30%*
Required total city acreage per person (assuming 0.0166 ha/person)		0.0208ha	0.0332ha	0.0553ha
Required urban space acreage per person		0.0125ha	0.0200ha	0.0333ha
Unitary city (10,000)	Total city (diameter)	4.90km	6.20km	8.00km
	Urban space (diameter)	3.80km	4.81km	6.21km
	Green belt width	1.10km	1.39km	1.79km
Unitary city (15,000)	Total city (diameter)	6.00km	7.58km	9.79km
	Urban space (diameter)	4.66km	5.89km	7.59km
	Green belt width	1.34km	1.69km	2.20km

Therefore the placement distance between cities where the minimum amount of green land (for fresh vegetable supply) is allocated, will average 6 km with around 50% land available for effective use, and the width of green land will be around 1.5 km.

The ratio of land available for effective use will be even greater in the heart of the plains where large city hubs are found, and conversely the ratio will be lowest in the peripheries of regional areas; therefore, for the three different ratios of land available for effective use (namely, 80%, 50% and 30%), calculations for the distance between cities, and the width of green belts, is shown in Table 9.9.2.

This is the average minimum spread when placing unitary city (wards).

Now, if we imagine the structure of the large city with the city center urban ward at its middle point, it is desirable for city wards in the so-called association of city wards to be within half an hour or around 25 km of the city center. Suburban city wards (a large city's suburban neighborhoods) are placed on its outskirts, connected by one-way journeys under an hour; and located further beyond these are unitary cities that form the hub of adjacent regional areas.

Assuming several graded ratios of land area available for effective use (or arable land ratio), and calculating the region's city placement capacity based on a few conditions such as vegetable and staple food supply for the region's population, a concrete representation for the model of these placement correlations can be seen in Table 9.10.

However, the reality of our nation's topography means that there are few instances where land simply stretches out all around the periphery of a regional hub city; and because of the proximity of the heartland for large cities to bays and seas, considerable areas of water are included whether you measure the regional area with a radius of 25, 50 or 75 km, making it difficult to attain the urban land dimensions shown in Table 9.9.2. Naturally, the degree of "shrinkage" due to these bodies of water and other factors varies in

Table 9.10 Regional zone acreage and number of cities in groupings

City designation	*Zone radius (km)*	*Arrival time (hours)*	*Total acreage (km^2)*	*Number of 10,000-person cities within zone*		
				Vegetable self-sufficiency (0.007 ha arable land per person)	*Main foodstuffs self-sufficiency (0.0833 ha)*	*Ditto (0.11 ha)*
			Arable land ratio (%)	33.3	50.0	50.0
				20.0	30.0	30.0
				12.0	20.0	20.0
			Effective land ratio (%)	83.3	56.0	55.0
				53.3	33.6	33.0
				32.0	22.4	22.0
			10,000-person city acreage (km^2)	19.8	166.5	220
				33.0	277.7	367
				55.0	416.5	550
1. Large city hub	25	0.5	1,870	94.4	11.2	8.5
				56.7	6.8	5.1
				34.0	4.5	3.4
2. Large city association	50	1.0	7,840	396.0	47.1	35.6
				237.5	28.2	21.4
				142.5	18.8	14.3
3. Regional zone	75	1.5	27,600	1394	165.7	125.5
				836	99.4	75.2
				502	65.5	50.2
4. Overlapping regional zone	150	3.0	110,400	5574	662	502
				3344	398	301
				2014	265	201

Note: 1. Required city acreage is calculated from required arable land acreage per person, and arable land ratio.
2. For required arable land acreage per person, it is assumed 20 *tsubo* (0.0066 ha) per person for vegetable self-sufficiency. For main foodstuffs self-sufficiency, two sets of figures have been used. (a) On the somewhat generous side, it is calculated as 0.0833 ha per person, or 1 ha per 0.9917 X 21.5 X 0.61/1.076 = 12 persons, where rice paddy per arable land acreage is 60%; rice consumption volume is 1.076 *koku* per person; and rice production volume is 2.15 *koku* per *tan*. (b) It is calculated as 0.11 (0.1113) ha per person, or 1 ha per 0.9917 X 19 X 0.52/1.1 = 8.9 persons, where the rice paddy ratio is 52%, rice consumption volume is 1.1 *koku* per person, and rice production volume is 1.9 *koku* per *tan* (statistics for 1939).
3. For total effective land ratio in all cases, since urbanized land (100 persons per ha, or 1 person per 0.01 ha) is added to arable land, multiply the arable land ratio by 0.017/0.007 for vegetable self-sufficiency; 0.0933/0.0833 for main foodstuffs self-sufficiency in the case of (a); and 0.12/0.11, in the case of (b). The results are shown in the table.
4. The number of cities is obtained by dividing total acreage by urban acreage.

each regional area, but it is conceivable that roughly 80–90% of land is available for effective use in a 25 km radius, 75–80% in a 50 km radius, and 60–70% in a 75 km radius. Furthermore, in a radius of 150 km where regional areas overlap, the degree of "shrinkage" will increase because neighboring areas extend into it as well as these bodies of water, and a ratio of 20–30% is conceivable.

In order to create mock-up values right now, let us assume actual effective area ratios of 85%, 80%, 70%, and 30%, and population distributions of 5 million for a large city hub, 7 million for an association of large cities, 10 million for a regional area, and 11 million for total[4] regional areas; the results can be seen in Table 9.11.

Accordingly, 20% arable land (ratio of total land available for effective use around 53%) in the central regions would make vegetable self-sufficiency possible, while 50% arable land (effective use ratio, around 56%) in an association of large cities would make 50% self-sufficiency in total foodstuffs possible, and 30% arable land (effective use ratio, around 33.6%) in all regional areas would mean complete self-sufficiency in foodstuffs.

In this case, the distance between cities for city wards of 100,000 is 6.1 km in the central areas (or 7.4 km for city wards of 150,000); 14.7 km in an association of large cities areas (or 18.0 km); 24.6–25.3 km in regional areas (or 30.1–30.9 km). (See Figure 67, p. 258 [p. 111].) In all cases, the distance between city wards does not exceed 30 km, which is roughly half the city ward catchment area radius of 50 km calculated previously, so we can see how they are useful as weekend hubs for nearby villages scattered about between cities.

Population density per square km ranges from 3,145 in central areas, to 1,196, 517, and 443, respectively. The population density for all rural areas is lower than the 523 per square km for the Kanto plain area (in 1935), but is higher in all other areas. Arguably, this is one model for placement that satisfactorily increases city density.

4. Regional Area Hubs across the Entire Nation—Placement of Megacity Associations

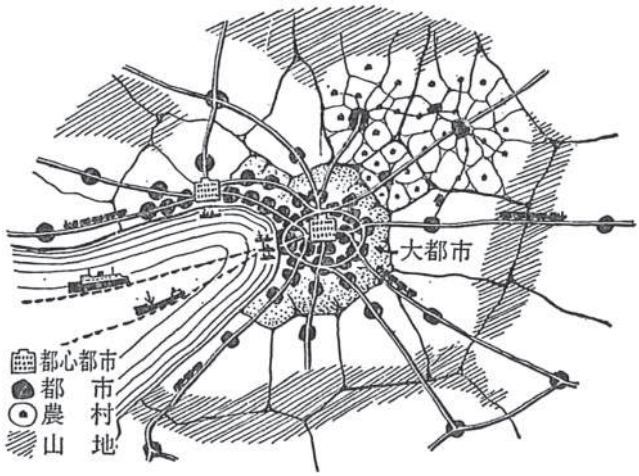
If we explore our nation for areas that clearly are, or might be, composed of a regional area with an association of large cities as its hub, examples emerge such as the Kanto region with Tokyo–Yokohama at its center, or the Kinki region centered around Kyoto–Osaka–Kobe. Although the following have much less sway compared to these two above, additional candidates can be found such as the Tokai region with Nagoya as its hub, and the region of Kyushu (including the western tip of the Chugoku region) centered around the Kitakyushu Industrial Belt.

For convenience' sake, if we check the differential figures for the statistics of the area and population (in 1935) for the first two regions, their populations are 16.87 million and 11.87 million respectively, and the latter is close to the aforementioned model. Their areas are 32,226 km^2 and 27,221 km^2

Table 9.11 Regional zone city arrangement structure

City designation	*Actual acreage ratio (%)*	*Ditto, assumed average (%)*	*Total acreage (km^2)*	*Estimated number of cities*	*Number of cities in zone*	*Ditto, acreage (km^2)*	*Acreage per city (km^2)*	*Distance between cities*	*Population density, within city zone (persons/km^2)*	*Population density, within entire zone (persons/km^2)*	*Distance between cities, for cities of 150,000 (km)*
1. Large city hub	80–90	85	1,590	50(58.9×0.85)	50	1,590	31.8	6.06	3,145	3,145	7.42
2. Large city association	75–80	80	6,270	75(93.8×0.8)	25	4,680	187.1	14.70	534	1,196	18.00
3. Regional zone	60–75	70	19,320	100(143×0.7)	25	13,050	522.0	24.56	455	517	30.08
4. Overlapping regional zone	25–30	30	24,800	110(367×0.3)	10	5,520	552.0	25.25	181	443	30.93

Note:
1. The actual acreage ratio is the ratio where actual regional zone assigned acreage is reduced by the filling in of topographical features such as water surfaces, and neighboring regional zones, and also by the total area of a circle inscribed with a regular zone radius.
2. In the case of figures devised for cities with 100,000, the estimated number of cities is presumed to be as in Table 9.9, with predicted possible effective land ratios, based on calculations of the number of cities by effective land ratio. In other words, the level of placement estimates where: in one zone, 20% of arable land (total effective rate of 53%) allows vegetable self-sufficiency; in two zones, 50% of arable land (total effective rate of 56%) allows 50% self-sufficiency in main foodstuffs; and in three zones or an entire regional zone, 90% of arable land (total effective rate of 34%) is more than adequate for complete self sufficiency in main foodstuffs.
3. For distance between cities, if cities are spaced equally apart, then $D^2 = (2/\sqrt{3})A$, from which the formula $D = 1.075\sqrt{A}$ was calculated. (Same as Table 9.9.)



Text: diagram

Large city

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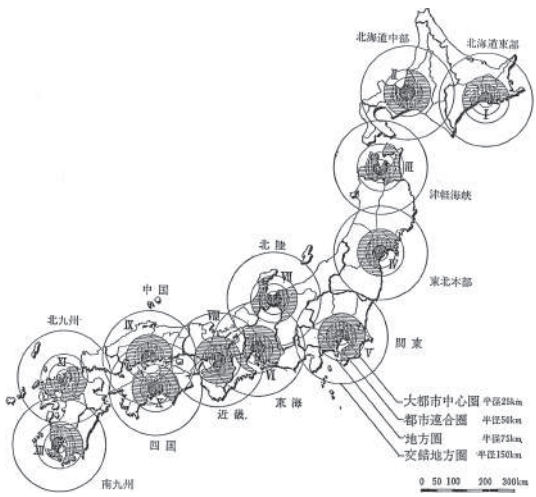
Capital city
City
Village
Mountain area

Figure 65 Model for fixed residences centered around a large city



Text: map of Japan

I. Hokkaido eastern region
II. Hokkaido central region
III. Tsugaru Straits
IV. Tohoku
V. Kanto
VI. Tokai
VII. Hokuriku
VIII. Kinki
IX. Chugoku
X. Shikoku
XI. Kitakyushu
XII. Minamikyushu

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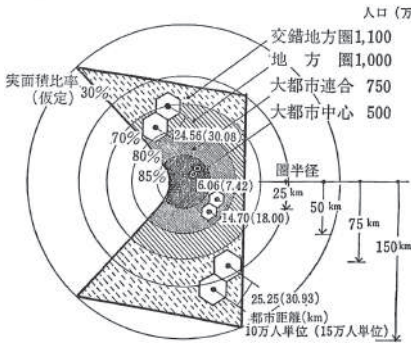
Large city hub zone	radius 25 km
City association zone	radius 50 km
Regional zone	radius 75 km
Overlapping regional zone	radius 150 km

Figure 66 Regional zone placement map

respectively, which are slightly larger than the 24,840 km^2 cited in the model. Therefore, the population density of the former is much higher than that for all regional areas, while the latter is roughly at the same level. However, the arable land ratio for the former is 25.3%, but for the latter it is an extremely low 10.1%. This ratio is higher in the former than the model, but its population density is relatively high; conversely, the population density in the latter is close to that in the model, but its arable land ratio is relatively low and only



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人口（万）	Population (10,000)
交錯地方圏１１００	Overlapping regional zone 1,100
地方圏１０００	Regional zone 1,000
実面積比率（仮定）	Actual acreage ratio (estimated)
大都市連合７５０	Large city association 750
大都市中心５００	Large city hub 500
圏半径	Zone radius
都市距離	City distance
１０万人単位（１５万人単位）	100,000 person unit (150,000 person unit)

Figure 67 Model map of regional zone structure

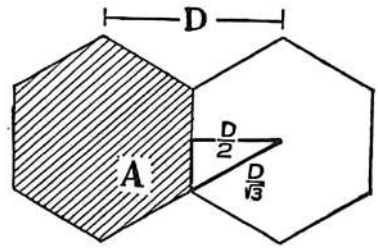


Figure 68 Diagram of distance between cities

Table 9.12 Acreage, population and population density, by statistical zone

Statistical zone	*Acreage (km²)*	*Population (in 1940)*	*Population density*
Hokkaido	88,775.04	3,272,718	37
Tohoku	66,911.21	7,164,674	107
Kanto	32,225.83	16,866,093	523
Hokuriku	25,292.37	4,288,554	170
Tosan	28,586.70	3,638,779	127
Tokai	18,616.33	1,383,235	343
Kinki	27,220.69	11,870,453	436
Chugoku	31,679.19	5,718,434	181
Shikoku	18,772.83	3,337,102	178
Kyushu	42,078.99	9,936,690	236
All Japan	382,545.42	73,114,308	191

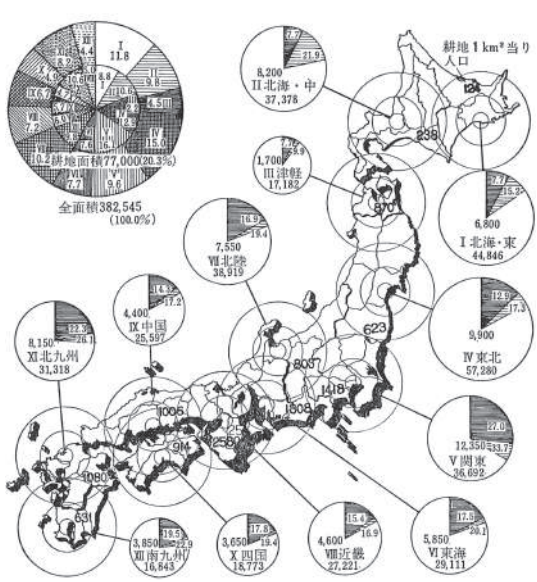


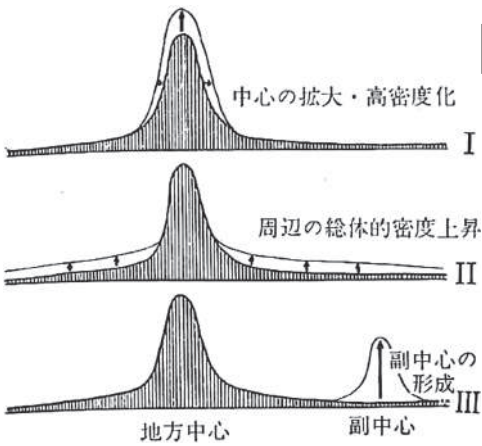
Figure 69 Arable land ratio and population density, by regional zone
Note:
1. Round key shows acreage. Base height represents population density per arable land acreage.
2. Dark shading shows arable land acreage for 1935; but combined with the area in the light shading, this shows the present (1938) latest arable land ratio after expansion of arable land; pie charts for total arable land acreage show latest arable land acreage.
3. Numbers on the map show arable land population density maximums.

half that of the model. Consequently, neither region is able to attain food self-sufficiency.

In other words, if the aforementioned model is used as the standard, these two regions are clearly overdeveloped. Now if we draw 150 km-radius circles around each of the regional areas with existing cities as their hubs examined above (see Figure 66), the Tokai and Kinki regions heavily overlap as shown in the figure, but large gaps can be seen between the other regions, and large swathes of land not included at all in the abovementioned regional areas are revealed.

Therefore, we can see how in future these gaps and spaces must be filled, and that it is desirable megacity associations be established in new regional areas in this middle ground.

This development strategy seems like a proposal to build a hub in this open space, simply because there is something missing in the middle of the countryside. All things being equal, such as requirements including where to locate industry, then naturally this way of thinking is plausible. However, in reality the factors behind locating industry vary according to region, and these



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I. Hub expansion, high densification
II. Overall density increase in periphery
III. Secondary hub forms; regional hub; secondary hub

Figure 70 Models for population concentration and population density increases
In I. there is no increase in hub density, and indeed there are cases where it declines. In other words, where a hub zone changes its character from an area used for both work and residences to one solely for workplaces, one can find examples where the central zone of a former large city often fragments. However, such phenomena are only seen on a small scale; in the big picture, as expected, there are many cases where hub regions continue to grow (although it is inevitable that growth rates will decline). That is, I. represents the typical situation for large city development at present.

differences are what give rise to the remarkable development in the Kanto and Kinki regions at the present time, and the relative lag in other regions. Despite some leeway in areas that are already developed, if we believe that the situation where a part of the nation is overdeveloped and too densely populated must on the whole be corrected in the future, then a proposal of this nature is feasible.

Considered in this light, if new hubs were to be sought while taking into account topographical and historical factors in each region, we could conceive of a total of 12 areas, including: hubs in Chugoku, Hokuriku, Tohoku, and Hokkaido; parts of Shikoku separate from Chugoku; Minamikyushu, separate from Kitakyushu; Tsugaru Straits region and the eastern Hokkaido region, separate from the central Hokkaido region. Problems may arise when terrain and climate factors are taken into practical consideration, but it is conceivable that by constructing these regional areas, a dispersion arrangement may be possible to rebalance the nation industrially and culturally.

These 12 areas differ from traditional statistical-area regional subdivisions. By establishing borders for these new regional areas around the prefectures shown first of all in Figure 66, and for each of these regions include figures for area; population; population density; amount of arable land (as of 1936); and arable land ratios; then, Table 13 is produced when calculating for each region the

Table 9.13 Arable land expansion ratios, by region

Region	*Total acreage (1930) (km^2)*	*Arable land (1939)*			*Extra arable land from expansion (1938)*			*Extra arable land from expansion ratio (%)*
		Paddies (ha)	*Farmland (ha)*	*Total (ha)*	*Paddies (ha)*	*Farmland (ha)*	*Total (ha)*	
Hokkaido	88,775.036	211,028	747,480	958,508	120,000	500,000	620,000	64.8
Tohoku	66,911.215	558,924	340,490	899,414	106,222	201,789	308,111	34.3
Kanto	32,243.184	416,863	535,878	952,741	59,311	182,039	241,350	25.3
Chubu	66,467.546	687,157	403,185	1,090,342	60,445	90,066	150,511	13.8
Kinki	32,985.995	395,066	121,469	516,535	19,241	33,171	52,412	10.1
Chugoku	31,672.623	334,842	135,725	470,568	39,208	54,846	94,054	20.0
Shikoku	18,772.679	147,883	116,788	264,666	7,580	20,387	27,967	10.6
Kyushu	42,050.541	467,324	438,216	895,541	55,520	94,764	150,284	16.8
All Japan	382,264.904	3,209,088	2,869,529	6,078,729	473,029	1,153,750	1,626,779	26.7

Note:
Arable land acreage is taken from the Koseikai's "National land development for Greater East Asia" [*Dai Tō-A no kokudo keikaku*], vol. 1.
Total acreage is from the 1930 national census report.

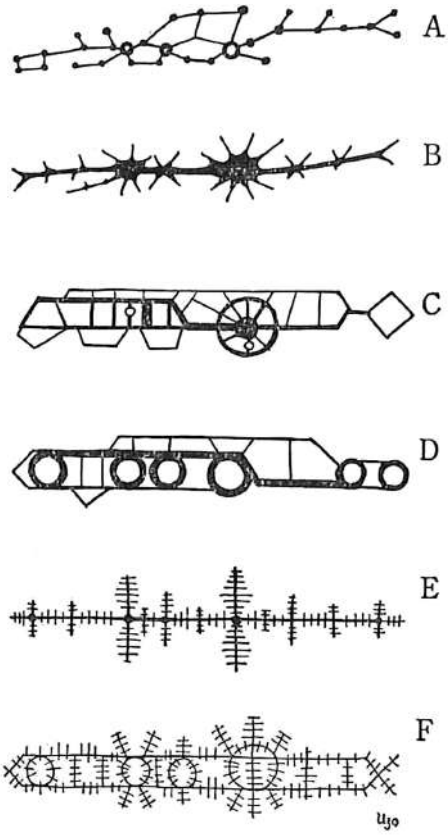


Figure 71 Structural models for Japanese land development
B: Natural-growth radial structure
C: Nishiyama Research Lab, "Design for Life Space in the Nation" [*Kokudo ni okeru seikatsu kūkan no kōsō*], *Shin Kenchiku*, March 1966.
D: Atsushi Ueda, "Design for Nation and City" [*Kuni toshi no kōsō*], *Mainichi Shimbun*, March 1968.
E, F: Spinal formation, and its compound formation.

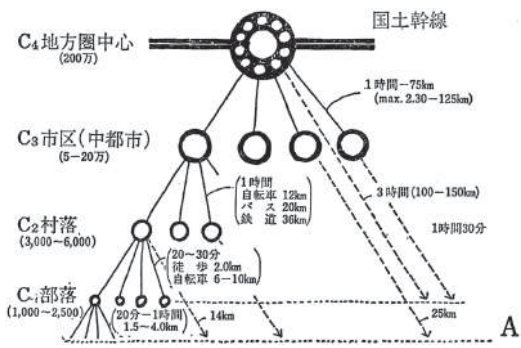
final amount of arable land—after adding postwar projections for 1.7 million ha. of reclaimed land nationwide—and their respective ratios. The above table shows trial calculations of regional placement for areas indices only, and no allowance has been made for climate and other geographical disparities and conditions in San-In, Hokuriku, Tohoku, Hokkaido, etc. so it would be a mistake simply to use this raw data; however, the following information can be acquired from the table: the state of development of each regional area, and its development ranking, from figures for population density and population density per arable land (referred to as arable land population density); and their relative development

reserves, or new urban dispersion reserves. From this, it will be clearer in which regions the nation's population and industries must be distributed in future.

Accordingly, we can remodel and reorganize regional area hub districts and their regions in existing developed areas such as Kanto and Kinki; at the same time we can carry out the urban arrangement of megacity alliances that will be the hub districts of new regional areas, and design the reorganization of transport networks to handle these new key formations.

5. Appendix

As discussed in the first half of the introduction, in the present chapter the principle objective of this tentative proposal for national formation is the gradated construction of residential areas; but it resembles an unusable outdated pattern because: the location of industry which is intrinsically linked with this issue has been disregarded; and technological innovations mainly in transportation, such as subsequent rapidly changing motorization, developments in airplanes, and the possibility of high-speed rail, have not been coordinated. However, in the national development that is actually being carried out, these technological advancements are being used by highly advanced monopolistic capitalism as a tactic or strategy to intensify overconglomeration, and there is a strong tendency that the warped state of the nation should simply be accepted. In this respect, this proposal sets aside the issue of the location of industry but nevertheless does discuss those conditions that check such issues, and cannot be said to be without significance. However, if we consider advancements in transport technology, several revisions are necessary in future designs. Also, as for the character of the city and the construction of residences, I later devised several propositions to revamp the aforementioned proposal. These do not appear in my collected works, so I add them here as a brief supplementary explanation to make up for any shortcomings.



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National trunk line
C4 Regional zone hub
1 hour; 75 km (max. 2 h, 30 min; 125 km)
C3 City zone (middle-sized city) (50,000−200,000)
1 hour; bicycle 12 km, bus 20 km, rail 36 km
3 hours; 100–150 km
C2 Village (3,000−6,000)
20–30 min; by foot 2.0 km, bicycle 6–10 km
1 h, 30 min
C1 Hamlet (1,000−2,500)
20 min–1 hr; 1.5–4.0 km
14 km
25 km

Figure 72a Zone area structure for Japanese land (A: original proposal; B: revised proposal)

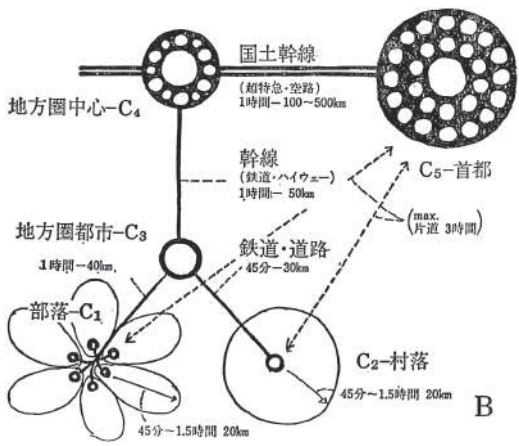
(1) In rural areas, foot traffic and bicycles are the main form of transport, but due to the systematic adoption of motorization, regions are expanding more, and furthermore it is possible to increase urban-style accumulation to bring about a better life.

(2) Because of this, it is possible to convert the gradated formation of cities from *C*4–*C*3–*C*2–*C*1 (Figure 72A) to the formation of $C4-C3 \begin{cases} C2 \\ C1 \end{cases}$ (Figure 72B).

(3) By strengthening C4 trunk-line rail links, the nation as a whole becomes more integrated; and with the necessary connections, the entire nation can be included in the "day-trip zone" of the nation's hub C5 (the capital city).

(4) The pyramid-shaped organization of regional formation appears to be constructed in a radial link pattern (concentric circle formation); however, Japan's long and massive land mass, its trunk-line rail lines that follow the shoreline, and a topography that features steep mountainous areas crisscrossed virtually at right angles by rivers, valleys and plains, mean to the contrary that a spinal formation or its compounded form (Figure 71, E and F) should probably be the basic configuration.

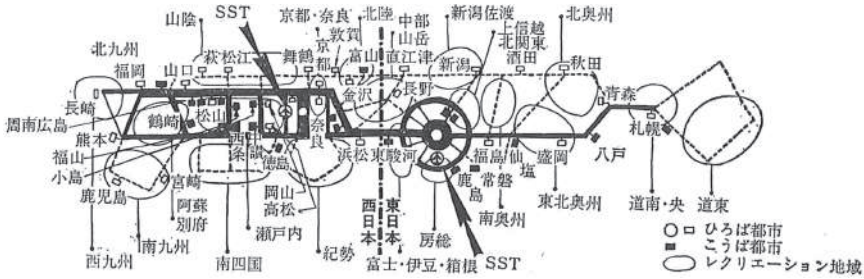
(5) The national rail network and the C3 aggregations, component elements of C4 and C5, form the backbone of a spinal or ladder shaped formation where the national rail lines run through the capital city and regional hubs; and in the central large city regions, perhaps a ringed formation encircling a "bay area" could be the framework, rather than a radial pattern.



Text: B, from top

National trunk line
(Super express; air route) 1 hour; 100–500 km
C4 Regional zone hub
Trunk line (rail; highway) 1 hour; 50 km
C5 Capital city
C3 Regional zone city
1 hour; 40 km
Railway; roads
45 min; 30 km
(max. one-way 3 h)
C1 Hamlet
C2 Village
45 min–1 hr 30 min; 20 km
45 min–1 hr 30 min; 20 km

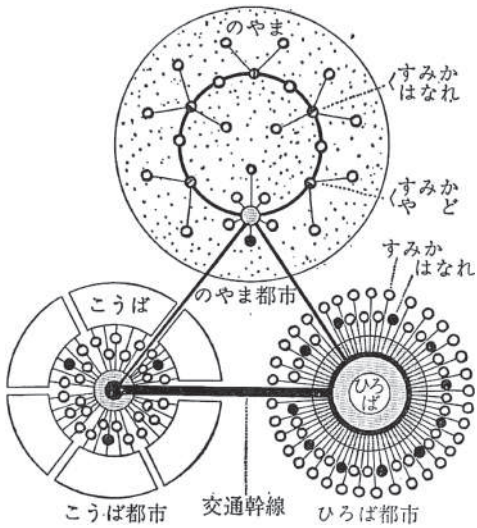
Figure 72b (continued)



Text: from top

山陰	Sanin	東駿河	Higashisuruga
京都・奈良	Kyoto-Nara	福島	Fukushima
北陸	Hokuriku	仙塩	Sen-En
新潟佐渡	Niigata Sado	盛岡	Morioka
北奥州	Kitaoshu	八戸	Hachinohe
敦賀	Tsuruga	札幌	Sapporo
中部山岳	Chubu Sangaku	小島	Oshima
上信越	Joshin'etsu	宮崎	Miyazaki
北関東	Kitakanto	岡山	Okayama
北九州	Kitakyushu	西日本	Nishi Nihon
荻	Ogi	東日本	Higashi Nihon
松江	Matsue	鹿島	Kashima
舞鶴	Maizuru	常磐	Tokiwa
京都	Kyoto	鹿児島	Kagoshima
富山	Toyama	阿蘇別府	Aso-Beppu
直江津	Naoetsu	瀬戸内	Setouchi
新潟	Niigata	高松	Takamatsu
酒田	Sakata	南奥州	Minamioshu
秋田	Akita	東北奥州	Tohokuoshu
福岡	Fukuoka	道南・央	Donan-O
山口	Yamaguchi	道東	Doto
長崎	Nagasaki	西九州	Nishikyushu
鶴崎	Tsurusaki	南九州	Minamikyushu
松山	Matsuyama	南四国	Minamishikoku
金沢	Kanazawa	伊勢	Ise
長野	Nagano	房総	Boso
青森	Aomori	富士・伊豆・箱根	Fuji-Ise-Hakone
周南広島	Shunan Hiroshima		
熊本	Kumamoto	**Text: key, bottom right**	
西条	Saijo	Plaza city	
中讃	Chusan	Factory city	
徳島	Tokushima	Recreation area	
奈良	Nara		
浜松	Hamamatsu		

Figure 73 National land framework, binangle structure
(Source: Nishiyama Research Lab, "Design for Life Space in the Nation" [*Kokudo ni okeru seikatsu kūkan no kōsō*], *Shin Kenchiku*, March 1966.)



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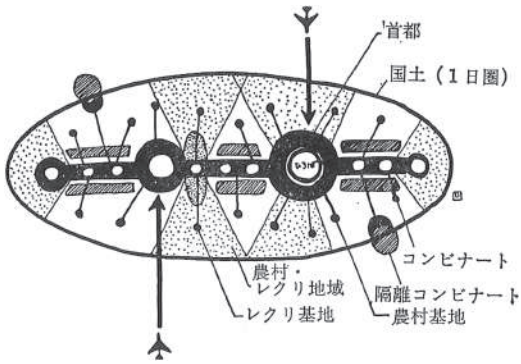
野山	Fields and mountains
すみか　はなれ	*Sumika* and *hanare*
すみか　やど	*Sumika* and *yado*
すみか	*Sumika*
はなれ	*Hanare*
のやま都市	Rural or mountain city
こうば	Factory
ひろば	Plaza
こうば都市	Factory city
交通幹線	Traffic trunk line
ひろば都市	Plaza city

Figure 74 Permanent residential model for national land space



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首都	Capital city
国土（1日圏）	Entire nation (one-day zone)
コンビナート	*Kombinat* (industrial complex)
農村・レクリ地域	Village-recreation area
レクリ基地	Recreation base
隔離コンビナート	Outlying *kombinat*
農村基地	Village base

Text: handwritten, in thick circle

ひろば　Plaza

Figure 75 Structural model for the nation

(6) Every part of these networks must be designed, according to their function: airplanes, high-speed rail, railways, [green] belts, and walkways; and a general connection system of roads and canals to supplement these.

(7) Residential areas or housing are rather compact for daily use, in order to manufacture high-density life spaces; so to get some relief from these, facilities to allow every person adequate access to travel, a change of scenery, or recuperation, must be incorporated into the network of residential areas. In contrast to permanent residences (*sumika*), detached cottages (*hanare*) for holidays and recuperation, and inns (*yado*) for trips to get away for a while, must be allocated and secured in every region.

(8) The C3 city can be roughly categorized into three different types: (a) the "factory" city that combines industrial production with the *kombinat*; (b) the "plaza" city that handles distribution, management, research and education, etc., and performs the central functions of politics, economics, culture and information; and (c) the "open field" city that is a primary producer connected to farming, forestry and fisheries, as well as being a hub for open area recreational zones. C3 cities are dispersed among all regions throughout the nation. (Figure 74.) Figures 71 to 75 provide a simple schematic view of the above points.

However, the structural patterns here are not provided to demonstrate that the actual situation in our nation can be converted in this manner easily or spontaneously; naturally, this proposal merely offers a target to reform two opposite images: the chaotic capital city area and the megalopolis belt along the Tokaido corridor that, due to overcrowding, are in fact gradually turning into uninhabitable environments; and on the other hand, the growth of sparsely populated zones that are becoming increasingly neglected.

Notes

1 Translated from *Nishiyama Uzō chosakushū 3* [The collected works of Uzō Nishiyama, volume 3], *Chiiki Kūkan Ron* [Reflections on Urban, Regional and National Space] (Tokyo: Keisō Shobō, 1968). "Dai 9 shō, Kokudo kōsei no shiron" [Chapter 9, An Essay on the National Structure], pp. 225–266.
2 Question mark inserted by Nishiyama.
3 Nishiyama's note: The terms employment ratio, external industry workforce ratio, commercial industry workforce ratio, etc., were examined in Chapter 2.
4 Translator's note: Nishiyama uses the term "total regional areas" [全地方圏] in the text. This refers to "overlapping regional zone" [交錯地方圏] in Table 9.11, Column 1.

10

MOUNTAIN CITIES[1]

Like the previous two chapters, this essay was previously published in a reprint of *Shin Kenchiku*, issues 3 and 4, 1946, as "Sangaku toshi ron" [On Mountain Cities], and was the final essay in a set of three entitled "The New National Construction" [*Atarashiki kokudo kensetsu*]. It was a proposal to build cities by utilizing steeply sloping terrain that makes up a large portion of Japan's land.

During the war, I looked on while excellent tracts of arable land were indiscriminately and steadily demolished for the expansion of structures such as munitions factories, simply because the land was easy to procure, but severe food shortages hit Japan when the war was over. When lasting world peace was established, food self-sufficiency was not necessarily essential because of rational international specialization; but assessing arable land as yielding meager profits based purely on the economics and productivity of capitalist economic mechanisms, is no reason to destroy it. There are magnificent views of verdant undulating rice paddies spreading across the alluvial plains as far as the foothills of distant mountains, or the glow of insect light traps on summer evenings glistening everywhere. What about moving cities into the hills onto steeply sloping land, rather than dispersing them through the alluvial plains? With this in mind, this chapter is the slightly expanded version of an amateurish suggestion I sent in to "Our Words"—*Watashitachi no kotoba*, the radio program that invited listeners' participation NHK began to broadcast weekly after the war—entitled "A proposal for mountain cities," which put together housing construction methods to use land more efficiently for high density living.

Naturally, when it comes to using land, the combining and placement of various industries must be considered. Japanese territory is a combination of the flat land of Holland and the steeply sloping terrain of Switzerland, and it is said there are few gently sloping hillsides suitable for raising livestock. Rice paddy cultivation was developed on flat land that accounts for merely one quarter of the total, and since the Meiji era arable land located on the urban periphery has been squandered through the development of capitalist cities. However, cities don't necessarily need to be built on flat land, residential areas in particular. What if some other place was put forward as more desirable than flat land; how about relocating cities into the mountains? In this sense, the

expression "mountain city" is a little too narrow. Of course, the issue of disaster prevention must be considered when making use of precipitous slopes, and considerable fabricated construction work is needed. Therefore, high-density, compact, comprehensive and concentrated development is in fact preferable. And then there is the reasoning that disasters must also be prevented, but if we're going that far, we might also establish a rationale that it is preferable to consider large-scale national land reformation using advanced building equipment, regardless of whether it applies to existing mountains. Indeed, in Kobe after the war, mountains behind the city were shaved and the sea was filled, and "flat" land was constructed from the mountains and the sea simultaneously. Also, although high-density housing was suggested, it was considered important to guarantee openness to the outside for every household, an important condition to ensure public health and security; but when high-density and concentration was pushed for even more, some indicated that the fabricated installation of multi-story housing as a substitute for local conditions was perhaps more favorable. However, immediately after Japan's defeat the design did not progress this far, because the proposal emerged at a time when the nation was barely surviving on soybean pulp and sweet potato vines. Many articles now discuss this issue, and emphasize the need to use steeply sloping land since "overpopulation" and "food self-sufficiency" are practically no longer problematic due to changes in the international environment, and to production methods and lifestyles; but this was one of many issues that people immediately after the war tussled with. Furthermore, great importance is placed on factors such as sunlight and ventilation when laying out housing, but despite strong opposition housing alignment until that time ignored these; to set this as a basic condition of urban construction could arguably be seen today as shortsighted. To discuss the future based on predictions made 20-odd years ago is diverting because from today's perspective they missed the mark considerably. This proposal is nothing more than an unadulterated and simple one-sided view, because with the purposes discussed above it was written during the war by quickly gathering together things that occurred to me at odd times; but it is included here as one perspective on utilization design for national space.

(Originally published as "Sangaku toshi ron" [On Mountain Cities], Part 3 of "Atarashiki kokudo kensetsu" [The New National Construction], in *Shin Kenchiku*, June 1946.)

1. Preface: The Case for Mountain Cities

When you gaze out at the passing scenery from the window of a car or a suburban train, what catches the eye are factories dotted throughout the splendid farmlands on the alluvial plains, and moreover they are surrounded by tall fences. Throughout the China Incident and the Pacific War, views like this were to be found everywhere. Today, now that the war is over, within

these tightly enclosed walls there are mere glimpses of unfinished buildings, and many barely completed factories lay dormant; just like a war-torn battlefield the vast expanses are piled up with building materials and such, and apart from being unsightly, they are not being put to any positive use at all. Due to food shortages, these days people are calling for undeveloped land to be cleared from deep within the forests and plains, but in doing so, should we just abandon even better land that until yesterday was fertile and productive?

The lands occupied by these virtually abandoned factories must be put to use to boost food production.

Generally speaking, factories were probably built on "the plains" because of prerequisites like convenient access to transport and the need for level ground; however, disparities in the relative value structure for types of land including urbanized, agricultural, and mountains and forests, were exploited—a condition for locating industry under liberal economics—with the aim to seek maximum profit from each enterprise, and this in the end resulted in wasting good quality arable land despite wartime efforts to expand it, and must be viewed as having heightened the distress of food shortages today. Considered from the point of view of the overall benefit to the people, many of these factories do not make use of this arable land, or would be better relocated to land with a low degree of utilization. Moreover, at the present time there is a pressing need internally and externally to arrange for our maximum self-sufficiency in food. Every piece of our nation's limited and precious land must be used and developed, employing methods that on the whole are becoming more efficient. Viewed from this perspective, low-lying marshlands must in principle be secured for use as arable paddy fields.

In our nation, cities generally grew around locations such as feudal-era commercial centers and castle towns that were trading posts for agricultural produce and key strategic points for transport (although this is not necessarily so in all cases due to historical development conditions). But many of them are in the heart of the alluvial plains close to rivers, so there is a tendency to believe that building cities on flat land is inherently predetermined. Moreover, capitalist development produces a swelling snowball effect around these former feudal towns, and before long the plains that make up their hinterland are completely destroyed; difficulties in supplying food from adjacent lands become obvious, and result in today's problem of overcrowded cities.

When thinking about the construction of the most ideal configuration for our nation, we need to completely abandon all that has happened in the past and reconsider matters. By so doing, we will obviously consider locating many of the facilities that make up so-called urbanized spaces, whether they be factories or housing, to steeply sloping land in mountains and forests that are difficult to use for arable farming, or sometimes even below ground.

This means building cities in the mountains, in valleys, on mountainsides, and on mountain tops.

Of course, it isn't possible to do this for all cities. Some cities probably can't be moved for historical and geographical reasons, and the nation as a whole

needs several general manufacturing bases, so these must be located in the heart of the great plains at key transport points. However, the construction of most cities, in particular medium- and small-sized cities over which there is now a great clamor for eliminating the adverse effects of overcrowding, ought to be decisively moved into the mountains.

During the war, plans taking air defense into consideration were enacted to transfer many factories into the mountains, valleys and underground, or simply into the countryside. Some of these were of course just a way to ride out the crisis, and there were probably many that from an overall national planning perspective placed things in inappropriate locations. However, there is no need to give up the locations themselves, as they were presented here. We should dispose of their current sorry state of abandonment, or thoughts of tearing them down, and positively consider their reexamination and use.

The penetration of cities into the mountains and the use of steeply sloping land have the edge on current city construction methods that merely spread urban sprawl. Vertical transportation becomes mechanized, and high-rise buildings are built intensively. This is a benefit for land usage, and for engineering works. If advancements in designs of engineering machinery and facilities for use in construction work on steeply sloping land are tailored to Japanese conditions, then difficulties presented by such work will not be of concern. Also, if south-facing slopes are used, it will be possible to build the sort of high-density housing that would be inconceivable on the plains, and secure the maximum amount of arable land even in the narrowest of spaces; furthermore, urbanized land coverage will become denser and it will be possible to fully deliver high-quality life facilities economically.

Let's say the typical urban landscape of traditional Japan is the view of temples and shrines such as Kurodani, Gion and Kiyomizu standing out against the blanketed slumbering form of purplish Higashiyama rising above a sea of tiled roofs spreading out across the plains; then I envisage the shape of a new Japan, where healthful fireproof high-rise residential areas are built like white horizontal lines etched into the foothills to halfway up the purplish green mountains encircling the rolling golden plains that stretch out all around, and where electrified factories, subway exits and other features are visible in the lowest areas adjoining the plains, with rapid transit facilities darting swiftly between them.

Rather than farming all the way to the mountains, people will live in these areas instead.

Although much effort will be needed to resolve the food shortage crisis, I hope we can take the time to make sufficient allowances within the various emergency measures to accommodate 100-year plans like these.

I recommend here that the building of mountain cities be actively pursued as an important direction for our nation's urban construction.

Submitted with the title "A proposal for mountain cities."

Broadcast on "Our Words"—*Watashitachi no kotoba*—on the morning of December 9, 1945.

2. An Appeal for the Effective Use of Land

The greatest problem facing Japan at present and into the future with regards to our people can be summed up by the term "overpopulation." Any mistakes made in steps to resolve this runs the risk of forcing Japan to face the worst possible outcomes.

In general, in most cases people refer to overpopulation when a population is out of proportion in relation to other factors, but problems to do with overpopulation indicate a "surplus" in a condition that is hard to alter (perhaps not an absolute condition), namely a country's natural resource. Moreover, studies in demography refer to relative overpopulation as an increase in population that leads to a decline in living standards, and among these cases that where existence can no longer be sustained is called absolute overpopulation. Since the ability to provide a population with a certain standard of living is called population sustainability, in the former case this means that in parallel with absolute increases in population there is no proportional increase in population sustainability, while in the latter, further declines in living standards to offset insufficient increases in sustainability are not possible.

Of course, "population sustainability" is an abstract concept, and varies according to the structure of the national economy. Factors determining declines in living standards, or threats to a country's existence, are not concepts like supra-historical "sustainability"; in many instances, "over" population arises due to barriers for boosting productivity based on contradictions in production relationships, or unfair distribution (in part, wastages, and in part, shortages). However, if for instance we consider sustainability in its entirety, including its social and economic contradictions, as a determining criterion for "overpopulation," what comes to mind and attracts the most attention is land, a natural resource that features in every aspect of life: it is a crucial condition, and an element of production for life's essentials; food in particular but also things such as raw materials. Land has its spatial limits, whether it is on a global or national scale; and its use under certain production relationships and technological conditions is an important and fundamental condition that limits production of the essential goods of life it supports.

Due to the law of diminishing returns, in general we cannot expect sustainability to increase in response to population growth the more intensively land is used, so there is a strong risk of overpopulation in countries that are unable to expand their territory. Although Japan has a population of around 70 million, it has a limited land area and high population density. Also, comparing arable land used in direct food production as a part of total national land across countries, this disparity becomes even greater. (See Table 10.1.)

For the most part, Japan is made up of mountains, forests, and steeply sloping land with little leeway for expanding arable land as in other countries. (See Table 10.2.) Therefore, all other factors being equal, Japan has a much greater risk of succumbing to what we call "overpopulation."

Table 10.1 Population and land (including arable) for key countries

Country	*Land per person (ha)*	*Arable land per person (ha)*	*Arable land per farmer (ha)*	*Ditto, ratio when Japan = 1*
Japan	.55	.087	.42	1.0
China	2.2	.26	1.1	2.6
India	1.32	.32	1.2	3.0
Holland	.40	.11	1.4	3.3
Italy	.73	.30	1.5	3.6
Belgium	.36	.13	1.7	4.0
Poland	1.13	.55	1.8	4.3
Germany	.70	.29	2.1	5.0
England	.52	.09	2.7	6.4
France	1.32	.51	2.7	6.5
Sweden	7.15	.59	3.6	8.6
Denmark	1.16	.72	4.8	11.5
U.S.	6.25	1.07	12.8	30.0
Canada	87.00	2.12	19.6	42.0
Australia	114.0	1.75	20.7	50.0

Note: Figures obtained separately from each country.
Source: Juitsu Kitaoka, "Population Policy" [*Jinkō seisaku*], p. 123.

