

Summary

A Garden of Microchips - The Architectural Image of the Microelectronic Age
Toyo Ito
p.42

The Visual Image of the Microelectronic Age
The 1990 exhibit entitled "Information Art — the Diagraming of Microchips" at the Museum of Modern Art in New York was an event of great significance for the world of architecture and design. I did not see the exhibit, but according to the catalog it consisted of many enlarged photographs of microchips, that is, diagrammatic images of integrated circuits that are used in computers.

These microchips resemble finely-woven textiles. They have grid patterns in beautiful colors applied on silicon, and each diagrammed image is different. On one chip shown in the catalog a striped pattern is repeated. Another features a patchwork, with each patch having a different color and texture. Many of the chips have borders, and these square, cell-like shapes are arranged like buildings on a map. Still another chip has a complex diagram in which a mesh suggesting an organic form like the nervous system of the human body is superimposed on a grid pattern.

These microchip patterns suggest not only electronic fabrics but maps for the contemporary city. A chip so tiny that it must be enlarged several hundred times to be identifiable to the naked eye can contain millions, and more recently tens of millions, of transistors. By the turn of the century the development of a chip with a billion transistors is expected. The seemingly flat patterns are really three-dimensional compositions with ten to twenty-five layers.

The MOMA exhibit was significant because these photographs of microchips presented in clear visual images an aesthetic for the microelectronic age. It was the first convincing presentation of a new aesthetic that will supplant the machine-age aesthetic of the 20th century...

Despite advances in microelectronics, we have been unable to develop clear visual images for the age of microelectronics as we were once able to do for the machine age. In the field of architecture and design, we ultimately depend on visually expressive forms, even when we attempt to depict a futuristic society ...

That points out the reason why we have been unable to create an aesthetic of the microelectronic age. In the machine age, the forms of machines, such as airplanes, ships, and automobiles and machine parts, like engines, screws and plugs, were themselves the inspiration for visual imagery, but in the electronic age, we have not been able to discover visual forms that can serve an iconic purpose.

There is a causal relation, however ambiguous, between the form of a mechanical object and the performance and function of that object. In the case of vehicles, dynamic forms that offer the least resistance to air or water are expressive of speed. The myth that the most functional forms are the most beautiful prevailed in the design world in the 20th century. However, there is no such

causal relation between form and function in electronic objects. Even the forms such as audiovisual equipment that produce sounds and images do not suggest their workings. The enormous capacity of computers to retain information or to compute does not evoke formal images. We see only the data to feed into the computer and the results that the computer produces. We cannot begin to imagine the flow of electricity or the speed and the immense quantities involved between input and output. That is why in trying to visualize images of the electronic age we have continued to rely on mechanical imagery.

However, the microchips clearly evoke images that are different from those of mechanical objects. These images are not so much of forms as of a space in which invisible things flow. One might describe that space as a transparent field in which diverse phenomenal forms emerge as the result of flow. What is important here is not so much the expressed forms as the image of a space that makes the expression of those forms possible...

The City is a Garden of Microchips

An enlarged photograph of a microchip is like a computer processed bird's-eye view of a city. When converted by means of an effector, an aerial photograph of an urban area can become a highly abstract diagram showing just the outlines of buildings and civil engineering works or a diagram filled with colorful points of light. Urban space loses substance and begins to look just like a photograph of a microchip.

The emergence of another city, that is, the city as microchip, when the substance of urban space is erased is symbolic, because the city not only is diagrammatically similar to the microchip but shares with the microchip certain attributes. Their common attributes are (1) fluidity; (2) multiple layers; and (3) phenomenality.

I have pointed out on previous occasions that urban space is composed of not only immovable objects such as buildings and civil engineering works but various things in flow such as water and air, human beings and automobiles stirred by diverse activities, and different kinds of energy and information.

