ARCHITECTURE OUT OF TIME:

METABOLISM AND THE NAKAGIN CAPSULE TOWER

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Introduction

I have titled this paper an "architecture out of time" when referring to Metabolism—and Kisho Kurokawa's Nakagin Capsule Tower as a case study of the movement—with a double meaning. Metabolism, a Japanese architectural movement of the 1960s and 1970s, was deeply grounded in reckoning with the destruction and cultural change brought about by the second World War and a rapidly industrializing Tokyo.[1] But Metabolists looked past this immediate context and took a deeply philosophical approach to their architectural movement, dreaming of utopian futures as they weaved emerging Western technology with Japanese tradition - ideas which stood *out of time* in how they mapped onto growing Japanese cities and culture. However, while the conceptual frameworks of Metabolism continue to be relevant objects of study in architectural history, in practice very few Metabolist plans were fully realized. The Nakagin Capsule Tower, constructed in 1972, was a shining example of core Metabolist ideas (capsule living, prefabrication) and considered by some to be the only true Metabolist building ever built.[2,3] But the Metabolist movement and the Nakagin Capsule Tower (at least in terms of how it was planned) found themselves running *out of time*, their lives cut short due to economic and social changes over the following decades.

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[1] Max Masquelier, "Kisho Kurokawa and the Metabolists, Paving the Way of Tokyo's Post-War Architecture," *Undergraduate History Journal at Illinois* 2, no. 1 (2022): 26–42, https://ojs.library.illinois.edu/index.php/IUJH/article/view/835, 26.

[2] Jonathan M. Reynolds, "Can Architecture Be Both Modern and 'Japanese'?," essay, in *Since Meiji: Perspectives on the Japanese Visual Arts, 1868-2000*, ed. J. T. Rimer (Honolulu, HI: University of Hawaii Press, 2012), 315–39, https://doi.org/10.1515/9780824861025-014, 331.

[3] Joshua P. Newell and Joshua J. Cousins, "The Boundaries of Urban Metabolism," *Progress in Human Geography* 39, no. 6 (December 5, 2014): 702–28, https://doi.org/10.1177/0309132514558442, 703.

Metabolism, as used in this paper, refers to a Japanese architectural movement. But readers may also also know "metabolism" by its biochemical definition, one which the Metabolists centered their thinking around.[4] "Metabolism, understood biologically, signifies the biochemical renewal of the cells and tissues of living organisms, including their growth and death," writes Yuriko Furuhata.[5] Substitute cells for capsules, tissues for urban infrastructure, and organisms for cities, and the vision of the Metabolists becomes more clear. Growth and death were especially present in the minds of the Metabolists in the 1960s as they faced the destruction wrought by World War II. "War helped me discover Japanese culture. As I stood amidst the ruins of Nagoya, the third largest city in Japan, there was nothing but scorched earth for as far as I could see", opens Kurokawa in *Metabolism in Architecture.*[6] Japan of the 1960s was an opportunity many modern architects of the West could only dream about: a blank slate. This was especially the case because Japanese cities had been traditionally constructed overwhelmingly from inflammable wood, as compared to the sturdier brick and stone of Western buildings.[7] And so what survived the war, rather than architecture, was Japanese culture itself.

As a result, Japanese architecture fragmented in the postwar period: some buildings retained their pretty, traditional, or classical ornaments, while others took on a brutal, modern look—a "proud new style" of a Japan looking towards the future.[8] At first glance we might interpret this latter modern style (which includes Metabolist architecture) as a rebellion against the former. In actuality, claims Robin Boyd, it represents an attempt to find the heart of Japanese

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[4] Yuriko Furuhata, "Spaceship Earth: Plastics and the Ecological Dilemma of Metabolist Architecture," essay, in *Climatic Media: Transpacific Experiments in Atmospheric Control* (Durham: Duke University Press, 2022), 104–32, 109.
[5] Furuhata, 109.
[6] Kishō Kurokawa, *Metabolism in Architecture* (Boulder, CO: Westview Press, 1977), 24.
[7] *Metabolism in Architecture,* 24.
[8] Robin Boyd, *New Directions in Japanese Architecture* (New York: George Braziller, 1968), 7.