Table 10.2 How land is used

Country	*Total acreage (ha)*	*Arable land (%)*	*Permanent grazing land and pasture (%)*	*Forests (%)*	*Other (%)*
Japan	38,225	15.8	8.7	51.5	21.0
Manchuria	130,314	14.1	…	16.8	69.0
India	269,869	46.6	…	13.4	45.0
Holland	3,293	29.2	39.2	7.4	23.8
Italy	31,019	41.7	18.8	17.9	21.6
Belgium	3,051	34.8	23.2	42.0	42.0
Poland	38,863	47.7	16.7	21.4	14.2
Germany	47,071	41.2	18.2	27.4	13.2
England	9,307	60.4	17.5	11.8	10.3
France	55,099	38.3	20.7	19.5	21.3
Sweden	41,024	9.1	2.7	54.2	34.0
Denmark	4,293	61.9	9.9	28.2	28.2
U.S.	770,213	16.8	…	…	…
Canada	897,821	2.6	…	…	…
Australia	122,388	6.0	…	…	…

Source: 57th "Statistical Yearbook of the Empire of Japan" [*Teikoku tokei nenkan*]

Naturally, a nation's ability to sustain its population is not influenced solely by the land resources it possesses; that sustainability also depends on things other than land such as commerce, industry and trade. However, to maintain settlements in a [favorable] direction, securing this sustainability is to a

considerable extent dependent upon trends in public opinion in other countries, and must also be predicated on lasting peace in international relations, therefore securing absolute sustainability cannot necessarily be taken for granted.

Furthermore, as a defeated country under the occupation of Allied troops, our nation at present cannot trade freely, and faces a situation where it must be anticipated there will be perpetually more trouble maintaining even the lowest standards of living. Moreover, while our nation is now facing the extraordinary situation of its worst crop failure in three decades, it is also confronted by absolute shortages of food, and faces the unprecedented crisis of difficulties in maintaining even minimum levels for the people's livelihood and national economic activity. On top of this, as far as the future is concerned, Japan must also bear in mind that the population will also continue to increase year on year.

For our nation to curb a tendency towards overpopulation that is limiting expansion of the people's economy, what will become issues of utmost urgency are the production relationships that determine population sustainability; in other words, striving for a more rational structure for the people's economy, while making maximum use of limited national lands to maintain and secure it, and establishing a direction in national development over the long term that realizes much better utilization.

The issue I would like to emphasize here is that of the relationship between the people and land, in particular the latter. Today 70 million people are crammed onto four main islands and must find ways to support themselves; consequently, it will be necessary to provisionally examine how these two corresponding conditions—population and land—may transform in the future.

Since before the second Sino-Japanese War [1937] many analysts have discussed trends in Japan's population growth. While their conclusions are not completely in accord, there is general agreement that Japan, from estimates based on the precedents of many developed nations, is at the end of the second stage of demographic change.

Reviewing population trends in modern civilized nations over roughly the last 125 years, four stages can be identified. In stage one, birth rates tend to rise slightly while death rates tend to stall or slightly decline, and the rate of natural population growth increases. In stage two, birth rates begin to decline but death rates drop faster than this, and natural population growth continues to rise. Following this, in stage three birth rates drop rapidly, but there is a gradual decline in death rates until it levels off, and natural population growth steeply decreases. The decline in birth and death rates continues, and birth rates can drop to zero. However, there is a limit to how far death rates can decline since all men are mortal; when birth rates drop below death rates, natural population growth can turn negative as a result. This is known as stage four.

The fact that our nation's population is [only] in the beginning of stage three, the first step of this shrinking, is because despite the difficult

Table 10.3 Population forecasts for Japan (Unit = 1,000 persons)

Year	*1. Statistics Bureau of the Cabinet (1927)*	*2. Shimojo (1931)*	*3. Sayuda (1931)*	*4. Ueda (1933)*	*5. Nakagawa, series 1*	*6. Nakagawa, series 2*	*7. Institute for Population Research (1941)*	*8. Kawakami & Kubo (1941)*	*9. Kitaoka*
1935	66,533	68,527	66,860	68,016			69,254		
1940	71,681	72,626	71,123	71,123	74,027	73,939	74,035	73,156	73,528
1945	76,144	76,298	75,667	75,261	79,202	78,985	79,291	80,110	77,972
1950	80,768	79,454	80,437	78,355	85,124	84,336	85,170	87,678	83,856
1955	86,563	82,014	85,292	81,144	91,544	90,107	91,589	93,264	90,276
1960		83,912	90,351	83,582	98,278	95,955	98,312	100,044	96,891
1965		85,099		85,776	105,193	101,608	105,231		
1970		85,542		87,723	112,356	106,857	112,408		
1975					119,963	111,453	120,005		
1980					128,161	115,379	128,190		
1985					137,001	118,554	137,018		
1990						120,914			
1995						122,528			
2000						122,741			

Source: Kaizo Noma, "Population and Economy of Japan" [*Nihon no jinkō to keizai*], p. 368. Nakagawa series 1 assumes death and birth rates will persist at 1935 levels; Nakagawa series 2, that both birth and death rates will gradually decline following recent trends. Ueda has constant death rates, by age, and constant birth rates (2.1 million); Kitaoka sets the natural growth rate at the 1941 level, or 14.4%.

circumstances of the unfolding of the second Sino-Japanese War, the government of the day succeeded to a certain extent in bringing about various public policies to boost the population. Population trends cannot necessarily be expected to unfold according to established patterns simply by implementing such population policies; however, based on assumptions regarding the aforementioned precedents related to advanced nations, we can draw various predictions concerning trends in Japan's population growth. See Table 10.3 for some of these predictions.

If we take a general look at these predictions, let us assume that over the long term the various factors that determine demographic changes remain constant; if we optimistically (regarding growth) set an upper limit where the rate of growth is kept steady at present levels, and allow for various pessimistic views that predict declining birth rates, then regardless of hypothetical conditions and excluding the primary premise that growth will continue forever, it is predicted that the absolute volume of population will reach its maximum rate of growth in any case in 30 years at the earliest, or roughly 80 years at the latest. And this maximum population will be of a magnitude between 90 million and 120 million.

The Japanese people's living conditions and the nation's population sustainability have declined significantly due to our defeat in the recent war, the reduction of Japan's lebensraum or living space because of our acceptance of the Potsdam Proclamation, and moreover the exhaustion of past reserves due to the war; at the same time, many people were killed in action, or died as victims of the war (said to be around 750,000), and it is predicted the population will decline as a result of the economic collapse that brought the subsequent food crisis to a head. Also, restricting births is being advocated to resolve this difficult situation.

These circumstances include factors that fundamentally overturn pre-war forecasts of population trends, even the optimistic ones among them, and as a result it is suddenly difficult to predict the shape of future demographic trends in our nation. However, even if, for instance, this inclination to expand suffers a large setback, we should still expect our population to "grow" for the time being; the result will be that we should probably anticipate the emergence of a situation where over 100 million people inhabit these four [main] islands, even if this takes place somewhat later than expected.

On the other hand, from a mathematical perspective, what about our nation's natural resources and land?

With regards to land as a production factor for foodstuffs, fuel, and raw materials, expanding acreage used for producing food is most difficult.

The amount of arable land in the main island of Honshu since the middle of the Taisho era [1912–1926] has fluctuated around the vicinity of 6 million hectares (of which, half consists of rice paddies), and has seen little growth. Of course a considerable amount of land has been reclaimed; nevertheless, this has been used for little more than expanding urban areas, or appropriated as

landfill for non-arable land for sociocultural facilities such as factories, buildings, roads, railways, and upgraded rivers.

As a result of our defeat in the war, large-scale land reclamation projects to boost food self-sufficiency systems have been set up (a 5-year plan beginning from 1946: land clearing, 1.55 million hectares, of which Honshu, 850,000 and Hokkaido, 750,000; drained land, 100,000 hectares, of which from lakes, 75,000 and shoreline, 25,000; land improvement, 2.10 million hectares; conversion to rice over three-year period, increased production of 20 million *koku* [102.4 million bushels]—Source: *Nihon Sangyō Keizai,* Nov. 11, 1945). However, this probably represents the upper limit to the expansion of the amount of arable land in our nation. Therefore, upon completion of this expansion project the volume of arable land in our nation will be 7.7 million hectares. Tentatively, this is the upper threshold for the total amount of our arable land.

In which case, what happens to the relationship between arable land and population if, for instance, we examine only the aspect of "food self-sufficiency"?

In order to proceed with this examination, let us look at two forecasts for population growth: A) those from the Institute for Population Research [*Jinkō mondai kenkyūjo*]; and B) forecasts based on a simple geometric growth rate (1.35% per annum).

Next, with regards to food allowances, if the amount of rice consumed per person is an average of 1.10 *koku* [5.63 bushels], or between 1.00 and 1.15 *koku* per person per annum from the middle of the Taisho period to the present day, then the volume of food allowances corresponding to these population changes appears in Table 10.4, columns 3 and 4.

If, for example, we supply this through total national production, the amount of arable land needed is shown in columns 7 and 8. However, it would be fatalistic to expect absolutely no change in the food productivity of arable land, so if we assume factors such as land improvement (based on the rising yield per *tan* [0.2451 acres] of 0.14 *koku* per decade, since 1884) and that advances in agricultural technology will continue in future, forecasts for changes in yields per *tan* are shown in column 5.

And to simplify matters, if we assume 60% of total arable land is used as paddy fields (for rice cultivation), then yields per *tan* for total arable land is shown in column 6.

When we compare the totals in columns 7 and 8 with the maximum arable land volume of 7.7 million hectares, food self-sufficiency is possible for the time being if we realize the aforementioned land reclamation project. However, in 1965, 20 years from now, self-sufficiency will clearly no longer be possible. But if continued growth in yields per *tan* is guaranteed, and furthermore if our population growth tends to stagnate as predicted by A), the amount of required arable land will peak at around 8.13 million hectares in the period 1975–1985, and demands on arable land will tend to decline. Even under this scenario, we must still expect a period where there is a shortfall of arable land of around 400,000 hectares.

Table 10.4 Volume of arable land acreage required for future food self-sufficiency

Year	*Forecast population*		*Volume of food required (million* koku*)*		*5. Volume of rice produced per* tan	*6. 60% of col. 5.*	*Arable land required (million ha)*	
	1. Institute for Population Research (1941)	*2. Simple geometric calculation*	*3. Using col. 1.*	*4. Using col. 2.*			*7. Using col. 1.*	*8. Using col. 2.*
1945	78,985,589	78,200,000	86.8	86.0	2.10	1.26	6.88	6.92
1950	84,336,487	83,607,530	92.6	92.5	2.17	1.30	7.12	7.11
1955	90,107,431	89,388,856	99.0	98.3	2.24	1.34	7.38	7.33
1960	95,955,701	95,569,784	105.4	105.1	2.31	1.39	7.59	7.57
1965	101,608,567	102,178,466	111.7	112.4	2.38	1.43	7.81	7.87
1970	106,857,962	109,243,836	117.3	120.2	2.45	1.47	7.97	8.17
1975	111,453,360	116,797,596	122.6	128.5	2.52	1.51	8.11	8.50
1980	115,379,596		126.9		2.59	1.56	8.13	
1985	118,554,200	133,509,296	130.2	146.9	2.66	1.60	8.13	9.18
1990	120,914,016		133.0		2.73	1.64	8.11	
1995	122,328,494	152,611,992	134.6	167.9	2.80	1.68	8.00	10.00
2000	122,741,777		135.0		2.87	1.72		
2005	122,186,682		134.4		2.94	1.76		
2010	120,737,750		132.8		3.01	1.81		
2015	118,492,685		130.3		3.08	1.85		
2020	115,465,386		127.0		3.15	1.89		
2025	111,776,766	199,407,654	123.0	219.4	3.21	1.93	6.37	11.47

Note:
For population forecasts in col. 1, see the Institute's 1941 "Guide to Population Issues" [*Jinkō mondai no shiori*], p. 55; for col. 2., see my "Housing Construction in New Japan" [*Shin Nihon no jūtaku kensetsu*], *Collected Works*, vol. 1, chapter 24, for population forecasts (annual growth rate of 1.35%).

Table 10.5 Required acreage for new urbanized areas

Year	*Population growth*		*Required acreage (km²)*	
	A	*B*	*A*	*B*
1950	5,350,898	5,407,530	535	541
1955	11,121,842	11,188,856	1,112	1,119
1960	16,970,112	17,369,784	1,697	1,737
1965	22,622,978	23,978,466	2,262	2,398
1970	27,882,373	31,043,836	2,788	3,104
1975	23,477,771	38,597,956	3,248	3,860
1980	36,404,007		3,640	
1985	39,568,611	55,309,296	3,957	5,531
1990	41,928,421		4,193	
1995	43,342,905	74,411,992	4,334	7,441
2000	43,756,188		4,376	
2025	32,791,177	121,207,654	3,279	12,121

Nevertheless, the above comparisons do not in any way take into account cultural destruction of arable land brought about by population growth or other factors, and this is unlikely. Population growth naturally necessitates the use of arable land for cultural facilities. How much land will this be?

For instance, if 1 km^2 of urbanized land (or residential land) is needed per 10,000 people, the required amount of additional urbanized land—or land for cultural facilities—for population growth after 1945 will be 3,957 km^2 according to calculations by A), and 5,531 km^2 according to B); in other words, 400,000 hectares and 557,000 hectares respectively.

How we obtain this will determine key changes to our nation's food self-sufficiency system.

That is, if this is supplied by destroying flat arable land, even with population growth forecasts calculated by A), in 1985 there will be an arable land shortfall of 800,000 hectares (8,000 km^2), or approximately 10% of the total. But if this is obtained by using steeply sloping land in mountains and forests that cannot be used as arable land, the shortfall will be reduced by half (or approximately 5% of the total); if the use of steeply sloping mountain and forest land is doubled—in other words, if we can relocate twice the number of people from our growing population into steeply sloping regions—then as far as food production alone is concerned, it is possible for the time being to establish a system of food self-sufficiency.

However, if demographic changes do not trend downwards in this way, the system of self-sufficiency described here[2] will be more difficult to attain. This can only further increase the importance of using steeply sloping land in mountains and forests to build cities. Since it is risky to make hypothetical arguments about the distant future, let us tentatively adopt estimates about our nation's population growth trends comparable to those of the Institute for

Population Research; from indications that a system of food self-sufficiency can be secured based on this, it is possible to attain the target of relocating twice as many people every year to mountain regions.

3. Technological Measures for High-Density Housing

In order to sustain a high-density population on scarce land resources, we must first do our utmost to locate cities on steeply sloping land in mountains and forests that are difficult to use as arable land; in this way, we must plan the most efficient use of the nation's land overall, and this will make it clear that establishing a system of food self-sufficiency is not necessarily out of the question.

What must be considered next is that cities built in this manner will make high-density housing a reality.

The realization of high-density housing is clearly significant in two positive ways. First, by engineering such buildings to be compact, the property is improved and the cost of urban facilities is relatively reduced. Second, by decreasing the area occupied, on plains the amount of wasted arable land is reduced; and in mountains and forests, on certain suitable sites the relocation and incorporation of people who were living on the plains is increased because ever more people can be accommodated, and this contributes to securing and expanding productive arable land.

This effort is a matter that must be taken seriously, not only in the mountain cities examined here, but likewise for the reconstruction of existing cities located on the plains. Of course, what we here call high-density housing cannot be built at the expense of protecting the public health and security of residences, nor the openness and other features of living areas in particular. On this point, we must not adopt construction methods for high-density concentrated [housing] that ignore certain minimum conditions, for example guaranteeing a specific number of daylight hours in living areas when arraying buildings, or ensuring transversal ventilation, etc.

This being the case, what methods can be considered when guaranteeing these conditions, while improving residential density? The following three suggestions can be made: highrisification; lifts; and using south-facing slopes.

3.1. Adopting High-Rise Buildings

The following notions have already been clarified: aligning the open side of every dwelling unit north–south, and arraying dwelling units in east–west rows is the method best suited to our nation's climatic and topographical conditions; in these cases, the interval between rows is the determining factor for a residential space's openness and healthfulness; in order to guarantee an identical openness factor (sky angle), the more floors are stacked up in building rows, the less acreage is required, etc. (See my *Collected Works*, volume 1, chapter 24, "Housing Construction in New Japan" [*Shin Nihon no jūtaku*

kensetsu]). However, in high-rise housing, above a certain level, usually above at least five floors, vertical traffic (traffic between floors) must be mechanized; this mechanization makes it necessary for corridor-type residences because of maintenance service and operating needs, and as a result, because building acreage per dwelling rises and the ratio of living space falls, relative dwelling density cannot be expected to increase on savings of land area from reducing the interval between rows. Therefore, although stacking floors on top of each other naturally increases dwelling density the taller the high-rise becomes, when constructing on flat land a building of around four floors where a staircase-type form can be adopted does not present the difficulties from mechanization of floor traffic; one conclusion which may be drawn is that this is a rather ideal number of floors.

3.2. "Buildings" with Lifts

Factors determining the intervals separating, and the spaces between, rows of housing, are related to the horizontal and vertical distances between the northernmost edge of the front (southernmost) row of buildings and the southernmost edge of the rear (northernmost) row of buildings; no matter how far the front (southernmost) row of buildings sticks out below the line connecting these two edges, there will be no effect upon the openness of the rear buildings. This fact has little significance in the case of single-story houses, but in two-story houses how far the depth of the upper floor is reduced relative to the depth of the lower floor depends on the positioning of the upper floor, and buildings with identical floor space can give rise to different intervals between buildings. (See Figure 76, 2.) For this reason, with respect to normal building methods,

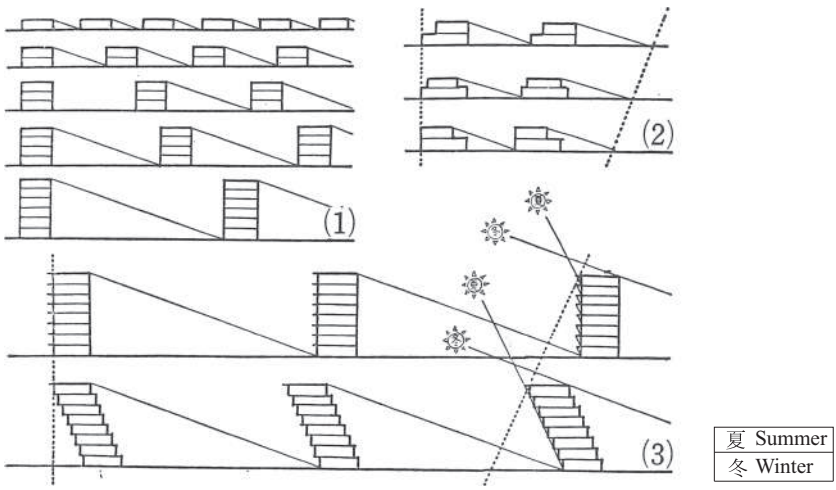


Figure 76 Diagram of intervals between residential buildings

the best method for two-story houses is to align the southern (front) side in order to increase housing density. This is why, when seeking a standard model for two-story dwelling units, this format is adopted as a rule.

Is there no way to apply this approach also to high-rise structures?

Generally speaking, identical dwelling units are stacked on top of each other, so it is impossible to vary the depth of the building by its floors. Therefore a solution like that adopted for two-story buildings cannot be applied. But as shown in Figure 76, 3, a possible solution could be to project the upper floor with *hisashi* (covered walkway) southwards.

On the whole, the nation's climate tends towards heavy rain, and during the rainy season in particular rain pours down continually. Also, it is hot and humid in summer, and as much as possible the summer sun must be prevented from penetrating indoors. These two considerations led to the development of the deep *hisashi*, and the *hisashi* and the related *engawa* (verandah) were indispensable elements at south-facing openings in particular. Incidentally, as long as the *hisashi* provided cover from rain and sun, how the area above it was used presented no problem to the opening side or the residential space for which it was intended. By projecting the upstairs residential space out onto this *hisashi*, this alone increases the perpendicular distance between the uppermost northern edge of the upper floor and the rear of the row of buildings (northern edge). Therefore, if identical openness is maintained, this alone reduces the interval between buildings, so building density and consequently residential density are raised.

Let us calculate the extent of this.

i. *Hisashi* protrusion.

The nation's key cities are located between latitudes 31° 36' (Kagoshima) and 43° 49' (Sapporo), with most between 35° and 36°. The angle of projection during the summer solstice when the sun is highest in the sky is the latitude minus 23° 47', producing the range of 7° 49' and 19° 17' (and a modal value of around 12°). If we now assume a national standard (model) using Tokyo's 35° 39', the angle of projection is 11° 52', and the projection of *hisashi* required to obstruct this is the height multiplied by tan 11° 52' = 0.210. If floor height is 2.7 m, the *hisashi* may protrude by 0.565 m.

However, midsummer is the period during which *hisashi* must obstruct incident sunshine: from mid-August initially, the sun gets lower by the end of August, and the height of the sun's meridian passage is approximately 64°; cot 64° = 0.488, so if floor height is 2.7 m, the *hisashi* needs to protrude by 1.317 m. Traditionally, many of the nation's typical dwellings were built with *hisashi* that protruded between 0.6 and 1.0 m.

With this point in mind, let us assume the average protrusion of *hisashi* as 1.0 m (1 unit).

In this instance, the distance of incident sunshine during the winter solstice is tan 59° 26' = 1.693, so if floor height (interior measurement) is 2.4 m, it is

Table 10.6 Ratio of rising residential density, due to protruding construction

Housing format	*Building height, h (m)*	*Row intervals, normal case (Sm)*		*Row intervals, protruding construction (S'm)*		*Residential density, normal case*		*Ditto, protruding construction*		*Ratio of row interval reduction*	
		4 h (of sunlight)	*6 h*	*4 h*	*6 h*	*4 h*	*6 h*	*4 h*	*6 h*	*4 h*	*6 h*
1 C	3.90	14.80	16.36	14.80	16.36	203.33	182.15			100.00	100.00
2 C	6.60	18.20	20.84	17.20	19.84	203.33	182.15			105.81	105.04
3 D	9.30	25.60	29.32	23.60	27.32	297.64	259.85	322.85	278.87	108.47	107.32
4 D	12.00	31.00	35.80	28.60	32.80	327.72	283.85	362.82	309.76	110.71	109.15
5 EF	14.70	37.40	43.28	33.40	39.28	302.81	261.56	339.09	288.29	111.98	110.18
6 EF	17.40	42.80	49.76	37.80	44.76	317.53	273.08	359.54	303.58	113.23	111.17
7 EF	20.10	48.20	56.24	42.40	50.24	328.94	281.93	375.72	315.59	114.22	111.94
7 (3D4E)						334.76	286.91	382.36	321.17		
7 (4D3E)						336.69	288.57	384.57	323.03		
8 EF	22.80	51.60	62.72	44.60	55.72	351.17	288.91	406.30	325.20	115.70	112.56
8 (3D5E)						356.61	293.36	412.60	330.21		
8 (4D4E)						358.41	294.83	414.68	331.86		

Note: For housing formats C, D, E and F, see *Collected Works*, volume 1, chapter 24.

(1.693 X 2.4 – 1.0 m) = 3.23 m. In other words, even with a *hisashi* of 1.0 m, 76.4% of a total incident surface of 4.23 m will reach indoors, and this is feasible.

ii. Interval between rows.

In the case where the *hisashi* protrudes 1.0 m, and floor height is 2.7 m (therefore tan $\beta = 0.370$), then the space between rows, α, is:

$\alpha = ha (\tan \alpha - \tan \beta) + 1.0$ m.

However, the + 1.0 m is an adjustment, because a 1.0 m *hisashi* protrusion on the highest floor does not help reduce the interval between rows.

Regarding tan α, if we assume during Tokyo's winter solstice four hours of sunshine (2.0), or six hours of sunshine (2.4), then,

$l_6 = 2.05$ h + 1 m (six hours of sunshine);

$l_4 = 1.65$ h + 1 m (four hours of sunshine).

The interval between rows includes the depth of the highest floor in the row of buildings.

iii. Residential density.

Residential density varies according to housing format (number of floors, and dwelling unit style). If we now make calculations based on examples of standard housing proposals in the aforementioned study (*Shin Nihon no jūtaku kensetsu)*, Table 10.6 shows there is no variation in the case of single-story homes, but in two-story houses we see residential density is 5.8% higher than those constructed in the standard way (or 5.0% when there are six hours of sunshine), and a rise in this ratio with the increase in the number of floors. In other words, there is a 10.7% (9.1%) rise for four-story buildings; 14.2% (11.9%) rise for seven-story buildings; and 15.7% (12.6%) rise for eight-story buildings. Generally, it is slightly more than 10% in mid-rise formats, and slightly more than 15% in high-rise formats.

As a result, in standard housing proposals for the mid-rise format (four-story buildings) with four hours of sunshine, the usual population density of 327.7 persons per hectare rises to 362.8 persons per hectare, while in the eight-story high-rise format, it rises from 358.4 persons per hectare to 414 persons per hectare.

Nevertheless, this construction method involves complications in ways to support southward projections during building construction. For high-rise formats in particular, the larger the projection the greater the complications in eliminating instability in the entire building structure. This is probably the reason why there are such difficulties in using this on a large scale.

3.3. Using South-Facing Slopes

If building sites are on south-facing sloping land, the construction base of the front row rises as far as the back row of buildings; so when the openness factor (sky angle) is uniformly implemented across the southern aspect, the steeper

Gradient (S/hd)		10.0	8.0	7.0	6.0	5.0	4.5	4.0	3.5	3.0	2.5	2.0	1.5	1.0
Housing density multiple	4 h of sunlight	1.20	1.25	1.29	1.33	1.40	1.44	1.50	1.57	1.67	1.80	2.00	2.33	3.00
	6 h of sunlight	1.24	1.30	1.34	1.40	1.48	1.53	1.60	1.69	1.80	1.96	2.20	2.60	3.40

the slope the narrower the gap between buildings. Therefore, using south-facing slopes not only has the benefit of locating cities in mountain regions that are hard to use as arable land, it makes very high-density housing feasible, and yields the advantage of making the construction of compact cities possible.

Reducing the interval between buildings, and how far the resultant housing density can be raised, is shown as follows in the following calculations, assuming certain sloping conditions.

First, the shrinkage ratio (and resultant rate of increase of housing density) for north-rising slopes (relative to building row intervals on flat ground), according to various slope angles of sloping land, is shown in the following table by slope angle, through the ratio of vertical distance to horizontal distance. (See Figure 79.)

Using these ratios we obtain two values for building row intervals, for four hours of sunshine and for six hours of sunshine, respectively; calculating intervals between buildings and (revised) population densities results in Table 10.7. However, there are two things that must be noted about these calculations.

First, on very steep slopes row intervals become narrower for housing formats with a small number of stories, and not only is there no space to build things like roads in between buildings, in extreme cases based on [theoretical] calculations, row intervals even become shorter than the depth of buildings, and buildings appear to sit atop each other. This is unreasonable, so minimum row intervals are set at the depth of buildings, and also minimum road widths are set at 6 m.

Second, various housing shapes are conceivable such as Format A or Format C, but the detached types of A, B, and C are unsuitable when taking into account difficulties with construction work on sloping sites.[3] Therefore only multi-story types of Format D and below can be considered, but external transport is determined by the placement of housing on slopes and involves a lot of vertical traffic, while internal transport and its corresponding vertical traffic increases greatly. Priority must be given to the location of housing units in order to reduce this vertical traffic as much as possible. It is conceivable that one method for doing this is to mechanize vertical traffic wherever possible, both externally and internally. To do so, it will of course be necessary to coordinate this with the housing format. Therefore, to calculate residential density, in terms of housing type this study mainly considers Formats E and F, where traffic between floors is assumed to be mechanized, while Formats C and D are also considered as a reference point.

Table 10.7 Gradient, row interval, and housing density, on south-facing slopes

Housing format		*4 h of sunlight*					*6 h of sunlight*				
		Level ground	*1:3.0*	*1:2.5*	*1:2.0*	*1:1.5*	*Level ground*	*1:3.0*	*1:2.5*	*1:2.0*	*1:1.5*
Row interval (Sm)	1 C	14.80	13.00	13.00	13.00	13.00	16.36	13.00	13.00	13.00	13.00
	2 C	18.20	13.00	13.00	13.00	13.00	20.84	13.58	13.99	13.00	13.00
	3 D	25.60	15.36	14.22	13.00	13.00	29.32	16.29	14.96	13.33	13.00
	4 D	31.00	18.60	17.22	15.50	13.29	35.80	19.89	18.27	16.27	13.77
	2 EF	22.20	14.00	14.00	14.00	14.00	23.84	14.00	14.00	14.00	14.00
	3 EF	25.60	16.36	15.22	14.00	14.00	30.32	16.84	15.47	14.00	14.00
	4 EF	31.00	19.60	18.22	16.50	14.29	36.80	20.44	18.78	16.72	14.15
	5 EF	37.40	22.44	20.78	18.70	16.03	43.28	24.04	22.08	19.67	16.65
	6 EF	42.80	25.68	23.78	21.40	18.34	49.76	27.64	25.39	22.62	19.14
	7 EF	48.20	28.92	26.78	24.10	20.66	56.24	31.24	28.69	25.56	21.63
	8 EF	51.60	32.16	29.78	26.80	22.97	62.72	34.84	32.00	28.51	24.12
Housing density (persons/ha)	1,2 C	203.33	244.01	244.01	244.01	244.01	182.15	244.01	244.01	244.01	244.01
	3 D	297.64	495.07	535.75	586.12	586.12	259.85	467.73	509.31	571.67	586.12
	4 D	327.72	546.20	589.90	655.44	764.68	283.79	510.82	556.23	624.34	737.85
	2 EF	213.69	312.37	312.37	312.37	312.37	190.02	312.37	312.37	312.37	312.37
	3 EF	255.45	425.75	459.81	468.54	468.54	224.51	403.40	430.26	468.54	468.54
	4 EF	283.13	471.88	509.63	566.26	600.65	246.20	443.16	482.55	541.64	640.12
	5 EF	302.81	504.68	545.06	605.62	706.56	261.65	470.07	512.83	575.63	680.20
	6 EF	317.53	529.22	571.55	635.06	740.90	273.08	491.54	535.24	600.78	710.01
	7 EF	328.94	548.23	592.09	657.88	767.53	281.93	507.47	552.38	625.25	733.02
	8 EF	351.17	585.28	632.11	702.34	819.41	288.91	520.04	566.26	625.60	751.17

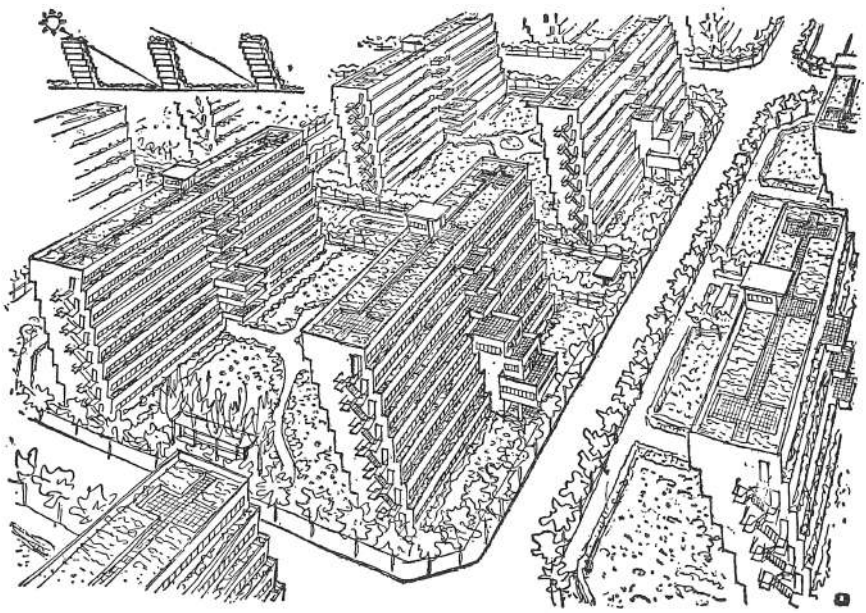


Figure 77 High-rise residential area with protruding construction

If we look at this in the case of four hours of sunshine, on level ground Format 4D allows 328 people per hectare, and Format 8EF 351 people; on a 1:3 gradient surface this rises by approximately slightly more than 60%, or 546 and 585 respectively; on a 1:2 gradient surface, a residential density of approximately double, or 655 and 702 respectively, can be secured. Naturally when using sloping land, this will usually include valleys and ridges, and because of the lay of the land it is hard to locate buildings as freely as one would on a level surface; this makes it difficult to realize according to plan the high-density arrangements shown here. However, with skillful placements, it should be possible to achieve something approaching these. Much of the nation's mountainous areas, in other words mountains and forests on steeply-sloping and unusable land, lie in the approximate gradient range of between 1:3 and 1:1.5; therefore if we construct cities on south-facing slopes in this gradient range, we can see that for housing only around half the acreage is needed compared to level ground.

As the previous table clearly shows, shrinking of row intervals (due to slope) for one- and two-story house formats, and three-story housing formats on steeply sloping land, cannot be effectively applied when the minimum gap between buildings is limited to 6 m. Therefore there is little expectation of a rise in residential density. From this perspective also, we can see that housing for residential estates on steeply sloping land has no advantage if mid- and high-rise formats are not adopted.

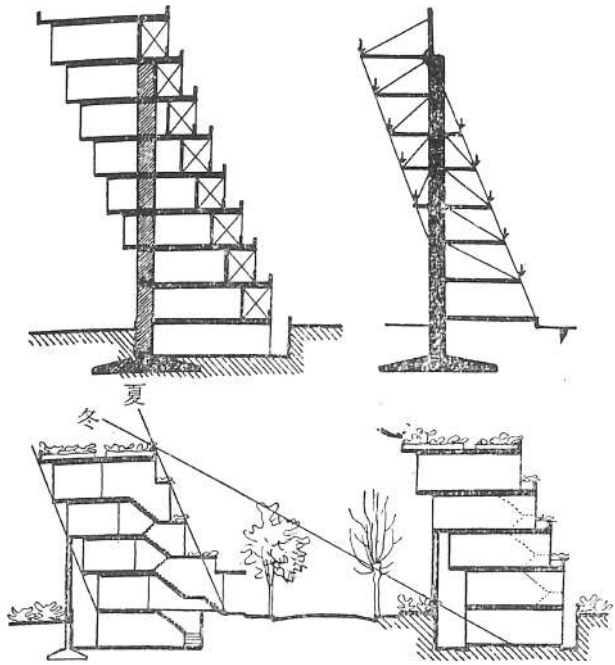
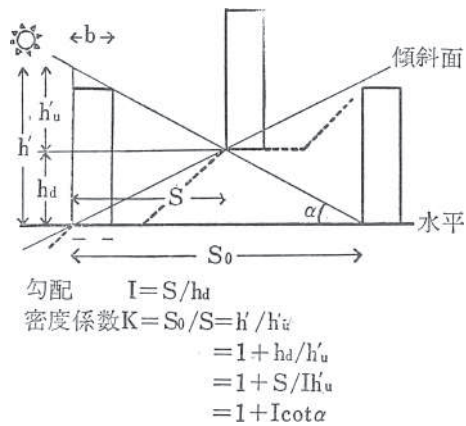


Figure 78 Protruding construction formats



Text: from top

Sloping surface
Level
Incline
Density coefficient

Figure 79 Residential building row intervals, for slopes facing due south

In cases where the sloped surface of sloping land is not south-facing, conditions are not that advantageous. For the placement of buildings in such instances, issues include insisting that rows at least be placed in an east–west orientation, or perpendicular to contour lines. (See Figure 80.)

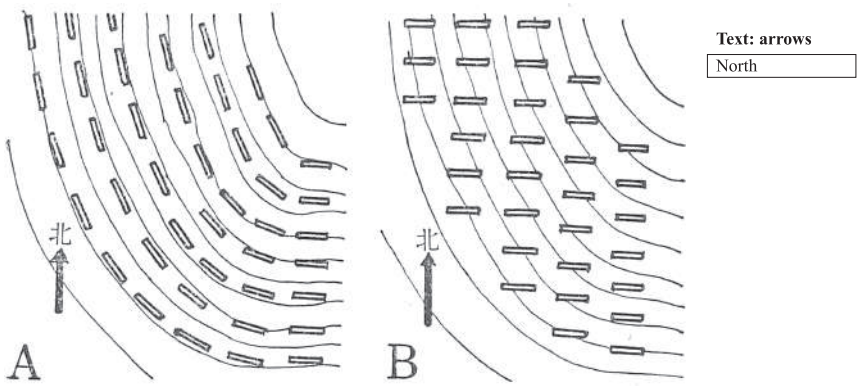


Figure 80 Slope contour lines and residential building placement

To improve dwelling unit daylight conditions the former solution is preferable, in which case building row foundations will have a slope and sloping-type corridors will be used, or multi-level floor buildings will have to be constructed where the flooring of each dwelling unit gradually changes. This creates disadvantages during building construction. The latter solution has drawbacks regarding daylight conditions, but the construction methods are much more sustainable. However, regardless of which solution is used, it will become an important issue as to what extent the direction of the slope deviates from south will be tolerated, in particular in the latter case.

Detailed examinations will be omitted here, but if placements are made using the latter solution, then generally speaking any deviation from due south within a range of 45° either east or west can in fact be considered as not so very different from a south-facing slope, and due east and due west should be considered to be upper limits of deviation.

Conditions determining row intervals in this case will vary according to the direction of the sloping surface, the degree of slope, and the number of daylight hours, but these detailed calculations will not be made here. However, for the most plentiful sloping surfaces with gradient range between 1:3 and 1:1.5, if the condition of four hours of daylight is applied, then even rows facing due east or due west can be arrayed more tightly than those on level ground.

As this examination has made clear, when adopting these construction methods to improve residential density, surfaces sloping due south are the most advantageous topographically, those sloping due east or due west are at the limit [of feasibility], and those sloping north are unfeasible. Therefore, places where these construction methods can be applied are limited. An important condition for applying these methods is to choose the most suitable location.

3.4. Sloping Land Use and Projecting Construction

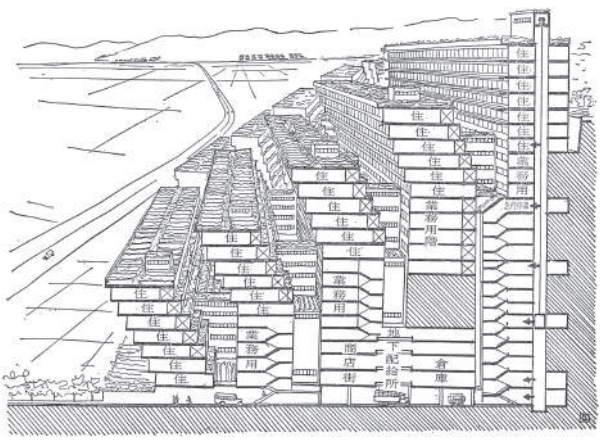
Methods found in 2 and 3 above are used at the same time.

It is possible to reduce the space between building rows to their smallest interval such that they can be used merely for air circulation and roads, and [still] make it possible to realize maximum residential density. Moreover, if rooftops and north-facing terraces on each floor are used as small productive green spaces (domestic vegetable plots, etc.), it is probably possible to create the maximum ground surface usage profile also from the viewpoint of using sloping land as productive green space. (See Figure 81.)

All the construction methods above have only been proposed with the view to boost residential density, but we must uncover even greater meaning contained within them, and strive to expand them. In other words, we must manage our residential sphere on the surface of the earth where the land meets the sky, but transform this contact area into a three-dimensional, optimally rich environment; without wastage, use all the blessings provided from the sky (especially the emission of solar energy) and natural resources from the ground; and create the best residential configuration on the earth's surface. Every "building" must be developed as part of the continued construction and development of an "earth's surface" imbued with this meaning.

4. Designing Mountain Cities

In order to rationally satisfy the two demands clarified above—namely, calls for where to locate cities in our nation in future, and the need to realize high-density housing—it is proposed that actively adopting mountain cities that exploit south-facing slopes as an important format for housing and the city henceforward is essential.



Text: from left to right

住	Residential
住	Residential
業務用	Business use
住	Residential
業務用	Business use
商店街	Shopping area
地下配給所	Underground supply center
住	Residential
業務用階	Business floor
倉庫	Warehouse
住	Residential
業務用	Business use
急行停車	Express train stop

Figure 81 Example of highly concentrated residences, using south-facing slope

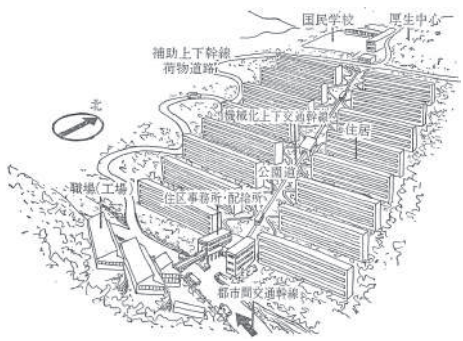
Below, let us examine my thoughts on what the mountain city is, and give two or three specific design examples.

4.1. The Character of the City

i. The scale of the city is limited by restrictions based on topographical conditions.

When looking for suitable south-facing slopes throughout the nation, most will be slopes and valleys from mountains that have been eroded by flowing rivers. In many instances, these locations have an irregular terrain. Therefore, even if ideal topographical conditions exist the acreage is usually small and narrow, making it difficult to permanently settle hundreds of thousands of people. So scale precludes large- and medium-sized cities, and probably small cities of at most one collective, around 50,000, will account for the majority. However, as in the case of Kobe, which has south-sloping Mt. Rokko and the Maya Range behind it, there are rare instances where it is possible to construct a large mountain city (although issues to do with geological features require serious examination).

ii. As for the functional nature of the city, it is likely to be a small unitary single-function city (small industrial city) with its own places of employment and residential areas—apart from those in valleys where main rail trunk lines pass through, there will probably be many places where heavy traffic is inconvenient due to terrain issues, so the industry will by nature mainly be precision processing requiring a relatively small volume of raw materials. As in the case of large cities or general industrial complexes, it is conceivable there will be special cases involving outlying residential cities (or social welfare cities) connected to a hub city unable to provide residential areas for all workers in proximity to their place of employment.



Text: from top

国民学校	Public school
厚生中心	Public welfare center
補助上下幹線荷物道路	Supplementary two-way main line freight road
機械化上下交通幹線	Mechanized two-way traffic trunk line
住居	Housing
公園道	Park road
職場（工場）	Place of employment (factory)
住区事務所・配給所	Residential zone office, supply center
都市間交通幹線	Intercity transport trunk line

Text: arrow

North

Figure 82 Model for mountain city

iii. In contrast to cities built on the plains, the overall city must be completely equipped with public facilities (primarily transport). This is why the city cannot be constructed such that it is completed gradually in a piecemeal manner. At the very least, those sections that constitute the core must be completed all at once, and within a fixed construction period. Therefore, it is necessary to transfer in the industry that carries out the core function, and also construct satellite towns ("new towns") connected to the new build.

On the way to constructing the new Japan, we must build urban housing for 600,000 households a year over the next 30 years; if we consider locating one-third of these in mountain cities, this will mean building 20 mountain cities per year if one of these can accommodate an average of 50,000 people (or 10,000 households). In order to realize this, we cannot rely on private construction activities. For the key components of investment to construct this housing in the people's economy, it will be necessary to establish political and economic support solely dedicated to the construction of mountain cities.

4.2. Suitable Location and Terrain for Cities

i. For public heath requirements, housing zones must be located on south-facing slopes, or at the very least on southeast- or southwest-facing slopes. However, it is impossible to find mountain regions consisting of large unbroken expanses of south-facing slopes. Therefore when keeping in mind housing format and housing zone location, areas with high ratios of high-utility south-facing slopes must be selected. Considerable differences in construction cost can arise from how this selection is made, so the choice of suitable location is important.

ii. In terms of both terrain and connecting intercity transport, the most suitable locations are either green fringes of mountainous regions on the broad plains (residential towns for small industrial cities or large hub cities on the plains); or valley areas in mountainous regions where large transport lines pass through, or secondary valley areas (small industrial cities adjacent to transport lines).

iii. Housing can be built on ridges below sloping surfaces. Ridge intervals of 100–150 m are ideal. It is thought that slopes of 1:3 and 1:2 are the most plentiful, but sloping surfaces of 1:1 may also be used. It doesn't matter how long the sloping surface is, but in many cases the vertical height of valley areas is at most around 150 m.

iv. By studying topographical maps, it is probably possible to find suitable locations meeting the above criteria, but one other key factor that must be focused on is the geological situation. Obviously terrain weakened by weathering must be avoided, but in addition, places that topographically or geologically have a risk of landslides, subsidence, or flooding must not be selected.

4.3. Constructing the City

i. As previously discussed, the scale of the city depends on terrain conditions, and cannot be expected to be very large. However, it needs to be at least as large as a primary school residential zone. In other words, it must assume a minimum threshold of around 10,000 people.
ii. One city comprises several primary school residential zone units. Each residential zone has a public welfare facility center that combines primary school, park and rest areas, etc.; and an office facility center that combines housing office, shops, medical facilities, and administrative offices, etc.; these two centers are built in the form of a tightly knit hub. It is recommended that the former, the public welfare center, is constructed at the top of the slope (mountain top), while the latter, the administrative center (in the case of an industrial city, to be connected to the industrial belt), is located in a suitable lower area close to main transport lines, or at the lowest point in the valley (here, in the case of an industrial city, factories may be set up on lower or other regions of north-facing slopes opposite). (See Figure 82.)
iii. The city is built on sloping surfaces.

