

Incongruity, Bizarreness, and Transcendence: The Cultural/Ritual Machine vs. Technocratic Rationalism at Expo '70

Scholarship on the Japanese Metabolist Movement generally points to the 1970 World Exposition in Osaka as the climax of a nationally concerted effort to revitalize Japan post-World War II.¹ It has also been referred to the “grand swansong of Metabolism, the final phase of the modern movement in Japan.”² Ten years after a group of young Japanese architects and designers with ties to the architect/educator Kenzo Tange burst onto the international design scene with a hastily produced manifesto espousing a techno-organic approach to Japan’s urban density problems, Expo '70 opened to 64 million visitors from across the globe.³ At the time Japan was a still-rising industrial hothouse, and an economic “miracle” second only to the United States in GNP. To the Japanese

designers involved in its conception and realization, Expo '70 was an opportunity to return Japan to prominence on the world stage after defeat in World War II. It was also an opportunity for Japanese culture-makers to differentiate Japanese modernization, contemporary values, and the Japanese way of life post-occupation, from those of other nations that had fallen under western influence. They did this consciously through referencing Japanese aesthetic traditions and attitudes in their contemporized works, and through a unique form of assimilation that adopted foreign ideas or things (such as European Modernist architecture) and created suitably “Japanified” simulacrum. The Japanese were determined to show their pride in rebuilding after the firebombings, Hiroshima, and Nagasaki, through means that were culturally Japanese. All of these factors combined to put architect Kenzo Tange (the representative Japanese architect on the international scene), the Metabolists (including Kiyonori Kikutake, Kenji Ekuan, Masato Otaka, and Kisho Kurokawa), and Arata Isozaki—an avowed Metabolist resister—at the forefront of the design efforts in Osaka.

The Expo’s central conceptual principle, and an oblique reference to the atomic devastation Japan had experienced, was a thematic umbrella of utopian idealism and optimism fostered by economic prosperity in Japan: Progress and Harmony for Humankind. In this theme there is not only reference to a world brought

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Figure 1: Visitors to the Osaka World Expo 1970 file toward the Big Roof and Festival Plaza, envisioned as the cornerstone structure for a techno-utopian city that was to evolve, mechano-organically, on site. Image: Yukio Futagawa.

together politically and spiritually at the Expo, but also a suggestion that technologies should henceforth be used peacefully and for the benefit of all people. As post-war Japan turned to state of the art engineering and mass industrialization to rebuild, the Japanese were uniquely positioned to use advanced technologies in the creation of beneficial exemplars to assemble an Expo experience. The tangible realization of Progress and Harmony for Humankind quickly evolved from a centralized exhibition facility proposed during the master planning stages, to what was ultimately referred to as the Big Roof and Festival Plaza (Figure 1). The critic/historian Hans Ulrich Obrist suggests that this mechanized public/theater space (Festival Plaza) under the world's largest space frame structure (the Big Roof) on a hillside park in Osaka, was the first realization of a "techno-utopia", the idealized synthesis of an "accelerated urbanism and advanced technology existing in parallel with an untainted nature."⁴ It has also been referred to it as, "a gigantic tombstone for the orgies of the Japanese economic miracle", and as the world's first "true cybernetic environment."^{5,6} Its modernist architect, Kenzo Tange, imagined this construction as the futuristic cornerstone for a city that would evolve, mechano-organically on site, assembled by automated construction machines and carried forward on the energy and goodwill generated by Expo '70. In writing the forward to Zhongjie Lin's, *Kenzo Tange and the Metabolist Movement: Urban Utopias of Modern Japan*, Tange's former student, employee, and collaborator, Arata Isozaki, suggests that Tange unequivocally saw rebuilding efforts in Japan as a uniquely orchestrated opportunity for the realization of a utopia that extended naturally from first-generation modernist "urban morphologies" such as Le Corbusier's *Ville Radieuse* proposal of 1924.⁷ Isozaki points to Expo '70's beginnings in Tange's 1960-61 scheme for urban expansion onto land that was to be reclaimed from Tokyo Bay. In this proposal, *Plan for Tokyo 1960*, Tange, Isozaki (then as a member of Tange Lab), Koji Kamiya, and Metabolist architect Kisho Kurokawa designed an elevated catchall for Tokyo's urban density surge in the form of linked, core-supported megastructures for 2.5

million people. That scheme has yet to be realized, but the Big Roof, with its giant organizing structural feature (a bubble-roofed space frame on “self-building” columns) and smaller-scaled “plug in capsules” (mechanized/moveable exhibition spaces located in the structural space of the roof) correlate directly in their techno-organic structure and modularity to Japanese techno-utopias envisioned by Tange and others - Ghost Tokyo/Island of Leisure (1954) by Taro Okamoto, and Marine City (1958) by architect/engineer Kiyonori Kikutake.^{8,9}

