Just What Is It That Makes Capsule Homes So Different, So Appealing?

Domesticity and the Technological Sublime, 1945 to 1975

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Of the various technical, domestic, and urban developments in 1960s architecture, none seems as bizarre or ill-conceived as the fascination with capsules and gantries as models for domestic living. Inspired by the fetishistic hardware of NASA and associated military organizations, capsule houses and their service towers celebrated the technological nihilism of the existenzminimum *rendered in profoundly late-modern terms. Latent in these radical proposals was the suggestion of a postmechanical sublime, a denial of humane space and experience in favor of systematizing biological and anthropomorphic requirements. This article focuses on capsule home proposals by the Japanese metabolists and contemporaries in Britain, France, and America, including proposals for domestic environments in aerospace situations and domestic capsule-gantry experiments by Kisho Kurokawa and Archigram. Kurokawa's essay "Capsule Declaration" serves as a convenient conceptual summary for an exploration of technical models from aerospace, cultural, and political influences on the capsule-gantry ideal and suggests the lingering influence of this odd yet compelling chapter in the architecture of the 1960s.*

Keywords: housing; capsule; technology transfer; aerospace; environment; anthropometrics

> A properly set up standard-of-living package, breathing out warm air along the ground (instead of sucking in cold air along the ground like a campfire), radiating soft light and Dionne Warwick in heart-warming stereo, with well-aged protein turning in an infra-red glow in the rotisserie, and the ice-maker discreetly coughing cubes into glasses on the swing out bar—this could do something for a woodland glade or creek-side rock that Playboy could never do for its penthouse.
>
> —Reyner Banham (1965)

A significant trend in postwar design has been an ongoing experiment in the functional and expressive potential of accelerated production technologies. Coupled with considerable demographic, societal, and cultural shifts linked to population trends and the destruction of much of urban Europe and Japan, this experiment proposed radical changes in domestic standards on the basis of technical advances in vehicular and construction engineering. Although many of these standards were driven by objective data and social science, the rationalization and technological streamlining of the domestic environment also proved to be productive subject matter for more radically inclined designers. Paralleling the ultimately optimistic—some would say naive—motives of those interested in housing as a problem of social science, this fringe group saw the cultural potential for housing as a radically efficient process. By 1960, dialogues in America, England, and Japan had crystallized around two archetypes borrowed from Cape Canaveral: the gantry and the capsule. Taking their cues from NASA and from science fiction, designers of capsule housing walked a fine line between ironic commentary and technological apologetics. Ultimately, their legacy has been to call into question the very nature of "dwelling" and to suggest the continuation of what cultural critic David E. Nye (1994) termed the "technological sublime." In the case of the capsule homes, the sublime experience is not one of magnitude or power. Rather, it is one of systematization, of the human mind being displaced by the rationalization of its most intimate connections to earth and space.

Two New Archetypes: Capsule and Gantry

The idea of a minimal, intensively serviced spatial container for the human body has uncertain origins; indeed, one may trace its Japanese sources to the traditional *kago* or sedan chair. However, its relevance as a cultural phenomenon dates largely from postwar aerospace developments, particularly the transformation of the military fighter cockpit into a container for astronauts. The cockpit itself was a staple of Hollywood war movies, particularly the film *Flying Leathernecks*, in which John Wayne starred as the prototypical military aviator. The combination of spartan conditions with an obsessive sense of control and discipline in these films suggests the emergence of a new archetype, a prosthetically extended ideal human, provided with as minimal an enclosure as possible. This enclosure, of course, was one of the earliest data-rich environments, with gauges and control levers occupying virtually every surface of these aircraft. Cockpit environments became more extreme with the advent of jet and rocket testing in the late 1940s. Craft of this era such as the Bell X-1, a "bullet with a pilot," provided only the barest possible accommodation, even subordinating the pilot's need to see the ground below to requirements for aerodynamic efficiency. Paired with this sensory and physical displacement, the dangerous nature of aircraft testing in this era elevated the capsule and its pilots to heroic status and suggested an oddly compelling displacement of the human body by technological and mechanical vectors.

