

The Roof at Fujisawa

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The Roof at Fujisawa

Fumihiko Maki

It is a well known fact that Japan began to modernize rapidly after the Meiji restoration. In the one hundred and twenty years that have passed since that restoration, Japan has developed into what is arguably the most industrialized nation in the world. In metropolises such as Tokyo and Osaka, traditional buildings that have survived natural disasters, fires, the war, and the effects of rapid modernization are very limited in number and scale. Old, pre-industrial streetscapes that remain fully intact are virtually non-existent. This trend toward industrialization will undoubtedly accelerate in the future, as the densities of these cities increase and, concomitantly, new construction continues to occur at a more rapid rate. Moreover, such rapid growth will be combined with increasingly stringent building codes intended to mitigate the destructive effects of natural disasters by way of particularly lightweight and sophisticated systems of construction. This is the situation in which the contemporary practitioner of architecture in Japan finds himself.

In this sense, the evolution of the industrialized city and the emergence of Modern architecture – from which contemporary architecture developed – must be seen as interrelated phenomena. The theoretical foundations of Modernism – including references to mass production, trabeate construction, investigations in new and lightweight materials, free-planning and functionalism – all suggest obvious comparisons to the world of industrialization.

We have witnessed this expanding industrialization with some concern. The most extreme position insists that such industrialization will undermine our culture, fracture our relationship to history, and bring about the formation of a forbidding urban landscape without reference to place. The Western world has given voice to similar concerns as well. For an architect in such a predicament, a pressing question reveals itself: What is the role of history and place in this industrial city, and how does one contribute works of authenticity and resonance to such a landscape?



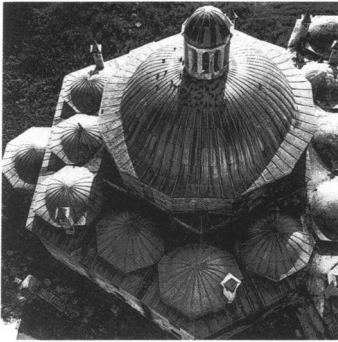


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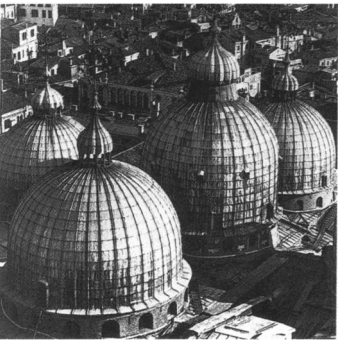
Going south in Manhattan along the East River, one encounters a series of huge concrete and steel bridges. Their stone foundations have been exposed to the elements over many years and are coated with moss. They remind one of the ruins of Roman aqueducts and the world of Piranesi. The factories and the tall, expressionless apartment buildings standing nearby are also weathering products of an early industrialized society, and appear before us as strangely reticent monuments of modern history. Cityscapes of this nature greet one in London and Manchester as well. In contrast to these examples of Western industrial vernacular that testify to the glories of a weighty past, the industrial vernacular of Japan has an entirely different aspect. The factories, high-rise apartment buildings and gas tanks that stand crowded together in the vast area reclaimed from Tokyo Bay that is visible from the expressway describe a world of abstract form. One can discern here a kind of lightness, a frail optimism that approaches lyricism. The past does not weigh down this cityscape as it does the cityscapes of the West, because here it is not allowed to accumulate. The human traces in this transitional landscape can be dated back only a few decades at the most. Features distinctive to Japan – everything from signs, vending machines, and plastic products to entire urban infrastructures – participate on an equal basis with cheaply constructed buildings in the formation of the surface of the city. If one looks closely enough, one can see in this surface composed of concrete, metals, glass, and plastic the layered, tactile quality that is distinctive to Japan. The aesthetic that this cityscape speaks of is one of fluctuation and fluidity. It is possible to recognize the existence of a unique perceptual order here.