On one hand, we could agree with Obrist that “techno-utopia” had been briefly or temporarily realized in Tange’s architecture for Expo ’70. In a mythical state associated with all utopias, the Big Roof and Festival Plaza harmoniously brought nations of the world together in a temporary symbolic city-space “separated from the sites of continuing daily life”, a no-place which no longer physically exists in the land of Japan Inc.¹⁰ But it is worth looking – in the context of Global Architecture Machine traditions – at what happened under the Big Roof, in order to examine the role of architectural machines in our contemporary techno-utopian/techno-progressive impulses. In this examination we will discover that Expo ’70 was critically corrected/compromised by a cynical, contrarian, champion of the human condition—Arata Isozaki—working to subvert the technocratic rationality adopted by the Metabolists.

“All of our invention and progress seem to result in endowing material forces with intellectual life.”

“It is the machine which possesses skill and strength in place of the worker, is itself the virtuoso with a soul of its own, in the mechanical laws acting through it.”- Karl Marx, Capital Vol. 1

THE RADICAL V. THE TECHNOCRATS: ARATA ISOZAKI

Artist, Hippy, Poet, Radical; Japanese architect Arata Isozaki has been labeled many things, but we cannot officially call him a Metabolist as he declined an invitation to become part of that movement at its inception in 1959. Although his education and early career are inextricably entwined with “Metabolist sponsor” Kenzo Tange, Isozaki has spent considerable effort editing his inclusion in the group - he began articulating a critical distance that separates his work from theirs as early as 1962. In the decade preceding Expo ’70, Isozaki had left Tange Lab, Tange’s kenkyushitsu at Tokyo University comprised of students and former students, and had built several buildings as artistically inspired formal exercises. While he continued to work and associate with Tange throughout the 1960s, independently, Isozaki became known as a “cultivated” architect, with ties to Japan’s 60’s generation of writers, poets, film-makers, artists, and political activists (in 1968– 1969, he became an open supporter of the radicalized Marxist student movement in Japan). In addition to buildings, Isozaki also began to write essays and to organize exhibitions in which he occasionally addressed the Metabolists and their “biologically processed” modernism-for-consumption as the new establishment from an almost-menacing outsider’s position. The following statement reveals Isozaki’s critique of the Metabolists, and simultaneously provides a window into the rebellious quality of Isozaki’s character: “I had no antipathy towards the Metabolism movement, but their interests were so limited. And another major issue; I didn’t like how they wanted to sell their ideas to the authorities, to the Japanese government and the establishment to get more work.”¹¹ In essays published prior to Expo ’70 (such as the “quasi-Dadaistic” City Demolition Industry, Inc.), and in his exhibition Electric Labyrinth for the 1968

Milan Triennale, Isozaki produced significant cultural works that concretized his criticisms of the Metabolists—defacing Metabolist urban planning schemes, despite their popularity within an increasingly globalized architecture community, with the dystopian specter of inevitable destruction and poetic ruin.

Ultimately, these three specific qualities of the architect’s personal experience—a conceptual foundation in the human condition fueled by his exposure to literature and the arts; active political sympathies for revolution resultant from distrust of the government and exposure to “the international movement of youths;” and an evolved distaste for the false scenario of endless-progress-through-consumerism associated with industrialized living—conspired within Isozaki, forming a “premonition of the downfall of the universe of technological signs” during the design phase of Expo ’70.¹² The result was an alternative program for Festival Plaza that, as a synthetic embodiment of Isozaki’s beliefs and an extension of his artistic/rebellious character, was quite different from what Kenzo Tange had in mind. While Tange approached the concept of Festival Plaza as an adherent of modernist planning trajectories that “aimed at social reform that moved toward utopia,” the space under the Big Roof was left to Isozaki to interpret through designs for activities, lighting, and sound. This was an opportunity, in his words, to “rebel against the paradise set up by modern architecture.”¹³ Writers like Zhongjie Lin have appropriately distanced Kenzo Tange’s urban planning work from the “concrete” Urban Planning as practiced efficiently and economically (that is to say artlessly) by later day bureaucrats and legislators in poor imitation of the modernists. According to Isozaki however, Tange falls squarely into one of two architectural groupings that characterize global modernism from 1960 – 1970, the Rationalists: a group linked through practices of restricted architectural exploration. Isozaki, and later Hajime Yatsuka (writing for *Oppositions* in 1981), describe Tange’s architecture as a synthesis of Japanese classicism and what Tange coined “the tradition of the new”, a historicism routinely orchestrated to “rationally fit actual conditions” as needed.¹⁴ In describing his frustration with the work produced by Tange’s group, Isozaki writes of his struggle to find fulfillment through Tange’s “organized spaces... perceptible in a way that was ever advantageous to the Establishment.”¹⁵