The Japanese city originally developed as the superimposition of a manmade network of roads and canals on a highly undulating natural terrain through which rivers coursed. Edo in particular featured attractive urban spaces in which the man-made network was skillfully wedded to natural topography. "Bushu Toyoshima-gun Edo shozu", considered the oldest surviving published map of Edo, is said to show Edo in the middle of the 17th century. It depicts a network of rivers, canals and roads centered on Edo Castle that spirals outward in dynamic fashion. The road grid, which one might expect to be rectilinear, is distorted and warped under the influence of this spiral pattern, and changes into a quite organic, fluid space. The result is a space entirely different from the urban spaces of the West, where geometrical patterns are rigorously imposed on natural terrain.

The "Edo ikkenzu byobu", said to have been painted in the early 19th century by Kuwagata Isaitsuguzane, shows this spiral quality of space even more clearly. The

screen is a bird's eye view from somewhere above Fukagawa, looking in the direction of Edo Castle and Mt. Fuji. Areas of abundant greenery, rivers and canals wind their way past daimyo residences and the houses of townspeople. A lively urban space with a dynamic quality that is scarcely imaginable from present-day Tokyo once existed.

Hideobu Jinnai describes the beautiful gardenlike city in which buildings, greenery and water were skillfully joined as the product of a compromise between the will to plan, so evident in castle-towns, and the desire to respond flexibly to the undulating natural topography of the Musashin plateau. "(The authorities) did not create a clear structure to which the entire city had to conform. On the contrary, the subtle underlying topography was carefully studied and the urban organization arranged bit by bit to create a mosaic pattern that was in harmony with the land".

In this garden city called Edo, man-made elements such as buildings, roads and canals blended with nature on every level. The result was a unified space. That is, technology and nature were integrated into one consistent system. From the macro-scale of the master plan to the microscale of residential and garden design.

Beginning in the Meiji era, man-made elements such as transportation systems were forcibly introduced into this beautiful space that had blended the artificial with the natural, and the equilibrium that had been maintained was upset. In particular, the introduction of a network of expressways and the enormous increase in the scale of structures in the postwar period of intensive economic growth proved decisive in destroying the natural system...

Tokyo has lost much of the dynamic flow of greenery and water that Edo possessed. As I have already stated, the loss has been in inverse proportion to the increase in the flow of man-made things. In central Tokyo numerous transportation networks are stacked one on top of the other, from a level several tens of meters below ground to up in the air. Each layer has an extremely complex horizontal network of its own, and these layers are linked by vertical transportation systems. Throughout the city there are spaces in which networks are layered in a way that would have been unimaginable in the Edo period.

People and cars are not the only moving objects. The flow of diverse forms of energy and information has increased at a tremendous rate, and indeed the flow of such invisible things is coming to dominate urban space. However, we cannot conjure up an image of an information space because information does not give rise to a physical network. It only takes a terminal to retrieve information.

Urban space inevitably becomes phenomenal as the flow of electronic things, including information, increases. That is, another phenomenal city of lights, sounds and images is superimposed on the tangible urban space of buildings and civil engineering works. This city as phenomenon takes many different guises, from spaces created directly by lights and images to abstract spaces woven from signs that fall into the category of

the media. In any event, the city as phenomenon is a space of ephemeral effects born of the invisible electronic flow. It does not express itself in form. The phenomenal city alters the surface of the tangible city into a city of lights, sounds and images or a city of illusion enveloped in signs. If the tangible portion of the city were removed, the network of energy and electronic flow that manipulates those illusions would no doubt become apparent.

Thus the spaces of the contemporary city are characterized by fluidity, multiple layers and phenomenality. These also happen to be the characteristics of microchips.

However, to call this city a "garden of microchips" may be to unduly idealize it. The presence of man-made things introduced in the process of modernization is oppressive. Like archaeologists excavating a ruin, we must now dig up the subtle network of flow that Edo possessed - The network erased when various transportation systems that did not take the existing topography into consideration were introduced, canals filled in, and huge buildings that completely disregarded the flow of nature constructed.

Might it not be possible to discover historical ruins and the flow of nature amid the constructs of the machine age, and superimposing the network of the electronic age, effect their rebirth, at least as phenomenal space? This city will become a true "garden of microchips" only when the network of new technologies and the basic flow of nature overlap and begin to work together.