Transport between cities would consist of main transport lines passing through the cities' lowest points, areas in the valleys, and green fringes on the plains. Therefore the main transport routes inside the city are vertical transport lines. However, vertical transport is inconvenient, so it will be mechanized in various ways to be discussed later; and foot traffic along contour lines where possible will become the mode of horizontal traffic.

In the case of industrial cities, factory complexes will be built in places along the lowermost main transport lines.

4.4. Housing Format

i. High-rise buildings are preferred, with the largest number of floors a foundation can support, to reduce the weight of building site construction work, and also to realize high-density housing. If high-rise buildings are chosen, then of course vertical traffic must be mechanized. The mechanization of this traffic between floors inside the building is closely related to vertical traffic methods used in the city as a whole, which in any case must provide the mechanical power. This is discussed in the point below.
ii. To eliminate mechanization of vertical traffic inside buildings all housing can be limited to four-story buildings; or each residential building can be six-stories high with a traffic floor constructed at the midpoint of each building, while the vertical transport to this floor is mechanized as a city service and entrusted to a vertical transport authority. If this method is selected, Format D may be used.

However, in order to make this mountain city livable on the many different elevations along the slope, attention must be paid to mechanizing all vertical transport wherever possible; to do this, Formats E and F should mostly be used.

4.5. Vertical Transport

i. Mechanization is necessary for vertical transport. However, the extent of mechanization is connected to issues such as volume of traffic (general and commuting traffic), fluctuations over time, and maintenance and servicing; determining the most suitable format is an issue for future study.

ii. The following methods for mechanization are conceivable:

   a. Perpendicular hoisting device (elevator);
   b. Sloping hoisting device (cable car);
   c. Bus; and
   d. Escalator.

   Escalators (d) can handle the greatest volume of traffic, but beyond specific places their use is problematic due to maintenance and servicing issues. The bus (c) option has the highest degree of flexibility, but its use is greatly limited by topographical conditions, and transport volume is not large. Therefore it is not possible to rely solely on these for vertical traffic, but they are suitable, and indeed essential, as supplementary transport modes.

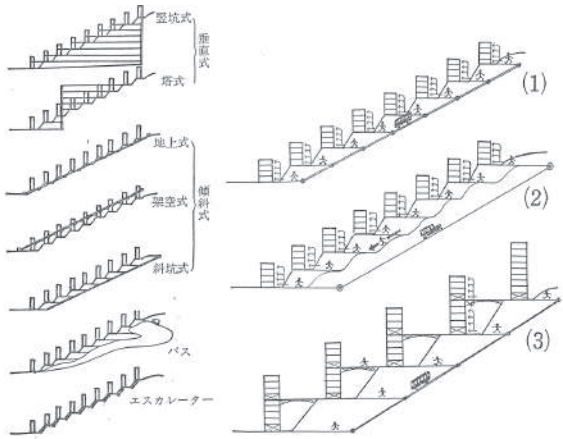
   Ultimately, hoisting devices (a and b) are the methods from which the most can be expected.

   The construction of track for sloping elevators is simple when suitable terrain is used, and it is possible to raise transport efficiency by increasing the number of passenger platforms. However, if the line becomes long, there is the disadvantage of operation becoming sluggish. On the other hand, for perpendicular hoisting devices, the hoisting column can be made from either an in-ground track system, or a transport path with frame construction; in both cases, complex methods must be adopted, and places where they can be used are limited.

iii. If mechanization is selected, the question of how far apart (different elevations) stops are installed is related to maintenance and servicing issues, and is an important matter. Frequent stops, for instance stopping at each floor, are possible in perpendicular hoisting devices that travel short distances, but are not feasible in other devices.

   In order to ensure each resident can travel to their dwelling using the minimum of vertical transport, various methods to do with housing format can be conceived.

   If vertical foot traffic is limited to a maximum of 10 m (perpendicular distance), this is equivalent to 3.5 floors; therefore passenger stops must be installed every 7 floors (20 m) at most.



Text: from top to bottom

垂直式	Perpendicular system
竪坑式	Vertical shaft method
塔式	Tower method
傾斜式	Sloping system
地上式	Above ground method
架空式	Overhead method
斜坑式	Inclined shaft method
バス	Bus
エスカレーター	Escalator

Figure 83 Transport systems for residential areas on slopes
In order to cut down on the trouble of maintenance and servicing, the three examples shown here in (1) through (3) do not use hoisting devices in their apartment buildings, but provide mechanized transport facilities through the middle of the residential zone. (1) is an example of providing stops for mechanized transport facilities at the ground floor level of each apartment building. (2) is an example of the simplest of vertical transport in such residential zones: stops are provided at the highest and lowest levels, and points in between are reached by foot traffic; however, to conserve pedestrian energy traffic is in one direction, downwards.

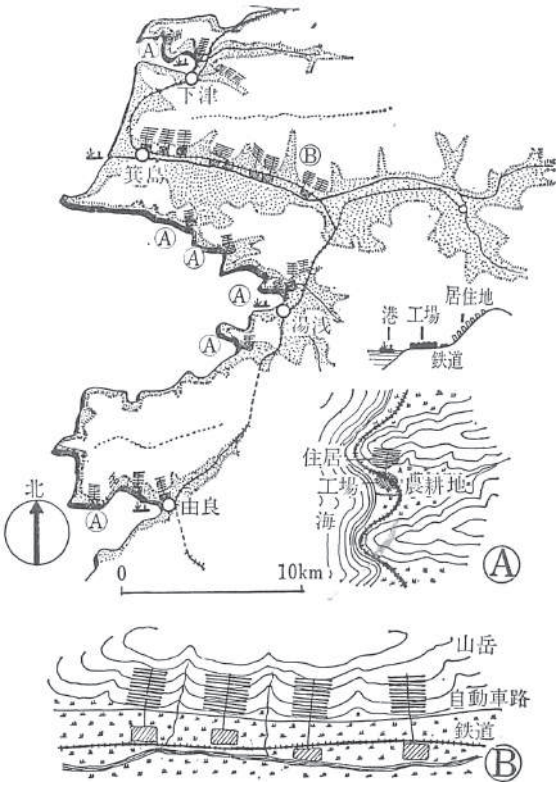
In these two examples ground level is designated as the traffic floor where one enters the residential building from the street, but clever use of sloping surfaces makes it possible to designate intermediate floors, such as the second or third, as the point of entry. This way, five- or six-story structures are possible without utilizing lifts within the apartment building.

Taking this format a step further, (3) shows how overhead walkways are provided to maximize the number of floors. By so doing, the interval between stops for residential zone vertical transport facilities can be made larger than that in (1).

However, of the various methods for vertical traffic, if strict limits are eliminated for downward traffic, and one-way traffic flows are adopted, in the extreme case it is entirely possible to set up passenger stops only at the highest and lowest points of the housing zone.

iv. Figure 83 shows the various types of vertical traffic systems that are conceivable, according to the analysis above; of these, the most viable probably entails the following system of methods, namely:

1. Using sloping hoisting devices as the main vertical transport service;
2. Using road vehicles (the type to be determined by traffic volume) as a supplementary service; and
3. In principle, foot traffic is to be on level surfaces; each residential floor is to be within a maximum perpendicular distance of 10 m. (See Figure 83, 1–3.)



Text: from top to bottom

下津	Shimotsu
箕島	Minoshima
湯浅	Yuasa
港	Harbor
工場	Factory
居住区	Residential area
鉄道	Railway
由良	Yura
住居	Residences
工場	Factory
海	Sea
農耕地	Arable land
山岳	Mountains
自動車路	Motor vehicle road
鉄道	Railway

Text: arrow

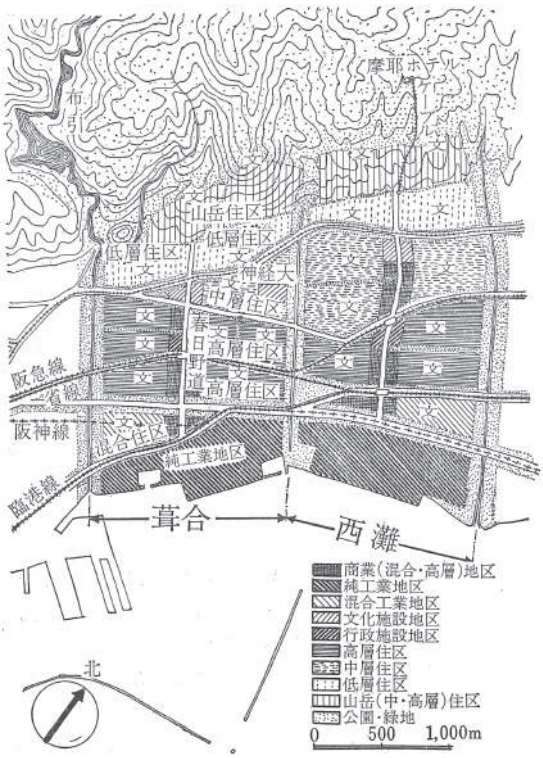
North

Figure 84 Layout example for mountain city (Wakayama)
The example of the Kishu coast is presented here to try to show the structure for the layout of a mountain city that has, for instance, places where mountains rise sharply from the sea (A), and places where transport trunk lines pass beneath the foothills of mountains that run east to west (B). However, this region is the home of the *Kishū mikan* or cherry orange, so due consideration must be taken as to which is more useful to the nation as a whole: the cultivation of *mikan*, or housing for the population.

It is conceivable that the simplest system (eliminating mechanization) is to have only road vehicles, and to restrict foot traffic to the downhill direction. (See Figure 83, 2.)

4.6. Residential Zone Structure

i. As previously noted the structure of residential zones, the unitary zones that make up the city, in principle takes the form of a public welfare center in the upper region and a business (place of employment) center in the lower region; their precise configuration depends greatly on several factors, such as overall location issues, as well as vertical transport



Text: from top

摩耶ホテルケーブル	Maya Hotel cable car
文	Elementary or junior high school
山岳住区	Mountain housing zone
低層住区	Lowrise housing zone
神経大	Kobe University of Economics
中層住区	Midrise housing zone
阪急線	Hankyu line
省線	Government run railway line
阪神線	Hanshin line
春日野道	Kasuganomichi Station
高層住区	Highrise housing zone
高層住区	Highrise housing zone
文	Elementary or junior high school
臨港線	Kobe Rinko Line
混合住区	Mixed housing zone
純工業地区	Semi-industrial area
葺合	Fukiai
西灘	Nishinada

Text: key, from top

Commercial (mixed, highrise) area
Semi-industrial area
Mixed industrial area
Cultural facilities area
Administrative facilities area
Highrise housing zone
Midrise housing zone
Lowrise housing zone
Mountain (mid-, highrise) housing zone
Park, green area

Text: arrow

North

Figure 85 Design proposal for Kobe city alliance (1945)
Each unitary zone is separated by rivers and is marked off by green areas.

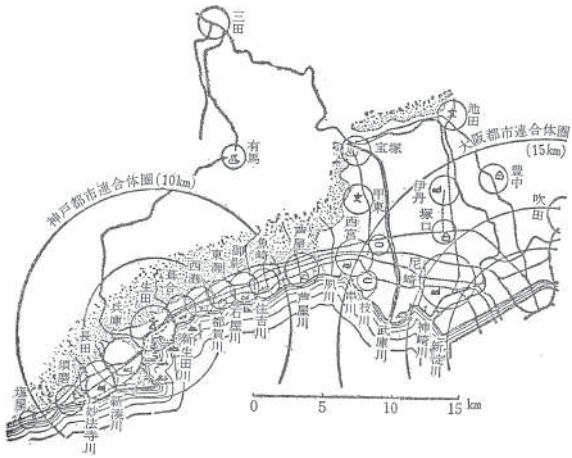
The unitary cities that make up the Kobe city alliance all have mountains behind them to the north, and their foothills have been used to build many mountain residential areas. The diagram shows the local structure of some of these, such as the two zones of Fukiai and Nishinada, which have the character of unitary industrial cities.

The use of sloping land is limited to around one housing zone per lower region, and in this design the two zones accommodate a population of around 70,000. However, this allows for urban greening where ample space is given to each residential building, and each housing zone. Zones housing around 100,000 are possible, if the use of sloping land is expanded and efficient consolidation of space is carried out. The south-facing slopes of the Rokko mountain range are often the scene of natural disasters, but can't this disintegration be completely prevented by investing heavily in the construction of mountain residential zones?

> modes to be utilized throughout the city, and housing formats and vertical transport methods to be used inside residential buildings.

See Figure 82 for what are considered the most common patterns of the various configurations for residential zones.

From the above, I think the various forms into which the mountain city can be constructed have been largely clarified. To rectify any shortcoming in the



Text: Kobe circle

神戸都市連合体圏 (10 km)	Kobe city alliance zone (10 km)
須磨	Suma
長田	Nagata
兵庫	Hyogo
生田	Ikuta
真合	Fukiai
西灘	Nishinada
東灘	Higashinada
御影	Mikage
魚崎	Uozaki
妙法寺川	Myohojigawa
新湊川	Shinminatogawa
新生田川	Shinikutagawa
都賀川	Togagawa
石屋川	Ishiyagawa
住吉川	Sumiyoshigawa

Text: Osaka circle

大阪都市連合体圏 (15 km)	Osaka city alliance zone (15 km)
伊丹	Itami
塚口	Tsukaguchi
豊中	Toyonaka
尼崎	Amagasaki
吹田	Suita
串川	Kushikawa
枝川	Edagawa
武庫川	Mukogawa
神崎川	Kanzakigawa
神淀川	Kanyodogawa

Text: other place names

三田	Sanda
有馬	Arima
宝塚	Takarazuka
池田	Ikeda
甲東	Koto
西宮	Nishinomiya
芦屋	Ashiya
芦屋川	Ashiyagawa
夙川	Shukugawa
塩屋	Shioya
♨	Hot springs symbol

Figure 86 Diagram of the Kobe city alliance zone

explanation, let us select several sites and present concrete examples of mountain cities that were planned.

First, let us take a part of the west coast of the Kii Peninsula, and show various configurations for mountain city placement. (See Figure 84.)

Second, the residential city (pop. 20,000) that was built on both sides of steeply sloping Haratoge (slope gradient approx. 1:3), which extends from Hiragino, in the northern suburbs of Kyoto, to Nikenchaya on the Kurama line.

Third, an example of a small industrial city (pop. 10,000), built in a branch valley near the same Nikenchaya mentioned above.

These have all adopted the simplest method for vertical transport.

Fourth, a small industrial mountain city built in a designated part of the Obata Gawa valley, which extends from Rakusai/Katsura, also in the suburbs of Kyoto, and Kameoka (Tottori Prefecture). Here, as a trial, the most concentrated housing formats and mechanized vertical transport have been attempted. (All the above [descriptions] have been abridged.)

The fifth example is the case of a mountain city that is part of a unitary city, itself a component of a large city; it shows an example of a unitary residential zone, part of a private proposal for the remodeling of Kobe City. (See Figures 85 and 86.)

Notes

1 Translated from *Nishiyama Uzō chosakushū 3* [The collected works of Uzō Nishiyama, volume 3], *Chiiki Kūkan Ron* [Reflections on Urban, Regional and National Space] (Tokyo: Keisō Shobō, 1968). "Dai 10 shō, Sangaku toshi" [Chapter 10, Mountain Cities], pp. 267–295.

2 Nishiyama's note: Things like advancements in the use of nuclear energy, or innovation in industrial production methods for food, etc., may thoroughly revolutionize the population sustainability limits examined here. However, I have resumed this discussion without including projections of that sort.

3 Translator's note: Formats A through H refer to examples of housing described by Nishiyama in his *Collected Works*, volume 1, chapter 24, pp. 523–525.

A = Single-story house;
B = Two-story house;
C = Row houses;
D = Staircase type;
E = Single-floor corridor type;
F = Multiple-floor corridor type;
G = Single-floor central-corridor type;
H = Mezzanine corridor type.

第１章　生活基地の構造

この論文は戦時中 1942 年の初夏にかかれたものであるが，ちょうどその前年の 6 月に「建築雑誌」に発表した「住居の質について」という論文でも，またこの年の初めにまとめられた著書『住宅問題』においても，住居のそなえるべき質がどのようなものであるかは生活全体の構造を明らかにする中でしか論じられないと主張していた．これにたいして，ではそのような考え方をした場合，あるべき住居の質がどのように規定されるか――私はこれについて具体的にどのような発言ができるであろうかと自らに問いつつ，その生活空間全体の構造についてまとめたのがこの小論である．「建築学研究」という小雑誌に発表した．

個々の住宅の条件については前掲論文の中で追求しているので，ここでは生活全体の構造とそれに対応する個々の住宅をこえたひろがりをもつ空間――これを「生活基地」とよんでいるが，人間が定住生活をしている一定のひろがりをもった「地域生活空間」をさしている――に重点をおいて追求している．

四つの部分からなりたっており，第 1 節は住居の質にたいする指導的標準・目標を構想するためには全生活（輪廻）の構造と生活空間の全体構造（住区・都市・国土といった生活基地）についての分析とその理想像がつかまれていねばならないという目標設定をのべ，第 2 節では資本主義都市の発展とともにこのような観点からながめられる生活基地の構成のアイディア（地域空間構造の理想像）としてどのようなものがかつて提案されてきたかを，都市化にたいする田園の回復の要望・地域制・田園都市・衛星都市あるいはル・コルビュジエやヒルベルザイメルの大都市の提案，ソ連の帯状都市，フェーダーの提案などに簡単にふれつつ歴史的にあとづけし，第 3 節では生活基地構成の現代の問題として，国防・強兵的要請をおもてにたてているが，戦時下の耐乏論でことをかたづけようとするのは不可であることをのべ，第 4 節ではそうした生活基地・地域空間の全体像の中で居住のための施設をとりあげる場合の個々の住戸と共同的・地域的な施設をふくめた居住地域の空間構成において問題となってくる住戸の配列・集合形態・集中と分散，ソ連の共同住宅や社会主義都市の提案，あるいは近隣住区の構成などの主張を検討している．そして最後に，住居をそれだけのものでなく，生産労働の場，あるいはそれらと共に構成される都市や地域空間全体のあり方，つまり全生活施設の体系的構成をどうしたらよいかという問題のなかで，労働と休養，生産と消費をあわせ考えつつ追求してゆかなければならないとのべている．しかし全体として力量不足のために，はじめに設定した問題を充分解明しきれずにおわっている．また戦時中の論述で，「大東亜戦争完遂」的な表現をかかげており，当時の「国土計画」への要請をあらわす歴史的興味があるものの，著作集 1・2 集でのべたと同じ欠陥をもつ論述であることは否めない．しかし個人や家族の生活空間である住宅も厳密には地域空間のなかで考えねばならないこと，その面を初めてとりあげて論じたものとして，そうした問題にたいする論考をあつめたこの著作集第 3 集の最初に収録するのが適当と考えた．なお，上にのべた『住宅問題』の「住居の質」については第 2 集第Ⅴ部の「住宅構想」の最初の章（第 24 章）に収録しているが，本章はそれをうけて論旨を展開しているとみていただきたい．挿図については原著では戦時中の印刷事情のため簡略化したのを説明のために若干補足している．（原題「生活の構造と生活基地」，建築学研究第 110，111 号，1942 年 9，10 月）

1. 住居の質と生活基地の構造

住居の質　住居の質の低下をふせぐ（法的制限の）根拠を得るため，住居の質を規定する個々の条件の最低限度を求めることは一応可能である．なぜならば他の条件がどれほどよくとも一個の条件の極端な悪化は住居の質の全体的低下をもたらすからである．19 世紀以来，世界各国において制定された建築物法，住居法の質規定の論理的根拠はここにあった．しかし，われわれはいま住居にたいする適正なる国民的・社会的標準を求めるべき仕事をせおわされつつある．指導標準としての住居の質規定を求めようとする場合には，住居の質を規定する諸条件のあり方は，別々に切りはなされた個々の条件の探求によっては明らかにされえない．

生活の全般的把握　この場合，「住居の質」は生活（輪廻）全体を考え，これをいかに合理的に構成するかということから出発しなければならない．すなわち，住居の質を考えるということは，生活基地全体の構成を考えることと密接に結びついている．そしてそれらすべては，「生活の構造」によって規定されるべきものである．

本稿はかかる見地から生活の構造と生活基地の構成方式に関して若干の理論的考察を試みるものである．

理想的標準探求の必要　単に理論的にかくあるべしとする生活の構造ないし生活基地の構成を論ずることは空想的論述に陥りやすい．問題は，このような考察にもとづいた方策を実現する生活基地を具体的に建設することと，それをみたし価値あらしめる生活者自体の育成・教化によって解決されるのはいうまでもない．にもかかわらず，生活基地の構成をいかにすべきかという理論的課題もまたわれわれにはゆるがせにし得ない．大東亜戦争下，生産力増強にともなう住宅の大量建設は依然として解決を要する緊急の課題であるとともに，東亜共栄圏の確立をめざす国土防衛の強化，産業経済体制の整備上，国土の空間的構成の計画的再編成もまた解決すべき緊急の懸案とされている．また遠く思いを大東亜の長期建設にいたせば，われわれの前にはさらに大きな課題が横たわっているのをみる．大東亜，なかんずくわが日本における日本国民の生活基地たる国土を，この大建設事業の原動力をつちかう日本民族の郷土として叩き

直し，美しく健やかに育てあげねばならない．かかる重大な事業の遂行に当って，われわれの目前にはつねに最も完全な国土のイデアルビルトが描かれていなければならない．このイデアルビルトを最も健やかに逞しく描くこともまた，現実の建設と平行してわれわれの果たすべき一つの課題である．本稿における生活基地構成にたいする理論的探求はこのような目的のために捧げられる．

2. 生活基地構成意想の歴史的回顧

大都市生活　さて問題をかく定め，現実を直視するとき，われわれの眼前にまず第1にあらわれてくるのは今日の大都市生活である．

明治以来，わが国における急激な都市の発展，大都市生活の展開と大都市居住者の絶対的・相対的増大は，政治的にも経済的にも大東亜の指導者たるわが日本をつくりあげる不可欠の条件であった．都市は今や日本国民の過半が日々の生活を送りまた育成されてゆく生活環境であり，郷土である．と同時に，都市なかんずく大都市は，わが国産業経済の中軸をなす地域である．このように都市はわが国土の構成においてますます重要な地位を占めつつあるにもかかわらず，この都市生活の発展と共に，わが国民の次第に増大する大部が投ぜられるに至ったこの生活環境がますます明瞭に不良化し，われわれの住む国土とそこにおける国民の生活を汚損変歪していった過程は覆うべくもない事実である．

われわれの国土は，この都市生活のほかに農山漁村の生活をもっている．国民生活基地の再検討は，この両者を総合しておこなわれねばならない．しかしさしずめ問題となる対象は，まず上述のごとき大都市的生活である．われわれはまず大都市生活を，それを生ぜしめた基底たる都市的産業経済と共に反省し，これをいかに再構成すべきかを考えたい．この意味で以下しばらく農村を考慮外におこう．

われわれはまず都市の歴史的発展過程において，生活の構造と関連して生活基地の構成がいかにとりあげられたかを振りかえってみよう．

近代都市の発展　産業革命以後，工場工業の発達に伴って都市は工業の中心として，したがって労働者の居住地として急激に膨脹していった．また資本主義経済の発展と商業交易の暴風的発展により，商業・金融の中心としての都市をますます殷盛ならしめた．地方的な商工業の中心地たる地方都市から，さら

にそれらを世界経済に結びつける世界都市が次第に成長した．都市は産業経済の中枢を構成すると同時に政治文化の中心ともなった．大都市生活が新しい時代を代表する生活環境となった．

大都市生活の成り立ち　しかしこれらの近代的都市の発達過程は，資本主義経済の原動力たる個々の企業家の利潤を追求する個別的な創意にもとづく活動によって推進され，都市はその結果の集積として形成された．それは有機的な全体として一個の「計画」に指導されてできたものではなく，資本主義社会のもつ発展法則の下に生み出された集合体であった．新しい生活の秩序は，それを考慮し得る能力をもつものが考慮した限りにおいてのみ改善され，合理的なものにされ，秩序づけられたが，その能力を持たない者，持っていても実現する力を持たない者にとっては，日々の生活のさしせまった必要のみが新しい生活にたいする適応を強制したに過ぎなかった．したがって，全体としての大都市生活は自然発生的な混沌たるものであった．この「混沌」はもちろんそれだけで放置されているが，やがて大都市社会それじしんを脅威するにいたる．この弊害は産業革命がまず進行した英国において最初に痛感された．さまざまの社会悪としての都市問題がそれである．道路・交通の問題，労働者住宅地区の不衛生状態，これらの地区の風紀上，保安上，大都市生活に及ぼす危険な放射能源としての役割などの欠陥が次第に認識されるにいたる．ここに私人の自由放恣の集積によって生ずる生活環境の反社会的悪化に対抗して，衛生立法，不良住宅改良事業など一連の公的対策が着手されるにいたる．

歪められた勤労階級の生活　しかしこれらはいわばいずれも「結果」として生じた放置し得ない弊害・脅威にたいする対症的措置であって，大都市生活を全体的に再組織する計画性にもとづいてなされたものでは無論なかった．工場労働者の生活はじめじめとした不良住宅と，不衛生な工場での身体を摩耗する労働との交替でできていた．この毎日機械的に繰返される単調な摩耗的生活に形に影が相そうごとく都市的な娯楽と休養（?），社交――飲酒，歓楽，その他さまざまな歓楽街での不健康な生活――が成長した．人びとの蝟集する盛り場が社交の中心となり，買物に人びとは生活の寂莫をいやす．しかしこれらはいずれも汚濁した環境内での不健全な生活であった．

田園の回復　密集生活のあらゆる不合理は人びとの注目するところとなった．

大都市の現状は恐怖に値するものとして，悪性の吹出物になぞらえられた．すでに近代的都市発展の初期において，このような汚毒された不衛生な都市生活は，資本主義のもたらした末世的罪悪として非難され，反動的な中世的田園への復帰，あるいは空想的な都市と田園との調和がさけばれ，若干の理想村の建設さえも空想的社会主義者たちによってこころみられた．しかし資本主義社会の発展に逆行したこれらのこころみはすべて失敗に終った．

英国よりおくれて独占資本主義の形態で世界市場へ進出した若きドイツは，このような前者の轍をみて，普仏戦争直後相ついで都市計画立法の先駆をなす建築線法，地域制度などを採用し，都市発展にたいする国家的規制にのりだした．後者は，都市の各種地域の用途，利用限度による構成を規定したもので，都市発展の全体的な有機性に一段の改善を加えたものであった．しかしそれは同種類の土地利用を一つの地域に集中することによってさまざまな土地利用者の相互干渉を合理化しようとしたものにすぎず，生活施設の総合的構成にはいまだはなはだ遠いものであった．

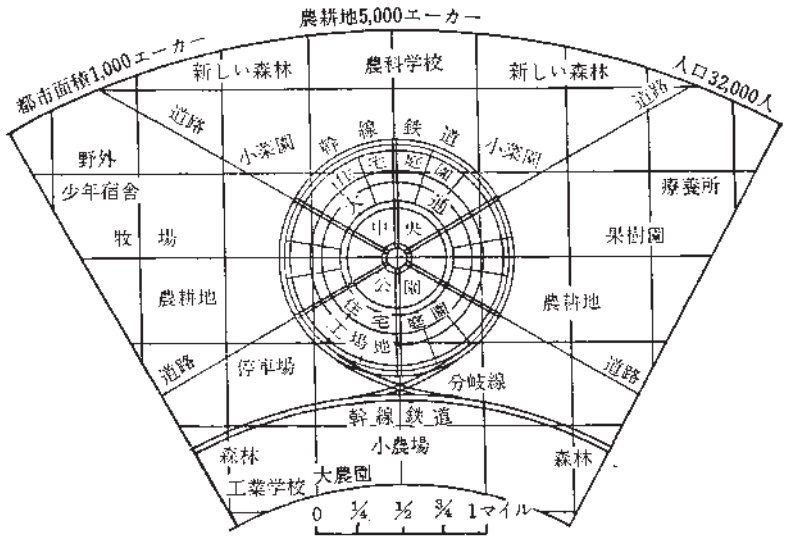
田園都市運動　英国における 19 世紀末から 20 世紀初めにかけての田園都市運動は，田園の回復をさらに新しい社会的・経済的関係に合致させるべく，新しい技術的手段を利用して実現しようとしたものであった．田園と都市との調和は，田園と都市の利点だけを集約することにある．それは適度の集中によって一定の生産施設の規模と，「都市」にゆるされた一定の文化度を享受しつつ，田園に囲繞され田園と結びついた生活である．

「田園都市」の提案者エベネザ・ハワードは 1898 年，その著『明日』において，人類の将来における理想的居住形態を示唆する彼の主張を明らかにした．彼の立場は彼の先人がとなえた，

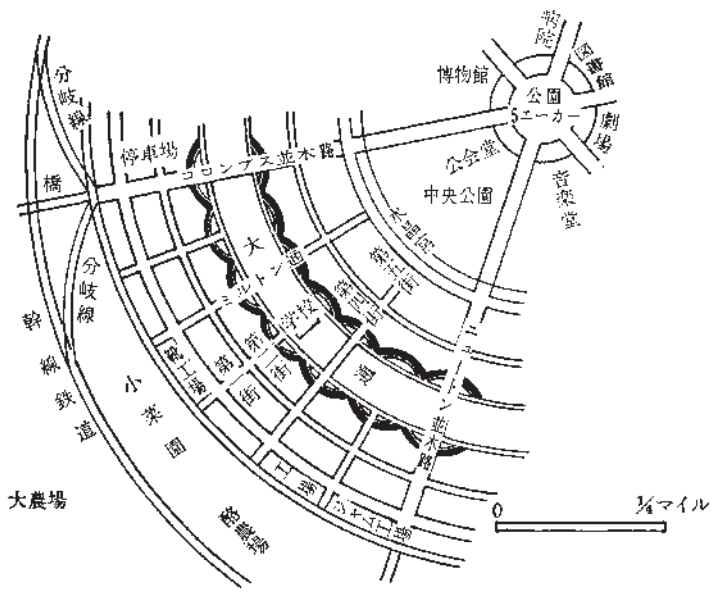
（1）　土地を国民，あるいは自治体の所有とせしむべしという土地に関する新しい考え方

（2）　それ自身で完成された小社会を形成する人びとの集団的定住に関する説

（3）　バッキンガムの立案した人口 2.5 万人で周囲を農村でとりかこまれた工業と農業の結合にもとづく新しい標本都市（586 ページ第 135 図）のアイディア



第1図　ハワードの田園都市の図式 (1)



第2図　ハワードの田園都市の図式 (2)

という三つのものに直接の基礎をおいている．ただしバッキンガムはこの新都市を組合の規制の下に目論んだのにたいして，ハワードは自由経済のもとに，

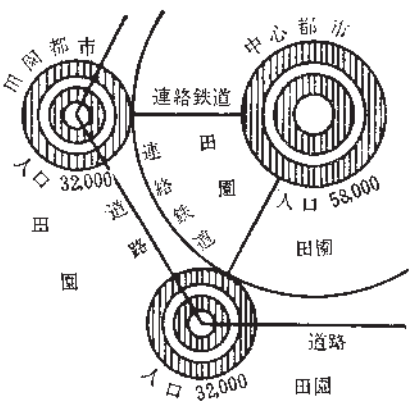
住民の自治によって，ただ土地の所有と管理の新しい方法を採用することによって達成されるとし，これをもって社会改革の手段であるとも信じた．

ハワードの主張　彼の田園都市にたいする意想は次のごとく要約される．

（1）　自給自足――農業地帯でとりかこまれた小商工都市，工業と農業の結合，工業，食料生産，その他のための農業，その交換のための商業，娯楽，教育および宗教的施設，自治機関の完備，新鮮なる食料，新鮮なる空気，汚廃物の農業地での利用など．彼のしめした例では，全地域6,000エーカーのうち1,000エーカーが市域となり30,000人の人口をもち，他の5,000エーカーが農業地として2,000人の人口をもつ（第1,2図）．

（2）　土地の公有――都市の発展によって生ずる地代，市民の租税負担能力の上昇を「公費地代」として徴収する．これは当初低廉な価格で買収された土地にたいする投資の利息および減債基金を賄ってさらに各種公共事業の維持経営をおこなう費用を充分捻出し得る．土地の利用はすべて自治的な管理委員会により計画的に指導される．

（3）　都市人口の限定――一つの都心，一連の商業地帯（水晶宮（クリスタルパレス）となづけて，これを市民の慰安の場所ともしている），これに密接する2列の住居地帯，その外側をとりまく商工業職場，鉄道および田園というような形で，一つのまとまった社会を構成する小都市の建設．市内交通は徒歩でなされる結果，その大きさは人口3.2万を最適，最大で5.8万人．したがって発展は新しい都市の分裂・新設によっておこなわれ，旧都市と新都市は田園を介して，高速度鉄道でつながれる．中心都市にたいし各都市は漸次衛星のごとくつくられてゆく（第3図）．

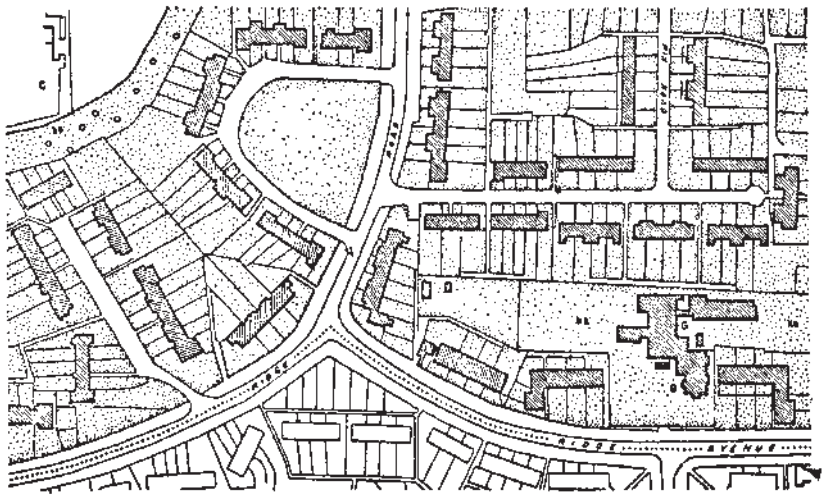


第3図　ハワードの田園都市発展形態の図式

自給自足的小社会建設の理想　この提案がもつ注目すべき内容は，限られた小地域に自給自足する小地域社会を田園都市という形で実現しようとした

こと，かかる小都市を次々と造ることによって国土を構成してゆこうとする地域構成の新しい理念である．それは何らかの形で――より大きな地域的ないし国際的分業と，小社会の持ち得ないより大きな社会に属する諸設備との連関によって――さらに大きな中心への関連を予想しなければ成立し得ないものであるが，一群の人口の生産と消費の場所としての自給自足の社会としてもくろま

第4図　田園都市（レッチウォース）



第5図　袋路と張出道路の例　（レッチウォース）

れる．そこでは，住民の生活の完全な「完結」を一個の小社会によってもたらそうとする都市的生活施設の最初の総合的再構成の企図が見出される．したがってそれはまた，都市住民の生活自身の総合的建設をも意味する．それは労働者を含めての都市生活者の不良な住居状態の改善を，職場の近くに配置され，田園に抱擁され，秩序ある生活施設をもった小都市において実現しようとしたアイディアとして注目される．

標本的実施　この理想は二つの注目すべき実例を実現した．レッチウォースとウェルウィンである（第4, 5図）．それは関係者の異常な熱意と，膨大な植民地を有する先進資本主義国たる英国に許された「企業家の理解」によって生まれ得たものであった．この成功は田園都市への関心を大いに刺激した．しかしこの万人から祝福された新しい生活形態も，これを実現することは，金融業者，企業家，地主，建築業者などの利益の完全な一致をみなければ不可能であるという自由経済の下では，きわめて困難な事業であり，それ以上の進展をみることができなかった．この運動は英国の都市計画運動の先駆をなし，1909年の住宅および都市計画法の制定に貢献したに止まった．それは都市発展の計画的規制を目標とするものであったが，田園都市が限られた地域ではあるが完成しようとした生活基地の総合的な構成という点からみると，あまり明確にとりく

まれたものではなかった.

田園郊外　田園都市の提案においてはじめて企図された生活施設の総合的・合理的構成は，このようにきわめて限定的な成功をかち得たに止まったが，ここに求められた理想と内容においては全然ことなっているが形のよく似た解決がその後あらわれてきている.

自分の職場（工場その他）をもった小都市としてでなく，ただ居住地だけを田園に囲まれた衛生的な土地に建設しようとする「田園郊外」の試みは，20世紀になって交通機関が発達するにともなって可能となってきた．むろんそれはそのような遠距離通勤を許される小範囲の人びとについてであるが，この居住形態において人びとは大都市生活から開放されつつしかも大都市の中心に繁栄する消費文化を自由に享受する生活が確保されることとなった．この趨勢は交通機関の発展によってますます激化され，働き場所としての都市から居住地への空間的距離は拡大され，大都市の垂直的・水平的発展は拍車をかけられて，20世紀的な巨大都市の膨脹をますます助長した．都市郊外の別荘的待避地はやがて常住の居所となり，郊外住宅地はいつのまにか大都市周辺の隣接地にかこまれた市街に変化する．分離された職場と住処およびこれに付随する商業的環境をもって構成される生活形態は，かつて職場と住処の結合していた小商工業者・都心生活者にも拡大されるにいたる.

職場と住処の分離　しかしこのような変化は大都市生活の困難を何ら軽減しなかった．都市中心区における密住は依然として負担力の少ない都市住民にとって避け難いものであったし，交通機関の発達はその利用者を無限に増大させることによってかえって交通難という新しい困難を助長した．集中的生活の利益をうち消すところの生活の無用の交錯と不合理はますます激化された.

衛星都市　居住形態の理想的発展にたいする田園都市の提案にもかかわらず，大都市はますますその外郊を蚕食して外延的・連たん的膨脹をつづける．そしてこの膨脹そのものは資本主義社会の発展の必然として抑止することができない．とすれば，残された方法は，無制限な帯状発展，連たん的膨脹と無用の生活交錯からくる混乱を可及的に排除することである．母都市を中心として一定の距離をはなして衛星的に配置された新たな中心を集中的につくり，発展を既存都市からはなれた場所に集中的におこなわせ，そのおのおのの間を高速度交

通機関で結び，大都市の利益を各小都市居住者にも享受せしめること――これがいわゆる衛星都市の理論である．そこでは全都市地域に住む人びとの生活は小都市内の生活，大都市内の生活，および大小都市間の交替生活などの組合わせによって構成されるものと予想されている．しかしこの提案もまた田園都市論と同じく実現に多くの困難をもっている．都市の連続的・外延的膨脹の阻止のためには，その周辺全体，あるいは楔状に建築禁止帯（緑地）をもうける方法が若干の国で採用されているが，広大な都市地域にたいするこの種の計画的な都市開発はまだ注目すべき成果を得ていない．けだし，大地域計画を，その総合的計画性を貫徹しつつ積極的に遂行することの可能な社会においては，大都市の無統制発展それ自身が抑制されるべき対象として浮び出てくるものであるから，衛星都市理論に限らずその他の多くの都市地域構成の理論は，それを実現し得ない国においてはあまりにも空想的であり，実現し得る国においてはあまりにも妥協的・微温的なものであるという批判をまぬがれ得るものではなかった．

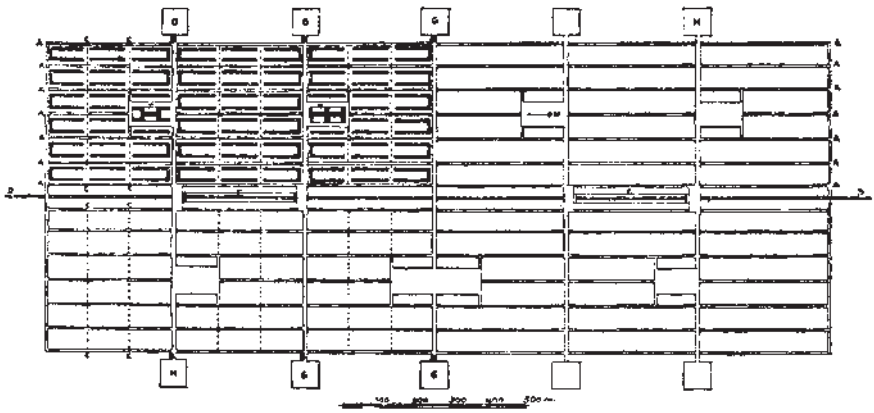
理想都市　しかし都市を純粋に理論的な考慮にもとづいて計画的に建設するということが全然なかったわけではない．たとえばオーストラリアのキャンベラのような植民地の都市は（1911年の懸賞設計にもとづいて）幾何学的な整然とした形で「計画」にもとづいて建設されている（592ページ第139図）．しかしそこにおこなわれる生活の構造という観点からこれをみると，それらはいずれも既成都市の要素施設をただ幾何学的に整理・配列することにのみ終始していたといい得よう．

第一次世界大戦後，都市の改造は多くの建築家の注目をひいた．しかし，彼らの提案はいずれも都市の「建築」的改造に止まるものが多かった．たとえばル・コルビュジエのパリ改造を例とする大都市案のごときも，ただ既成大都市の中心区の稠密，不衛生をいかに建築的に解決するかに止まり，都市の生活構成そのものについては何ら触れていない．彼は人口300万人の都市を計画するに当って，都心では16階の1棟に1～5万人の従業員をもつ大摩天楼を1km間隔に24棟配置し，その周囲に中層住宅群をめぐらし，工場地帯は遠く周囲部にもってゆくという都市構成を立案している（589ページ第137図）．しかし，それは金融資本主義社会の中枢たる近代国家の首都の自然発生的形態を，ただ

そのもろもろの罪悪・不衛生・無秩序をささえている建築施設においてのみ改造してそれを「建築化」したというに止まり，都市の機能構成はアメリカ的・自然発生的都市生活をそのまま，これにいささかの「空想的」解決を加えたものでしかなかった．

第6図　ヒルベルザイメルの住居都市案

A．住居道路　B．業務道路　C．連絡通路　D．地下鉄　E．停車場　F．業務建築　G．学校　H．病院



ドイツの建築家ヒルベルザイメルも，衛星都市的思想にもとづく一つの理想的住宅都市を提案している（第6図）．それは都市の中央を貫通する高速度鉄道によって主都市と結ばれた矩形の都市で，その両側は道路によって六つの地区に分かたれ，四つの商業中心と都市の外側の田園地帯に突出した四つの学校と一つの病院を両側に配置している．住宅はすべて10層の高層建築でつくられ，上階は住居に，下階は商店街とされている．ここでも提案は，住居・学校・病院・商店街・都心・職場などという自然発生的都市の諸構成要素をただ一部分切りはなして再構成したというに止まり，都市機能の再構成という点から考えても，都市生活の構成という点から考えても，不徹底でまた効果の期しがたいものであった．

ソ連における試み　資本主義的自由の支配せる多くの国々では大都市は不可抗と思われる根づよさをもって膨脹しつづけ，大都市生活の秩序は何ら確立されることなく，大都市生活の複雑な相互関係はいたずらに社会学的考察の興味をひくにすぎなかった．

しかし，田園都市の理想は一つの新しい展開を英本国以外に見出した．それ

はソ連である．住居と職場を至近の距離に結びつけ，両者間の交通によって失われる時間と労力を生活過程の合理化に利用し，適当の人口集団を確保することにより文化的・公共的な施設を具備させつつ全生活環境を田園の開続する中につくり出すことによって，生活の健康化と文化の向上をはかろうとする田園都市の理想は，ソ連では異なった政治的・経済的基礎のうえに，まったく異なった形をもって展開された．それは「帯状都市」と呼ばれる新しい計画意想の中に結晶されている．

線状都市　形のうえから帯状都市の先駆をなしたものはソリア・イ・ナータの提案になる線状都市であるとしばしばいわれる．これは，田園地帯を貫く自動車交通路ぞいに長く布置された住居地区の細長い線で都市がつくられ，この線の網によって田園をおおいつつ居住地をつくってゆくという形で，居住者はこの交通路を利用して一定の場所にある工場に運ばれることになっている．マドリッドの郊外に1882年につくられたものは全長22 km，人口3万人に及ぶものであった．

しかし，いわゆる帯状都市といわれるものは，形の上でこれとやや類似しているが，全然別個の理論のうえにたつ．そこでは生産施設そのものが線状をなし，作業行程にしたがって交通路線（鉄道・自動車路など）ぞいに合理的に配置された生産施設の系列があり，それに平行して公共施設・住居施設・緑地帯などが長く配置される．それは都市居住者の住居と職場が緑地をへだてて，並列的につくられた田園都市の特異なタイプといえる．

ミリューチンはその著『社会主義都市』において彼の主張する帯状都市を次のごとくのべている．彼はまず，過去の無統制に発展した都市がもつ諸施設と相互交通の混乱による浪費と困難とを排除するため，すべての居住地は工業および農業生産・交通・動力・管理・生活過程・教育および学習などの基本的事項にたいし，「綜合された全体」として計画的に建設されるべきことを主張し，これを具体的に次のごとく規定する．