Although experiments in hypersonic, transatmospheric flight continued during the 1960s, the development of the manned space program following the Soviet launch of the first Sputnik in 1957 had more immediate consequences for the capsulization of anthropomorphic space. The two vectors of miniaturization—or compression of the capsule to its absolute minimum dimensions to save weight—and the design of the interior to provide maximum spatial efficiency were coupled with an extensive provision
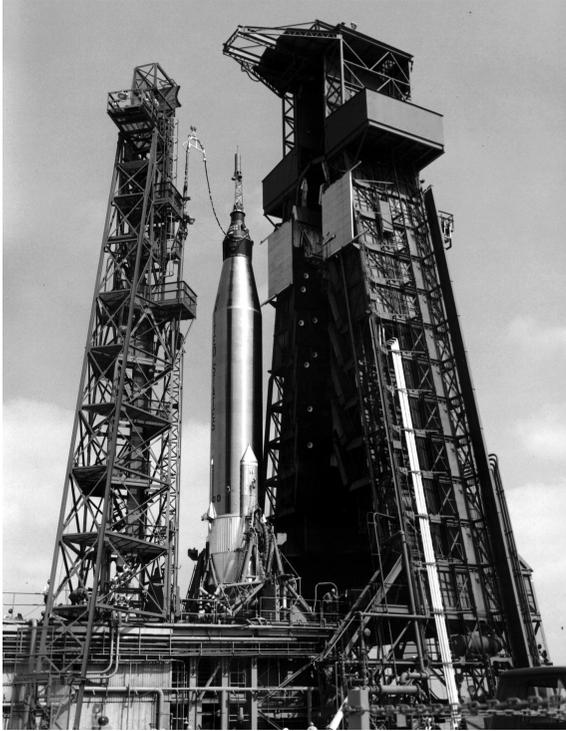
Figure 1. The Capsule-Gantry Duality In Its Archetypal Form, a Mercury-Atlas Launch Complex at Cape Canaveral, Circa 1962

Source: NASA.

of data surfaces within, necessary to monitor the performance of the craft and the livability of its interior.

The space capsule became an instant staple of popular culture in the early 1960s. Whereas earlier science fiction had generally placed heroic pilots at the controls of their (often winged) ships, new portrayals of astronauts garbed entirely in metallic suits featured them scanning acres of analogue dials, digital readouts, and forests of switches and toggles. The sublimation of the human body to the new scales and velocities of space travel also became a consistent theme, most provocatively in the 1956 film *On the Threshold of Space*, in which an Air Force sergeant subjects himself to rigorous biomedical testing in the service of manned spaceflight. Concurrently, the support systems required for these capsules during their preflight preparation suggested an architecture based not on human scale or space but on the piped flow of gases and fluids. Gantry towers required for the assembly and support of NASA's missions appeared in architectural publications as early as 1963, although their impact on visitors to Cape Canaveral had apparent influence even before their sanctification by the mainstream architectural press ("Building," 1963).

Capsule Architecture, 1960 to 1972

Whereas previous advances in transport had challenged architecture primarily on the level of production or aesthetics, the spatial implications of the developing space capsules presented challenges on levels ranging from the urban to the anthropomorphic. This apocalyptic vision, in which physical space was reduced to a biomedical minimum, and in which the environmental needs of the human body were handled exclusively by prosthetic means, had immediate effects on architects in Japan and the United Kingdom. In general, these designers shared an interest in miniaturization, the aesthetics of complex mechanical systems, and the ultimate possibility of architecture's evaporation into a totally systemic provision of environmental and electronic services.

Certain precedents to the capsule movement can be found in the prefabricated building proposals of Jean Prouve and Buckminster Fuller, but each of these results maintained an allegiance to traditional scales of residential construction. Fuller ap-

proached the implosive ideal of capsule architecture perhaps more closely in his Dymaxion car projects, modeled on the gondola cabs of airships, and in his Dymaxion bathroom, a project in which molded steel provided two watertight compartments containing plumbing and fixtures formed to precisely contain the human body. The minimal dimensions of these proposals and their prefabricated assembly out of decidedly nondomestic materials suggests an early paradigm of the residential capsule, limited though it was in its scope of anthropomorphic provision.

Two theoretical documents frame the propositions of capsule architecture: Reyner Banham's (1965) essay "A Home Is Not a House," illustrated by Francois Dallegret, and Kisho Kurokawa's (1969/1977a) essay "Capsule Declaration." Banham's essay is essentially an indictment of the traditional notion of shelter, which he saw as "avoiding the issue and hiding under a rock, tree, tent or roof" (p. 75). Banham instead suggests that the active control of the environment, originally through fire, now through mechanical servicing, has become the raison d'être of late-20th-century architecture. He and Dallegret suggest seeing the American mobile home as an inspiration and developing a "standard of living package" of environmental control and electronic entertainment as the core of a new dwelling paradigm, surrounded by the flimsiest of pneumatic enclosures. The "power-membrane" approach, they suggest, would be a radically anticultural statement and ultimately a deployment of shelter and control systems that would accurately reflect the antimonumental nature of contemporary lifestyles. There is an oddly suggestive tone throughout: Banham and Dallegret are photocollaged in the drawings in the nude, and Banham continually refers to the power-membrane's potential as a the ultimate "bachelor pad." The underlying ironic tone of the piece indicates that Banham and Dallegret's capsule may in fact be more a lusty technofantasy than a legitimate tectonic proposition.