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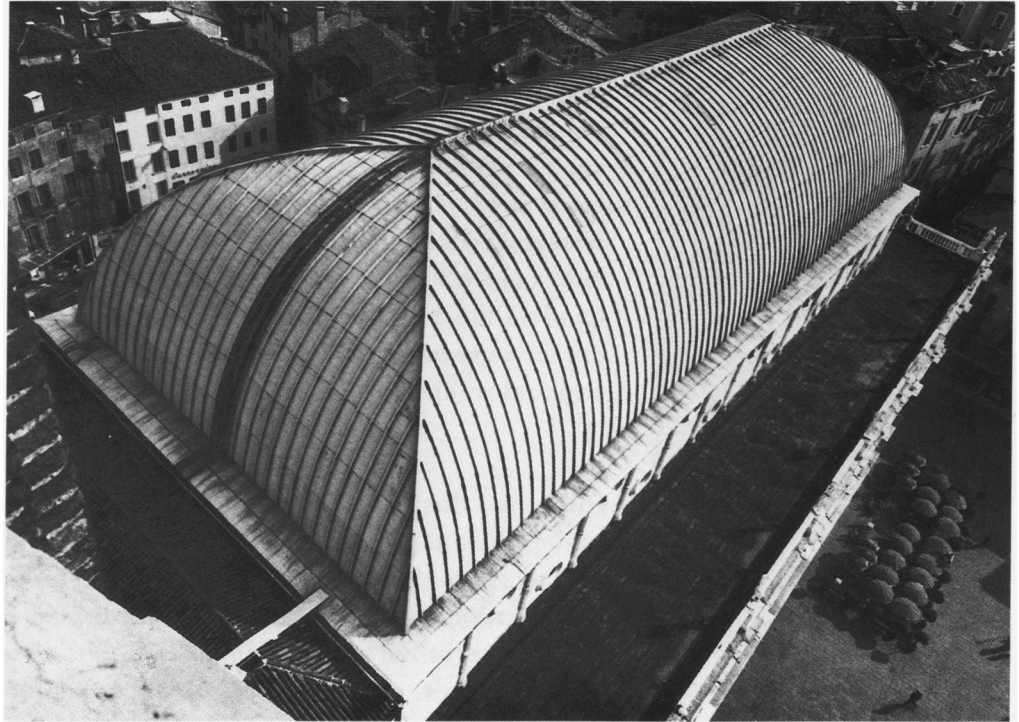
The phenomenon of the modern city cannot be understood as a manifestation of the industrial imperative alone. Notwithstanding the expectations of early twentieth century theoreticians – who foretold the development of our cities along models provided by this industrial revolution – it remains possible to identify significant distinctions between one modern city and another. The proportion of new construction to old, the persistence of local preferences, and the particular characteristics of a regional culture all con-



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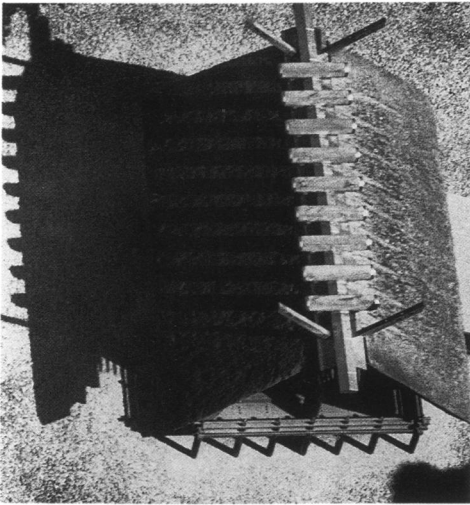
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tribute to this diversity. While it is true that modern frame construction must conform to laws of tectonics independent of the specifics of place, that particular quality of place still finds expression in our buildings.

