

DESIGNING FUTURE AND HOUSE IN MID-20TH CENTURY ARCHITECTURE:
DYMAXION, FUTURO, AND THE METABOLIST CAPSULE

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DYNAMAXION, FUTURO AND THE METABOLIST CAPSULE**

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ABSTRACT

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This study dwells on the conceptions of future and house in twentieth century architecture. The post-war periods, which witnessed immense societal and environmental changes, both built and natural, due to massive destructions and losses offered a ground for discussions on the future of cities, housing and daily life and thus were particularly productive in this regard. It presents briefly the nature of technological developments, and the associated principles of design, production and building in the late 19th and early 20th centuries to set the historical context and conceptual framework. It elaborates the history of the experimental aspect of architectural thought and practice, which often took the conceptualisation and production of 'house' at its core and used the private setting as an implementation lab of ideas. The discussion takes to its focus certain prefabricated houses that were developed in the aftermath of the second world war, in conjunction with science fiction literature and theory as a cultural reference point behind their designs. Three major examples are discussed in this scope: the *Dymaxion* houses designed by R. Buckminster Fuller in the United States of America in 1927 and 1941-47; Finnish

architect Matti Suuronen's *Futuro* which was designed and built between 1965-68; and finally, Kisho Kurokawa's *Metabolist Capsules* built in 1972 (*Capsule House K* in Nagano and the Nakagin Capsule tower in Tokyo) after Osaka Expo 70 which was a pinnacle moment in Japanese architecture.

Keywords: Future, House, Science Fiction, Modernism, Prefabrication.



Öz

20. YÜZYIL ORTASI MİMARLIĞINDA GELECEK VE EV TASARLAMAK: *DYMAXION*, *FUTURO VE METABOLİST KAPSÜLLER*

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Bu çalışmanın esas odağı yirminci yüzyıl mimarlığında, özellikle ev mimarisinde gelecek tahayyülleri ve bu çerçevede yapılmış tasarımlardır. Yirminci yüzyılın savaş sonrası dönemleri topyekûn savaş sonucu oluşan yıkım sebebiyle inşa edilmiş yahut doğal çevre bakımından muazzam değişimlerin yaşandığı bir dönemdir. Tarihsel ve kavramsal bir altyapı oluşturmak amacıyla çalışma ilk önce on dokuzuncu ve yirminci yüzyılın teknolojik gelişmeleri ve bu doğrultuda ortaya çıkmış yapı tasarım ve teknikleri üzerinde durmaktadır. Bu çalışma ayrıca mimarlığın pratik ve düşünsel boyutunda deneyelliğin ön planda olduğu, ‘ev’ kavramını ve özel alanı alışılmışın dışında fikirlerin somutlaşma imkânı bulduğu bir laboratuvar olarak görüp çalışmanın merkezine koyarak kısa bir tarih yazımı sunmayı amaçlamaktadır. Bu doğrultuda İkinci Dünya Savaşı sonrası geliştirilmiş prefabrik evler esas odak noktasıdır. Savaş sonrası bu dönemde bilimkurgu edebiyatı ve teorisi bir kültürel referans noktası olarak alınarak “modern ev” ve “geleceğin evi” kavramları incelenmektedir. Bu doğrultuda incelenen üç ana örnek; Amerikalı mucit-mimar Buckminster Fuller tarafından ilk önce 1920’lerde tasarlanmış ve daha sonra 1940’ların sonuna doğru revize edilerek

retimi tamamlanmıř olan *Dymaxion* evi, Finlandiyalı mimar Matti Suuronen'in 1965-68 yılları arasında tasarlayıp retime geirdiđi *Futuro* evi ve *Metabolist* akım mensubu Japon mimar Kisho Kurokawa'nın 1970 Osaka Fuarı'ndan sonra tasarlayıp inřa ettiđi Kapslleridir.

Anahtar Kelimeler: Gelecek, Ev, Bilimkurgu, Modernizm, Prefabrikasyon.





*to my shattered dreams,
may they rust in pieces...*

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CHAPTER 1

INTRODUCTION

Architecture, at times of rapid technological development and in the aftermath of destructive conflicts serves as a production ground for ideas and queries into the future through which the prevalent ideologies and ways of living get criticised and re-evaluated, especially through house and domesticity. The development of modern technology has undoubtedly been a central factor in the shaping of modern architecture since the early 20th century. For instance, in the immediate aftermath of the First World War in Germany, at a time of political revolutions and severe housing shortage, new construction technologies gave way to the development of a new and modern style. Walter Gropius' 1910 proposal advocated the use of new production methods for mass housing.¹ Although written before the War, his proposal can be regarded as a premise to the establishment of Bauhaus in 1918. Established by Gropius and his colleagues, Bauhaus today is regarded as a pioneering school dedicated to the evolution of 'minimal dwelling' in a utopian modern spirit – making use of factory modes of production and technological innovations. Bauhaus sought to provide the masses with "low-cost, well-built, and practical houses in good taste" with room available for "individual variations" only if the customers were willing to abide by the "principle of uniformity based on industrial production."² It is argued that the profession of architecture had been suffering from what is called the "Henry Ford syndrome"; the idea of the standard, well-designed, low-costing mass-produced house and its potentialities were dreamed by architects for a long time.³

¹ Barbara Miller Lane, ed., *Housing and Dwelling: Perspectives on Modern Domestic Architecture* (Oxon: Routledge, 2007). 237.

² Walter Gropius, "Program for the Founding of a General Housing-Construction Company Following Artistically Uniform Principles," in *Housing and Dwelling: Perspectives on Modern Domestic Architecture*, ed. Barbara Miller Lane (Oxon: Routledge, 2007), 237–40. 239.

³ Gilbert Herbert, "The Dream of the Factory-Made House," in *Housing and Dwelling: Perspectives on Modern Domestic Architecture*, ed. Barbara Miller Lane (Oxon: Routledge, 2007), 240–47. 240.

Although Bauhaus has seemingly been in the vanguard of a creation of a new movement in this regard in the 1920s and 30s, the history of the prefabricated house dates back to the 19th century, to the second phase of the industrial revolution.⁴

The industrial revolution, which began towards the end of the 18th century, drastically changed daily life practices and perception of nature. It is reasonable to say that industrialisation triggered the emergence of a distinct modern condition based around industrial production and economy in which technological prowess and innovation unavoidably became integrated to the daily life at all social levels. The methods and practices of mass production and consumption that were especially being shaped since the 19th century, with the aid of scientific and technical development of an unprecedented speed, reached a more effective hegemonic level in the 20th century – creating the modern condition that has since turned the world into a “global village”, as Marshal McLuhan theorised in the 1960s.⁵

The modern condition the industrial revolution has created for humanity is a cycle of fast, seemingly more comfortable, and mobile style of living, illustrated well with the invention of, first the steam engine and later the internal combustion engine that made transportation faster via trains, cars, aeroplanes, and thus shortened travelling distances. In the same vein, the advancements in electricity and electronics made communication wireless and fast, almost near instant. The modern condition, eventually cherished making capital, seemingly endless production and consequentially endless consumption, phenomena that made intellectuals and visionaries from various fields and professions, scientists, architects, planners and authors reflect on aspects of modern condition and its possible further consequences. In the 19th century for instance, renowned scientist Nikola Tesla predicted the current outcomes of wireless technology. British urban planner Ebenezer Howard pioneered the idea of a garden city to counter the negative effects

⁴ Edinburgh Iron founder C. D. Young is known to have pronounced in the 1850s that his cast-iron houses were “susceptible of being carried out in ranges to any required extent, so as to form whole streets or squares.” *Ibid*.

⁵ McLuhan coined the term and elaborated on it in two of his books, *The Gutenberg Galaxy: The Making of Typographic Man* (1962), and *Understanding Media* (1964). It appeared yet again in *The Medium is the Massage* (1967): “Ours is a brand-new world of allatonce. “Time” has ceased, “space” has vanished. We now live in a global village... a simultaneous happening.” In Marshall McLuhan and Quentin Fiore, *The Medium Is the Massage: An Inventory of Effects* (Berkeley, CA: Gingko Press, 2001). 63.

of dense industrial cities. Authors such as Jules Verne and H. G. Wells pioneered the scientific novel, or science-fiction. In the mid-20th century, such intellectuals engaged in future studies as Alvin Toffler, John McHale, Isaac Asimov and Arthur C. Clarke speculated about the future, assessed the advantages of technology, theorised its societal benefits and warned about the possible long term negative effects, challenging the *status quo* to change for the better. In other words, the modern condition has brought upon an inquiry into the present, and stimulated thoughts on how life in the future would possibly be like – based on the present – and how to make these speculations palpable.

Another context, apart from the periods of technological confrontation, in which modernity becomes an agenda of challenge and transformation is the post-war periods. Indeed, one can easily trace humanity's technological progress by looking also at histories of warfare. The destructions caused by warfare, aside from

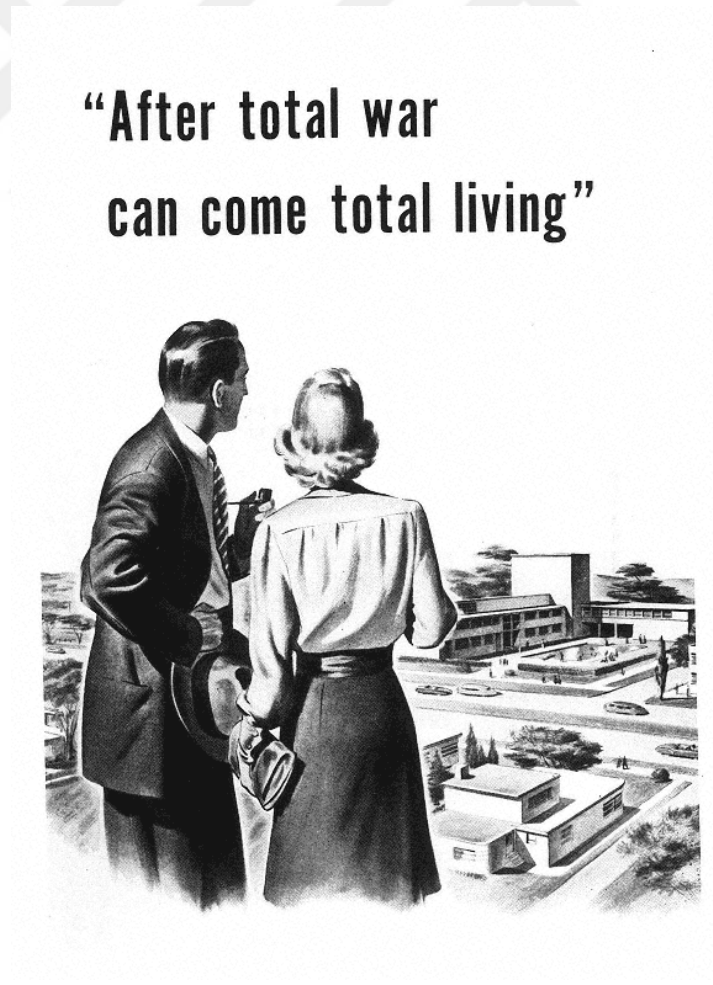


Figure 1 – Revere Copper Company brochure “After Total War Can Come Total Living” (1943).

the immense tragedies and dramas it caused, almost always brought an opportunity to build back, to start anew. Post-war periods, in this respect, are especially productive eras to reconsider urban, architectural and societal changes. City planning and architecture, in particular housing, gets the biggest share from the rebuilding processes, that are often shaped under the pressure of an emergency demand which needs to be met both quickly and efficiently. Thus, the American wartime propaganda, “after total war, can come total living” is a maxim that describes the post-war situations in the 20th century (Figure 1).⁶ It was featured in a series of pamphlets published by Revere Cooper and Brass Incorporated “to remind consumers of its participation in wartime production and its intended return to manufacturing consumer goods after the war.”⁷

The fact that new and novel design ideas emerge more often in the aftermath of wars is well illustrated after both WW1 and WW2, during when there was an urge to accommodate the post-war societies. The social and spatial rebuilding in both periods were thus geared to implement the modern and contemporary, and aim to transform the pre-war patterns of daily life. The post WW2 era, in this respect, activated such creative minds as R. Buckminster Fuller, Ron Herron, Peter Cook, Matti Suuronen and Kisho Kurokawa to develop visionary ideas and projects based on exploring the potentials of new materials, structural systems and technology to transform dwelling, domesticity and private space.

Many cities in Europe, Japan and USA were redesigned and planned to accommodate cars, after the destruction of the WW2. Cars increased mobility at a micro level, enabling families and individuals move with increased freedom and speed, compared to the previous century. Furthermore, faster modes of transportation like trains and aeroplanes grew in popularity as well since their dedicated infrastructures were repaired and expanded. Train stations and airports became inherent spaces of 20th century urban modernity.

⁶ Total war refers to a type of warfare that does not discriminate between civilian and military targets. During times of total war all the resources of a society are allocated to fight, with no restrictions in terms of the weapons used. ‘Total living’ is a play on the term, referring to peace time. (<https://www.oxfordreference.com/display/10.1093/oi/authority.20110803105038425>)

⁷ Dell Upton, *Architecture in the United States*, 1. publ, Oxford History of Art (Oxford: Oxford University Press, 1998). 234.

The architecture of transportation hubs also became influenced from the technological progress that accelerated in the post WW2 era. For instance, airport terminals started to exhibit more streamlined features, reminiscent of jet aircraft design; well-known examples are Eero Saarinen's Dulles International Airport main terminal in Washington D.C. (Figure 2) and the TWA Flight Center in John F. Kennedy International Airport at New York (Figure 3), both of which were built in 1962 and exhibit dramatic forms that are suggestive of flight. Saarinen rigorously critiqued the existing terminals with the main terminal of Dulles International which was designed as an endlessly expandable structure on an enormous site (9,600 acres). The podium on top of which the thrusting suspended roof rests has piers that are approximately 13 meters high on the field side, and 20 meters high on the approach side. The podium's basement houses all the untidy baggage handling and service operations. The main floor was intended to be an open, airy area with ticket counters running down its centre, from which passengers would transfer to the mobile lounges that would take them to the waiting planes at the mid-field.



Figure 2 – Dulles International Airport main terminal building in 1962. Note how the terminal could be expanded horizontally from either edge – which eventually did over time. Also note how the overall form of the building is shaped like an aerofoil, alluding the idea of flight. Source: <https://seeitsaveit.home.blog/2019/11/19/a-historic-crossroads/>

Saarinen wanted to improve the aesthetics of flight while avoiding the protracted lines of travel and finger terminals that are found in the majority of American airports.⁸ The head house of TWA Flight Center is a pioneering example of thin-shell construction along with the main terminal of Dulles, consisting of a reinforced concrete shell roof supported at the corners. Saarinen, in a talk he gave at the Architectural Association in 1957 described the design as such: "...the reason why these (plastic forms) are being built now... is really aesthetic and not economic; and we should face that."⁹ Saarinen wanted to "express the drama and wonder of air travel" in the form of a dynamic concrete building, which posed a peculiar challenge: "how to make the vaults, whose compressive forces are always downward, become soaring rather than earthbound?"¹⁰ The initial design consisted of a continuous undulating elliptical paraboloid shell which was held down by four angled columns at the centre that allowed the two outside edges to cantilever out and upwards in the form of wings. Although it seems ambitious at first, the engineering capabilities of



Figure 3 – The head house of TWA Flight Center unmistakably resembles the wings of a bird or an airplane. According to the architect himself, it was meant to be an abstraction of the idea of flight itself. © Cameron Blaylock. <https://www.archdaily.com/788012/ad-classics-twa-flight-center-eero-saarinen>

⁸ Richard Guy Wilson, "Dulles International Airport," in *SAH Archipedia* (Society of Architectural Historians, n.d.), <https://sah-archipedia.org/buildings/VA-01-NV33>.

⁹ Rob Whitehead, "Saarinen's Shells: The Evolution of Engineering Influence," in *Shells, Membranes and Spatial Structures: Footprints* (IASS-SLTE 2014 Symposium, Brasilia, Brazil: IASS, 2014).

¹⁰ *Ibid.*

the time were advanced enough to shape the building to its current form through a series of revisions.¹¹

The era was also a productive one for space studies, that also had consequences on architecture and domestic space. Space programs and science-fiction inspired the design of household items and furniture, which began to be made out of plastic, a post-war novelty which came into common use in especially the 1960s. Not only consumer items but buildings in the 1960s and early 70s were inspired by the space race between the Soviet Union and the United States. Two examples are the “Futuro” designed by Matti Suuronen (Finland, globally distributed, 1968) which is made out of plastic and resembles a flying saucer, and Kisho Kurokawa’s Capsule Houses (Capsule House K in Nagano and the Nakagin Capsule Tower, Tokyo, 1972) which were directly inspired by the orbital space capsules and heavily incorporated metals in their construction. One may describe these designs as somewhat utopian in a period of accelerated space exploration which, at the same time, faced the possibility of nuclear annihilation.

1.1. Aim and Scope

This study, in this context, aims to discuss the futuristic tendencies and experimentation in modern domestic architecture by elaborating the following research questions: In which ways the future was envisioned in the 20th century? What are the intersections between future, architectural thought and science-fiction in the 20th century? What are those aspects through which the house of the future was designed and discussed? Thus, what makes a house a house of the *future*? It will elaborate the discussion by three case-studies: R. Buckminster Fuller’s *Dymaxion*, Matti Suuronen’s *Futuro*, and Kisho Kurokawa’s Nakagin Capsule Tower. The examples are introduced, compared and discussed in terms of their futuristic aspirations in reference to the contemporary dynamics. All three buildings were designed and realised after the Second World War with adherence to principles of lightweight prefabrication and flexibility. They represent challenging ideas regarding

¹¹ For more information on Saarinen’s terminal buildings and their engineering solutions see, Whitehead’s “Saarinen’s shells: The evolution of engineering influence”.

the design of the optimal living experience as a way to transform domesticity in the post-war era.¹² The *Futuro* was designed as a vacation house and hence was completely devoid of urban context, while the Nakagin Capsule Tower was intended to serve a role similar to a hotel. The *Dymaxion* House was designed as a family home, intended to fulfil the demand for cheap and light-weight housing in post-war United States. All three designs, were deemed futuristic at the time of their conceptions, in terms of form, materials, structure and logic of furnishing. Despite representing shared ideas, the three buildings, however, have not been contextualised together in a research.¹³

Throughout the study, comparative examples are also used to demonstrate that most of the 20th century architecture was somewhat stylised and defined according to the spirit of the era, which was mostly characterised by rapid technological development resulting in, or caused partially by the Cold War phenomena – namely the race for space and nuclear armaments between the Soviet Union and the United States, short-lived economic miracles in Europe, and globalisation. Possible interactions and/or relationships, between utopianism, science-fiction, and the ever-changing architecture of the 20th century are also scrutinised to demonstrate that the three case studies chosen are not only important to the greater narrative of architectural history itself, but important also to the history of modern architecture because they represent a futuristic approach – critical alternatives to the prevalent styles of modernism of their time. It is one of the aims

¹² Although I agree that the term “post-war” usually refers to the immediate end of the Second World War, for the sake of the integrity of this study I prefer to use it to refer to a broader time period as is done by Tony Judt in his *Post-War History of Europe*: “Europe’s future would look very different - and so too would it’s past. In retrospect the years, 1945-89 would now come to be seen not as the threshold of a new epoch but rather as an interim age: a post-war parenthesis, the unfinished business of a conflict that ended in 1945 but whose epilogue had lasted for another half century.” Tony Judt, *Postwar: A History of Europe Since 1945* (London: Vintage Books, 2010). 2.

¹³ *Dymaxion* House and the Nakagin Capsule Tower are included in a dossier published in *YAPI* journal that looked at contexts of reducing complexity in design and building, Fahriye Hilal Halıcıoğlu and Seçkin Koralay, “Tasarım ve Yapımda Karmaşıklık Azaltmak: Basit, Bütünleşik ve Yenilikçi Yaklaşımlar,” *Yapı Dergisi*, accessed May 14, 2022, <https://yapidergisi.com/tasarim-ve-yapimda-karmasikligi-azaltmak-basit-butunlesik-ve-yenilikci-yaklasimlar/>. The only other exception I have come across is Marko Home’s chapter, “Alternative Futures” published in the book, *Futuro: Tomorrow’s House From Yesterday* (2003), in which the *Dymaxion* and the Nakagin Capsule Tower, along with the works of Archigram group, are given as supporting examples to demonstrate *Futuro*’s futurism and Space Age aesthetics.

of this study to demonstrate how the case studies represent futurism in their respective contemporary dynamics.

The second chapter examines the relationship between architecture and science-fiction to establish a framework on how future was reflected in contexts of design and fiction and to identify the concepts that are used to examine the main cases. It briefly looks at the new construction materials, practices and, types of buildings introduced by the industrial revolution in the 19th century. It highlights that such new materials as steel, concrete and glass, and their abundant production, gave way to the emergence of skyscraper as a new archetype. The skyscraper phenomenon, particularly in the United States in the 19th century, coupled with other technological developments in the fields of communication and transportation (invention of the telephone, the telegram, the steam locomotive, and airship) has evidently captivated the imaginations of a whole generation of professionals working in the fields of visual arts, design and literature. The thinkers, writers, designers, artists, planners, and architects of the late 19th century have speculated how cities, houses, and everyday life would look like in the future, and they published works that can be described as fantasies. The genre of science-fiction, in this respect, is briefly exemplified to illustrate how the future was imagined and conceptualised in the 19th and 20th centuries, and to discuss the influence of art and design of forecasting on architecture that was deemed futuristic by critics and public alike in regard to the dynamics of the period. The “problem of house”, in this regard, is elaborated as an experimentation arena of fantastic and futuristic ideas.

The third chapter discusses the development of the “modern house” and the discussions that revolved around new amenities and forms of domestic living. It dwells on the works of various schools of architecture and architects, such as the Bauhaus and Le Corbusier, while the main focus is on the “Case Study Houses” project that was developed in the United States in the 1950s. These houses provided a context to compare it and the case studies in terms of form, style, planning and symbolic meaning.