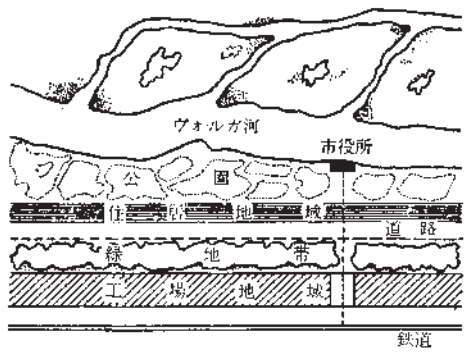
（1）　個々の生産施設および相互交通の理想的な配置．機能的な流れの構成．

（2）　職場と住処は，地理的条件と工業の種類により異なるが，原則として500 m の緑地（防護地）をへだてて配置される．10～20分の徒歩交通．新鮮な空気，森と原野の享受．通勤をたのしむ．

（3）　生産施設の背後に配置される鉄道．緑地帯を通る自動車道路．停車場は両者の中間地にもうける．自動車による市内連絡．

（4）　農業地の最適な配置．酪農場・菜園・園芸地などの国営農場．汚水による灌漑．

（5）　生産施設（工場）および農場・官庁・病院などと連絡ある（工・農・経・医の）専門および中等教育施設．労働と教育との結合．理論的および実験的研究所・仕事場・緑地・図書館・文庫など，教育の機会はすべての人にあたえられ，教育への関心の向上を期する．

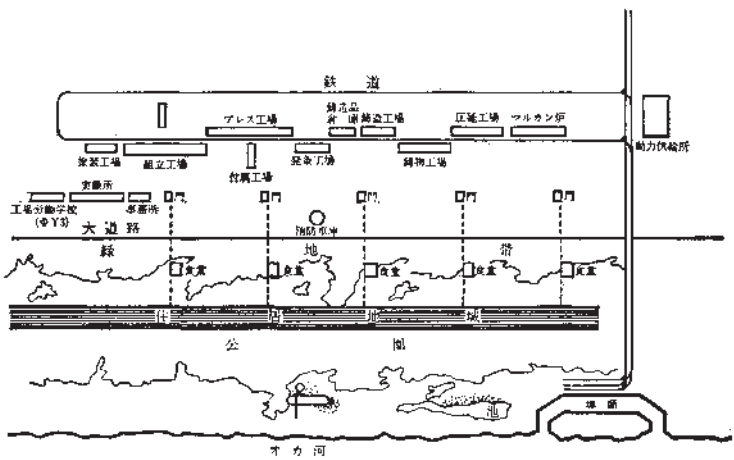


第7図　ソ連・帯状都市の模式図
（マグニトゴルスク）

（6）　病院は住居地内の公衆保健指導所と学校付属病院・サナトリウム・研究所を含む固定施設とよりなる．後者は保健緑地内に配置．

（7）　7年制国民学校は少年村に，一般教育機関（クラブ・図書館）と工場と

第8図　ニジエゴーロド市自動車工場と住居地域の計画



に連絡され，生産労働と学習・体育とを結合する．両親の教育参加を拒否しないが，よりすぐれた社会的教化を実施する．

（8）　管理・行政施設は生産地帯で，管理，配給などに最も便利な場所へ．

（9）　倉庫．生産地帯と鉄道・道路の付近に．

（10）　不衛生地区の徹底的な防止と排除．

以上の原則より次のごとき地帯構成を得る．

帯状都市の構成

（1）　鉄道地帯

（2）　工場および管理行政施設地帯：倉庫・停車場およびそれに付属する教育研究機関

（3）　緑地帯：自動車道路

（4）　住居地帯：

a. 公共施設――食堂・保健指導所・市民および農民集会場

b. 住　宅

c. 少年村（ピオネール隊・幼稚園・保育所）

（5）　公園地帯：休養地・体育場・水泳場

（6）　農業地帯：酪農場・菜園・園芸農場・野菜畑・灌漑地――国営農場

なお地帯の配置は水系，土地の状況，風向などによって定められる．

防空的価値　この構成は，この場合工場施設の作業行程にもとづく配列方法と連関してとりあげられているが，大都市の地域配列方法としてこれを利用するときは，単に自給自足的な「都市と農村の結合」という点のみならず，都心というものがなくなり，特殊な交通上の弱点がないという点で，防空上からも，もっとも理想的な都市形態であるといわれる．

それはさておき，この理論にもとづいて建設されたソ連の新都市はすくなくないが，技術者の不足によってその実績はきわめて不満足の状態であるといわれる．

生活構造の改革　しかしわれわれは，この理論のうちに，かつての田園都市理論の中にはまだ明確な形をとって現われていなかったが，生活の構造ないし生活施設の体系に関して，次のような考慮がはらわれてきているのを見落してはならない．それは，

（1）　勤労者（それはこの都市が国民経済にたいして寄与すべき仕事に直接に従事している人びとである）の労働生活と剰余の（休養・慰楽・鍛錬・教育などの諸生活）過程とが総合的に把握され，全体の生活施設体系の中に平衡のとれた満足すべき生活循環を実現することが目標とされていること――これは無論「田園都市」においても求められたところである．しかし，ここでは教化や社交あるいは慰楽などにたいする施設は，既存大都市において自然発生的（営利的）に発達した公共施設・商店街などの諸形態をそのまま踏襲し，ただ規模を限定しただけで整頓しようとしている「田園都市」的計画から一歩進んで，これら施設全体を新しい社会生活と社交を支援し発展させるための根本的な編成替えを意識しつつ提出されている．

（2）　勤務者の通勤が生活輪廻において積極的な意義をもってとりあげられている．従来の都市生活におけるやはり苦業ともいうべきそれが，ここでは工場生活に欠けている田園的環境内の一つの生活過程として，積極的に意義づけられている．

（3）　教育と生産労働との結合，とくに労働者の家庭に生活する次代の労働者たる学修者（青少年）の生活が，都市生活における付随的なものとしてでなく，主要要素として，すなわち都市全体を，たえず精神的・肉体的に成長しつづける居住者がはぐくまれてゆく理想的環境・「郷土」として，総合的に構成されようとしている．

旧都市の改造問題　これらの原則は，旧都市の改造においても貫徹すべく努力されている．大規模な住居地区と中心地区の改造，とくに都市内外および全国的な（教育的施設と総合された）休養地の建設などは，社会生活の構造的変革と結合して遂行されたものとして注目される．

帯状都市の提案がなされた対象は主として新しい工業都市であった．新しい生活形態を予想する全然新しい生活施設の体系がそこでは追求された．各種の社会的・経済的現象にたいする国家的統制がきわめて強力に加え得られる場合，新都市の建設はこのような理想的生活構造（輪廻）の創造という形で実現され得る．しかし多くの国では，問題はほとんどすべてがすでに存在せる大都市において起こり，そこでは既存の条件がすべてを制約する．また，そこでは生活の構造の再構成や合理化ないし新しい生活様式の創造という問題も，まったく

別個の形をとってあらわれざるを得ない．われわれはこの点で，各国の厚生運動，なかでも独・伊などの全体主義国家における試みを注目したい．

厚生運動　厚生運動は，アメリカにおいて都市の無統制発展がもたらした青少年生活の変歪にたいして，彼らに「遊び場」を与えようとしたプレイグラウンド運動として最初の注目すべき生活施設にたいする交渉をしめしている．しかし，余暇生活の再組織という点から出発した厚生運動の今一つのゆき方がヨリ注目される．イタリアのドポラボーロ，ドイツの KDF の事業のごときがそれである．その活動はむろんいまだ生活施設の全体系を再構成するというようなところまで発展していない．しかし生活自体を対象とし，これを直接合理的に再構成しようと試みつつあることは，やがてその成果を基として生活施設全体のヨリ基本的な改革をみちびき出し得ることとなるだろう．

そこでは，生活基地の新しい構成意想のごときはいまだ明確な形をとってあらわれていない．しかし環境の美化・余暇生活の組織から出発して，日々の生活輪廻，1日・1年のそれ，あるいは数年に1回の行事にいたるまで，直接生活自体を改革の対象にとりあげようとしている点，その中に生活構造および生活基地にたいする新しい意想が宿っていることをよみとってもよい．

菜園つき住宅　ナチスの都市労働者にたいする定住地事業は，ドイツ民族の郷土を拡張しようとする，主として東部地方の農村定住事業と同様に，労働者に住宅を所有させることによって「帝国」を支持する中堅層を育成しようとするものであるが，そのかかげている主なる利点は労働者に健全な住居境環をあたえると同時に防空のための疎開を達成し，副業として不況時には家計の補助，好況時には休養と鍛錬および生産とをかねた労働力涵養に資そうとする点などである．それはナチス以前からうけつがれている失業救済的な食料自給を目標としている点では疑義の多いものであるが，かつて小工農結合社会を理想とした論者が主張していた，工場労働の余暇を休養と鍛錬および生産的活動に結びつけた耕作によって組織しようとしている点で，生活構造にたいする積極的な再編成に一歩すすんだものとして，注目される．

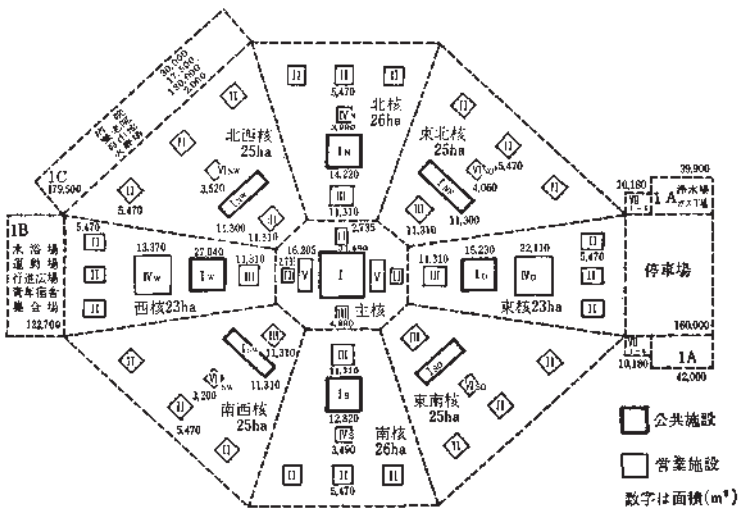
フェーダーの理想都市　こうしたナチスのこころみる諸解決は彼らの新都市構想に当然あらわれてくるであろう．この点でナチスの党綱領起草者フェーダー教授の理想都市案は注目に値する．フェーダーは彼の理想都市探求の過程を

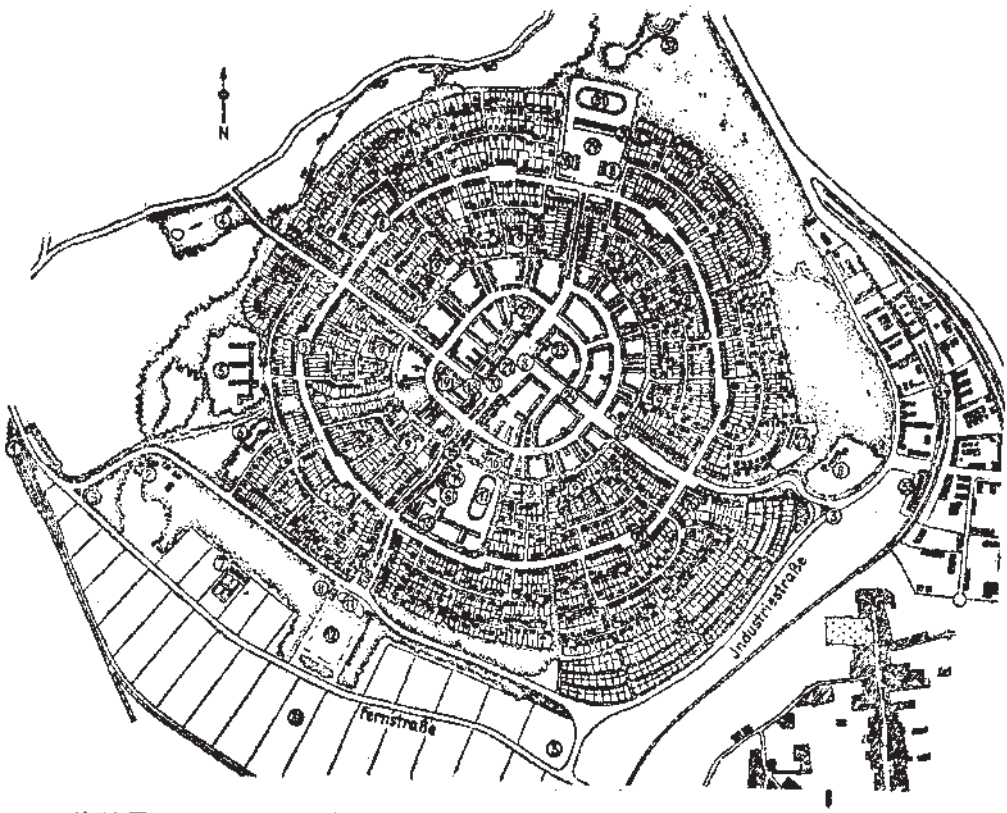
その著『新しき都市』において明らかにしているが，その結論として彼の呈示する都市の例示的設計案（第9, 10図）はつぎの諸点で注目される．

（1）　人口2万人をもつ自給自足的小都市――農耕地帯で囲繞され，その一方の側の至近の距離に工場地帯・職場をもつ工農都市．彼はこの2万人都市の構成を立案するに当って，既存都市の諸施設にたいする調査をおこなって，その研究を基礎として理想都市のもつべき公共的および営業的施設の種類・規模および量を定めている．

（2）　地区の段階構成――全都市は3群9地区にわかたれる．各地区（核）は日常生活の中心をなしている営業施設をもった五つの細胞よりなり，地区全体にはこのほかに学校・教会・劇場などをもつ中心がある．全地区は東部，中部および西部の各三つで一群を構成し，公共施設はこれらの各群ごとに配置される．中心核には全市に対応する中心施設が設けられるが，そのうち文化施設は西側に，工場施設は停車場と共に東側に分割される．これを具体的にいうと，中央地区には，日常生活の中心をなす営業施設と共に，各種官庁・議事堂・銀行・市場・図書館・映画館・保育所・専門学校などがあり，都市の外側には浄水場・ガス工場・配電所・農場・屠場・塵芥処理場などを付属する停車場地帯（東側），水浴場・グランド・広場・

第9図　フェーダーの2万人都市の模式図





第10図　フェーダーの新都市案

青年宿舎・集会場をもつ訓練地（西側），病院・養老院・空地・火葬場などをもつ休養地（西北側），などが配され，これら全体を小菜園・酪農場および農業地帯がとりまいている．

この構成を具体的設計にあらわした諸案のうち，キルスの設計案では，細胞・核および都市がそれぞれ日常用途・週間用途・月間用途に対応し，またそれぞれが党細胞，地区グループおよび核に対応せしめられている．

以上の提案は自給自足的に完備した小社会を田園の中につくるという点で，また都市が学校そのほか公共施設をもつ若干の下級地区に分かたれている点などで，田園都市以来の理想都市に関する諸原則を再現しているものといい得る．

また休養と鍛錬の結合，青少年の育成などに関しては，ナチスの経験に裏づけられ，充分現実的な形で野外的作業・団体訓練・鍛錬などの施設が都市構成

のなかに折込まれている点はとくに注目される．

それは既存都市の調査を基礎としてこれらの施設の規模と質を設定せんとし，またこれらの施設を生活輪廻と有機的に結び合わせて日常的・週末的・月末的中心たらしめようとしている点などにおいて，田園都市的理論をヨリ現実的・ヨリ組織的に組立てたものだといい得る．しかしこのことは，その反面で，帯状都市のごとく全く新しい生産と分配の社会機構を予想し，そういったものと結合して提案されているというものではなく，ただ諸種の施設を過去の形態において整理しようとしている点で，多分に中世的な小都市を再現するという方向に近づいている．

生活構造の問題　以上のごとき若干の歴史的試みにおいて，われわれは資本主義的自由主義経済社会が生み出した自然発生的な都市環境と都市生活の構造にたいして，生活輪廻の再検討とその合理的再構成をめざす積極的な生活基地建設についての諸試案と，若干の重視すべき要点とを振りかえってみることができた．しかし，生活基地の構成にたいするわれわれの理論，われわれのイデアルビルトは，果たしてこれで充分であろうか．

3. 生活基地構成に関する現代的課題

都市問題　資本主義社会の発展は大都市を生み出した．それは産業経済および文化の中心として，資本主義社会の発展を可能ならしめた地盤であった．しかしその成長と発展は多くの弊害をもたらした．住宅問題・交通問題・保健問題などはそのもっとも顕著なるものである．

大都市人口の大部を構成する勤労階級は慢性的生活難の下に適当な住居を取得することが困難であり，住宅の供給もまたこの事情を反映して粗悪な住居がかれらに提供されることになり，慢性的・経済的住宅難と反社会的な不良住宅の成長は不可避とされる．都市生活にたいする風紀上・保安上・衛生上の脅威は増加する．いっぽう産業の急激な発展期においては，都市はその潜在的労働力と既存住居施設の集中して存在することによって労働力の豊富な供給地となると同時に，そのこと自身が人口の都市集中と絶対的住宅難をひきおこし，産業発展に暗影をなげかける．近代的な意味の住宅難はたえず都市に成長する．

無統制膨脹の弊害　都市への産業と人口の集中はその無制限の空間的膨脹を

要求する．地域的な拡大が必然的にもたらされるが，これはたえず中心区からの住宅のおいだしをともない，中心区における産業経済の集中と，住居地にとりまかれて内部に入ってしまった工場地域とは，都市勤労者の日々の生活に内から外へ，外から内への繰返される通勤を要求することになる．この典型的な片方的交通流と，それにまつわる幾多の交錯的な地域関係によって生ずる不規則な衝突する交通流によって，都市の交通は混乱され，雑踏をきわめ，ついに正常な都市の営みに暗影をなげかけるにいたる．

このような弊害の激化は資本主義社会への直接的脅威となり，あるいは利潤率の低下による間接的脅威となり，その解決をせまる．この結果，その解決は当初はび縫的・対症的処置として，そして次第に総括的な対策として成長する．金融資本主義あるいはビューロクラティック・キャピタリズムの段階は，かかる要求を反映してその解決をおこなうための機構を次第に明確にととのえてくる．

新しい危険　しかも広域経済圏を確保しようとする列国間の国際対立の激化は，この段階においてその対立の総力戦的性格をますます明らかにする．軍事のみならず，産業・経済および人的資源の総力をあげて国防目的のために動員せざるを得なくなり，国土の構成もまたこのような要請を反映して国防のためもっとも効率的な形態への整備を要請され，自由主義は止揚され，強力な国家統制が前面に押出される．すなわち「国土計画」の要請である．

いっぽう，航空機の発達は戦争様式を一変させ，全国土を戦場化することにより，国土の防空的構成を必要とし，とりわけその心臓部をなす都市構成の課題も一変する．防空的都市構成である．

都市の立地と都市における富と人口の配分は，国土計画により規制される必要を生ずるいっぽう，都市環境と都市生活とは直接的には国土防衛・防空上から，間接的には総力戦遂行の人的・物的兵站基地として，再検討の対象となってくる．国土計画・重要施設の地方分散が問題となり，都市と農村の対立の新たな修正が考えられねばならなくなる．古き都市計画は，新しい視野から批判され，生活基地としての都市環境の再検討は切実な問題となってくる．

こうした事情をさらに一歩前進させて考えてみよう．

国防の基本問題　国際抗争の規模と性格の拡大・深化は経済的要求に先行す

る政治的・国防的観点から対策をたてるように視野を拡大したことは確かである．しかしこれを単に目前の事情のみにとらわれず，いま一歩前進して考えるとどうだろうか．国防の終局的な目標は，長期にわたる勝利の確保でなければならぬ．この抗争において勝ち抜くことも抗争の後にくる平和の時代の目標も，ともに国家発展の最大の標識たる国民自体の量的・質的繁栄にある．このような究極の目標たる民族・国民の繁栄は国民の価値・労働力の価値のすぐれた認識にもとづく正しい評価――これを住居についていうならば，国民に適正にして充分なる生活と生育の場所をあたえることによってのみ期し得られる．住居は国民経済における価値増殖の源泉たる健全な労働力を保全・育成すると同時に，また強兵の生育する温床でもなければならぬ．

国土と郷土　それは国民がそだってゆく今までとはちがった国民的生活基地・郷土を与えることを要求する．都市は農村に対立する「国民」の浪費地であってはならない．と同時に農村の非文化的生活環境もまたその半封建的未開性が直ちにもたらす若干の「利点」*)のみを固守するために改革すべからざるものとしておしとどめておくべきものではない．高度に発達した産業経済に対応する国民生活の質的再編成，新しき社会生活の創造，都市農村を通じて強健で豊かな能力にめぐまれた国民を育成する郷土たらしめること――これが国民生活基地の再構成におけるわれわれの目標である．

4. 生活基地の構成要素としての住居施設

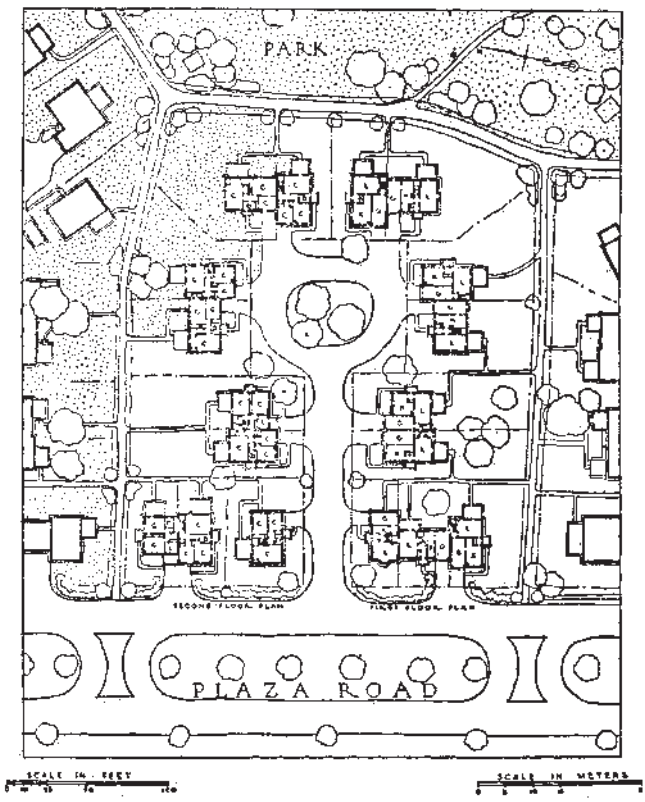
居住地の構成　住居の理想的な計画は，都市においては当然その集団的構成にたいする考慮をともなわねばならない．それは最初に住宅の配列方法，住宅群のつくり方などの問題になってあらわれる．

集合住宅　密集した都市生活に対応して早くから集合的な住居形式が発達している．すでにローマ時代，われわれは数階建の下層民の住宅の存在したことを知るが，中世においても城壁に囲まれた都市では，人口の増加にしたがって同様にこの種の集合住宅をつくりだした．近代都市における人口の急激な増加は都市における密集居住に拍車をかけ，集合住宅は19世紀中葉から顕著に建

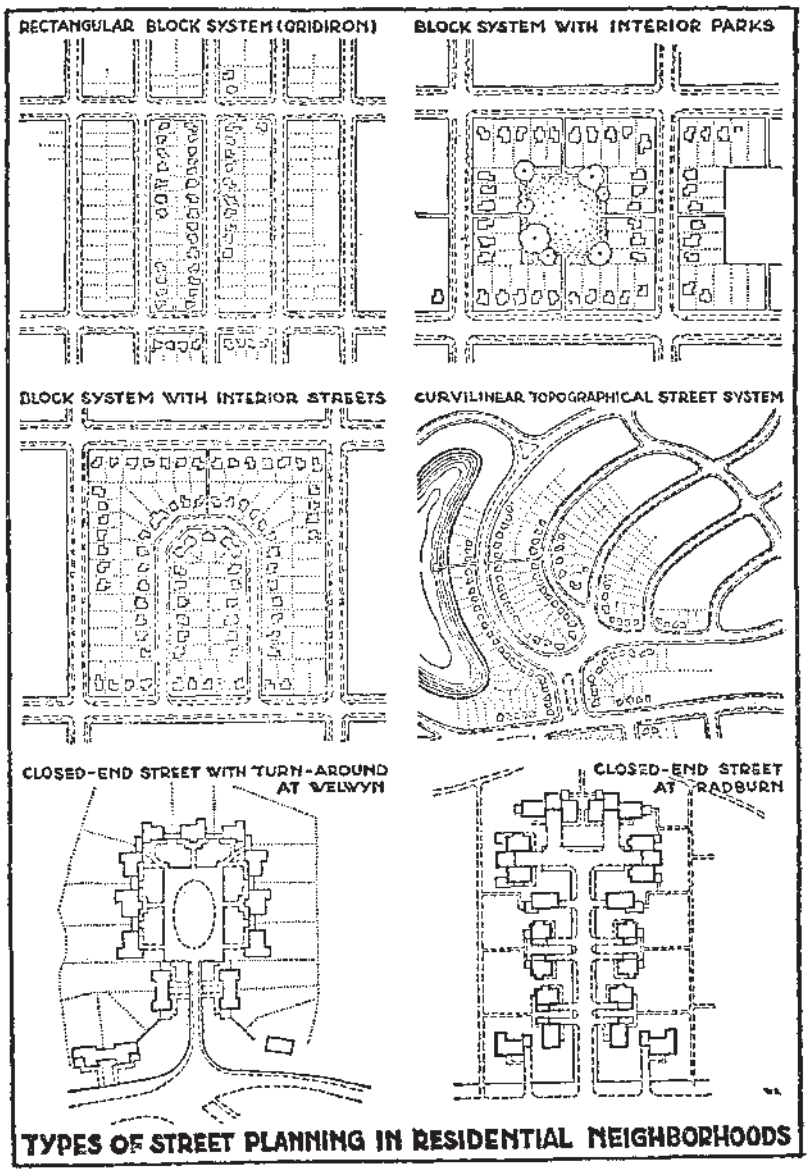
*) 戦時中にいわれていた例の「民族耐乏」，素朴な環境がつよい国民をつくりだすということ．

設されるようになった．ドイツの兵営式長屋，英国のいわゆるフラット，アメリカの高層アパートなどはいずれもこの代表的なものである．これらの住居形式は，狭い敷地に稠密に建設し得ること，集合による建設費や維持・管理費の節約などによる経済的な利益と，独身者をも含めて小家族の増加，移動性の多いこれら居住者に簡易な住居をあたえるという社会的要求などによって支持され発達した．集合住宅の形式探求への努力は，住戸の配列・建物の形の組合わせなどにおいて種々の試みを生んだ．しかしこの過程を誘導したものは営利的建築業者および貸家業者であって，その結果は，望ましき住居群の構成というよりも，しばしば居住条件のあらたな切りつめの探求という方向にむかった．

わが国では早くから都市住宅として長屋形式の発達をみているが，木材を主



第11図　もっともゆっくりした，車が奥で回転できるカル・デ・サック型の住宅路
（バーンハム・プレイス）



第12図　近隣住区の中の街路計画の型（T. Adams, "The Design of Residential Areas", p. 151）

とする構造・材料上の制約によって，それ以上の共同的・集合的な住居形式の発展はみられなかった．第一次大戦後の住宅難の激化にともない，重ね建あるいは共同住宅などのいわゆる文化長屋，アパートなどと呼ばれるものが急速に

増加した．しかしこれらはいずれも集合によって営利性を高めようとする意図に出たものであって，住居施設の積極的な改善を企図したものではなく，住居群の構成という点からみて何ら賞揚さるべきものではなかった．

開放的住宅群の配置　第一次世界大戦後の相対的安定期において，西欧諸国では住居の集団的大量建設が相次いでおこなわれた．このような住居の大量建設が住居群の構成にたいする積極的な関心を導きだしたことは当然である．1戸建（独立）住宅をもって本旨としてきた英国においては，田園都市以来の分散的・田園的配置が主流をなし，その経験にもとづいて住戸密度の限定がとりあげられた．1923年および24年法によって，国の補助によって建設される住宅は，1エーカー当り市街地20戸，地方12戸以下たるべきことが定められた．

個々の住宅の具体的な配列の仕方は，このような独立分散住宅の建設では主として道路の配置と密接に関連するが，ここでは「袋路」や「張出道路」などの奨用がおこなわれたのが注目される．

建てつまった市街地的住宅地における袋路は，衛生上また恐慌時における保安上の問題から拒否されるべきものだが，開放的建設の場合は道路面積の節約と住居の閉鎖性・静謐性を高める点でとくに有利なものとされた．また，曲線道路や住宅配列の変化による環境の美化が追及され，充分開放的な住宅地の空地を小菜園としたり，これを集中して郭内公園やそのほかの休養地に利用する方法の発展をもたらした．

ヨーロッパにおける探求　前世紀後半以来集中的な居住形態を発達させてきたドイツでは，大戦後の新建設において採用されるべき住居形式が分散・開放型か集中型か，あるいはその他の何ものであるべきかが大いに論じられた．むろんかつての営利的な「兵営式貸長屋」は拒否されるべきものであった．しかし配列法を適当に考慮し，充分疎開された高層住宅は必ずしも拒否さるべきものではなかった．したがってここでは住宅の配列にかかわる諸原則，なかでも低層か高層かの問題が論議の中心になった．そのもっとも代表的なものは国際新建築会議（CIAM）のメンバーであるグロピウス，マイ，ヒルベルザイメルなどのあいだで論じられた諸論争で，第3回の会議は「合理的配列方法」を主題とし，主としてこの問題をめぐって論議がおこなわれた[*]．この論争は高層あるいは低層住居のもつ居住形態が新しい社会生活をつくりあげてゆくうえにい

かなる意義をもつかという点についても論じられているが，おもな議論のわかれ路は全体としていずれが経済的（土地，建築費，したがって居住者の負担として）であるかという点であった．

高層か低層か　単に経済的な観点からみるならば，建築の経済性は土地開発費と昇降機の費用との相殺によって階数の増減により一定の最小値が見出されるといわれる．グロピウスはこれを10～12階とした．低層住宅は庭に親しみやすく，小児の監督に便であり，また住居の独立性がよりよく確保せられる．しかし高層住宅もそれに劣らないもの静かなものとなし得るし，通風採光ともによく，広い芝生や遊戯場をつくりうるし，施設の共同化と集中によって便宜と管理費の低下をはかり，家庭労働から婦人を解放し得る．高層建築にたいする反対の多くは感情的な心理，習慣上の問題であり，これは政治と世界観によって解決さるべきだ――とグロピウスはいっている．しかし政治と世界観を問題にしつつ，いっぽうでは生活難の故に住居費の低下を動かすべからざる前提とし，目前とにかく可能な切下げにたいする優劣，すなわち「経済性」をもって問題のわかれ路とするようなこれら社会民主主義者の考察は，注目すべき問題提起とその処理をしめしたものといわれているが，反面きわめて狭隘な視野に立つものであった．

論争の現実的結果は，昇降機の不用な4～5階の中層建がもっとも経済的だというところに落着いたのである(**)．

住宅敷地の割付　この種の論争は，わが国においては住宅の構造様式が（木造1・2階建といった）全然別個の資源的・技術的条件をもっている点で，単に理論的興味をひいたにとどまった．また現実にわが国においては，1団地にたいする集団的住宅建設は若干の営利的ないし公益的住宅経営の分譲地建設をのぞいては問題とならず，そこでは住宅の配列は主として顧客の趣味に迎合し，またヨリ高い収益をねらった土地分割がおこなわれてきたのであった．

区画整理の画地割　これと類似の仕事が都市計画事業の一つとして，都市周

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*）"Rationelle Bebauungsweisen" Ergebnisse des 3 Internationalen Kongresses für Neues Bauen, Brüssel Nov. 1930.

**）この結論は，30年後の第二次大戦後のわが国のアパート建設でもほぼそのまま踏襲されているが，その後の生産力の発展，技術の進歩，都市化と高密度化の進展によって，高層化の評価，条件の相互関係は大きくかわってきている．

辺部の市街化に有力な役割を果たした土地区画整理においてみられる．しかしここでは住宅地の構成は，既存の自然発生的な地割と住居規模を基とする仮定にもとづいて，その地区の「予想される」程度によって特1級地より9級地にいたる級別による画地の大きさの選択があたえられているにすぎない[*]．しかもここに許されているわずかな計画的配慮はただ予想にもとづく「画地の大きさ」をあたえることによって実現しようとするような，もともとたよりない手段しかないのであるから，計画者の意図の実現はきわめて困難である[**]．計画者の予想と土地所有者の利害，および計画者の制御圏外にある都市発展の現実といった矛盾ははなはだしく，けっきょく一般の「計画」と同じく，必ずしも予期の通りには開発されず，狭く曲りくねった乱雑な道路の発生を防ぎ得たという程度の効果をあげているに過ぎなかった．

新住居形式と住居群の構成　住居群の構成はソ連邦においてまったく異なった観点からとりあげられた．

ここでは単に建築群の配置の問題としてでなく，社会生活ともっとも密接な関連をもつ住居施設をもって社会主義の建設の促進の一つの手段たらしめるという観点から，生活の社会化にもっとも適合した住居形式を発見するということに目標がおかれたのであった．

ドーマ・コムムヌイ　この問題は社会主義的建設が大きな飛躍を開始しようとした1930年ごろ，共同住家（ドーマ・コムムヌイ）と呼ばれる新しい社会主義的住居形式の創造・探求という形で盛んに論じられた[***]．個別住宅の古い形式は，古き家族形態と個人家庭経済とに結びついたものであり，それは生活の社会化の障害をなしている．社会主義的生活様式は生活施設や食事・養育・教育文化・家政などの最大限の社会化，婦人を家庭経済から解放するということを先決条件とする．新しい住居は，個人的能力を尊重すると共に新しい社会心理的な結びつきや社交と習俗を生み出し，生活文化の向上をもたらす集団生活を可能とするものでなければならない．家族は独立の最小生活単位であるが，それは相互に組織的に結合され，子どもの養育その他も専門家の指導の下にも

＊）土地区画整理設計標準（1933.7）
＊＊）伊部貞吉「住宅の標準画地」，都市問題（1940.5）
＊＊＊）"ДОМА-КОММУНЫ" строительство москвы 1929～1931.

っとも合理的に社会化され得る住居が必要である――以上のような前提にもとづいて，居住者個々の睡眠・休養のための個室，および共同の文化的・経営的施設を総合した大建築総合体たる住宅が，いわゆる「共同住家」である．

集中型と分散型　多くの建築家によって，種々の形でもって提出された共同住家の設計は，大体3種のタイプに分かたれる．

第1の型は集中型と称せられるべきもので，多くは1,000～2,000人程度の居住者を一個の共同家屋の中に収容することとしている．これらの家屋は各人の私的生活のための個室と，最大限に集約・分化された共同部分をもって構成されている．この形式は建築物としても都市としても，集約的な形式をもつゆえに，建設・経営ともにもっとも経済的なものとなるが，個人はこの1,000人もの集団の中で「自己」というものを見失ってしまう結果，ただ「よく整頓されたホテル」ができあがるだけで，新しい社会を創るための生活施設としては不適当なものである――とされた．

第2の型は，これと極端に対立する分散型と称せられるもので，小菜園にとりまかれた一家族住居をもって構成されるものとし，交通・通信機関その他あらゆる近代的・機械的技術の駆使によって，この孤立した住居を共同生活に組織だてようとするのである．この提案は経済性の点から考えてはなはだ空想的なものであるが，社会生活の成長という点から考えてみても，むかしからあった住居群の羅列と何らことならず，そこでは小児の養育も個々の家庭における個人的養育か，両親から隔離された養育か，どちらにしても不合理な形が予想されるだけである．

段階型の提案　こうしたの二つの型にたいして最後の型は「段階型」とも称すべきもので，一定の個人的結合によってつくられた細胞的生活集団を基礎とし，漸次広い，高次の生活圏を構成してゆく生活集団の段階構成を実現し得るような住居施設の一群を提案するもので，基礎的細胞たる個室が，各生活集団に対応した共同施設をもって漸次広い地域的集団群を構成する形をとっている．

はげしい論争と討議の結果，最後に第3の型が新しい社会生活の物質的環境をつくりあげてゆくためにもっとも正しい解決であるとされるにいたったが，この見解にもとづいて提案された社会主義的都市の一つの構成を紹介すると次のごときものである．

社会主義都市の一構成

（1）　共同体の細胞（36人）

個室（物入・便所・洗面シャワー・電話をもつ．18人の男女に各人1室）

共同施設．静休養室（読書・ラジオ・将棋）・遊戯室・書きもの室．

（2）　共同体の要素（180人）

音響をともなう作業室・集団事務室・集会場・社交室・遊戯室・日光室・会議室．

（3）　共同体の2要素（360人の成人，30人の小児）

一般休養室・図書閲覧室・集団事務室・集会場・特殊用途個室・遊戯室・食堂・スタンド・乳幼児保育所・個人および集団用鍛錬休養広場・外套室・会議室．

（4）　2,000人の共同体（八つの要素と560人の小児）

社交中心（集会場・映画・集会室・小児社交中心）・休養公園（遊戯場，屋外劇場）・体育中心（スポーツ館・プール・スタンド）の3歳～8歳までの幼児寄宿舎付学校．8歳～16歳の小児寄宿舎付学校．外来患者部（寝台つき）．作業場．

（5）　共同体の結合

集合広場・文化の家（上級の集会場），スポーツ中心・学校地区・公園道・映画館・図書館・地区医療施設・射撃訓練場．

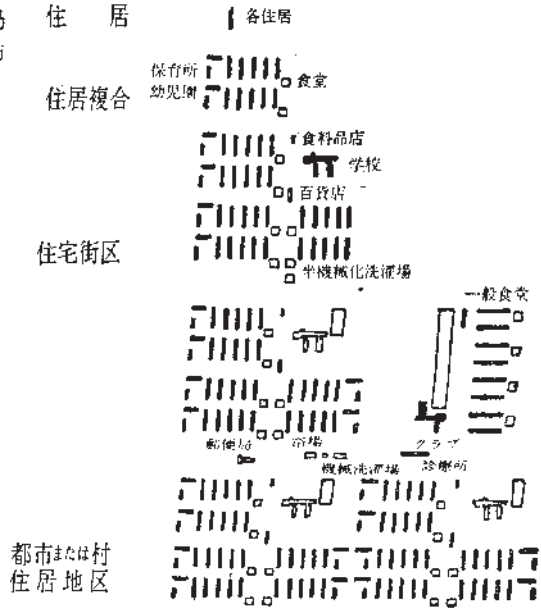
（6）　社会主義都市

中央集合広場・文化館・スポーツ中心・高等専門学校・青年文化館・科学技術館・公園地帯（文化と休養の公園・並木道・動物園・植物園），ラジオ中継所，航空港，医療施設（予防，保健相談所，病院）その他．

標準都市計画局の標準　また工業地区における集団住居地の早急建設の要求に対応してつくられた1931～32年の標準都市計画局の一標準をしめすと，住居地区構成は同様の原則にもとづいて実際的要求に合致すべく次のような地区構成の段階を定めている[*)]．

定住地の構成体系（第13図）

*）П. Н. БЛОХИН, ТИПИЗАЦИЯ ЖИЛИЩ, ОБЩЕСТВЕННЫХ ЗДАНИЙ ПРИ ПЛАНИРОВКЕ НАССЕЛЕННЫХ МЭСТ, 1933.