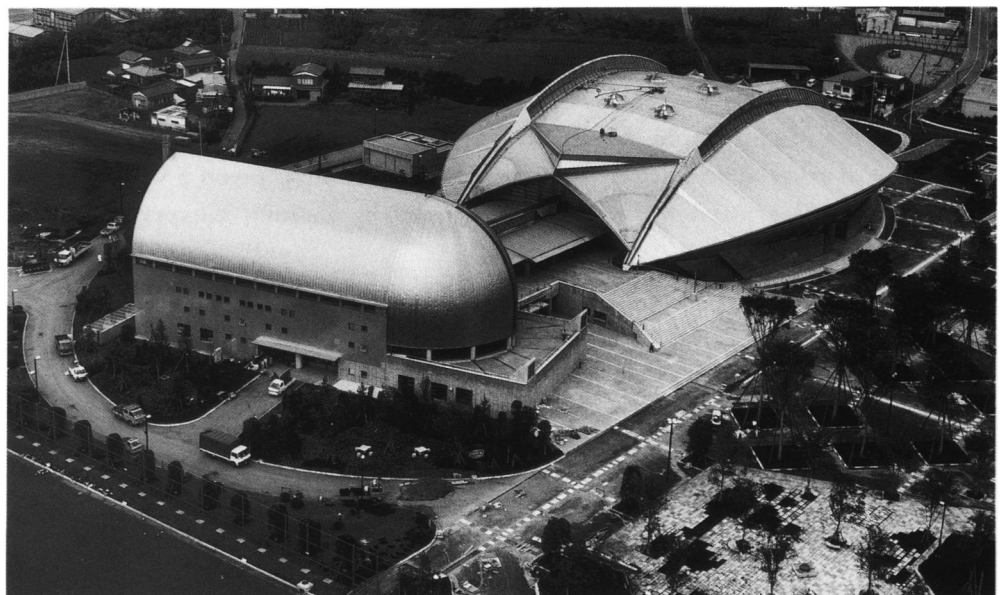
The Japanese variation derives primarily out of a historical phenomenon. Japan has many strong traditions of craft, custom, dress, and family structure. We do not, however, possess an accumulated stock of traditional architecture around which our cities could be formed. In this sense, our traditions persist in the form of intangible as opposed to tangible structures. The imprint of Japanese culture on the industrialized city is felt not in the juxtaposition of old and new artifacts – as is seen in Europe – but in the overlay of an entirely new architectural landscape on a very old culture. The integration of the two results in a very distinctive experience of the Japanese city.



6

It is this experience – this persistent expression of culture – that must form the basis of a true modern vernacular. The design and construction of individual buildings capable of speaking to both the traditional past and industrial future of Japan depends on a sensitivity to this historical fact. The challenge facing the architect today is to understand and contribute to this integration of intangible traditions with tangible artifacts – to link together the historical character of our culture with the development of a built urban landscape which cannot literally recreate its own history. Such a challenge involves the investigation of industrial artifacts with an eye for their more evocative natures, searching among them for a specific character related to regional tradition.

