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Home among right angles: cube living

Shannon Wallace[1,*]

[1] University of Toronto, Canada
* Correspondence: shannon.king@mail.utoronto.ca; née King

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Abstract

This article focuses on the dwellings of the Villa in Beroun in the Czech Republic, designed by HŠH Architects, and Buckminster Fuller's Dymaxion, with architectural designs inspired by games, toys and creative play. The architectural designs inspired by the stacking blocks Lego®, K'nex® and Cidori® are explored and compared to GC Prostho by Kengo Kuma. The environmental implications of housing designs with malleable layouts, which reduce the need for constant changing and moving of houses throughout occupant lifetimes, are explored. The melding of the house and the game as a basis for rethinking the home space, which allows for rearranging walls and renewable capsular compartments, are analysed through the unsuccessful Nakagin Capsule Tower case study. The Villa in Beroun was dissected using gestalt psychology in order to unpack how the human mind reads its enveloping, malleable design. Due to its unique approach to black steel, concrete and glass material, the Villa in Beroun was analysed against new brutalist definitions.

Keywords modular housing; gestalt design; new brutalism

Introduction

Housing availability and affordability have been recurrent issues for much of human history; the architects who seek to address these issues have searched continuously for utopian solutions. In the Czech Republic, a new, yet historically inspired, prefabricated home was conceptualised by HŠH Architects in 2001, and the prototype was realised between 2002 and 2004.[1] The house is made of a steel skeleton with concrete and glass panels. The building comprises 24 cubes, with each cube measuring a uniform 3 × 3 metres. The architects intentionally broke up the home into clearly defined areas: 'Each of the cubes forms a separate unit with its own function.'[2] There are functionalist implications as every cube exists for a reason; this is quite provocative considering the contemporary status quo of owning a 280-metre-square house. In this article, I examine how the Villa in Beroun (Figure 1) organises and simplifies space and how it engages with materiality, while also considering how it differs from Buckminster Fuller's historical design and new brutalist aesthetics. The Villa in Beroun and the Dymaxion are then compared with two case studies: Kengo Kuma's GC Prostho, to see how the projects utilise games as an inspiration, and Nishi Kurokawa's Nakagin Capsule Tower, to analyse the issues that accompany prefabricated dwellings.

Figure 1. Frontal view of the *Villa in Beroun* (Beroun: HŠH Architects, 2004), showing the concrete solidifying the exterior and the glass revealing the interior (Source: reproduced with permission of former HŠH Architects' members and photographer Ester Havlova)

Gaming housing

The Villa in Beroun's design has taken elements from what may appear to be an unlikely source. The architect referred to this design as an 'imaginary three-dimensional chessboard',[3] which shows a playful approach to architecture, while considering its mobility. Comparing a building to a type of game is an idea that complicates housing but is not unprecedented. Buckminster Fuller's Dymaxion (Figure 2) has a pointed structure atop the home that strikingly resembles a spinning top. Fuller suggests and imagines that if buildings could move and spin, they would, ironically, cause the viewer to question their expectations of what a 'home' entails. The design of the top may invoke a carefree attitude from childhood and remind the viewer of movement. A spinning top is a whimsical toy that can be played with and without restrictions or formal parameters. The Villa in Beroun draws inspiration from a very different type of game; chess has associations with numerous rules, yet this design is not as heavily regulated; it remains convivial and open. The Villa has multiple similarities to the lower two-thirds of the Dymaxion. Both use shades of grey and black with geometric shapes and lines. The Dymaxion has a large central

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window as a key design component, while the Villa features many of them. The Villa adheres to typical conventions of housing domiciles being shaped (loosely) around squares or rectangles but is taken to an extreme. The Dymaxion is hexagonal,[4] making it appear alien, and the interior is difficult to organise. The form of the Dymaxion simply looks like an abstract object rather than a traditional dwelling or home living space.