It wasn’t possible in 1967 to state that Arata Isozaki stood in direct opposition to the Rationalists as a member of the group he would later label the Radicals (Hans Hollien, Archigram, and the like). He is, however, singled out in Yatsuka’s *Architecture in the Urban Desert: A Critical Introduction to Japanese Architecture After Modernism*, as the young architect responsible for the “breakdown of Modernism in the Osaka World’s Fair.”¹⁶ We can associate this characterization of Isozaki by Yatsuka with additional commentary by the later, which leads us to examine Isozaki’s role in the collapse of techno-rationalized Modernism at Osaka: “It was a historic irony that Isozaki should design his most technologically oriented project, the Robot(s) at the World’s Fair of 1970, under the direction of Tange.”¹⁷

REBELLION: POLITICS, SOCIAL SPONTANEITY, AND GIANT ANARCHIC ROBOTS

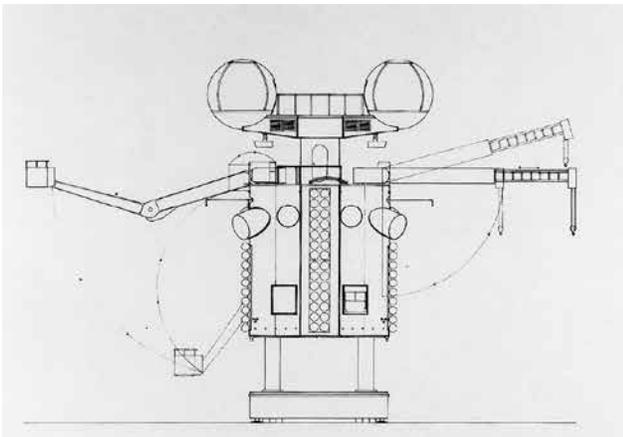
“The only doubt I had about the Metabolists was that these architects had no skepticism toward their utopia; they represented only a form of progressivism. I thought they were too optimistic. They really believed in technology, in mass production; they believed in systematic urban infrastructure and growth.”- *Arata Isozaki*

A formal inventory of architect Isozaki’s responsibilities in designing/orchestrating *Festival Plaza* (taken from a 1991 catalog published in association with an exhibition

of his architecture at the LA MOCA) includes all the essential elements of a proposed self-regulating, feedback-processing “cybernetic environment”¹⁸

- *variable, computerized components*
- *a roof that could be opened to the sky*
- *robots moving on the ground*
- *sound, lighting, and other*

It is important to note that several writings about or by Isozaki which detail the years 1967 – 1970 mention that the architect entered into the Osaka project at Kenzo Tange’s request, but in a state variously described as ambivalent, exhausted, bewildered, or on the verge of mental collapse. This condition of compromised will may have been what finally allowed the architect to act against the Metabolists. By Isozaki’s own account, after a last-minute review prior to the Expo’s opening ceremony, he checked himself into a hospital. Looking back, Isozaki wrote, “This period, however, was for me full of contradiction. Expo ’70 was a Grand National festival. Though I was taking part in the production of that festival, I was not happy. I wanted to stop and destroy it. It was as if I had been helping to carry out a war but at last had emotionally dropped out.”¹⁹