第13図　ソ連・標準都市計画局によってしめされた都市の内部組織の段階構成

（1）　住居細胞――住居の基本要素（睡眠・個人的休養・読書整容のための室・家庭経済の場合は炊事・食事室）．個々の家族の家または寄宿舎の室．

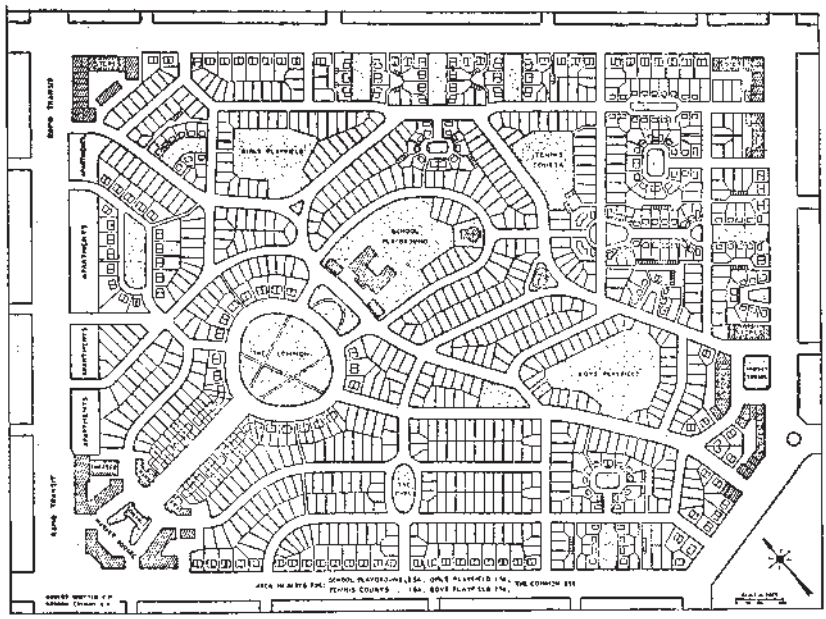
（2）　住居――住居細胞の結合．共同生活者のばあい共同食堂と休養室．

（3）　住居複合――住居の集団・食堂・未修学児童の養育（乳幼児の保育所，3歳～8歳群の幼稚園）・体育館．

（4）　住居街区――学校，洗濯工場，一般都市的・地区的種類の施設（浴場・百貨店・食料品店）．

（5）　地区――行政的・公共的施設（郵便局・公衆保健指導所・クラブ・食堂・運動場）．

アメリカにおける近隣地計画　社会主義国家の対極たる資本主義自由主義国アメリカにおいては，この種の問題は特に自動車交通の発達という特異な事情を反映する解決として促進された．高速度の街路交通の発展は，都市の急激な発展とともに人びとを道路から追い出し，都市生活をますます歪められた形に追いつめた．この窮状はプレイグラウンド運動にみられる厚生運動の展開をもたらしたが，この過程を通じて提案された各種の厚生施設の都市における配置



第14図　160エーカーの近隣住区の単位区分計画（R. ホイットマン）

の問題に関連して，次第に近隣地区の組織的構成に関する見解をそだてあげた．いっぽう，住宅地を休養・養育の場所として安穏で静かなところとするため，頻繁な自動車交通をもつ幹線から隔離された地区を構成するという要求は，袋路・公園道路・小公園などをもつ多くの近隣住区の設計を生み出した（第14, 15, 16, 17図）．

わが国の住区研究　わが国においては，既述のような現実的制約の下に，都市構成の基本単位である住区の計画は，まだ現実の課題となるにいたらなかった．しかし諸外国，とくにアメリカにおける近隣住区の計画に刺激され，住居地区の構成に関する理論的研究として，この種の問題は早くから専門家の注目をひいている．

純然たる机上問題として都市を構成する単位地区はどうなるか――という種類の研究の一例を第6回都市問題会議における山岡敬介氏の研究「都市構成の単位区画」[*)]についてみると，提案者は内務省街路計画標準にもとづき住宅地区

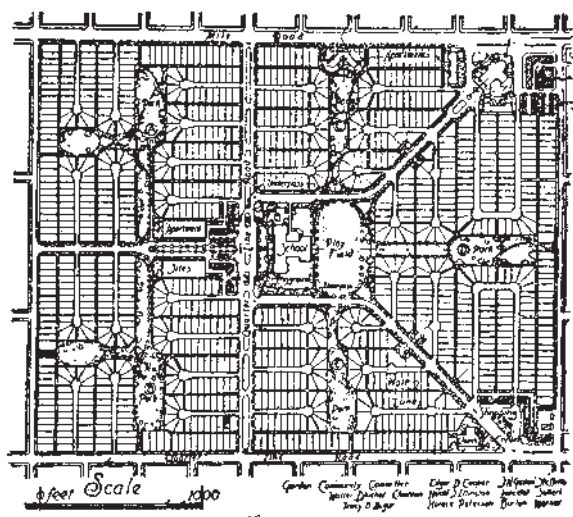
＊）山岡敬介「都市構成の単位区画」，『都市計画の基本問題 下』（1938. 9）

の単位を幹線道路に囲まれる 500 m 角の大きさと仮定し，これを交通（電車・バス）上から，また公園・小学校・公設市場・防空避難所・水道幹線・消火栓などの公共施設の配置の点から吟味し，500 m 角の中心に小学校・公園・市場などを配置する案をたて，人口密度の大小によりその大きさは若干増減するとしても，大体それでよいと結論している．

建築学会の懸賞　昭和 14（1939）年に建築学会は懸賞競技において，殷振産業労務者の銃後生活刷新を目標に「労務者向集団住宅地計画」をとりあげた．その規定は独身者約 700 人をふくむ人口 3,000 人の居住者を収容する木造住宅群および付属共同施設の設計を求め，これをいれるため 1,000 m を一辺とする地区をとり，中心に 200 m 角の小学校・郵便局・公園などを主体とする中核を設け，周囲を 400×600 m の 4 地区に分かち，その 1 地区にそれぞれ浴場・託児所・日常品市場・児童公園などの中心施設をもつこととしている．この懸賞の応募案には，住宅は数戸をもって 1 団とし，井戸・物干場を共同とし，あるいは町会集会場をもうけるなどの案がみられた．*)

地区中心としての小学校　上述の 2 例の考え方はいずれも小学校その他の公共施設を中心とした地区構成（ないしはより分化した段階的地区構成）をもつ点においてまったく同じ観点にたつもので，ただ後者においては単位地区の大

第 15 図　近隣住区案

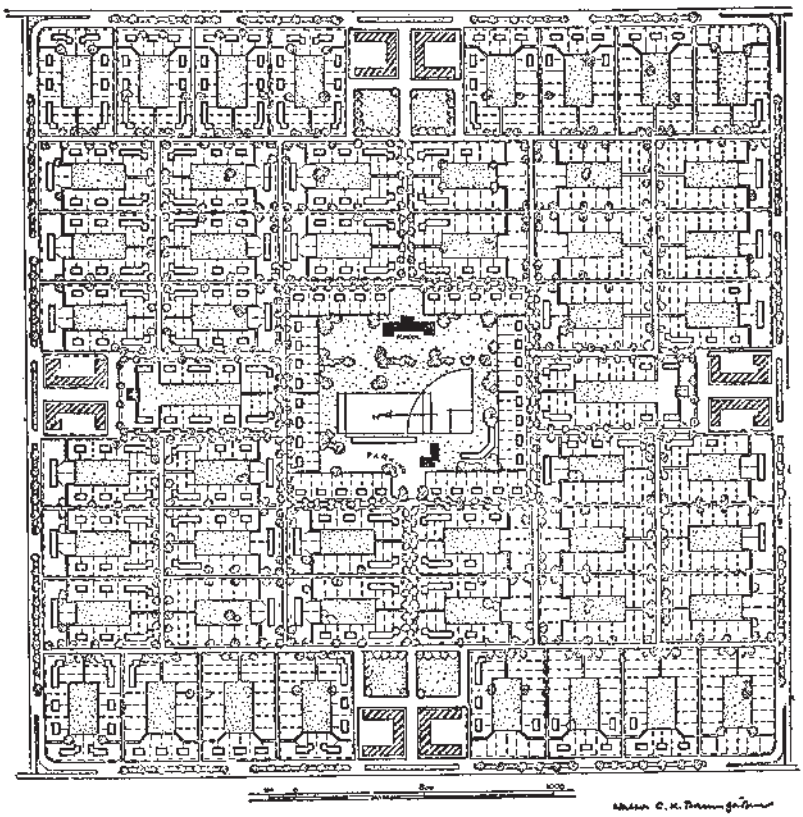


*）建築雑誌　1939 年 12 月号．

きさが増大している．この増大については吉村辰夫氏[*]もその「近隣単位」の考察において，鉄道・商店街などから住居の静けさのために離すべき距離，買物・通勤における交通機関利用の上からみた便否，小学校への通学などの点から，100 ha をもって適当とすべしと述べている．

社会学的研究　このような近隣住区の研究は，集団的住居地の設計が新しい社会集団をつくるという意味でとりあげられるべきこと，そこでは第1に社会的安寧感ついで生活の利便，社交性および快適性が必要であるとする住居地区

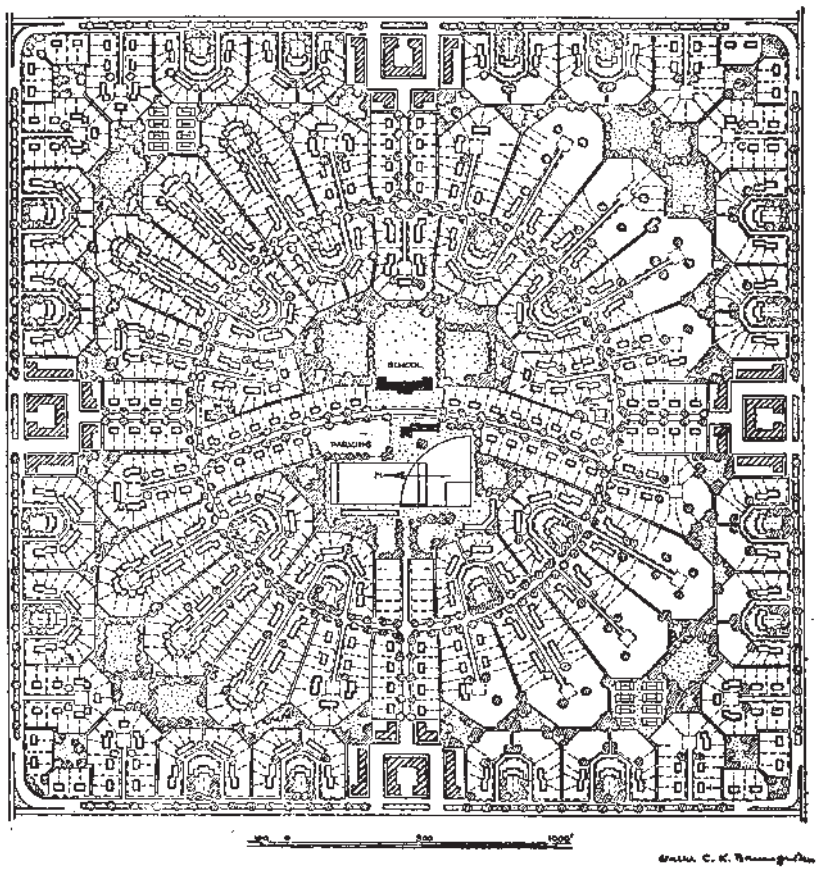
第16図　近隣住区案（矩形と十字路のパターン）
Thomas Adams; "The Design of Residental Areas" (1934), 210, 211 ページより



*）吉村辰夫「近隣単位」，都市公論（1940.5）

の社会的性格に関する社会学者の研究にも啓発された．「近隣住区」の社会学的意義の考察は主としてアメリカ的大都市の研究の刺激の下に進められたが，ここでは地域社会の確立，郷土性の確保が必要であることが論じられた．人間は自己の姿を映じ得る周囲・社会がほしい．それには狭さと定着とが必要である．こういう形でつくられる小社会はわが家の延長でもある．居住地はかかる意味の小社会をつくり得るごとく建設されてはじめて郷土性を保ち得，居住者にとって真の「郷土」となり得る．*)

第17図　近隣住区案（袋路と輪のパターン）



*)　奥井復太郎「現代大都市論」
〃　「住宅論の社会的性格」，建築と社会（1940.6）

社会学者はこのような研究の結果としてやはり小学校を中心とする住区がもっとも適当なものであるという．それは小学校が閉鎖された郷土性をもつ小社会の中心たるにふさわしく，また施設としての小学校は単に小国民の教育に役立つばかりでなく，集会・サービス・休養・運動その他多くの目的のために地区中心の公共施設として利用され得る利点をあわせもつからである．

地区の段階構成　いっぽう，日中戦争開始以来の国土防衛と行政機構の強化に呼応して，地域の防護細胞として，また国民組織体の最下部機構としてとりあげられた地縁的結合細胞たる「隣組（となりぐみ）」が，消費統制による日用品の配給・切符制そのほか現実生活の処理と結合してその意義を漸次重要化してくるにつれ，地区構成がこのような「隣組」的集団を単位細胞としてとるべきだということも漸次主張されるにいたった．その結果，最下部の共同施設を隣組単位に付属させ，だんだんと上級地域集団に上級公共施設を付加してゆき，地域全体を構成してゆく「段階型」居住地区構成の理論が重きをなしてきた．建築学会の住宅問題委員会による「庶民住宅の技術的研究」における「近隣住区の構成」[*]は，このような研究のゆきつくところをしめすものとして注目される．この段階構成を簡単にしめすと次の通りである．

学会住宅問題委員会の案

（1）　隣組住区　（10～20戸，0.5～1.0 ha）

隣組広場（学齢以下の幼児遊園をかねる）．防空壕・井戸・プール・砂場（非常時の消火と待避用）

（2）　警防住区　（60～80戸，3～6 ha）

隣組住区に広場なき場合は幼児公園，おこなうとすれば「共同給食施設」．周囲を消防車の入り得る（6 m 以上の）道路でとりまく．

（3）　購売住区　（400～500戸，12～25 ha）

市場（または配給所）・小公園・保育所・浴場・町会事務所・巡査派出所など．

（4）　近隣住区（1,600～2,000戸，60～100 ha）

小学校（地下室に待避所―講堂または雨天体操場は公会堂をかねる），図書館・

*）　建築学会住宅問題委員会報告「庶民住宅の技術的研究」，建築雑誌（1941.1）

区会事務所・警防団事務所・生活指導所．近隣公園．医院（診療所）・郵便局．

満州国の例　満州国で，都市構成の基本単位としてとられるべき集団住区制について，日系（日本人の）住宅に関ししめされた案もまったく同様の考え方に立脚している．ただここでは最下位単位を上述の（2）に相当する単位住区とし，以下隣保住区，集団住区として，次のような設計基準が一例としてしめされている[*]．

（1）　単位住区（50戸，250人，22,500 m²）

幼児公園．

（2）　隣保住区（300戸，1,500人，157,500 m²）

住宅管理所（事務・中央暖房・塵芥処理）・幼稚園・児童公園・派出所．

（3）　集団住区（1,200戸，6,000人，810,000 m²；900 m角）

国民学校・区公署・住区公館・保健院・消費組合・商店街・住区公園．

住居地としての完成　以上のような近隣住区あるいは集団住区制は，すべて都市における一般勤労者・庶民を対象（学会案の母体をなした1939年の競技の出題ではより限定して労務者となっているが）としているのであって，住居地以外において何らかの形で職場をもつ一群の人びとの定住形態をもっとも理想的と考えられた単位として机上的に立案構成したものだといい得る．それは呈示された解決案の形からいえば，ソ連の建築家たちによってしめされた共同住家（ドーマ・コムムヌイ）の段階型解決における都市構成の1中間単位とほとんど一致する．

生活の二つの部分　しかしわれわれはここに「住居」のためのかかる体系的組織をもつ施設を実現し得たとしても，われわれの「生活」が直ちに同様に望ましい体系に組織されたとはいい切り得ないことをかえりみる必要がある．すなわちわれわれは，これらの解決にしめされた「住居における生活」のほかに，さらに生活のいま一つの重要な半分をなしている職場における生活，およびこれら両者をつなぐもろもろの派生的生活過程をもっており，これらは相互に構造的な連関をもっているのである．われわれがこの国土を，そのためにもっと

*）秀島乾「満州に於ける都市計画と集団住区制」，住宅（1941.1）

も望ましい空間たらしめようとしている――民族発展の現実的過程だというべき――「生活」は，職場と住処にはっきりと区分され，それぞれ別個に考えられていいものではない．

生活施設の全体的構成の問題　住居を生活全般，なかんずく生産労働の生活から分離し，それのみで一つの完成された組織につくりあげようとすることは，当初から空想的あるいは不完全な狭い視野の上にたって出発することを意味している．

それは企業が職場を自己の意思でつくり，住居は彼らがそこで得てくる収入の一部をもって別個の意思の下につくられるという社会を不変の前提とし，「職場は職場・住居は住居」と分離してしか考え得なかった都市計画における（現在をもふくめての）過去の時代に対応するものである．それが空想的というのは上に述べたような前提にたつ以上，このような机上案は到底実現し得べくもない夢であることをさす．それが不完全であるというのは，もしわれわれがいま考えているような理想を実現し得るような条件を得たとするならば，われわれは問題をもっと根本から総合的に，すなわち職場と住居を通じ全生活の体系的再構成，それを基礎とする全生活施設の体系的構成という形に展開せしめ得るときであり，またそうしなければならないという意味においてである．

われわれは以上において住居地区の構成にたいする既往の研究をきわめてかいつまんで一瞥してきた．しかし，住居の問題は上述の意味で第1に職場における生活，第2に職場と住居とを総合した生活基地としての都市全体，あるいは国土全体の構成問題につらなっている．

これらの諸問題が次いでわれわれの考察の対象とならざるを得ない．

――1942. 7. 7 浄書――

第９章　国土構成の一試論

本章は，第二次世界戦争中および戦争直後にひろくとなえられていた「都市分散論」にたいして，それを批判する立場から書かれた日本の国土における都市の配置構成にかんする試案的な提案である．前章にひきつづいて「国土と都市の段階構成」という標題でまとめられている1篇であるが，若干きりちぢめた．

過度の人口と産業の集中による巨大都市はいろいろな点で批判されるが，フィジカルな面からは人工環境が連たんして巨大化するという点であるとし，これにたいして田園の中に小居住地を分散的に配置することが考えられるが，それはわが国の国土と人口の条件からは不可能である．このような見方で戦時中『皇国都市の建設』などの著書で展開された石川栄耀氏の都市構成理論を批判し，職場と住居を緊密にむすんだ，文化的な生活をささえるための一定の人口規模をもつ居住地単位・都市構成単位として人口10万～20万程度の中都市に注目し，これを国土構成の基本的単位とすることを提案しているのである．それによると，農村地域は，その全域の居住者が日常的に利用しうる文化・経済の中心地としてこの中都市をうまく配置することで構成し，いっぽう，地方や国の中心となる巨大都市圏地域は，この単能的中都市ないしその数個の連合体が，合理的な機能分担と連絡組織をもって集中的に配置されている地域としてつくられる．いずれの場合にもこの都市単位は，最低の場合緑地帯程度であるとしても田園地帯で区切られ，連たん的巨大都市の形成は阻止される．また，「顔見知り」とまではゆかなくても，最高20万程度で充実安定した地域社会が形成される．これは，「盛り場」の研究から出発して商業・経済・文化の中心としての機能を前面におしだし，年・季・月・週・日といった生活のリズムと結びつける都市圏域の段階構成を提案した石川氏の理論が，市民生活を無視して都市化と地方の荒廃を進める日本の開発にたいして一定の批判的意義をもっていたことを評価し，これをうけつぎつつ，より高密度の国土構成が要求される日本の事情に適合するよう修正を加えた試論だといえる．この主張は，一定の人口規模が養いうる経済的・文化的中心への人びとの日常的ないしもう少し長いリズムをもった利用・帰属という条件を原則として組みたてているが，今一つの重要な都市成立の条件である産業立地や交通組織の条件をいちおう捨象している．これはそれらの条件を無視したのではない．むしろ現実は，自然成長的なそれらの条件のみによって都市の成長が支配され，過度の集中と巨大化，混乱と過密が生じているのにたいして，人間生活の福祉の回復を条件として，その再編成の目標をこの条件でチェックしてみるということに重点をおいたからである．そのうえで，そこに探求されたモデルによる，細長い日本列島にたいする大都市を頂点とした地方圏の設定の試案をいちおう描いてみている．

ところで，この国土構成の試案を，その後の20余年をへた国土開発の現況とくらべてみると，大きなくいちがいがみられる．それは，当然のことなのであるが，この構想をくみたてている，たとえば交通技術だとか農業問題だとかいったいくつかの重要な条件が，まったくちがった方向に発展していることである．このことについては，ここに

しめされた国土構成のパターンの骨格を根本からゆるがすものではないかという疑問もあるので，ふれないでおくことはできない．

たとえば，圏域構成の大きさをきめる基礎的な条件である交通手段については，この構想では下位の部落（C_1），村落（C_2）の段階では徒歩および自転車しかみていない．そのため部落圏の半径は最大4kmにしかなっていない．自動二輪車，あるいは四輪車を前提とすると，もっと大規模な圏域構成をもちうるようになり，C_1, C_2の段階の構成は大きくことなってくる．また，航空機や超特急鉄道など速度の早い交通機関が入ってくることによって，今では日本全土を首都から1日圏ないし日帰り圏に入れることも充分可能と見通されるようになりつつあるので，提案されている12の地方圏中心都市の配置といったことよりも，もっと中心の集中・集約化したパターンが考えられうるということにもなる．さらに，人びとの生活が，段階的な中心施設（ひろば）に結節点をつくりつつ，つみかさねられてピラミッド構成をつくるといった形でなく，もっと全国土的な流動性をましてくるとすると，居住地・都市施設の展開は，交通軸にそっておこなわれ，国土の構成は結節点パターンよりネット・パターンをとるべきだということになるかもしれない．さらに農業については，都市環境を田園に結合するという観点と，食料自給体制の強化を前提として工農の結合，少なくとも生鮮食料品の大都市周辺での生産といった考え方をうち出していたが，これも現実は特産地形成や高速輸送体系の発展，あるいは国際貿易への依存といったことで，このような考え方を否定するうごきがすすんでいる．

こういったところから，現在の現実がそのままみとめられてよいというわけではないが，この試案は現実とはかけはなれ，根本的に修正されるべき点をもっている．それらの点については，現在研究をすすめつつあるが，本章では，若干の挿図で新しい考えの一部をしめして補足しておくだけで，原著をそのまま収録することとした．

今一つ，この収録に際しては大部分省略したが，産業・人口の増加に対応してこのような圏域構成をもつ都市のネットワークの中で，どこに将来の増加人口をうえつけてゆくかという問題がある．これについては，人口10～20万の単位都市を，農業地域とバランスさせつつ，産業建設と並行して年次計画により必要な個数だけ新設してゆくという姿を原著では考えている．これは，全経済が国家計画によってすすめられるような社会体制でないと不可能であり，そのような条件が整備されてもかなり困難な問題であることを指摘しておかねばなるまい．

いずれにしても，この試案は，具体的にはかなり時代おくれのものである．しかしそこに主張されているいくつかの問題は，今後の国土構成の構想計画においても考慮されるべき条件といえるので，あえてこれを収録しておくこととした．（原題「新しき国土建設」，新建築1946年6月）

1. 平面的連続的都市環境の制御

前章においていわゆる過大都市論を吟味し，その欠陥を明らかにした．しかしこのことは現実におこりつつある京浜・京阪神などにみられる大都市周辺における連続的都市化という事実を妥当なものとして承認しようというのではない．いな，それは都市と農村のへだたり，都市住民の生活・文化・経済，そのほかあらゆる面において，国民生活そのものを窒息させつつある事実を指摘し，その確実な改革のみちを早急に見出さねばならない．

事実を明らかにするため，そも現実に何が起こりつつあるかをのべてみよう．

わが国の主要都市のうちで，京浜・阪神地区，名古屋・北九州など4個の地域において（京浜1,000万，阪神500万というがごとき），わが国総人口（7,000万）に比しいちじるしく均衡を失したと思われる巨大な人口が集中しつつあるという事実，それによってこれら地域の全体が連続的に市街化し，周辺群小市町村の行政区画をはるかにとびこえ，これをうずめつくして従来の都市の概念を超えた巨大な連続的都市環境を成立させ，産業上・国防上きわめて不利な状態をかもしつつあるというのが，いわゆる過大都市の非難であった．

しかしすでにみたごとく，巨大都市の成立を促す条件は必然的のものであり，それは必ずしもすべて排撃されるべきものでない．集中はまた進歩と生産力の向上を意味する側面をもつ．またこの集中を否定するには，農村における人口包容量がすでに飽和点に近い以上，根本条件にたちかえって，わが国の人口増加そのものを否定するのでなければ，既存の大都市か，そうでないいずれかの都市，あるいは新都市への人口集中をもってこれにかえなければならない．これは部分的にはおこなわれ得ても，限られたわが国土の中で巨大都市の成長をふせぎうるほど田園的環境に富む新都市をつくることは事実上不可能である．

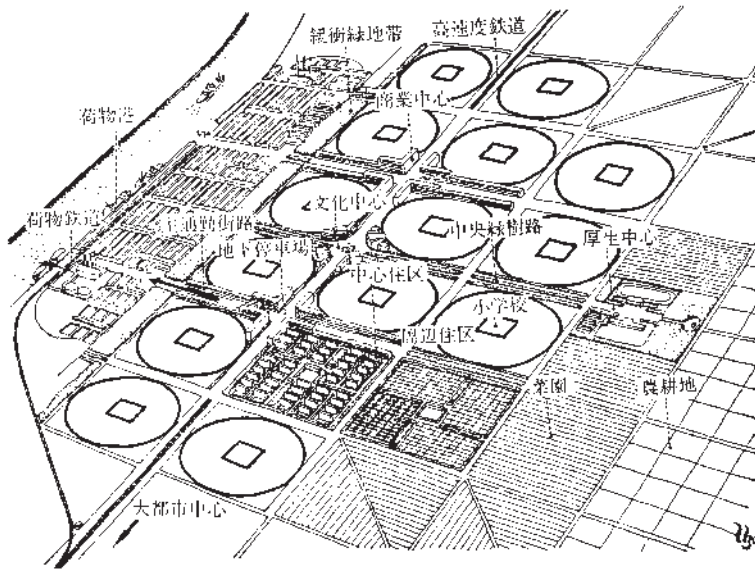
ではわれわれは，この巨大都市環境の発展の中で何を排撃すべきなのであろうか．

それは，

第1「連続的」都市環境の成立

第2 巨大な生活圏における交錯生活（混乱交通）

の2項に要約できると思う．

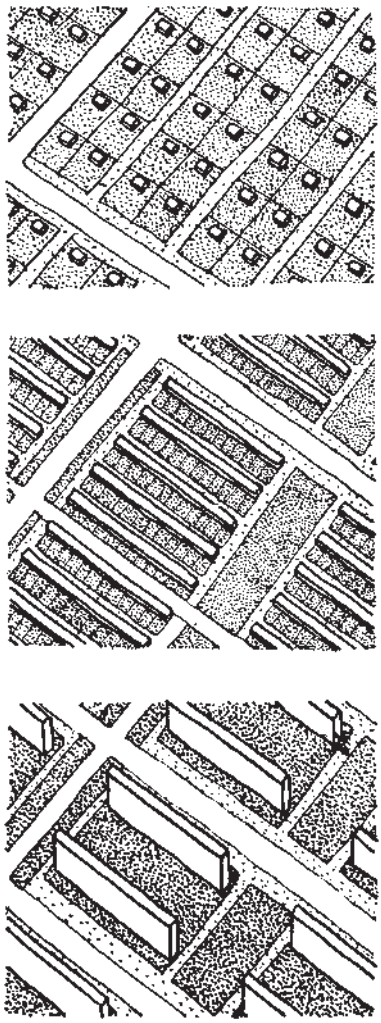


第57図　単位単能工業都市の模型図（16住区をもって構成される場合）

市街的・密住的生活環境は市民の生活にたいし好ましくない．とくにわが国の都市に見られる低層・高密度の居住形態は自然との容易なる接近をとりもどすことによって改善してゆかなければならない．その方法は二つある．一つはわれわれの生活を田園の中にもってゆくことであり（第58図A），他は市街的拡がりを適度に止めて，個々の市街的拡がりを分割してその間へ田園を挿入することである．第1の「ゆっくりとした」方法は，都市面積のいたずらな拡大を惹起し，とうていのぞみ得べくもない．ただ無統制な小規模低層住宅の混乱配置を整理し，合理的形式のものに改めることによって生じた余裕をもって田園的要素をヨリ多く導入すること（第58図B, C）は必要である．しかしこの方法には当然限度がある．とすれば第2の方法，すなわちこれら市街地を一定の限度をもって田園的環境により分割し，連続的市街地構成をさけることが考えられねばならない．

第2の目標については，あらゆる過大都市論がひとしく攻撃するところで，この非難自体に問題はない．ただこれが大都市に付きものの条件ないし性質のように非難されるところに問題がある．

石川氏は大都市の経済上の不利な点として機能疎隔・交通混雑をあげている．



第58図　居住環境の田園化の諸方式

居住環境を田園化するもっとも簡明な方法は，住宅を田園の中に持ってゆくことである．しかし，それでは都市生活は営めない．都市生活を営みつつこれと同じ状態を生み出すためには，個々の住戸を広い緑地でとりかこむこと，すなわちAの方式である．しかしこの方法は第1に個々の住戸にきわめて広いニワ，したがって敷地を必要とし，その拡大された敷地に応ずる道路面積，交通施設などの負担もバカにできない．結局過去においては贅沢仕放題の少数の富豪の居住地にこのような方式が実行されただけで，わが国の当面する地理的・経済的条件の下には将来も国民住居としてはこれを実現することが不可能である．そこでこれに代る方法として，田園的環境を個々の住戸にあたえず，これを集約した一団の住戸にたいしてあたえる方法が考えられる．かくすることによって，せまい土地に高い居住密度をもって，しかも一団の住居が充分の広さの緑地をもってかこまれ，生活を田園的環境におき得るであろう．国民住居における居住環境の田園化の方式はこれ以外にはない．すなわちBおよびCの方式である．

大都市を中心とする巨大都市環境の成立は，その各部をすべて同一生活圏構成体としてしまうことを前提としており，そのため，各部相互間の交通が激化され，都市の各部，とくに中心部においてはその機能に直接必要のない通過交通などが累加され，それが不必要な混雑を生み出し，また不必要な機能疎隔を生ぜしめる．しかしこれは大都市の「大」なることによる欠陥ではなくて，各地区要素の自然発生的・非合理的な配置構成にもとづくものである．この非合理

的配置をいかに是正するかが問題で，ただ都市分散をすすめることはかえって距離的拡大，――疎隔と交通難をさらに激化するであろう．したがって小都市分散はなんらこの欠陥を解決する方法とはならない．反対に，もし巨大都市の構成要素にして互いにもっとも緊密な関係にあるべき要素を緊密に結合配置し，このようにしてできた単位的地域――それはその構成要素の性格にしたがい，都市全体の営みにたいして地区的な分業的＝単能的営みをなすものとなるであろう――を都市全体の複能的機能の構成にもっとも緊密に参加し得るよう配置する場合は，交錯交通は全然とまではゆかないまでも最低限度にまで整理され，しかも小都市分散においては企図し得ないような各要素の高度の能率的連絡交通を確保し得るであろう．

このような観点から，筆者は大都市処理の方式として，1. 生活基地の段階構成，2. 単能的単位生活基地の連合としての大都市，3. 緑地配分――の3点を主張したい．

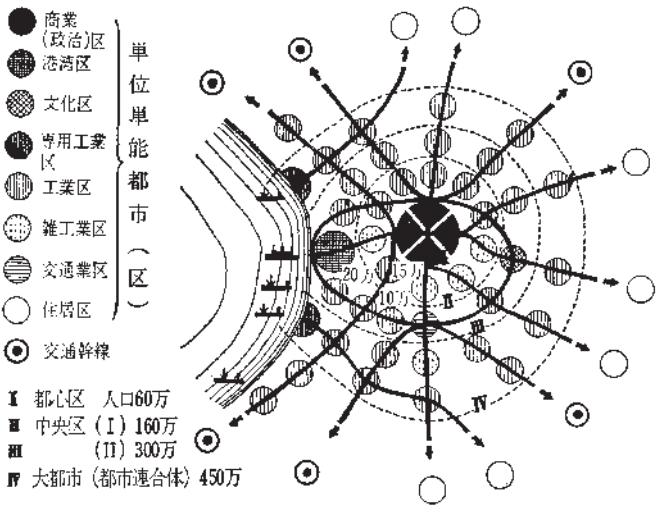
（1） 生産基地の段階構成

都市住民の生活中（交渉頻度および利用能率上）もっとも緊密な関係にあるものを彼らの居住地のもっとも近い場所に配置し，そうでないものをヨリ遠くに配置するという考え方をもっとも合理的に総合的に解決する方法は，生活基地構成を段階的に単位集団のピラミッド型構成としてゆくことである．

これについては前（著作集1，第26章）に住宅の集団構成において明らかにしたが，都市的規模の段階ではその最低位（最下部構成）単位として小学校を中心とする日常生活施設の集団地区である小学校住区をとってよい．この地区内で，居住者の日常的消費生活はいちおう完結する．

しかし，居住者が彼の「消費」生活を維持してゆくために，生産（社会的労働）の生活を持たねばならぬ．そこへの日常の通勤はもっとも頻度多くかつ緊要度の高い交通である．しかし職場施設は，一小学校住区の居住者のみを対象とするのでは小に過ぎる．通常一単位の職場（工業地域，商業事務地域など）にたいしては数個の住区が従属せしめられねばならない．この結果，住区にたいする上位集団地区として職能的地区が考えられてくる．その単位規模を規定するものは職場（産業）施設集団の規模である．

それは業種によってことなるが，工業においては少なくも一中心工場，一系



第59図　単能都市の連合による大都市中心部の構成モデル

統工場（コンビナート）とこれに付属する傘下協力工場，あるいは一群の小工場集団など，相当まとまった生産施設単位であることが必要であるから，その従業員総数は数千人から，ときに数万人におよぶ場合も少なくないであろう．したがって，小学校住区の所属人口が5,000～10,000人とすると，少なくも数区，ときに十数区をもって工業地区が構成されることになる．

商業的職場の場合はその利用人口すなわち都市の規模によってかわってくるが，百万～数百万の大都市の都心地区としては，やはり十数区以上のものをもって構成されることになるであろう．

この職能的単位地区は，その職能を営むための一次的連関施設を包含するだけだから，単能的なものと考えてよい．ただそれが数ないし数十住区によって構成されて相当の大きさをもつ場合，都心商業区への連絡条件によっては，その地区内に独自の商業中心――副都心が必要とされる場合が生じよう．

（2）　単能的単位生活基地の連合構成としての大都市

上記の単位地区はそれぞれ特殊な職能をもった人口数万～十数万の中小都市的規模の地区を構成することになるが，大都市はこれらの単位地区の結合の上に成立する上位集団であるということができる．

しかし大都市はこうした単位地区の単なる集合ではない．大都市はその巨大なる人口集団を背景として産業・経済・文化機能（管理中枢的な機能）の集中

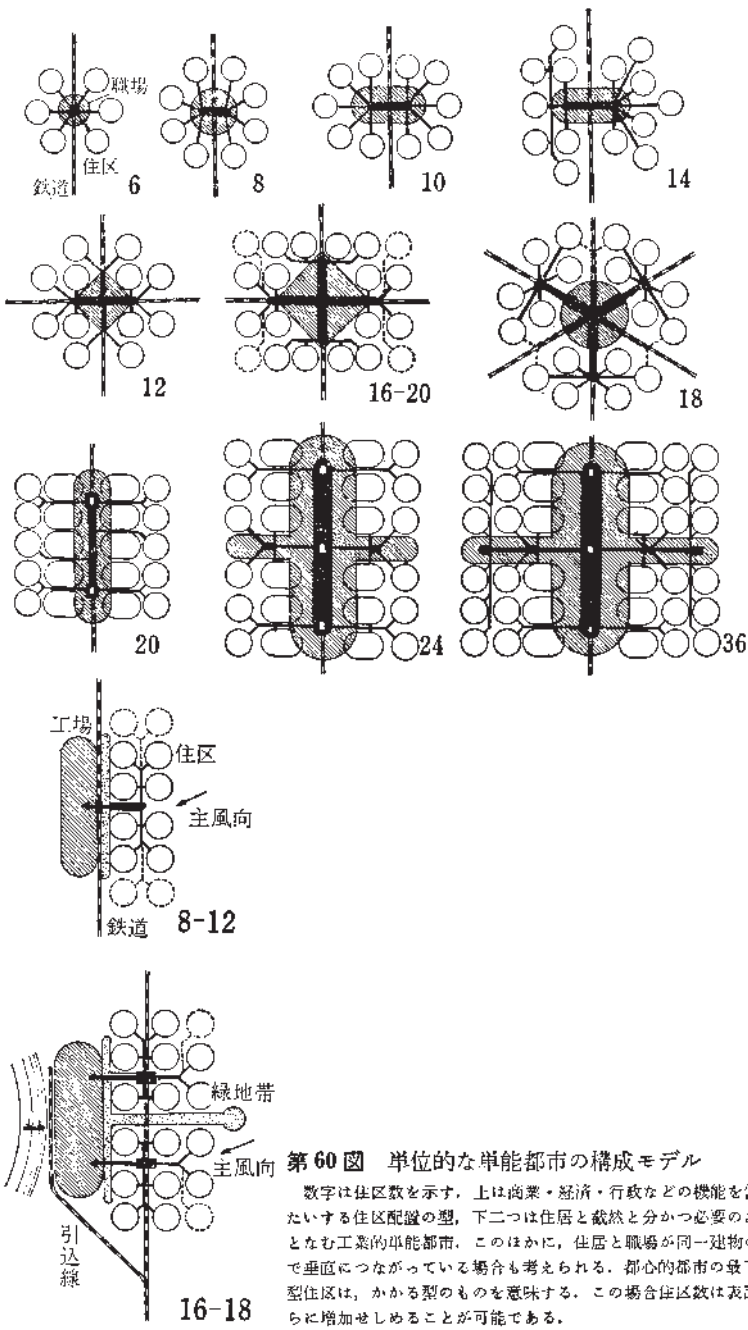
的な高度の発達をもつことがその特質であり，またその任務でもある．そしてまたこれに依拠しようとあらゆる商業・工業などの企業や人口が集中してくる．したがってこの単位地区の中には全体として大都市の特質をなす諸機能——都心商業，高級慰楽地域，商業・金融・行政の中心，総合的工業地帯，そのほかその都市の特殊な機能を担当する地域など——を持たねばならない．これらの機能はむろんそれぞれその性格にしたがって分類され集約されて，単能的地区として構成されてよい．しかしこれに付随する従業者の居住地をもふくめた全体の規模が単位生活基地としての好ましい範囲を越えない程度ならば，これらの機能が若干複合した単位地区となることも許さるべきであり，しかもそのほうが有利である．とりわけ高度の都心商業や経済金融業務の中心あるいは行政の中心など管理中枢機能を結合した都心単位地区の構成は，特別に考慮される必要がある．そして高度に集約化されたこの都心地区の存在が「大都市」のもっとも大きな特徴となるであろう．

ところでここにいう単位地区の適当なる大きさとはどのようなものであろうか．

そのもっとも重要な規定条件は，通勤交通であると考えられる．それは短い時間（いわゆるラッシュアワー）に集中される極度に偏頗な大量交通であるから，交通機関の利用は不経済である．したがってなるべく徒歩交通としたい．とすれば片道最大限 1.5 km 程度として職場地域にたいする住区の配置は奥行が 2 住区程度であるのが最大限となる．とすればその大きさは職場地域の総延長，あるいは住区の片側配置，両側配置などの形式によって若干ちがうが，最低 6 住区程度から最大 20 区程度となる（第 60 図参照）．

ただ上記の都心地区は，大都市の場合はかなり大きくなりそうである．この場合，大都市の都心地区を職能的にさらに（たとえば中央行政地区，商業業務地区，盛り場地区などと）細分する方法と，その従業員人口の一部を後にしめす総合コンビナート地域にたいする労働者の配置と同様に遠距離高速度交通機関によって職場から隔離された住居地区に配置する方法と，二つの方法が考えられる．そのいずれをとるかは一概にいえない．したがってさまざまな解決が可能である．

既存の巨大都市地域はこのほかにいずれも群小協力工業を従属せしめた大規



第60図　単位的な単能都市の構成モデル

数字は住区数を示す．上は商業・経済・行政などの機能を営む都心的都市にたいする住区配置の型，下二つは住居と截然と分かつ必要のある工業などをいとなむ工業的単能都市．このほかに，住居と職場が同一建物の上と下という形で垂直につながっている場合も考えられる．都心的都市の最下例にしめす小判型住区は，かかる型のものを意味する．この場合住区数は表記のものよりもさらに増加せしめることが可能である．

模かつ高度に発展した工業を持っている．このような巨大総合工業にたいし充分なる地域を確保することがまた大都市形成の必須条件の一つである．巨大都市の成長はこうして総合工業地域の発展を可能としたのであり，形は変わってもそうしたものが将来要求されてくることが考えられる．このような総合工業地域の従業員人口を養う居住地は，その工業の規模により必ずしも既出の単能的単位地区の範囲に入れ得るとは考えられない．可能なかぎり単位地区的規模に分解並置することは必要であるが，それができない場合は，この種の地域のみにたいして純職場＝生産施設地域と居住地域とを地域的に分離し，高速度大量輸送機関によって両者を連結して配置するという解決も必要となってこよう．このような職・住分離の地区配置もまた大都市構成の特異な一面となってくる．

以上の検討によって，大都市とは，都心区，純工業（総合工業）区，そして純住居区のような特徴ある地区をその構成要素にもつ単能的単位区の連合した一つの総合的生活基地集団ということができよう．しかしてこれを構成する各単能的単位地区が，おのおのその特異な分業に対応して高速度交通機関や重荷物輸送機関によって結ばれることとなれば，なんらの混乱なく最少最短の交通努力をもって最高能率の大都市的機能が充足されることとなるのである．

（3）　緑地配分

大都市を構成する単能的単位区の確立とそれを結ぶ完備した交通機関によって大都市機能は確保されるが，このような単位区連合体としての巨大都市が古い大都市と形のうえでことなる今一つの重要な条件は，その構成要素たる単位区がそれぞれ緑地でめぐらされ，どの居住地からも田園的環境に容易に接し得るということである．これは従来の，都市環境改善の方法としてしばしばとりあげられてきた緑地帯の設置とよく似ているが，単にそれを基盤目状あるいは放射線状に市街地に入れるという形と異なって，自足的な単位区を限界づける要素となっていることである．

緑地の具体的な形は，都心単位区やそれをかこむ単位区のあいだでは，相互の緊密な立地と交通のため最小限度の幅でいわば緑樹帯的なものとなるであろうが，中心から離れるにしたがって交通におよぼす影響度が減じるから，相当の幅広い生産的緑地帯を入れることになる．

都市が自己の所要する食糧・農産物をその地域内よりの生産でまかなうとい

う考え方が将来どの程度に合理的な考え方となりつづけるかは疑問であるが，生鮮蔬菜程度をその近傍郊外地域よりまかない得るようにするということが，この種の「自給問題」についてのいちおうの目安といい得るだろう．この場合単能的単位区を相互に隔離する緑地は交通条件の許すかぎり大きくすることが望ましいが，その結果その生産緑地の市街地にたいする面積比は，かりに1人にたいする蔬菜供給のための必要面積を20坪 (60 m²)，市街地人口密度を100人/ha——つまり1人当り100 m²——とすると，市街地との比率は10対6となり，全市域面積の37.5%が生産緑地面積ということになる．

2. 都市（人口集団）の段階構成

前節でのべた巨大都市の構成原則は，従来いわれてきたさまざまの理想都市形態論とくらべて，あまりにも現実肯定的であるように見える．そこで従来の理想都市論との関係を明らかにしておくため，なお二，三の補足的検討をしておく．

（1） 都市単能化縮小論にたいして

戦争中に防空の見地から大都市の分散が各方面でとなえられ，直接不必要な人口——たとえば恩給取りや妾さんなど——の疎開だけでは間に合わず，人口集中の原動力である工場・学校・官庁などの地方分散が叫ばれた．東京などではその機能を行政中心だけにする，あるいは工業施設移転はむつかしいから官庁・学校などを移設して工業都市とする，というような大都市の分解・縮小化が提唱されていた．

巨大都市が否定すべきものであるならば，この主張はいちおうもっともである．

しかし，この主張にあやまりがないであろうか．

巨大都市に集中している機能を分解して，単能化された部分機能に対応する単能的小都市をつくるとすれば，まず第1に分解されてしまったおのおのの単能的機能は果たして独立して存在し得るものかどうか．第2にこのような単能的小都市が「巨大都市を分解した」と表現し得る程度に，狭いわが国土のうえに，また能率的条件の低下を償い得るほどの積極的有利性をもって，分散的に配置し得るかどうか．

なるほど東京のもつ行政中心的機能は，日本が存在する以上，大東京でなくとも存在し得る．だからそれを箱根の山奥にもってゆくことも可能である．しかしそうすれば，将来は若干事情に変化があるとしても，金融・商業・工業など商社の移動が必然的に生じて，官庁だけの移動ではすまない．さらにまたその従業員，そしてそれへの従属的な商業，サービス業そのほかさまざまの副次的従属人口も移動する．

また，単能的都市の分散疎開は，都心商業――都心地区をもまとまった形で単能的都市ならしめる基盤をうしなわせるし，各単能都市へ分解付属させるとすれば，日本的中心を形成するような「都心」の消滅をきたす．

このように都市を分散して，急傾斜地山林をもふくめたわが全国土の中にばらまくとしても，その相互距離は大したものとならず，ただ分散による機能疎隔の否定的効果のみ大きくひびいてきて，田園との近接というような心理的効果以外にはなんら積極的な利益をもたらさないであろう．1,000万人の人口をもつ巨大都市を平均10万人の人口をもつ中小都市に分かつとすれば100個の都市を必要とする．これをたとえば関東地方全域3,200 km² にばらまくとすれば，1個の都市に対応する面積は32 km² であり，その相互の中心距離はわずか6 km 弱にすぎない．人口10万の都市の面積を10 km² とすれば，都市間の空隙の幅はわずか2.5 km 程度にしかならない．

このように単能化による分解と分散は，けっきょく一つの夢想である．これを実現しようとするならばけっきょく筆者の主張しているような大都市の中小都市的規模をもつ単能区への分解と，その緊密な連合構成という，巨大都市の再編成以外にはあり得ないことが明らかにされよう．

さらに次のことが考えられる．

現状はともかく，将来は世界経済の一環をになうものとして，わが国は東アジアの工業中心を形成するであろう．この場合，少なくともわが国土内に数個の総合工業基地を必要とするであろう．それを存立させるためには，当然，大人口集団の居住地域を必要とする．このような大人口集団の居住地――大都市は，当然複能化されざるを得ない．それによって大人口集団の居住地がヨリ快適に，かつヨリ効率高く営まれ得るからである．われわれは大都市というものをかく考え，総合的な複能的地域の存在について積極的な意義を見出したい．

（2） 都市疎散論にたいして

巨大都市の人口を思い切り減らして全国土に人口をばらまくべしという「人口疎散論」もまた戦中・戦後を通じて広く人口にカイシャされた通俗理論の一つである．

この理論には二つの型が見出される．

第1はわが国は農業国にならねばならぬという敗戦後の一時的風潮にのる農村人口増強論である．しかしわが国の農業は過度の集約的零細経営となっていて，たとえ耕地拡張の余地がなお3割存在するとしても，労働の生産性向上を企図する場合，農村の人口収容余力はきわめて少ないから，この議論はいちじるしく反動的である．

第2の型は必ずしも農業人口になれとはいわないが，農村に還れという．農村に時計工業，そのほかさまざまの副業的中小工業を興して，これによって彼らの生計をたてしむべしと主張する．しかしこれも大きな錯覚にたった主張である．そこには非能率的な中小工業に従事させつつ人口の大部を半封建的農村

第1表　石川氏による都市の生活圏的配置

(1) 中心機能	(2) 交通許容時間	(3) 交通機関	(4) 距離 (km)	(5) 修正距離 (km)	(6) 政治機能	(7) 中心機能	(8) 人口限界(仮定)
5. 日常中心	30分	徒　歩	2	2	村中心都市	5	
4. 〃		自転車	10	5	郷中心都市	4+5	最小都市　2万
3. 週末中心	1 時間	バ　ス	20	15	地区中心都市	3+4+5	一般都市 5～10万
2. 月末中心	1.5時間	電　車	50	50	地域中心都市	2+3+4+5	
1. 季末中心	2 時間	汽　車	100	100	地方中心都市	1+2+3+4+5	大都市 30万

（備考）石川栄耀『皇国都市の建設』198ページ，「皇国都市の生活圏的配置」より．第61図参照．

第2表　石川氏による生活圏構成の諸元

中心機能	(1) 圏の半径 (km)	(2) 圏内面積 (町歩)	(3) 圏内水田 (20%) (2)×0.2 (町歩)	(4) 米産高 (1町歩 40石) (石)	(5) 自給許容人口 (人)	(6) 適正農家戸数 (1町1戸)	(7) 同人口 (6)×5	(8) 農業外自給人口 (5)−(7)
日常中心	1.5	706	141	5,640	5,000	141	705	4,300
〃	5.0	7,854	1,570	62,800	63,000	1,570	7,850	54,000
週末中心	15.0	70,686	14,136	565,400	565,000	14,136	70,690	494,000
月末中心	45.0	639,174	127,834	5,112,360	5,112,000	127,838	639,170	4,473,000
季末中心	135.0	5,725,666	1,145,132	45,805,280	45,805,000	1,145,132	5,725,600	40,079,000

環境の中に押込めてしまおうとする反動的意図が感じられる．この種の意見はまた，人目の多い盛り場で餓死者が出るのは目ざわりだから田舎や山奥へ引込んでどうなとなってくれといったような無責任さを感じさせる．

この第2の型の主張をヨリ理論的に整理したとみられるものに，地方生活圏の再構成による小都市分散論があげられる．

この理論を農村生活圏の構成方法として展開している代表的主張者・石川氏の小都市分散論を，その著『国土計画』によってとりあげ批判してみよう．

石川氏は「皇国都市の生活圏的配置」(『皇国都市の建設』，198ページ）において，その生活圏計画の趣旨を

（A）　国民をしてその出生せる郷土に定着せるまま国家の全産業（？――筆者）に関与せしめると同時に，

（B）　大都市が保育せる文化をも享受せしめ，

（C）　同時にまた国家にたいしては市民をして農本的な状態のままにして，かつて大都市がこれを統合せしごとく統合せしめる．

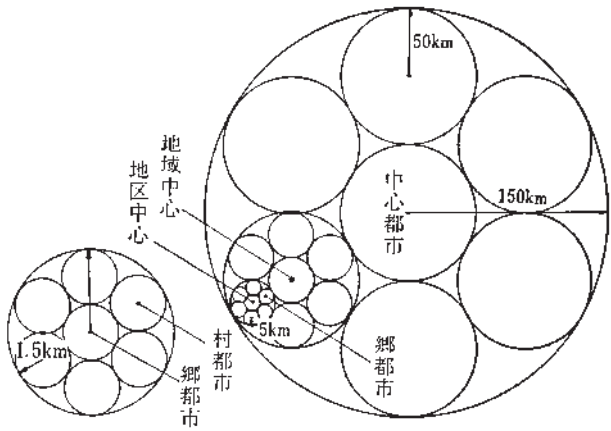
といっているが，すでに批判ずみの主張は別として，それが農村の側にあたえうるものとは，けっきょく都市文化から置き去りにされている農村にも都市文化を享受させるという文化人らしい「人道主義」的めぐみにしかすぎない．