The Fourth chapter articulates the cases of the study in a chronological order. The first part discusses Buckminster Fuller’s *Dymaxion* systems and designs, with a special focus on the lightweight *Dymaxion* House. It is argued that the design was

considered a ground-breaking concept of house when it was first introduced in the 1920s. The *Dymaxion*, derived from the term "dynamic maximum tension," embodied Fuller's philosophy of doing more with less. It was a prefabricated, lightweight structure designed to be easily transportable, energy-efficient, and adaptable to various contexts. It challenged the traditional approaches to housing by incorporating cutting-edge technology, efficient space utilization, and sustainable design principles. Fuller's inventive approach to architecture and his commitment to solving global challenges indeed makes the *Dymaxion* House an iconic symbol of his legacy. The second part of the chapter focuses on the *Futuro* House designed by Matti Suuronen, who was known for his experimental designs. The *Futuro* House that was intended to be a portable, easily assembled dwelling which could be placed in various locations was no exception. It is argued that this innovative prefab structure captured the futuristic spirit of the 20th century – the Space Age optimism of the era. Its distinctive flying saucer-like shape and use of materials like plastic and fiberglass set it apart from the traditional architectural norms and captured the imagination of



Figure 4 – Left, *Kubuswoningen* of Helmond. Right, *Kubuswoningen* of Rotterdam. Built in a similar spirit to the *Bolwoningen*, the *Kubuswoningen* were designed by Dutch architect Piet Bloom in the early seventies. The first houses were built in Helmond near Eindhoven between 1974-5. After gaining 'experimental' status the project quickly grew to 18 houses in 1977 and was accompanied by a theatre (*'t Speelhuis*). The cubes were constructed out of wood. A fire destroyed the theatre and a few surrounding houses in 2011. The project in Rotterdam was the application of the suburban experiment to a more urban context. The development was finished in 1984, and contains 270 dwellings, 1000 square meters of catering and shops, and a parking lot for 300 cars. (Photographs by the author, summer of 2020.)

many, evoking a sense of otherworldly charm. Although relatively few were ever built, the *Futuro* House became an iconic symbol of the mid-century avant-garde modernism and a testament to Suuronen's forward-thinking vision. The third part explores Japanese Metabolism through Kisho Kurokawa's Capsules. The Nakagin Capsule Tower stood as a remarkable example of the Metabolist movement (until it was demolished in 2022), which sought to create adaptable and modular structures that could respond to the rapid urbanization and changing needs of the society. The tower, located in Tokyo, consisted of two interconnected concrete cores with 140 individual capsules attached to them. These capsules, resembling futuristic sleeping pods, were designed to be versatile living and working spaces. Kurokawa's innovative approach, blending technology, prefabrication, and a vision for future urban living, resulted in a distinctive and forward-thinking architectural icon. The Nakagin Capsule Tower stood as a testament to Kurokawa's commitment to pushing the boundaries of design and his lasting influence on the architectural landscape.

The final chapter concludes with a recap of all the major highlights. The industrial revolution and world wars as fundamental motivators for futuristic ideas



Figure 5 – The *Bolwoningen* in Maasport, Den Bosch. These spherical houses were designed by Dutch artist and sculptor Dries Kreijkamp and were built in 1984. The 50 houses were originally designed to be made out of polyester, however, fire regulations demanded it to be built from concrete reinforced with fiberglass. Kreijkamp's design is an example to lightweight prefabricated dwelling. (Photographs were taken by the author in June 2020)

prepared a ground for authors to create fantastic fictions narrating and visualising the architecture and life in the future, and for architects to develop alternative housing concepts and forms of domesticity inspired by such fictions. The ideals of 20th century studies on future, however, seem to have eventually failed in creating a utopian welfare society.

1.2. Scope, Method and Limitations

The study covers the period between the 1900s and 1980s which has witnessed two world wars that have definitively shaped the course of world history, and specifically the western culture. The aftermath of the WW2 was truly a very dynamic era, as the social, economic and spatial destructions caused by the war would take decades to heal. In the study, the post-war period, unlike the conventional periodization, is extended to 1989, when the Berlin Wall fell, and the Warsaw Pact began to unravel in the Eastern Bloc. This was the time when the old order of things eventually came to an end.¹⁴

The study mainly uses secondary sources and makes use of relevant literature. A limitation is the lack of site visits. In early March 2020, at the early stages of the writing I was an exchange student at the Technical University of Eindhoven in the Netherlands. The initial work schedule then included site visits and archival studies, as The Netherlands is home to some novel examples of modern and contemporary domestic architecture. This schedule was overshadowed by the COVID-19 restrictions imposed by the European governments. In addition, the Museum Boijmans Van Beuningen in Rotterdam, which houses an example of *Futuro*, one of the case studies in the thesis, was unfortunately closed due to the planned renovations. According to the information on the museum's website, the structure was dismantled and kept in a shed within the museum grounds since it was last displayed in the Sarkis Ballads exhibition in 2012.¹⁵ Therefore, it was neither possible to see the *Futuro* nor to get information from the museum sources. However, I did manage to see some modern housing projects, such as the the cube houses, *Kubuswoningen* (Figure 4) in Helmond

¹⁴ For detailed information on post war European political history, see Tony Judt's *Postwar*.

¹⁵ <https://www.boijmans.nl/collectie/kunstwerken/131959/futuro>

and Rotterdam; and the spherical houses, *Bolwoningen* (Figure 5) in 's-Hertogenbosch. All three were built as experimental housing developments commissioned by the Dutch government in the 1970s and 1980s. Yet, even though I was able to see the buildings in person, I was not able to interview any of the residents or see the interiors of the dwellings in Den Bosch and Helmond. However, I could see an interior in the *Kubuswoningen* in Rotterdam, as one of the houses in the site was converted into a museum, and was open to visitors. Thanks to their extraordinary look and design, these two projects provide a supporting insight for the main discussion.¹⁶



¹⁶ For more information on the Dutch experimental program as a whole refer to: Marcel Barzilay, Ruben Ferwerda, and Anita Blom, *Predicaat experimentele woningbouw 1968-1980: Verkenning Post 65*, (2018).

CHAPTER 2

ARCHITECTURE, FUTURE and SCIENCE FICTION

Even so imaginative a writer as Jules Verne failed to envisage the speed with which electric technology would produce informational media. He rashly predicted that television would be invented in the XXIXth Century. Science-fiction writing today presents situations that enable us to perceive the potential of new technologies. Formerly, the problem was to invent new forms of labor-saving. Today, the reverse is the problem. Now we have to adjust, not to invent. We have to find the environments in which it will be possible to live with our new inventions. Big Business has learned to tap the s-f writer.¹⁷

The relationship between science-fiction and architecture is an interesting and multifaceted interplay that stimulates much thought. While architects themselves often deny any direct influence from science-fiction, it is undeniable that the genre's imaginative stories and futuristic concepts have had some impact on the architectural thought. Science-fiction often serves as an unconscious source of inspiration that push architects to envision and contemplate on new possibilities for the built environment. Through speculative narratives and fantastical landscapes, science-fiction challenges the limits of what is possible, and should be sparking the imagination of architects to explore uncharted territories in design. Architecture, in turn, is an excellent tangible platform for science-fiction to materialize, and to transform the realm of imagination into concrete structures that capture the essence of futuristic visions. This dynamic relationship between science-fiction and architecture goes beyond the boundaries of fiction and reality, forging a captivating realm where the fantastical becomes conceivable and the unimaginable becomes achievable. This chapter explores the concept of science-fiction (SF) and how it translated into architecture throughout the modern era.¹⁸

¹⁷ Marshall McLuhan, *Medium is the Message*, 124.

¹⁸ To consider SF and architecture as domains that mutually influence each other, I have made use of several reference books, internet sources, literary examples and works that combine basic SF theory with cinema, architecture and design. It seems that architecture influences the visual language of SF more than SF influences architecture.

Literary historian and critic Darko Suvin defines the concept of SF, as “a literary genre whose necessary and sufficient conditions are the presence and interaction of estrangement and cognition, and whose main formal device is an imaginative framework alternative to the author's empirical environment.”¹⁹ According to this definition, one can find examples of SF dating from as far back as ancient Greece. Yet the genre began to take its current form in the 19th century. A medium that merges SF and architecture is cinema, and David T. Fortin’s book *Architecture and Science-Fiction Film* extensively details the relationship between the two by focusing on Philip K. Dick’s stories and their film adaptations.²⁰ Those interested in SF will of course find many other examples ranging from H. G. Wells to J. G. Ballard, and an extensive analysis of how architectural discourse intersects with SF mainly in the form of “prediction as [a] tool for thinking about the future.”²¹ According to Fortin, for example, Charles Jencks’ *Architecture 2000* is an exercise of architectural SF fashioned in the aforementioned manner.²²

Another comprehensive book on the subject is Paul Dobraszczyk’s *Future Cities: Architecture and the Imagination* (2019). Dobraszczyk, aims to bring together “visions of future cities from the nineteenth century to the present day in all their many and varied forms: in literature, art, architectural imagery, cinema and video games.”²³ The author defines the fundamental aim of his book as “ground[ing] these imaginary cities in architectural practice, demonstrating just how many connections can be made between the two.”²⁴ He concludes that images of the future, no matter how fantastical and weird they may be, are essentially grounded in reality, and are really about the present moment. This, Dobraszczyk states, is “a way of changing

¹⁹ Darko Suvin, *Metamorphoses of Science Fiction: On the Poetics and History of a Literary Genre* (New Haven: Yale University Press, 1979). 7-8.

²⁰ Fortin analyses in detail the *Blade Runner* (adapted from *Do Androids Dream of Electric Sheep?*), *A Scanner Darkly* (adapted from the eponymous novel), *Total Recall* (adapted from the short story “We can Remember it for you Wholesale”), and the *Minority Report* (adapted from the eponymous novella).

²¹ David Terrance Fortin, *Architecture and Science-Fiction Film: Philip K. Dick and the Spectacle of Home*, Ashgate Studies in Architecture Series (Farnham, Surrey [England] ; Burlington, VT: Ashgate, 2011). 62.

²² *Ibid.*

²³ Paul Dobraszczyk, *Future Cities - Architecture and the Imagination* (London: Reaktion Books, 2019). 7.

²⁴ *Ibid.*

current thinking and practice in order to set them on a different course or courses.”²⁵ What enables this line of practice is imagination itself, since to think of the future is to imagine it by necessity.

It is explored below, in which ways modern SF has shaped itself into a full-blown genre in the late 19th century, and how it provides a foundation for some related concepts, such as “design fiction”, that can be liberally used to describe anything that operates within the realm of fiction, but grounded in reality.

2.1. Architecture as *Novum* and Home as “Zero World”

The 19th century is undoubtedly a breaking point in the history of human civilisation due to the severity of the consequences of industrialisation. It was a time of invention and exploration, and a time when people, especially in Western geographies, started to gain greater mobility in traveling thanks to the technological progresses in transportation. Aside from the invention of the steam engine which granted people higher mobility, the invention of photography, and towards the end of the century the developments in motion picture technology had a great cultural impact on the Western societies, opening up new visual dimensions in people’s minds.²⁶ Individuals became acquainted with visiting cinema theatres and thus immerse themselves in an adventurous journey in the comfort of their seats. It is also no surprise that in this period there was an increase in travel literature, be it fiction or non-fiction. There was especially an abundance in the publication of adventure novels that took place in exotic lands – also coinciding with the emergence of the modern understanding of historical thinking towards the end of the century. Particular forms of stories and publications speculating about the future arose during this time – mostly of a utopian nature. Such printed media often displayed conceptual illustrations of how the future

²⁵ *Ibid.*

²⁶ The reason for mentioning motion picture technology is that cinema proved to have a great influence on fiction in general. For instance, Georges Méliès is regarded as the first, pioneering director to have shot a SF film with a plot. Throughout the 20th century, designed fictions, as Bleecker talks about in his essay, were realised through big budget films of the SF genre. Stanley Kubrick’s *2001: A Space Odyssey* (1968), Ridley Scott’s *Blade Runner* (1982), and Steven Spielberg’s *Minority Report* (2002), are but a few popular examples.

might look like, and were somehow of a predictive nature – self-fulfilling prophecies.²⁷

Historian Reinhart Koselleck, in his book *The Practice of Conceptual History*, is particularly interested in utopias. He argues that, the future cannot be observed or checked as it cannot be captured by experience – it is therefore a genuine and pure achievement of the author's mind.²⁸ He explains that “the imagined support of spatial controls break free,” and hence, “the fictional status of a temporal utopia differentiates itself from a spatial utopia” – meaning that the author's fiction exists solely in the mind of its creator and not in the material world. The controllable ground of the present gets abandoned as the reality of the future exists merely as the product of the writer.²⁹

Thus, Koselleck continues: “any utopia of the future has to assume temporal continuities regardless of whether they are openly thematized or not. [...] The entire utopia of the future thus lived off points of connection not only in the realm of the fictive but in the empirically redeemable present.”³⁰ What Koselleck describes here is what Suvin calls “cognitive estrangement” in utopian literature. Furthermore, literary critic and philosopher Frederic Jameson stresses that “Utopia” is a rather ambivalent concept that is highly political and always ideological. He argues that understanding the psychology of utopian production is essential in understanding the concept:

It is important to complete this utopian formalism with what I hesitate to call the psychology of utopian production, a study of utopian fantasy mechanisms, rather, and one which eschews individual biography in favor of historical and collective wish-fulfillment. Such an approach to utopian fantasy production will necessarily illuminate its historical conditions of possibility: for it is certainly of the greatest interest for us today to understand why utopias have flourished in one period and dried up in another. This is clearly a question that needs to be enlarged to include science fiction as well if one follows Darko Suvin, as I do, in believing utopia to be a socio-economic sub-genre of the broader literary form.³¹

²⁷ In the sense that they become reality because they have been imagined in some form, and thus have guided development in that direction, just like the popular TV series *Star Trek* did in the 1960s, regarding such technologies as sliding doors or cellphones – another good example of design fiction.

²⁸ Reinhart Koselleck, *The Practice of Conceptual History: Timing History, Spacing Concepts*, trans. Todd Samuel Presner, Cultural Memory in the Present (Stanford, Calif: Stanford University Press, 2002). 87.

²⁹ Ibid., 87.

³⁰ Ibid., 87.

³¹ Frederic Jameson, *Archaeologies of the Future: The Desire Called Utopia and Other Science Fictions* (London: Verso, 2007). xii-xiv.

Indeed, the definition provided by Suvin, in his own words, “seems to possess the unique advantage of rendering justice to a literary tradition which is coherent through the ages and within itself, yet distinct from nonfictional utopianism, from naturalistic literature, and from other non-naturalistic fiction. It thus makes it possible to lay the basis for a coherent poetics of SF:”³²

What is the common denominator the presence of which is logically necessary and which has to be hegemonic in a narration in order that we may call it an SF narration? In other words, how can the proper domain of SF be determined, what is the theoretical axis of such a determining? The answering is clouded by the present wave of irrationalism, engendered by the deep structures of the irrational capitalist way of life which has reduced the dominant forms of rationality itself (quantification, reification, exchange value, and so on) to something narrow, dogmatic, and sterile inasmuch as they are the forms of reasoning of the dominant or of the dominated classes. Nonetheless, I do not see any tenable intrinsic determination of SF which would not hinge on the category of the *novum*, to borrow (and slightly adapt) a term from the best possible source, Ernst Bloch. A *Novum* of cognitive innovation is a totalizing phenomenon or relationship deviating from the author’s and implied reader’s norm of reality.³³

The *novum* can be understood as a category that serves as a mediator, possessing the ability to explain and bridge several domains such as literature and non-literary aspects, fiction and empirical evidence, as well as formal and ideological elements coming from its inherent historical nature further enhancing its explanatory

³² Suvin continues by suggesting the presence of “a spectrum or spread of literary subject matter which extends from the ideal extreme of exact recreation of the author’s empirical environment to exclusive interest in a strange newness, a *novum*. From the 18th to the 20th centuries, the literary mainstream of our civilization has been nearer to the first of these two extremes. However, at the beginnings of a literature, the concern with a domestication of the amazing is very strong. From Iambulus and Euhemerus through the classical utopia to Verne’s island of Captain Nemo and Wells’s island of Dr. Moreau, an island in the far-off ocean is the paradigm of the aesthetically most satisfying goal of the SF voyage. This is particularly true if we subsume under this the planetary island in the aether ocean – usually the Moon – which we encounter from Lucian through Cyrano to Swift’s mini-Moon of Laputa, and on into the nineteenth century. Yet the parallel paradigm of the valley, “over the range” (the subtitle of Butler’s SF novel *Erewhon*) which shuts it in as a wall, is perhaps as revealing. It recurs almost as frequently, from the earliest folktales about the sparkling valley of Terrestrial Paradise and the dark valley of the Dead, both already in Gilgamesh. Eden is the mythological localization of utopian longing, just as Wells’s valley in “The Country of the Blind” is still within the liberating tradition which contends that the world is not necessarily the way our present empirical valley happens to be, and that whoever thinks his valley is the world is blind. Whether island or valley, whether in space or (from the industrial and bourgeois revolutions on) in time, the new framework is correlative to the new inhabitants. The aliens – utopians, monsters, or simply differing strangers – are a mirror to man just as the differing country is a mirror for his world. But the mirror is not only a reflecting one, it is also a transforming one, virgin womb and alchemical dynamo: the mirror is a crucible.” Suvin, *Metamorphoses*, 4-5.

³³ *Ibid.*, 64.

power. This inherent characteristic renders the task of providing a fixed and unchanging definition of the concept unattainable. This is due to the fact that the concept is constantly influenced by the distinct and unforeseeable circumstances and processes it is intended to represent and clarify. The postulated innovation can vary in magnitude, ranging from a single discrete new invention, gadget, technique, phenomenon, or relationship, to a comprehensive setting involving a spatiotemporal locus, main character or characters, and/or relationships that are fundamentally new and unfamiliar in the author's environment. In addition, it is worth mentioning that the context in which a text is written can be discerned from its historical semantics. This context is inherently linked to a specific time, location, and sociolinguistic standard. Consequently, what may have been considered utopian or technological science fiction in a previous era can be analysed through the lens of the *novum*, thereby providing insights into "just how SF is a *historical* genre"³⁴

The most prominent author of the 19th century who produced works in speculative writing – the fantastic voyage story, or *voyage extraordinaires* as they were called at the time – was Jules Verne (1828-1905), who is considered to be the godfather of modern SF. He is, along with other contemporaries such as Hugo Gernsback and H. G. Wells, is known to have accurately predicted some of the relatively more recent developments of the modern era, like the Moon Landings, the nuclear stalemate and the take-over of commercialism in many aspects of daily life.³⁵ Verne is an important figure in literature not only because his predictions were accurate, but because his novels brought SF closer to the natural and human sciences that increasingly became sophisticated.³⁶ According to Suvin, "the natural sciences

³⁴ *Ibid.*

³⁵ Mike Ashley, *Out of This World: Science Fiction but Not as You Know It* (London: The British Library, 2011). 86.

³⁶ Suvin states that SF has started from a "prescientific or proto-scientific approach of debunking satire and naïve social critique," as evident in the stories of Francis Godwin, Cyrano De Bergerac, or Jonathan Swift. Suvin, *Metamorphoses of Science Fiction*. 12. I should clarify here that SF did in fact exist before Verne in the aforementioned satirical form; however, it is safe to assume that it was with Verne that the genre took its form as we know it today. In an interview, Verne criticised H.G. Wells for not adhering to "scientific bases" unlike himself who relied on real physics (Verne and Wells both wrote about trips to the Moon in *From the Earth to the Moon* [1865] and *The First Men in the Moon* [1901] respectively. While Verne used a cannon to launch his protagonists to the Moon, Wells had his protagonists invent a space capsule that defies gravity thanks to an imaginary metal). However, he also implied in the same interview that his stories should not be taken too seriously as "scientific"

caught up and surpassed the literary imagination” during this time, and “the sciences dealing with human relationships might be argued to have caught up with it in their highest theoretical achievements but have certainly not done so in their alienated social practice.”³⁷ In the twentieth century, SF seemingly moved into the sphere of “anthropological and cosmological thought, becoming a diagnosis, a warning, a call to understanding and action, and –most important– a mapping of possible alternatives.”³⁸ Thus, effectively moving away from utopianism.³⁹ In this regard, SF can be regarded as a literature of revolt for it questions the *status quo*. In basic terms, a SF story can be understood as a kind of writing that creates prototypes of other worlds, experiences, and contexts for life based on the imagination and creativity of its author – designed objects, or fictions, can also be treated similarly.

“Design Fiction” is a term coined by Julian Bleeker in an eponymous essay published in March 2009, in the blog of Near Future Laboratory – a micro-multinational organisation that focuses on understanding how imagination and hypothesis are realised to create new, more habitable future worlds. They specialise in design fiction which involves developing concepts and making prototypes based on those concepts.

Bruce Sterling, a SF author of the cyberpunk sub-genre and futurist, summarises the formal definition of design fiction as “the deliberate use of diegetic prototypes to suspend disbelief about change.”⁴⁰ According to this definition, design fiction is something that is done with a purpose, as it is deliberate. The term “diegetic” comes from film and theatre studies – it means that the details about the world in a story are explicitly revealed through narrative and supported by detailed

either, since he himself did not invent anything new. See, Robert H. Sherard, “Jules Verne Revisited,” *T.P.’s Weekly*, October 9, 1903, <https://jv.gilead.org.il/sherard2.html>.
<https://web.archive.org/web/20000829032025/https://jv.gilead.org.il/sherard2.html>.

It should also be noted that the term “science-fiction” was first coined by Hugo Gernsback between 1927-29. See, “Gernsback, Hugo,” in *The Encyclopedia of Science Fiction*, 2023, https://sf-encyclopedia.com/entry/gernsback_hugo.

³⁷ Suvin, 12.

³⁸ *Ibid.*

³⁹ Indeed, the “New Wave” of SF which emerged during the 1960s-70s (the works of Philip K. Dick, William Gibson, J. G. Ballard, Harlan Ellison and Roger Zelazny, to name a few) tackled questions regarding climate change, drug culture, sexual revolution, and the violence that engulfs our daily lives, effectively drawing bleak, dystopian visions for the future.