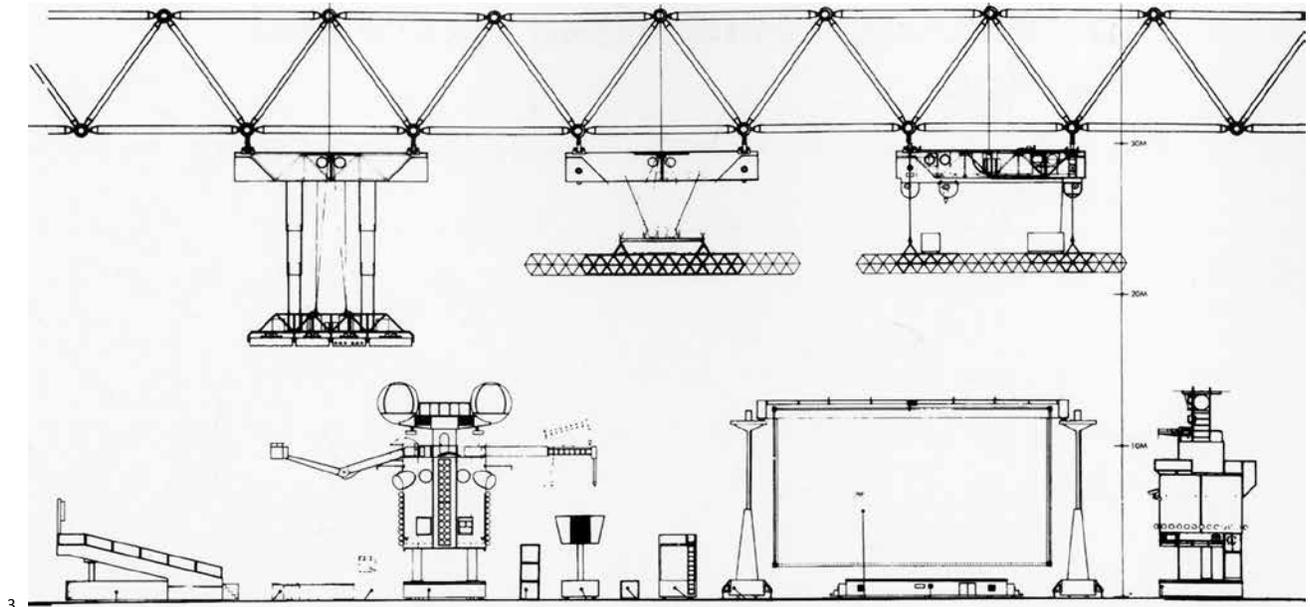
To set about compromising Tange’s Metabolist techno-utopia, Isozaki reprogrammed *Festival Plaza* into a “space of random encounters” as opposed to realizing the tidy, idealized, pro-Establishment social space prescribed by Tange. Critical to this reversal in the essence of the space (from *rational* to potentially *radical*) was the design and programming of two 20-meter tall robots that inhabited the plaza as mechanical hosts; *Deme* (the performer) and *Deku* (the controller), also known as RM and RK (Figure 2). With these two semi-automated machines (industrial *deidalia*) Isozaki set about contradicting Tange’s techno-rationalism by instrumentalizing the “rich quotations and deliberate ironies” of his own political/poetic/artistic sensibilities. In other words, the critical distance, technological skepticism, rebellion, and faith in humanity that separated Isozaki from the Metabolist Movement were embodied in the architect’s cultural/ritual architecture machines.²⁰ The resultant public experience of *Deme* and *Deku* at *Festival Plaza* was to be loaded with political symbolism, artistic eccentricities, and contradictory displays of so-called high technology—all intended to delight, provoke protest, and contradict—rather than harmonize and/or inspire conformity.

Toyo Ito provides critical information on shifting the social agenda of *Festival Plaza* to a political one, as a Japanese architect intimately familiar with the players in 1970:

“Isozaki’s experience of 1969 – 1970 was complicated. He was heavily involved in Expo ’70. Yet before that he maintained deep friendships with

Figure 2: Arata Isozaki’s drawings and models of *Deme* (also known as RM) and *Deku* (also called RK). These cultural/ritual architecture machines were designed to act as hosts for, and constructors of *Festival Plaza*. Images: Arata Isozaki. Figure 3 - Party Above; Business Below Examples by David Salmela and architectsAlliance.

avant-garde artists, and he repeatedly spoke and acted in support of national revolution. During the university strife of 1968-69 he did not conceal his sympathy for the student struggle against state power, and his plan for *Festival Plaza*... was an attempt to alter state protocol from within.”²¹



In designing the architectural machinery of *Festival Plaza* (Figure 3), Isozaki himself derides the lighting, sound, and robots—all of which had to be newly developed for the Expo but where ultimately destroyed and disavowed by Isozaki—as “a serious limitation.”²² In his writings about Expo '70 there is a suggestion that his struggles in designing and orchestrating these architectural machineries hardened his resolve against any expectation of social/political perfection founded on technocratic rationalism and *the Machine*: “...all those areas of modern architecture and design which had been developing through the celebration of industrialized society were to meet, inevitably, most serious and debilitating problems.”²³ In Isozaki’s *When the King was Killed*, written five years after the Expo in an attempt to articulate events and forces in the struggle over modernism that occurred in 1970’s Japan, the architect describes a methodology for the Radicals vis-à-vis technology and their anti-rationalist stance. Portions of the essay read as an admission of rebellion against Tange, the Metabolists, and their rational pursuit of industrialized perfection. His words also cast light on the essential nature of machines in an architectural context:

“They (the Radicals) utilize to an extreme the technological achievement set up by modern architecture until they go beyond their limits... there is a fervent pursuit of feelings of incongruity, bizarreness and transcendence. The result is an anarchism of expression. This is in direct opposition in its disorderliness of expression to *rationalism*, which pre estimates an order in its background.”²⁴