Figure 2. Outside view of the Dymaxion (model prototype: Buckminster Fuller, 1929), showing the external shape reminiscent of a spinning top and the design's use of geometric lines and angles (Source: reproduced with courtesy of the Estate of R. Buckminster Fuller)

The cubed shapes of the Villa in Beroun do not follow the logic of a chess game and do not visually remind the viewer of a chess board. The Villa does not follow the typical alternating grid of black and white patterns of chess boards but takes on a randomised sequence reminiscent of Tetris® pieces. The shape of the concrete in the right half of Figure 1 may depict a chess move, specifically how the horse piece moves in an L-shape. The prototype Villa includes 24 squares, while a chessboard has 64. These small gestures to remove (and thus differentiate) the architectural design from the object that inspired it allow it to take on an identity of its own. The Villa in Beroun manages to not overtly look like an object (a chess board), as its clear steel structure, furniture and life are revealed through the glass, reminding us that it is indeed a home and a dwelling space. However, there is a futuristic sleekness to its form that echoes parts of Fuller's aesthetics. I interpret the Villa in Beroun as having drawn inspiration from Fuller because of the playful approach to design that references games and similarities in the formal structure with the Dymaxion.

Another case study that will be used in this article to analyse game-inspired elements is the GC Prostho in Kasugai, which was designed by Kengo Kuma. Kuma was influenced by a game similar to K'nex® and Jenga®, which brings a feeling of anticipation and possibility: 'The design for this building originates in the system of Cidori®, an old Japanese toy. The Cidori® consists of a simple assembly of wood sticks with joints, all the same size, which can be extended merely by twisting the sticks without any nails or metal fittings.'[5] Kuma's architectural interpretation of the stacking-based game uses the same wooden materials as the traditional game. The square and cube convey a sense of eternity as the design continues and intersects both inside and outside the building.

The unity between the interior and exterior spaces creates further cohesion in the design. Kengo Kuma discussed in detail how he views all architecture in terms of particles, the smallest aspect of the design.[6] The emphasis on the smallest component is seen visually throughout the design as the multiplicious wooden lines and cubes combine into the outer structure. As Kuma says, 'This architecture shows the possibility of creating a universe by combining small units like toys with your own hands. We

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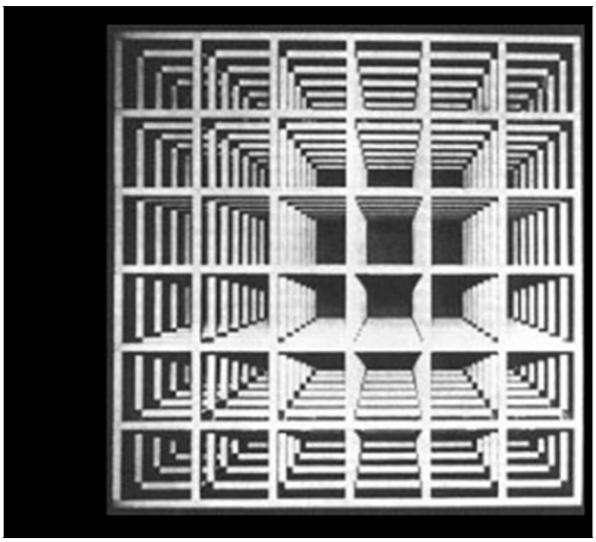
worked on the project, hoping that the era of machine-made architecture would be over and humans would build them again by themselves.'[7] Kuma also had a furniture line utilising the same idea and aesthetics as Cidori®; the dwelling and the furniture inside can be customised at any time.

This design approach is almost a return to nesting behaviour. This design allows the natural desire to create your own nest, as seen with many animals, to be accomplished in a game-like approach. The repetitious, nearly hypnotic continuation of the sticks stacked upon each other lends a meditative atmosphere to the structure, alongside a theatrical suspense as to whether the sticks will topple. The Villa of Beroun's slabs of concrete at the base of its structure create a completely different effect of density rather than the unspoken potential for movement that is not there in the GC Prostho. Much like Fuller's design, which looks like a top that should spin, the GC Prostho looks as if it can continue to be adjusted. Both the Dymaxion and the GC Prostho play within the limitations of a building's potential movement, while the Villa in Beroun, ironically, becomes an extremely solid building that is, in fact, malleable. The GC Prostho shows a huge delineation in how stacked sticks as a basis for design creates a sense of depth, while the concrete and glass slabs as the basis of Dymaxion and the Villa in Beroun are a solid mass with a sense of density.

Scalability

Both Fuller and HŠH Architects investigated the issue of large-scale housing production using diverse approaches. The Villa prototype was created alongside HŠH Architects' imaginings for wide-scale mass production (Figure 3) using cubes to create a large three-dimensional square grid. This architectural plan shows an assertive decision to reject the vertical rectangle, as found in most large-scale contemporary mass-housing structures, with skyscrapers being the most obvious. As a vertical rectangle is practically metonymy to mass-scale housing, the cube has been defamiliarized. The cube motif extends exponentially, suggesting the potential for incrementally adding more cubes. The plan for the skeleton of the grid structure does not differentiate between separate family spaces. This methodology can utilise the cube-centric design to create a variety of shapes and structures that are customisable depending on spatial availability and various needs.