⁴⁰ Bruce Sterling, “Patently Untrue: Fleshy Defibrillators and Synchronised Baseball Are Changing the Future,” *Wired*, 2013, <https://www.wired.co.uk/article/patently-untrue>.

sets and props. Design fiction does not tell stories of conventional sorts, it tells stories through designing prototypes within the context of a changed world, which expects its audience to suspend their disbelief. Sterling describes design fictions as “fakes of a theatrical sort,” but they are not hoaxes or frauds, merely creative acts that temporarily puts their viewers into a different conceptual space.⁴¹

Bleecker also states that, “a designed object can connect an idea to its expression as a made, crafted, instantiated object.”⁴² These objects are like props or conversation pieces that help speculate, reflect, imagine, and around which discussions happen, eventually helping us to imagine other kinds of worlds and experiences: “These are material objects that have a form, certainly. But they become real before themselves, because they could never exist outside of an imagined use context, however mundane or vernacular that imagined context of social practices might be. Designed objects tell stories, even by themselves.”⁴³

So, “if design can be a way of creating material objects that help tell a story, what kind of stories would it tell?” asks Bleecker, and says that the stories would be based partially on fact and fiction. There is one particular genre that blends scientific facts and fiction: Science fiction. Hence, it could be said that a work of design fiction manifests itself the same way a SF story does: by alienating, or as Darko Suvin puts it, by “cognitively estranging” its audience by confronting them with factual reporting of make-believe futures, or strange and new environments, and making them question their usual assumptions about reality. The make-believe aspect here is crucial, for a story to be successful in alienating its audience it somehow has to be grounded in reality, meaning, it has to be based on empirically verifiable properties around the author which make up the “zero world.”⁴⁴

⁴¹ *Ibid.*

⁴² Julian Bleecker, “Design Fiction: A Short Essay on Design, Science, Fact and Fiction” (Near Future Laboratory, March 2009), <http://blog.nearfuturelaboratory.com/2009/03/17/design-fiction-a-short-essay-on-design-science-fact-and-fiction/>. 6.

⁴³ Bleecker. 6.

⁴⁴ Suvin, *Metamorphoses of Science Fiction*. 11. This is also what distinguishes SF from the fantasy genre. Although SF stories are fundamentally ‘fantasies’, it is their relation to empiricism and scientific knowledge that distinguishes them from ‘sword and sorcery’, in which everything exist outside the boundaries set by natural laws. For instance, a SF story featuring giant flying lizards (dragons obviously) would often explain how they defy gravity, whereas in a fantasy, dragons fly ‘magically’, no explanation required.

As stated above, SF fundamentally tells stories about the present, just as histories are reflections on the past based on the present. Hence, design fiction, Bleecker states, “is the embodiment of materialised reflections on design today, as well as projections and anticipations of the designed futures.”⁴⁵ In a sense, historical examples of various visions of the future (let us call them ‘retro-futures’) can be labelled, in an admittedly anachronistic fashion, as design fictions.

For instance, a cartoon by George du Maurier published in the *Punch Almanack* of 1879 and depicting the fictional invention called the “telephonoscope” by Thomas Edison shows an elderly couple sitting in front of their fireplace and talking over the phone, while viewing what seems to be a live image of the person they are talking to and her surroundings. The caption reads: “Edison’s telephonoscope (transmits light as well as sound)” (Figure 6).

Another illustrative example is a series of illustrations published in the *Pall Mall Magazine* in 1894. Drawn by Fred T. Jane, the nine illustrations in the *Guesses at Futurity* depict different aspects of daily life in the year 2000 (Figure 7). Jane’s vision is of a leisurely, genteel future which clearly aimed at an upper-class audience.



Figure 6 – George du Maurier’s cartoon in *Punch Almanack* for 1879 depicting the ‘telephonoscope’ which seems to operate over the phone linked to a camera as in today’s video phones. (source: Mike Ashley, *Out of This World - Science Fiction: but not as you know it*, [2011]).

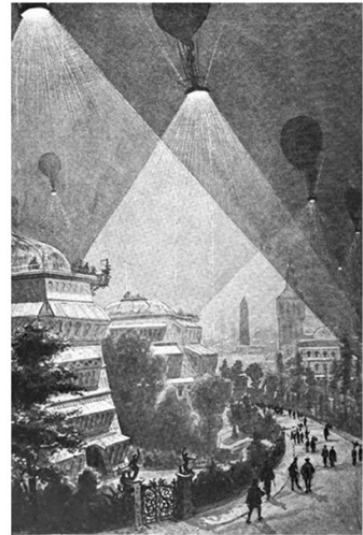
⁴⁵ Bleecker, “Design Fiction.” 16.



GUESSES AT FUTURITY.—No. 1.
HOME LIFE IN ANNO DOMINI 2000.



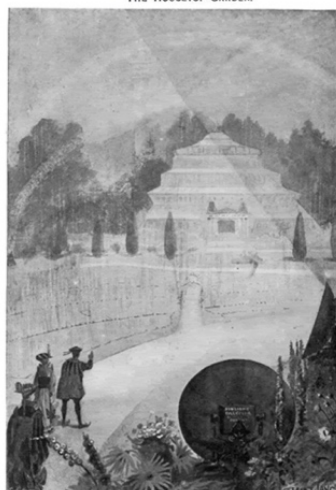
GUESSES AT FUTURITY.—No. 2.
THE HOUSETOP GARDEN.



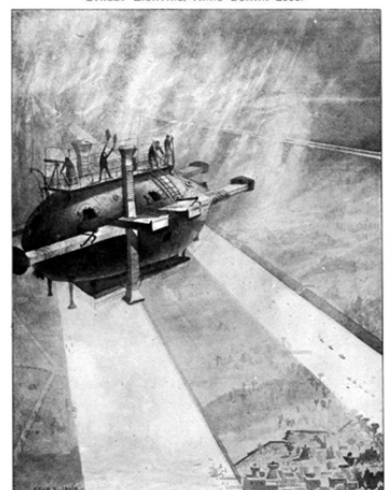
GUESSES AT FUTURITY.—No. 3.
STREET LIGHTING. ANNO DOMINI 2000.



GUESSES AT FUTURITY.—No. 4.
COURTYARD TO MANSIONS. ANNO DOMINI 2000.



GUESSES AT FUTURITY. No. 5.—SUN RADIATORS.



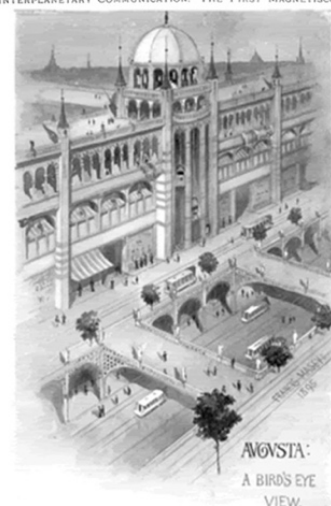
GUESSES AT FUTURITY. No. 6,
INTERPLANETARY COMMUNICATION.—THE FIRST MAGNETOSCOPE.



GUESSES AT FUTURITY. No. 7.
INTERPLANETARY COMMUNICATION.
GOLD MINING IN THE MOUNTAINS OF THE MOON.



GUESSES AT FUTURITY. No. 8.
A DINNER PARTY A.D. 2000. MENU OF CHEMICAL FOODS.



GUESSES AT FUTURITY. No. 9.
"A STREET IN THE CITY OF THE FUTURE."

Figure 7 – “Guesses at Futurity” by Fred T. Jane from *Pall Mall Magazine*, 1894, showing life in the year 2000. Clockwise: No.1 Home Life, No.2 The Housetop Gardens, No.3 Street Lighting, No.4 Courtyard to Mansions, No.5 Sun Radiators, No.6 Interplanetary Communication, No.7 Gold Mining in the Mountains of the Moon, No.8 A Dinner Party, No.9 A Street in the City of The Future. (source: <https://www.flyingcarsandfoodpills.com/menu-of-chemical-foods>)

Spaces depicted are quite obviously Orientalist in style. One can spot allusions, or perhaps predictions, of familiar technologies on display in the series: A living room featuring a home theatre system, and the 19th century version of the internet (huge newspaper rolls delivering the latest news), street lighting provided by drones (small hot air balloons floating over the city illuminating whole buildings). Furthermore, Jane also depicts a “sun radiator” illuminating a temple for what seems to be a group of explorers/tourists, a “magnetiscope” for interplanetary communication, a mining operation on the surface of the Moon, and a city with at least two surface levels.

Indeed, within a hundred years’ time, most of the technologies depicted in Jane’s illustrations were realised, one way or another. The latter additions to the 19th century invention of telephony, television in the early-mid 20th century, and finally the internet through the world-wide-web in the mid-late 20th century are introduced to homes and transformed the daily life into a fast paced, distanceless “global village”, as McLuhan put it,⁴⁶ blurring the distinction between the public and the private further. It is striking how these design fictions have predicted, albeit in a comical way, what the world would look like a century later. If closely examined the architecture depicted in the illustrations, notably the interiors, depict a distinct Orientalism: illustrations 1, 2 and 4 show courtyards reminiscent of Moroccan riads, while the illustration 8 shows an ancient Egyptian themed party. The exteriors shown are no different, with illustrations 3 and 5 depicting ziggurat-like structures and, 9 showing an arcaded building with details clearly drawn from Islamic architecture. The reason for the choice of this particular style can be explained with the amazement of the socially well-off audience with the archaeological discoveries made in Africa and the Middle East at that period.

In 1908 Moses King published his own vision of the future of several American cities, including New York, Boston, and Philadelphia among others. The title illustration for *King’s Dream of New York* shows airbridges between skyscrapers, a sky dominated by airships, and multiple vertical layers of traffic and pedestrian paths (Figure 8). King’s presentation of his dream is as follows:

⁴⁶ Marshall McLuhan and Quentin Fiore, *Medium is the Message: An Inventory of Effects*, 63.

The Cosmopolis of the Future: A weird thought of the frenzied heart of the world in later times, incessantly crowding the possibilities of aerial and inter-terrestrial construction, when the wonders of 1908 – the Singer Building, 612 feet high – will be far outdone, and the 1,000-foot structure realized; now nearly a million people do business here each day; by 1930 it is estimated the number will be doubled, necessitating tiers of sidewalks, with elevated lines and new creations to create subway and surface cars, with bridges between the structural heights. Airships, too may connects us with all the world. What will posterity develop?⁴⁷

Indeed, between 1890 and 1940 New York had served as the laboratory of the Machine Age culture. In his retroactive manifesto for Manhattan, *Delirious New York*, Rem Koolhaas describes Manhattan as a “mythical island where the invention and testing of a metropolitan lifestyle and its attendant architecture could be pursued as a collective experiment in which the entire city became a factory of man-made experience, where the real and the natural ceased to exist.”⁴⁸ According to this idea, Manhattan is the product of an unformulated theory: *Manhattanism*.

2.2. New York and Manhattan as a Backdrop for Science-fiction

Manhattanism is described by a desire to live in a fantasy world totally fabricated by humans, “removed from the natural as humanly possible.”⁴⁹ Koolhaas explains in detail a number of historical planning schemes that led to the creation of Manhattan as we know it. Within the limitations of “the Grid”, Manhattan could only expand towards the sky, thus the skyscraper became the utopian solution, a device to expand on land that only virtually exists. Thus, Manhattan, in a sense, formed a new “frontier in the sky,” reproducing the world through engineering, notably the elevator, an invention described by Koolhaas as the “ultimate self-fulfilling prophecy [for] the further it goes up, the more undesirable the circumstances it leaves behind.”⁵⁰ Furthermore, it is also identified as a factor that establishes a relationship between repetition and architectural quality by enabling a great number of floors stacked around the shaft, thus congealing them to a single form; thus, the elevator created the “first aesthetic based on the absence of articulation.”⁵¹ The elevator was put in a

⁴⁷ Rem Koolhaas, *Delirious New York: A Retroactive Manifesto for Manhattan* (Rotterdam: 010 Publishers, 1994). 84.

⁴⁸ *Ibid.*, 10.

⁴⁹ *Ibid.*

⁵⁰ *Ibid.*, 82.

⁵¹ *Ibid.*

steel frame in the early 1880s, which meant that tall buildings could now support seamless vertical expansion with ease.

One can further argue that New York, through Manhattan, became the epitome of American metropolitan “Manifest Destiny”: progress meant constant building, and building upwards towards the sky remained the aim, and the norm since the early 1900s.⁵² This desire for vertical static expansion can perhaps be explained by the peoples’ growing interest in air travel, an old concept, yet technically still in its infancy at that time.⁵³ The skyscraper, after all, could be used as a platform to launch and dock aircraft and airships, as so many conceptual images like *King’s Dream of New York* show. Indeed, the Empire State Building had an observation tower which doubled as an airship mooring mast; on which Koolhaas writes:

[It] thus resolves Manhattan’s paradoxical status as a city of landlocked lighthouses. Only an airship could select its favourite harbour among all Manhattan’s needles and actually dock to make the metaphorical literal once more.⁵⁴

Apparently, Manhattan was taken to represent the ultimate achievement of American ingenuity, and hence became the capital of the new machine age. The skyscraper was the means to realise that.

Of course, New York and Manhattanism is just one example of the utopian architectures of the early 20th century; however, as Koolhaas argues in *Delirious New York*, it encompasses, or rather absorbs and utilises all other foreign movements like Futurism, Expressionism and constructivism thanks to Hugh Ferriss and his skyscraper theories.⁵⁵ The skyscraper, in this respect, was not purely handled as a modern and technologically driven design. It was also approached as an experimental context of allusion and symbolism. While various styles were experimented with in

⁵² *Ibid.*, 89.

⁵³ In the 18th century, the hydrogen gas was discovered, and the hot air balloon began to be used for manned flights in Europe. Experiments with gliding throughout the 19th century eventually gave way to heavier-than-air-flight and navigation in the early 1900s with pioneers Gustave Whitehead, the Wright brothers, and Gabriel Voisin conducting the first flights with airplanes in the first decade of the century.

⁵⁴ Koolhaas, *Delirious New York*. 143.

⁵⁵ Ferriss’ skyscraper theories and the “Zoning Law” are interesting subjects that are worth looking at to understand how the skyscraper became the image of the future city and the ramifications of this phenomena. *Ibid.*, 117.



Figure 8 – *King's Dream of New York*, rendered by Herry M. Petit, 1908. Source: <https://ragpickinghistory.co.uk/2017/07/04/vertical-cities-farewell-horizontal/kings-dream-of-new-york-1908/>

the 1900s and 1910s, a “battle of styles” occurred in 1922 in the form of a competition held by the Chicago Tribune newspaper for the design of their new office tower with the Gothic tower proposal by Howells and Hood (Figure 9) coming out as the winner over Eliel Saarinen’s (Figure 10). The result affirmed Gothic as the prevalent style for the remainder of the decade, especially in the United States.⁵⁶ Gothic was preferred for both spiritual and material reasons.⁵⁷ And even though the ornamental and symbolic programs of skyscrapers were predominantly Gothic, other forms also arguably contain mythic properties. The visual metaphor of the mountain as a symbolic bond between the heavens and earth is especially apparent in the drawings of Hugh Ferriss where he presented the skyscraper as a natural phenomenon (Figure 11), who also offered a solution to the “setback skyscraper,” an

⁵⁶ The symbolic requirements expected from the 281 submissions made from around the world were made clear in the program published by the newspaper: “... it cannot be reiterated too emphatically that the primary objective of the Chicago Tribune in instituting this competition is to secure the design for a structure distinctive and imposing-the most beautiful office building in the world.” Stuart Cohen writes that the ultimate objective was to acquire a symbolic design that displayed the Tribune’s power and importance. They also subsequently published a catalogue of all the entries and arranged a travelling exhibition that aimed at the “the stimulation and encouragement of better designs in skyscraper architecture, its appreciation by the public, and the consequent achievement of beauty in big buildings.” Besides, the editors also wrote that “... the competition has achieved in a noteworthy way not only the Tribune’s purpose to procure for itself the most beautiful and distinctive building, but its secondary objective to stimulate architectural genius and bring forth works of beauty...” further stating that all the entries “may be considered an encyclopedia of the architecture of the skyscraper.” See, Stuart Cohen, “The Skyscraper as Symbolic Form,” *Design Quarterly*, no. 118/119 (1982): 12–17. 14.

⁵⁷ In the 1840s A. W. Pugin promoted Gothic for religious reasons stating that: “I must beg, in the first place, to draw your attention to the use and intention of spires. They may be considered under two heads, natural and symbolical. The natural use of a spire is as a covering or roof to the tower, the symbolical to make that roof an emblem of the Resurrection and to elevate the great symbol of our redemption.... The vertical line illustrative of the great mystery of the Resurrection is the very foundation of Christian architecture. Everything tends upwards and runs into pyramids and points, arches, roofs, vaulting, pinnacles, turrets, and towers. When the vertical principle was lost, Christian architecture soon declined, and four-centered arches, flat roofs, and square topped towers came in.” Here, I find Pugin’s emphasis on ‘resurrection’ and ‘redemption’ especially important since they are recurrent themes (or concepts) in nearly all forms of spirituality and religious belief that dictate human action. Furthermore, as I shall explain in a latter part of this study, we will come to see that these concepts reveal themselves in unexpected ways involving the human psyche. For instance, Carl J. Jung, as an explanation to the UFO sightings that frequently occurred in the late 1940s, and throughout the ‘50s and ‘60s, gives humanity’s unconscious desire to be saved by off-world redeemers in the face of possible nuclear annihilation. Furthermore, circular symbols have always played an important part throughout history, and are especially associated with god or gods – thanks to their shapes, UFOs can be conceived as gods as well. Hence, if we come back to the Gothic style, the religious connotations it provided must have had a greater appeal (greater than its structural advantages) to the 19th century American society which was rather conservative. On the other hand, another 19th century proponent of the Gothic, Violet Le Duc who was an atheist, stressed its structural aspects when advocating for the Gothic style. See, *Ibid*.

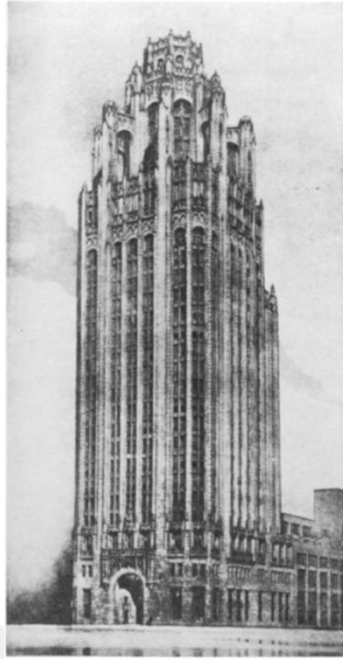


Figure 10 – Howells and Hood, Drawing for the Chicago Tribune Tower Competition, 1922. Note the vertical Gothic details and the flying buttresses in the terminal section of the building. Source: Cohen, “The Skyscraper as Symbolic Form”



Figure 9 – Eliel Saarinen, Drawing for the Chicago Tribune Tower Competition, 1922. Note that Saarinen’s design is devoid of overly expressive ornamentation. Source: *Ibid.*

obligation of the New York zoning law of 1916 that required “buildings over a certain height to step back from the street at a prescribed angle, with only 25 percent of the area of the site in a tower of unlimited height.”⁵⁸ The eclectic setback skyscrapers of the 1920s often resembled the forms of ziggurats, pyramids, or mountain-top sacred sites and *acropoleis*. These recurring formal themes can be explained by the religious imagery provided by the mountain itself, and its imitations, the real ziggurats and pyramids.⁵⁹ In essence, skyscrapers were the symbolic holy mountains of the era.

⁵⁸ *Ibid.*, 16.

⁵⁹ Stuart Cohen quotes *The Sacred and the Profane* by Mircea Eliade to explain the imagery of the mountain: “...the mountain occurs among the images that express the connection between heaven and earth; hence it is believed to be at the center of the world. ...All these beliefs express the same feeling, which is profoundly religious; ‘our world’ is holy ground because it is the place nearest to heaven, because from here, from our abode, it is possible to reach heaven. ...In cosmological terms, this religious conception is expressed by the projection of the favored territory which is ‘ours’ onto the summit of the cosmic mountain. ...This same symbolism of the center explains other series of cosmological images and religious beliefs. Among these the most important are: (a) holy sites and sanctuaries are believed to be situated at the center of the world; (b) temples are replicas of the cosmic mountain and hence constitute the pre-eminent ‘link’ between earth and heaven. ...As for the assimilation of temples to cosmic mountains and their function as links between earth and heaven the names given to Babylonian sanctuaries themselves bear witness; they are called ‘Mountain of the House, House of the Mountain of all Lands ... Link between Heaven and Earth,’ and the like... The

Furthermore, Hugh Ferriss' drawing called "Reversion to Past Styles" in his *Metropolis of Tomorrow* (1929, Figure 12) depicted a Greek temple on top of a setback skyscraper further solidifies the notion that these buildings were treated as sacred sites.

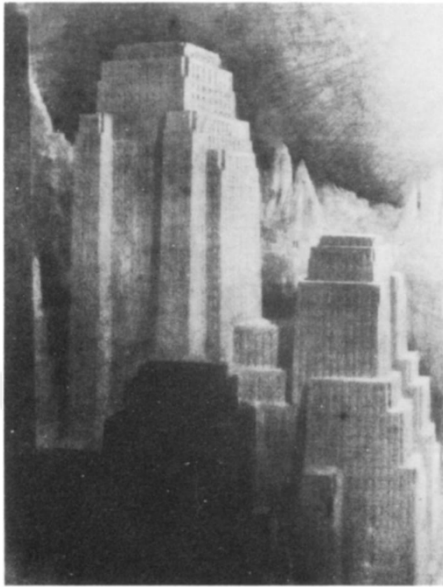


Figure 12 – "The Four Stages" from *Metropolis of Tomorrow* (1929) by Hugh Ferriss. Note how the setback skyscrapers are aligned to form an artificial mountain range. Source: *Ibid.*

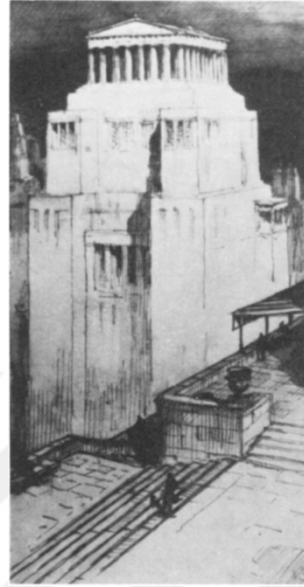


Figure 11 – "Reversion to Past Styles" shows a setback skyscraper with a Greek temple placed on top. Also notable are the columns placed in the middle section. *Ibid.*

The skyscraper's holy union with symbolic forms ended in the 1930s, eclectic ornaments were replaced with modern geometric patterns while the question of height was solved with successive setbacks, like in Saarinen's 1922 design, resulting in the streamlined skyscraper that became the new image of the "future utopian metropolis" (Figure 13).⁶⁰ By the end of the decade, Ferriss's vision of the skyscraper landscape that resembled mountains and canyons was succeeded by the widely spaced towers placed on a grid. Finally, in the 1950s the symbolism of the tall building shifted, via Mies' work that accentuated steel details instead of its form to further reflect technological advancement. Moreover, curtain walls continued to obscure the horizontals of buildings in favour of the verticals. Indeed, Cohen writes that Louis

ziggurat was literally a cosmic mountain, the seven stories represented the seven planetary heavens; by ascending them, the priest reached the summit of the universe." *Ibid.*

⁶⁰ *Ibid.* 17.