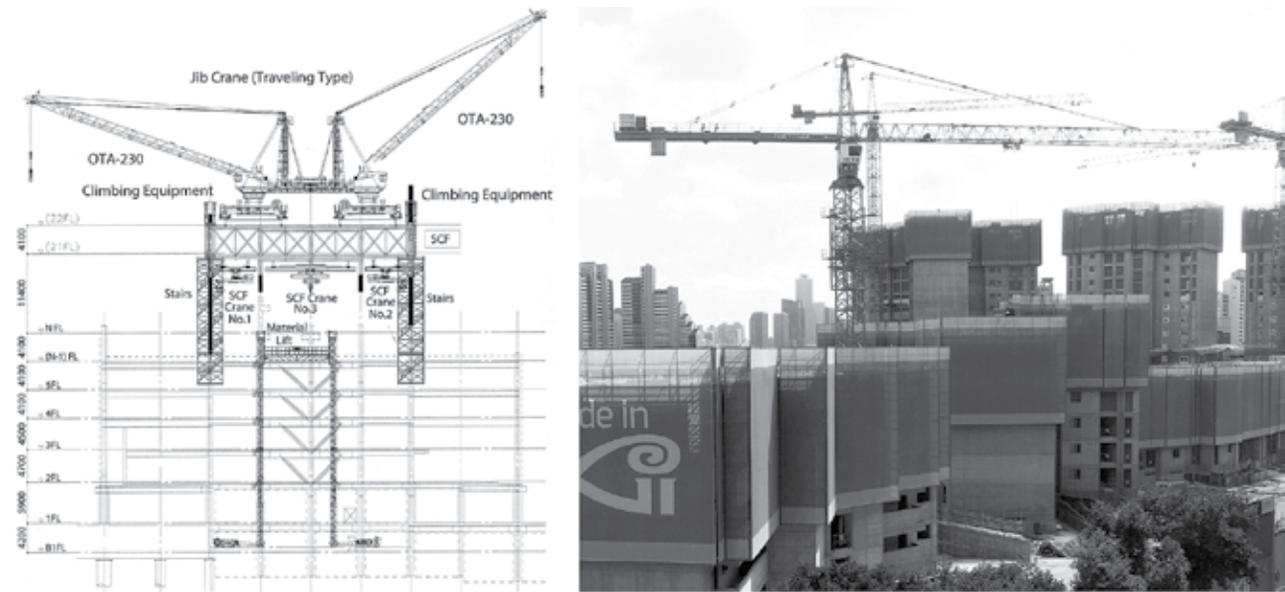
Using this formula, Arata Isozaki “twisted” *Festival Plaza* into a reconfigurable technological space that could support an opposition culture, political spontaneity, and other forms of social expression. And although the disorderliness and transcendence he had designed for did materialize (headlines from the Expo include *3000 Students Arrested to Prevent Trouble at Osaka Worlds Fair*), they failed, initially, to register at Expo '70. The vast space, while ultimately providing visitors with a greater variety of experiences, failed to instigate significant revolution, incite socio-political

Figure 3: The architectural machinery of Osaka World Expo 1970’s Festival Plaza, the world’s first true “cybernetic” environment. Image: Arata Isozaki.

reaction, or support meaningful visitor interrelations. Hajime Yatsuka’s critique of Expo ’70 bypasses the particulars within the plaza and aims squarely at the big picture: “One possible reading is this: just as the technology-oriented rationality of the Metabolists failed to create a true public realm, so the grandiose void of the festival plaza revealed the limitations of Tange’s technological symbolism and the bankruptcy of his aspiration...”²⁵ Contemporary scholarship on Expo ’70 describes a somewhat startled detachment between visitors and the newness of the displays that is, perhaps, symptomatic of a nagging incongruence between people and environments dominated by technology—a feeling that still compromises the technotopias we envision today.