architecture - to see what lasts.[9] We might also pass it off as mimicry of Western styles, observing the *béton brut* and geometric shapes which evoke Le Corbusier. Boyd rejects this claim as well, suggesting instead that Le Corbusier and Western modernism acted more like a "stepping stone out of the past to avoid parodies of the past", transforming the architectural discipline while maintaining its visual language.[10] Metabolists' hybrid stance between traditional and modern reassured the Japanese public that their work was not as radical as it first appeared and would not "dislodge their habits".[11] Their prefabrication called back to the standard sizing of tatami mats; their impermanence to the regular reconstruction of the Ise Grand Shrine every 20 years; their modularity to the expansions of the Katsura Imperial Villa.[12]

The main guiding factor in Metabolism is space - both in its abundance and scarcity. Metabolism's roots were established before the war, when Japan invaded Manchuria in the 1930s.[13] This expansion had two major consequences for Japanese architecture. First, it gave architects the opportunity to plan at large scales - an "almost unthinkable activity" in Japan's large dense cities confined by mountainous terrain.[14] It also aligned architects with the imperial regime - perhaps the "wrong side" when contrasted with avant-garde modern movements in the West, but one that gave Metabolists sincere attention from the government and the media instead of suspicion or doubt - this would be important when it came time for them to present their ambitious ideas.[15] As discussed above, World War II also presented the Metabolists with some opportunities to grow Japan as the nation tried to re-establish its footing.

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[9] Boyd, 7.
[10] Boyd, 7.
[11] Rem Koolhaas et al., "Project Japan at the AA," *AA School of Architecture* (lecture, UK, February 2, 2012), https://www.youtube.com/watch?v=OpwcTQ5RKbw, 7:00.
[12] Aki Ishida, "Encapsulated Masculine Dreams: The Cultural and Material Impermanence of the Nakagin Capsule Tower," sITA 2022, no. 10 (November 15, 2022), https://doi.org/10.54508/sita.10.16, 203.
[13] Koolhaas et al., 7:00
[14] Koolhaas et al., 7:00.
[15] Koolhaas et al., 13:45.

Yet with all of these factors the Japanese still struggled with civic engagement, and large-scale architectural changes only really came with national developments such as Olympic Games (1964) or a World Exposition (1970).[16] Overwhelmingly, Metabolists found themselves addressing constrained space. Tokyo is the world's largest city and a very dense one at that, which makes urban planning a challenge. "In the cities, and especially in Tokyo, the pressure of the twentieth century on an ancient web of spidery streets and flimsy, inflammable houses has seemed to be at tearing point continuously for about two decades", writes Boyd.[17] This left Metabolists with a few options. First, they could go inward, consolidating shared public spaces and condensing housing into increasingly smaller units. This contributed to the development of capsule architecture, inspired by cells - the basic unit of living reflecting the basic unit of life. The Nakagin Capsule Tower was composed of 140 8-by-13-foot living units, each furnished with a bathroom, circular window, bed, cabinets, a stereo, and other amenities for lounging and sleeping.[18] Second, Metabolists could go upward, guiding them to design "megastructures" of steel and concrete which could support entire cities on their backs while still allowing life to operate as usual on the ground (notably, Arata Isozaki's "City in the Air"). The Nakagin Capsule Tower featured two rigid-frame cores onto which capsules were securely bolted, which contained utilities and vertical transportation.[19] Third, they could go outward in new directions, such as the Tokyo Bay as in Kiyonori Kikutake's "Ocean City".

With expanding space also came an increased focus on mobility. The central inspiration for Kurokawa's Nakagin Capsule Tower was what he referred to as *Homo movens,* or man on the move - a term he used to emphasize "mobility as the special characteristic of contemporary

[16] Boyd, 14.
[17] Boyd, 12.
[18] Ishida, 200.
[19] Ishida, 200.

humankind" in an industrial society.[20] Kurokawa was hired by Nakagin to create residential units that appealed to a growing class of white-collar Japanese "salarymen".[21] "Corporations expected the salaryman to work long days to advance Japan's economy–one considered to be thriving–and extend that motivation to the evening by meeting with coworkers and potential businessmen", explains Kelsea Whaley.[22] Given these downtown dinners and drinks, taken into account with the stressed transportation systems of a rapidly industrializing Tokyo, it made more sense for the salaryman to spend weeknights sleeping in the city as well.[23] This solution to mobility was central to the early success of the Capsule Tower.