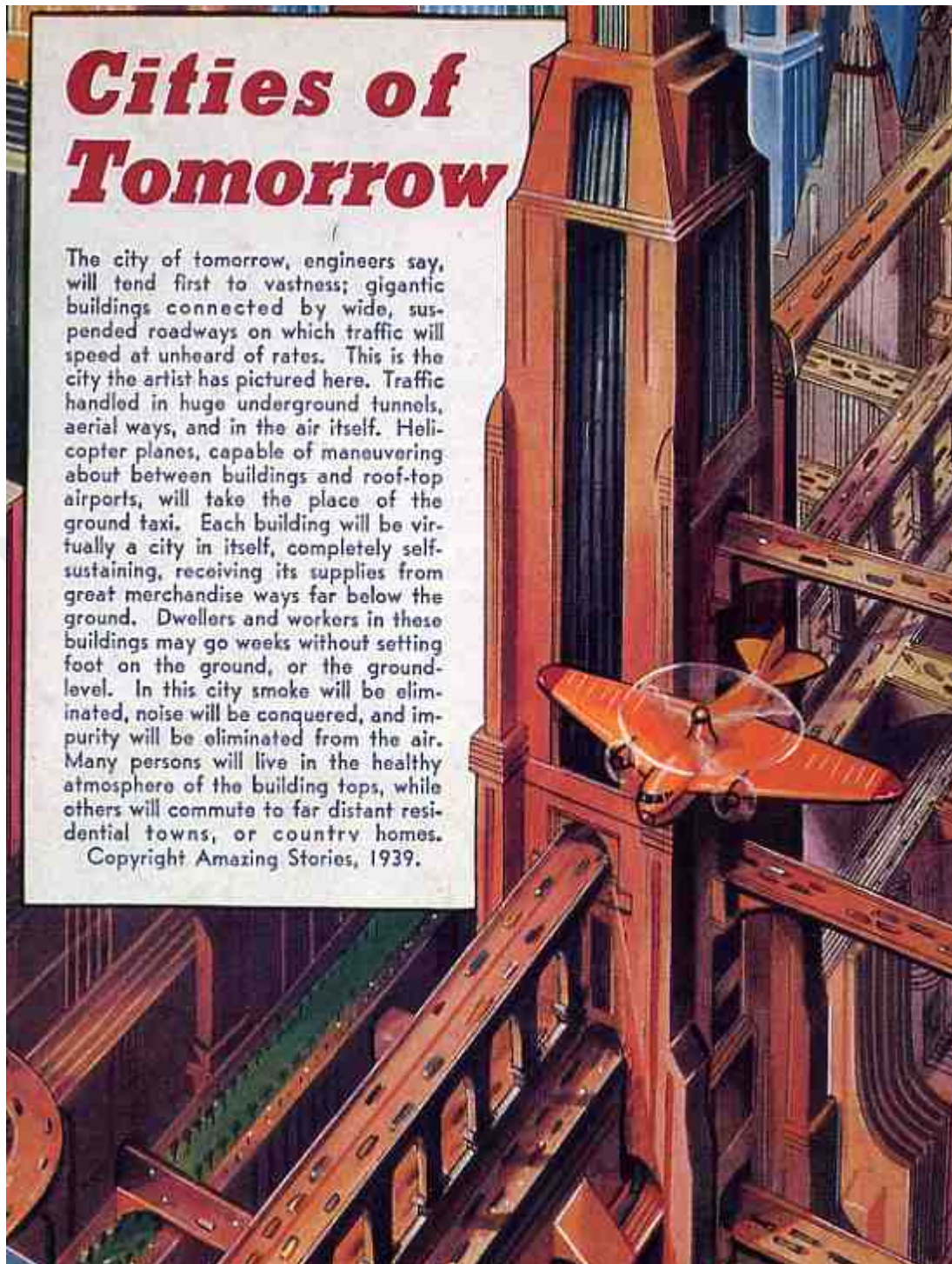


Figure 13 – “Cities of Tomorrow” published in the SF magazine *Amazing Stories*, the illustration shows streamlined skyscrapers connected to each other with highways. This is not particularly in a stark contrast with *King’s Dream*; however, one can notice that the buildings are more apart from each other, and the overall art style is representative of the 1930s and in line with the technological developments of the period. The obvious example is the “helicopter airplane” that has replaced the airships of *King’s Dream*. Source: <https://longstreet.typepad.com/>

Sullivan’s conception of the skyscraper was re-established by Mies who set an example for the visual formula that corporate America followed for the rest of the century, the abstract expression of verticality.⁶¹

Interestingly enough, a debate had sparked on the aesthetics of skyscrapers in the 1970s. Felicity Scott presents the 1970s debate on the architectural dilemmas regarding technology in her 2001 article "Architecture or Techno-Utopia". Called as the "Gray and White debate", the debate was about "inclusivism versus exclusivism", or otherwise about "neorealism versus neorationalism." It was put forward by Bernard Huet, the chief editor of the journal *l'Architecture d'aujourd'hui* in 1976.⁶² According to Scott, Huet used "New York's urban crisis and its concentration of the most highly-refined architectural avant-garde" to reflect on American cultural imperialism and to "posit it as a warning."⁶³ Huet argued that American architecture was characterised by a "generalised architectural consumption" and was "caught between two consumer systems" which are as follows: One that is based on the market value of construction where architecture is reduced to the level of symbol, the other being the integration of architectural production into the art market by embedding itself to the artistic and speculative enjoyment of collectors and museums.⁶⁴

Scott argues that the debates revolving around the meaning of architecture which was sparked by the battle of Grays and Whites effectively prevented making alternative re-evaluations of modernism. She further suggests that the "modernist orthodoxy cited by [Robert] Stern" was not threatening either the White's "neo-avant-garde", nor to the Gray's "post-avant-garde" positions.⁶⁵ According to Scott, the return to the discussion of semantic codes in architecture not only put an end to "modernist shibboleths of formal composition, functional fit, and constructional logic" but also to the various inquiries instigated by what Peter Cook would call "experimental architecture."⁶⁶ If it were not so, she continued: "this would open the

⁶¹ *Ibid.*

⁶² The dossier published in *l'Architecture d'aujourd'hui* was prepared by Brian Brace Taylor and was entitled "New York in White and Grey" and was marked by the appearance of Manfredo Tafuri's "The Ashes of Jefferson" alongside Robert Stern's "Gray Architecture as Post-Modernism, or, Up and Down from Orthodoxy". Felicity D. Scott, "Architecture or Techno-Utopia," *Grey Room*, no. 3 (Spring 2001): 113–26. 113.

⁶³ *Ibid.*

⁶⁴ *Ibid.*

⁶⁵ *Ibid.*, 115.

⁶⁶ *Ibid.*

discipline up to its complex articulation with contemporary technology; it was nothing less than to experiment out of architecture.”⁶⁷

The skyscraper hence, served as both the first representative of modern architecture and also its ultimate stronghold. It gave the modern architectural movement its utopian model in the form of the city of towers.⁶⁸ Thus, the skyscraper has become a frequently used form in SF cityscapes across all forms of media throughout the 20th century. The film *Metropolis* (1927), directed by Fritz Lang, and which is widely regarded as a seminal work in the science fiction genre had a pivotal role in redefining the portrayal of architectural visions. It is argued that it put emphasis on the significance of the architectural metaphor, rather than its tangible existence, which became an essential part of “filmic imagination.”⁶⁹ The union of



Figure 14 – Scene from Fritz Lang’s *Metropolis* (1927), depicting the New Tower of Babel. Note the highways connecting the skyscrapers and the vastness of the buildings in terms of scale.

⁶⁷ *Ibid.* The debate and its conclusion may very well be the reason why Fuller was largely forgotten up to the 1990s, and productions like Matti Suuronen’s *Futuro* never became part of the mainstream architectural discourse. Indeed, the *Futuro* has featured in a handful of recently published studies.

⁶⁸ Stuart Cohen, in a 1982 article, tells that the technological history of the skyscraper from its beginnings in Chicago with the development of steel frame has been well chronicled, and furthermore, the forms created by the designers of these early skyscrapers were argued to be pragmatic rather than ideological, as the historians of modern architecture put. However, a whole era of modern architecture, that of the eclectic, *Beaux Arts* skyscraper with its overtly decorative and symbolic program, has been overlooked because histories of modern architecture have focused primarily on the relationship between the skyscraper and the advancement of technology, Stuart Cohen, “The Skyscraper as Symbolic Form”, 13.

⁶⁹ Fortin, *Architecture and Science-fiction Film*, 34.

Modern architectural idealism and SF film is equally celebrated in William C. Menzies' *Things to Come* (1936). The writer of the screenplay for the film, the esteemed SF novelist H. G. Wells, expressed a desire for the film's aesthetics to be in direct contrast to Lang's *Metropolis*, which drew inspiration from the imposing towers of the New York skyline (Figure 14). Instead, Wells opted for a "modern and rational aesthetic" that resonated of "vigorous optimism and utopian thrust."⁷⁰ While *Metropolis* can be regarded as a dystopian warning of industry, technology and capitalism, *Things to Come* celebrates the optimism of early modernist architecture by claiming that the path of science is the only path to prosperity and progress.⁷¹ Indeed, Wells' utopian city of Everytown of the year 2036 is a sub-terranean engineering marvel (Figure 15).

Early era SF films such as *Metropolis* and *Things to Come* display a high enthusiasm over progress fuelled by science and technology. Interwar period SF deemed progress essential to the fate of humanity and technology was considered



Figure 15 – Scene from William C. Menzies' *Things to Come* (1936) depicting a large plaza in the underground city of Everytown. Note the futuristic helicopter in the centre of the frame.

⁷⁰ To achieve this particular aesthetic, Ferdinand Léger was asked to submit designs which were ultimately rejected by Wells. Subsequently, Wells invited Le Corbusier to submit designs, this time to be declined himself. Finally, it was László Moholy-Nagy who helped set designer Vincent Korda with the designs, but ultimately much of his work was discarded. Moholy-Nagy's contribution here is important because of his well-known (rather Futurist) position that was in favour of freeing architecture from the "oppression of history and tradition" to make it "entirely universal in its form and conception." See *Ibid.*, 34-35.

⁷¹ *Ibid.*, 35.

as the means to slingshot humanity towards a better future. Whether dystopian or utopian, they are always distinguished from the past and present, and are certainly intended to be unhomely, unfamiliar, and uncomfortable.⁷² This last rule largely applies to much later productions as well such as Paul Verhoeven's *Total Recall* (1990), Luc Besson's *The Fifth Element* (1997), and Steven Spielberg's *Minority Report* (2002) (Figure 16).⁷³ Urban verticality is almost always emphasised and present in Sf productions, regardless of their utopian, anti-utopian or dystopian context.

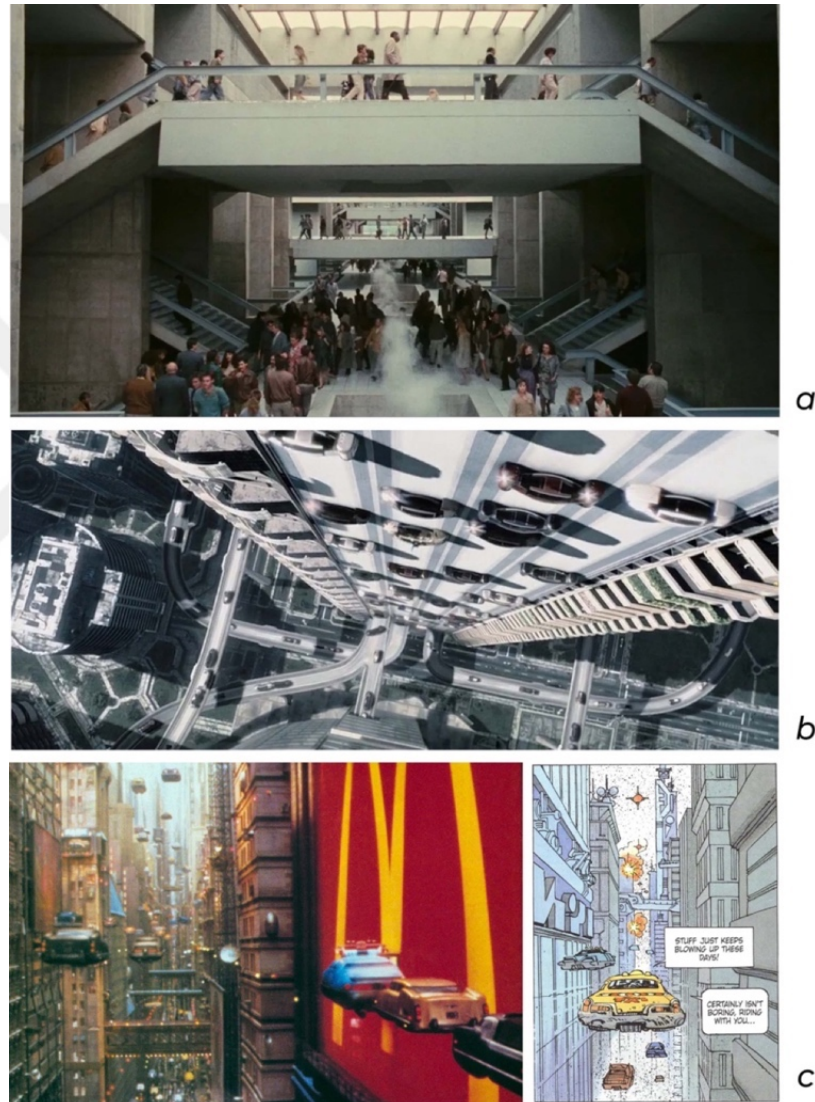


Figure 16 – Scenes from a: Paul Verhoeven's *Total Recall*, b: Steven Spielberg's *The Minority Report*, c: Luc Besson's *The Fifth Element* and Jean Claude Mézières *Valerian*.

⁷² Suvins's concept of "cognitive estrangement", or simply "alienation" is achieved through the works of authors, directors, set designers, and architects who provided the visions. See *Ibid.*, 37.

⁷³ *Total Recall* and *Minority Report* are adaptations of Philip K. Dick's stories "We Can Remember It For You Wholesale" (1966) and "The Minority Report" (1956) respectively. *The Fifth Element* had an original script by Besson himself but the aesthetics were inspired by the drawings of French comic book artist Jean-Claude Mézières who took part in the creation of its storyboards and production design.

A rather extraordinary and largely overlooked example of mid-century SF is authored by Isaac Asimov. His 1954 novel *The Caves of Steel*, takes place roughly three millennia in to the Earth's future, a time when hyperspace travel has been discovered, and a few worlds relatively close to Earth have been colonized, the fifty planets known as the "Spacer worlds". The Spacer worlds are rich, have low population density (average population of one hundred million each), and heavily rely on robotic labour. Meanwhile, Earth, after a series of defeats in wars against its former colonies is overpopulated (with a total population of eight billion, three times that of Asimov's 1950s) with strict rules against robots put in place. Its people live in "caves of steel," vast city complexes covered by massive metal domes (one can think of Buckminster Fuller's Manhattan Dome proposal of 1960, see Figure 17) capable of supporting millions of inhabitants each.⁷⁴ The New York City, where the story takes place in this particular universe, covers the entirety of present-day New York with large part of New Jersey as well. The cities were gradually connected to each other (via underground transit systems) until no one ever felt the need to exit the domes,



Figure 17 – R. Buckminster Fuller's Geodesic Dome proposal covering Midtown Manhattan. 1960. Like in Asimov's domed New York, Fuller's proposal would regulate climate and supposedly also reduce energy use.

⁷⁴ "Kentin en zengin kesimlerinden bazılarının en üst katlarında doğal "solaryumlar" vardı. Burada maden bir kepengi olan kuvartz bir bölme havayı engeller ama güneş ışınlarının içeri süzülmesine izin verirdi. Kentin en yüksek mevkideki yöneticilerinin karıları ve kızları bu solaryumlarda güneşlenirlerdi. Bu yerlerde her gece eşsiz bir doğa olayı görülürdü...Yani gece olurdu." Isaac Asimov, *Ölü Gezegen*, trans. Gönül Suveren (İstanbul: Altın Kitaplar Yayınevi, 1984). 93.

and most of the population suffers from extreme agoraphobia as a result. Asimov draws a rather grim picture with Earth being economically exploited by the Spacers, most of the population live in rather confined spaces with communal facilities, and almost every consumer product is rationed.

The imagery drawn here may very well seem incomprehensible, or as an awful dystopia to a reader who enjoys outdoors. However, Isaac Asimov was a known *claustrophile* who spent large amounts of time indoors for writing. He is known to have commented on his condition as follows: “For instance, I wrote a novel in 1953 which pictured a world in which everyone lived in underground cities, comfortably enclosed away from the open air. People would say, “How could you imagine such a nightmarish situation?” And I would answer in astonishment, “What nightmarish situation?” But with me everything becomes a challenge. Having made my pitch in favour of enclosure, I wondered if I could reverse the situation.”⁷⁵



Figure 18 – “Man inside the Ferrissian Void, the womb of Manhattanism” Koolhaas, 116.

⁷⁵ Written as a preface to a short story named “It’s such a Beautiful Day” and originally published in 1954, Isaac Asimov, *Nightfall and Other Stories* (New York: Doubleday, 1969, 244). Isaac Asimov (born 1920) was the only child of a Russian-Jewish immigrant family who had moved to New York in 1923, and lived almost his entire life in the city until his death in 1992. He despised travelling, was afraid of flying and very rarely did so. Being the most prolific writer of his generation, he spent a great deal of his time typing at his typewriter, and later, his computer. For his full SF bibliography, see, “Asimov, Isaac,” in *The Encyclopedia of Science Fiction*, 2021, https://sf-encyclopedia.com/entry/asimov_isaac.

Asimov's imagined future for New York is a reversal of the ideals of Manhattanism, but only on surface: New York's skyscrapers are still there, only they are enclosed, creating an image that much resembles the "Ferrissian Void" – a womb (Figure 18, Figure 19).⁷⁶

Asimov published *The Naked Sun* in 1957, in which he introduced the 'Spacers' in depth. The protagonist from the prequel, the police detective Elijah Baley is sent to an investigation to Solaria against his good will, and becomes the first Earth citizen to



Figure 19 – Covers of different editions of the Caves of steel: a:1953, d: 1991, b: 1955, c: 1985. Note the enclosed spaces in the background, and their vast scale.

⁷⁶ Koolhaas, *Delirious New York*, 117.

conduct an interstellar travel in ages. Poorly briefed, Baley learns about Solarian history and customs as his investigation progresses, and faces his agoraphobia whenever he can. Solara is described early in the novel as a self-sustaining Earth-like world with a mere population of exactly twenty thousand. With a fully roboticized economy, Solarians enjoy their lives in solitude, as each citizen have his own private estates. Each Solarian estate has multiple purpose-specific rooms, thousands of robots for maintenance, and is equipped with high-tech viewing devices capable of projecting three-dimensional images in hyper-realistic quality. As the story unfolds, Baley finds out that with the advanced Solarian communication technology, and the vast amount of distance between a Solarian and their closest neighbours, the society had evolved to a point in their history where it became completely unnecessary to engage in physical contact. So, the Solarians almost never “see”, but instead, “view” each other. The plot itself, a whodunit detective story, revolves around the stark dichotomy between the two opposing lifestyles and the Solarian taboo of actually seeing someone in person. Solarians are free to pursue their individual interests, yet intellectual activity is mostly limited to eugenics and robotics, the only social scientist of the planet is a self-taught sociologist who seems to have invented the science by purely rational means, without referring to historical texts, and their art is abstract.⁷⁷

Asimov’s writing is rather plain and mostly devoid of visual descriptions; and on top of that, the covers of the different editions of the books provide not nearly enough visualisation as to imagine what Solarian estates would look on the outside (Figure 20). Elijah Baley is never shown the outdoors, his android partner escorts him almost everywhere and continuously intervenes whenever he tries to get a glimpse of the outdoors. Even the ground car they use throughout the case to travel around has its windows shuttered.⁷⁸ However, we are given plenty of information as to the interiors from the point of view of the protagonist:

⁷⁷ Isaac Asimov, *The Naked Sun*, 15th ed. (London: Voyager, 1996), 196.

⁷⁸ In Asimov’s universe, “positronic” brains of robots are hardcoded with “The Three Laws of Robotics”. The first law dictates that a robot cannot harm a human being or allow a human being to come to harm. Baley is deliberately *protected* from the outdoors to prevent him from being overwhelmed by his agoraphobia. He manages to trick his partner once, however to ill effect. Baley can only reason with his partner to let him expose himself to the outdoors in the later stages of the investigation.