Kurokawa's (1969/1977a) "Capsule Declaration" takes a more technocentric view, focusing on the capsule as an organizational tool for human activity and a rationalization of domestic production. He defines a capsule in a number of ways: as that without which what is contained within could not survive, as the result of planning for "perfectly free movement," and as a condition to which both our tools and our dwellings are moving. This last condition is explained as the result of tools such as the automobile becoming more like a dwelling and of dwellings becoming more like tools. "Capsule Declaration" emphasizes the need for a "qualitative" change in the way dwellings are constructed, more along the lines of automobiles and aircraft. However, this is paralleled in Kurokawa's argument by the resulting "qualitative" changes in human life. In opposition to Banham (1965), Kurokawa does not recognize the eros of the capsule dwelling. Rather, his ideal capsule operates as a kind of filter to keep unwanted information out, while accelerating the influx of information desired. In this scenario, the capsule functions to facilitate the individuality of its dweller in context to the city as a whole, to the point at which homes might be created out of capsules for each spouse and child, surrounding a negative space that could form the social nexus of the home. Indeed, whole cities might develop along these lines, "metapolises" that would so efficiently systematize daily life that information centers might become the new spiritual centers. Here, we find the capsule's evaporation of human tradition on a complete, urban scale, part of the new urban growth process that would control and configure the Japanese city in the fantasies of Kurokawa, Tange, and the metabolist group.

These two poles, the one hedonistic, ironic, and ultimately aesthetic and the other authoritarian, serious, and bureaucratic, defined the two parallel explorations of capsule architecture in England and Japan during the late 1960s and early 1970s. Whereas the tectonics of the former involved a nihilistic move toward complete ephemeralization and consumer culture, the latter tended toward structures of total sociopolitical control and eventually a paradoxical "monumental" ephemerality in the structures of Expo '70 in Osaka.
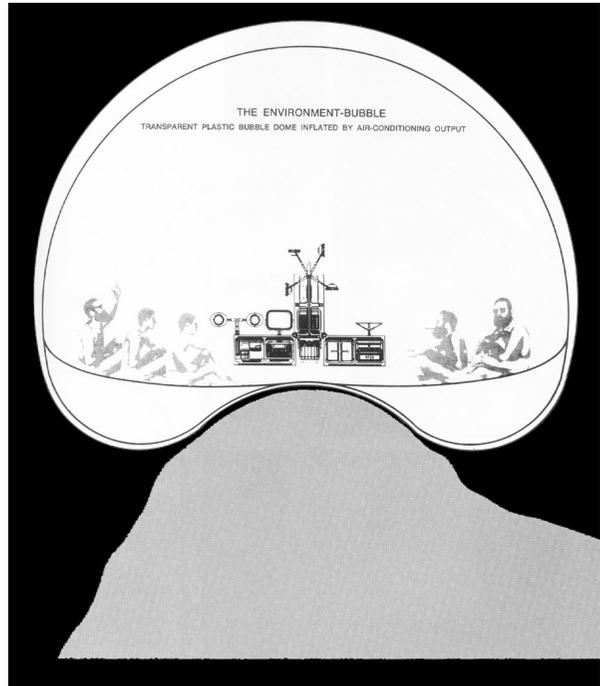

Figure 2. "Enviro-Bubble," Beyond Fuller's Wichita House in Its Radical Ephemerality, Consisting of a Centrally Located "Standard of Living Package" and an Inflatable Surround

Source: Banham (1965).

The British Movement: Archigram

Reyner Banham's influence, along with the palpable presence of Buckminster Fuller, had a galvanizing effect on the British scene in the mid-1960s. As early as 1961, the ad hoc group Archigram, formed from a group of self-described "bored" group of recent graduates from the Architectural Association, had begun meeting and publishing an irregular journal. Their emphasis on science fiction imagery and the expressive potential for building technology led them to naturally consider the capsule as a fundamental element in their "wild-eyed" architectural philosophy:

> The love is gone.
> The poetry in bricks is lost.
> We want to drag into building some of the poetry of countdown, orbital helmets,
> discord of mechanical body transportation methods
> and leg walking
> Love gone. (Cook & Chalk, 1973, p. 8)

By the time of *Archigram 3*, published in 1963, Buckminster Fuller's Dymaxion bathroom had made a guest appearance, alongside other examples of "throwaway" architecture ranging in scale from boxes of cereal and laundry soap to temporary housing set up by the London City Council. In editorials accompanying the collage, Peter Cook and Warren Chalk argued for architecture that could be "bought off the peg" and suggested that planned obsolescence in automobile design had allowed the rapid development of a technologically ideal object. The lagging behind of domestic environments in the race toward mass production was portrayed as unfortunate if not ir-
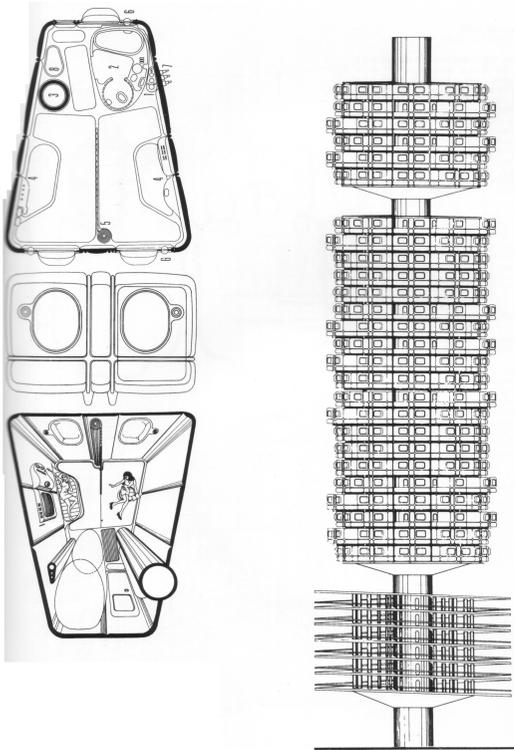
Figure 3. Warren Chalk, "Plug-in Tower," 1964
Source: Cook and Chalk (1973).

