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## **on japanese spatial layering**

sur l'étagement des plans japonais

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**introduction by Kengo Kuma**

The Japanese space is built through overlapping several bi-dimensional planes. Whilst in Western architecture space is limited by thick heavy walls, in Japanese architecture the space for people is obtained by using "Shoji", mobile thin and light partitions formed by wood and paper frames. This building system, in my opinion, is not obsolete, but up-to-date, even more in the 21st century, when the environmental issue has acquired a worldwide interest. It derives from the need for living in a limited territory – such as the Japanese one – which is poor in raw materials. This approach has improved over time, permitting thus to live comfortably also in limited energy-saving spaces. It is thanks to this method that the Japanese average residential area is smaller compared with the Western one.

In spite of smaller dimensions, the use of layering succeeds in giving Japanese architecture a sense of opening and a well-organized space.

The 11th March 2011 earthquake, which ravaged Tohoku region in Japan, stressed the importance of this building system. Such geographic area is one of the poorest in Japan and, with steep mountains sloping down to the sea, has few habitable spaces. In this case the use of layering was able to conquer room for a practical and comfortable living in such a small space. Tohoku may be considered now a gold mine for the study of this system.

The so-called "Kesen's carpenters" – coming from one of the areas more severely hit by the Tsunami – have always been well known for their skill in space stratification through the use of wood. In the past, the technical level and the beauty of their works were well known all over Japan. We are studying now with them, in Rikuzentakata – the town destroyed by the Tsunami by more than a half – the "Great Home": a dwelling for the elderly who are now homeless.

This work started thanks to the commitment of the Comunità di Sant'Egidio, an Italian NGO, and by the Italians for Tohoku Association.

I think this disaster has to be an opportunity to revitalize the layering system, handed down through generations in the Japanese building tradition. In the future, a low energy consuming life style will be important, using small areas and building small houses: in this challenge layering will play a crucial role. The architecture and planning of our cities, then, will have to be aimed at this perspective.

We have to leave behind us the culture – characteristic of the 20th century – which destroyed the environment to produce dilated spaces, consuming big amounts of oil and nuclear energy.

Kengo Kuma

## ON JAPANESE LAYERING

Kengo Kuma's words effectively describe the role that the concept of spatial layering plays in Japanese architectural tradition and its huge potential in contemporary production. Through this system, the Japanese have always given a strong sense of spatiality to their architecture, although its dimensions were necessarily limited. The outstanding role of the image in the contemporary production of architecture is food for thought on the role of space in the past, in particular in the Japanese building tradition. It was born open and flexible, connected to the concept of patriarchal family. With the opening of Japan to the Western world and its consequent cultural contamination – which occurred in 1868 with the Meiji restoration - architecture adapted to the circumstances and started to shut itself up, losing the spatial flexibility that had characterized it. Today, it is again advisable to rediscover the opening up of the past, as an answer to a deeply changed society, which requires more flexible spaces.

Spatial layering is an extraordinary tool for the creation of intermediate spaces. It can supply food for thought on an about-turn of contemporary architectural research. The potential of present technologies can recover tradition and its re-proposition in new forms. Its outcomes in designing terms envisage the implementation of contemporary works of architecture, whose spatial features derive from understanding and metabolizing traditional spatial concepts.

To better understand spatial layering it is necessary to dwell on some concepts which permeate the definition of space in Japanese culture.

The Japanese word Ma (間) means “pause” and gives an idea of space including the concept of time. Unlike the Western concept, having a quantitative connotation, the Japanese term suggests a relativized and sensory perception of space. Arata Isozaki contributed to the diffusion of this concept through the Exhibition “Ma: Space-Time in Japan” This principle is constantly present in many aspects of Japanese culture, from photography to theatre, from music to architecture. Thinking in terms of figure-background relationship, one might imagine Ma as a “negative space”, a very effective definition supplied by Yoshinobu Ashihara. (1)

The second concept is the rikyū grey, or “philosophy of grey”, according to Kisho Kurokawa's definition. Describing the city of Kyoto, he remarks that all the elements of its architecture tend to dissolve in the twilight, losing every perspective and three-dimensional character.

“At the very basis of Japanese ethical conscience in painting, music, drama and even town-planning, you find this bi-dimensional or frontal character. It is an atemporal non-sensuality deriving from the reduction of a three-dimensional world to a flat world”. Katsura's imperial palace in Kyoto is a case in point: here there are no defined perspective points and the space is created by a sequence of flat elements.