Elijah Baley felt like an inhabitant of one of the smaller Cities, say Helsinki, visiting New York and counting the levels in awe. He had thought of a “dwelling” as something like an apartment unit, but this was nothing like it at all. He passed from room to room endlessly. Panoramic windows were shrouded closely, allowing no hint of disturbing day to enter. Lights came to life noiselessly from hidden sources as they stepped into a room and died again as quietly when they left.⁷⁹

Judging by the automation described here, Solarian houses work in total automation. This is further mentioned and emphasised throughout the story via Baley’s rare encounters with household robots during his investigation. Furthermore, it is explained that the house is built especially for his stay and his stay only, constructed by robotic labour as a temporary structure (in Solarian style as evident from panoramic windows) as no Spacer would stay in the same place with an Earthman. Baley often feels lonely in the house and so does the reader, since the structure is temporary and it is minimally furnished like a Modernist pavilion while efficiently taking advantage of all the built-in mechanical and digital facilities, just as in Buckminster Fuller’s *Dymaxion*.

Frankly, the exteriors are completely left to the readers’ imaginations, so, any design that adheres technological ideals would do perfectly to visualise the architecture of such a technologically advanced society envisioned in the 1950s; Asimov was, after all, a fundamentally futurist author. Upon his return to Earth, Elijah Baley is greeted with adulation and recognition by his superior. When prompted to disclose any identified flaws, the detective asserts that the attributes formerly perceived as advantageous among the Spacers, namely, their use of robots, their sparse population, and their extended lifespans, would finally manifest as vulnerabilities. The absence of collaboration among individuals hinders the cultivation of an engaged and inquisitive mindset, which Earth-dwelling humanity could ultimately rekindle upon gaining the capability to depart from Earth. One can sense a bias towards urbanism in Asimov’s tone.

An interesting parallel can be drawn between the societies envisioned with Broadacre City and Solaria. Solaria seems much like Wright’s plan enlarged and fitted to cover a whole planet, a distanceless society thanks to telecommunications, which is discussed briefly below. Wright’s utopic plan was of course more down to earth,

⁷⁹ Asimov, *The Naked Sun*, 32.

since he actually envisioned that it would be formed/built/realised. Lack of distinction between work and leisure, and sparse population are the societal parallels between the two, while the differences are that Solaria is only like that because it has a robotic economy, whereas Wright supported the idea that economic prosperity could be achieved by equality in land ownership. According to Wright, property served to define and protect the society's greatest good, and independence rested on the individual's right to property. He prescribed an acre of land per person, in



Figure 20 – Covers of different editions of the Naked Sun a: 1968, d: 1986, b: 1991, c: 1958.

which everyone would have an absolute right to the area they used and improved. This meant that one city could sprawl over 100 square miles without a recognisable centre, and Wright insisted that he was presenting a coherent planned community according to the “new sense of time and space” he introduced: the motorized citizen of Broadacres, traveling at 60 miles an hour, could reach any of his 30,000 neighbours within 15 minutes.⁸⁰ In Broadacre city, the house would be the main element that

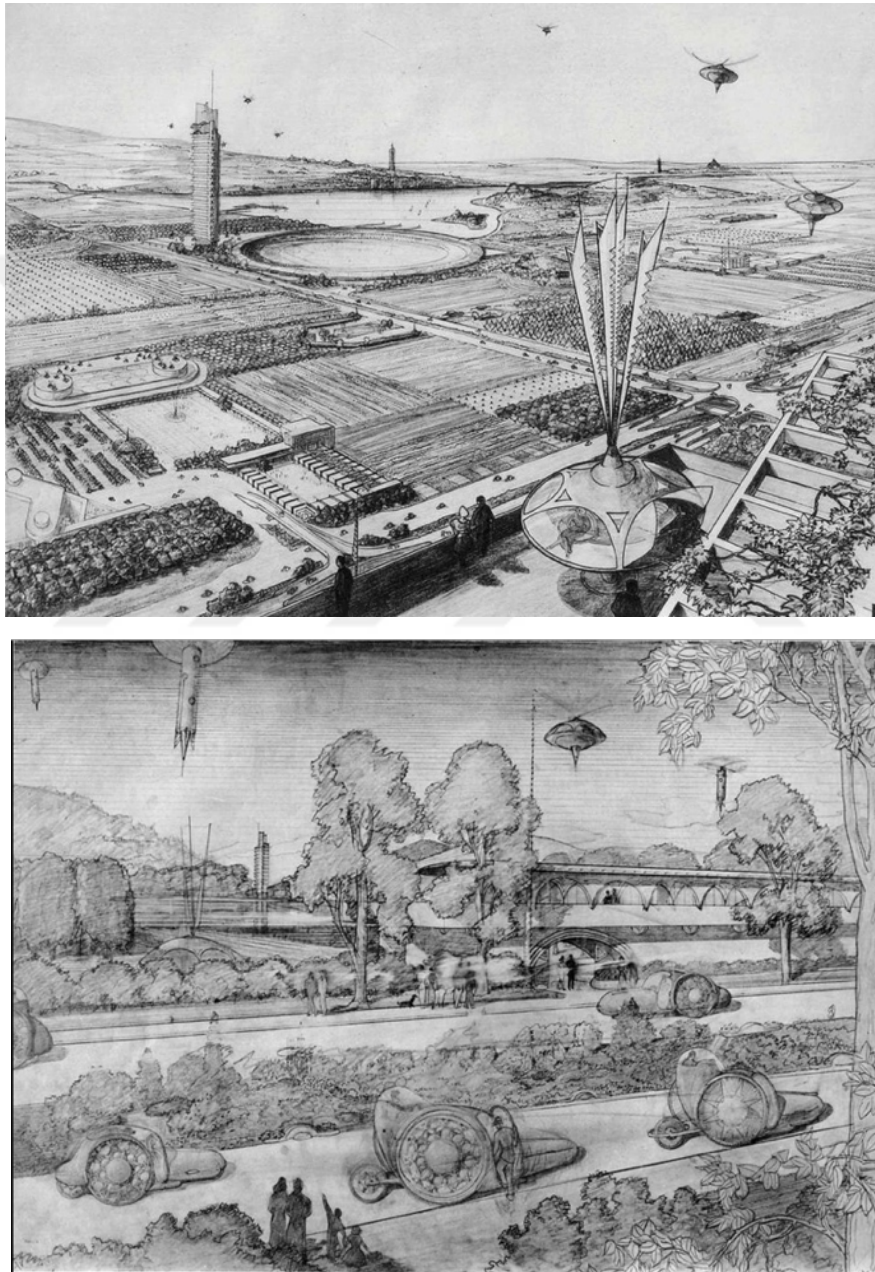


Figure 21 – Two drawings of Broadacre City, c. 1950, published in *The Living City* (1958). With its weird machines of transport, Frank Lloyd Wright’s utopia envisioned a high-tech countryside.

⁸⁰ Robert Fishman, *Urban Utopias in the Twentieth Century: Ebenezer Howard, Frank Lloyd Wright, and Le Corbusier* (New York: Basic Books, 1977). 127.

made up the city, and as mentioned above, there would be no distinction between urban and rural, or rigid specialisations in labour; “everyone would have the skills to be a part-time farmer, a part-time mechanic, and a part-time intellectual” (Figure 21). Furthermore, “only drudgery would be absent from work. The small farms that surrounded each homestead would serve as the natural extensions of gardens. If the machines were in the service of man, factory labour could become an exercise in mechanised craftsmanship, and the daily variety of tasks would blur the line between work and leisure.”⁸¹ In Wright’s words the purpose of Broadacre City was not merely to create:

...a better livelihood but to recreate the framework of our modern life that our leisure, our culture and our work will be our own and as nearly as possible One. Men must desire to qualify to go forward to their original inheritance – The Good Ground – so that each man may again be a whole man in himself living a full life. That does not mean that every man must be a genius or a farmer but there is no longer excuse for him to be the kind of parasite that machine centralization has been busy making of him.⁸²

The advancement in communication technologies we have achieved today is uncannily similar to what Asimov envisioned in the early 1950s. One of the primary plot devices, the ultra-realistic holographic viewing capability of the houses in Solaria, in this regard, remind us Terrence Riley’s following statement in the introduction of the catalogue of MoMA’s *Un-private House* exhibition of 1999:

Today, the private house has become a permeable structure, receiving and transmitting images, sounds, text, and data. The German philosopher Martin Heidegger made particular note of the fundamental difference between the presence of the newer, electronic media and the more traditional media, which had been present in the house over the centuries. In his essay “The Thing,” Heidegger expressed concern over the way in which the electronic broadcasting of words and images alters our fundamental relationship, that is, our distance, from events and things: “What is this uniformity in which everything is neither far nor near—is, as it were, without distance? Everything gets lumped together into uniform distancelessness. How? Is not this merging of everything into the distanceless more unearthly than everything bursting apart?”⁸³

⁸¹ Fishman, 128.

⁸² *Ibid*, 129.

⁸³ Terence Riley, *The Un-Private House* (New York: Museum of Modern Art: Distributed by Harry N. Abrams, 1999). 11-12. What Heidegger calls “unearthly”, the absence of distance and/or privacy is explored by Asimov in a short story named “The Dead Past” (1956), where a historian tries to gain access to a government sanctioned technology (called a chronoscope) that allows viewing of past events in the hopes of establishing whether the Carthaginian sacrificial rituals really involved burning of children. In this world of strict bureaucracy where interdisciplinary studies are forbidden, he finally manages to get access through illegal means, and accidentally makes it public with the help of a third

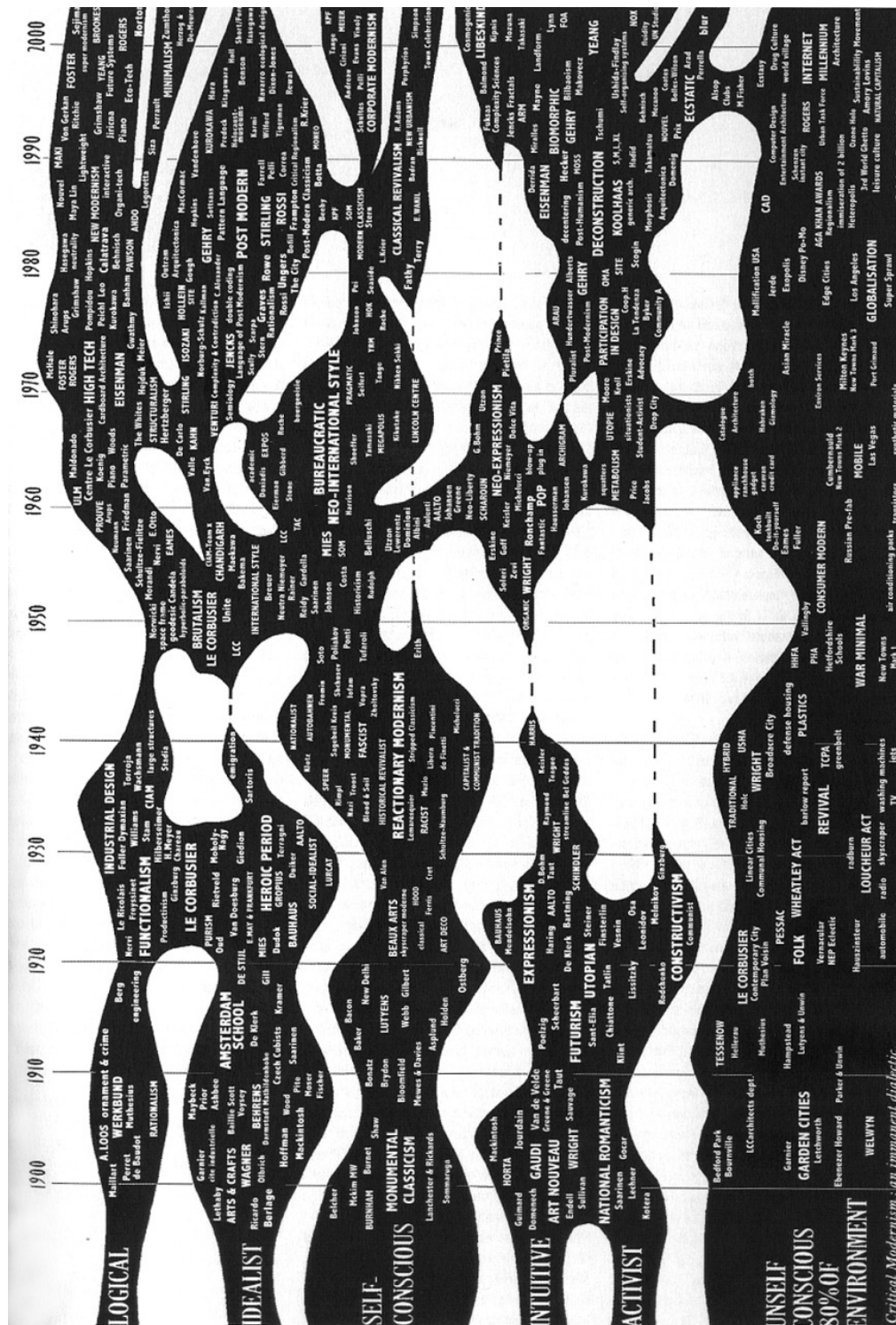


Figure 22 – Jencks' timeline of Architecture from Architecture 2000.

party; it is revealed that it is impossible to view as far back as ancient times, however one could start viewing what was happening anywhere in the world with a slight delay.

2.3. Charles Jencks and Architectural Forecasting

Charles Jencks, mostly known for his theories and critiques regarding post-modern architecture, has an extensive arsenal of works that specifically concern modernism; he has indeed, in part, devoted his career to forecasting and prediction. *Architecture 2000 and Beyond* published in 1969, is undoubtedly a testament to his devotion to futurology. In Jencks' words, this "small sketch of a book" foretold the next thirty years of the time it was written.⁸⁴ The book covers issues like science, religion, socio-political trends, evolutionary theory and transport, all within the context of architectural prediction. Jencks identified six main traditions in architecture: "Logical", "Idealist", "Self-conscious", "Intuitive", "Activist", and "Unselfconscious" (Figure 22). He further speculated about how these traditions would evolve over the coming years in the face of environmental and societal changes the world would face. Jencks does not adhere to singular ideas or conclusions regarding the development of architecture, but rather discusses individually each tradition and its context, and speculates upon them accordingly. For instance, in reference to the trends of 1969 in Western architecture, he concluded that architectural production would change itself in favour of privatisation.⁸⁵ Furthermore, he stressed the importance of finding a cultural expression and value in architecture that was divorced from corporate and political worlds; unless this was done so, he wrote: "architects will continue to succumb to power and architecture will remain dumbed-down with Disney's Dopey."⁸⁶ In other words architecture must relieve itself off of global mass culture and its "Disneyfication."⁸⁷ The second edition of the book in 2000 showed, in a way, how much of his predictions became true since 1969. In the foreword Jencks admitted that the book was inevitably a product of its period, and that some of its assumptions and overall tone would seem dated as time passed, which is invariably true, yet he also deservedly praised himself for getting 80-90% success rate for his

⁸⁴ Charles Jencks, *Architecture 2000 and Beyond: Success in the Art of Prediction* (Chichester: Wiley-Academy, 2000). foreword.

⁸⁵ *Ibid.*, 51.

⁸⁶ *Ibid.*, 135.

⁸⁷ Disneyfication is a term used to define things becoming overly popular and stripped of their original meanings and value for the sake of mass consumption. See what happened to the Star Wars franchise in recent years after Disney bought its intellectual property rights.

predictions. For example, he claimed to have successfully predicted the Internet with Pentagon as its major supporter three years before it was invented and twenty years before it became active.⁸⁸ Furthermore, in architecture, he had predicted the emergence of several styles and trends like “parametric architecture”, “participation in design”, and “post-modernism”.⁸⁹ Jencks has also predicted in 1969 how cities would become more decentralised over time and sprawl across large areas, further increasing various forms of pollution and loss of secluded areas.⁹⁰ He particularly attributed the cause to the increase in transportation hubs and their traffic, and gave the noise pollution caused by airports, such as Heathrow and Newark, at their peak times as an example. Moreover, Jencks also wrote in 1969 about neo-fascism and how centralised states could carry out large-scale engineering building programmes, giving Germany as an example. In the 2000 edition of the book, he pointed out that centralised states in Asia have indeed carried out such schemes in the 1980s and 1990s, for example in the Schenzen area near Hong Kong, Jakarta, Thailand and Malaysia.⁹¹

Jencks states that anticipating the future of the human species has become an unavoidable practice starting from the 19th century. In both the East and the West, the course of evolutionary progress was a major intellectual occupation and there happens to be a tendency towards increased efficiency and increased control of environment. This idea has been favoured by both Marxists and biologists in Russia, who have actually worked out an “objective calculation of progress”, and by the capitalists and architects of the West, who believed in “doing more with less”.⁹² This idea has also caused a natural shift in consciousness that separated the present from the past. John McHale, forecaster (someone who speculates on future events) and artist who also worked with Buckminster Fuller, summarized this as such:

⁸⁸ *Ibid.*, 3.

⁸⁹ *Ibid.*

⁹⁰ *Ibid.*, 32.

⁹¹ *Ibid.*, 41.

⁹² Jencks cited V. I. Kremyanskiy for this idea. In a 1958 article entitled “Certain Peculiarities of Organisms as a ‘System’ from the Point of View of Physics, Cybernetics, and Biology” (translated by Anatol Rapoport for U.S. Joint Publications Research Service in 1960), Kremyanskiy argued that evolutionary progress of organic systems (i.e., organic lifeforms) could be quantified and calculated by analysing objective criteria such as superiority. *Ibid.*, 13.

The record of technological development is one of the progressive overlays of another form of evolution on the natural genetic process. We may date this second evolutionary period, from man's first use of tools, as marking the point when he became an active agent in his own development – when his species' survival was no longer dependant on natural selection. The consciousness of this active participation in his own development occurred quite recently – in a first groping manner around the time of the Renaissance. The consciousness of his possible control over his own future development, one would place even more recently, possibly in the decade between 1940 and 1950.⁹³

Jencks has apparently stated in 1969 that this thinking was supported by other experts, such as Daniel Bell, the head of the Commission on the Year 2000, who proposed that the old Renaissance balance of *fortuna* and *virtu* should be shifted in the favour of the latter by stressing alternative projections.⁹⁴ All in all, most experts believe in technological advancement accompanied with a shift in the consciousness of humans: from a past in which people believed in fate, towards a future where they believe in conscious control.⁹⁵ However, Jencks continues by saying that from a historical point of view, the statement above falls apart on multiple levels. He states that, if we look at the Greeks and Romans, we can see that man has always believed in consciously shaping his own destiny, and secondly, while there were more control of lower levels of actions, there had been no proof that the relationship of fate and control had changed on a higher level.⁹⁶ If we take automobiles as an example for our times, we see that at the lower level it has brought more control through an increase of speed and energy, but it also brought a decrease in control by increasing pollution, noise, and traffic jams. Thus, while there may have been an increase in control at a lower level, the overall balance of control and fate remains the same as it did in the Renaissance.⁹⁷ The reason for this is because almost any technical innovation has both positive consequences (aspects that can be controlled) and negative ones (ones that cannot be controlled). Daniel Bell and the other experts in the Committee for

⁹³ Ibid.

⁹⁴ "The Commission on the Year 2000" was formed by the American Academy of Arts and Sciences in 1964, and was designed to provoke interest in long-range thinking on various areas: biomedical sciences, computer technology, privacy, natural resources and many more. It had two aims: First, to make logical assumptions about the future; and second, to identify problem areas and social and intellectual questions that were likely to be central by the year 2000. For more information visit: https://www.amacad.org/archives/rg-xxi-projects-and-programs_Commission-Year2000.

⁹⁵ Jencks, *op. cit.*, 14.

⁹⁶ Ibid.

⁹⁷ Ibid., 15.

the Year 2000 had somehow assumed that some of the negative consequences could be predicted and eliminated.⁹⁸

The 1967 short documentary film titled "The Futurists" broadcasted on CBS in 1967 explores the collaboration between scientists and visionaries who employ a unique approach that combines the scientific method with random chance operation to provide forecasts regarding the 21st century and the physical, social, and economic forces that drives the world civilisation. The host, Walter Cronkite, provides an explanation:

A panel of experts has studied a list of possible 21st century developments, from personality-controlled drugs to household robots. They have estimated the numerical probability of each, from zero to 100 percent. The twenty-sided dice are then rolled to simulate these probabilities. A use of random numbers known as the Monte Carlo technique, often used in thinktank games. All of this is highly speculative.⁹⁹

The initial dice rolls, as Cronkite informs the viewer, are not part of a "crap game" but a "serious game at the University of Pittsburgh". A multitude of possibilities were anticipated for the forthcoming century. These encompass the abstract concept of the "heightened significance of human interests," the science fictional notion of "instruction through direct neural recording," and the foreboding concept of "devices for controlling tactical behaviour" ¹⁰⁰ (Figure 23). The individual interviews with the panel of experts¹⁰¹ however were less whimsical, with the exception of Buckminster Fuller who made a prediction regarding the possibility of physical teleportation by the use of radio waves, similar to the technology shown in Star Trek. However, The Futurists exhibit a remarkable level of foresight, as its panel of experts in futurism proclaimed that we would "wind up with a world which has the following features: fertility control, 100-year lifespan, controlled thermal nuclear power, continued

⁹⁸ *Ibid.*, 16.

⁹⁹ "The Futurists," *The 21st Century* (CBS, 1967), <https://archive.org/details/thefuturists>.