Figure 3. Digitally created expanded design of Villa in Beroun (prototype design: HŠH Architects, 2004), showing possibilities for mass production (Source: reproduced with permission of former HŠH Architects' members)



The cubic design is organised visually according to functionality rather than through a predetermined programme related to shape and function, such as in Fuller's prefabricated designs.[8] The model of a neighbourhood of Dymaxion houses (Figure 4) shows geometric placement and walkways that link the

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community.[9] Suburbia, with identical houses stretching for blocks, would undoubtedly be disorienting and essentially dystopian. Fuller's plan assumes, antiquatedly, that access to large areas of land and space between each dwelling is rarely available or affordable in the twenty-first century. This 'paper architecture' and some designs created by Fuller provided conceptual groundwork that influenced aspects of the Beroun housing system. The Beroun system becomes a three-dimensional reference point that could be added to or subtracted from as the users' needs evolve. The design allows for incremental growth over time, rather than a preplanned one-off structure, and for clearly defined separate dwellings that maintain their own particular characteristics and stylistic choices while remaining cohesive to the modularity of the large cube.

Figure 4. Dymaxion Dwelling Machine (model of a neighbourhood of dymaxion houses: Buckminster Fuller, 1929), showing how the dymaxion can be used as widespread residential housing (Source: reproduced with courtesy of the Estate of R. Buckminster Fuller)

Compared to small-scale models of the Villa in Beroun and the Dymaxion, the Nakagin Capsule Tower, created in 1972 by Nishi Kurokawa, was a residential prefabricated capsule building erected in a major city. Its background provides a rich case study, revealing a unique approach as well as limitations to capsular housing. Kurokawa was a member of a Japanese architecture group that aimed to advance the architectural art world. As Tokyo art magazine *Sabukaru* explains, 'Metabolism is the law of growing and living things. But also, the original Japanese version of the word *shinchintaisha* (新陳代謝) overtones a spiritual perspective, closest to the Buddhist concept of impermanence, the meaning of renewal, replacement, and regeneration.'[10] Metabolism approaches permanence and replacement in a unique manner, where the core is preserved. Buddhist shrines made of wood are often rebuilt every two decades, and the idea that there is something divine within the materials is not present within this world view.[11]

The materiality of buildings has already been desacralised and dethroned from the meaning of 'permanent'. The Nakagin Capsule Tower was created with the idea that buildings change systematically, like a living thing with changing needs and forms. Kurokawa advocated for a symbiosis of the city rather than having a centralised preset grid system with confines that must be adhered to.[12] The Tower was intended to have its capsular dwelling spaces interchanged and replaced with a crane, allowing for the core structure to remain the only aspect of the original structure, rather like a lizard shedding its skin or a plant shedding its leaves and keeping its stem. The connection between the naturalness of changing through life and a building having multiple iterations was made in this 1970s Japanese context, partially through the influence of Buddhist philosophy. This case study will ultimately prove that

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in the management of prefabricated modular (or capsular) housing, the unnaturalness of bureaucracy and reliance on the approval of homeowner associations required to modify buildings serve as direct opposition to the natural, spontaneous growth of nature that Nakagin tried to emulate.

The idea of the Tower originated from a child's block tower, based on the freestyle happenstance structure that the child managed to stack. Kurokawa's son recalls the moment of inspiration, 'When my sister and I played with cubic blocks, my father watched us and said, "this is an interesting shape", then he started sketching what we had made.'[13] This certainly adds pressure to a child's playtime and complicates the scalability of the family presence in architectural design. The block structure created by a toddler is never completed, as completion is not the purpose of such creative play: blocks are made to be stacked and unstacked as the child sees fit.