The third concept is carried in the word Oku (奥) which makes reference to an idea of “innermost area”. Fumihiko Maki writes: “The Japanese have always postulated the existence of what is called Oku (innermost area) at the core of this high density space organized into multiple layers like an onion. The word oku, expressing a distinctive Japanese sense of space, has long been a part of the vocabulary of daily life. It is interesting to note that the use of the term with respect to space is invariably premised on the idea of okuyuki, or depth, signifying relative distance or the sense of distance within a given space. The Japanese, long accustomed to a fairly high population density, must have conceived space as something finite and dense and, in consequence, developed from early in their history a sensitivity finely attuned to relative distance within a delimited area..” (2)

Maki's image can be found also in the formation of Japanese cities, where the built develops in a centripetal way, enveloping an often empty nucleus in onionskins. Unlike the Western cities, where the centre is dense and strong, Tokyo converges to emptiness. Don Hanlon finds out four typologies of spatial layering in architecture: horizontal, vertical, concentric and radial (3). The spatial layering described by Maki can be defined concentric. Those who are acquainted with Japanese culture know the extreme care and attention devoted by the Japanese to enveloping objects. In the same way, as described by Maki's onionskin metaphor, they tend to envelop space.

Marja Servimaki lists some of the several elements creating this type of spatial layering in traditional dwellings: “(...) besides shoji and gangji panels are various kinds of adjustable space dividers, as folded screens (byōbu) cloth curtains (noren), and bamboo or reed shutters (sudare). .... sliding elements that have paper on both sides (fusuma) as well as the latticed areas above the openings (ranma)”. (4)

These elements, called *Kyokai*, are devices aimed to organize space and play a basic role in creating Japanese intermediate space. In contemporary architecture their re-discovery can produce environments able to start social and environmental relations and to act as containers. They can also supply functional performances, such as filtering light, views, sound etc. and contributing to the building's sustainability, favouring thus natural air control or producing energy. As Kengo Kuma writes - having analysed in depth the role and potential of *Kyokai* in a recent publication – “by ‘modern architecture’ I mean an architecture that can control boundaries at will, that is, an architecture that can subtly adjust relationships between human beings, between human beings and things, between human things and nature. It is not a self-centered, sculptural architecture that is formally self-assertive, but an architecture of relationships”. (5)

In the late '70s Kengo Kuma studied at the Tokyo University with Hiroshi Hara and Fumihiko Maki. According to Botond Bogner (6), Kuma's interest for the theme of spatial layering might be connected to his teachers' influence. Hara, for example, at that time was researching “multilayered structures” and , in 1979, Maki wrote his text on the concept of *Oku*.

In the text “Spatial Layering: an Effect of Cubist Concepts on 20th Century Architecture” Basel Kotob analyses the role of spatial layering in the definition of Cubism's poetics. This movement's revolutionary theories have, as everybody knows, deeply influenced 20th century architecture. The concept of overlapping of bi-dimensional layers appeared in Japan in the 12th century with the use of “collage” and was later re-discovered by Cubism. This fundamental step paved the way to the translation of the concept to architecture. “ Just as the planes overlap each other in an ambiguous state in paintings, they are actually constructed one on top of the other in collage, and finally are physically separated from each other in architecture. The translation of the concept to architecture is a transformation from visual layering to experiential layering”. (7)

In the essay entitled “Transparency: Literal and Phenomenal”, Colin Rowe and Robert Slutzky are confronted with the issue of spatial layering describing it as an effect of transparency in architecture. The paper opens by the definition supplied da Georgy Kepes: “If one sees two or more figures overlapping one another, and each of them claims for itself the common overlapped part, then one is confronted with a contradiction of spatial dimension. To resolve this contradiction one must assume the presence of a new optical quality. The figures are endowed with transparency; that is they are able to interpenetrate (...) Transparency means a simultaneous perception of different spatial locations”. (8)

Le Corbusier's house in Garches is used by the authors as a case in point to talk about spatial layering obtained by superposing layers with different transparency levels.