¹⁰⁰ *Ibid.*

¹⁰¹ Coming from various disciplines including: Sir Peter Brian Medawar (Nobel laureate, Zoology), Dennis Gabor (Physics, Imperial College London), Daniel Bell (Sociology Columbia University), Walter Sullivan (Science editor of *NY Times*), Gerard Piel (Editor of *Scientific America*), Lord Richie Calder (Science writer, international relations, Edinburgh University), Herman Kahn (Physics, Director of the Hudson Institute), Isaac Asimov (Science and SF writer, Biochemistry, Boston University), Harrison Brown (Geochemistry at California Institute of Technology), Bertrand de Jouvenele (Economist and journalist), and R. Buckminster Fuller (Architect, inventor).

automation, genetic control, man-machine symbiosis, household robots, wideband communications, opinion control, and continued organization.”¹⁰² A significant point raised is that the future cannot be predicted; however, it can be invented, and determined. And the question of what we want from the future is the question that should be asked. This attitude is clearly in favour of shaping the future by actively directing technological progress and its consequences, and is seemingly a feature of Modernism that can be observed in post-WW2. On the stance of early 20th century modernists, Reyner Banham wrote that:

*Whether or not the enforcement of norms and types by such a conscious manoeuvre would be good for the human race... [was not] a question that was entertained by the theorists and designers of the First Machine Age. They were for allowing technology to run its course, and believed that they understood where it was going, even without having bothered to acquaint themselves with it very closely. In the upshot, a historian must find that they produced a Machine Age architecture only in the sense that its monuments were built in a Machine Age, and expressed an attitude to machinery – in the sense that one might stand on French soil and discuss French politics, and still be speaking English. It may well be that what we have hitherto understood as architecture, and what we are beginning to understand of technology are incompatible disciplines. The architect who proposes to run with technology knows now that he will be in fast company, and that, in order to keep up, he may have to emulate the Futurists and discard his whole cultural load, including the professional garments by which he is recognised as an architect. If, on the other hand, he decides not to do this, he may find that a technological culture has decided to go on without him. It is a choice that the masters of the Twenties failed to observe until they had made it by accident, but it is the kind of accident that architecture may not survive a second time – we may believe that the architects of the First Machine Age were wrong, but we in the Second Machine Age have no reason yet to be superior about them.*¹⁰³

¹⁰² *Ibid.*

¹⁰³ Reyner Banham, *Theory and Design in the First Machine Age*, 2nd ed. (New York: Praeger Publishers, 1970). 329-330.

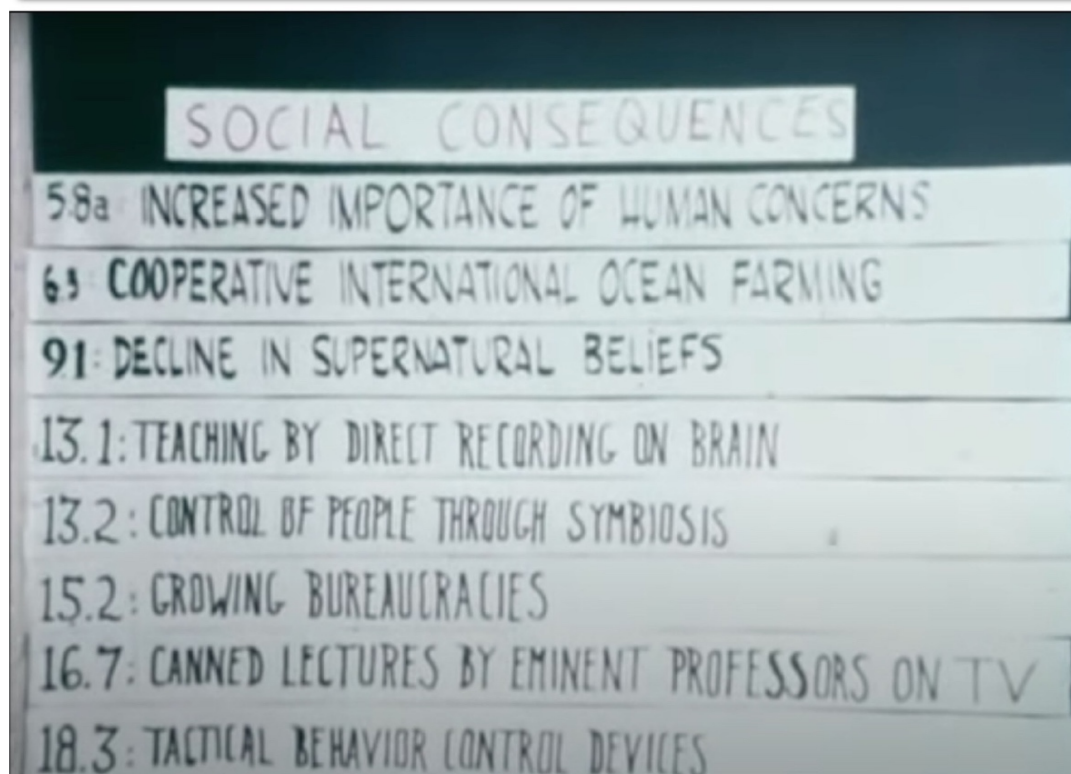
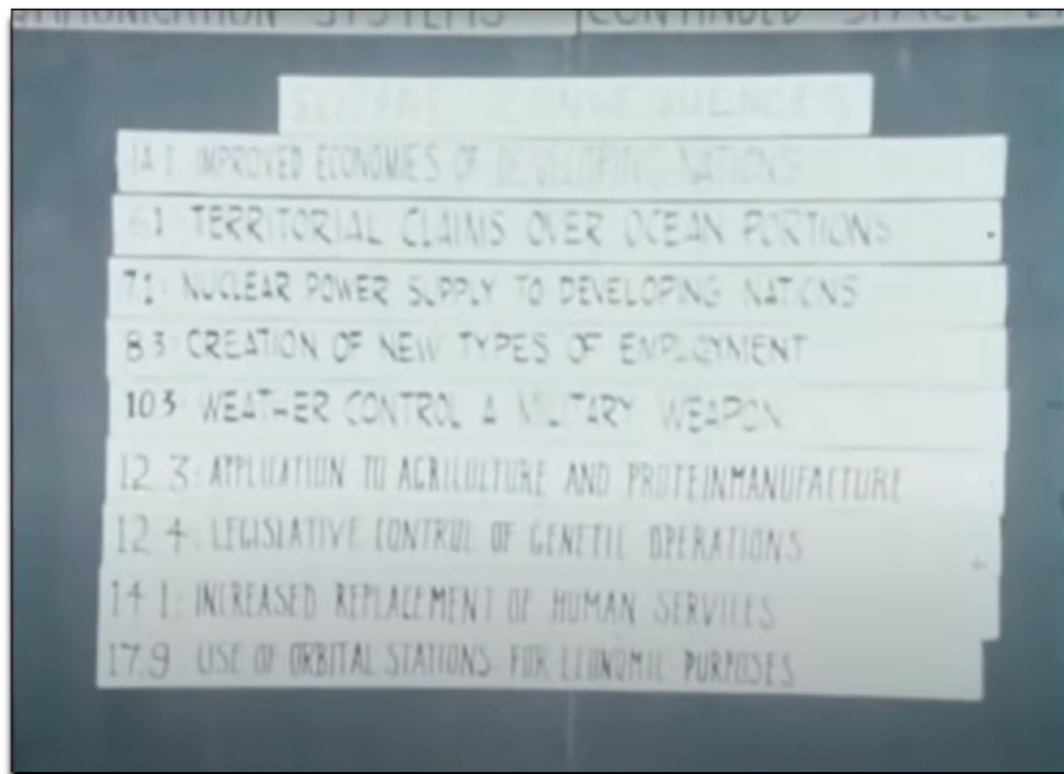


Figure 23 – “Social Consequences” Stills from “The Futurists”. Predictions like “Weather control a military weapon; increased replacement of human services; creation of new types of employment; control of people through symbiosis; tactical behavior control devices” may deserve attention regarding today’s global socio-political conjuncture.

CHAPTER 3

THE MODERN HOUSE and its DISCONTENTS

The works of Charles Jencks, Kenneth Frampton, and Reyner Banham provide a background on the experimental nature of 20th century modern architecture. Although Frampton's work provided valuable insight into how architectural production in the United States was shaped by economy politics of the era, it provided limited information on the specific trends in domestic architecture that this study is concerned with, hence, Charles Jencks' and Reyner Banham's writings have proved more useful in sketching the architectural context of the study, and are quoted more often. Both Jencks and Banham did "operative criticism," that is, they advocated particular approaches in architectures, and hence are biased as they are not engaged in "critical and rigorous architectural history".¹⁰⁴ However, their questionable objectivity regarding history should not necessarily be considered as negative since objectivity in historical narratives has always triggered heated debates, and thus one can also argue that it is often unattainable. C. Behan McCullagh, a philosopher of history, elaborates on this as such:

In practice, historians sometimes have a rather hazy idea of what an adequate explanation requires, so that their explanations are somewhat haphazard, often reflecting their personal interests. The significance of their accounts of the past is then somewhat obscure.¹⁰⁵

Historians prefer interpretations of historical subjects which are fairly comprehensive and which make many features of them intelligible, both by showing how they are related to one another and by explaining their existence. Above all, however, historical interpretations are expected to be fair, not misleading. This concept of fairness has not

¹⁰⁴ This was a critique that was given to an early version of this study which relied heavily on Charles Jencks's writings. Although it still does in certain parts, it is worth noting that the author is well aware of the situation.

¹⁰⁵ C. Behan McCullagh, *The Truth of History* (London; New York: Routledge, 1998). 308.

been noticed before, yet it is a fundamental constraint upon descriptions of things in the world.¹⁰⁶

The “modern house” in itself was, and still is, a subject of debate in architecture, and respectively one can find numerous opinions and studies, some praising, and some criticising, about particular architects and their buildings in the canon of architectural history. Some famous names that have been popularly discussed are Le Corbusier, Adolf Loos, Walter Gropius and the Bauhaus school in Europe, and Frank Lloyd Wright in the United States. Rightly so, because these names have all contributed to the modern architectural discourse in various unique ways, and from ideas to projects.

3.1. The Modern House and Its Critiques

The 20th century was a turning point in the development of contemporary housing, that initiated changes in the definition and conception of house. The functionalist philosophy that 20th century modern housing adopted prioritised simplicity, efficiency, and a seamless integration with the surrounding environment set it apart from the earlier architectural movements. Modern homes of this era frequently had open floor plans, big windows, and clean lines, blurring the barriers between indoor and outdoor environments. They also embraced cutting-edge building materials and methods. Despite the radical departures from the elaborate designs of earlier centuries, it is important to note that the basic function of a house, to provide shelter and home, did not necessarily change in modern housing. Instead, modern architecture aimed to preserve the essential qualities that make a house a home while improving liveability and meeting the evolving needs of the modern lifestyle. However, as we shall come to see, there existed fringe designs that transcended the standard boundaries of the Modern movement. Some scholars argue that these designs are in fact more representative of the major ideals set about by the movement, compared to the works of the movement’s pioneers, and should be held in higher regards.

¹⁰⁶ *Ibid.* Hence, rest assured that one can consider the same for this study which aims to analyse and describe its subject matters in all fairness and without misleading the reader.

3.2. Early 20th century Modernism

The most definitive aspect of early twentieth century modernist architecture is a spirit of mass-production that began in the 19th century, when prefabrication became an industry of sizable proportions with specialised manufacturers in Britain, continental Europe, and the United States started exporting whole structures in component form in every type imaginable across the globe.¹⁰⁷ Although it was around for quite some time, prefabrication only started to be discussed in professional architecture in the 1910s and 1920s. The most famous proponent of mass-production and standardisation in architecture in terms of technicality and aesthetics is arguably Le Corbusier who wrote in *Vers une Architecture* in 1923 that: “We must create the mass-production spirit. The spirit of living in mass-construction houses. The spirit of conceiving mass-production houses”.¹⁰⁸ Walter Gropius, however, had already written in 1910 a “Program for the founding of a general housing-construction company following artistically uniform principles”, advocating for a uniform style, use of the same building components and materials for all houses, standard sizes and multiple use of completed plans that could be slightly changed to accommodate individual needs.¹⁰⁹ According to Gilbert Herbert, Le Corbusier adds no new concepts to Gropius’s formulations, whether he was aware of the document itself or not it was him that inspired generations of architects and not Gropius; it was Le Corbusier’s powerful visual imagery and prose that led the Modern Movement in its quest for standardisation and industrialisation in architecture.¹¹⁰ Yet it is still appropriate to use Bauhaus and Gropius’ housing schemes of the late 1920s as a major example to address mass architectural production in the first half of the century. Even though Le Corbusier was seemingly more influential, it was Bauhaus, as an

¹⁰⁷ Ranging from cottages, houses, farm buildings, hospitals, schools, churches, meeting halls, theatres, exhibition pavilions, warehouses, factories and barracks to blockhouses several architectural structures were produced to be assembled and erected in home markets, but mostly abroad in Europe, Asia, Africa, the Americas and Australasia. However common the practice was, it was not until the 1930s that the industry became known as the prefabrication industry. Herbert, “The Dream of the Factory-Made House.” 240-1.

¹⁰⁸ *Ibid*, 241.

¹⁰⁹ Gropius, “Program for the Founding of a General Housing-Construction Company Following Artistically Uniform Principles.”, 237-40.

¹¹⁰ Herbert, 241.

institution, that brought significant novelties to large scale housing schemes, and to domestic equipment, such as the renowned “Frankfurt Kitchen”.¹¹¹

3.2.1. Mass Housing in Germany

Germany, in this context, provides a good case for the austerity of interwar domestic architecture because the Weimar Republic was not particularly stable either economically or politically. Bauhaus’ involvement in industrial production reached its peak with the institutional move from Weimar to Dessau in 1926.¹¹² Gropius, in a policy statement he delivered the same year, said that “The Bauhaus wants to serve in the development of present-day housing, from the simplest household appliances to the finished dwelling. The home and its furnishings are mass consumer goods, and their design is more a matter of reason than a matter of passion... the creation of standard types for all practical commodities of everyday use is a social necessity.”¹¹³ Standardisation was essential if machines were to be effectively exploited in providing the individual with mass-produced products that were “cheaper and better than those manufactured by hand.”¹¹⁴ An overall comprehensive system of dwelling and contents had not yet been devised at this point. Walter Gropius and Adolf Meyer’s proposal for the *Baukasten im Großen* (Big Construction Kit) of 1925 did not address this issue either, though it was an experiment inspired by children’s building blocks adapted to large-scale prefabricated elements that sought to achieve variability within a standardised system rather than solving the problem of an overall system of prefabrication (Figure 24).¹¹⁵ This building system has an architectural

¹¹¹ This statement does not intend to underestimate the importance of the works of Le Corbusier, or any other architect and movement that belonged to the Modern Movement. Modernism itself is just a subject too wide to be covered in its entirety in this study. Although many will be mentioned in this chapter, the author heartily recommends Reyner Banham’s pivotal work on the subject, *Theory and Design in the First Machine Age*, for further inquiries on the works of other regional movements, such as *De Stijl* (the Netherlands), Cubism (mainly in France), and Futurism (Italy), and their relations to the Academic traditions at the turn of the century. I believe that the example of Bauhaus as pioneers of the general movement and in the creation of the International Style would be sufficient enough to provide a general idea of how Modernism approached housing and domesticity.

¹¹² This move also marks the shift from a handicrafts-oriented education and production to an increasingly industrial one. Herbert, 242.

¹¹³ *Ibid.*

¹¹⁴ *Ibid.*

¹¹⁵ *Ibid.*, 243.

expression of cubism, expansiveness and austerity. The austere look of the houses is justifiable given the state of the Weimar Republic after the Empire's defeat in the Great War and the internal strife that followed in the years after Kaiser Wilhelm II's abdication and exile. Yet the expansive quality of the system was promising of future growth, and perhaps with it, prosperity. The *Reichsheimstätten* law in Germany allowed Gropius and his associates to engage in a series of mass-housing projects between 1926-1930.¹¹⁶ The housing project at Törten-Dessau was commissioned by the City of Dessau and was sponsored by the *Reichsforschungsgesellschaft für Wirtschaftlichkeit in Bau und Wohnungswesen* (The National Society of Research into Economic Building and Housing), where Gropius was an executive officer (Figure 25). Planned to be built over 3 years between 1926-29, the project was planned to house 5,000 residents, and 316 of the two-story row-houses were built in the first two years.

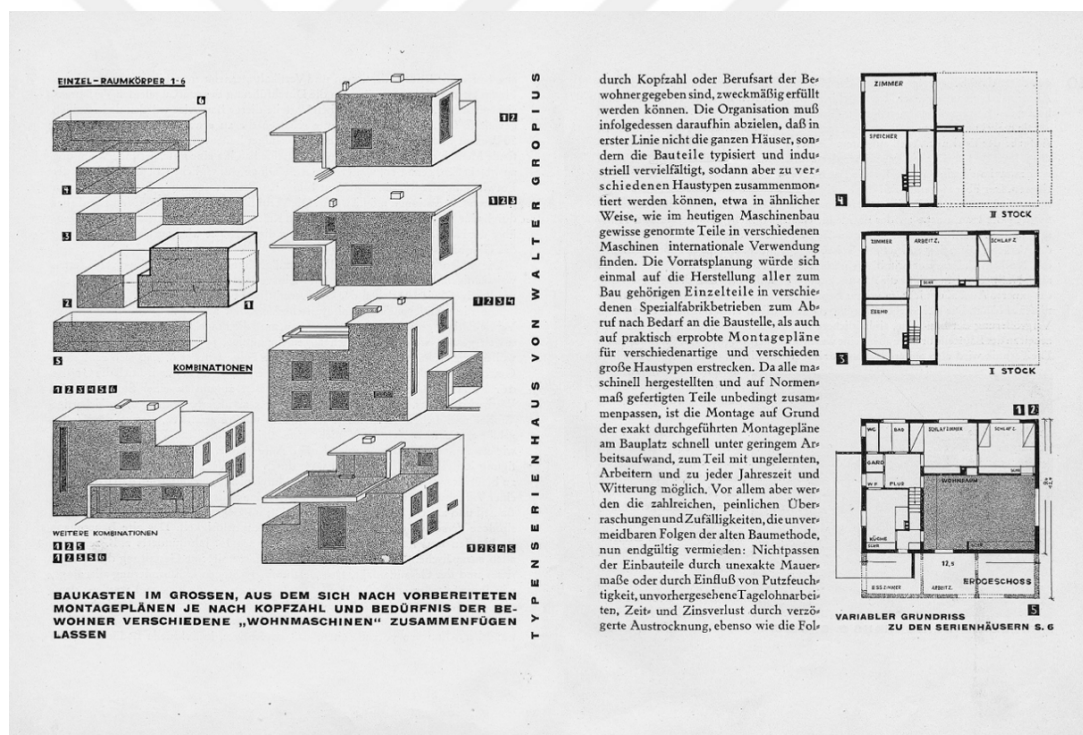


Figure 24 – Baukasten im Großen. From “The Construction Kit and the Assembly Line — Walter Gropius’ concepts for Rationalizing Architecture” by Atli Magnus Seelow

¹¹⁶ The *Reichsheimstätten* was a law enacted in Germany that aimed to allow families to purchase homes on favourable conditions. It was aimed to provide cheap housing after the First World War when Germany faced severe housing shortage. In Berlin alone, the number of registered house seekers had risen from 75,000 to 179,000 between 1925 and 1929, and there was a demand for 100,000-130,000 apartment units.. The situation was not much different in other major cities either, see, Kathrin Siebert, “Low-cost Avant-garde? Contradictions in Industrialised Housing in the 1920s” accessed through: https://ethz.ch/content/dam/ethz/special-interest/conference-websites-dam/no-cost-housing-dam/documents/Siebert_Paper.pdf

The houses had a standard design. They were made of reinforced concrete and cinder blocks, and planned to have annual maintenance. Floors, roofs, infield blocks, cross walls, and beams were standardised and produced on the construction site. The sand and gravel already found at the location were deemed appropriate for the production of concrete, hence requiring just the transportation of cement and cinder materials. The materials were kept in close proximity to the construction site and transported by trolleys over pre-established tracks to the casting areas situated between the houses. These casting areas served as locations for the production and curing of the building parts, ensuring their proximity to the intended point of utilisation. Once prepared, the objects were lifted using mechanical equipment and

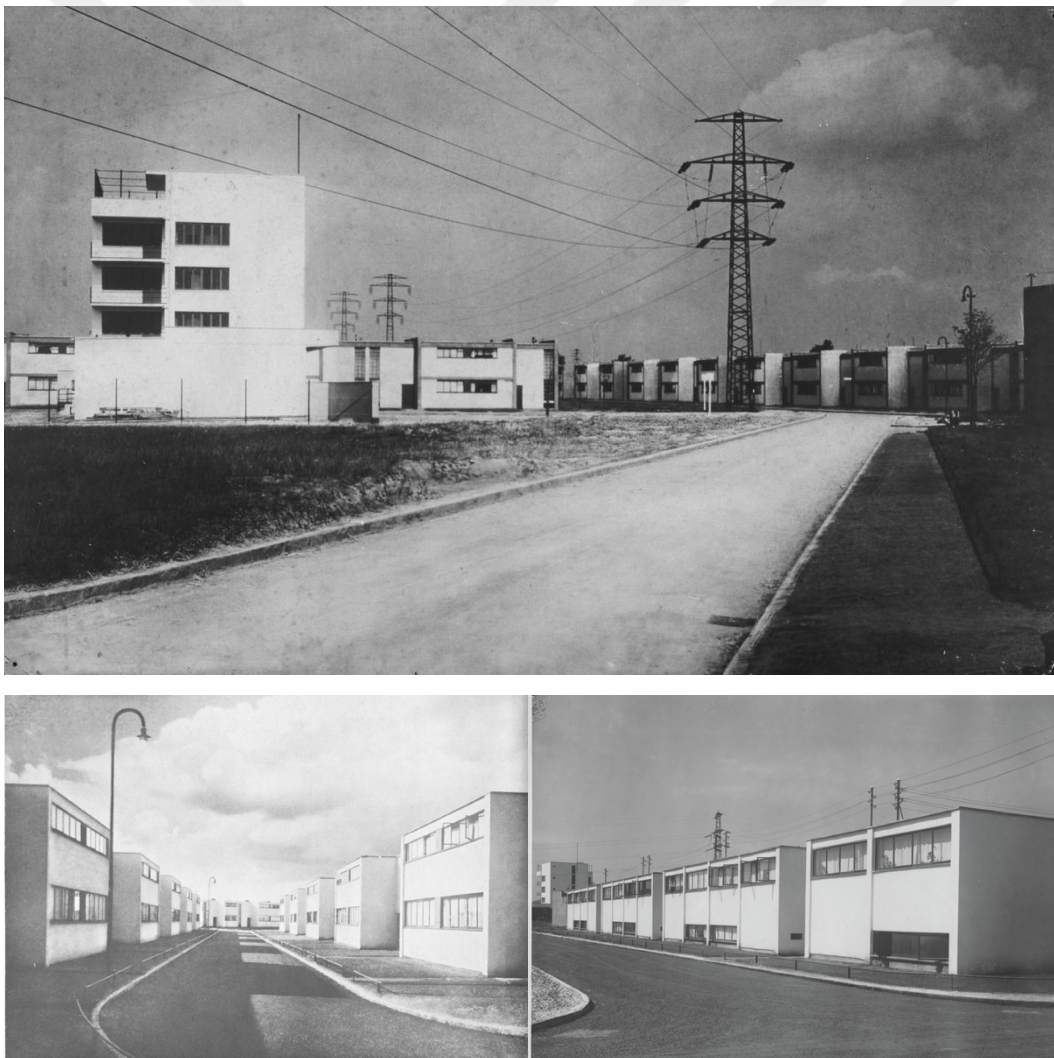


Figure 25 – Törten-Dessau Estate by Walter Gropius Top: Buildings of the Cooperative Society from the Southeast, around 1928. Source: <https://architectuul.com/architecture/torten-estate/media/58e4a5a4-ce30-4abb-8721-78d36d7b5e1b> Bottom left: *House type SieTö II 1927, view of the Kleinring towards the southeast, Photo: Gropius construction office, around 1930.* right: *Houses of the SieTö IV type 1928, Photo: Emil Theis, around 1930. From Stackmann, 2019.*



Figure 26 – Top: Hufeisensiedlung (Horseshoe estate, Bruno Taut and Martin Wagner) in Berlin-Britz, “Bauarbeiten / logistics during construction, 1925; LDA Berlin” Middle: “Baustelle / construction site, 1926; public domain.” Bottom: “Postkarte, o.D. / Postcard, undated; private archive” source of images: <https://welterbesiedlungen-berlin.de/hufeisensiedlung/>

positioned by specialised workers. The phases of construction were meticulously articulated. For example, the basic shell could be built by following a fourteen-step assemblage order. A timetable was created, serving both as a visual representation

of projected advancements and a mechanism for oversight. A systematic record of the successive stages was kept by photographic documentation.¹¹⁷ Much of the work was done on site by traditional methods, which indeed meant that the project cannot be considered an example of prefabrication. However, the general method is similar to how a factory worked, there is standardisation, mechanised operations, specialists, and organisation of labour and materials.