A third Metabolist principle which guided the development of the Nakagin Capsule Tower was prefabrication. At Expo '70, Kurokawa was given the opportunity to try out Metabolist architecture on a short timeline and at a small scale, allowing him to get a better sense of how buildings might be rapidly constructed and deconstructed.[24] For the Nakagin Capsule Tower, Kurokawa worked with a company that developed shipping containers, making the development of the tower and sale of units fast and efficient.[25] The tower was completed within a year, and all 140 units were sold by the time it opened.[26]

So on paper, perhaps, the Nakagin Capsule Tower looks like a perfect embodiment of Metabolism; with its efficient use of space, addressing of mobility, and prefabrication. I say "on paper" because, as according to Ishida, "the Nakagin Capsule Tower has been iconized

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[20] Kishō Kurokawa, "A Master Plan for Redeveloping the Nation: The Symbiosis of Redevelopment and Restoration," essay, in *Each One a Hero: The Philosophy of Symbiosis* (Tokyo: Kodansha International, 1997), https://www.kisho.co.jp/page/310.html.
[21] Kelsea Whaley, "Invisible Infrastructure: Reinforcing Postwar Gender Inequality in Tokyo's Nakagin Capsule Tower," *Athanor* 40 (February 2, 2024), https://doi.org/10.33009/fsu_athanor134937, 85.
[22] Whaley, 85.
[23] Ishida, 205.
[24] Michael F. Ross, "Beyond Metabolism: The New Japanese Architecture," College of Architecture and Planning Guest Lecture Series (lecture, Muncie, IA, October 15, 1979), https://www.youtube.com/watch?v=ioZSmoE-kvE, 31:40.
[25] Ross, 32:00.
[26] Ishida, 200.

through the highly stylized photographs that were taken at the time of the building's completion".[27] These images do not address the lived reality of its occupants, nor its slow demise, ending with its demolition in 2022 - 10 years earlier than Kurokawa's most conservative estimate of the core structure's lifespan, and 150 earlier than his dream for the project.[28, 29]

Most obvious of the Nakagin Capsule Tower's challenges was its physical upkeep. What made the building stand out as a work of architecture was its modular design - 140 individual units installed asymmetrically into the larger structure. In order to combat obsolescence, writes Boyd, "buildings should either accept that they are dispensable, in which case they should be made much more readily destructible, perhaps with exposed bolted joints, or they should recognize that they have a dual nature … the servicing parts should be brought out of their hiding places in the walls and ceilings to be as removable and renewable as a refrigerator in a kitchen."[30] True to his commitment to mobility (in this case, the physical mobility of the unit), Kurokawa prioritized dispensability in designing the Nakagin Capsule Tower. However, as the building aged, this became its biggest weakness, as it introduced 140 points of failure. Because units were designed to be regularly replaced as a whole, rather than continually serviceable, plumbing and wiring was largely inaccessible on both their inside and outside.[31] Leaks emerged everywhere as pipes corroded and rain entered the gaps where the units were installed, with makeshift waterproofing contraptions littering the hallways of the building. The Tower eventually lost hot water and central air conditioning. Even if the building had been more repairable, the salaryman that the building was designed for would not necessarily have had time

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[27] Ishida, 206.
[28] Ishida, 199.
[29] Tim Hornyak, "In Tokyo, Rescuing the Residential Spaceship That Fell to Earth," *The New York Times*, January 15, 2024, https://www.nytimes.com/2024/01/15/realestate/tokyo-japan-nakagin-tower.html.
[30] Boyd, 15-16.
[31] Ishida, 203.

to perform this maintenance, given he would be working throughout the week and at his family home on the weekends.[32]

Ishida documents how the construction of the building presented further challenges.[33] Although the units were designed to look futuristic and appeared to be constructed entirely of futuristic building materials like plastic and metal, the units leveraged plywood extensively, only being given a lifespan of 25 years - a fairly standard amount of time for a Japanese building. In the warm seasons, humidity caused the wood to rot and deteriorate; in the cold seasons, a layer of thin asbestos provided scarce warmth. The units, left without an operable window and later without central AC, placed occupants at the mercy of the elements. And when these occupants punctured the steel walls of their capsules to install their own condensers, they created additional leaks and exposed the harmful asbestos insulation in the process.