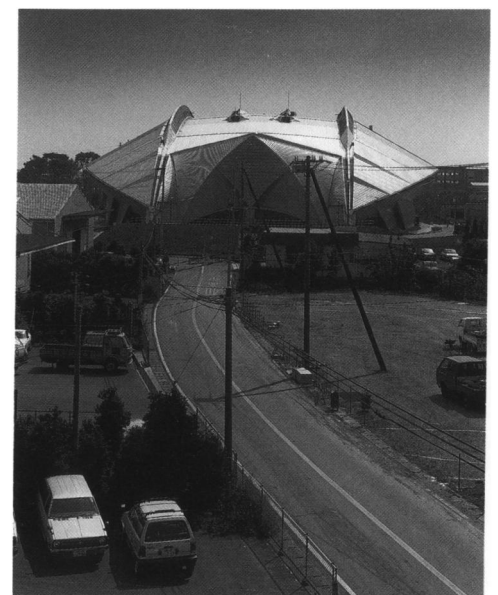
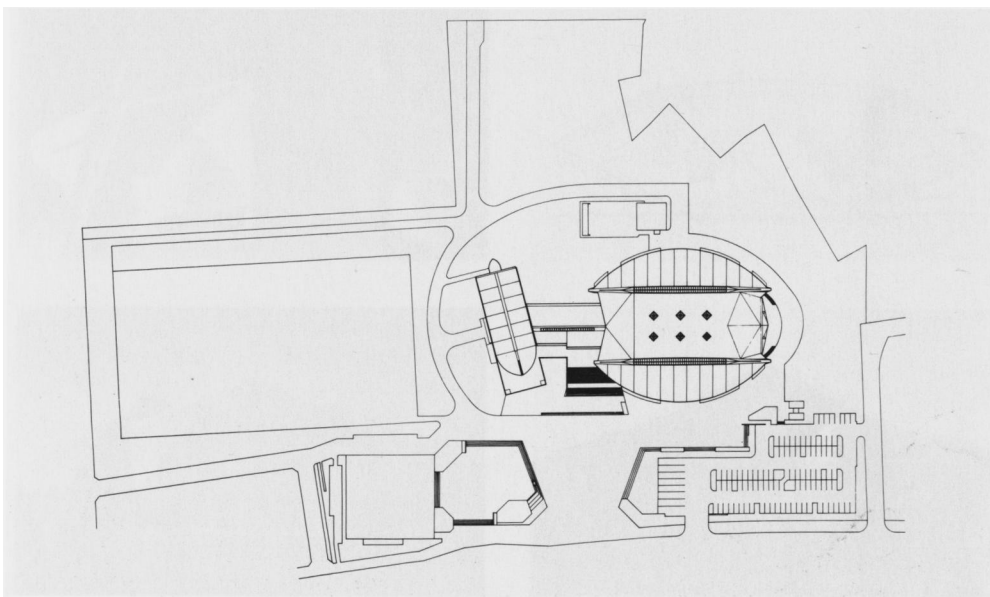
This search for a meaningful integration of the past with the future has dominated my thinking in recent years. Much of my work has been undertaken in pursuit of this integration. For an architect committed to building, this investigation is deeply involved in formal and technical matters of construction, such that the entire issue becomes manifest in their resolution. As can be seen in the battered and monolithic stone constructions of England's industrial past, or the lightweight and luminous assemblies scattered along the edge of Tokyo Bay, these issues related to place and character may be deciphered in essentially physical terms. For this reason, I believe it to be critical to the design process that one constantly reference the material nature of one's proposals to both their historical and geographic context. The study of primary architectonic elements – the foundation, walls, columns, and, perhaps of most importance here, the roof – related to any particular construction must be undertaken with a sensitivity to the material history of that element, to insure that this architecture may speak to more than its own occurrence.



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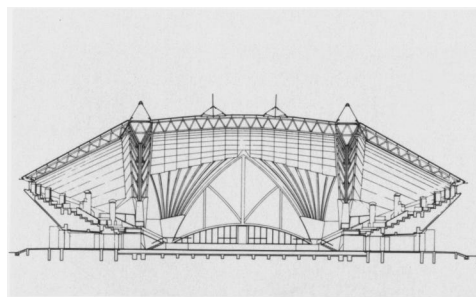
The capacity of a single architectural element to possess this dialectic was made clear to me in the conception of the roof for the Fujisawa Sports Complex. In fact, the stainless steel roof to be seen here has a complex history of its own, intimately tied up with the specifics of its coming to be – its technical and formal inception along with its actual production in the field. It is necessary to speak at some length about this technical history in order to communicate the intention of the roof as a cultural artifact, as a *constructed* artifact that stands in a complex relationship to history. In this way I believe it is possible to see the roof itself as a metaphor for the coming together of two traditions.

Fujisawa is a city located very close to the seashore, about thirty kilometers from Tokyo. The landscape of this area is, in fact, quite bleak. The particular site chosen for the new sports complex lacked any distinguishing characteristics of its own, and remains surrounded, for the most part, by smaller structures arranged in a loosely-defined configuration. The introduction of a very large structure of the scale required by the program assured that the new building would assume a strong presence in the city. We recognized early on that the successful accommodation of this program would necessitate the construction of two very large rooms, each of which would have a definition and a nature of its own. Given our experience with this particular building type, we understood the critical issues of scale that such constructions inevitably present. We also knew that the roof itself would most profoundly influence this eventual reading of scale. The manner in which this roof was conceived and developed would be crucial to the final character of the building.