さてこの主張をまとめた生活圏計画による都市布置の構成は，だいたい第61図のようになり，その中心都市と圏内構成の関係をしめす諸数字をあげると第1,2表のようになる．

さてこの数表の中でとくに注意を要する仮定は，(9) の農村の心要とする農業以外の人口を農業人口に等しいとした仮定，および (10) の中心都市の人口

(9) 農村の必要する人口 (農家人口に等し) (人)	(10) 中心都市人口 (仮定) (万人)	(11) 圏内都市人口 (万人)	(12) 工業を要する人口 (11)−(9) (万人)	(13) 中心都市工業人口 (万人)	(14) 自給許容人口 (5)−(11) (万人)	(15) 農業的な自然発生的都市の人口分布よりする中心都市人口 (万人)
705	—	—	—	—	—	—
7,850	2	2	1.2	1.0	3	1
70,690	5	17	10.0	3.0	32	3
639,170	20	134	70.0	10.0	313	15
5,735,666	100	1,018	444.0	70.0	2,882	80

（備考）石川栄耀『国土計画――生活圏の設計』(1942.8) より．



第61図　石川栄耀氏の生活圏構想図
(『皇国都市の建設』, 253ページ)

にたいする仮定である．前者については「農村の必要とする人口」「農業の養い得る人口」といわれているが，農業人口に付随する他業種の人口とするならば日常中心程度の小都市——町においてはやや大にすぎると思われる．

後者の仮定は単なる仮定であるが，この生活圏構成が実現されたとすると，つぎの第3表にしめすような結果が現われてくる．

第3表　石川氏の生活圏構成における都市段階別の人口配分比

	単位都市人口	地方圏内都市数	所属人口	同比率
1. 村落	—(人)	—	573(万人)	40.7(%)
2. 郷中心都市	20,000	216	432	30.8
3. 地区中心都市	50,000	36	180	12.9
4. 地域中心都市	200,000	6	120	8.5
5. 地方中心都市	1,000,000	1	100	7.1
全地方圏		259	1,405	100.0

(備考) 1. 都市数の計算については，各上級圏の中にその中心圏以外に下級圏があるとして計算した．
2. 村落人口については原書に明示されていないが，全農業人口をもって村落人口とみなした．原著者の意図では中心都市人口の中にも相当農業人口がふくまれているとしているのかもしれないが，はっきりしない故，かく推算した．

すなわち，地方圏の下位構成を標準図の通り内接円の個数の通りと仮りに考えると，地方中心都市にたいし，人口2万の郷中心都市は216となり，全人口1,400万（面積56,800 km²にたいして計算すると人口密度は1 km²当り247人となる）のうち40%が農業人口であるのはいいとして，30%が郷中心都市に居住し，全人口の71.5%が人口5万未満の小町村に居住することになる．*)

この計算結果をみて感じられることは

（1）　第1に地方圏全体の人口密度が低いということである．

このように地方圏内の農村のすみずみまで文化的開発をしているにもかかわらず，全体の人口密度は1 km²当り247人である．わが国の人口密度は全国をとっても1940年において1 km²当り191人で，全国的にみてこの計画の水準に達するには3割の余裕しかない．しかもこのような開発をおこない得る地区は，統計区別にみると関東・東海・近畿以外のいわゆる未開発地方のみである．この前の地方ではたとえ郷中心都市をいかに拡充しても，この生活圏構成にしめされた程度の上級都市の容量ではその人口は収容し得ない．

したがってこの地方圏の構成は「過大都市」解消にはあまり役立たない．

（2）　第2に人口配分の重点が2万人という最小都市に偏している．

これを農村人口とあわせると7割の人口が2万人以下の都市に住んでいることになる．ところが，わが国の市町村人口段階別所属人口の統計（省略）では，1940年において66%の人口が5万人未満の市町村に居住し，全体の3割は10万人以上の都市に居住している．

この統計は市町村の単位が行政区域によっている点で若干割引をしなければならないが，それにしても前述の生活圏構成の場合は，これに比し人口がいちじるしく小都市・村に偏していることがわかる．

これを要するに，この人口配分構成は，そうとう分散的であるにもかかわらず，あまり多くの人口をそこに収容し得ていないことをしめす．

したがってこの分散的（小都市配置の）基礎のうえになお巨大都市の

第4表　統計区別人口密度

統計区	1930年	1935年	1940年
北海道	35	35	37
東北区	98	104	107
関東区	427	474	523
北陸区	163	166	170
東山区	123	125	127
東海区	297	321	343
近畿区	362	408	436
中国区	169	176	181
四国区	176	179	178
九州区	216	226	236
全　国	169	181	191

*）別の著書，『皇国都市の建設』のほうで計算すると，半径135 kmの地方圏で600万町歩，水田を1割として都市人口1,200万に対し農業人口300万，計1,500万（263ページ）となり，農業人口比率は20%に低下しているが，都市人口の都市段階別構成は明示されていないし，1,200万の算定の基礎も明示されていない．しかしこの場合でもやはり人口布置の重点は2万人都市にあるものと思われる．

発展をみとめるか，あるいは巨大都市をあくまで否定して分散主義を貫徹するため2，3級の都市規模を大ならしめるか，二つの方法しかない．前者は単なる小都市分散論の否定である．後者は，分散的都市建設の結果，すべての人びとに適当な都市的施設をあたえることが困難となり，またほぼ10 km 間隔にあるこの小中心を結ぶ（消費生活上はむろん，生産――荷物輸送のための）交通施設の負担がいちじるしく大となり，国民経済の原始化をもたらす憂いなしとしない．

これを要するに，地方農村への都市文化の導入を考慮して小都市分散をおこなっても，中心都市を100万程度の規模に押えるならば，その全人口収容力はあまり大きくなく，したがって巨大都市は解消され得ない．またかかる人口の非能率的な分散配置は国民経済にたいして交通上・都市施設上，きわめて重い負担をあたえる．

筆者の考えを端的にいうならば，小都市の人口はやはり10万程度を標準としなければならないと考える．人口布置の重点はこの10万（5～20万）の中都市におかねばならない．しかもこの中都市たるや，巨大都市を構成する単能的単位区（単位都市――その人口はさきに数万～十数万といった）と本質的になんら異なるものではない．すなわち巨大都市も，実質的にはこの中都市によって構成される．巨大都市とはこの中都市がやや密度高く集合し，その機能分担の関係が相互にきわめて密接な連関をもち，その中には過去の巨大都市の特徴的要素であった都心的機能をもったものも存在する――という特徴をもった地域の包括的名称（これを大都市連合とよんでもよい）である，とするのである．

いいかえると，都市は大都市にあっても中都市にあっても，同じく10（5～20）万程度の規模をもった単能的都市区をもって構成され，その配置密度と連絡関係・機能分担の相互関係の疎密によって，一連の中都市の連合体とみられるものを大都市といい，それからやや疎に隔離されている独立度の高い都市区を中・小都市とする．

国土はこのような単能的中都市の交通線上の疎・密の配置によって構成される．

都市の単位をこの程度のものにすることによってきわめて効率高く都市的文化施設を整備することが可能となり，かつ交通上の負担も許し得べき範囲のも

のとなるであろう．

（3）「区」の再認識

なおこれは蛇足かもしれないが，従来の大都市に存在する「区」の再吟味を提案しておきたい．

従来の「区」は大都市の地域的・人口的拡がりにたいして行政技術上これを地域的に分割したものにすぎないが，大都市を単能的中都市の連合構成とする考え方と結びつけて，それを新しい意味をもった「区」という段階の地域単位として積極的にとりあげることとする．すなわち「区」を在来のようなものに終らせず，有機的な一段階の完結せる機能をもつ生活地域空間としてはっきりさせることである．そしてこれを上述の単位的単能都市のような性格をもったものとする．そうすれば，「区」は大都市の下部構成要素として機能的にも独立性の高い単位地域として，その存在価値を明確にすることとなる．

なお，巨大都市の構成においては，一方において多数の区＝中都市がそこにふくまれることになるが，それと同時に都心区，総合工業区といったような標準的な単位区の規模をはるかに超えたものが生じてくる．こうしたものの構成や施設の配分をヨリ組織的にするため，単位区が数個あつまった「連合区」といってもよい区と大都市との中間的な結合単位を考えることも必要となってこよう．

3. 新しい国土の構成——人口の分散集中の形態

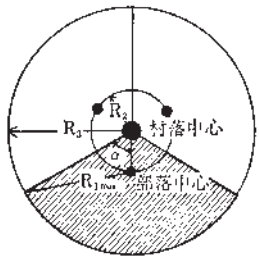
前2節において，筆者の考えている巨大都市ならびに一般都市の再構成にかんする主張を明らかにした．これをここでもう一度簡単に要約すると，

1）　あらゆる非農業的産業は都市区を構成し，そこに配置される．
それは工業・鉱業・商業（農業中心ならびに都市中心）そのほかの単能的色彩の強い単位生活基地である．

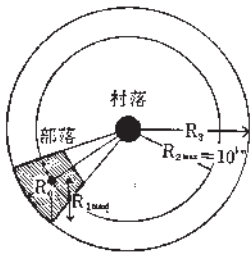
2）　都市の単位的規模は人口5万～20万，約10万をもって標準とする．

3）　都市における居住地は小学校住区を構成し，1都市区はその数個ないし十数個の集団をもって構成される．

4）　単位都市区はその交通圏内にある商業都市の有無，その性格と相互の距離によって異なるが，各自の生活に必要な程度の商業・文化中心をもつ．



第62図　村落半径図



第63図　村落半径図（最大型）

5)　国土全体にたいしては，総合工業基地の配置とからみあって，単位都市区の配置が密度高く，かつ相互に顕著な機能分化をした単位都市区の連合した集団——巨大都市圏が数個考えられる．

6)　単位都市区の配置密度は巨大都市地域の中心部においては密に，それより遠ざかるにつれて疎となる．その密なる上限は市街地にたいして6割程度の生産緑地を配するをもって標準とし，その疎なる上限はその周辺の農村地域よりの都市にたいする求心的交通に必要なる限度——たとえば石川氏のいわゆる週末中心程度，片道1時間，半径10 km 程度——とする．

となる．6）項において単位都市配置の限度をかなり具体的に述べたが，この上下限のあいだに現実にはどのような配置が考えられるだろうか．これはその地方の既往の開発状況と地理的条件，および国土全体にたいする人口配分の条件などが関係するが，つぎにやや詳しい数字的な検討をおこなってみよう．

（1）　農村の側よりみた都市配置の最低限度構成

〔C_1．部落〕　農家の単位的聚落．散村形態の場所も少なくないが，住民の協同と生活の向上を期するため，集村形態をもって基本と考える．

部落の規模はその住宅から耕地までの「通勤」距離によって規定される．

最適，片道20分以内．最大1時間．徒歩にて標準 1.5 km（最大4.0 km）．

〔C_2．村落〕　部落が数個集まって日常生活の中心施設（小学校，配給所，組合事務所など）をもった村が構成される．

各人の住居よりこの「日常中心」への距離は最適，片道20分以内，最大30分徒歩交通とすれば 1.5 km (2.0 km)，自転車交通とすれば 6 km (10 km)．

1村落包容面積ならびに外径を上記の条件より算出すれば，徒歩交通で（第63図参照），

$$R_1^2\max = R_3^2 + R_2^2 - 2R_2R_3\cos\alpha$$

$R_2=1.5$ km，$R_1\max=4.0$ km，$\alpha=60°$，$\cos\alpha=0.5$ より

中心部以外の部落数が3の場合（$\alpha=60°$）$R_3=4.61$ km，面積 $A_2=66.7$ km^2

同様にして　4の場合（$\alpha=45°$）　$R_3=4.98$ km　$A_2=77.9$ km^2

5　（$\alpha=36°$）　$=5.16$ 〃　$=83.6$ 〃

6　（$\alpha=30°$）　$=5.26$ 〃　$=86.9$ 〃

すなわち，村落の外径はだいたい5 km 程度ということになる．

山間部のごとき有効利用地が細長く線的である場合は，日常中心への交通を自転車基準（10 km）にとると $R_3=14$ km となる．1村落中の部落数は，1部落当り面積を 50 km^2（部落最大半径 4.0 km の円として）とすると，$A_2=615$ km^2（半径 14.0 km より）の中に 12 部落．1部落当り面積を（平均 3.0 km 半径として）28.6 km^2 にとると 22 部落ということになる．しかしこのような長い半径をもつ山間部では，土地は四方にひろがっていないから，村落の長径を 28 km，短径を 8 km の矩形と考えると，面積 224 km^2，1部落当り面積 28.6 km^2 とすれば1村落当り部落数は 7.8 となる．つまりこの種の長い外径の山間部村落では，部落数はせいぜい15 程度で，標準は 8 個程度と考えてよいであろう．

さてこの村落の包容人口はどれほどとなるか．

わが国の耕地面積は総面積 38 万 km^2 中 600 万町歩（約 6 万 km^2）である．これに現在計画されている 170 万町歩開墾計画を加えて，耕地面積の最大限を 8.0 万 km^2 とすれば，その総面積にたいする比率は 21% となる．

しかし山岳地帯ではずっと低下するであろうから，総平均比率の 1/2 ～ 1/3 程度と考えて 10% および 7% （全国府県中耕地比率最低の和歌山県では 10.2% となっている）と仮定し，これら3種の耕地比率を基準として村人口の計算をおこなってみると（表省略），部落人口はだいたい 1,000～2,500 人，中心村落の人口はだいたい 1,600～7,000 人程度となる．

全村落所属人口は，21% 耕地の場合には 4 部落の 8,000 人より 7 部落の 10,000 人，35% 耕地の場合には 4 部落 13,000 人より 7 部落 17,000 人，自転車交通にすると 7% 耕地で最大 24,000 人，10% 耕地では 35,000 人ということになる．

日常中心が有利に形成されるための対象人口を最低1万人，適度 1.5 万人とすれば，4部落（村中心と周囲3部落）の構成はいずれも小に過ぎて不適当，ただ耕地の多い平野部でのみ許容し得る構成となり，21% 耕地程度の地域では，

7部落（中心1と周囲6）構成の程度の大きさが必要である．また10%耕地の場合は総人口1.3万，村中心人口は3,700となる．

〔C_3．**市区**〕 農村よりの週末中心．

片道1時間半の距離，すなわち村中心より1時間の距離．——自転車で12 km，バスで20 km，鉄道で36 km——とすれば，各農村居住地よりの時間距離は最大片道1時間半となる．

相当数の村落にたいする中心を形成するもので，相当程度の文化的施設のととのった地方中心的都市であると同時に，単なる農業中心でなく——農業中心のみでは充分の施設をととのえる人口規模を確保し得ない——工業そのほかの単能的独立都市が予想される．人口5～20万，10万を標準とする．その機能に対応して少なくも鉄道幹線が通っていると考えてよい．

鉄道以外にこの中心へ2方向直通4線のバスのような交通機関を考え，そのほかに自転車による補助交通を予想すると，中心より1時間の交通圏たるこの都市に従属する農村地方圏は図式的には第64図のような形をとる．

第5表　都市圏人口構成計算表

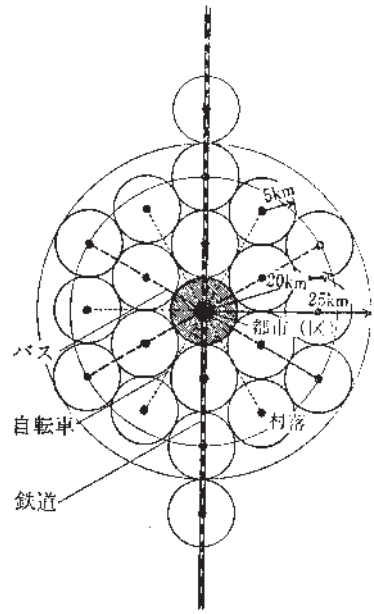
村落形式	村落農業人口	村落中心人口	村落全人口	全市圏内人口	全市圏内農業人口	中心都市人口（仮定）	同付加非農業人口	村落非農業人口	全村落非農業人口	全市圏非農業人口	全市圏人口	非農業人口比率
7	8,270	3,252	10,340	206,800	165,400	100,000	96,748	2,070	41,400	138,148	303,548	45.5
10	10,180	3,684	12,725	254,500	203,600	〃	96,316	2,545	50,900	147,216	350,816	41.1
2	10,600	5,300	13,250	265,000	212,000	〃	94,700	2,650	53,000	147,700	359,700	41.0
8	13,820	5,436	17,280	345,600	276,480	〃	94,564	3,460	69,200	163,764	440,164	37.2
17	14,280	3,993	17,850	357,000	285,600	〃	96,007	3,570	71,400	167,407	453,007	36.9
18	14,360	4,017	17,950	359,000	287,200	〃	95,983	3,590	71,800	167,783	454,983	36.9
19	19,550	5,570	24,438	488,760	391,000	〃	94,466	4,888	97,760	192,226	583,226	32.9
20	27,960	6,992	24,950	699,000	559,200	〃	92,088	6,990	139,800	231,888	791,088	29.3

（備考）　1市圏は19村落，1市によって構成されるとし，市は人口10万と仮定，そのうち村落人口に該当する人口は村落人口と同等の構成をもつものとし，それ以外はすべて非農業人口とす．

これを単純化して要約すると，だいたい半径25 km，20村落（19村落，1市）となる．村落の構成として前計算表（表省略）の7（21%耕地，7部落構成），10（7%耕地，7部落），2（35%耕地，4部落），8（同，7部落），18，19（自転車交通，7%耕地，16部落），17，20（同，10%耕地）を例にとって地域全人口および中心都市人口の構成を計算してみると第5表となる．

ただし17以下の例では村落半径が10～14 kmとなっているから，このような村落を20個も1時間圏内に配置することは困難である．

第64図　単位単能都市圏の構成図



さてこれによって中心都市の人口を10万とする場合，全地域非農業人口中70～50％が中心都市に集中居住し，そして全非農業人口比率は7の45.5％より20の29.3％となり，だいたい4割ということになる．

わが国の全有業者中に農業者の占める比率は1930（昭和5）年の国勢調査で47.7％，また世帯主の職業よりみたる農業世帯の比率*)は1920（大正9）年の国勢調査において44.2％（同所属人口は50.0％）であり，太平洋戦争中に立案された人口政策では内地人口中農業人口4割定有の目標がかかげられていたのであるから，ここに表われた比率は，この地方中心的単能都市以外に，なお総合商工業基地――巨大都市――のための非農業人口を充分残置していることがわかる．

村落中心的機能を分担する人口を除いた非農業人口は，全人口10万中9.5％，有業率40％としても4.3万人の従業者が得られる．このうちその都市住民へのサービスのための対内職業人口を50％（第2章参照）とすると，2.2万人がこの都市の特殊化された機能に奉仕する従業員とみることができる．それは1個の独立した生産基地を営むについて一応充分な大きさといいうる．

〔C_4．**大都市**〕　地方中心的都市．地域中心都市たる市区から高速度交通機関をもって片道適度限界1時間半（その従属村落人口にとっては，市区中心への農村居住地からの交通時間・1時間半を加えて3時間）で結ばれたところに，最大の人口集団を背景として成立し得る高度の文化的・商業的・経済的・行政的機能を

*）農家人口を耕地面積600万町歩にたいし550万戸，2,750万人とすれば，7,000万にたいし39.3％，耕地を170万町歩（28.4％）拡張したとしても3,420万人で1945年の予想人口7,800万人にたいし，43.8％である．しかもこれは農業人口を最大限に拡大した場合の予想であって，この農地拡張は少なくも5カ年を要し，また以後増加する人口はほとんどすべて非農業人口とならねばならぬから，その比率は4割以下となり，年々さらに低下するであろう（農業の生産性の向上，耕地当り人口の減少によっては，さらに非農業人口は増加する）．なお将来の人口変動と農業人口の比率の変化については第7表にしめす．

もった地方的，ときに一国的あるいは国際的中心都市が配置される．

石川氏のいわゆる月末中心ないし季末中心であり，日帰り可能の最大限度（往き3時間，滞在3時間，帰り3時間）をもって国土のあらゆる末端農村居住地から到達し得るごとき位置にあるものである．

高速度交通機関の速度を1時間50 kmとすれば，その中心よりC_3市区への距離は75 kmとなる．市区の勢力圏の半径が25 kmとすれば，この大都市の全勢力圏の外径は100 kmである．交通時間限度をもう1時間延長するとすれば150 kmとなる．中心の100 km圏が完全な勢力圏であり，150 km圏はほかに近接せる大都市が存在しない場合，あるいはこれに代るべき地方的副中心がない場合，その勢力圏に入る準勢力圏である．前者を地方圏，後者を交錯地方圏と名づけよう．100 km圏をとる場合は若干はみ出すが，内接円として19の市区が得られる．

これが1大都市（C_4）に属する市区（C_3）の最小数である．150 km圏をとれば約40市となる．中間をとって一つの1大都市の下位構成たる市区をいちおう30程度と考える．

ただしこれは農村地域をその後背地としてもつ，農業地方の中心として必要な最小限度の都市数である．大都市を構成する単位都市＝区はこの数の中にはふくまれていない．また国土の工業化につれて市区はさらに広く配置され，その数は増加する．

（2）　全地方圏の段階構成

〔**大都市の規模**〕　C_1部落よりC_4大都市にいたる地域の段階構成を整理し，一つの大都市によって包括される地方圏（1大都市の全後背地）の人口の居住

第6表　地方圏の構成

居住地段階	人口規模範囲（人）	標準（人）	内農業人口（人）	標準圏半径（最大）（km）	下位構成	1大都市にたいし	総人口（千人）	内農業人口（千人）
C_1 部落	1,000～2,500	2,000	2,000	2.0 (4.0)		$3{,}000C_1$	6,000	6,000
C_2 村落	3,000～7,000	5,000	2,000	5.0(15.0)	$C_1\times(4\sim7)$	$600C_2$	3,000	1,200
C_3 市(区)	50,000～200,000	100,000	2,000	25.0(35.0)	$C_2\times20$	$30C_3$	3,000	60
C_4 大都市	1,000,000～	x	2,000	100.0 (150.0)	$C_3\times30$	C_4	X	2
全地方圏							X＋12,000	7,262

地別構成状況を，前項の試算を基礎としてしめすと第6表となる．

すなわち，一地方圏内の農業人口は7,262,000人となる．

これにたいして非農業人口はどれほどになるであろうか．これについては，ここにかかげたような地方圏によって全国土が構成されると考えると，全人口の産業別の構成比率と各地方圏のそれとが同じと考えてよい．よってこれにたいして1945年の推定人口78,985,589とし，耕地は170万町歩開墾を考え，これにたいする全農業人口を3,500万人と仮定し，爾後農業人口は一定数を保つこととし，また人口問題研究所の推定数によって，将来100年間の人口構成の変化を考えると第7表を得る．

第7表　全国人口の変化と人口の業種構成および中心大都市人口

年次	年月	予想人口 (1,000人)	農業人口 (仮定)	農業人口比 (%)	一地方圏総人口	中心大都市人口
1945	0	78,986	35,000	44.3	16,388	4,388
1955	10	90,107	〃	38.8	18,696	6,696
1965	20	101,609	〃	34.4	21,082	9,082
1975	30	111,453	〃	33.0	23,125	11,125
1995	50	122,328	〃	31.5	25,381	13,381
2015	70	118,493	〃	29.6	24,585	12,585
2045	100	111,777	〃	31.4	23,192	11,192

（備考）1. 予想人口は人口問題研究所（1941年）の推定計算値である．
2. 農業人口は現在2,650万人にたいして170万町歩開墾の結果850万人増加して3,500万人と仮定，耕地の拡大はそれ以上おこなわれないものと考える．人口増加に対応して都市人口――都市面積は増加するが，その大部は山林急傾斜地の利用により耕地面積を食いつぶさないと考え，また農業経営の集約化により，農業人口350万は増加しないものと仮定する．
3. 地方圏人口は第6表の一地方圏内農業全人口726.2万人を農業人口比でわって算出する．
4. 中心都市人口はこの人口よりC1, C2, C3の人口の総和1,200万を減じて算出す．

これによってみると，1945年に農業人口比率は44.3%であるが，30年後には33.0%となる．この比率から第6表のXを逆算すると，1945年の比率をとって地方圏総人口は1,600万になり，大都市人口は中都市を10万単位とすると439万，中都市を15万単位とすると289万となる．地方中心たる大都市が10万単位の単位単能市区で構成されるとすれば，それは40ないし30区でなりたつ巨大な市区連合体となる．10万の都市5個を合した50万の連合区を考えると，それは6ないし8連合区によって構成されることがわかる．

上記の計算は地方圏内の農業中心都市を30とした場合であるが，100 km圏，20都市とすると，大都市人口は単位都市10万の場合400万，15万の場合250

万となる．今かりに単位都市の規模を10万，大都市人口を400万とし，これをもって人口の所属都市階級別比率を算出すると第8表となり，10万以上の都市居住者の比率は43.7%，2.5万以下の部落・村落居住者の比率は37.5%となる．

第8表　都市段階別所属人口比率

都市段階	単位都市10万の場合		単位都市15万の場合	
	人口(万)	比率(%)	人口(万)	比率(%)
C_1 部　落	600	37.5	600	37.5
C_2 村　落	300	18.7	300	18.7
C_3 市　区	300	18.7	450	28.1
C_4 大都市	400	25.0	250	15.6
計	1,600	100.0	1,600	100.0

〔大都市の限度〕

以上の計算では大都市の規模を算出するのに地方農村地域の経済的・文化的中心となるC_3市区の規模をその中心施設維持に必要な大きさとしていちおう10万（あるいは15万）と仮定し，これら地域中心の市区に配分される人口以外の非農業人口をすべてその中心である大都市に配置すると考えた．しかしこの大都市に配置されることになった非農業人口はじつはいずこに配置されてもよいものである．ただ大都市に配置するほうが集積によって都市施設経営の経済性を高め，居住者の消費生活にとってもヨリ有利であるためであった．

しかしこの巨大化にともなう有利性は，どこまでもつづくものではない．やはりそこに一種の経済的限度が存在するだろう．

まず第1にいかに立体的・集約的に構成するとしても，都市の巨大化は，その平面的拡大によって，その各部が疎隔され，一体化した機能体としての都市内の分業の遂行を困難にし，けっきょく地方圏全体に連続的に広がった市区の乱雑な連合となんら異ならない形になってしまうであろう．

また分業化された機能をいとなむ各部の規模自体が，あまりに大きくなると，緊密な相互連絡も困難となり，分業化の利益が減少する．

すなわち，極端な巨大化は，集中を必ずしも能率高い都市経済を営むための積極的要素たらしめなくしてしまう．

さらに，複合機能体としての大都市を構成する各部・各種施設は，その均衡

のとれた調和が必要であるのに，都市が無制限に拡大するとすれば，それにともなう施設の並行的改善は既存施設の時々刻々の改善を必要とするから，不可能に近い．したがってわれわれは巨大都市の規模をどの程度に予想すべきかという「大都市」の目標限度を検討しておく必要がある．

以下，これを二，三の条件でみておこう．

（イ）　都市面積から

都市の建築構成をいかに立体化し，稠密居住形態をいとなむとしても，都市人口の増加はその面積の増大を結果し，その市街化された土地の連続的ひろがりは，やがて相互交通の困難さをまして集合による利便さをつぐない得ない程度のものとするであろう．この限度はどうであろうか．

交通機関として鉄道を考え，中心への交通時間を30分以内（待合せ時間および停車場への交通時間を入れて片道1時間となる），時速50 kmとすると，都市圏の半径25 km，その面積は1,870 km²である．

グロス居住密度を市街地100人/haと考えると人口は1,870万となるが，蔬菜供給の生産緑地，水面そのほかの嵌入を考えて市街地面積を40%とすると，総人口748万人，約750万人いうことになる．

（ロ）　交通機関の負担より

石川氏は人口当り自動車量と主要街路の容量よりして，主要街路における交通量と市中在車数とにかんする経験的関係式を利用して東京の限界人口を200万と算定している（『皇国都市の建設』62ページ）．しかしこれについては疑問が大きい．

これとは別に，高速度都市交通はわが国の特殊事情から自動車交通よりもむしろ鉄道にありとして，検討してみる．

周囲地方圏内人口の都心への交通，大都市内居住者の都心への交通をつぎのように算出してみる．

1高速度鉄道1時間の輸送量（1車150人，5輌連結，3分間隔）	15,000人
ラッシュアワーにおける1時間の交通量は1昼夜交通量の1/4として，1日の輸送量	60,000人

都心への交通は週末（土曜および日曜）に集中するとし，平常時の日曜4倍，土曜3倍とすれば1週間の輸送総量は12/4を乗じ

て　　180,000人

居住人口中40%（成年有業者比率にほぼ等しい）が1週1回都心に出るとして1鉄道の負担し得る人口数は100/40を乗じて　　45,000人

したがって300万の大都市には理想的に配置された放射状高速度鉄道7本，450万の場合は10本，600万の場合は14本を所要する．

ただしこれは大都市内部の人口についてであり，その外部に，1,200万（単位都市15万の場合は1,350万）の人口が地方圏内に存在する．これらの外郭地居住者が月1回の割で（つまり都市人口の1/4に等価換算）都心に出るとすれば，都市人口換算300万となり，さらに7～8本の鉄道を所要することになる．

両者を合して300万人都市で15本，600万人都市で21本の鉄道が所要される．また1本当り混雑時1時間の輸送量1.5万人として前者の場合1時間22.5万人の人の流れを処理し得る広場と道路を必要とすることになる（ここではこのような計算をしているが，高速度鉄道・主要道路幅員は都市規模を規定する条件としてでなく，考え方としてはむしろ反対に都市規模よりして交通機関の量を決定すべきである）．

（ハ）　都心区の規模より

巨大都市は複能的な構成をもつものであるが，そのうち商業・経済機能は都心区へ集約したい．

都市が巨大となると，この集約された商業的都心区自体があまりに巨大化し，集約された機能がマヒ状態に陥る．このような状態に陥るのを防ぐため都心区の最大限度を1連合区（五つの10万人都市）――50万と押えてみると，その有業者比率40%，対外業種人口50%として，都心的業務へ参加し得る総人口は，50万人×0.40×0.50＝10万人ということになる．しかるに1935年の数字をとって大都市の商業人口比率は32%，中都市のそれは27%であるから，その差5%が大都市機能に対応するものと考え，この5%が10万となるべき全有業者数は200万，有業率*)40%とすると――全大都市人口500万という逆算が成立し得る．

以上の計算はすべて大都市を単一中心に集中された形のものとして予想しているが，現実にはたとえば近畿地方圏のように，商工業の中心の大阪，港湾・

*）有業率，対外業種人口率，商業人口比率などにかんしては第2章の研究によっている．

工業中心の神戸，文化・厚生の中心の京都，というような独立した中心で構成される場合もある．このばあいは中心機能が分散させられるので，上の計算よりもヨリ大きくなるだろう．ただ分離された中心をむすぶ交通機関の能力と中心の分散にたいする連絡交通の巧妙な配慮が必要とされる．

〔人口増加と人口の都市配分〕

大都市の規模について前項に算出したような限度があるとした場合，人口増加に対応する諸都市間への人口配分はどのような形で進められるべきか．これはむろん，非農業人口の従事する産業の国土における配置からきめられることであるが，その条件を捨象して考えてみるとどうなるか．

将来人口の予想として人口問題研究所の推算をとると，50年後においてわが国の総人口は1億2,233万という最大値に達する．この場合，農業人口比率は28.6%に低下し，前々項と同様の方法で計算すると地方圏全体の人口は2,538万人，中心都市人口は1,338万（15万人都市の場合は1,188万）となる．この値は前項の検討に照らして明らかに過大である．

そこで大都市の人口を600万人程度にとどめるとするならば，残余の738万（588万）はこれを中心都市以外の場所になんらかの形で配置せねばならない．

これには三つの処理方式が考えられる．

第1，単位都市の規模を10万とせず，さらに大ならしめる．

この方法によって解決するとすれば，単位都市の規模は35万となる．10万（あるいは15万）の都市として出発したものをこのように拡張することは，都市施設の対応目標にあまりに大きな変化を与える点で不可である．

第2，単位都市の配置密度を上昇させる．

当初30都市であったものに74都市をふやして104都市（すなわち3.5倍）とすればよい．都市配置の間隔を1/2に縮めれば，すなわち既存都市のあいだに1個ずつ新しい都市をつくってゆけば全体で4倍となるから，だいたいこの方法によって解決される．

都市を完成された生活体と考え，これを単位として建設してゆくという考えからは，この方法が最適である．

第3，副中心都市の建設あるいは地方圏の再分割．

一地方圏内にありながら，地理的条件その他によって中心大都市から隔離さ

れていたり，また一群の単位都市が相当密に配置された地域には，副中心をつくることが有利となる場合がある．また既存大都市を中心とする地方圏の配置間隔ではまばらに過ぎる地方もある．そういうところに新しい地方圏中心都市を育成し，やがて古い地方圏から独立した新地方圏を創り出す方法が考えられる．余剰非農業人口738万（588万）は明らかに新たな大都市中心をつくり得る人口量である．

以上の三つの方法のうち第2および第3の方法が積極的に採用されるべき方法と思われる．第2と第3といずれをとるべきか，それは産業の国土における配置の動向，交通網の組織，各地方圏内の地理的・歴史的条件，地方圏および国土全体との関係などによって定まる．しかし，将来における人口増加は――その中心都市のよりいっそうの高度化のための集中累加，副中心の形成，地方圏の再分割，あるいは都市配置密度の上昇など，いずれの方法をとるにせよ――非農業人口を単位都市区の創設を通じて都市人口として配置されるべきで，これを村落や部落にバラマクことであってはならない．

〔大都市を中心とする単位都市配置密度〕

地方圏の構成は前項では漠然と大規模な大都市的中心と30の地方圏内単位都市の配置として考えてきたが，すでにたびたび述べてきたように大都市といっても単位都市で構成されており，ただその配置密度が高いものであるにすぎない．したがって全地方圏を単位都市の配置密度という点からみなおすことができる．

単位都市として人口10万（a），15万（b）の二つの場合を考えてみる．

まず蔬菜自給を条件として最密配置距離を考えてみる．

市街地人口密度100人/haとすると都市面積は（全部市街地として）1,000 ha（1,500 ha）となり，半径1,784 m（2,185 m）となる．有効市街地として有効に利用し得る面積を50％とすれば面積は20 km²（30 km²）となり，その外径は円の場合5.05 km（6.18 km），六角形とする場合4.81 km（5.89 km）となる．生鮮蔬菜供給用耕地として1人当り20坪（0.0066 ha），耕地面積を全土地の20％とすれば都市所要全面積は3,300 ha（4.950 ha）となり，都市間の距離は6.18 km(7.57 km）となる．

したがって最低限度の緑地（生鮮蔬菜自給）を付する場合の都市間の配置間

隔は，有効利用地50%程度として平均6km，緑地の幅は1.5km程度ということになる．

第9表 (1)　都市段階別所属人口比率

都市規模(万人)	面積(100人/ha)(ha)	都市半径($r=\sqrt{A/\pi}$)(m)	蔬菜耕地(66ha/1万人)(ha)	全都市面積 耕地12%(ha)	20%(ha)	33.3%(ha)	都市間距離 耕地12%(km)	20%(km)	33.3%(km)
5	500	1,261	330	2,750	1,650	990	5.64	4.37	3.88
10	1,000	1,784	660	5,500	3,300	1,980	7.97	6.17	4.78
15	1,500	2,185	990	8,250	4,950	2,970	9.76	7.56	5.86
20	2,000	2,523	1,320	11,000	6,600	3,960	11.28	8.73	6.76

（備考）(1) 市街地所要面積は100人/ha，蔬菜耕地所要面積は66 ha/1万人（1人当り20坪）とする．
(2) 都市間距離は都市が正六角形をなし相連接しているとし，$D^2=(2/\sqrt{3})A$ より $D=1.075\sqrt{A}$ 式により算出した（258ページ第68図）．

大都市中心の存在する平野中心地では有効利用地率はさらに大であるべく，反対に地方圏の周囲部ではもっと低率であろうから，全有効利用地率80%—50%—30%の3種について都市間距離，緑地帯の幅を同様に算出するとつぎのごとくなる．

第9表 (2)　蔬菜自給をなす場合の都市間緑地帯幅員

全有効土地面積率		80%	50%	30%
1人当り全市所要面積（1人当り0.0166 haとして）		0.0208 ha	0.0332 ha	0.0553 ha
1人当り市街地所要面積		0.0125 ha	0.0200 ha	0.0333 ha
単位都市(10万)	全市（直径）	4.90 km	6.20 km	8.00 km
	市街地（〃）	3.80 〃	4.81 〃	6.21 〃
	緑地帯の幅	1.10 〃	1.39 〃	1.79 〃
同(15万)	全市（直径）	6.00 〃	7.58 〃	9.79 〃
	市街地（〃）	4.66 〃	5.89 〃	7.59 〃
	緑地帯の幅	1.34 〃	1.69 〃	2.20 〃

これが単位都市（区）配置の平均最小間隔である．

さて大都市の構成をその中心である都心都市区を中心として考えると，いわゆる都市区連合を形成する市区は少なくとも都心と半時間＝25 kmの程度の距離以内にあることが望ましい．この外部に片道1時間以内で結ばれる郊外的都市区（巨大都市の郊外区）が配置され，さらにその外側に地方圏周囲部の中心となる単位都市が配置される．

その配置関係の模型を，有効利用地面積比率（あるいは耕地比率）に若干の

段階を仮定し，かつ圏内人口の蔬菜自給・主食自給などの若干の条件をあたえて圏内に配置し得る都市数を算出し，これを具体的に描き出してみると第10表のようになる．

第10表　地方圏面積ならびに都市配置個数

圏名称	圏半径	到着時間	全面積	圏内10万人都市配置個数								
				蔬菜自給（1人当り耕地 0.007 ha）			主食糧自給 (0.0833 ha)			同 (0.11 ha)		
			耕地比率	% 33.3	20.0	12.0	50.0	30.0	20.0	50.0	30.0	20.0
			有効土地率	% 83.3	53.3	32.0	56.0	33.6	22.4	55.0	33.0	22.0
			10万人都市面積	km² 19.8	33.0	55.0	166.5	277.7	416.5	220	367	550
	km	時間	km²									
1. 大都市中心	25	0.5	1,870	94.4	56.7	34.0	11.2	6.8	4.5	8.5	5.1	3.4
2. 大都市連合	50	1.0	7,840	396.0	237.5	142.5	47.1	28.2	18.8	35.6	21.4	14.3
3. 地方圏	75	1.5	27,600	1394	836	502	165 7	99,4	65.5	125.5	75.2	50.2
4. 交錯地方圏	150	3.0	110,400	5574	3344	2014	662	398	265	502	301	201

（備考）（1）都市所要面積は1人当り耕地所要面積と耕地面積比率より算出す．

（2）1人当り耕地所要面積は，蔬菜自給の場合は1人当り20坪（0.0066 ha）とし，主食自給の場合は（イ）耕地面積中水田比率66%，1人当り米消費量1.076石，反当り産米量2.16石より計算した1 ha当り主食可給人口 0.9917×21.5×0.61/1.076＝12.0人より得る1人当り0.0833 haと，いくぶん余裕をみた．（ロ）水田比率52%，1人当り米消費量1.1石，反当り産米量1.9石（1939年の数字）より計算した1 ha当り 0.9917×19×0.52/1.1＝8.9人，1人当り0.1113 ha＝0.11 haの二様の数字を用いた．

（3）おのおのの場合の全有効土地率は，耕地に市街地（100人/haすなわち1人当り0.01 ha）が加わるわけであるから，耕地率に蔬菜自給の場合は $\frac{0.017}{0.007}$，主食自給（イ）の場合は $\frac{0.0933}{0.0833}$，（ロ）の場合は $\frac{0.12}{0.11}$ を乗ずればよい．表にしめす通りである．

（4）都市数は全面積を都市面積で除して得る．

しかしわが国の地形の実情は，地方圏中心都市の周囲に陸地が一面に拡がって存在する場合は少なく，大都市的中心地方はほとんど湾海に接している関係で25 km圏，50 km圏，75 km圏などをとるといずれも相当水面が入ってきて，上表に示すような都市の立地面積を得ることはむつかしい．むろんこの水面そのほかによる土地の減少度は各地方圏によって異なるが，大体25 km圏で有効面積80～90%，50 km圏で75～80%，75 km圏で60～70%程度と考えられる．さらに交錯地方圏たる150 km圏をとると，水面のほかに隣接地方圏が入ってきて減少度はさらに増え，20～30%程度と考えられる．

いま模型的な数値を出すため，かりにこの実在面積率をそれぞれ85, 80, 70, 30%と仮定して，大都市中心人口500万，大都市連合700万，地方圏1,000万，全地方圏1,100万といった人口配分を仮定してみると，第11表のごとくなる．

第11表　地方圏の都市配置構成

圏名称	実面積比率	同仮定標準	総面積	想定都市数	圏内都市数	同面積
1. 大都市中心	(80～90)%	85%	1,590 km²	50 (58.9×0.85)	50個	1,590 km²
2. 大都市連合	(75～80)	80	6,270	75 (93.8×0.8)	25	4,680
3. 地方圏	(60～75)	70	19,320	100(143 ×0.7)	25	13,050
4. 交錯地方圏	(25～30)	30	24,800	110(367 ×0.3)	10	5,520

1都市当り面積	都市間距離	都市圏内人口密度	全圏内人口密度	都市人口15万の場合の都市間距離
31.8 km²	6.06 km	3,145人/km²	3,145人/km²	7.42 km
187.1	14.70	534	1,196	18.00
522.0	24.56	455	517	30.08
552.0	25.25	181	443	30.93

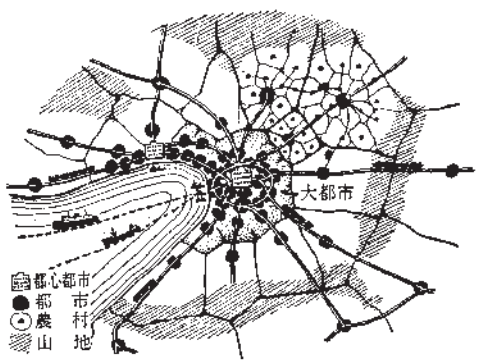
（備考）(1) 実面積比率とは地形の関係で水面，隣接地方圏などの嵌入により正常な圏半径で描いた円内の総面積よりも実際の地方圏所属面積が減少する比率をさす．

(2) 都市予想数は，10万人都市を考えた場合の数字で，第9表算出の有効土地率別都市数を基礎として，あり得べき有効土地率を予想して表のように仮定した．すなわち，1圏では蔬菜自給20%耕地（全有効率53%）程度，2圏では50%耕地（全有効率56%）で主食の半量自給，3圏全地方圏では90%耕地（全有効率34%）で充分主食自給可能な程度の配置仮定である．

(3) 都市間の距離は，都市が等間隔に布置されるとして $D^2=(2/\sqrt{3})A$ より $D=1.075\sqrt{A}$ 式によって算出した（第9表と同じ）．

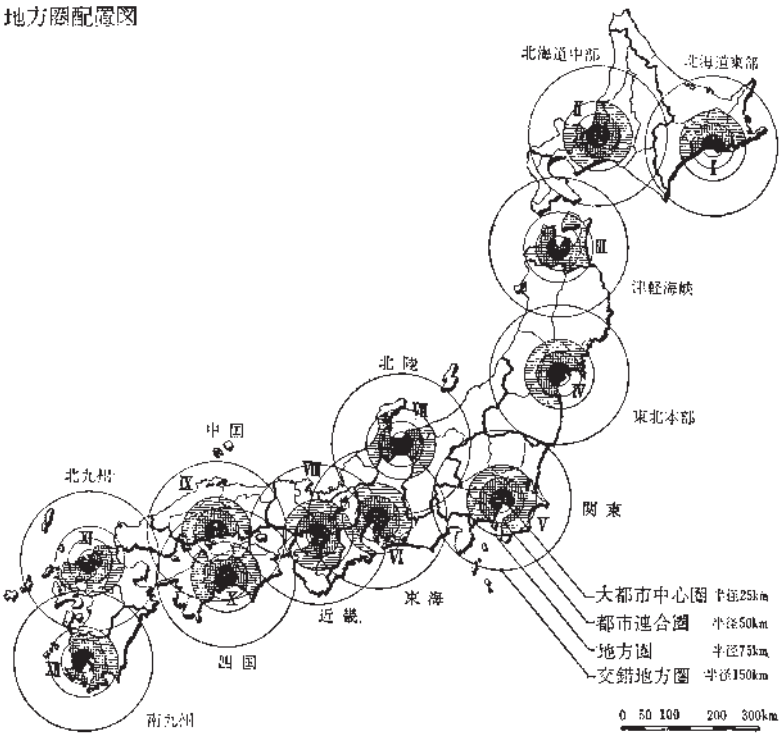
これによって，中心地帯は20%耕地（全有効利用地率53%程度）で蔬菜自給可能，大都市連合圏では50%耕地（全有効利用地率56%程度）で全食糧の半分自給可能，全地方圏内では30%耕地（同33.6%）で充分食糧自給可能ということになる．