“Each of these planes is incomplete in itself and perhaps even fragmentary; yet it is with these parallel planes as points of reference that the façade is organized, and the implication of all is of a vertical layerlike stratification of the interior space of the building, a succession of laterally extended spaces travelling one behind the other”. (9)

In the text also the concept of fragmentation appears. As objects were broken up into particles by Cubism, in the same way architecture can be broken up and “particularized” (according to Kuma's definition). “It can be argued that the concept of fragmentation came in part from the discovery of the X- ray by W.C. Roentgen in 1895. What appears to be a wholesome entity from the outside, becomes fragmented in the X- ray. This may have served to inspire artists and architects to be more curious about the inside of solids.” (10)

The pseudo-perspective in use in Japan – of Dutch influence – reproduced too a spatial condition through the fragmentation of the image into small elements (increase in the detail rate) and their dimensional change according to the distance from the observer. Each element corresponded to a plane of the image equivalent to a given distance. This kind of layering was present also in Hiroshige Ando's *Ukiyo-e*, where the Western perspective was replaced by a sequence of planes having different levels of visual permeability. Frank Lloyd Wright was strongly influenced by this space concept. In his *Prairie Houses* – the works which mainly show this influence – both horizontal and vertical boundaries create a continuous set of spaces having different values, unified by a single big Japanese- inspired roof. Already in 1893 he had the opportunity of visiting *Ho-o-den*, the Japanese pavilion at the Columbian Exhibition in Chicago. Kevin Nute writes: “ Japanese Homes and the *Ho-o-den* are together shown to have played a central part in the development of the *Prairie Houses*. These sources encouraged Wright to experiment with a repertoire of plan-types in which he tested ideas of spatial layering and transparency”. (11)

In many dwellings designed by Wright, for instance John Pew House, one finds spatial layering as an instrument to mediate the relationship between the interior and the exterior of a building. As he himself affirmed during a meeting with his apprentices in *Taliesin*: “See how simply they get in these planes : they rendered all this sense of distance, there is no lack of perspective here, as you'll notice. They're supposed not to have known perspective. They knew all they wanted of it...they didn't want much of it” (12)

Inspired by these representation system, obtained by interposing several layers between the observer and the building to increase the perception of depth, Wright used it often to represent his projects. Kengo Kuma has recently analysed the contribution of Japanese culture to Wright's stylistic development, in particular Hiroshige Ando's role (his works were collected by Wright) and the role of the Tea Book by Kazuko Okakura. "Wright's encounter with the transparent spaces, based on multilayered boundaries achieved in Hiroshige's ukiyo-e prints, enabled him to go beyond the perspective space of the West. He was able to transcend the laws of perspective to express depth in space that had constrained Western architecture and painting since the Renaissance" (13)

Another outstanding figure of 20th century architecture, Carlo Scarpa, visited Japan and was particularly influenced by it. In 1969, invited by Cassina, he visited Tokio, Kyoto and Nara. The outcomes of this travel, and of his great interest in the East, that he had already showed in the previous years, can be read in his works. (14)

Carlo Scarpa, studying Japanese architecture, had the opportunity to understand its essence in terms of space. In particular, he was able to absorb the concept of Ma and with it the sequence of spaces and layering. "Scarpa realised that space, as for the Japanese, is an experiential rather than measurable compound. And if space is experiential, it must be sequential and depending on empirical experience – hence its temporal aspect.

In architecture, space becomes both layer and procession. It's no accident that in Japanese ideograms, time is expressed as a "space in flow". (15)

Among the greatest experimenters of spatial layering in Japanese contemporary architecture, Kengo Kuma is the most prolific. In his works, inspired by a careful spatial research uniting traditional culture and present technology, he often uses bi-dimensional elements acting as filters or connections, through the interior/exterior relationship in architecture.

We already mentioned the role of Hiroshige Ando, the ukiyo-e's painter, in Wright's formation. In the museum dedicated to him and designed by Kengo Kuma, several elements of Japanese spatial layering converge. Kuma writes: "Hiroshige took note of the particles that constitute the natural world and in his works showed the essence of nature by layering the particles he observed. He had a tremendous influence on Europe's Impressionist movement and on Frank Lloyd Wright's architecture. What I attempted to do with the Hiroshige Museum was the exact opposite. Avoiding concrete as building material as much as possible, I created virtually all the architectural elements, from the roof and the walls to the partitions and furniture, out of louvers made of cedar wood grown on the mountain behind the museum. I hoped that the use of wooden louvers as particles would make the building blend in with the surrounding environment, thus erasing the architecture" (16) Through the spatial layering obtained by the iteration of loopholes, Kuma shifts the observer's standpoint transforming the experience from external to internal, and erases architecture, creating thus an "anti-object".

Even though with substantially different conditions and outcomes from Kuma's, Toyo Ito's architecture also shows the spaces formed by often undefined and ephemeral surfaces acting as filters, re-creating a "vague and ambiguous condition as the one of drifting particles". (17)

Toyo Ito defines this concept as "graduation": in a conversation with me and Salvator John Liotta, Ito states: "In my architecture I always try to go beyond the frame in which I have been constrained, to make the project overstep the mark. I try to make landscape go beyond the space I had to carve out, to make reality progress towards a blurring image. I call this way of working "graduation". I think of graduation as a process in which clearly shaped objects start to melt.