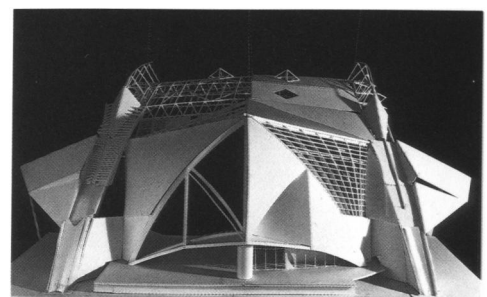


Several considerations led us to choose stainless steel as the primary material for this roof. Many of these considerations had to do with specific physical characteristics of the steel itself: its great resistance to the degenerative effects of salt air, its considerable luminosity, its capacity to be shaped and bent into fairly complex segments, and certain inherent qualities of scale suggested by its extreme thinness and fragility. We regarded each of these characteristics as advantageous to the formal and technical ordering of the roof. Their cumulative effect was to provide a point of departure of considerable rigor, a set of limitations demanding precise calculation, and considerable investigation of relevant construction procedures.

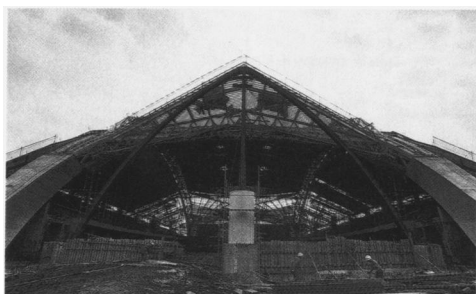
We determined through our investigation that each steel sheet would be limited to 40 centimeters in width and only 0.4 millimetres in thickness, a thickness of such fragility and susceptibility to creasing and wrinkling that extraordinary measures would be required in its manipulation. Such thin sheet steel would not be capable of maintaining an even surface in the life of the building, nor, for that matter, during construction when particularly extreme concentrated stresses would be exerted on each sheet in its transportation and manipulation. When seen against the sunlight, these inevitable imperfections would become particularly apparent. Working with the manufacturer, we were able to devise a method for producing systematic wrinkles in each sheet in such a way that these deformations would appear uniform and intentional, providing a certain texture to the roof and allowing another scale reading to be manifest in the surface itself. This texture might then speak of the nature of steel in the same way that grain speaks of wood, or the visible composition of minerals speaks of stone.



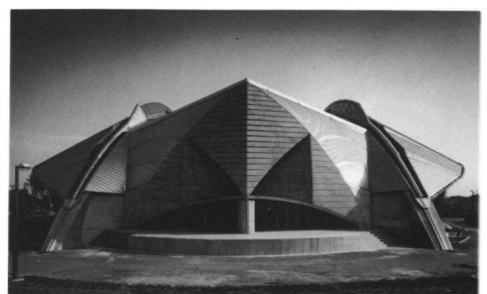
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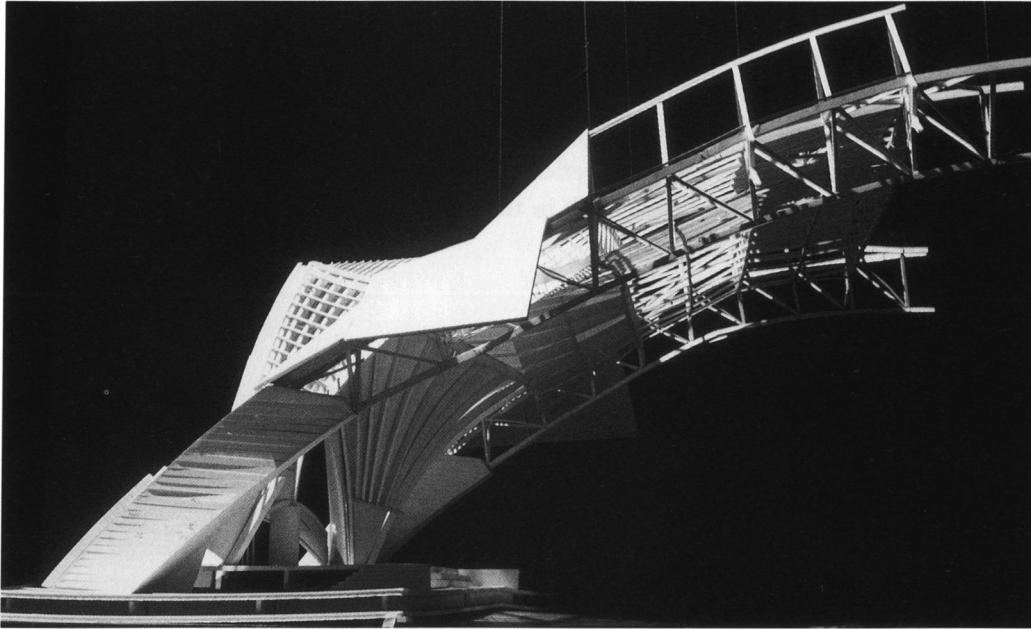
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The manner in which these steel sheets might be fabricated and joined was studied carefully so as to avoid a repetitive or mechanistic assembly, or conversely, an homogenous, membrane-like appearance that might belie the building's truly assembled nature. To this extent, we wanted very much to avoid the "inflated" quality that such large structures commonly suffer. Through many attempts in model, we were able to determine a configuration of individually-fabricated segments that collectively achieved the desired whole, while maintaining the integrity of the part. Each of these steel sheets was in itself quite unique. Rather than accept a repetitive subdivision of the roof by way of highly complex, curved segmentation – which we learned would be quite difficult to manufacture – we made liberal use of trapezoidal segments, requiring certain adjustments to be made at critical points in each sheet. Many of these adjustments had to be modified – even conceived – at the construction site itself.