この場合の都市の間隔は10万人単位の都市区をとると，中心圏では6.1 km（15万人単位では7.4 km），大都市連合圏では14.7（18.0）km，地方圏では24.6～25.3（30.1～30.9）kmとなる（258ページ，第67図参照）．いずれの場合も，都市区間の距離は30 kmに満たず，さきに計算した市区の圏域直径50 kmの約半分程度となり，都市間にはさまれる周囲部農村の週末中心として充分役立ち得ることがわかる．

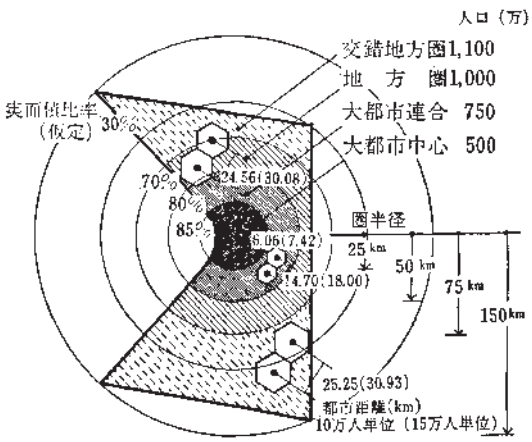


第65図　大都市を中心とする定住地のモデル

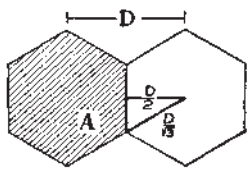
第 66 図　地方圏配置図



第 67 図　地方圏構成模型図



第 68 図　都市間距離図



人口密度は中心圏より順次にそれぞれ 3,145 人/km²，1,196 人/km²，517 人/km²，443 人/km² となる．全地方圏の人口密度は関東地方圏の 523 人/km²

(1935年) に比すれば低いが，ほかのどの地方に比しても高い．充分都市密度を高めて配置した場合の一模型であるといえる．

4. 全国土における地方圏中心——巨大都市連合の配置

以上に明らかにした大都市連合体を中心として地方圏が構成されている——あるいはされ得る地域をわが国土の上に探すならば，京浜を中心とする関東地方，京阪神を中心とする近畿地方などがあげられる．このほかにこれにくらべると中心の重力がずっと減少するが，名古屋を中心とする東海地方，北九州工業地帯を中心とする九州（中国地方の西端をもふくむ）などがその候補地としてあげられる．

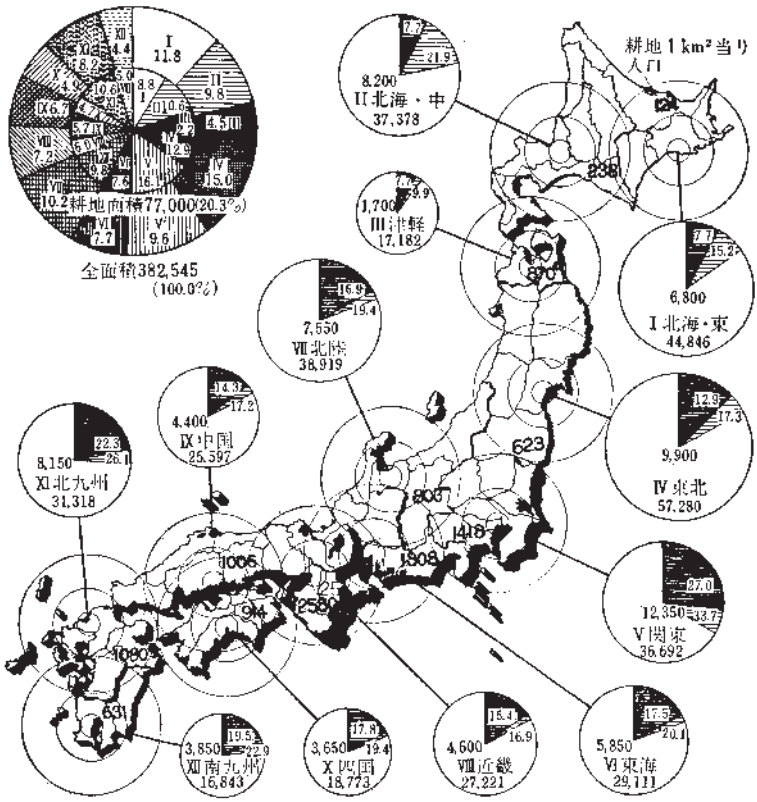
前2者の面積および人口（1935年）を，便宜上統計区別の数字でチェックしてみると，人口はそれぞれ1,687万および1,187万で，後者は前出模型に近い．前者は前出模型よりかなり大きい．その面積はそれぞれ32,226 km² および27,221 km² で，模型の24,840 km² よりも若干大きい．その結果，全地方圏人口密度は前者ではかなり高く，後者ではほぼ近い値となっている．しかしこれら2地方の耕地面積は，その比率が前者は25.3%だが，後者は10.1%で極端に少ない．前者は模型よりは高いが人口密度のほうが相対的に高く，後者は反対に人口密度は模型に近いが耕地率は相対的に低くて模型の半分しかない．したがってこれら2地方はともに食糧自給不能となっている．

第12表　統計区別面積・人口・人口密度

統計区	面積(km²)	1940年人口	人口密度
北海道	88,775.04	3,272,718	37
東北区	66,911.21	7,164,674	107
関東区	32,225.83	16,866,093	523
北陸区	25,292.37	4,288,554	170
東山区	28,586.70	3,638,779	127
東海区	18,616.33	1,383,235	343
近畿区	27,220.69	11,870,453	436
中国区	31,679.19	5,718,434	181
四国区	18,772.83	3,337,102	178
九州区	42,078.99	9,936,690	236
全　国	382,545.42	73,114,308	191

すなわち，これら2地方は，前述の模型を標準にとってみると，いずれも明らかに過度開発地域である．

さてわれわれは，上にみた既存都市を中心とする地方圏についてそれぞれ150 kmの円を描いてみる（第66図参照）と，図のごとく東海と近畿とはきわめて深く重なり合っているが，そのほかの地方間には大きな間隙が見出され，また上記地方圏に全然ふくまれない地方も大きく残っていることがわかる．し

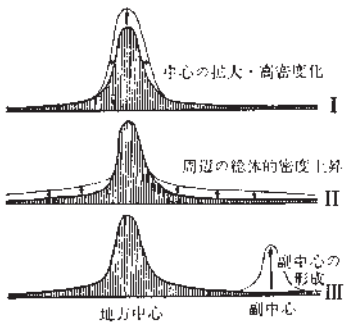


第69図　地方圏別耕地比率および耕地人口密度

(円は面積をしめす．地盤の高さは耕地面積当りの人口密度をあらわす)——1935年　耕地面積は濃いハッチが現状（1938年)，薄いハッチをふくめたものが耕地拡張後の最終耕地比率，全耕地面積の比率円は最終耕地面積によってしめす．地図は耕地人口密度(数字)を高さとしてしめしたもの．

たがって将来この間隙と空虚をうずめるべく，巨大都市連合をその中間にもつ新しい地方圏を設定することが望ましいということを知る．

この開発構想は，単に田舎の中心になるものが欠けているから，その空き間に中心をつくりたいという主張のごとくに見える．産業立地そのほかの条件において等しいとするならば，むろんこのような考え方もありうる．しかし事実は産業の立地条件が地方によって異なり，その差が現在のごとき関東・近畿2地方の異常な発展と他地方の相対的おくれとを生み出したのである．しかし国土の一部における過度開発，過度密集居住の状態は，既開発地においてなお若干の余裕があるとしても，全般的に見て将来は是正すべきものと考えると，こ



第70図　人口集中と人口密度増加の模型

Iの場合に主心密度の上昇が行なわれず，かえって低下の生ずる場合がある．すなわち中心地区の性格の職住兼用地より純職場へ転化する場合で，旧大都市の中心部ではしばしば部分的にかかる例が見出される．しかしかかる現象はミクロにみた場合のもので巨視的には中心部（増加率の低下は必至だが）はやはり増加をつづける場合が多い．すなわち，大都市発展の現在の典型的状態はIである．

のような提案がなされるのである．

このように考えて，各地方の地理的・歴史的条件を考慮しつつ新しい中心をさがすと，われわれは中国・北陸・東北・北海道の中心を，ついで中国より分離して四国を，北九州より分離して南九州を，北海道中部より分離して津軽海峡地方および北海道東部地方，といった合計12の地方を想定し得る．地形や気候条件などを捨象しているから問題はあるが，こうした地方圏の構成によって国土の産業的・文化的に均衡のとれた配置構成がえられると考える．

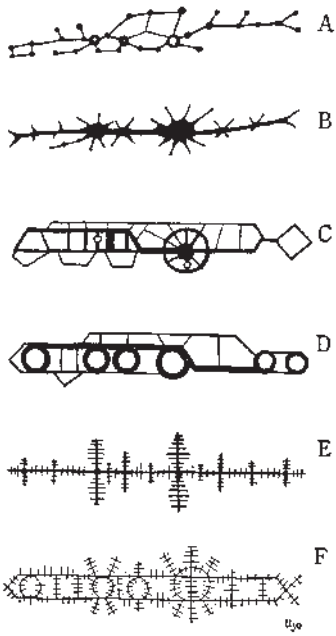
この12地方圏は従来の統計区地方区分とはちがっている．とりあえず第66図のごとき府県界をとって新しい地方圏の境界を定め，各地方についての面積，人口，人口密度，（1936年現在の）耕地面積，耕地面積比率，およびこれに終戦後の全国170万町歩開墾計画を加算した最終耕地面積，同比率を算出してしめすと，第13表となる．

第13表　地方別耕地拡張率

地方名	総面積（1930年）（km²）	耕地（1939年） 水田（町歩）	畑地（町歩）	計（町歩）	耕地拡張余地(1938年) 水田（町歩）	畑地（町歩）	計（町歩）	耕地拡張余地率（%）
北海道	88,775.036	211,028	747,480	958,508	120,000	500,000	620,000	64.8
東北地方	66,911.215	558,924	340,490	899,414	106,222	201,789	308,111	34.3
関東地方	32,243.184	416,863	535,878	952,741	59,311	182,039	241,350	25.3
中部地方	66,467.546	687,157	403,185	1,090,342	60,445	90,066	150,511	13.8
近畿地方	32,985.995	395,066	121,469	516,535	19,241	33,171	52,412	10.1
中国地方	31,672.623	334,842	135,725	470,568	39,208	54,846	94,054	20.0
四国地方	18,772.679	147,883	116,788	264,666	7,580	20,387	27,967	10.6
九州地方	42,050.541	457,324	438,216	895,541	55,520	94,764	150,284	16.8
全国	382,264.904	3,209,088	2,869,529	6,078,729	473,029	1,153,750	1,626,779	26.7

（備考）耕地面積は工政会『大東亜の国土計画』上巻所載のものによった．
総面積は1930年国勢調査報告記載のものによる．

上表は面積指標だけで地方配分を試算しており，太平洋側にたいして山陰・



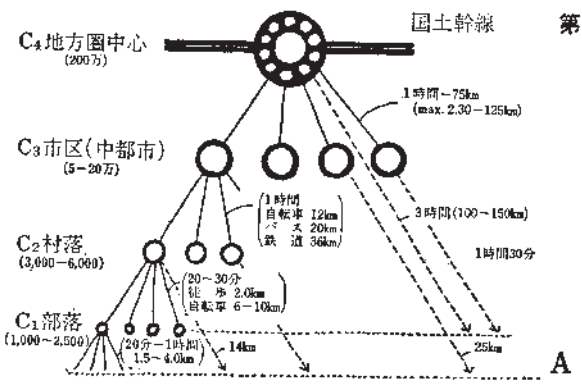
第71図　日本国土の構成模型
B—自然成長的放射構造
C—西山研究室「国土における生活空間の構想」(新建築 1966.3)
D—上田篤「くに都市の構想」(毎日新聞. 1968.3)
E，F—脊椎型及びその複合型

北陸・東北・北海道などの気候そのほかの地理的な格差条件を加味していないから，この数字を生のままでうけとることはまちがいであるが，この表の人口密度，耕地当り人口密度（耕地人口密度と呼ぶ）から，各地方圏の開発状況，その発展上の位置などを知り得，またその相対的発展余力——新都市配置余力——を知り得る．それによってわが国の人口・産業が将来どの地方に配分指向さるべきかが明らかにされる．

これによって，既開発地たる関東・近畿などの地方圏中心地および圏内の改造・再編成とともに，新しい地方圏の中心地域への巨大都市連合体の都市配置と，この新重点形成に対応する交通網の再組織などが構想されることになる．

〔補　論〕

解説前文にものべたように，本章の国土構

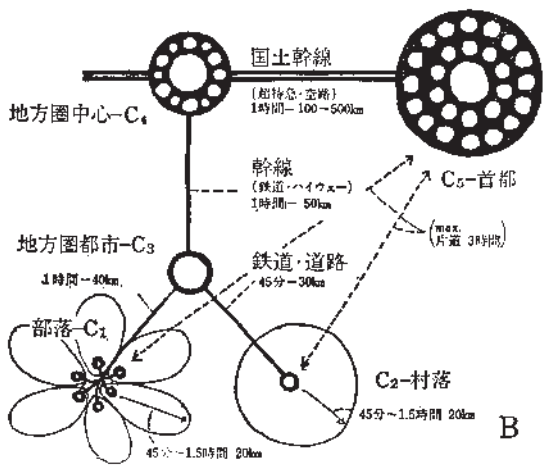


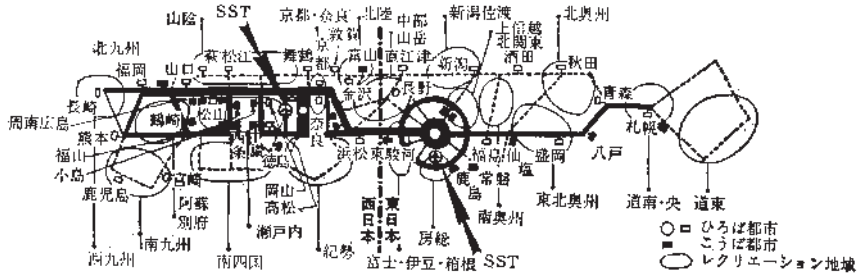
第72図　国土の圏域構造
←A本稿の案
修正案B→

成に関する試案は居住地の階層構成を主眼にしており，それが結びつくべき産業の立地を捨象している点，またその後急速な変化をみた自動車化（モータリゼーション），航空機の発達，超高速鉄道の可能性といった主として交通上の技術革新にマッチしていない点で使いものにならぬ時代おくれのパターンのようにみえる．しかし現実に進行している国土開発は，これらの技術的進歩が，高度に発達した独占資本主義によって過度集積を強める戦術・戦略として利用され，国土がひずめられてきた姿としてうけとるべき面が非常に強い．それにたいして産業立地を捨象したこの試案はむしろそういったものをチェックする条件をのべたものとして，無意味であるとはいえない．ただ，交通技術の発展を考えると，将来の構想としてはいくつかの修正が必要である．また，都市の性格や居住の構造については，そののち前述の構想を組みかえるようないくつかの提案もおこなわれている．それらはこの選集には収録していないので，ここで簡単な補足的説明を加えてその不備の一部をおぎなっておきたい．

（1）　農業地域では徒歩と自転車を主要交通手段としているが，ここでは自動車化を計画的にとり入れることにより，もっと圏域を拡大し，かつ生活向上に資する都市的集積をつよめることができる．

（2）　それによって C_4—C_3—C_2—C_1（第72図A）という段階構成から





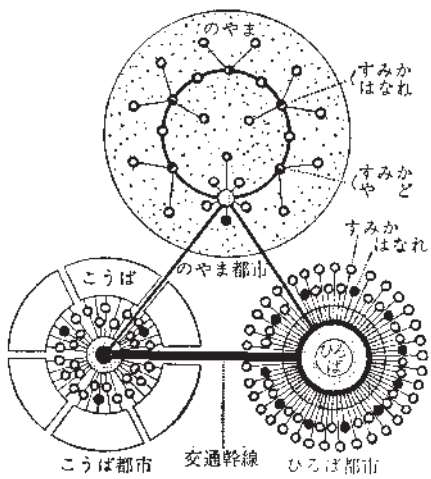
第 73 図　二角構成による国土の枠組（西山研究室「国土における生活空間の構造」，新建築 1966.3）

$C_4—C_3\begin{matrix}C_2\\C_1\end{matrix}$（第 72 図 B）という構成に転換させうる．

（3）　C_4 を連絡する幹線の強化により，国土全体の一体化が強化され，必要な連絡については全国土がその中心である C_5（首都）の「日帰り圏」内に包括されうる．

（4）　圏域構成のピラミッド型組織は，放射状連絡パターン（同心円構造）をつくりだすようだが，日本のような長大な国土，海岸線ぞいの幹線，そして急峻な山地へのこれとほぼ直交する河川・谷間平野のわりこみといった地形では，むしろ脊椎型ないしその複合型（第 71 図 E, F）を基本とすべきであろう．

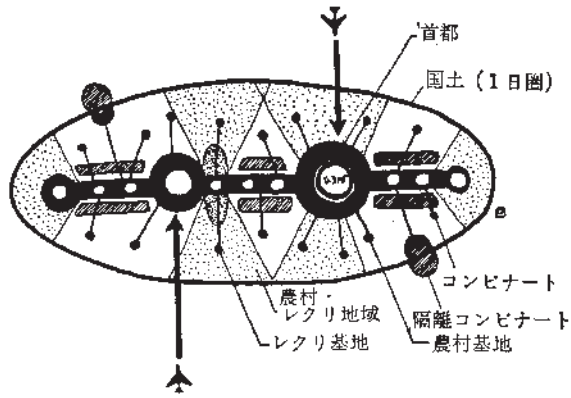
（5）　国土全体のネットワークと，C_3 集合体としての C_4，C_5 の配置構成は，



第 74 図　国土空間の定住模型

定住地の三つの型とそれをむすぶ交通幹線．
「すみか」は定住住居，「はなれ」は旅行・休養のための，「やど」は転地活動のための臨時住居．

第75図　国土の構造モデル



首都・地方圏中心をつらぬく国土幹線を背骨とする脊椎型ないしハシゴ型とともに，中心大都市圏では放射状構造よりも，ベイ・エリアをめぐる環状構造が骨格になるかもしれない．

（6）　これらのネットワークの各部分は，その機能によって航空機，超高速鉄道，鉄道，ベルト，歩道およびこれを補足する自動車路，水路などの総合的な連絡体系として構想されねばならない．

（7）　居住地＝住宅は，高密度生活空間の造出のため，日常用にはかなり圧縮されたものとなるから，それからの解放をすべての人びとに充分にあたえるような旅行・転地・休養のための施設を居住地ネットワークの中にくみこまねばならぬ．定住地（すみか）にたいし，旅行・休養のための（はなれ），転地活動のための（やど）が，各地域に配分・確保される．

（8）　都市 C_3 は，(1) 工業生産・コンビナートに結合する「こうば」都市と，(2) 流通・管理・研究・教育など，政治・経済・文化・情報の中心機能をいとなむ「ひろば」都市，および (3) 耕地・山林・水面などと結びついた第1次産業およびオープン・エリア・レクリエーション地域の中心をなす「のはら」都市との，三つの種類に大わけされ，これが国土の全域に配置される(第74図)．

以上の諸点を簡単に図化してしめしたのが第71～75図である．

ただし，ここにしめした構成パターンは，そのようなものに現実の国土がたやすく自然にかわってゆくということをしめすのではなくて，過度集積によって現実に人間のすめない環境にかわりつつある混乱した首都圏や東海道メガロ

ポリス地帯と，他方，荒廃がすすみつつある過疎地帯の発生にたいして，その反対像として出されている改善目標についての一提案であることはいうまでもない．

第10章　山岳都市

この論文は前の2章と同じく，1946年の「新建築」復刊3+4号「新しき国土建設」にのせた3篇の論文のうちの最後のもの，「山岳都市論」である．都市の建設に日本の国土の大部分をしめる急傾斜地域を利用せよという提案である．

戦時中，ただ手がるに入手できるということで，軍需工場の拡張などに立派な耕地が乱雑にドンドンつぶされてゆくのをながめていたが，戦争がおわると食料難がおそってきた．国際的な恒久平和が確立されると，合理的な国際分業によって，必ずしも食料は自給しなくてもよいということになろうが，農地を，そこから上がる収益が少ないからという資本主義経済のカラクリが生む経済性・生産性だけから評価して，つぶしていってよいというわけはない．遠くの山すそまでひろがる沖積平野に波うつ水稲のみどり，あるいは夏の夜の誘蛾灯のかがやきが一面にきらめく景観はみごとである．都市を沖積平野の上にひろがらせずに丘の上，急傾斜地にうつしてはどうであろうか．そういった気持から，戦後NHKが毎朝放送しはじめた聴取者参加番組「私たちの言葉」に投書した「山岳都市の主張」というやや素人っぽい提案をもうすこしひろげて，国土を効率よく高密度にすむための住居のつくり方についてまとめたのが，この章である．

むろん土地の利用という場合，さまざまな産業のくみあわせと配分を考えるべきである．日本の国土は，オランダのような平地と，スイスのような急傾斜地とが組みあわされていて，牧畜に適するなだらかな丘陵地は少ないといわれる．そのような比率にしては1/4ほどしかない平地に水田耕作が発達し，都市の周辺のそういった耕地が，明治以降，資本主義都市の発展によってくいつぶされていった．しかし都市は必ずしも平地を必要としない．とくに住居は．それをほかの，平地であることがヨリのぞまれるものに提供して，山の中にもちこんではどうであろう……という意味のもので，「山岳都市」というのはいささか表現がきつすぎる．むろん急峻な傾斜を利用するには，防災の問題もあり，かなり人工的な造成工事が必要である．したがって，かえって高密度・コンパクトな総合的集中開発のほうがよい．それで災害も防げる．――といった論法であるが，そこまでするのなら，すすんだ建設機械力を利用して，現存の山などにとらわれずに大規模な国土の地形改造を考えたほうがよいという論法もなりたつ．事実，戦後神戸では，裏山がけずられ，海をうめたて，山と海に同時に「平らな」土地がつくられている．また高密度居住といっても，保健性・保安性，そのための重要条件の一つとして外界への開放性を各戸に保証することを大切だと考えているが，高密度集積をさらにおしすすめてゆくと，そういった環境条件を人工装置で代替した積層住宅のほうがもっと有利なのではないかというようなこともでてくる．しかし敗戦直後のこの構想は，そこまで発展していない．何しろマメカスとイモヅルを食っていた時代の提案であるから．なお国際環境や生産技術・生活様式の変化で，今日ではほとんど問題になっていない「人口過剰」「食料自給」といったことが傾斜地利用の必要性を力説する前提として多くの紙面をさいてのべられているが，これは敗戦直後の当時人びとをつよくとらえていた問題の一つである．また，住戸の配列において日照・通風などを非常に重視しているが，それまでの住宅配置がこれを無視してきたことへの強い反撥であるとしても，これを都市造形の基本条件にすえていることは，今日からみれば短見であるといえよう．20数年前にたてられた予測をもとにして将来を論じているところは，今日からみればかなり的はずれで面白い．戦争中，おりおり考えていたことを急にとりまとめて，上のような趣旨でかいたのであるから，素朴・単純で一向的な見方しかしていない主張であるが，国土空間の利用構想の一つの考え方として収録した．（原題「新しき国土建設，第3篇 山岳都市論」，新建築1946年6月）

1. 序——山岳都市の主張

汽車や郊外電車の窓から，走り行く外の景色を眺めていると，よく目立つのは沖積平野の立派な耕地地帯の中に点々と，しかも大きく塀を繞らした工場である．日中事変，太平洋戦争を通じて，このような風景がいたるところに現出した．しかも終戦後の今日，その厳重にめぐらした塀の中には未完成の建物がポツリポツリあるだけで，わずかな完成工場も休眠状態のものが多く，広い土地は戦災地と同じように材料などが野積みにされ，とり散らかされているほかいっこう積極的に利用されていない．食糧難で山林原野の奥深くをわけ入って未開墾地の開墾が叫ばれている今日，こうした，昨日まで美田だったヨリよい土地がそのままほっておかれていてよいものか．

よろしく休眠工場の敷地を食糧増産に活用すべきである．

しかしながら，私はこの問題をさらにもう一歩進めて考えてみたい．

だいたい，工場を「平地」につくるということは，交通の至便，平坦地の必要というような要求もあろうが，市街地・農耕地・山林などの地価の相対的構成における不均衡という間隙をぬって，自由主義経済下の工業立地条件——個々の企業の最高利潤の追求という見地からおこなわれてきたものであって，そのことがけっきょく戦争中懸命の耕地拡張にもかかわらず良質の耕地の食いつぶしをもたらし，結果として今日の食糧不足という窮状を拡大したとみるべきである．これを国民全体の利益という立場から考えるならば，これらの工場の多くは耕地として利用されない，あるいは利用度の低い土地へ持っていってよいものであった．しかも今やわれわれは食糧の最大限度の自給体制の整備を内外から強要されている．われわれ国民は狭い貴重な国土を，全体としてもっとも効率を高からしめるような使い方で，その部分部分を利用し，開発してゆかねばならぬ．この観点より考えると，低湿平地は原則として水田耕地として確保すべきである．

わが国において，都市は（その発展の歴史的条件により必ずしもそうとはいえぬが），だいたい交通の要衝，農産物の集散地たる封建時代の商業都市，城下町などを中核にして発達してきている．ところがこれらの多くは河川などに接した沖積平野の中心にあり，したがって都市は平地につくられるものと先天

的に定められているごとく考えられがちである．しかも資本主義の発展がこれらの旧封建都市を中核として当だるまのようにふくれていった結果，やがてその後背地をなしている平野全体を押しつぶすようになって，近接地よりの食糧供給の困難も顕著となり，今日の過大都市論を生む結果となった．

われわれは国土のもっとも理想的な形における建設を考える場合，このゆきがかりをサッパリ捨てて，考えなおしてみることが必要である．そうすれば，あえて工場といわず住居といわず，いわゆる市街地を形成する施設のうちの多くのものが，耕地として利用し難い山林急傾斜地，時には地下へでも持っていってよいという考えが当然起こってくる．

都市を，山の中，谷あい，山の脇腹，山の上に建てることである．

むろんすべての都市をそうすることはできない．動かすことのできぬ歴史的・地理的立地条件もあろうし，全国土の中には数個の総合産業基地が必要だから，そうしたものはどうしても大平野の中心，交通の要衝に配置することが必要だ．しかし大部分の都市，とくに過大都市の弊害除去のため今やかましくいわれている中小都市の建設は，山の中へ積極的に持ってゆくべきである．

戦争中，防空上の考慮から，山の中へ，谿谷へ，地下工場といった形で，あるいはまた単に疎開といった形で，多くの工場の移転が計画され実施されてきた．これらのうちにはむろん急場しのぎで，その立地が全体の国土計画からみて不適当なものもたくさんあろう．しかしここに現われている形自体は捨て去る必要はない．いな現在のいたずらな虚脱感的放置――あるいはぶっこわしの態度をすてて，積極的にその再検討と利用とを考えるべきである．

都市の山岳への侵入，急傾斜地の利用は，従来のただ単にだだっ広い拡がりをもった都市建設方式を不利にする．上下交通は機械化され，高層建築が集約的に建てられる．そのほうが土地の利用上からいっても，土木工事の上からいっても有利である．わが国状に適した急傾斜地工事用の土木機械設備を考案発達させれば工事は按ずるほど困難ではない．また南傾斜面を利用すれば，平地では考えられないほど高密度の居住が可能となり，狭い国土にも最大限の耕地を確保できようし，また市街地面積がコンパクトになって，高度の生活設備を経済的に充実することができるようになる．

平地をうずめつくした甍の波の上に，フトン着てねたる姿の東山が紫に見え，

それを背景に黒谷，祇園，清水の堂塔寺社が浮き出す景色を古き日本の代表的都市景観だとすれば，私は一面にひろがる黄金の波うつ平野と，その縁辺をくまどる緑紫の山々，そのふもとから中腹にかけて白い水平線が幾条にもきざまれて健康的な不燃高層住宅街がつくられ，一番下の平野に接する部分には電化された工場や地下街の入口などが見え，そこを高速度交通機関が矢のように走っているという景観を，新しい日本の姿と夢想する．

耕して山にいたるでなくて，住んで山にいたるである．

食糧難の解決に惨憺することも必要だが，ジックリとこのような百年の計を考え，それに個々の緊急対策をそわせてゆくだけの余裕をわれわれは持ちたい．

私はここに，わが国の都市建設の重要な方向として，山岳都市の建設を積極的にとりあげるべきことを主張する．

題して「山岳都市の主張」とする．

―― 1945年12月9日朝放送「私達の言葉」 ――

2. 国土の有効利用の要請

現在および将来においてわが国の当面する最大の問題は，これを人口問題という面から見れば「人口過剰」ということに要約できる．それは，その解決の方法を誤ると最悪の状態へ追いつめられるおそれがあるといえる．

およそほかのものに比して人口が比例を失して大なる場合はすべていちおう人口過剰といい得るが，人口問題でいう人口過剰とは，動かしがたい条件（これも絶対的とはいいがたいが），すなわち一般に一国の自然富源にたいする「過剰」をさすものとされる．そして，人口問題上，人口の増加が生活程度の低下をみちびくような場合は相対的人口過剰とよばれ，その一部が生存し得なくなる場合を絶対的人口過剰と呼ぶ．一定の生活程度において人口を収容する能力を人口扶養力というゆえ，前者は人口扶養力が人口の増加に並行して絶対的に増加し得てもそれに比例的には増加し得ない場合であり，後者はさらにこれに加うるに扶養力増加の不足を補う生活程度の切下げが不可能な場合である．

むろんここにいう「人口扶養力」なるものは一つの抽象であって，それは国民経済の構造によって異なる．生活程度の切下げ，あるいは生存の脅威などを規定するものは超歴史的な「扶養力」ではなく，人口「過剰」は生産関係の矛

盾にもとづく生産力発展の抑止，分配の不公平（一部における浪費と一部における不足）とによって生じている場合が多い．しかし，仮りにこの「人口過剰」を判定すべき基準として，このような社会的・経済的矛盾をもふくめた全体としての扶養力なるものを考えてみると，これを規定する条件として，生活必需品，とくに食糧および原料などの生産要素の一つであり，あらゆる生活の場でもある土地資源がもっとも注目を要するものとしてうかび上ってくる．土地は，世界的にも一国としても，その広さに限界があり，その利用は一定の生産関係と技術的条件の下には，それによって支持されている生活必需品の生産を限定する大切な基礎的条件の一つである．

土地は，一般には集約的に利用されている場合ほど収穫逓減の法則によって人口増加に対応する扶養力の増大が期待し得られないゆえ，領土の拡大がのぞまれない国においてはいわゆる人口過剰の状態に陥る傾向が強い．わが国は人口7,000余万を有するにかかわらず，国土面積が狭く，人口密度は高い．しかもその国土のうち直接食料生産に利用されている耕地について比較すれば，さ

第1表　主要国人口・国土および耕地

国名	人口1人当り国土 ha	人口1人当り耕地 ha	農業者1人当り耕地 ha	同，日本を1とする比率
日本	.55	.087	.42	1.0
中国	2.2	.26	1.1	2.6
インド	1.32	.32	1.2	3.0
オランダ	.40	.11	1.4	3.3
イタリア	.73	.30	1.5	3.6
ベルギー	.36	.13	1.7	4.0
ポーランド	1.13	.55	1.8	4.3
ドイツ	.70	.29	2.1	5.0
英国	.52	.09	2.7	6.4
フランス	1.32	.51	2.7	6.5
スエーデン	7.15	.59	3.6	8.6
デンマーク	1.16	.72	4.8	11.5
アメリカ	6.25	1.07	12.8	30.0
カナダ	87.00	2.12	19.6	42.0
オーストラリア	114.00	1.75	20.7	50.0

（備考）　各本国のみについての計算．
北岡寿逸『人口政策』123ページによる．

第2表　土地利用状況(1936)

国名	総面積 ha	耕地 %	永久放牧地及採草地 %	森林 %	その他 %
日本	38,225	15.8	8.7	51.5	21.0
満州国	130,314	14.1	…	16.8	69.0
インド	269,869	46.6	…	13.4	45.0
オランダ	3,293	29.2	39.2	7.4	23.8
イタリア	31,019	41.7	18.8	17.9	21.6
ベルギー	3,051	34.8	23.2	—42.0—	
ポーランド	38,863	47.7	16.7	21.4	14.2
ドイツ	47,071	41.2	18.2	27.4	13.2
英国	9,307	60.4	17.5	11.8	10.3
フランス	55,099	38.3	20.7	19.5	21.3
スエーデン	41,024	9.1	2.7	54.2	34.0
デンマーク	4,293	61.9	9.9	—28.2—	
アメリカ	770,213	16.8	…	…	…
カナダ	897,821	2.6	…	…	…
オーストラリア	122,388	6.0	…	…	…

（備考）　第57回帝国統計年鑑による．

らにその度合は大きい（第1表）．わが国土の大部分は山林急傾斜地であって，他国のように耕地拡張の余地はきわめて乏しい（第2表）．したがって，ほかの条件にして同一ならば，いわゆる「人口過剰」の状態へ転落する危険をもっとも多く持っている．

むろん一国の人口扶養力は必ずしもその国土のもつ土地資源のみに左右されず，商工業と貿易とによってその扶養力をその国土以外のものに依存せしめ得る．しかし，かかる方向への解決を持続するためには，国際関係の恒久平和という前提条件に加うるに，その扶養力の確保はかなりの程度に他国の世論の動きに従属させられるゆえ，確実なる扶養力の確保は必ずしも期待し得ない．しかも現在のわが国は連合国軍の占領下にある戦敗国として貿易の自由をもたず，最低限度の生活維持になお多くの困難を予想しなければならない状態にある．また現在わが国は30年来の大凶作という特殊条件の下とはいえ，食糧の絶対不足に直面し，国民生活および国民経済活動の最低限度を維持することすら困難であるという未曾有の難局に直面している．しかも将来にたいしては，われわれはさらにこのうえ年々増加してゆくわが国の人口のことも考えねばならない．

われわれ国民にとってこのようなわが国民経済の発展を制約している人口過剰的傾向を解決するため，人口扶養力を規定する生産関係，すなわち国民経済の構造をヨリ合理的ならしめる努力をなすべきであると同時に，またその維持確立のため限られたわが国土を最高度に利用すること，ヨリよい利用形態を実現すべく長期にわたる国土開発の方向を確立することが絶対的重要性をもった問題となってくる．

さて著者がここで問題にするのは，とくにこのうちの後者，人口と土地との関係である．そのため，四つの島に7,000万の人口が押し込められ，自活の道を見出してゆかねばならない今日，この二つの対応条件——人口と土地——が将来いかに変化してゆくであろうかを，いちおう検討してみる必要がある．

わが国の人口増加の趨勢については日中事変以前より多くの研究者によって論ぜられてきた．その結論は全き一致をみていないが，だいたい諸先進国の例より推測して，人口変動の第2期の終りにあるということに意見の一致をみていた．

近代文明国の過去およそ125年間の人口変動をみるに，四つの時期が区分さ

れる．第1期は出生率がやや上昇するが死亡率はほとんど停頓ないしやや上がり気味で，自然増加率は上昇する．第2期は出生率が低下しはじめるが，死亡率はそれよりも急速に低下して自然増加はなお継続する．第3期はこれにつづいて出生率はなおも急激に低下するが，死亡率の低下速度は漸減し，停頓するにいたり，自然増加は急激に減少する．出生率と死亡率の低下はなおつづいて，前者はゼロまで下り得る．しかし，後者は人間が生物である以上その低下に限度があるから，前者が後者よりも低下するようになって，その結果自然増加がマイナスに転ずるにいたる．これがすなわち第4期である．

わが国の人口事情がこのような衰退の第1歩，第3期の初めにあるということは，日中事変の進展という困難な情勢下にかかわらず，時の政府によって人口増強の諸政策をある程度具体化せしめたのであった．このような人口政策の実施によって，人口変動は必ずしもこの公式通りに変動するものとは予想できないが，以上に述べた先進諸国の先例より推して，わが国の人口増加の趨勢にたいしては種々の予想が成立し得る．これらのうち，若干のものをしめすと，第3表のようになる．

第3表　わが国将来の人口に関する推測（単位千人）

年次	(1) 内閣統計局(1927)	(2) 下条氏 (1931)	(3) 左右田氏 (1931)	(4) 上田氏 (1933)	(5) 中川氏 第1	(6) 中川氏 第2	(7) 人口問題研究所(1941)	(8) 川上・久保氏 (1941)	(9) 北岡氏
1935	66,533	68,527	66,860	68,016			69,254		
1940	71,681	72,626	71,123	71,123	74,027	73,939	74,035	73,156	73,528
1945	76,144	76,298	75,667	75,261	79,202	78,985	79,291	80,110	77,972
1950	80,768	79,454	80,437	78,355	85,124	84,336	85,170	87,678	83,856
1955	86,563	82,014	85,292	81,144	91,544	90,107	91,589	93,264	90,276
1960		83,912	90,351	83,582	98,278	95,955	98,312	100,044	96,891
1965		85,099		85,776	105,193	101,608	105,231		
1970		85,542		87,723	112,356	106,857	112,408		
1975					119,963	111,453	120,005		
1980					128,161	115,379	128,190		
1985					137,001	118,554	137,018		
1990						120,914			
1995						122,528			
2000						122,741			

〔備考〕　本表は野間海造『日本の人口と経済』，308ページによる．
中川氏第1は1935年の死亡率，出生率の永続を仮定，第2は出生率，死亡率共に最近の傾向をたどって逓減するものとす．上田氏は年齢別死亡率一定，出生率一定（210万）とし，北岡氏は1941年の自然増加率14.4‰を一定とせるもの．

これらの推測を通観すると，人口増減を規定する諸条件が長期にわたって変化しないと考え，現在程度の増加率が永久に持続されるとする（増加の側よりみた）楽観的見解を上限として，出生率の減退を予想する種々の悲観的見解があり，その仮定条件いかんにより，無限に増加をつづけるという第1の見解を除いては，いずれも早くて30年，おそくて80年前後に人口の絶対量は増加の頂点に達することが予想されている．そしてその上限人口は9,000万～1億2,000万程度となっている．

今次戦争の敗戦，ポツダム宣言の受諾による日本人の生活圏の圧縮，それに加うるに戦争による過去の蓄積の消尽は，日本人の生活条件，あるいはわが国の人口扶養力をいちじるしく低下せしめたが，それと同時に一方，戦争による多量の人口の戦死・戦災死（約75万といわれる）があり，これにつづく食糧難を頂点とする経済的破局の結果としての人口減少が予想されている．またこの困難な状態を解決すべく，産児制限が説かれている．

これらの事情は，戦前の人口趨勢の予想，なかでも楽観的予想を根本から覆えす要素をふくんでおり，その結果わが国の人口変動が将来いかなる形をとるかはにわかに予断しがたい．しかし，たとえその増加趨勢が大きな挫折を経験するとしても，われわれはなお当分わが国の人口の「増加」を予想すべきであり，その実現の時期に多少のおくれを生ずるとしても，結果において1億を超える人口が四つの島に生活する状態の到来を予想しておかねばならないであろう．

これにたいして，方程式の他の側，わが国の資源・土地はどうであろうか．

食糧・燃料・原料の生産要素としての土地のうち，さしずめその拡がりがもっとも問題となるのは，食糧についてである．

わが国（内地）の耕地面積は大正中期以降だいたい600万町歩（その過半320万町歩が水田となっている）を上下してあまり増加をしめしていない．むろんこの間，開墾が相当おこなわれたのであるが，それにもかかわらずそれらは結果として市街地の拡大，工場・建物・道路・鉄道・河川改修などの文化的施設のための文化的潰地の穴うめに充当される以上のものとはならなかった．

敗戦の結果，食糧自給体制強化のため大規模な開墾計画（1946年より5ヵ年計画をもって，開墾155万町歩――内地85万，北海道75万町歩，千拓10万町歩――湖面7.5万，海面2.5万，土地改良210万町歩，3ヵ年で米換算2,000万石増産――日本

産業経済，1945. 11. 11）が樹立されているが，これはまずわが国の耕地面積拡大の最大限度をしめすものであろう．したがって，本拡張計画完成後のわが国の耕地面積は約770万町歩となる．これがわが国耕地面積のいちおうの面積的上限である．

とすれば，この耕地と人口の関係が，「食糧自給」という面のみを仮りにとりあげて検討してみると，どのようになるであろうか．

この検討をすすめるため，人口増加の予想としては（A）人口問題研究所のそれと（B）単純な幾何級数的増加率（年1.35%）を予想するものとの，二つをとってみる．

つぎに食糧所要量については，米1人当りの消費量，大正中期より最近にかけて1人当り年1.00石～1.15石の平均1.10石とすると，この人口変化に対応する食糧所要量は第4表の（3），（4）のようになる．

第4表　将来における食糧自給のための耕地面積所要量

年次	人口予想		所要主食糧(百万石)		(5)	(6)	所要耕地(百万町歩)	
	(1) 人口問題研究所(1941)	(2) 単純増加計算	(3) (1)の場合	(4) (2)の場合	反当り産米量	(5)×60%	(7) (1)の場合	(8) (2)の場合
1945	78,985,589	78,200,000	86.8	86.0	2.10	1.26	6.88	6.92
1950	84,336,487	83,607,530	92.6	92.5	2.17	1.30	7.12	7.11
1955	90,107,431	89,388,856	99.0	98.3	2.24	1.34	7.38	7.33
1960	95,955,701	95,569,784	105.4	105.1	2.31	1.39	7.59	7.57
1965	101,608,567	102,178,466	111.7	112.4	2.38	1.43	7.81	7.87
1970	106,857,962	109,243,836	117.3	120.2	2.45	1.47	7.97	8.17
1975	111,453,360	116,797,596	122.6	128.5	2.52	1.51	8.11	8.50
1980	115,379,596		126.9		2.59	1.56	8.13	
1985	118,554,200	133,509,296	130.2	146.9	2.66	1.60	8.13	9.18
1990	120,914,016		133.0		2.73	1.64	8.11	
1995	122,328,494	152,611,992	134.6	167.9	2.80	1.68	8.00	10.00
2000	122,741,777		135.0		2.87	1.72		
2005	122,186,682		134.4		2.94	1.76		
2010	120,737,750		132.8		3.01	1.81		
2015	118,492,685		130.3		3.08	1.85		
2020	115,465,386		127.0		3.15	1.89		
2025	111,776,766	199,407,654	123.0	219.4	3.21	1.93	6.37	11.47

（備考）　人口予想（1）は人口問題の案（1941）55ページによる．（2）は拙稿「新日本の住宅建設」（著作集1，第24章）における人口予想（年増加率1.35%）による．

これを仮りに全部国内生産によってまかなうとすれば，これにたいする所要

耕地は(7)，(8)となる．ただし，耕地面積にたいする食糧の生産量については，全然変化なしとみるのも消極的と考えられるので，1884（明治17）年以降の反当収量の増加傾向（10年間0.14石）が土地の改良，農業技術の進歩などにより今後も持続されるとみ，(5)のように反当収量の変化を予想した．そして簡単にするため全耕地のうち60%が水田（米作地）として利用されるものと考えて，全耕地の反当収量を(6)のように考えた．

この(7)(8)の計算値を，最大耕地面積770万町歩と比較してみると，食糧自給は上記開墾計画が実現されれば当分のあいだ可能である．しかし20年後の1965年には明らかに自給不能となる．ただし，反当収量の持続的増加が保証されるとし，かつ(A)のような状態でわが国の人口増加が停滞に向かうとすれば，1975～85年ごろの所要耕地813万町歩程度を上限として耕地要求が減少傾向に転ずる．ただこの場合においても約40万町歩の耕地不足がある時期に生ずることを予想しておかねばならぬ．

第5表　新市街地所要面積

年次	増加人口		所要面積 (km²)	
	(A)	(B)	(A)	(B)
1950	5,350,898	5,407,530	535	541
1955	11,121,842	11,188,856	1,112	1,119
1960	16,970,112	17,369,784	1,697	1,737
1965	22,622,978	23,978,466	2,262	2,398
1970	27,882,373	31,043,836	2,788	3,104
1975	23,477,771	38,597,956	3,248	3,860
1980	36,404,007		3,640	
1985	39,568,611	55,309,296	3,957	5,531
1990	41,928,421		4,193	
1995	43,342,905	74,411,992	4,334	7,441
2000	43,756,188		4,376	
2025	32,791,177	121,207,654	32,79	12,121

しかるに，以上の比較は，人口増加そのほかに起因する耕地の文化的潰廃を全然考慮に入れない場合であって，これはありえない．人口の増加は当然，文化的施設のための新用地を必要とする．その量はどれほどであろうか．

仮りに市街地（または居住地）面積1 km²当り1万人としても，1945年以降の増加人口によるあらたな市街地――文化施設用地――所要面積は，1985年において，A計算の場合3,957 km²，B計算の場合5,531 km²，すなわちそれぞれ40万町歩あるいは55.7万町歩となる．