responsible. Throughout 1964 and 1965, Archigram's work consisted almost entirely of experiments using the capsule-gantry paradigm, in particular "Amazing Zoom Archigram 4," which borrowed imagery and layouts from science fiction comic books. Parallel to this celebration of space pods, Cook and Chalk produced a series of "Plug-in" projects, whose rationale directly defines the new model:

Definition: The Plug-in City is set up by applying a large scale network-structure, containing access ways and essential services, to any terrain. Into this network are placed units which cater for all needs. These units are planned for obsolescence. The units are served and maneuvered by means of cranes operating from a railway at the apex of the structure. The interior contains several electronic and machine installations intended to replace present-day work operations. (Cook & Chalk, 1973, p. 39)

The Plug-in projects contain megastructural elements incorporating mechanical and electric services, into which a series of repetitive prefabricated capsules can be inserted. In virtually every rendering, cranes are shown lifting the capsules into place, suggesting a continuous process of growth and regeneration. Whereas the Plug-in city itself was largely an experiment in creating urban forms and spaces out of gantries and units, Chalk's capsule home projects of the same time frame concentrate much more on the tectonic potential for such a system. Wedge-shaped units consisting of a floor tray, surrounding walls with service ducts and interfaces, and a unitary roof were to be clipped together to form an enclosure. Additional elements in the interior included "clip-on appliance walls" with integrated video and audio monitors—the only apparent activity suggested for the space—and a recognizable version of an advanced Dymaxion bathroom.

A more subversive version of the capsule homes was executed the following year by Chalk with Ron Herron. Conceived as a buildup of rubber gasket profiles on a large scale, the "gasket homes" suggested a less systematic approach, with services and structure appearing on an ad hoc basis, and with the homes themselves customizable on the basis of the layering strategy of the gaskets. Further explorations in the countercultural potential for the capsule dwelling included the less celebrated Living-Pod project by David Greene of the same era. Here, a central "pod" was to have been supported by a series of legs allowing for varying terrain and by a number of "attached machines" that would each perform a domestic task: washing, climate, food dispensation, and entertainment. Bearing a disquieting similarity to an actual human organ,

the Living-Pod project suggested the erotic potential of "plugging in," because the apertures of the pod and its machines bore a consciously conceived resemblance to those of the human body.

The Japanese Scene: Metabolism and Expo '70

If Archigram was by its own admission fascinated by the imagery and sensual of-ferings of idealized residential technology—"short on theory and long on draftsman-ship," as their self-avowed fan Reyner Banham put it—their (presumably) ironic stance at least suggested that the capsule could have socially and politically charged meaning. The Japanese experiment in capsule-and-gantry housing, though more re-fined and occasionally actually put into practice, suggested a stronger engagement with bureaucratic planning, economics, and corporate management. If Archigram saw the capsule as a liberating mechanism from societal norms and political organization, the metabolists saw the capsule as a tool of regimentation, a way to fix one's social re-lationship and standing in an overall framework or order.

Metabolism was a made-to-order architectural philosophy, emerging suddenly at the 1960 World Design Congress in Tokyo alongside its earliest and most potent man-ifestation, Kenzo Tange's Tokyo Bay Plan. The plan represented the metabolist ideal of continual growth and renewal through mechanical processes. A large infrastructural matrix was proposed for Tokyo's harbor, with megastructures for civic, residential, and commercial zones attached via rail and highway. Each component of the overall sys-tem could be "unplugged" as it became obsolete or worn out, from individual air han-dling units to entire apartment or commercial blocks. Although suggesting the con-stant renewal of vernacular Shinto shrines, metabolism also proposed a unique corollary to the gantry-capsule model, based not on the consumer model of Archi-gram but rather on a management model suitably disguised as a biological metaphor. The movement's supposed emphasis of a link to the natural world was utterly belied by its design production, which was invariably mechanistic and in many cases as fetishistic as Archigram's output.