The Nakagin Capsule Tower is made of 140 steel capsules attached to two tall concrete bases extending up and above the capsules.[14] The capsules were ordered from a department store's interior construction division that specialised in making interiors for temporary dwellings inside planes, ships and trains.[15] Each capsule was sold individually, with most owners having only one capsule. Nishi Kurokawa explained why he chose to use the term 'capsule' rather than 'prefabricated': 'For the individualized and diversified society in the future, I think we should make each house unique.'[16] Yet, the architect's words and how his building was utilised by its occupants suffered a disconnect. From an exterior view, the building's capsules did not appear unique in any respect; they all were the same size and colour, had the same circular window and were made by the same supplier. Each capsule was 2.5 $\times$ 4 metres, based on a traditional Japanese tearoom's size.[17] I would argue that there was a huge oversight in repurposing an exact-sized room that was historically used for one specific, almost ritualistic, purpose in the occupier's culture. This room size already had a context and familiarity to it that may have brought about an unsettling quality to its reappropriation.

As a tower with jutting cubes, pointy towers and grey walls, the building faced much criticism from laypeople and designers alike. The singular circular window was intended to mimic a camera's shutter, yet viewers interpreted it as looking more like the window of a washing machine due to the square steel structure that housed it. There is still the question of why anyone would want to live inside a camera's shutter, as that is where images are viewed from and stored but not where the beauty one intends to capture takes place. The cubic room's circular window leads to the sensation of being on a ship or inside a large washing machine, causing a sense of claustrophobia. This circular window emphasises the angularity of the interior even more through its juxtaposition of organic lines.

The tower was actualised but demolished due to a collective vote by the homeowners based on a variety of managerial, plumbing, decorative and other issues. Due to its thin steel structure, the capsules would get very cold in winter.[18] A lack of upkeep and leakage problems meant that the building had a lot of areas with peeling paint and moss growing in outdoor hallways. The moss can be explained away as a fact of nature, yet the peeling paint can be seen as a collective giving up on the upkeep of the building or having used cheap materials to begin with. This is why homeowners did not replace the capsules as intended. If your neighbours take no pride in living here, why should you? 'In 2007, 80 percent of the residents voted in favour of replacing the building with a newer one.'[19] The units did not connect enough with the residents to cause them to want to preserve the collective look and feel of the building. As a house intended for salarymen (who did not spend much time there and were accustomed to living out of hotel rooms, on business trips and so on), the occupants lacked the attachment to the dwelling necessary for its ongoing alterations.

The plan for the Nakagin Capsule Tower remains unrealised as the capsules were never changed out and remained stagnant. The failure of the metabolist movement can be viewed by the result of this structure; it was intended to evolve but, instead, deteriorated over time. When the Nakagin Capsule Tower was originally constructed, the technology used was not compact enough to suit such small living quarters. Many photographs of Nakagin capsules in use show a vignette of clutter on all sides, with the large window revealing a busy maximalist city view – a 1970s computer would have taken up a large portion of the available desk/living space. While the Nakagin Capsule Tower was intended to evolve with time, the residents did not foresee the immediate inconveniences as a price worth paying for realising Kurokawa's metabolist ideals. The architect attempted to fix these issues by designing and building the television set and radio to fit into the wall's frame, but this complicated evolution of the space as it would require dismantling part of the wall. The radio control panel, now obsolete, required a new wall panel to be commissioned, ordered and designed. Installing the television and the radio in the

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wall saved space and were convenient, yet they aged into difficult-to-fix and dated features that busy Tokyoites were trying to avoid with cheap premade housing. The success of metabolism relied on each capsule's occupant to replace them: the homeowners would have had to plan, organise and finance such an evolution. Ultimately, the beauty of theoretical architecture ideals could not quell the residents' dissatisfaction with daily life in the Nakagin Capsule Tower's prefabricated units.

Shifting and sustainable

The Beroun Villa could be as solid as its materiality suggests or it can take on malleability: 'Square fields are defined as needed by fixed or sliding walls … No distinction is made between individual fields; and their character is determined purely by their contents.'[20] It is a fact of life that the family unit remains in dialogue and continues to be reorganized; the rooms can be altered alongside spontaneous developments in life. This allows the structure to be altered as the family grows and changes. If a new baby is born or if an elderly relative moves in, the walls of the structure itself will mould to fit their needs. Many widows or surviving family members relate similar experiences of feeling out of place in a home layout that they used to live in as a bigger family unit. The uncomfortable feelings that accompany grief can be magnified by the presence of an empty room in the home. The shiftable aspect of the HŠH Architects' prototype does not expect the consumers of their design to have their entire lives planned out when they purchase their home, as many current real estate practices require. Caulder explains that British buildings have historically needed to be organised to withstand harsh winter climates and prevent drafts. Technological developments around the brutalist period of the 1960s changed the previously held necessities and narratives for architecture. The avant-garde notion of functionality alongside malleability is a tremendous advantage to brutalist design ideology and features: 'With cheap, cool electric lighting, mechanical ventilation, central heating, and the versatility of concrete structure, rooms could be whatever size and shape was needed. The building could fit around the functions rather than the functions having to accommodate themselves to the normal restrictions of buildings.'[21] Contemporary standardised housing (and even Fuller's designs) were not created to grow with its inhabitants, which was a massive oversight in terms of their long-term utility.