Architecture as a Device for Retaining and Transmitting Information

What bearing does the development of spaces in the contemporary city into gardens of microchips have on architectural design? Is it possible to translate such phenomenal spaces into actual works of architecture?

I have always thought of my architecture as being inseparable from gardens. By that I mean that I have always thought of my architecture as being itself a garden, not that my aim has been necessarily to create an architecture integrated with the landscape. To be sure, in the last several years I have tried in several projects to unite architecture and the landscape. I have tried to diminish the apparent size of buildings and to establish an active relationship between buildings and exterior space by selectively removing or adding earth. I have found such work very stimulating and believe inserting an artificial "natural" environment between buildings is an effective stratagem in Japanese urban spaces where no context is easily discovered.

However, when I speak of architecture as a garden, the architecture I am imagining is one that is as fluid and phenomenal as urban space. It is not an architecture whose overall image is made apparent in an instant. The people who experience the architecture connect in their minds the phenomenal spaces that an overall image emerges. Instead of scenes that are clearly articulated, like rooms in a building, I am trying to create scenes that shift imperceptibly from one to the next, as in a motion picture in which fade-ins and fade-outs are repeated.

An architecture that involves such temporal sequences is not so much visual as aural. That is, the space is close to being a space of sounds - a space in which countless sound are afloat. These sounds of course are not the randomly - transmitted sounds typical of urban noise. They are selected so that they enter into relationships, yet the whole is not governed by one form as in classical music or a Japanese tour-style garden. The people who experience the architecture are free to choose which sounds to connect. A musical space from which a score can be created exists, but the score itself as a sequence of sounds in time is different for each individual. When I refer to an architecture that is a garden, I am imagining such an aural space...

In what way is information to be converted into an environment to create an architecture that is a "garden of microchips"? An act of architecture represents the creation of a new environment that is both physical and phenomenal through the introduction of information into an existing environment. Architecture becomes a device for both the transmission and the retention of information. That is, instead of being an assertive physical form, architecture ought to be a device for producing a phenomenal form, that is, an environment...

In any case, visualizing an image for the microelectronic age is for me a task consistent with trying to achieve a "garden of microchips". It is an attempt to create an electronic eddy in the electronic flow, that is, an attempt to give rise to a place of information where in the past there was a *genius loci*.

Vladimir Krstic Stillness of Hyperreality The In(de)finite City p. 68

The reason for the visual chaos and physical impermanence of the Japanese metropolis have been repeatedly sought in the idea of destruction as a major force through which the city and its understanding have been shaped. Japanese architectural historian Riichi Miyake clearly articulated this idea by stating: ...that the historical growth of certain Japanese cities has not been a continuous flow and that it has always been motivated by some catastrophic event. The will to build a city and to construct a building has been constantly next to the reality of destruction and included an impulse to destroy the unified whole...¹⁾

Although such insights embody a profound grasp of the particular urban condition, it is necessary to move beyond their generalising framework in order to recognise the archetypal destructive event that constitutes the ineradicable, physical and conceptual origin of the Japanese contemporary city: the destruction of castle towns. The Meiji Reformation of 1867 resulted not only in profound sociocultural transformations in Japan but also in massive and violent physical changes of its major cities. The collapse of the entire socio-political system rendered the corresponding iconographic idea of city - the castle town - void. Now emptied of its political content, a condition graphically signified by the literal destruction and vacation of the castle as its topological and sym-

bolic centre, the spatial order of the town was deprived of any further authority to subordinate and relate. The consequent reduction of the city to a system of abstract physical properties and relationships opened it up to commercial exploitation by the freed powers of capital which were solely concerned with the pragmatic opportunism of new urban circumstances devoid of any conscious desire to articulate a specific idea of urbanity.²⁾

The two extreme aspects of this situation - the destruction of the urban model that embodied the idea of totality, and the emergence of the non-ideological, fragmentary vision of the city framed by the autonomy of capitalist pragmatism - denote the point of origin of the modern Japanese city. Accordingly, it can be argued that the modern 'decentred' Japanese city has developed with no apparent concept of a larger totality. Signifying the triumph of what Tafuri called a 'while for formlessness', the constituting urban parts have achieved utmost autonomy while engaging the city in the perpetuation of random relationships.³⁾