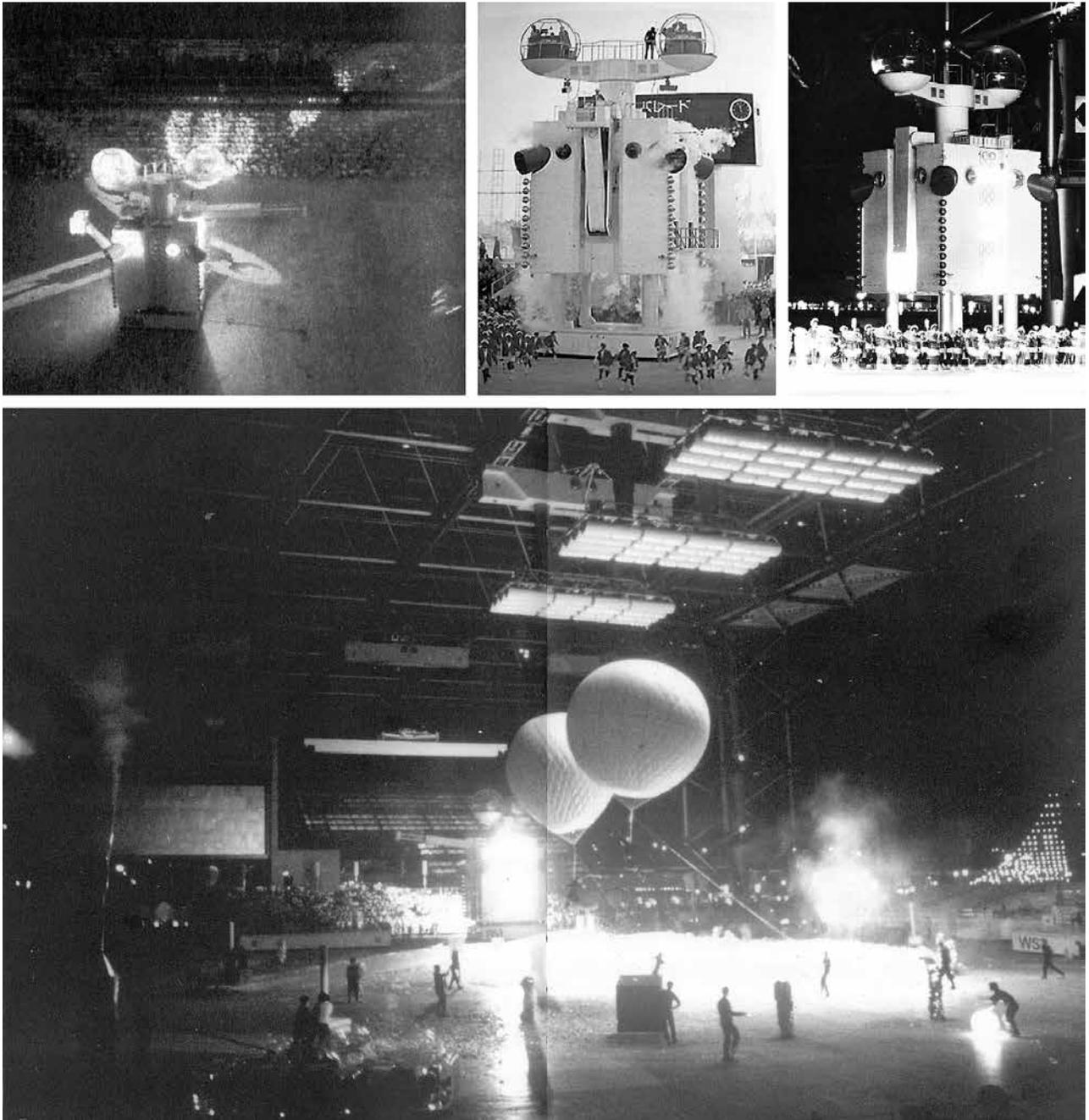
THE ESSENTIAL DUALITY OF ARCHITECTURE MACHINES: CULTURAL/RITUAL AND RATIONAL

At this point it is important to qualify and expand on a duality within *the Machine* in an Architectural context, situated at cross-purposes between the Rationalists (Tenge/The Metabolists) and the young Radical (Isozaki) at Expo ’70. Critical to illuminating the Rationalist’s take on technology is a little background into construction technologies as evolved by the Japanese in the decade prior to the Expo. Isozaki’s take on technology, on the other hand, may be enhanced by connecting with an older cultural reading of technology and machines—one articulated by Sigfried Giedion in his work *Mechanization Takes Command: A Contribution to Anonymous History*, and by Lewis Mumford in *The Myth of the Machine: Technics and Human Development*.



In parallel with urban development schemes proposed by Metabolist architects, engineers in the Japanese construction industries were developing a genre of mechanical engineering that addressed maximum speed, efficiency, and economy in building construction—perhaps what is now commonly known as Construction Automation. The singular construction innovations of 1969 - 1970, such as the climbing jacks that assembled the *Big Roof* on its minimally engineered columns, would evolve into the “climbing factories” and jib-facilitated climbing concrete formworks now commonly used by construction *zaibatsus* to produce single building stories in one shot (Figure 4). After Expo ’70, these systems were progressively engineered into highly rationalized tectonic machines of economy and efficiency. These construction machines – decoupled from architects/designers who provide an appro-

Figure 4: Common building technologies that have roots in Expo ’70. It is noteworthy that the jib crane and Deme look so similar. Images: Martin Bechthold (left) and the author (right).