Törten-Dessau represents a single example in the wider scheme of experimentation throughout the country. The *Hufeisensiedlung* in Berlin-Britz was a project that was drawn up in a similar concept, albeit from a different point of view (1925-1933, Figure 26). It was a cooperative project by Bruno Taut and Martin Wagner who had founded a cooperative building construction company.¹¹⁸ Large-scale mechanical equipment, such as traveling cranes (back then a novelty), and specialised division was used on the construction site.

In 1926, in another project at Friedrichsfelde in Berlin a pre-cast concrete system of construction, based on the Dutch method, was used to erect 31 three-story buildings.¹¹⁹ The approach in this project was improved further in a large-scale scheme at Praunheim in Frankfurt where Ernst May built 1,400 dwellings between 1926 and 1930 (Figure 27). Like all the previous examples, this project too adhered to the key principles of rationalisation and mass production. A limited number of carefully thought-out component types with standardised details were devised for doors, windows, hardware, stoves, sanitation, and the highly efficient and standard 'Frankfurt Kitchen' as well as a construction system of prefabricated concrete panels

¹¹⁷ Gropius explained the logic behind the procedures as such: "The principle of work at the site was to reuse the same man for the same phase of the construction in each block of houses and thereby increase output. In order to ensure the interlocking of the individual construction phases from the start of the rough construction and interior work, an accurate timetable was worked out, similar to the ones used by railroads." Herbert, 243.

¹¹⁸ *Ibid.*, 244. The owner of the project was GEHAG (*Gemeinnützige Heimstätten AG*) which was founded at the initiative of Wagner in 1924 with the involvement of unions and cooperatives, and became the leading property development company in Germany in a short period of time. Kathrine Siebert, "Low-Cost Avant-Garde? Contradictions in Industrialized Housing in the 1920s" (ETHzurich, n.d.), 8, https://ethz.ch/content/dam/ethz/special-interest/conference-websites-dam/no-cost-housing-dam/documents/Siebert_Paper.pdf.

¹¹⁹ Pre-cast concrete construction was being experimented at this time throughout Europe. The "Bron patent" was used for the first time in Germany in this project. It involved "the casting of large story-height wall panels, complete with their windows and doors and all other components such as beams and slabs on the site, and then transporting them by a large overhead crane moving on tracks that straddled the line of buildings under construction." Herbert, 244.

and pre-cast beams.¹²⁰ This standardization created the *Frankfurter Normen* (Frankfurt Guidelines) that were obligatory to use, if the house was to be mortgaged.

Within the context of industrialization in Germany then, the production was shifted notably from the factory to the site. This shift entailed a change in the technical approach, which became project-specific rather than universally applicable. Additionally, the conceptual approach to addressing the housing issue progressed from individual private houses towards mass housing developments, such as rowhouses and apartment blocks. The expansion of scale can be attributed to various factors, including the prevailing social and economic conditions, the significant housing shortage, the improving economic situation following a period of inflation, the substantial increase in housing investment, and the unstable social and political climate. Housing indeed, was perceived as a potential remedy for the volatile social and political situation.¹²¹ Its realization was based intensively on the idea of Prefabrication and application of novel structural systems, like pre-cast concrete.

3.2.2. The Frankfurt Kitchen

The development and instalment of the Frankfurt Kitchen in the Weimar Republic homes marks a period of modernisation in the domestic sphere. Elimination of *drudgery* in housekeeping was the goal and promise of the domestic reform. The “new housekeeping” would take less time, it was to be less tedious, and would free the house-wife for “more uplifting endeavours”.¹²² Essentially a professionalisation of the domestic sphere was to take place, and this was to be realised through simplification in household design and the introduction of labour-saving appliances. An increase in productivity could only be made possible by eliminating waste of effort, which would result in a stable home life where the husband would be content, and the children healthier. Middle class women could pursue housework with “ease and grace”, and their working counterparts could be “expected to maintain two jobs

¹²⁰ *Ibid.*

¹²¹ *Ibid.*, 244-245.

¹²² Susan R. Henderson, “A Revolution in the Woman’s Sphere - Grete Lihotzky and the Frankfurt Kitchen,” in *Housing and Dwelling: Perspectives on Modern Domestic Architecture*, ed. Barbara Miller Lane (Oxon: Routledge, 2007), 248–58.249.

with dexterity.”¹²³ Household self-sufficiency and time-saving techniques were not, however, novel ideas developed in the 20th century, as American women had already come up with the core concepts in the 19th century.¹²⁴

The modernist model of domestic affairs relied on technology and rationalisation, and the standing notion held by domestic scientists and architects at the time was the need to bolster and improve upon (instead of changing) the existing model of family and the traditional role of women in maintaining it. Erna Meyer’s kitchen which was displayed at the *Siedlung und Wohnungen* (Settlement and Housing) section of the *Werkbund* Exhibition in Stuttgart was the product of these currents.¹²⁵ However, the best-known kitchen to be designed during this period was Margarete Schütte-Lihotzky’s, “Frankfurt Kitchen”, which gained her international recognition.

Lihotzky, after finishing her studies in Vienna, started working under Adolf Loos in 1920, when he assumed the leadership of the Vienna Housing Authority. For the next five years she designed houses and new domestic facilities for the city. A socialist activist, she shared a political outlook with Loos, and an interest in “economising strategies of rationalisation” which included “the reduction of living spaces to their smallest functional component.”¹²⁶ Lihotzky and Ernst May first met when she acted as a guide in May’s visit to Vienna to see Loos and his worker housing estates. She reportedly impressed May during their conversations on household rationalisation (something May was exploring when he was the head of the Silesian Rural Housing Authority [*Schlesische Heimstätte*] in 1921), and May asked her to contribute to the journal he was then publishing (*Silesian Home* [*Schlesisches Heim*]), for which Lihotzky published a modular kitchen that was to be concrete, factory-assembled, and installed by crane on site. In 1925 she was invited by May to join his

¹²³ *Ibid.*

¹²⁴ The teachings of Catharine Beecher, Harriet Beecher Stowe, and Christine Frederick were highly influential. Frederick was especially regarded as the leading figure in the scientific management of homes and the founder of “domestic science” in the 20th century. She emphasised the use of time charts, meal plans and inventories that would effectively turn women into “plant managers” as she considered the kitchen to be the “woman’s factory work station.” Her ideas resonated strongly in Europe, as the bourgeois women’s organizations (which had grown in number since the end of WWI amidst a “wave of patriotic sentiment and conservative reaction”) embraced “household reform” in the form of a campaign called *Mütterliche Politik* (motherly politics). See, *Ibid.*

¹²⁵ *Ibid.*

¹²⁶ *Ibid.*, 250.

design team in Frankfurt for the Praunheim development where she would get the chance to realise her published design.¹²⁷



Figure 27 – Praunheim estate, Frankfurt, by Ernst May. Source:

<http://ai.epitesz.bme.hu/en/portfolio/ernst-may-praunheim-lakotelep-frankfurt-am-main-nemetország-1926-30/>

¹²⁷ *Ibid.*, 251.

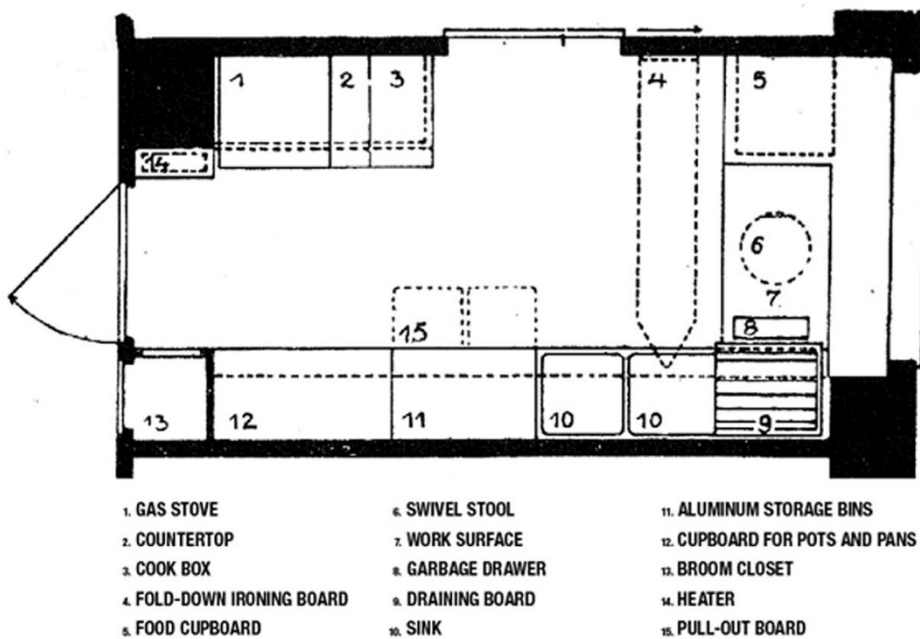


Figure 28 – The Frankfurt Kitchen by Grete Lihotzky. Source: MoMA
https://www.moma.org/interactives/exhibitions/2010/counter_space/the_frankfurt_kitchen/#highlights

Lihotzky's points of reference for her designs came from commercial kitchens: ship galleys, dining car kitchens in trains, and lunch wagons. These types of kitchens were developed to serve huge volumes of food to be served within short periods of time. Lihotzky's kitchen design intended to achieve the same, and hence was a "highly specialised piece of equipment – a work station where all implements were a simple extension of the operator's hand" (Figure 28).¹²⁸ Its small dimensions, 1.9m by 3.44m, was calculated *scientifically* as the optimal dimensions required for every movement of the operator to be as efficient and coordinated as possible. Although different, larger versions were designed for middle-class families with one or two servants, the standard model was fully operable by one person.

The worker/housewife was surrounded by a continuous counter space. Positioned at one end of the room, there was a cutting board equipped with a small waste bin, which received direct illumination from a nearby window. Additionally, a wooden plate holder was affixed to the underside of the glass-faced cupboards at the opposite end, enabling wet dishes to drip into the drainage tray and sink situated below. Located above, a linear arrangement of hooks facilitated convenient retrieval of a diverse assortment of specialised instruments, while adjacent to it, a total of eighteen metal drawers, each with a label, served as storage for various types of flours and other essential food items. The kitchen included a centrally located square area of open circulation space, which was in close proximity to the sliding door connecting it to the living room. Therefore, as the homemaker transferred the prepared food to the dining table, her locomotive actions were restricted to this limited space. The cube of space was illuminated by the light emanating from the end window, a design choice made by Lihotzky to enhance the perception of openness by removing cabinets from the higher walls.¹²⁹

Of the various proposals developed to modernize kitchens, Lihotzky's proposition stood out as the sole design that effectively converted the kitchen into a commodity for consumers. The Frankfurt Kitchen was a prefabricated model that was transported to a construction site and installed using a crane. A total of 10,000 units were placed in the Frankfurt settlements alone. Additionally, these individual units

¹²⁸ *Ibid.*

¹²⁹ *Ibid.*

were commercially offered as a commodity accessible through the Frankfurt Register. In contrast, the kitchen of Erna Meyer at the Weissenhof Settlement, as well as other contemporary designs were reportedly “fragmented and unresolved.”¹³⁰

The presentation of the kitchen as a consumer commodity highlights the increasing commercialization of domestic culture and the intrusion of market forces into the private sphere. Lihotzky's design method relied on industry collaboration, namely with Georg Grumbach (the manufacturer), and sought input from clients, who were the ladies affiliated with middle-class housewife's clubs. May and Lihotzky perceived this collaboration as a noteworthy accomplishment of the Frankfurt Kitchen, exemplifying a symbiosis between the corporate sector and the welfare state. They expressed their satisfaction in witnessing the remarkable alignment between industry and the pressing practical needs of housewives. Consequently, the transfer of power from the private patriarchy embodied in the family structure occurred progressively, leading to the establishment of a public patriarchy mostly influenced by the realms of industry and government.¹³¹

Lihotzky firmly believed that rationalisation could eliminate *drudgery* from household work and the Frankfurt Kitchen reflects that, however, dubious whether it actually reduced the amount of work or not. The way it was designed was modelled after a factory work station characterised by repetitive monotonous operations, and household work was regarded as “drudgery” comparable to factory work.¹³² The “professional housewife” of the 1920s could only be relieved from her daily grind, though only momentarily, through techniques invented by professional authorities; and furthermore, the male dominated positivist architectural culture continued to produce new household items that contributed to the development of the market for household goods.¹³³ Even if they were backed by modernised domestic facilities, women of the time, especially in Germany, could either contribute to the “public world of men”, or remain at home; the Frankfurt Kitchen, in this regard, can be seen

¹³⁰ *Ibid.*, 251-52.

¹³¹ *Ibid.*, 252.

¹³² *Ibid.*, 256.

¹³³ This policy was not properly criticised at the time as there still remained a backlash against women's movements following World War I, which inevitably contributed to the “general erosion and devaluation of women's contribution to culture.” See *Ibid.*

as “a brief, if uncomfortable, resolution between women’s culture and the ideal of a technological utopia.”¹³⁴

3.2.3. The Problem of Ornamentation

Modern architecture is also often defined by a lack of ornamentation as its distinguishing trait. Was the lack of ornamentation a consequence of mass-production or was it purely an aesthetic choice that architects of the time adhered to? The problem of ornament was famously written about by Adolf Loos in the late 1900s.¹³⁵ Loos’ essay “Ornament and Crime” (*Ornament und Verbrechen*) was first published in 1913 in the magazine *Der Sturm* in Germany, and was subsequently translated to French in the same year, appearing in *Les Cahiers d’Aujourd’hui* that enabled it to find a wider audience. The essay was reprinted in 1920 in *L’Esprit Nouveau*, albeit with a different translation. This reprint enabled Loos to be recognised in the Paris scene and paved the way for his arrival to the city; because, while it supported Le Corbusier’s demands for an architectural reform that insisted on the abandonment of “catalogue styles”, it also supported the Dadaists’ campaign of mockery and ridicule of the fine arts.¹³⁶

Reyner Banham states three reasons for why Loos’s ideas prevailed over the other more cautious attitudes. First, his vehement dislike of ornament immediately

¹³⁴ *Ibid.*

¹³⁵ The status of decoration was not a new issue by the time Loos started reflecting on it; his approach towards it was different and often contradicted the contemporary opinions, particularly of the German *Werkbund*. Banham gives various examples to opinions on ornamentation around 1910. These opinions mostly point out (in their own ways) that ornaments and decoration in well designed buildings with beautiful, pleasing forms are redundant. The *Werkbund*’s stance on ornamentation was articulated in an article written by Karl Gross in 1912, which suggested that decorations, or ornamentation in technical terms, must be treated as a distinctive feature of an object to elevate it from the general mass, and must be of quality work. Gross drew a line between “justifiable” and “superfluous” ornaments. “The power of survival of the artistic handicrafts” he said “rests directly on this premise.” For instance, Peter Behrens’s products for industrial users were undecorated, yet the ones he designed for domestic use were. See, Banham, *Theory and Design in the First Machine Age*. 91-93. Furthermore, the problem seems to have risen largely from semantics, the difference in the meaning of two German words *Schmuck* and *Ornament* which do not translate into English as two different words (Decoration and Ornament, respectively). *Ibid.*, 92.

¹³⁶ Paul Dermée, a Dadaist, was one of the editors of *L’Esprit Nouveau* at the time of publication, and hence, Loos was accepted into the circle of Tristan Tzara and the other Dadaists. *Ibid.*, 90.

solved everybody's problems with the issue.¹³⁷ The second reason was that his timing was very accurate since his attack on ornament was seemingly launched against renowned Art Nouveau designers at a time when the style was beginning to fall into discredit.¹³⁸ Third reason was that his expression of the issue and arguments were delivered in an unusually forceful manner.¹³⁹ Banham states that it was rare for a new theory (apart from the Futurist Manifestoes) to be presented in a radical and dynamic style, or in a way that persuades by resonating with so many established bodies of thought, even when they were arranged in novel ways. Except for the notion that adornment was a waste of time, Loos did not expand on his arguments. However, the abundance of levels of reference allowed for virtually limitless possibilities.¹⁴⁰ It is also stated that Loos was in fact permissive to ornamental activities of those he regarded as "culturally lagging-earlier civilisations, primitive persons, even the labouring poor of Vienna."¹⁴¹ It was sophisticated decoration by trained artists that he was adamantly against. He himself is known to have used the Doric order when situation required it, e.g., in his Chicago Tribune Tower project (Figure 29). Moreover, Loos was a Traditionalist and a Classicist as evident from his use of Classical details such as the coffered ceiling of the American Bar in Vienna (Figure 30).¹⁴² Additionally,

¹³⁷ As previously mentioned, even though Karl Gross was not a proponent of ornamentation he tried to establish a middle ground for the issue, and was rejected by those who were fanatically against ornament of any kind, as the distinction between quality ornament and worthless ornament faded. *Ibid.*, 93.

¹³⁸ According to Loos, ornament was not organically integrated into Western culture, and hence was not a valid expression of culture. He blatantly attacked contemporary designs by saying that they had no relevance to humankind or the cosmic order, calling them "unprogressive and uncreative." He further asked, rhetorically, what had happened to the works of Otto Eckmann, van de Velde, and others, stating that "the artist used to stand for health and strength at the pinnacle of humanity, but the modern ornamentalist is either a cultural laggard or a pathological case. He himself is forced to disown his work after three years." Furthermore, he wrote that modern ornament had no past and no future, and was only positively received by "uncultivated folk" who would soon forget it as well. *Ibid.*, 94.

¹³⁹ Loos, in the opening paragraphs of *Ornament and Crime* basically argued that ornamentation was a savage act by giving the Papuans as an example: "The Papuans tattoo themselves, decorate their boats, their oars, everything they can get their hands on. But a modern man who tattoos himself is either a criminal or a degenerate... The urge to ornament oneself and everything within reach is the ancestor of pictorial art. It is the baby talk of painting... what is natural to children and Papuan savages is a symptom of degeneration in modern man. I have therefore evolved the following maxim, and pronounce it to the world: the evolution of culture marches with the elimination of ornament from useful objects." *Ibid.*

¹⁴⁰ See above. *Ibid.*

¹⁴¹ *Ibid.*, 95.

¹⁴² Banham states that he used English tailoring, which adheres to tradition, as an example of reserved excellent taste. Loos did not share the Futurists' appreciation of machinery as a means of expressing

he held the opinion that purity in form was symbolic to the purity of mind. That building without concern for architecture, without direction from architects and their concerns with style and Styles, like a peasant (or an engineer of the time) does, would achieve harmony with the universe. Without interference from architects, the builder could only build houses in the style of his time.¹⁴³ Bearing in mind his stance on the evolution of culture and ornamentation, this could only mean building in an

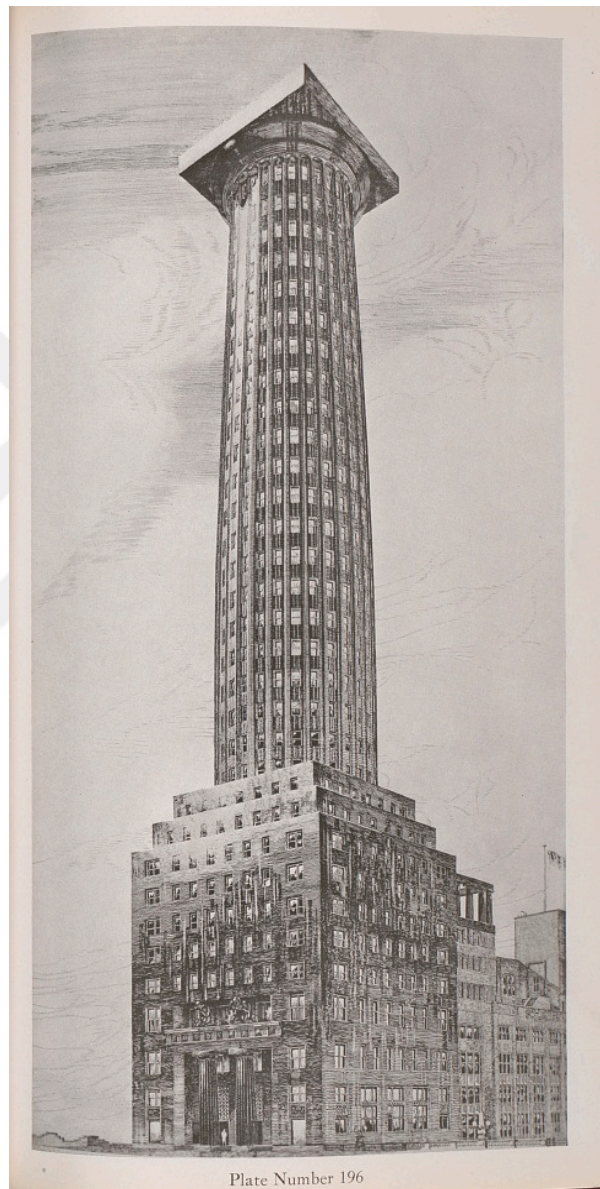


Figure 29 – Adolf Loos, submission for the Chicago Tribune Tower, 1922.

oneself, and he mocked the notion of a high-obsolescence, scrapping economy, which was already taking shape in the United States and was enthusiastically embraced by the Futurists. Loos was also quite fond of the works of the Neo-Classical Prussian architect Karl Friedrich Schinkel, and had a permissive attitude towards the ornament of the past. *Ibid.*

¹⁴³ *Ibid.*, 96-97.

undecorated style, free from ornament, and indication of an uncorrupted mind. Banham states that this view was adhered to by the succeeding generations that further solidified the notion that engineers were “noble savages” (Filippo Marinetti also contributed to this idea) which was vital to the creation of the International Style.¹⁴⁴ To build without decoration was to build like an engineer, in an appropriate manner to the Machine Age. So, it can be clearly stated that the lack of



Figure 30 – American Bar (or Kärntner Bar) in Vienna by Adolf Loos (1908). source: https://www.geschichtewiki.wien.gv.at/Loos_Bar

¹⁴⁴ *Ibid.*, 97.

ornamentation in Modern Architecture was an aesthetic choice, perhaps secretly dictated by the austere economic conditions of the interwar period.