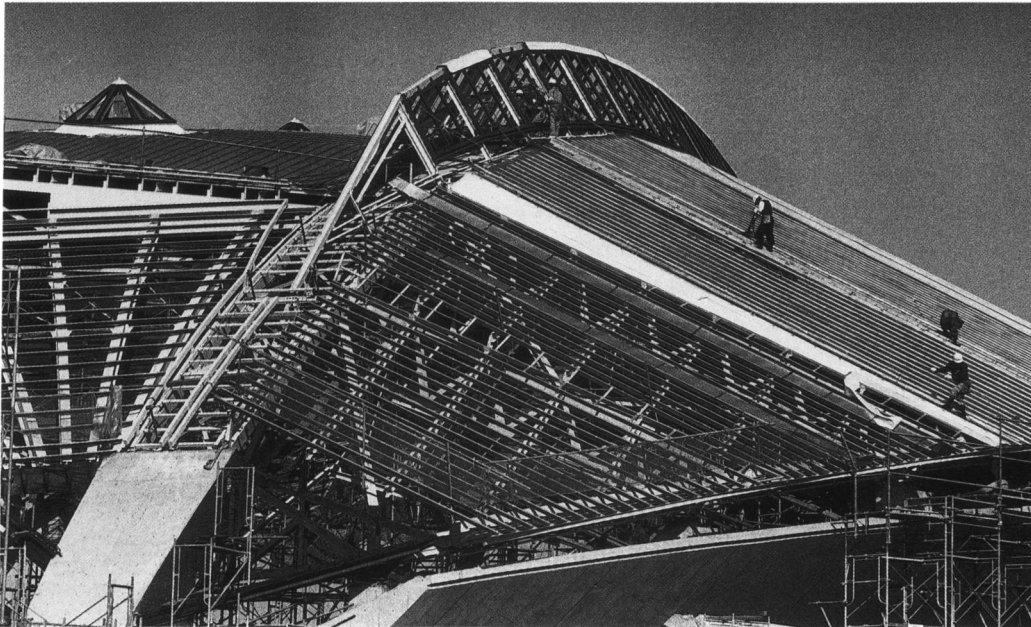
Several members of the design team were present at the site throughout construction to supervise this on-going process of study and correction. In fact, it was necessary to set up a small office at the site where the design team could work, maintaining day-to-day contact with the builders – even assisting in the construction itself – to insure that each connection and each detail was executed correctly.

In an effort to make apparent the hovering quality of the roof – to disassociate it from the more massive base of its support – we developed a series of pin connections where the meeting of these two elements could be poignantly accomplished. Such a meeting further reinforced the apparent *lightness* of the roof, allowing it to maintain an identity of its own that speaks of an almost ethereal presence. Through the development of these pin connections we were able, as well, to underline the *assembled* nature of the steel-clad roof structure, reinforcing once again our ambition not to fall victim to that "inflated" appearance, so contrary to the proper definition of scale.