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Figure 5: Isozaki's Architecture Machines flashing lights, emitting smoke, absurdly positioned in the performance of a children's dance troupe, and as part of the Japanese Gutai Movement's "happening" at Expo '70. Images: LIFE Magazine and the Stedelijk Museum Schiedam.

appropriate vision – are responsible for the sterile and debilitating apartment high-rise buildings that have proliferated in cities like Tokyo, Seoul, and Beijing. While the architectural quotient of these high-rise apartment blocks may be close to zero, it has been argued that these contemporary megastructures are the bastardized progeny of rationalized modernist architecture and a strain of construction development and engineering. In the context of efficient and economic construction, they exist as extensions of industrialized technocratic perfection (in terms of time, material, and labor). One can't help but wonder if, from his position on the inside (that is close to all activities Metabolist), buildings like these were not part of Isozaki's anti-technological "premonition" and subsequent break with Tange's rationalism? It is interesting to note that *Deme* and *Deku*, as semi-automated construction robots, were also an offshoot of advancements in Japanese construction engineering. They were

charged with the building/dismantling of various “hallucinatory urban” scenarios in *Festival Plaza*—artistic spectacles that were initiated by Isozaki, but which were essentially open to the variable expression of two self-regulating robots through primitive cybernetic feedback mechanisms.

This is where Giedion’s profound insight into technology comes into play. In *Mechanization takes Command*, Giedion, writing about ancient machines and our original technological impulses as materialized by the Greeks, suggests that machines were initially used for three purposes: construction, destruction (warfare), and “in service to the miracle”, that is to say in service to human needs both rational and irrational.²⁶ A simplified way of looking at this is that a building technology as common as the crane was used rationally by the Greeks in construction to lift extraordinary loads, rationally in warfare as a device for capsizing enemy ships, and ritually in cult spectacles as means of elevating a priest in ritualized “flight” over assembled congregants. Mumford completes this notion of *the Machine* as a component of cultural (rather than technological) development on a larger scale, tying technology to humanity’s early attempts to express fear, love, survival, and to our invention of gods.

With this expanded view of technology living in a realm of culture rather than supplanting it, we can return to Expo ‘70 and contrast the wholly rationalized architectural technologies of Kenzo Tange against the broader ritualized and expressive technologies of Isozaki, which appeared in the form of *Deme* and *Deku*—who, in addition to building “scenarios” and rearranging seating, “danced” and did spectacularly ambiguous acts such as emit smoke and flash lights (Figure 5). What is interesting and relevant about these somewhat “free-willed robots” is that, in comparison, the idealized and industrialized construction of the *Big Roof* felt technocratic and/or somehow empty. *Deme* and *Deku*—very different products of the same technoprogressive impulse—were, in *Festival Plaza*, transformed through art, ritual, and spectacle into technological experiences that were more provocatively “human.” In humanizing the robots through participation in cultural acts, Isozaki simultaneously transformed them from building technologies into the occupants of *Festival Plaza*, and very publicly reoriented people’s perception of advanced technology so that progress, ironically included the transmission of ritual, spectacle, “incongruity, bizarreness and transcendence”. These factors, evident to visitors in the experiences at the Expo, destabilized any notion that Kenzo Tange and the Metabolists had put in place the touchstone of an exemplary techno-rationalized city. By installing robotic hosts under the *Big Roof*, Isozaki appeared to suggest that the true inhabitants of a techno-rationalized space are products of technology (machines), not human beings. By making these technological inhabitants eccentric, he also undermined the perfection of high technology, creating machines with oddities and impulsiveness that were essentially human buried deep in their logic. In this very public contradiction there is also a reaffirmation of the essential role of delight (thaumato) in architecture’s fundamental synthesis. Any architecture—utopian or not—constructed on commodity and firmness alone, forfeits its architectural-ness and its relevance to humanity.

CONCLUSIONS

Isozaki’s prescient reading of the inevitable failure of a utopia founded on technology in 1970 appears to be obscured today, as the digital and sustainability - tied to technology and technical systems - have super-charged our contemporary attempts at utopia’s realization. The great lesson to be learned from *Festival Plaza* is that progress is a human-to-human affair meant to inspire a more-perfect place. Ultimately, the technological takes back seat in these aspirations, as the striving for social per-

ENDNOTES

1. Kayoko Ota and James Westcott, eds., *Project Japan: Metabolism Talks... Rem Koolhaas, Hans Ulrich Obrist*. (Köln: Taschen, 2011).
2. Hajime Yatsuka, “Architecture in the Urban Desert: A Critical Introduction to Japanese Architecture after Modernism.” *Oppositions Reader: Selected Readings from a Journal for Ideas and Criticism in Architecture, 1973 -1984*. Ed. Kay Micheal Hayes (New York, New York: Princeton Architectural Press, 1998), p. 257.
3. Noboru Kawazoe, et al. *Metabolism 1960: The Proposals for a New Urbanism*. (Tokyo: Bitjutsu Shuppan Sha, 1960).