The most important aspect of the chaotic urban condition brought about by the uncontrollable proliferation of autonomous parts, is the displacement and subversion of any fixed sense of reality. The primary reason for this phenomenon resides in the obliteration of an idea(l) city plan whose uprooting has eliminated the existence and authority of an external 'referent' against which the reality of the built environment could be measured. The modern Japanese city hence embodies an inverse (or antithetical) concept of urbanity where individual urban artefacts invent and frame their own realities; they are independent of each other and the city as a whole which, within this process, comes to represent an elusive, almost nonphysical form of a locale. Created through such haphazard constructions, the hybrid structure of the city envelops its own territory with an incessant spectacle of urban phantasmagory in which delirious acts of architecture stand in indifferent juxtaposition to engineering stunts and to the perverse contraptions of electronic technology. The city thus appears as a surreal, panoptic vision composed of virtually impossible and mutually cancelling physical and temporal perspectives. The disappearance of the idea(l) framework of reference has reduced the production of the city to a self-referential activity where the idea of reality has no particular relevance; while its parameters remain in the continuous flux perpetuated by the ideologically unbounded production process itself, reality can only be circumstantially and temporarily inscribed in the city...

Since the actualisation of architecture is contingent upon discovering the parameters of its own reality in a particular locus, this object must be interpreted and articulated as a theoretical proposition, through the working of architecture's own spatial and formal structures. Every act of architecture is thus founded in the need to construct a hypothetical resolution of the city as a basis for the argumentation and assertion of its own authenticity. Conceived and applied in such a way, architecture as a sum of practical acts

constitutes an experimental (and apparently only viable) tool of inquiry into the condition of the city where conceptual insights and concrete actions are synonymous and derived through the direct encounter with the chaotic urban matter.

The paradox of this situation lies in the fact that the eventual resolution of the city can never happen within a work of architecture itself. Given the mechanisms that generate its hybrid structure, the city possesses no subsumable reality and hence remains opposed to and infinitely outside of architecture's capacity to rationalise its objects. As Koji Taki points out: 'In the Japanese city, architecture is not symbolic of the city as a whole; it can never be more than partial or fragmentary'.⁴⁾ This contention could be taken to imply two critical points. First, it denotes the fact that architecture has lost the capacity to maintain its own autonomy with the dissolution of all attempts to revise the chaos of the Japanese city according to the Modernist ideal of rationality. Second, it suggests that, since there is no fixed reality to the city, architecture can only be actualised as a fragment of its hybrid body in which case the city conversely symbolises architecture and delimits its capacity to signify. By the same analogy then the actual purpose of the desire to resolve the city within architecture can only be a resolution of architecture itself. If architecture is to sustain any relevance within the irreversible schizophrenia of the Japanese city, then the conventional (Modernist) means and concepts through which architecture can only be a resolution of architecture constructs its own reality - and which are now rendered obsolete and ineffectual by the chaotic urban texture - must be revised and defined anew in its every act in order to maintain a critical engagement with the imposing uncertainty of the external world...

Fredric Jameson argues that in our Post-Modern culture we inhabit the space of 'perpetual present' analogous to the condition of schizophrenia where the inability of temporal conceptualisation of language reduces experience of the external world to the succession of disconnected and discontinuous moments: 'material signifiers'.⁵⁾ The consequent loss of correspondence between signifier and signified, a mental condition whose cultural equivalent Jameson sees in the failure of Post-Modern society to retain the past and focus the present, transforms the isolated signifier into an image whereby its meaning is lost and superseded by the intensified experience of its materiality. This eventually leads to the transformation of reality itself into an image.

This argument curiously echoes the condition of the Japanese city where the displacement of a sense of history, or any other temporal determinant, is induced by the perplexing syntax of urban fabric which comprises an infinite array of incoherent formal and physical elements.