While the Beroun Villa can reduce the waste and pollution that accompany the periodic changing of one's primary residence throughout life, the Villa itself is not made of environmentally friendly materials. However, reducing the need for moving vans, shipments and driving to a new location multiple times throughout the homeowners' lives means that this changeable home would be an ecological success. The Villa has the benefits of being an irregular-looking home while also being cube-based, which is easier to build, move and transport. Suppose an average person moves home once during childhood, goes to university, gets married and becomes an empty nester. In this case, the occupant must change their dwelling to suit their needs, which has huge environmental implications. If we dig deeper into the building blocks of the Beroun, we find permanent, non-renewable materials. The main ingredient in concrete production is environmentally destructive:

> Cement manufacture releases large amounts of carbon dioxide (CO_2), the most important greenhouse gas. The cement manufacturing industry is the third-largest source of anthropogenic (human-caused) carbon dioxide emissions after forest destruction and the burning of fossil fuels for transportation and electricity generation. About 5% of global anthropogenic carbon dioxide emissions are from cement manufacture.[22]

Whether the impact of concrete production for the widespread implementation of Beroun methodologies would be less environmentally destructive compared to moving multiple times throughout the human lifespan remains unclear. The international availability of concrete allows for the scalability of some of the techniques of the Beroun model to be immediately plausible: 'Today, cement-based concrete is the most abundant manufactured material on Earth.'[23] Attempts to modernise the concrete-based design will fundamentally interrupt the overall impact of the building; for example, replacing matte concrete walls with a gabion of natural materials, such as recycled building materials or stones, will not have the unified texture of the silent monolithic concrete the designers intended.

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Gestalt

The relationships between particles, modules and units to create a unified design is analysed using gestalt psychology. The pleasant qualities of alternating concrete and glass sections may be perceived and have limitations to what the human eye or mind can consciously absorb: 'The appreciation of modern and conceptual art especially relies on non-perceptual processes.'[24] Nonetheless, utilising the gestalt theory, Beroun's Villa design will be approached by considering how the human brain views it as a whole and as a combination of material modules.

Upon taking in the initial image of the dwelling, the difference in materials in certain exterior parts is barely recognisable. The Beroun is naturally grouped together seamlessly as the cubic forms are identical in size and shape. This uses 'the Gestalt principle of similarity, according to which a set of elements that are similar to each other tend to be seen as a separate visual group or whole'.[25] The similarity of the concrete unifies the rectangular shape, despite the anomalies of the glass windows. The human eye could have perceived the modules revealed by the glass as separate from the concrete group, but this does not occur. The contiguity of the overall rectangular form being constructed by the glass and the concrete unifies it.

The principle of good continuation is utilised as Beroun uses the straight lines of the steel cladding to create this sense of continuity. The smooth lines of the steel and the flatness of the unornamented walls create a safe consistency. From many viewpoints, from both inside and outside the Beroun, viewers see the cubes extending into the distance in their peripheral vision: 'The principle of good continuation according to which elements tend to be grouped into visual wholes if they are smoothly continuous with each other.'[26] The Beroun Villa uses this concept as the cubes are stacked and extend past one another to create the rectangle. The cube continues vertically and horizontally as the same shape is repeated; it groups itself as a continuous, consistent structure within the visual field.

The cubes' arrangement and organisation encapsulate them within a larger shape as the repeated cubes extend into a rectangle. The next aspect of gestaltian theory is the 'principle of closure, according to which elements tend to be grouped if they form closed contours'.[27] Closure is seen in the Beroun as the closed rectangle envelope of each individual cube is incorporated into a larger, organised, repetitive structure. Despite gaps within the rectangle with glass as a disruptor, the overarching lines cause the eye to see it as one cohesive rectangle. Angular cubes and rectangles are also associated with cages like fish tanks and zoos, giving another dimension to evoking closure.