The sustainability of the building and the Metabolist movement have also been called into question in recent years. While the replaceable design of the units promised long-term renewal and growth, Furuhata points out how Kurokawa's reliance on plastics—both materially, and later financially with his work in oil-exporting countries—undermined this vision.[34] Japan's industrial metabolism produced waste and pollution, poisoning the natural world in constructing an artificial one. And where an organic body is designed to automatically renew its cells and repair structural damage, Furuhata continues, "the metabolic pathways of built structures and cities must be consciously maintained" - or, in the case of the Nakagin Capsule Tower, left unmaintained.[35] In its 50-year lifespan, not a single capsule of the building was replaced.[36] This was for a variety of reasons. First and foremost, there was no infrastructure in place to continue

[32] Ishida, 210.
[33] Ishida, 211.
[34] Furuhata, 116, 129.
[35] Furuhata, 119.
[36] Ishida, 200.

mass-producing capsules, and so a replacement would have likely been significantly more expensive than the original unit cost (Kurokawa's office estimated the replacement cost at $80,000 USD, as compared to the original $4,500). Secondly, it would have been extremely difficult to physically replace capsules, given surrounding buildings and an elevated highway had developed to "encroach tightly" in the years since the Tower's construction.[37]

Logistically, a full redevelopment made the most sense for the building's owners. "The tower stood on prime Tokyo real estate", Ishida elaborates, with the land being worth far more than the building.[38] It was more cost-effective to tear down the dying structure and replace it with a non-modular building free from the maintenance challenges detailed above. Despite overwhelming support from the architectural community worldwide (only 5% voting for demolition), the "perfect encapsulated democracy formed in the capsule tower decided to destroy itself", with 80% of residents voting for demolition in 2007 (the year of Kurokawa's death).[39,40] Kurokawa, in an attempt to maintain the legacy of the Metabolist movement and that of his own, launched efforts to save the building, but these were ultimately stopped by his death and a poor economic climate. The building had only 10 to 15 occupants by 2013, and demolition began in April 2022.[41]

The Nakagin Capsule Tower fell into social obsolescence as well as physical decay. Kurokawa was especially inspired by the mobile home parks of the United States in his design of capsules; independent units with shared electricity, water, and telephone service.[42] The mobile

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[37] Ishida, 203.
[38] Ishida, 203.
[39] Ishida, 203.
[40] Koolhaas et al., 36:30.
[41] Agence France-Presse, "La Célèbre Nagakin Capsule Tower de Tokyo, Joyau Du Patrimoine Architectural Des Années 1970, VA Être Démolie," France Info, March 29, 2022, https://www.francetvinfo.fr/culture/arts-expos/architecture/la-celebre-nagakin-capsule-tower-de-tokyo-joyau-du-patrimoine-architectural-des-annees-1970-va-etre-demolie_5051002.html.
[42] *Metabolism in Architecture,* 77.

home was an excellent vessel for *Homo movens,* but a capsule could go farther—it could be used for temporarily installation, as in the Capsule Tower; but also used for transport (perhaps on a train or ship) and perhaps translocated as a temporary vacation home.[43] (Ironically, the capsules traveled only after being abandoned, many being refurbished to show in museums around the world).[44] Yet the design of the individual capsule was never intended to adapt. The units of the Nakagin Capsule Tower were only ever intended for the salaryman, for one particular individual of *Homo movens.* Capsules were later transformed by their owners into offices and informal hotels (through services like Airbnb); but this presented complexity for Nakagin as the building management firm in terms of billing and security.[45] They had no kitchens, because the expectation was that the salaryman would eat his meals at work or out in the city; they lacked the space for multiple dwellers; nor were they furnished for elderly or child occupants.[46] They were used for domesticity, but never remotely designed for it—Kurokawa had always imagined that the family unit would exist as a unit several smaller capsules. As such, one of the core motivations for occupants in voting to demolish the tower was that they could get twice as much square footage for their families in a non-modular design. The capsules were designed around a specific masculinity and sold to certain businesses in the 1970s—to men with pressed business suits and late nights working. The sons of these men, referred to as *herbivorous* or "grass-eaters", were a generation more interested in shared earning power and shared domestic roles, and for whom solo capsule living was less appealing; and their daughters, seeking greater equality and representation in the workforce, found the masculine-oriented architecture oppressive.[47] As a

[43] *Metabolism in Architecture,* 78.
[44] Ishida, 204.
[45] Ishida, 203.
[46] Ishida, 200.
[47] Ishida, 206.

Metabolist, Kurokawa may have foreseen advances in technology and a need for the building to grow and change; but he may have had a harder time predicting these cultural changes.