The fictitiousness of the city is constructed through the reduction of reality into images which, as an instrument of commercial advertising mechanisms, conceives and produces the urban environment as a collage of contrived eclectic scenes. The reality of these

scenes, independent of an disinterested in the original situations and their circumstances, is authenticated by the materialisation of abstracted (architectural) forms. This marks the final point in the reduction of reality, a reality which, confined to a single image, acquires the status of replicable commodity.

The reduction of reality to images brings the chronological progression of time to a perceptual rest. The city, in spite of its perpetual turmoil, enfolds a paradoxical stillness that comprises the multitude of isolated and fragmented scenes; imbued with the surreal emptiness of the collapsed time found in still photos, such scenes fail to connect and generate the difference between relative temporal positions. The city appears transfixed in the ahistorical dimension of its composite body. It is constantly re-created, or made anew through the construction of new scenes and the dismantling of existing ones which, after having exhausted their commercial purpose, are removed without a trace thereby revealing in the moment of their own disappearance the actual structure of the city: the infinite void of oblivion. Hence, the visual noise of the Japanese city, termed by Kazuo Shinohara as the 'metropolis of no-memory', resonates with the amnesic silence of the 'perpetual present' where no fundamental change seems possible⁶⁾...

As previously proposed, the texture of the Japanese city is constructed through images which denote reality as the materialisation of form and, to paraphrase Jean Baudrillard, these images substitute the real itself with signs of the real.⁷⁾ More importantly, having had their reference to original realities (objects and situations) abstracted through the eclectic structure of the urban context, these signs constitute 'models of (the) real without (the) origin of reality', hence they are 'hyperreal'.⁸⁾ The city therefore constitutes an absolute space of simulations imbued with the perverse vitality of impossible phenomena in perpetual unfolding which, generated through the hyperreal existence of urban artefacts, diffract space and time into the depthlessness of two-dimensionality. The materialisation of the city thus reflects a screen-like condition, where all projected phenomena are automatically inserted into a mesmerising realm. In this realm the real and the unreal appear as equidistant and synonymously interchangeable parameters that determine the existence of all things. Such volatility eliminates the possibility of discriminating between a metaphorical scene and real scene, between dream and its fulfilment, or more precisely, this discrimination is short-circuited by the infinitely simulative mode of the Japanese city where all things share the same hyperreal appearance...

In the Japanese city the fundamental problem of architecture resides not only in the fact that its production has become debased by the elimination of reality itself as a field of reference in which all of its premises and actions are grounded but also, even more importantly, in the fact that the very concept of architecture's corporeality has been called to question. The relegation of meaning (reality) into an autonomous system of two-dimensional codes has delineated the antithetical and annihilating coun-

terpoint to the concept of architecture as a vessel which, in its physical, spatial and formal relationships, contains instances of an undeniable reality. Hence what once was considered real now seems to be void or, as Baudrillard has phrased it, 'The real itself appears as a large useless body' that marks the pending eclipse of architecture.⁹⁾

So, what are the perspectives left when the entire foundation on which architecture can be thought of and acted upon appears to be irreversibly undermined? In the enormous output of explorative designs by contemporary Japanese architects two positions of ideological extremes can be identified. One position, held by architects like Tadao Ando, is marked by the adherence to the Modernist concept of architectural autonomy, and is used as a form of critique and eventual rejection of the city. The other position, whose proponents are architects like Shin Takamatsu and Atsushi Kitagawara, suggests their acceptance of the existing condition of the city as an inescapable and unresolvable destiny of architecture; this position is subsequently used as a pretext for the indulgence and the legitimisation of the most decadent and inaccessibly personal architectural travesties.

Both of these positions, along with the others in between, appear equally hopeless relative to the resolution of urban impasse of architecture's 'archaic' parameters and are consequently incapable of truly constructive confrontation with its hyperreality which must be encountered through its own annihilating mechanisms if the conceptual recovery of architecture is to be made possible. Only by recognising the hyperreality of the city as a zero degree condition of architecture from where all attempts for its (re)construction and (re)discovery have to start can there be a chance for a genuine exploration, otherwise all architectural production remains mere proliferation of consumable images...