It is something opposite to what we said before, when we said that the image of soft objects gradually takes shape. Taking that process and reversing it we get something which, thanks to the photographic tool, has a form which melts, a form which gradually blurs. I am very deeply interested in the passage from one state to the other and the other way round. For me, graduation expresses exactly this change." (18)

If architecture, as Sou Fujimoto states, is nothing but a device to separate interior and exterior and consists in creating boundaries, then his House N in Oita is one of the most interesting experiments in this sense. Boundaries identifying architecture are not to be necessarily clearcut, as often happens in the West. They can have endless gradations, like all the shades of grey between white and black. This architecture encloses a space similar to the one of a forest, or a clouded sky.

Fujimoto writes: "On traditional Japanese folding screen paintings, the individual scenes depicted are often separated by bands of clouds. Rather than being depictions of actual clouds, they serve as background motif that may connect, separate, or relate scenes set between them. Their vacuity creates a diversity of relationships. The ultimate boundary, like those clouds, is a transparent thing that can establish a multiplicity of relationships, even among phenomena that exist in different temporal and spatial dimensions. The architecture of the future may well be a space like these clouds". (19) The foldable screens mentioned by Fujimoto, called Byobu, have inspired the graphic design of this review.

"Layered house" is the name of a dwelling recently designed by Jun Igarashi and inspired by the concept of spatial layering described so far. The spaces, organized according to a linear sequence, are separated by



curtains and permeable diaphragms and represent a line wisely mediating the relationship between home space and external landscape. The sleeping area is the most protected and sheltered core of the dwelling, a sort of Oku, and is enveloped by the other areas. Here too, as in the traditional Japanese dwelling, spatial flexibility is extreme.

Jun Igarashi, playing with mobile diaphragms, wisely narrows and dilates space, creating what has been defined as the “house of illusions”.

The theme of spatial layering has also been concretely experimented in some of my recent projects designed with Salvator John Aliotta.

“Intermediating Patterns”, for instance, is an exhibition which took place in 2011 at the Istituto Italiano di Cultura in Tokyo. It collected the research works on the theme of pattern and intermediate space carried out at the Tokyo University Kuma Lab. A parametric installation entitled “paper garden” explored the potential of spatial layering by using strips of re-cycled paper and showing how it is possible to produce quality spaces by using bi-dimensional surfaces and patterns.

Nami is the title of the project designed for YAP (Young Architects Program), promoted by MoMa in New York and Maxxi in Rome. Inspired by Katsushika Hokusai’s famous waves and by the concept of harmony permeating Japanese culture, it envisages the creation of a “flight” suspended in Maxxi’s external space. The elements composing it derive from the parametric re-elaboration of a Japanese traditional pattern (hataru tsuyushiba) and are assembled by flat modules in sequence, implementing thus a spatial layering able to supply shadow, create relations and give new and unexpected perspectives of the museum.

This work shows that traditional patterns can be successfully used to produce intermediate spaces and new architectural forms and structures.

Thanks to the cooperation between Kengo Kuma, the Comunità di Sant’Egidio, the voluntarism group Italians for Tohoku, the Italian Embassy in Japan and the Tokyo University Kuma Lab much has been made to give a concrete contribution to the community of Rikuzentakata, a town almost completely wiped out by the last March 11th tsunami.

This will happen through the construction of a center for the elderly: a public work having a high social and cultural value. It represents a message of hope for the future, when architecture will be designed to be in tune with the rules of nature, not to oppose them. The plan presents a concentric spatial layering. The centre – empty like in the city of Tokyo, but symbolically the most representative space – is surrounded by a set of elements mediating the relationship with the outside. The structure, made of local wood, shows a transparency and porosity open to new relations between building and nature.

Concluding in Kengo Kuma’s words: “Japanese architecture is a treasure-trove of boundary techniques, and is full of ideas for surviving an age in which growth has ended. Diverse screens (such as louvers and noren) and intermediate domains (such as verandas, corridors and eaves) are gaining attention once more as devices for connecting the environment to buildings. Today, when the focus is on global environmental issues, these architectural devices are of great interest as precedents for sustainable design. They enabled people in the past to dwell at high density in places with limited supplies of energy and resources while screening off sunlight, promoting ventilation, and controlling security. The entire world can be said to be undergoing Japanization.” (20)

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**note**

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