The following principle can be viewed through the cube's angularity in relation to the unorganised and imperfections of the ground. The Villa has no illusionary effect, but the concrete exterior of the house appears to be the figure, while the glass revealing the interior almost becomes part of the background. The figure and ground gestalt principle is challenged by using glass windows to reveal a certain spatial cavity of the interior. The figure is not a flat silhouette of an object but a traditionally flat rectangle with receding areas of depth. These areas of depth contrast with the matte concrete. The external frame of the rectangle then frames the glass cube, playfully creating another 'figure and ground' within the 'figure and ground' of the rectangle and physical background.

The principle of simplicity can be seen as the eye interprets the Beroun as a rectangle rather than perceiving the concrete as one complex, separate unit with glass cubes as empty spaces or other separate units. The familiarity of the rectangle is much more recognisable than a rectangular shape with missing cubes in the middle. The missing pieces are mentally filled in rather than subtracted. The mind does not focus on what is missing but sees the overlying shape first.

The limitations of the exterior form encapsulate the cubes' affect and determine how the Beroun Villa cubes will be used: 'Natural wholes, according to the Gestalt view, are not simply the sum total of their constituent parts. Rather, characteristics of the whole determine the nature of its parts, prescribing the place, role, and function of each part in the unified whole.'[28] Because the residents know that the rectangle is of a certain size, they divide the space into cubes in an idiosyncratic way. The whole is preordained to be a rectangle, while the interior is limited to a number of cubic parts where the divisions can still be moved. As a completed and formal rectangle, the whole is unmoving, but the cubes' divisions are still movable. The nature of the parts of the Beroun can find and re-find their place, role and function within the larger shape.

The Beroun resists ornamentation, deviations and disorder as the design emphasises purpose and organisation: 'It has been suggested that most principles are special instances of a single general

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principle of *Prägnanz* (a German word meaning, approximately, "conciseness" or "succinctness") or *good gestalt*, according to which there is a tendency for those groupings to be perceived that are as regular, salient, ordered, simple, lawful, compact.'[28] The Villa is certainly regular and simple in its similarity of materials and sizing of the cubes. The cubes are compacted tightly by their right angles, continuing to form the external rectangle. The rooms are tightly packed next to one another without hallways, reducing the dweller's time traversing liminal spaces. The Beroun design is succinct and graceful in how the parts and the whole are individually and dually pleasing to the human brain according to gestalt psychology's concept of Prägnanz.

Surveillance

The organisation of alternating glass and concrete panels has possibilities for outside surveillance, especially if a prototype is installed in a city. Passers-by would be able to view the entirety of certain rooms. In Figure 1, the room exposed by a glass wall at the top of the structure reveals a black bathtub basin; this could imply the dwellers of this specific villa have a scenic view before them or that the neighbours are a distance away. This is a startling difference from many contemporary homes with small windows (that usually have their blinds drawn) mere metres away from their neighbours. The social impact must be considered when using transparent material as a wall. If the prototype for the Villa in Beroun was mass produced, would every building contain the same number of exposed and covered rooms?

Brutalism definitions

Definitions must be touched upon to engage in the discourse surrounding concrete-based architecture. Art critic and journalist Reyner Banham created the term 'new brutalism' and defines the movement in three theses: '1. Memorability as an image 2. Clear exhibition of structure 3. Valuation of material as found'.[29] The relationship between the Villa in Beroun and the new brutalist movement is examined through these parameters. While this set of criteria may be broad, it captures the vastness of possibilities for the evolution of new brutalist aesthetics. The viewer easily digests the silhouette of the Villa; there is a straightforwardness to the form. This building deviates from contemporary architectural norms in several ways, giving it a memorable quality. The Villa's structure is clearly defined (almost outlined) in black as it recedes through the home. The glass and concrete walls, floors and ceilings assert themselves as crucial parts of the design. The architects rejected huge slabs of concrete and, instead, alternated them with glass and black steel; this stopped the building from giving the impression of an imposing monolithic fortress. The form being broken up by the black lines stops it from being harsh and dull on the eyes. The cubes stacked atop and next to each other come together to form a rectangle. The house's interior consists largely of rectangles and squares receding into space. The interior and exterior of the design have geometric features that create a sense of unity. The Beroun's interior has sparse walls with angular shapes in each cube; yet because of how the black skeleton is exposed against the concrete (Figure 5), it creates a feeling of spaciousness and depth rather than emptiness. The materials of the Villa in Beroun are acknowledged and celebrated, making this design successful. As Barnabus Caulder explains, 'The uniform sobriety of concrete turns out, when you look at it more closely, to conceal a subtle gamut of textures and colours, beautiful in themselves and a permanent record of how the building was made.'[30] The concrete of the Villa in Beroun resembles a Rothko painting with its ambient effect on the eye. The presence of the home's construction remains a constant through the variations in its concrete textures juxtaposed with glass, revealing the world outside. The texture and slight variations in the shades of the concrete vastly accentuate the design. The Villa adheres to Banham's criteria for New Brutalist architecture.