Notes:

- 1) Riichi Miyake: 'Pursuit for Internal Microcosms' *The Japan Architect*, January 1987, p6.
- 2) For further discussion of these issues see John and W. Hall, 'The Castle Town and Japan's Modern Urbanisation', *Far Eastern Quarterly* Vol XV, No 1, November 1955; Ken-ichi Tanabe, 'Integrational Structure of Japanese Cities', in *Japanese Cities: A Geographical Approach*, Association of Japanese Geographers, Tokyo, 1970; Takeo Yazaki, *Historical Geography of Urban Morphology*; Tameiro, Tokyo, 1970.
- 3) Mafredo Tafuri, *Architecture and Utopia*, MIT Press, Cambridge, Mass 1988, p16
- 4) Koji Taki: 'Fragments and Noise' *Architectural Design*, Vol 58, 5/6, 1988, p34
- 5) Frederic Jameson, 'Postmodernism and Consumer Society', in Hal Foster, (ed) *The Anti-Aesthetic*, Bay Press, Port Townsend, Wash, 1983.
- 6) Kazuo Shinohara: 'The Context of Pleasure' *The Japan Architect*, September 1986, p23
- 7) Jean Baudrillard: 'The Procession of Simulacra', in Brian Wallis, (ed) *Art After Modernism: Tethinking Representation*, MOCA, New York, 1984, p254.
- 8) *Ibid*, p253.
- 9) Jean Baudrillard: 'The Ecstasy of Communication' in Hal Foster, (ed) *The Anti-Aesthetic*, Bay Press, Port Townsend, Wash 1986, p129

"Technical optimism", that is, optimistic feeling for technical development and possibilities, seems to be unbroken in Japan in the 1990s, contrary to many other countries in the world. How do you see this aspect? Why is Japan keeping this optimism?

The background of "technical optimism" of Japan is rooted in the technological achievements and greater awareness of technology after the war. The factors leading to this infatuation with technology seem to be as follows: a) As a country greatly dependent on export, technological development has been a national proposition. b) As seen in the automobile industry, Japan has confidence in the prospect of developing technological solutions to the problem of pollution. c) Actively seeking technical solutions is considered to be the only viable means of tackling future environmental problems. d) In the areas of cities and architecture, the Japanese iron, glass and cement industry has achieved the leading position in the world. Therefore, it is constructing artificial environments, based on these artificial materials. While there are the warnings of Yoshiro Hoshino, a technical pessimist, Professor of Teikyo University, the prevailing trend is toward optimism, as expressed by Hajime Karatsu, Prof. of Tokai University, and Takemochi Ishii, Prof. of Tokyo University. Arata Isozaki, who believes in putting an end to big architectural demonstration, tends to enjoy much less support than Kenzo Tange, who believes in technology as a leading force. I consider in my methodology that design is supported by technology. However, the range covered by technology is expanding to structure, facilities, information, automated construction (using robots, artificial intelligence, etc.

Are the contemporary projects of super highrise buildings (1000 to 4000 m), space lab-cities, underwater cities, etc. fulfillments of early metabolistic ideas and resurrections of the 1960's?

- Reproduction of Metabolism 1960 - I was creating designs for super-high-rise buildings and floating cities in the 1950's. I have put a lot of thought into these things over the many years since that time, have continued projects, and created new projects. Metabolism did not die with the 1990's.

After the Japanese government removed the 30-meter height limit, many very tall buildings appeared. The 300-meter buildings envisioned in the 1960's have now materialized as the 60-story Sunshine City Building and the new Tokyo Metropolitan Government Offices.

For Metabolism of the 1990's, I think even taller buildings are required in order to strengthen the urban infrastructure. Floating platforms to hold cities are not yet viable because of the high cost compared with land reclamation, for example. Nevertheless, parts of a marine city, such as Aquapolis, marine power stations, marine hotels, marine pulp plants, loading stations and floating barges have become reality. Also, the results of re-

lated technology have been accumulated, such as the deep-sea 6500 investigation ship (best in the world), undersea tunnels, and undersea fiber-optic cables. In addition, the artificial island projects in Kobe and Yokosuka, the Kansai International Airport are gradually materializing.