Conclusion

In studying Metabolism and the Nakagin Capsule Tower as a case study, we find an architecture “out of time” - rapidly obsolete in its direct manifestations, yet reflective of an eternal Japanese culture. Where architects like Kurokawa had begun by reimagining an urban life unconstrained by space, mobility, or materials, the Nakagin Capsule Tower ultimately succumbed to physical deterioration, economic pressures, and shifting social dynamics. The Tower's demolition in 2022 represents not just the end of the building’s half-century lifetime, but a closure to a period of postwar imagination in architectural history. Yet even though few pure Metabolist designs are visible in urban centers like Tokyo today, the Japanese city quietly continues to metabolize. Buildings are demolished and others quickly grow in their place; train lines and highways form a megastructure of transportation above the ground.

Bibliography

Agence France-Presse. “La Célèbre Nagakin Capsule Tower de Tokyo, Joyau Du Patrimoine Architectural Des Années 1970, VA Être Démolie.” France Info, March 29, 2022. https://www.francetvinfo.fr/culture/arts-expos/architecture/la-celebre-nagakin-capsule-tower-de-tokyo-joyau-du-patrimoine-architectural-des-annees-1970-va-etre-demolie_5051002.html.

Boyd, Robin. *New Directions in Japanese Architecture*. New York: George Braziller, 1968.

Furuhata, Yuriko. *Climatic media: Transpacific experiments in atmospheric control*. Durham: Duke University Press, 2022.

Furuhata, Yuriko. “Spaceship Earth: Plastics and the Ecological Dilemma of Metabolist Architecture.” Essay. In *Climatic Media: Transpacific Experiments in Atmospheric Control*, 104–32. Durham: Duke University Press, 2022.

Hornyak, Tim. “In Tokyo, Rescuing the Residential Spaceship That Fell to Earth.” *The New York Times*, January 15, 2024. https://www.nytimes.com/2024/01/15/realestate/tokyo-japan-nakagin-tower.html.

Ishida, Aki. “Encapsulated Masculine Dreams of the Nakagin Capsule Tower.” *Virginia Tech School of Architecture*. Lecture presented at the F23 Faculty Lecture Series, October 2023. https://www.youtube.com/watch?v=JoX4xDsllhU.

Ishida, Aki. “Encapsulated Masculine Dreams: The Cultural and Material Impermanence of the Nakagin Capsule Tower.” *sITA* 2022, no. 10 (November 15, 2022). https://doi.org/10.54508/sita.10.16.

Koolhaas, Rem, Hans Ulrich Obrist, James WestCott, Brett Steele, and Shumon Basar. “Project Japan at the AA.” *AA School of Architecture*. Lecture presented at the AA School of Architecture, February 2, 2012. https://www.youtube.com/watch?v=OpwcTQ5RKbw.

Kurokawa, Kishō. *Metabolism in Architecture*. Boulder, CO: Westview Press, 1977.

Kurokawa, Kishō. “A Master Plan for Redeveloping the Nation: The Symbiosis of Redevelopment and Restoration.” Essay. In *Each One a Hero: The Philosophy of Symbiosis*. Tokyo: Kodansha International, 1997. https://www.kisho.co.jp/page/310.html.

Marek, Harrison. “Metabolism Past and Future, Images from a Utopian Past.” *Hyper Objective*. Lecture presented at the University of Texas at Austin, May 2019. https://www.youtube.com/watch?v=r7YdPM01GqA.

Masquelier, Max. “Kisho Kurokawa and the Metabolists, Paving the Way of Tokyo’s Post-War Architecture.” *Undergraduate History Journal at Illinois* 2, no. 1 (2022): 26–42. https://ojs.library.illinois.edu/index.php/IUJH/article/view/835.

Newell, Joshua P., and Joshua J. Cousins. “The Boundaries of Urban Metabolism.” *Progress in Human Geography* 39, no. 6 (December 5, 2014): 702–28. https://doi.org/10.1177/0309132514558442.

Reynolds, Jonathan M. “Can Architecture Be Both Modern and ‘Japanese’?” Essay. In *Since Meiji: Perspectives on the Japanese Visual Arts, 1868-2000*, edited by J. T. Rimer, 315–39. Honolulu, HI: University of Hawaii Press, 2012. https://doi.org/10.1515/9780824861025-014.

Ross, Michael F. “Beyond Metabolism: The New Japanese Architecture.” *College of Architecture and Planning Guest Lecture Series*. Lecture presented at the Ball State University, October 15, 1979. https://www.youtube.com/watch?v=ioZSmoE-kvE.

Whaley, Kelsea. “Invisible Infrastructure: Reinforcing Postwar Gender Inequality in Tokyo’s Nakagin Capsule Tower.” *Athanor* 40 (February 2, 2024). https://doi.org/10.33009/fsu_athanor134937.