Kurokawa, a Tange disciple, moved from a series of urban proposals that derived directly from the Tokyo Bay Plan to a much smaller scale explorations of a technolog-ically conceived dwelling. Although prefabricated residential units had been impor-tant elements in Tange's plan, Kurokawa advanced the conceptual rationale for such a development in a series of increasingly sophisticated projects from 1962 to 1975. In his essay "Meta-Architecture," Kurokawa (1962/1977b) suggested a number of advantages that suggested the encapsulization of domestic space. First, the obvious economic benefits of mass production, as proved by automobile construction, were paralleled by the assembly line's ability to achieve precise tolerances and high-quality standards. Second, prefabricated capsules would allow the metabolist ideal of component inter-changeablity; in other words, as mechanical systems or interior finishes became obso-lete or worn, they could be detached and replaced without major construction effort. Although this process focused largely on service packages, the homes' "space units" themselves would be a relatively permanent chassis onto which these more functional elements could be attached. The chassis, however, could be arranged or attached to others to form elementary social connections, an idea Kurokawa credited to Yona Friedman. These connectors, both within the capsule dwelling and without, would

form the fundamental basis for modular construction and composition, suggesting an ordering pattern to life within and among the capsules. Finally, Kurokawa recognized the overall aesthetic and compositional potential for this extreme modulation, pointing out that the process held the potential to not only be a "mechanism" for social and physical change in cities, but also to suggest a new aesthetic on the basis of human proportions. According to Kurokawa in "Meta-Architecture," production processes and the functional disposition of spaces and elements would be more closely tied to the abilities and requirements of the human body than traditional construction processes.

Kurokawa's first capsule proposition came in the form of a "prefabricated apartment house", proposed for a sloping site in 1962. Taking Louis Kahn's servant-served space dialogue to a radical level, it proposed a structure of prefabricated concrete units, into which a series of residential walls and mechanical capsules could be placed and replaced. Adopting some aspects of traditional Japanese aesthetics—an asymmetrical balance or *gangyo* and the occasional use of *tatami* proportions within the living spaces—this project contained within its otherwise fairly conventional planning the first instance in Kurokawa's work of genuinely removable mechanical components, in this case the restrooms in each apartment. The project did not, however, suggest the full capsulization of domestic space, because the living quarters were to be defined by "kit-of-parts" planar wall elements, an advance in production if not in the quality of space provided.

Kurokawa continued to develop capsule and gantry proposals throughout the late 1960s and early 1970s, resulting in several constructed prototypes and two successfully built systems. Following the completion of the Discotheque Space Capsule in the nightclub district of Roppongi in 1968, Kurokawa was made part of the design team for Expo '70 in Osaka, along with Isozaki and Tange. Inspired by the successful pairing of ephemeral construction and electronic technology evident at the 1967 Montreal Expo, Tange and the design team proposed a radical reconception of the urban experience on all levels, from that of mass gathering and transport to materiality and detail. Expo '70 was the first to recognize and celebrate the separation of "hardware" and "software," that is, between the content of the exposition pavilions and their containers, and a redefinition of architecture as primarily an instrumentalist support system for electronic content became a major theme of the grounds. Tange's major design contribution, a 100-meter by 300-meter space frame hovering over a plaza containing mobile theaters, kiosks, and robots designed by Isozaki, set the tone of the Expo's architecture. According to Tange, this space frame was not "architecture" in the traditional sense but simply a massive piece of "environmental equipment" designed to be a "neutral…self effacing…invisible" support structure for the circulation and exhibits within (Tange & Kawazoe, 1970, pp. 31-32).

In other words, the space frame was to be an urban gantry, a silent service structure whose aesthetic intent was to be largely those sublimating effects of its lumbering scale and its radical functionalism. Within its long-spanning overhead structure, the frame contained a series of exhibits, mostly from smaller countries and industries. By far the most popular of these exhibits was Kurokawa's first true capsule house prototype, suspended from the frame's structural nodes by cables and a single services trunk and accessible by bridges bearing a marked resemblance to those of NASA's gantry towers. Within, arranged around a central round living space, a series of (allegedly) detachable pods contained bedrooms, bathrooms, and services for cooking and cleaning. The result was similar to any number of contemporary proposals for space stations, which

were usually proposed as conglomerations of small, easily launched components, yet the interiors of the Expo '70 capsule were recognizably domestic, with shag carpet lining the walls, floors, and occasionally the ceilings. The scale of the house in comparison to that of the overall frame was an apparently unintentional explication of the overwhelming size of the gantry, while the tight confines of the capsule's interior suggested
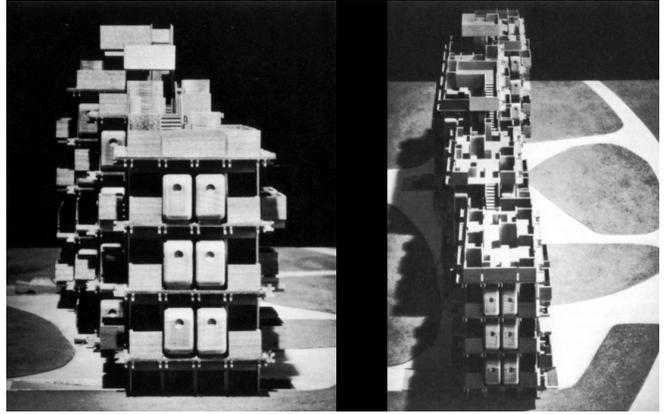

Figure 4. Kisho Kurokawa, Prefabricated Apartment House, 1962
Source: Kurokawa (1977c).

nothing so much as the noble suffering of the astronaut and the suggestive nature of the *existenzminimum* space, here rendered in shaggy fur, as if to emphasize the point.