これをいずれに求めるかによって，わが国の食糧自給体制に重要な変化が生ずる．

すなわち，もしこれを耕地である平地の潰廃によりまかなうとすれば，人口増加を(A)計算によるとしても，1985年において80万町歩——8,000 km²，約1割の耕地不足を現出する．しかしこれをもし耕地として利用不可能な山林急傾斜地の利用によってまかなうならば，耕地不足は半減（5.0%程度）するし，さらに山林急傾斜地利用をその倍にすれば——すなわち，増加人口の2倍の量の人口を山林急傾斜地に入植移住せしめることができれば，食糧生産にかんするかぎり，いちおう自給体制を確立することが可能である．

しかし人口趨勢がこのように衰減の方向にむかわないとしたら，ここにいう自給体制の達成はさらに困難となる*)．このことは，山林急傾斜地を都市として利用することの重要性をますます大きくするだろう．ただあまりに遠き将来のことを仮定して立論することは危険であるから，いちおうわが国の人口増加趨勢を人口問題研究所推算の程度のものとし，その上における食糧自給体制の確保ということからして，年々の増加数に倍する人口を山岳地域へ移住させるという目標をたてることができる．

3. 高密度居住への技術的対策

狭い土地資源の上に高密度の人口を扶養するためには，まずわれわれは都市立地の指向をできるだけ耕地として利用しがたい山林急傾斜地に向けるべきこと，かくて国土全体の最高効率の利用を企図すべきこと，それによってわが国の食糧自給体制の樹立がかならずしも不可能でないことを明らかにした．

つぎに考えるべきことは，このようにつくられる都市が，高密度居住を実現することである．

高密度居住の実現は，明らかに二つの積極的意義をもつ．第1は，その建設を集約的に遂行させ得ることによって，土地の改良，都市施設の費用を相対的に低下せしめることである．第2は，その占有面積の縮減によって，平地にある場合は生産耕地の食いつぶしを少なくし，山林にある場合は一定の適地にヨリ多くの人びとを収容することにより平地居住人口の移住吸収を大ならしめて，

*) 原子核エネルギーの利用に関する進歩，あるいは食糧の工業的生産方法の発明などのごときは，ここに問題としている人口扶養力の限界を徹底的に変革するかもしれない．しかしここではそのような予想を組みいれずに話をすすめた．

生産耕地の確保・拡大に貢献し得ることである．

この努力は，今ここに問題としている山岳都市だけでなく，平地にたつ既存都市の改造においても同様，重視すべき事項である．むろん，ここにいう高密度居住は，居住の保健性・保安性，なかんずく居住空間の開放性などの確保を犠牲にしておこなわれるものであってはならない．この点，たとえば建物配列に際して居住空間に一定時間の日照を確保し，また通過通風を確保するなど，一定の最低条件を無視するような高密度集約建設の方法は採用すべきではない．

しからば，このような条件を留保しつつ居住密度の向上をはかるにはどのような方法が考えられるか．これについては，高層化，せり出し，南斜面の利用という次の三つの方法を提案しうる．

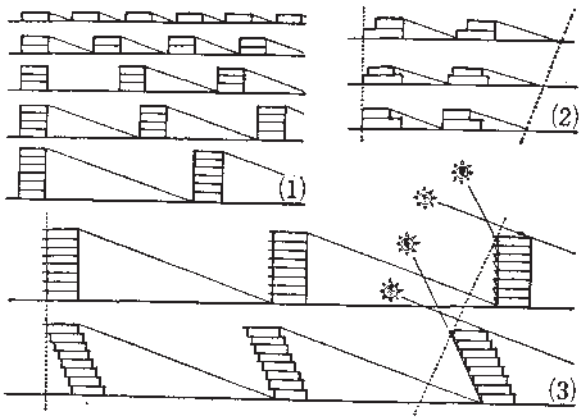
（1）　高層建築の採用

各住戸の開放面を南北にとり，住戸を東西列に配置する方法がわが国の気候的・地理的条件からもっともよいこと，このばあい南北の列間隔が住居空間の開放性・健康性を規定する条件であること，同一開放条件（天空角）を確保するためには，建物列を階層的に積み重ねるほど地積の所要量が少なくなることなどはすでに明らかにしたところである(「新日本の住宅建設」，著作集1，第24章)．ただ高層住宅は，ある程度以上，通常少なくも5階建以上になると，その上下交通（階交通）を機械化する必要が生じ，機械化すればその維持管理，経営上の条件から廊下式住居形式が必要となり，その結果，1戸当り建築床面積の増大，居住面率の低下をきたすため，列間隔の縮小による土地面積の節約に比例した居住密度の上昇を期待し得ない．したがって階層つみ重ねは，むろん高層となるほど居住密度の上昇を生むが，平坦地に建設する場合，階段型形式の採用可能な4階建程度が階交通の機械化による困難をともなわないから，かなり有利な階数であることが一つの結論として得られていた．

（2）　せり出し「建築」

住宅の列間隔・列空隙を規定する条件は，前方(南方)列建物の北側最上端と後方（北側）列建物の南面最下端との水平および垂直距離の関係であり，この両者を結ぶ線以下にある前面（南側）建物列の突出部はいくら存在しても後方建物の開放性には何ら影響がない．この事実は平家建の場合あまり重要な意味をもたないが，2階建の場合に上階奥行が下階奥行にたいし短くなってくると

その上階の配置いかんにより，同じ床面積の建物についても列間隔に差を生ずる（第76図(2)参照）．こうした理由から，通常の構造方法では2階建の場合，南面（前面）を揃える建て方が居住密度を上昇せしめるために最上の方法となる．これは，2階建住戸の標準型探求においてこのような形式を原則として採用した理由である．



第76図　住棟間隔図

このような考え方を高層形式においても利用する方法がないであろうか．

だいたい同一形式の住戸のつみ重ねであるから，階により建物奥行が変わるということはあり得ない．したがって2階建で採用したような解決方法は応用し得ない．ただ図の(3)にしめすような，廂を利用した上階の南方向こり出しによる解決が一案として考えられる．

わが国の気候は全般的に多雨であり，とくに梅雨期においては雨がふりつづく．また夏期は高温多湿で，夏期の日光の屋内射入はできるだけ防がねばならぬ．この二つの事情から，奥行の深い廂が発達し，とくに南面の開口には廂およびこれと相補足する縁側が不可欠の要素となっていた．ところでこの廂は，ただ雨と太陽の遮蔽物であればよいので，その上部が何に利用されていても，それを必要とする開口面あるいは住居空間にとっては問題とならない．そこで，上階の住居空間をこの廂の上にせり出してくれば，それだけ上階の北側上端線がその建物列の後方（北側）にある建物列との水平距離をます．したがって同一開放条件を保持するとすれば，それだけ建物間隔をちぢめ得て，建設密度，したがって居住密度を向上し得る．

その程度を算出してみる．

〔**廂の出**〕　わが国主要都市の緯度は鹿児島の31°36′より札幌の43°49′のあいだにあるが，35～36°がもっとも多い．太陽がもっとも高くあがる夏至の入

斜角は，この緯度より23°47′を減じたもので，それは7°49′より19°17′（最頻値12°程度）ということになる．いま全国の標準（代表）として東京の35°39′をとると入斜角は11°52′となり，これをさえぎるための廂の出は高さにたいしてtan 11°52′＝0.210となる．階高を2.7 mとすると廂の出は0.565 mでよいことになる．

しかし，廂による太陽入射の遮蔽の必要な時期は，盛夏の候，まず8月中であるから，太陽はこれよりもさらに低くなる8月末日をとると，日南中の高度はだいたい64°となり，cot 64°＝0.488で，2.7 mにたいし廂の出は1.317 mを所要する．従来わが国の一般住宅において設けられる廂の出は0.6～1.0 m程度のものが多い．

この点を考慮して，廂の出の標準を1 m（1単位）とする．

この場合，冬至の太陽入射距離はtan 59°26′＝1.693であるから，階高（内法）2.4 mとして（1.693×2.4－1.0m）＝3.23 mとなる．すなわち1 mの廂があっても全体の入射面4.23 mにたいし76.4％が室内に入り，利用される．

第6表　せり出し建設による居住密度の上昇比率

住居形式	建物高さ h(m)	通常の場合の列間隔 (Sm)		せり出し建設の場合の列間隔-(S′m)		居住密度（普通の場合）		同（せり出し建設）		列間隔縮小率	
		4時間	6時間	4時間	6時間	4時間	6時間	4時間	6時間	4時間	6時間
1 C	3.90	14.80	16.36	14.80	16.36	203.33	182.15			100.00	100.00
2 C	6.60	18.20	20.84	17.20	19.84					105.81	105.04
3 D	9.30	25.60	29.32	23.60	27.32	297.64	259.85	322.85	278.87	108.47	107.32
4 D	12.00	31.00	35.80	28.60	32.80	327.72	283.79	362.82	309.76	110.71	109.15
5 EF	14.70	37.40	43.28	33.40	39.28	302.81	261.56	339.09	288.29	111.98	110.18
6 EF	17.40	42.80	49.76	37.80	44.76	317.53	273.08	359.54	303.58	113.23	111.17
7 EF	20.10	48.20	56.24	42 20	50.24	328.94	281.93	375.72	315.59	114.22	111.94
7(3D4E)	〃	〃	〃	〃	〃	334.76	286.91	382.36	321.17	〃	〃
7(4D3E)	〃	〃	〃	〃	〃	336.69	288.57	384.57	323.03	〃	〃
8 EF	22.80	51.60	62.72	44.60	55.72	351.17	288.91	406.30	325.20	115.70	112.56
8(3D5E)	〃	〃	〃	〃	〃	356.61	293.36	412.60	330.21	〃	〃
8(4D4E)	〃	〃	〃	〃	〃	358.41	294.83	414.68	331.86	〃	〃

（備考）住居形式（C, D, E, F）は著作集1，第24章参照．

〔**列間隔**〕廂の出を1 m，階高2.7 m（したがってtan β＝0.370）とせる場合の列空隙 α は，

$$\alpha = \mathrm{ha}(\tan\alpha - \tan\beta) + 1.0\ \mathrm{m}$$

ただし，＋1.0 m は最上階の廂の突出 1 m が列間隔短縮に役立たないための修正である．

となる．tan α として，東京における冬至 4 時間日照（2.0）および，6 時間日照（2.4）をとると，

$$l_6 = 2.05\,\mathrm{h} + 1\ \mathrm{m}\ (6\text{時間日照}),\quad l_4 = 1.65\,\mathrm{h} + 1\ \mathrm{m}\ (4\text{時間日照})$$

を得る．

列間隔はこれに最上階の建物列の奥行を加算せるものである．

〔**居住密度**〕 居住密度は住居形式（階数・住戸形式）により異なる．いま前研究（前出「新日本の住宅建設」）において計算せる標準型住居案を例にとって計算してみると，第 6 表のごとく平家建の場合は何ら変わりはないが，2 階建において普通りの建て方のものよりも居住密度において 5.8%（6 時間日照のばあい 5.0%）の上昇をみ，階数の増加とともにその比率は増加する．すなわち，4 階建の場合は 10.7%（9.1%），7 階建で 14.2%（11.9%），8 階建で 15.7%（12.6%）の上昇となる．だいたい中層形式で 1 割まし，高層形式で 1 割半まし，というところである．

その結果として，中層形式（4 階建）では 4 時間日照の場合に標準住居案をとって，人口密度が普通のばあい 327.7 人/ha が 362.8 人/ha となり，8 階高層形式では 358.4 人/ha が 414 人/ha となる．

ただし本建設方式は建築構造上南面せり出しの支持方法に難点がある．とくに高層形式となると，せり出しによる建築物全体の構造の不安定をいかに除去するかという構造設計上の難点が増加する．これがため，その大々的利用は困難であろう．

（3） 南斜面の利用

建設地が南下りに傾斜している場合，後列の建物ほど前列の建物地盤より上がることになるから，南面開放条件（天空角）を同一にする場合は傾斜が大となるほど建物間隔を縮小し得る．したがって南斜面を利用するということは，耕地として利用しがたい山岳地に都市を配置するという利益に加うるに，きわめて高い密度の居住を可能にし，コンパクトな都市を建設し得るという利点をあたえる．

建物間隔の縮小，したがって居住密度の上昇がどの程度になるかを若干の傾斜条件について算出すれば次の通りである．

まず，北上りの傾斜によって生ずる各傾斜度の傾斜面における（建物列間隔の平地の場合にたいする）縮小比率（したがって居住密度の増加率）を，傾斜度を表わすに垂直距離に対する水平距離の比(第79図)で表わすと次表のごとくなる．

傾斜度(S/hd)		10.0	8.0	7.0	6.0	5.0	4.5	4.0	3.5	3.0	2.5	2.0	1.5	1.0
居住密度倍数	4時間日照	1.20	1.25	1.29	1.33	1.40	1.44	1.50	1.57	1.67	1.80	2.00	2.33	3.00
	6時間日照	1.24	1.30	1.34	1.40	1.48	1.53	1.60	1.69	1.80	1.96	2.20	2.60	3.40

この比率を利用して，建物列間隔の条件として4時間日照および6時間日照の2種をとり，建物間隔ならびに（修正）人口密度を計算してみると第7表のようになる．ただし本計算では次の2点に注意する必要がある．

第1，急傾斜の場合，階数の少ない住居形式では列間隔が狭くなって建物と

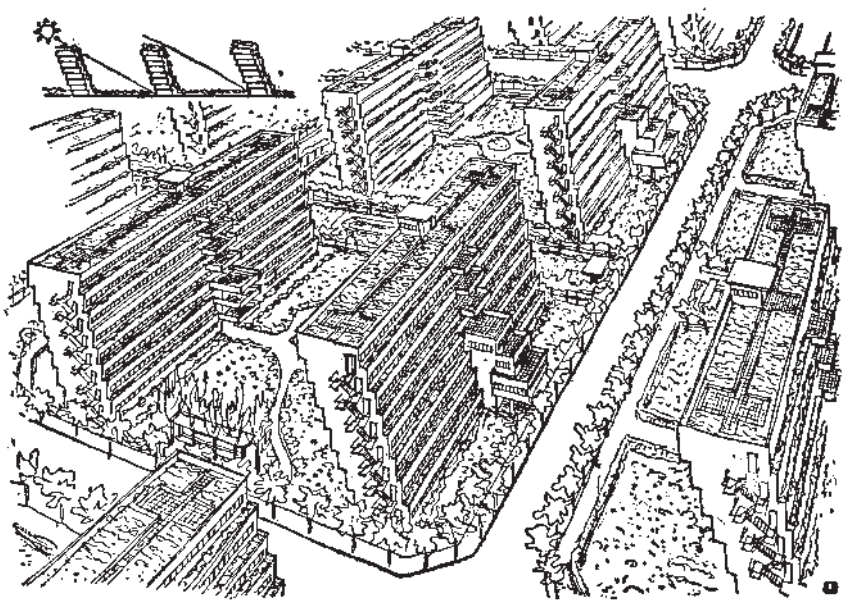
第7表　南傾斜面における傾斜度と列間隔ならびに居住密度

住居形式		4時間H照の場合					6時間H照の場合				
		平地	1/3.0	1/2.5	1/2.0	1/1.5	平地	1/3.0	1/2.5	1/2.0	1/1.5
列間隔(Sm)	1C	14.80	13.00	13.00	13.00	13.00	16.36	13.00	13.00	13.00	13.00
	2C	18.20	13.00	13.00	13.00	13.00	20.84	13.58	13.99	13.00	13.00
	3D	25.60	15.36	14.22	13.00	13.00	29.32	16.29	14.96	13.33	13.00
	4D	31.00	18.60	17.22	15.50	13.29	35.80	19.89	18.27	16.27	13.77
	2EF	22.20	14.00	14.00	14.00	14.00	23.84	14.00	14.00	14.00	14.00
	3EF	25.60	16.36	15.22	14.00	14.00	30.32	16.84	15.47	14.00	14.00
	4EF	31.00	19.60	18.22	16.50	14.29	36.80	20.44	18.78	16.72	14.15
	5EF	37.40	22.44	20.78	18.70	16.03	43.28	24.04	22.08	19.67	16.65
	6EF	42.80	25.68	23.78	21.40	18.34	49.76	27.64	25.39	22.62	19.14
	7EF	48.20	28.92	26.78	24.10	20.66	56.24	31.24	28.69	25.56	21.63
	8EF	51.60	32.16	29.78	26.80	22.97	62.72	34.84	32.00	28.51	24.12
居住密度(人/ha)	1,2C	203.33	244.01	244.01	244.01	244.01	182.15	244.01	244.01	244.01	244.01
	3D	297.64	495.07	535.75	586.12	586.12	259.85	467.73	509.31	571.67	586.12
	4D	327.72	546.20	589.90	655.44	764.68	283.79	510.82	556.23	624.34	737.85
	2EF	213.69	312.37	312.37	312.37	312.37	190.02	312.37	312.37	312.37	312.37
	3EF	255.45	425.75	459.81	468.54	468.54	224.51	403.40	430.26	468.54	468.54
	4EF	283.13	471.88	509.63	566.26	600.65	246.20	443.16	482.55	541.64	640.12
	5EF	302.81	504.68	545.06	605.62	706.56	261.65	470.07	512.83	575.63	680.20
	6EF	317.53	529.22	571.55	635.06	740.90	273.08	491.54	535.24	600.78	710.01
	7EF	328.94	548.23	592.09	657.88	767.53	281.93	507.47	552.38	625.25	733.02
	8EF	351.17	585.28	632.11	702.34	819.41	288.91	520.04	566.26	635.60	751.17

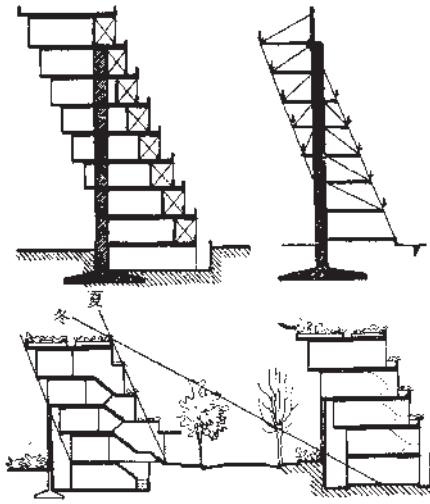
建物とのあいだに道路などをとる余裕がなくなるばかりでなく，はなはだしい例では計算上，建物奥行よりも列間隔が短くなり，建物が重なり合うようになってくる．これは不合理であるから，最小限列間隔は建物奥行に最小道路幅として6mを加えたものと定めた．

第2，住居形式としてはA型ないしC型の各種のものが考えられるが，A，B，Cなどの分散形式は斜面敷地の造成工事の困難さを考えて，不適とした．したがってD型以下の複層形式のもののみを考えるが，斜面に住宅が配置される関係で屋外交通に上下交通が多く入ってきて，屋内交通のそれと合して上下交通が非常に多くなる．この上下交通をできるだけ軽減することが住戸配置上もっとも重点をおくべきところである．その方法として屋内，屋外の上下交通を可及的に機械化することが考えられる．それには，住居形式も当然それに合致したものとする必要がある．したがって本研究では住居形式は主として階交通の機械化を予想したEF形式をとり，参考のためCD形式のものについても居住密度を算出してみた．

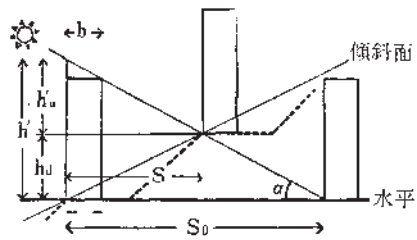
4時間日照の場合をとって，これによってみるに，平地では4D形式で1 ha



第77図　せり出し構造の高層住宅街



第78図　せり出しの構造形式



勾配　$I=S/h_d$

密度係数 $K=S_0/S=h'/h'_u$

$=1+h_d/h'_u$

$=1+S/Dh'_u$

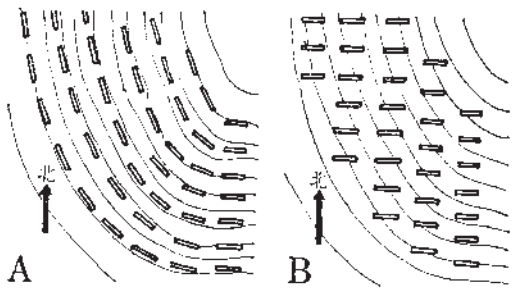
$=1+I\cot\alpha$

第79図　正南斜面の住棟列間隔

当り328人，8EF形式で351人であるが，1/3の傾斜面では約6割ましの546人および585人となり，1/2の傾斜面では約2倍の655人および702人という居住密度を確保し得る．むろん傾斜地を利用する場合は，傾斜地はつねに谷と尾根とを持っていて，その地形の関係で平地のように自由な建物の配置が困難で，ここにしめされた高密度配置をその計画通りに実現することはむつかしい．しかし，配置の巧妙さによってこれらに近いものを得ることはできよう．わが国の山岳地，すなわち山林急傾斜不利用地はだいたい1/3から1/1.5程度の傾斜度が多いから，この程度の傾斜の南斜面に都市を建設するとすれば，住宅地にかんしてはだいたい平地の場合の半分程度の地積があればよいことが判る．

なお前表に明らかなように，平家，2階建，および急傾斜地では3階建程度の形式では斜面による列間隔の短縮が，建物間の最小の空隙6mに制約されて有効に利用され得ないことがわかる．したがって居住密度の向上もほとんど期し得ない．この点からしても，傾斜面居住地の住宅は中・高層形式を採用せねば不利であることがわかる．

斜面の傾斜の方向が南向きでない場合は，条件はさほど有利ではない．この場合，建物の配置については，その列の配置方向をあくまで東西方向として固執するか，等高線と平行とするかが問題となる（第80図参照）．

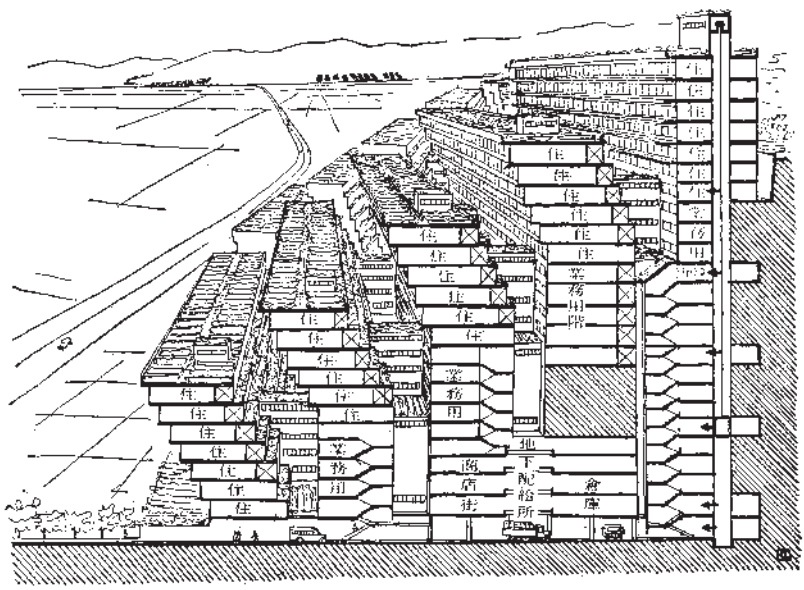


第80図　斜面の等高線と住棟配置

住戸の日照条件をよくするためには前者の解決をとるほうがよいが，そうすれば建物列の地盤が傾斜をもち，廊下をスロープ式にするか，あるいは各住戸の床面をだんだんかえてゆく段階形式の建物をつくらねばならない．これは建築構造上不利を生ずる．後者の方法は日照条件上欠陥があるが，建築方法としてはもっとも無難である．ただしいずれの場合においても，どの程度まで斜面の方向の南よりの偏向が許容し得るか――とくに後者の場合はこの問題が重要となってくる．

詳細な検討は省略するが，後者の配置をとる場合，大まかにいって正南方向より東または西に45°程度の範囲内における偏りでは実際上，正南面と大した差はないと考えてもよく，その最大限度のフレはまず正東および正西と考えたい．

この場合の列間隔を規定する条件は，斜面の方向と傾斜の度合および日照時



第81図　南斜面を利用した高度集約的住居の例

間によって異なってくるが，その詳細の計算はここではおこなわない．ただもっとも多い 1/3 ないし 1/1.5 程度の傾斜面では，4時間日照の条件をとれば，正東または正西の場合でも平地におけるよりはヨリ密な配置が可能である．

居住密度向上のため本建設方法を採用する場合は，この検討に明らかなるごとく，地形上正南斜面がもっとも有利であり，正東・正西斜面を限界とし，北斜面は不可である．したがって本建設方法を採用し得る場所は限定されている．本法を採用するには，それに最適の場所を選ぶことが重要な要件となっている．

（4）　斜面利用とせり出し建築

上述の第2と第3の方法を併用する．

建物列間の空隙はただ通風と道路に利用し得る最小限の距離で充分であるという程度に列間隔をちぢめることが可能となり，最高の居住密度の実現が可能となる．また屋上および各階北側テラスをすべて小生産緑地（家庭菜園など）として利用することとすれば，傾斜面を生産緑地として利用するという点から考えても最高度の地表面の利用形態をつくり出すことになるであろう（第81図参照）．

以上各種の建設方法は単に居住密度の向上という点から提案されているが，われわれは，そのうちにふくまれているさらに大きな意義を見出し，それを拡充することにつとめねばならない．すなわちそれは，――われわれは天空と地塊との接触面たる「地表」にわれわれの居住圏を営んでいるのであるが，この接触面を三次元的に最大限度に豊富な環境と化し，天空からあたえられるすべての恩恵（なかんずく太陽エネルギーの照射）と地塊のもつあらゆる資源とをあますことなく利用する――われわれの最高の居住形態を地表面につくり出すということである．あらゆる「建築」はこのような意味の「地表」の工作・開発をすすめるものとして把握されねばならない．

4. 山岳都市の設計

わが国の将来における都市立地指向にたいする要求，高密度居住の実現の必要，という以上に明らかにした二つの要求を合理的に充足するものとして，南急斜面を利用した山岳都市が，将来における重要な居住形態・都市形態として積極的にとりあげらるべきものであることが提案される．

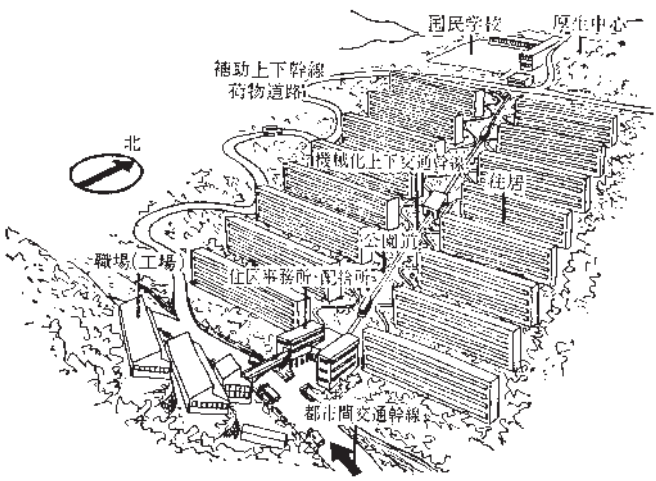
以下，筆者の考える山岳都市がいかなるものであるかを吟味し，二，三の具体的設計例を呈示しよう．

（1）　都市の性格

(i) 地形条件の制約から，都市の規模は制限せられる．

適当な南斜面を国土の中に求めるとすれば，山間を河川が流れている侵蝕されてできた斜面，谷あい地が大部分となる．これらの場所は地形が不規則である場合が多い．したがって好適の地形条件を得ても，地積は通常狭隘で何十万という人口を定住させることは困難である．したがって規模の上からは大・中都市たり得ず，せいぜい1集団，5万程度の小都市が大部分をしめることになろう．――ただし神戸のごときは，南斜面の六甲，摩耶連山を背負って（地質の問題は慎重な研究を要するが）大山岳都市を建設し得るまれな例である．

(ii) 都市の機能的性格としては，それ自身に職場と住居をもつ小単位単能都市（小工業都市）――この場合交通幹線がとおっている谷間は別として，地形条件より重量交通の不便なところが多いだろうから，その工業は精密加工工業のような原材料量の相対的に大きくない性質のものが主となる――となるであろう．特別の場合として，大都市あるいは総合工業基地のごとき，その職場付近にすべての勤労者の居住地をとり得ない中心都市と結合した郊外の住居都市（あるいは厚生都市）といったものも考えられる．



第82図　山岳都市のモデル

(iii) 平地に建てられる都市とは異なり，都市全体としての（主として交通上の）施設が完備されていねばならない．だから，徐々に部分的に完成されてゆくというふうなゆき方で都市が建設されるわけにはゆかぬ．少なくともその主体を構成する部分は一挙に，一定の建設期間内に完成されねばならぬ．したがってその中心機能たる工業の移駐または新設と結合した殖民都市（ニュータウン）として建設されることが必要である．

新日本の建設途上，30年間にわれわれは年々60万戸の都市住宅を建設してゆかねばならないが，その1/3が山岳都市としてつくられてゆくと考えると，1都市平均人口5万（1万戸）として毎年20個の山岳都市が建設されてゆくことになる．これを実現するためには，個人の建設活動にたよることはできぬ．国民経済における住宅建設のための投資の重要な部分が，限られた山岳都市の建設に集中されるような，政治的・経済的基盤の確立が必要である．

（2） 都市の立地・地形

(i) 居住地の保健的要求から，南斜面，少なくとも東南，または南西斜面でなければならぬ．しかし山岳地域に大きな連続した南斜面を得ることは不可能である．したがって住居形式，住区配置を頭に入れて利用率の高い南斜面の割合に多い地域を選ぶ．その選び方いかんによって建設費に格段の相違が生ずるゆえ，立地選択は重要である．

(ii) 地形上，また都市間の連絡交通上，大平野の縁辺山岳部（小工業都市または大平野の中心にある大都市のための住居都市）か，大交通路の貫通している山岳の谷間部あるいはそれからの派生的谷間部（交通線に沿った小工業都市）が最適である．

(iii) 住宅の建てられるのは傾斜面の下り尾根である．尾根の間隔は100～150 mが好適である．傾斜は1/3ないし1/2がもっとも多いと思われるが，1/1程度の急斜面でも差支えはない．傾斜面の全長はどれほど長くてもよいが，谷間部ではせいぜい垂直距離150 m程度までのものが多いであろう．

(iv) 地形図を調査することにより，以上の条件に好適の場所を捜すことができようが，いま一つ注意すべき重要条件は地質条件である．風化した軟弱な地質は避けられねばならぬことはいうまでもない，そのほか，地形上，地質上，山崩れ・地辷り・洪水などの危険のない場所を選ばねばならぬ．

（3）　都市の構成

(i) 都市の規模は地形上の条件から先にのべたごとく，そう大きなものは望まれない．しかし最低小学校住区の大きさであることが必要である．すなわち人口1万程度を最低限度とする．

(ii) 小学校住区単位が数個よって1都市が形成される．各住区は小学校と公園休養地などを結合した厚生施設中心と，住区事務所，商店，医療機関，行政機関などを結合した事務施設中心をもち，この2中心を軸として緊密に結ばれた形を構成する．前者厚生中心は斜面の上部（山の上）に，後者事務中心（これには，工業都市の場合，工場地帯が連絡される）は主交通路に接した下部の適当な場所，あるいは最下部の谷間（この際，工業都市の場合は工場は反対側の北斜面の下部などに設けられてよい）に求められるのがよい（第82図参照）．

(iii)　都市は斜面に建設される．

都市間の交通はその最下部，谷間部または平野縁辺部をとおる主交通路でなされる．したがって都市内部の主交通路は上下交通路となる．ただし上下交通は不便であるから，後に述べる各種の方法でこれを機械化し，徒歩交通は可及的に等高線に沿った水平交通となるようにする．

小工業都市である場合は，その職場施設はこの最下位の主交通路にそった場所につくられる．

（4）　住居形式

(i) 階数は敷地造成工事の比重を軽減するため，また高密度居住を実現するため，地盤の許すかぎり高層としたい．高層とすればむろん上下交通を機械化しなければならぬ．この建物内の階交通の機械化は，どうしても機械力の援助を必要とする都市全体の上下交通の方法と密接な関係がある．これについては次項でのべる．

(ii) 建物内の上下交通の機械化を省略するため，すべての住宅を4階建程度に限定するか，あるいは各住棟を6階建程度として各住棟の中位に交通階を設けて，そこまでの上下交通は都市施設としての機械化された上下交通機関にゆだねる．そうした方法をとる場合はD形式の採用が可能である．

しかし，斜面に沿う高低差の多いこの山岳都市を快適にするためには，上下交通のすべてを可及的に機械化する着意が必要であって，そのためには，やは

りEF形式が主となってこよう．

（5）　上下交通

(i) 上下交通にたいしては機械化が必要である．しかしどの程度に機械化するか，交通量（一般交通と通勤交通），時間的変動，維持管理などの問題と関連してその最適形態を決定することは将来の研究問題である．

(ii) 機械化の方法としては，

（イ）垂直昇降機（エレベーター）

（ロ）斜面昇降機（ケーブルカー）

（ハ）自動車（バス）

（ニ）自動階段（エスカレーター）

などの方法が考えられる．

（ニ）エスカレーターは輸送量がもっとも大きいが維持管理の点から特殊な場所以外には使用は困難である．（ハ）のバス形式はもっとも融通性に富むが，その利用は地形条件などに大いに制約され，かつ輸送量も大きくはない．したがって上下交通をこれのみに依存することはできないが，補助交通としては最適で，また必須である．

けっきょく，（イ），（ロ）の昇降機がもっとも期待せねばならぬ方法となる．

斜面エレベーターは適当な地形を利用することにより軌道の構築が容易で，また乗降口を多くして輸送能率をあげることも可能である．しかし延長が長くなると操作が鈍重となる欠陥がある．垂直昇降機のほうは，その昇降路を地中に坑道式につくるか，あるいは架空構造の交通路をつくるか，いずれにせよかなり困難な方法をとらざるを得ず，その利用場所は限定される．

(iii) 機械化する場合は，どのくらいの区間（高低差）ごとに停留所を設けるかという問題が維持管理と関連し重要な問題となる．あまり頻繁な，たとえば各階停車というような方法は，運転区間の短い垂直昇降機などでは可能だが，ほかのものでは不可能である．

各居住者に最低限度の上下交通で住居に交通し得るようにするためには，住居形式と関連して種々の方法が考えられ得る．

徒歩上下交通を最大限10 m（垂直距離）に限定すると，階数にして3.5階，したがって最大限7階（20 m）ごとに1停留所を設ける必要がある．

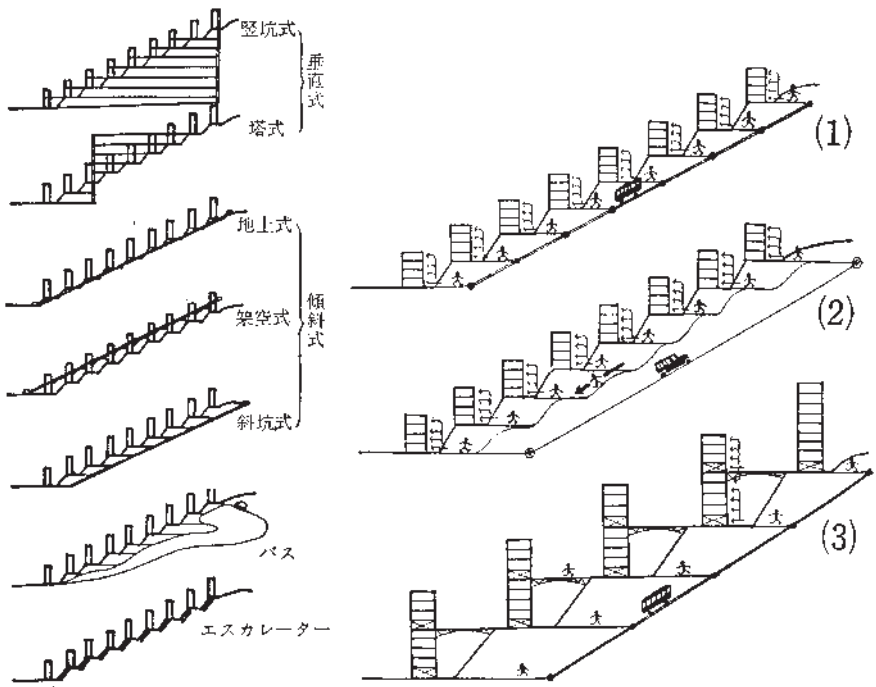
ただし上下交通のうち，下り交通には厳格な上限を設けないとすると，片流れ式交通方式を採用して，もっとも極端な場合は住区の最上部と最下部にのみ停留所を設けるというやり方で，やれぬことはない．

(iv) 以上の検討において，第83図にしめすような各種の上下交通形態が考えられることになるが，そのうちもっとも実現性の多いものとしては，だいたいつぎの方法といえよう．すなわち，

(1) 主上下交通機関として斜面昇降機を用いる．

(2) 補助機関として自動車交通を用いる（荷物などはこれによる）．

(3) 徒歩交通は水平交通を原則とし，最大限 10 m の上下により，各住戸

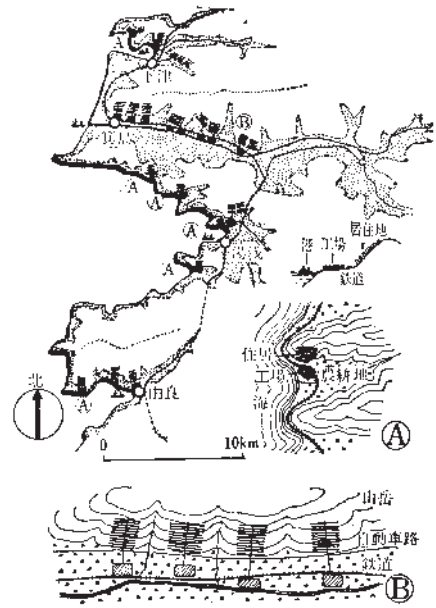


第83図　斜面住区の交通方式

ここに示す第77図 (1)～(3) 図の3例は，いずれも維持管理の手数をはぶくため各住棟には昇降機を用いず，住区の中心に機械化された交通機関を設ける例である．(1) は各住棟の第1階のレベルに機械化交通機関の停車場を設ける例，これは停車間隔がせまくなるところが難点である．(2) はこの住区上下交通を最も簡単化し，停車場を住区の最高地と最低地に設け，その間は徒歩交通，ただし体力の消耗を避けるため徒歩は下り一方交通とした例である．

これら2方法は街路より住棟へ入る交通階を第1階にとったが，斜面をうまく利用すると第2，第3などの中間階へ入るようにすることができる．そうすれば，住棟内に昇降機を用いずとも5,6階建が可能である．

この方式をさらに発展させ，架空道を設けて階数を最大限にとったのが (3) である．こうすれば，住区上下交通機関の停車間隔は (1) よりも大きくすることができる．



第84図　山岳都市の配置例（和歌山）
山が海に迫っている場所（A），山脈が東西に走ってその下を交通幹線がとおっている場所（B）などの場合の山岳都市配置の型を，紀州沿岸を例にとって示してみた．ただしこの地方は紀州ミカンの本場で，ミカンの栽培と人間の居住と，どちらが国土全体として考えて有利であるかは一考を要する．

階に到達し得るようにする（第83図1あるいは3）．

なおもっとも簡単な（機械化を省略する）方法としては，自動車のみによって，徒歩交通はただ下り一方のみとするというような方式が考えられる（第83図2）．

（6）　住区構成

(i) 都市を構成する単位地区たる住区の構成はすでにのべたように上部に厚生中心，下部に事務（職場）中心をもつ形を原則とするが，斜面の長さ，幅，傾斜の度合は，その全体の立地条件などにより，また都市全体として採用すべき上下交通形式，住居形式と住棟内上下交通形式などによって，その具体的な姿は大いに異なってくる．

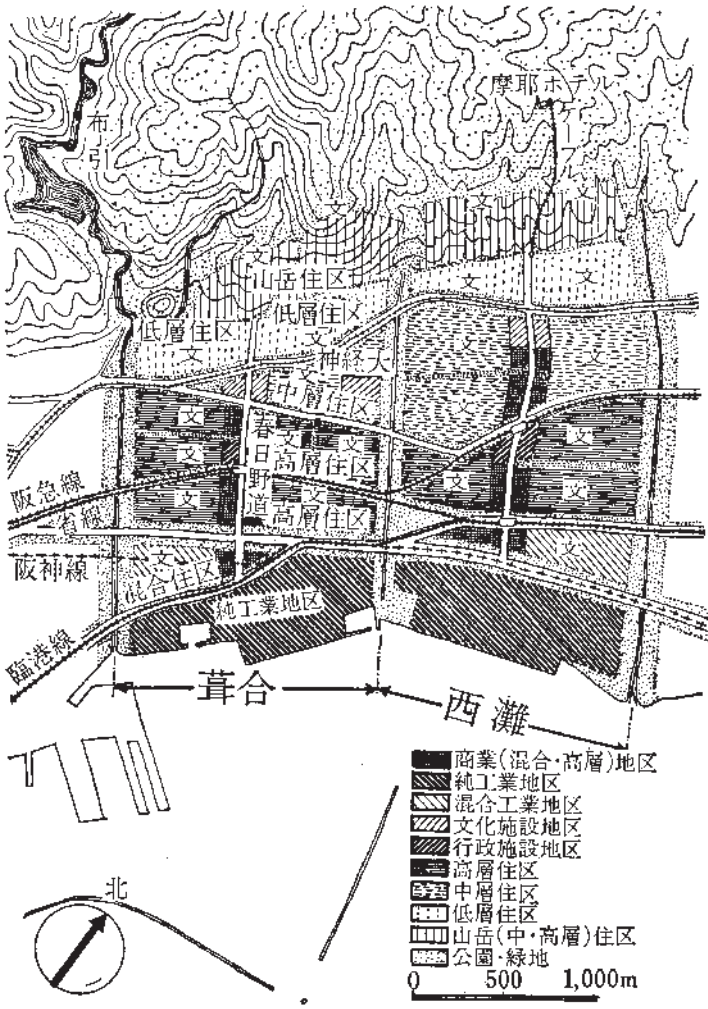
模型的にもっとも普通の場合として考え得べき住区の諸形態をしめしてみると第82図のようになる．

以上によって，山岳都市がいかなる形をもってつくられるかがだいたい明らかにされたと思う．説明の不足を補う意味で，二，三の土地を選んで計画した山岳都市の具体的な姿を例示しておこう．

第1は紀伊半島西海岸の一部をとって山岳都市配置の諸形態をしめしてみる．

——(第 84 図).

第 2 は京都北郊，柊野より鞍馬電車二軒茶屋に抜ける原峠の両側急斜面（傾

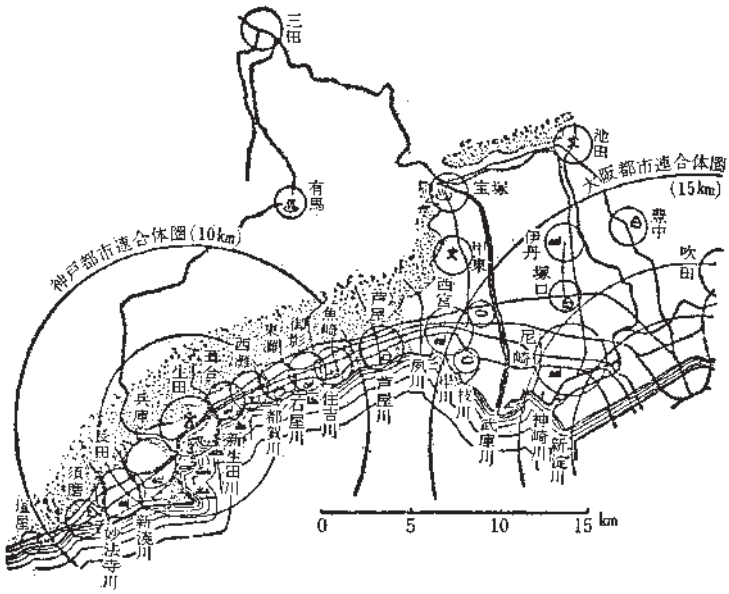


第 85 図　神戸連合都市の計画案 (1945)

各単位区は川をはさむ緑地で区切られている.

神戸連合都市を構成する単位都市はいずれも北に山を背おって，その山麓部は充分山岳住居地として利用され得る．本図はそのうち，単位工業都市たる性格をもつ葺合・西灘両区についてその地域構成をしめしたものである．

傾斜地利用は下部一住区程度の所に限ったが，この計画でだいたい両区とも 70,000 人程度の人口となる．ただしこれは，各住棟ごと，住区ごとに充分空地をとった場合の緑化都市の計算である．傾斜地利用をさらに拡大し，空地の効率的集約化をおこなうと 10 万人程度の区とすることが可能である．六甲山系の南傾斜面はしばしば災害をひきおこしているが，山岳住区として高度の造成投資をおこなうことで，その崩壊を完全にふせぐことができるのではないか．



第86図　神戸連合都市圏図

斜度約 1/3）につくられた住居都市（人口 2 万）．——

第 3 は同じく二軒茶屋付近の支線谷間に設けた小工業都市（人口 1 万）の例．いずれも上下交通は最簡略方式をとる．——

第 4 は同じく京都近郊，洛西桂から亀岡（烏取）へぬける小畑川谷間の一部を下してつくられた山岳小工業都市．ここでは試みにもっとも集約化された住居形式，機械化された上下交通を考えてみた．——(以上いずれも省略)

第 5 例は，大都市を構成する単位都市の一部を山岳都市とした例で，神戸市改造私案における一単位住区を例にとってしめしたものである——(第 85, 86 図)．