The reality, or the spirit of the steel itself seemed to us to be very much tied up with its sharpness, its precision, its capacity to define an unequivocal edge. This was always on our minds as we studied each corner



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and intersection, and particularly as we explored the termination of the roof near its base. But such luminous metal has another evocation as well: I have observed that at certain times of day – in a very particular light – this luminous steel virtually disappears into the sky, suggesting an aura not unlike that of the sun during an eclipse. Its reflection of such bright light is so complete as to wholly absorb the material itself in the act of reflection. This is its paradox and mystery.

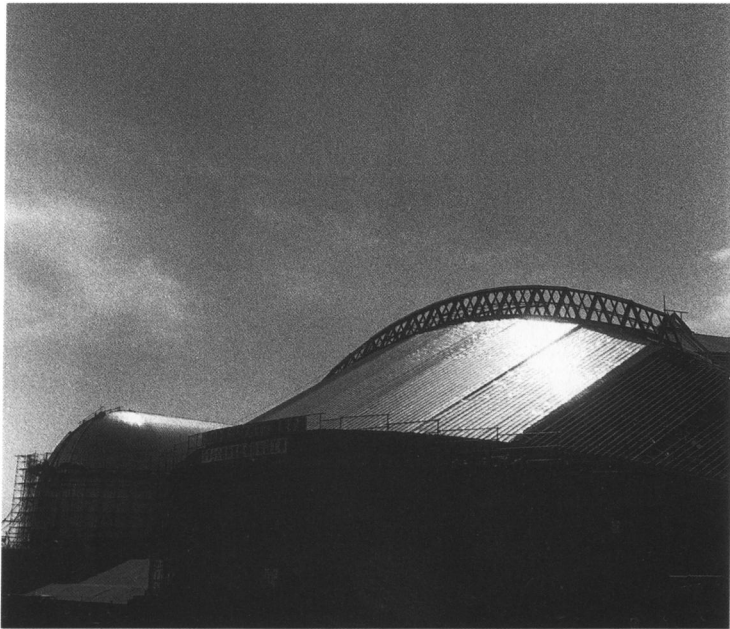
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These facts are important insofar as they document the coming together of a traditional procedure of construction with the development of a new and highly sophisticated building material. In a strict sense, the manner in which the Fujisawa sports complex was built cannot be considered innovative. Many of the procedures we evolved here might even be considered medieval. The building was constructed with the active participation of an attendant work force; a supervisory team responsible for both the conception and execution of detail was present at the site at all times; and the work being performed was of a singular and unique nature. This was not a building composed of repetitive elements, mechanically produced in great quantities for use in buildings other than Fujisawa itself. Accordingly, the complex speaks of a fundamentally traditional reality. Its character is determined by the piecing together of carefully crafted, individual components in a complex assembly not unlike its Japanese predecessors. It is here that the intangible traditions of craft and method referred to earlier exert themselves on the production of otherwise entirely modern artifacts.