Nearby, Kurokawa also executed a showpiece structure for the Takara furniture concern, the "Beautillion," made of continuously repeated steel pipes, bent and conjoined into prefabricated corner pieces that were quickly bolted together to form a large moment frame. Within this frame, Kurokawa placed a series of encapsulated environments, ranging from small art galleries to domestic service pods containing kitchens, lounges, and toilet rooms. Although contemporary accounts focused on the relentless nature of its structural module—and the apparently careless provision of its services, draped over the structure's rear—Kurokawa (1977c) himself saw the Beautillion in more philosophical terms:

> Disassembly was similarly easy to perform, and was a beautiful process. It was like the falling petals of a cherry blossom tree which suggest to the Japanese the spirit of *bushido*. In Buddhism it is considered noble to fulfil one's life and pass away beautifully, in accord with nature. (pp. 101-103)

Here, the sublime evaporation of the structure suggests a beauty based on fragility, on obsolescence, a slightly different notion than that of the protective capsule yet one that is intricately related—whereas the capsule protects, it nonetheless suggests Archigram's ideal of a mass-produced and therefore expendable shelter.

In 1972, Kurokawa completed a paradoxically monumental thesis on metabolism and capsule architecture, the Nagakin Capsule Tower in the Ginza district of Tokyo. Designed to provide studio housing for transient businessmen, the Capsule Tower was conceived as an economic method of quickly supplying a large number of housing units, but it was also seen by Kurokawa as an opportunity to prove the cultural and economic potential of the capsule archetype. The building consists of two service towers, each containing a central elevator surrounded by a helical staircase and a structural core of poured-in-place concrete. One hundred forty-four prefabricated housing units were bolted into these two shafts, at a rate of up to 8 per day. Each unit was built up from a welded steel chassis, similar to those used in the production of shipping containers, onto which an exterior of galvanized, ribbed steel coated with a glossy

Figure 5. Kisho Kurokawa, Expo '70 Capsule Home, Osaka, Japan

Source: Kurokawa (1977c).

rustproof paint was attached. Within this building skin, a trademark round window with a rotating shade device provided each capsule with daylight while referring—intentionally or not—to a tradition of round openings in Buddhist architecture. Further encapsulization occurred in the bathrooms and built-in furniture for each capsule, each of which was fabricated separately and plugged in to the chassis in the factory. After a transit of some 450 kilometers, the completed capsules were delivered to the site at night, because of Tokyo's traffic restrictions, and hoisted into place by a self-climbing tower crane, their services then attached to major runs inside the tower cores. Within each capsule, a combination bed-couch was located adjacent to the end window, with a built-in entertainment system at one end. A small office desk and a wall of storage containers were the only other architectural amenities, alongside a recognizably Fulleresque bathroom subcapsule containing a small shower, sink, and toilet, all sharing a space on the basis of precise anthropomorphic data, using sectional volume in addition to floor space, to accommodate human dimensions.

Inspired by the relative success of the Nagakin project—the capsules continue to be popular with short-term businessmen, residents, and commercial artisans—Kurokawa went on to design a decidedly more generous capsule-based summer house for himself, in which the pressboard and plastic interior of the tower was replaced by a more generous sense of material and space. Further experiments in concrete capsules, advanced to prototype status in 1975, and a hillside "capsule village," formed of larger, presumably more family-friendly units, remained unbuilt, and Kurokawa soon moved on to larger, more traditional architectural practice. A lingering fascination with prefabrication and the *existenzminimum* continued to intermittently inform his practice, however, particularly in his 1975 proposal for a casino hotel in the Middle East. Here, a more traditional tower core would have supported curvilinear rooms, constructed in a conventional slab and wall manner, but with encapsulated bathrooms creating the major exterior aesthetic of the building.