Although political will for macro projects is insufficient, the spirit and symptoms for urban creation to achieve a project of the century are merging at last in society, economy and culture, in terms of planning, economic and management capability. I think that this is proceeded through guidance by the insight of "metabolism".

The idea of metabolism as a biological analogy was already replaced by a pure technological approach in the 1960's. Was the original idea which included also a life-style, changed and what were the consequences for the idea of the city? The results seem to be limited to individual huge buildings.

- "Metabolism" is a biological and ecological ideology - The ideology and idea of "metabolism" are not yet adequately recognized by society. "Metabolism" is not effectively recognized by society. "Metabolism" is not effectively utilized in cities and architecture. Not a few buildings are imitating and following European architecture, based on the direction of non metabolism. However, although gradually, the necessity to socially create systems with greater consideration given to recycling and reuse, to effectively use resources and improve the quality of the environment is becoming keen. As general social recognition, people are not yet aware of it. Even if people are aware of it, examination is not made well regarding where to start and who should do what. The only thing we can feel is that the world situation is becoming severe in terms of the problems of energy, the global environment and resources, and thus we will come to a metabolic way of thinking someday and eventually have to work on it in earnest. An example is the research on the stratiform structure system. This artificial environment system has been researched commissioned by the government for over 20 years since 1970, and I am a member of the research group. However, it is still in the experimental stage and no real system has yet achieved. The reason is that huge investment is required for the infrastructure, based on a long-term vision.

Mr. Kikutake, you are one of the inventors of "metabolism" and still associated with its ideas. How would you define "metabolism" today? What are the essential points?

- My Deep Feelings - I am proud to be living in the age of modern architecture, particularly in Japan, because I can feel that I am living in an era in which "metabolism" is regarded as the most significant key concept.

I feel that my mission is to create modern architecture by utilizing space performance enhanced through the "mechanism of demo-

lition and assembly" achieved with wooden architectural structures and their rebuilding, particularly the relationship between open space and highly flexible lifestyles. Another subject for me is harmonization with ecological nature. Generally, this is called Japanese-style architecture. However, this concept is socially misunderstood as clinging to tradition or denial of European architecture, or even demodernization. However, the concept of Japanese-style architecture is required not only in Japan, but also in Asia, the United States and Europe. Metabolism is the global way to artificial environment and ideology needed for the 21st century. I think that the era of metabolism architecture will start soon.

The Japanese culture always seems to be tending towards artificial environments. How do you see the relation between nature and artificial environment? Will there be in the future continuously more artificial environments despite worldwide problems of using thus too much energy, producing CO2 gas and garbage? Where do you see ecological aspects and approaches in your planning?

- Towards Eco-Polis - To live in harmony with the natural environment is a part of Japanese culture. I do not think it is only artificializing. The influence of British culture after the 18th century was very strong. It is a fact that the tendency towards artificial environments by the industrial evolution disseminated worldwide. Japan was no exception.

Currently, I think that architecture should be based on "metabolism" as an internal environment and should learn a lot from plants in nature in terms of environmental adaptation as an external environment. Architecture has mainly pursued self-environment and regarded influence on and harmonization with peripheral environment as a minor subject. As a result, cities have destroyed nature and architecture has invited overcrowding and confusion to cities.

If the theories of architecture are not wrong, better urban environments should be produced through active construction of buildings. The larger a city grows, the more it should harmonize with nature. If this is not true, the theories of architecture must be corrected so that construction of buildings leads to a more people-oriented environment and better views as groups. Beautiful and harmonized views should be created between cities and nature.

As an example, a single tree has a beautiful shape and its changes with the seasons are attractive. Many such trees become a forest, as seen in Japanese pictographs, such a direction of architecture is called eco-polis. To achieve this, we must carefully utilize natural wind, light and rain by giving the artificial environment a supplemental role. We must find new solutions on how to create desirable environments for people. I would like architecture to have such types of discovery and preservation that carefully use resources, reuse them, and socially obtain common universality that can be applied everywhere.