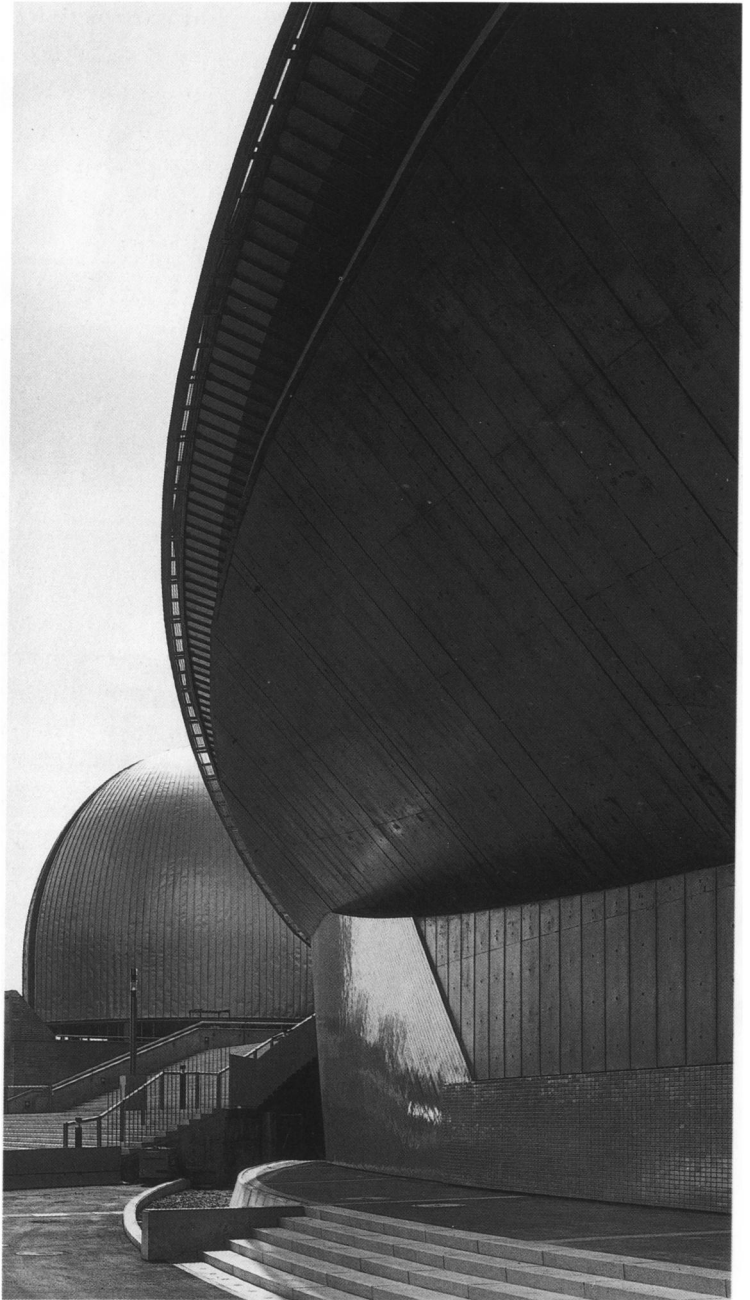
Such a reading, however, is inevitably challenged by our sense of its definitively unique character, as well as by its relationship to modern industrial construction. We see in the formal language of the building – in its scale and in the precise fabrication of elements that make it up – a type of construction that is not familiar to us through the traditional world of hand-crafted production. Despite its connection to that past, it cannot be wholly explained by or absorbed in it.



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A similar and intended ambiguity exists in the associative qualities of the sheathing itself. What does this metal roof mean? Of course, we cannot speak of this with any precision. Metal has many associations with both an industrial and a traditional reality. It is a material of hardness, precision, strength, and great reflectivity, thereby making reference to a future populated by the artifacts of an advanced science. But it also recalls the tools and equipment of an earlier time, a world of medieval helmets and weaponry, of artifacts from an iron age marked by a great fascination with such metals. This luminous steel thereby shares a past with a future – a complex relationship to time and place alongside an insistent industrial character – intended to assure it a vital history.

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Tokyo has undergone many changes in physical appearance over the last century. The city, so decimated by World War II, has had to rebuild from ashes. In its rebuilding it has become – perhaps it has returned to being – a city without heaviness. It was once a city of wood and paper; it has now become a city of concrete, steel, and glass. The feeling of lightness, however, remains.

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We might now return to the notion of specificity of place that introduced this essay. The sports complex at Fujisawa represents an attempt to address this problem by way of a set of material and constructive considerations guided, in turn, by an image of place and a sense of history, such that the eventual building demonstrates an unequivocal geographic inevitability. Paradoxically, it has been necessary to allow the building an ambiguous relationship to history – to both the past and the future – in an effort to define this specific connection to place. The temporal associations possible in any interpretation of this building, therefore, are manifold and complex, while it remains our intention that its geographic relationship be without ambiguity. In this way, Fujisawa might speak to a specific regional history – to the lightness and architectonic precision of its constructive legacy



24

– as it is intrinsically tied to that region. In short, we wish the building to be free in time so as to be fixed in place.

The suggestion of a modern or industrial vernacular of rigorous architectural character might be found in this process. This has certainly been our struggle. If the metal roof at Fujisawa finds an evocative place among the industrial artifacts of its milieu, making explicit the ambitions of a culture in search of a more resonant architecture, we will have successfully catalyzed an investigation critical to the Japanese future.