Contemporary interest by Japanese industrialists and designers in the economic potential for encapsulated dwellings was undoubtedly inspired by Kurokawa's work, particularly at Expo '70, but it generally failed to integrate the commercial and conceptual potential of such an idea. Although advances were made in "open systems" of
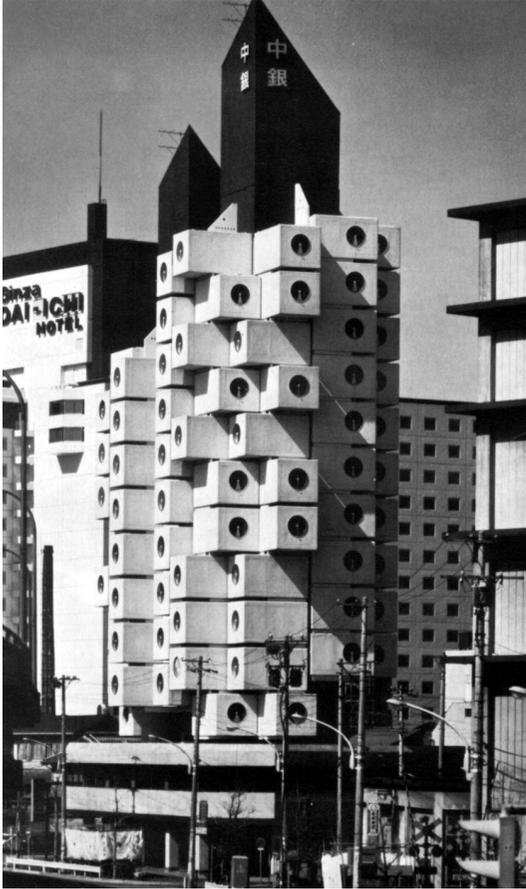
Figure 6. Kisho Kurokawa, Nagakin Capsule Tower, Tokyo, 1970

Source: Ross (1979).

construction, in which dwelling shells of prefabricated concrete or steel were occasionally used to create standardized apartment blocks and complexes, these experiments by Katsuhiko Ohno and others generally followed standard residential typologies, or else resorted to a Congres Internationaux d'Architetecture Moderne–like stacking of modular units. Likewise, attempts by companies such as Misawa and Shinihon to supply services components for traditional homes were a technical advance—particularly in their use of materials such as fiberglass and plastics to increase production efficiency—yet they failed to challenge the traditions of the houses surrounding them in any serious way. Whereas Kurokawa's propositions had integrated production, performance, and experience into a new suggestion of domestic space, these more commercially successful attempts essentially co-opted traditional notions of dwelling and residence to provide support for new processes on one hand and new performances on the other.

The lack of any sort of emotional charge from these industrial experiments points out the fundamental radical idea behind both Kurokawa's and Banham's manifestos, namely, that the capsule, beyond its mere production- or performance-based efficiency, suggests an intimacy with the body that is both sublimely horrifying and sensually gratifying. To have one's biological and spatial needs met by a bare minimum of tubes, wires, and walls is to suggest a coziness with one's body that is not without sexual suggestion. Likewise, Kurokawa's (1969/1977a) claim of "individuality" in his "Capsule Declaration" seems to be a suggestion more of privacy than of anything else: Inside the capsule, one can do as one wishes away from political or social eyes. This, of course, may be the capsule's most obvious legacy, in the development of the capsule hotel type in urban Japan. In these, capsules the size of a single human body serve as the last resort for businessmen rushing to catch the last train. The capsules often provide as their only amenity a single television screen broadcasting pornographic videos, suggesting that the capsules are not merely the functional bodily enclosure suggested by Kurokawa but actually a filter that keeps out societal elements such as family, social mores, and so on.

This, of course, is rather a sad counterpart to Banham's freewheeling celebration of the lusty potential for inflatable capsules throughout a newly eroticized landscape, and it must be admitted that the capsule and gantry have acquired decidedly negative con-

notations alongside the total fascination suggested by Kurokawa and Banham. Most notably, the unhomely nature of Stanley Kubrick's *2001: A Space Odyssey* features a scene of a vaguely anthropomorphic, cylopean space capsule turning on its former inhabitant, tearing apart his life support system and casting his flailing body into the infinity of space. This moment may well serve as the crux of the debate over whether the "encapsulization" of our domestic needs and desires is a positive suggestion (the liberation of closed doors or shades, the filtering of information in and out, the potential for mass mobility and rapid expansion) or a negative one (the bureaucratization of residential life, the submission of one's individuality to a massive conceptual and physical framework, and the lingering sense of trusting one's biological functioning to fallible mechanisms). In any case, the suggestion of the capsule assembly as a proposed social framework seems to suggest the worst possible intrusion of corporate or political management into the messy vitality of everyday life.

Figure 7. Kisho Kurokawa, Nagakin Capsule Tower, Tokyo, 1972: Detail Isometric of Prefabricated Capsule Dwelling

Source: Ross (1979).