4. Kayoko Ota and James Westcott, eds., *Project Japan: Metabolism Talks... Rem Koolhaas, Hans Ulrich Obrist*. (Köln: Taschen, 2011), p. 18.
5. Zhongjie Lin, *Kenzo Tange and the Metabolist Movement: Urban Utopias of Modern Japan*. (New York: Routledge, 2010), p. xvii.
6. *Ibid.*, p. xviii.
7. Noboru Kawazoe, et al. *Metabolism 1960: The Proposals for a New Urbanism*. (Tokyo: Bitjutsu Shuppan Sha, 1960), p. 21.
8. Arata Isozaki, "When the King was Killed", *GA Document: Global Architecture 1970 -1980*. Ed. Yukio Futagawa (Tokyo: A.D.A. Editions, 1983), p. 16.
9. Yatsuka Hajime, Kikuchi Makoto, Yamana Yoshiyuki, *Metabolism, The City of the Future: Dreams and Visions of Reconstruction in Postwar and Present-day Japan*. (Tokyo: Mori Art Museum Publishers, 2011), pp. 78-79.
10. Noboru Kawazoe, et al. *Metabolism 1960: The Proposals for a New Urbanism*. (Tokyo: Bitjutsu Shuppan Sha, 1960), p. 43.
11. Hajime Yatsuka, "Architecture in the Urban Desert: A Critical Introduction to Japanese Architecture after Modernism." *Oppositions Reader: Selected Readings from a Journal for Ideas and Criticism in Architecture, 1973 -1984*. Ed. Kay Micheal Hayes (New York, New York: Princeton Architectural Press, 1998), p. 258.
12. Arata Isozaki, "When the King was Killed", *GA Document: Global Architecture 1970 -1980*. Ed. Yukio Futagawa (Tokyo: A.D.A. Editions, 1983), p. 19.
13. *Ibid.*
14. Kenneth Frampton and Arata Isozaki, *GA Architect 6: Arata Isozaki vol. 1: 1959 - 1978*. (Tokyo: A.D.A. Editions, 1991), pp. 86 -91.
15. *Ibid.*
16. Yatsuka, *Oppositions*, p. 257.
17. *Ibid.*
18. David B. Stewart, *Arata Isozaki, 1960 - 1990*. (New York: Rizzoli International Publications, 1991).
19. Frampton and Isozaki, *GA Architect 6*, p. 86.
20. See Marco Frascari's "The Compass and the Crafty Work of Architecture", *Modulus 22*. In this article Frascari delves into Metis, and categorizes deidalia within this grouping of "wonderful and circular tools". He describes deidalia and deidalion as instrumentation containing all of the craftsman's cunning and knowledge. Isozaki's Deme and Deku certainly fall into this categorization—cunning instrumentation that embody, in Marx's words, "the skill and strength" of the architect.
21. Kayoko Ota and James Westcott, eds., *Project Japan: Metabolism Talks... Rem Koolhaas, Hans Ulrich Obrist*. (Köln: Taschen, 2011), p. 552.
22. Kenneth Frampton and Arata Isozaki, *GA Architect 6: Arata Isozaki vol. 1: 1959 - 1978*. (Tokyo: A.D.A. Editions, 1991), pp. 86.
23. David B. Stewart, *Arata Isozaki, 1960 - 1990*. (New York: Rizzoli International Publications, 1991).
24. Isozaki, *GA Document*, p. 18.
25. Yatsuka, *Oppositions*, p. 260.
26. Sigfried Giedion, *Mechanization takes Command: A Contribution to Anonymous History*. (New York: W. W. Norton & Company, 1969), p. 32.
27. Ray Kurzweil, *The Age of Spiritual Machines*. (New York: Viking Press, 1999).
28. Francesca Hughes and Gergely Kovács. "Inculpable Machines: The Guillotine, the Computer, and the Engineering of Neutrality." *SPACE Magazine*, August 2012: pp. 86 - 99.

fection is an essential piece of the human condition—something Isozaki's "artist friends" may have had an easier time expressing. In parametric design today there is a particularly dead-ended push (again) to put technology in charge by equating algorithmic choice making with the trial-and-error laden impulsiveness of design/making, as practiced by humans for tens of thousands of years. These efforts have gained more traction and appeal through reorienting industrial manipulators (mechanical hands) toward building, armed with the mathematical creativity provided by algorithmic "decision making tools" such as the Grasshopper software. This technological cocktail may be the soft entry into some type of bio-mechanical dynamic as envisioned 50+ years ago by the Metabolists, and more recently by futurists like Ray Kurzweil, but it is too early to call these experiments with machines *proxy-tectonic* or *progressive architecture*. As we have seen, industrialization and capital tend to turn unique technological developments into money-making enterprises.²⁷ In our latest technologies it is critical to differentiate a variability generated by every rational possibility that might fit assigned design parameters (what Francesca Hughes refers to as an "abdication of responsibility") from constructions at least partially generated through the miraculous, irrational, and imperfect - the ritual/cultural component that is essential to the machine in an architectural context.²⁸