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Figure 5. The interior view of the Villa (Beroun: HŠH Architects, 2004), revealing the black cubic frames that divide the interior space.

Conclusion

The Villa in Beroun was influenced and inspired by the ideas of Buckminster Fuller's Dymaxion and new brutalist aesthetics. The reference to toys and geometric shapes was inspired by the Dymaxion. HŠH Architects took a formulaic approach to design where functionality could be constrained into a uniform cube, but the walls still have the potential for adjustability. A building designed to go through repurposing has more potential to last an entire lifetime and adapt to mass production. The Villa in Beroun adheres to Banham's criteria to be a New Brutalist structure, but it deviates in appearance from traditional historical brutalist works. The colour scheme of the grid and walls allows the structure to appear open, welcoming and neutral rather than a hostile, closed-off fort of concrete. The Villa in Beroun was approached using gestalt psychological principles that were analysed with regard to the entire structure versus the sum of its modules. The Villa was compared to two tertiary case studies: the GC Prostho by Kengo Kuma showed an alternative game-inspired design using sticks and wood to create depth rather than concrete cubes or glass slabs creating density; the Nakagin Capsule Tower by Nishi Kurokawa was a large-scale capsular residential building that began with ideals similar to the Villa in Beroun but was actualised with various oversights.

Notes

[1] HŠH Architects, 'Villa in Beroun'. Accessed 8 March 2020. https://www.hsharchitekti.cz/index.php?lang=en&page=project&name=villa-in-beroun. Quotations used from this source were auto-translated into English from the original Czech website using Microsoft Edge.

[2] HŠH Architects, 'Villa in Beroun'.

[3] HŠH Architects, 'Villa in Beroun'.

[4] Drosos, 'Radical architecture'.

[5] Arquitecturaviva, 'GC Prostho, Kasugai'. Accessed 7 December 2023. https://arquitecturaviva.com/works/museo-y-centro-de-investigacion-prostho-3.

[6] NHK World–Japan, 'Kengo Kuma monologue'.

[7] Mehta, 'Tradition and technique'.

[8] Drosos, 'Radical architecture'.

[9] Drosos, 'Radical architecture'.

[10] Moreno, 'Metabolism movement'.

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[11] Kurokawa, *Metabolism in Architecture*, 9.
[12] International Celebrations in Architecture, 'Richard Neutra'.
[13] Yamazaki, *Nakagin Capsule*.
[14] Yamazaki, *Nakagin Capsule*.
[15] Yamazaki, *Nakagin Capsule*.
[16] Yamazaki, *Nakagin Capsule*.
[17] Yamazaki, *Nakagin Capsule*.
[18] Yamazaki, *Nakagin Capsule*.
[19] Yamazaki, *Nakagin Capsule*.
[20] HŠH Architects, 'Villa in Beroun'.
[21] Calder, *Raw Concrete*, 7.
[22] Gilman, 'Cement industry', 180–3.
[23] Gilman, 'Cement industry'.
[24] Leder, Helmut and Nadal, 'Perception and art', 652–4.
[25] Todorović, 'Gestalt psychology', 310.
[26] Todorović. 'Gestalt psychology'.
[27] Todorović. 'Gestalt psychology'.
[28] Todorović. 'Gestalt psychology'.
[28] Todorović. 'Gestalt psychology'.
[29] Banham, 'New brutalism'.
[30] Calder, *Raw Concrete*, 5.

Declarations and conflicts of interest

Research ethics statement

Not applicable to this article.

Consent for publication statement

Not applicable to this article.

Conflicts of interest statement

The author declares no conflict of interests with this work. All efforts to sufficiently anonymise the author during peer review of this article have been made. The author declares no further conflicts with this article.

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