Why, in short, would anyone choose to live in such a machine-pod? Just what is it about capsule homes that seems so intriguing, so desirable? With 25 years or so of hindsight, they might largely be seen as odd bits of nostalgia, yet there is a continuous strain of this idea in present debate. A clue might be found in Kurokawa's (1977c, p. 95) description of his 1968 Discotheque Space Capsule, in which he writes that "a capsule" is "for those who want to release what is pent up inside them," and in Banham's (1968/1981) review of the cult science-fiction movie *Barbarella*, in which he describes the inflatable, fur-lined spacecraft in which Jane Fonda frolics as an archetypal capsule, a model for housing units that would "provide everybody with their own habitable bubble of innocence" (p. 133). In both of these remarks, one senses that the capsule has been conceived almost as a defense mechanism, an anxious response in Kurokawa's case to the danger of releasing one's id into a socially strict society and in Banham's case to the degrading conditions of the world outside. In this respect, it is interesting to note that the two countries in which "research" into capsule dwellings had been focused had been devastated by aerial bombardment only 20 years before. In this model, the capsule takes on both a sinister tone (the capsules of the attacking aircraft) and a protective one (the refuge of the air raid shelter). Likewise, both England and Japan were undergoing massive social change—even unrest—during the late 1960s. The capsule home thus can be seen as either an escape via Banham's envirobubble to the unpopulated wilderness or a hunkering down in Kurokawa's case in an urban refuge.
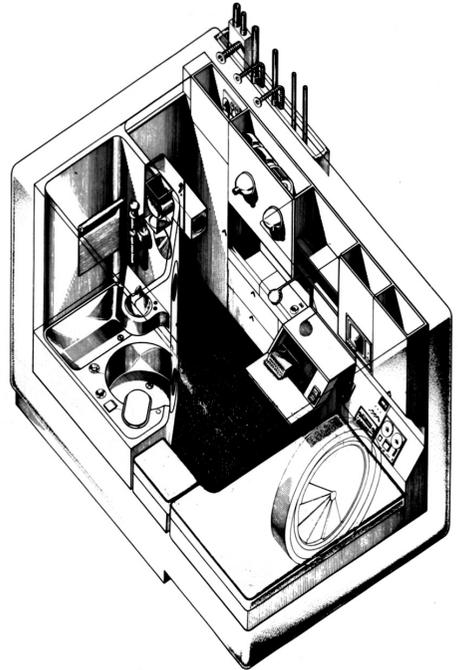
Figure 8. Richard Horden, "SkiHaus," Eigerjoch, Switzerland, 1992
Source: Horden (1995).

Thirty years on, the capsule home remains a compelling, though largely fantastic proposition, having never been successfully pursued by the housing industry. Recent work by MVRDV and LOT/EK has revived the interest in the gantry-capsule relationship, using shipping containers as building blocks for urban proposals that remain unbuilt. Similarly, Banham's escapist fantasies have been developed in the work of Richard Horden into a series of portable dwellings designed for extreme—usually alpine—environments. In his projects for a mountaintop weather station and a "Ski-Haus," he suggests a quite literal interpretation of NASA capsules either connected to the ground by the flimsiest of supports or able to physically ski down a snowy slope. Similar proposals by Future Systems, especially for a "peanut" house mounted on a hydraulic boom to enable occupants a 360° vista of the surrounding countryside, also suggest a largely recreational legacy for the capsule home.

Arguably, capsule housing has been most seriously pursued not by architects but by the automotive industry, in a neat reversal of the 1960s capsule philosophy. Rather than taking architectural inspiration from vehicular technology, aftermarket companies such as Winnebago have developed methods of transforming automobiles themselves into domestic environments. This is best exemplified by the uniquely American motor home, a grossly oversized "capsule" mounted on a truck chassis and sold with the promise of "total freedom," a goal that often requires a more maneuverable vehicle in tow. More recently, consumer automobiles by Jeep and Pontiac have been designed to transform into tents or sleeping platforms, inverting the logic of the mobile home by adopting the scale of the car, rather than the house. In each of these examples, the mechanistic intimacy of the metabolists' capsules is matched by the suggestion of liberation from both societal pressures and in the case of the new transforming cars even the road itself.

The capsule thus continues to function as both a prosthetic device, enhancing the human body's performance, and as a sublimation of human needs and desires to a mechanical structure or device. This odd pairing seems to have been consistently linked to suggestions of the most intimate behavior and activity, implying that what *really* makes capsule homes and gantries so compelling is neither their economic logic nor their spatial implications. Rather, the capsule is a fantasy involving both our fond-

Figure 9. 2002 Pontiac Aztek

Note: Currently the ultimate heritage of the capsule phenomenon. In the words of Kurokawa, our dwellings have failed to become more like tools, but our tools seem to have little hesitation in becoming like dwellings. That the Aztek was so dramatic a sales failure (it ceased production in late 2004) suggests that this is not as universal an urge as Kurokawa (and Pontiac) may have wished. *Source:* Pontiac Aztek promotional brochure, 2002.

est hopes and deepest fears regarding the operations of technology on our bodies, our social relations, and our culture. In experimenting with the subversive potential of capsules, groups such as Archigram and Kurokawa provided an intentionally seductive, morally ambiguous taste of this evaporation of our spatial, cultural, and social traditions. This vaporizing effect of the capsule is something between science fiction and architectural proposal, between genuine concern for the leveraging of housing resources and the wholesale capitulation to the liberating yet disconcerting technologization of the human body.

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