3.2.4. Futurism

Reyner Banham's *Theory and Design in the First Machine Age* (1960), was indeed a truly ground-breaking study on 20th century architecture. The book filled a gap in architectural history in terms of placing Italian Futurists to their rightful place within the development of modernism. Banham's study entirely focuses on the development of modernist architectures and eventually of the 'International Style' in Europe in the first quarter of the 20th century: the "First Machine Age" as it is called. He extensively studied the academicism and rationalism of the early 1900s *Beaux-arts* school; analysed the functionalism of the latter styles such as Bauhaus, *De Stijl*, and Cubism. Banham's study, however, excelled and distinguished itself by demonstrating the influence of the Italian Futurists, whether conscious or unconscious, on their contemporaries and the emergence of the International Style, something that has not been done by architectural historians before Banham, such as by Sigfried Gideon or Nicolaus Pevsner.

Between 1912 and 1914, Italian architect Antonio Sant'Elia made a number of imaginative drawings of buildings and town-planning ideas, and displayed them at the exhibition of the group *Nueve Tendenze* in May 1914 in Milan (Figure 31).¹⁴⁵ In the catalogue of the exhibition there appeared a *Messaggio*, signed by Sant'Elia. The reworked version of this particular text which was about the problems of Modern architecture reappeared as the "Manifesto of Futurist Architecture" in July 1914.¹⁴⁶ Sant'Elia asserted that architecture "cannot be subject to any law of historical continuity," and that "it must be as new as our state of mind is new, and the contingencies of our moment in history:"

The art of building has been able to evolve through time and pass from style to style while maintaining the general character of architecture unchanged, because in history there have been numerous changes of taste brought on by shifts of religious

¹⁴⁵ Banham, *Theory and Design in the First Machine Age*, 127.

¹⁴⁶ *Ibid.*

conviction or the succession of political regimes, but few occasioned by profound changes in our conditions of life, changes that discard or overhaul the old conditions, as have the discovery of natural laws, the perfection of technical methods, the rational and scientific use of materials. In modern life, the process of consequential stylistic development comes to a halt. Architecture, exhausted by tradition, begins again, forcibly, from the beginning.¹⁴⁷

Thus, Sant'Elia concluded in disfavour of "modish architecture of any style and nation," perpendicular and horizontal lines, cubic forms of a static nature; and affirmed that: "we – materially and spiritually artificial – must find our inspiration in the new mechanical world we have created, of which architecture must be the fairest expression, the fullest synthesis, the most effective artistic integration."¹⁴⁸ According to Reyner Banham, what is remarkable about Sant'Elia's *Messaggio* is that it put together all the newly emerging ideas of the pre-War period that only became mainstream after the War was over, as evident in the works of Le Corbusier, Gropius, and Mies. One can especially find traces of Sant'Elia's futurism in Le Corbusier's *Vers une Architecture* (1923). Banham's major point is that although functionalism played a major role in the emergence of the International Style, it has often been misinterpreted.¹⁴⁹ Accordingly, he argues that the symbolic meanings in Functionalist designs were largely ignored in the 1930s:

The architecture of the Twenties, though capable of its own austerity and nobility, was heavily, and designedly, loaded with symbolic meanings that were discarded or ignored by its apologists in the Thirties. Two main reasons emerge for this decision to fight on a narrowed front. Firstly, most of those apologists came from outside the countries – Holland, Germany and France – that had done most to create the new style, and came to it late. They thus failed to participate in those exchanges of ideas, collisions of men and movements, congresses and polemics, in which the main lines of thought and practice were roughed out before 1925, and they were strangers to the local conditions that coloured them. Thus, Sigfried Giedion, Swiss, caught only the tail end of this process in 1923; Sartoris, Italian, missed it almost completely; Lewis Mumford, American, in spite of his sociological perceptiveness, was too remotely placed to have any real sense of the aesthetic issues involved-hence his largely irrelevant tergiversations on the problem of monumentality.¹⁵⁰

¹⁴⁷ *Ibid.*, 128.

¹⁴⁸ *Ibid.*, 129-130.

¹⁴⁹ Banham, *Theory and Design in the First Machine Age*, 320.

¹⁵⁰ *Ibid.*, 320-321.

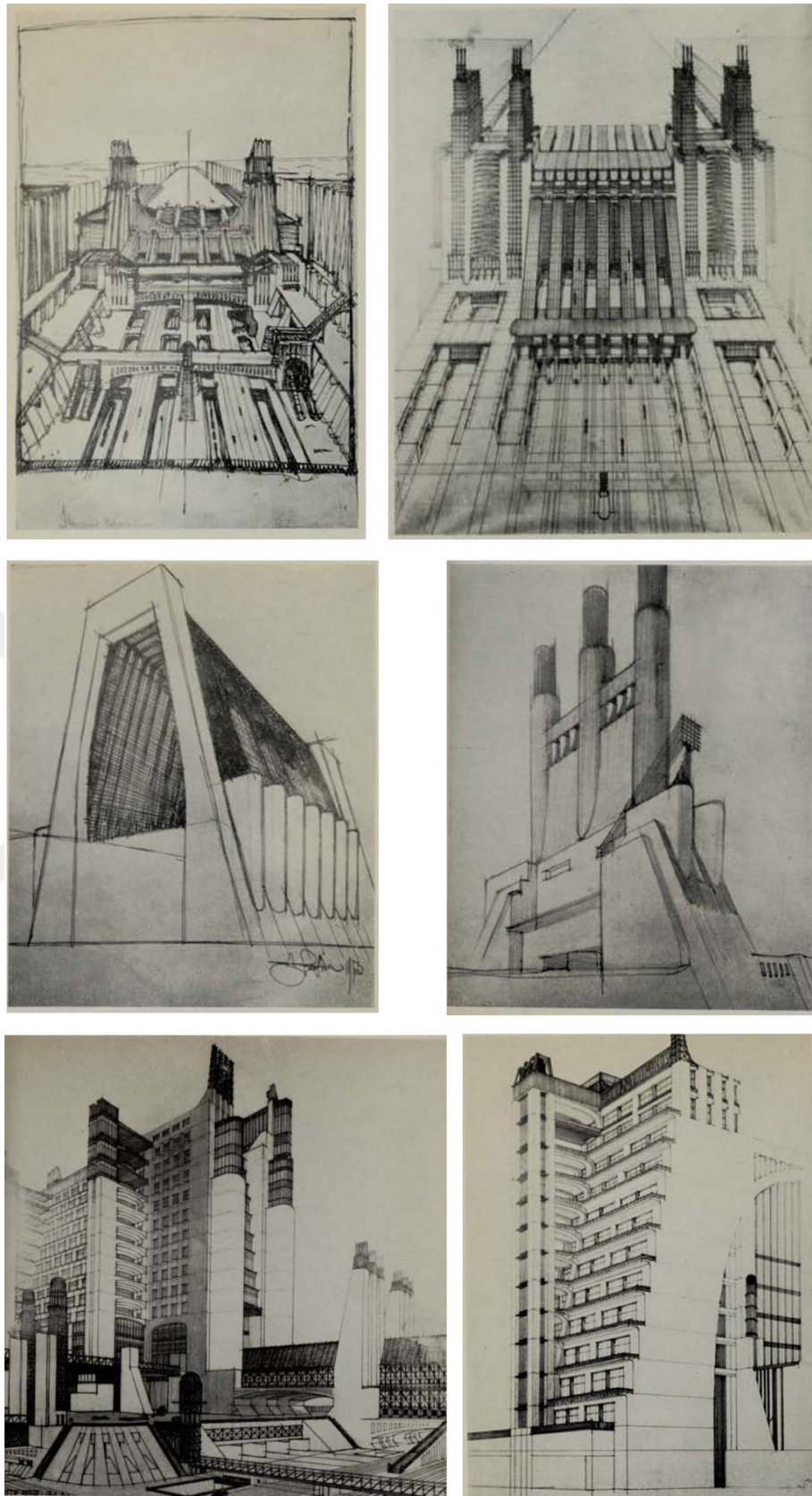


Figure 31 – Sant'Elia's drawings, 1914. First row: Central station for the Citta Nuevo, Second row: Airship hangar and power plant, Third row: high rise apartment blocks. Note how Sant'Elia's skyscrapers foreshadow 1930s setback skyscrapers. From *Theory and Design in the First Machine Age*.

Furthermore, Banham states that since the International Style was “outlawed politically in Germany and Russia, and crippled economically in France, the style and its friends were fighting for a toehold in politically-suspicious Fascist Italy, aesthetically-indifferent England, and depression-stunned America. Under these circumstances it was better to advocate or defend the new architecture on logical and economic grounds than on grounds of aesthetics or symbolisms that might stir nothing but hostility.”¹⁵¹ Banham discusses two examples representing the height of Modern architecture in the twenties – Mies’ 1928 Barcelona Pavilion and Le Corbusier’s Villa Savoye (*Les Heures Claires*, 1928-1931) with an emphasis to the symbolism used in these buildings. He states that the clear-cut standards of “Rationalist efficiency” or “Functionalist formal determinism” would not be sufficient in analysing their architectural effectiveness.¹⁵² For instance, he points out that certain elements of the Barcelona Pavilion (Figure 32) have *Dadaist* qualities (Kolbe’s nude statue that was placed in the small pool, and the movable furniture), while Le Corbusier’s villa has “a viewing window in the screen wall of the roof-garden” which fulfils “however late and unconscious”, Futurist poet Filippo Marinetti’s demand for villas that are sited for “view and breeze.”¹⁵³ Banham states that “they came extraordinarily close to realising the general idea of a Machine Age architecture that was entertained by their designers”. This statement can be expanded by looking at Le Corbusier’s houses from a technical standpoint, which were supposed to be frame-built, walled in light materials, raised on stilts, glazed, and flat-roofed. They were to have a straightforward, cubical aesthetic; featuring a horizontal top line without a cornice, and openings in the walls that were placed in accordance with basic geometry. There were only two indirect connections that could be made between these two sets of premises: the primacy given to the plan, which could not be completely divorced from either the structural frame or the fenestration and thus was ought to provide a link between the technique and aesthetics; and the identical definition of window and covering, which requires a particular kind of façade

¹⁵¹ *Ibid*, 321.

¹⁵² *Ibid*, 323.

¹⁵³ *Ibid*, 323-325.

composition in relation to the window openings in frame constructions.¹⁵⁴ However, the *Villa Savoye* at Poissy has a standard band of fenestration that runs around the main floor of the house with little regard to what is behind, and the frame is a three-dimensional grid independent from the planning of various floors (Figure 33).¹⁵⁵ The ground floor of the villa is setback, and the reason for it being that way was explained by the architect himself as to accommodate the minimum turning circle of a car. There is enough room for a motor-car to pass between the curved wall and the stilt supporting the floor above after setting down its passengers at the main entrance on the apex of the curved wall. The car could go down to the other side of the house while still remaining under the cover of the floor above and return to the main road by a drive parallel to the one it used to approach the house. Banham wrote that this

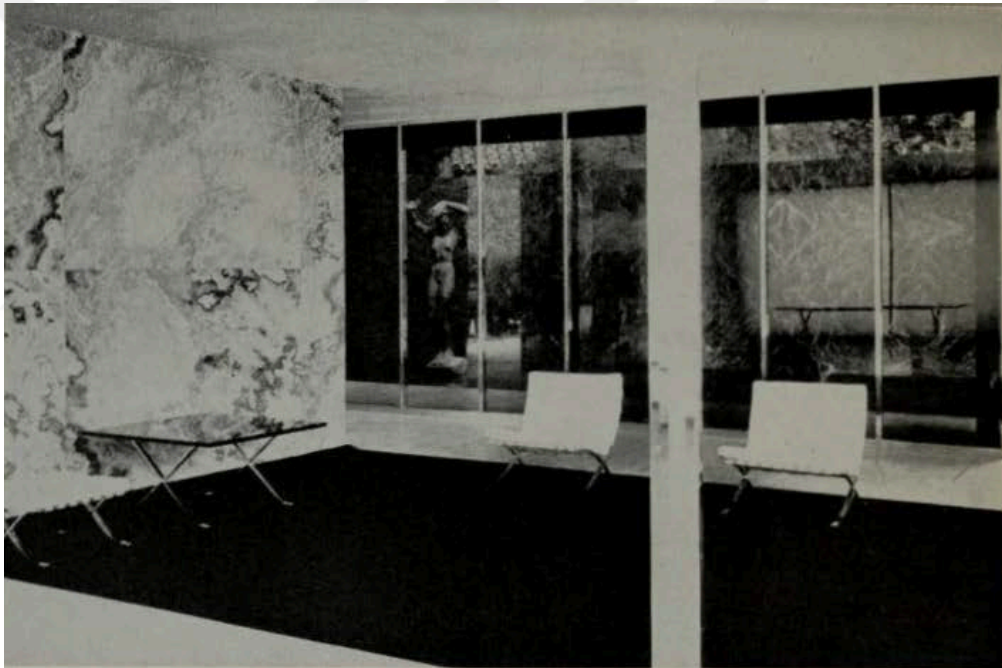


Figure 32 – Mies Van Der Rohe, Pavilion of the *Deutscher Werkbund*, international exhibition, Barcelona, 1929. Photograph showing the interior with furniture and the Kolbe figure visible through the tinted glass. Banham calls the pavilion “a summation of the possibilities and symbolising Powers that underlay the German side of the International style, gathering up traditions that ran back through the the Elementarists, the G-group, Berlage, Wright and Schinkel.” p.301.

¹⁵⁴ *Ibid.*, 262.

¹⁵⁵ The windows of *Villa Savoye* are unglazed and looked to the open courtyard instead of the closed room-space. Furthermore, stray columns run through some rooms in awkward places, and in some instances walls that could fill in spaces from column to column were slightly moved out of line to avoid clear partitioning. Additionally, one can see a clear inconsistency between what Le Corbusier wrote and practised here, which is illogical. His illogicality however was well known in the architectural sphere at the time, and regardless of this, his ideas set the main discourse of the Modern Movement. Moreover, more of his persuasive writings and formal usages came later. *Ibid.*

was “nothing less than a typically Corbusian inversion of the test-track on roof of the Matte-Trucco's Fiat factory, tucked under the building instead of laid on top of it, creating a suitably emotive approach to the home of a fully motorised post-Futurist family.”¹⁵⁶

Despite all, it is doubtful whether the aims of the International Style or the requirements of the Machine Age could be fully entertained. After all, houses were still designed, for the most part, to distribute their facilities to relevant rooms: cooking facilities went into the kitchen, washing machines went into the laundry, music players into the living room, and alike. Hence Banham slots a rebuttal of the International Style from Buckminster Fuller: “The 'International Style' brought to America by the Bauhaus innovators, demonstrated fashion-inoculation without necessity of knowledge of the scientific fundamentals of structural mechanics and chemistry.”¹⁵⁷ Fuller also stated that the simplification done by the International Style was rather superficial because it had replaced “exterior embellishment[s]” with “formalised novelties of quasi-simplicity” of hidden structural elements made out of modern alloys that the discarded *Beaux-Arts* ornaments were made out of:

The new International Stylist hung 'stark motif walls' of vast super-meticulous brick assemblage, which had no tensile cohesiveness within its own bonds, but was, in fact, locked within hidden steel frames supported by steel without visible means of support. In many such illusory ways did the 'International Style' gain dramatic sensory impingement on society as does a trick man gain the attention of children...¹⁵⁸

Indeed, Fuller's own domestic design, the *Dymaxion*, was a radical concept that could render modern houses of the period completely obsolete, only if it could have been immediately realised after its conception in the late 1920s. Different from his contemporaries, Fuller considered household equipment, everything that provides heat, light, music, ventilation, food, and sanitation, as a whole, and packed them together at the central core of his house to be distributed to the surrounding living space. Banham comments that the *Dymaxion* House had a stunning, but unintentional, futurist quality since it was to be lightweight, disposable, and

¹⁵⁶ *Ibid.*, 324.

¹⁵⁷ *Ibid.*, 326.

¹⁵⁸ *Ibid.*

constructed out of the materials Sant'Elia had mentioned as replacements for wood, stone, and brick. Furthermore, Fuller shared his desire to harmonise man and nature while using all the advantages of science and technology. Additionally, the notion of a central core dispersing services across the surrounding space parallels Umberto Boccioni's field-theory of space, with objects dispersing lines of force throughout their surroundings.¹⁵⁹ Such an approach to domestic design should definitely be considered as the true embodiment of the First Machine Age ideals.

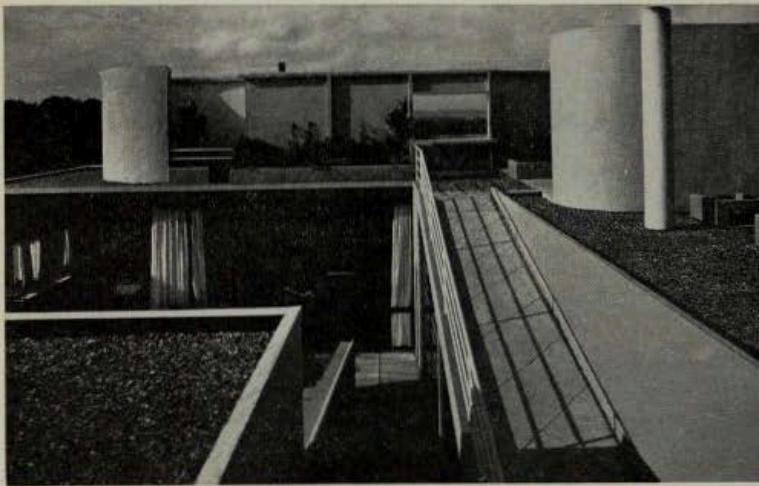
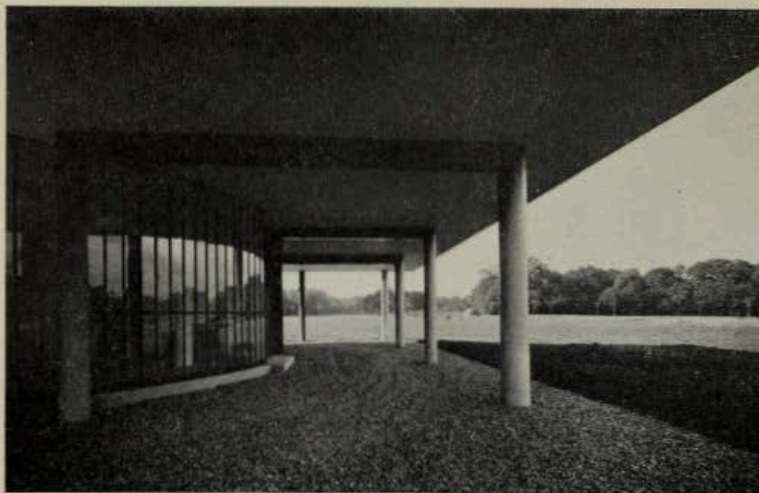
Fuller's design is important in the European context because the only production that can compare to it is Ernst May's House 17 built for the Stuttgart Werkbund exhibition at Weissenhof. Both designs pursued solutions to low-cost housing by making use of new materials and methods in line with modern technology. However, Gropius was less concerned with weight and its distribution, but rather focused on "standardization for the sake of freedom, openness to nature, harmonious and free spaces, and proportion of parts."¹⁶⁰ Accordingly, the most distinguishing feature of the House 17 was its firm relationship with its site as it was fully engaged with it through its concrete foundation; whereas Fuller's Dymaxion was held above the ground with no significant consideration of terrain.¹⁶¹ Although House 17 had a better synthesis of interior and exterior spaces, it was mechanically and spatially less efficient compared to Fuller's design. The fundamental difference between the two designs lies within the two designers' approach to achieving low-cost industrial housing: Fuller's objective was to establish standardisation in housing, whereas Gropius aimed to rationally systematise the construction of buildings through utilisation of mass-produced and standardised components. While it is true that Gropius, as an architect, placed a greater emphasis on the qualitative characteristics of site, space, and composition, the outcomes were not significantly different from those of Fuller's.¹⁶² So, if the results achieved by both approaches are the same, this objectively means that neither design was superior over the other.

¹⁵⁹ *Ibid.*, 327.

¹⁶⁰ Robert M. Arens, "Houses at Fifty Cents a Pound: Buckminster Fuller's Conception of Domestic Space," in *Constructing Identity*, 1998, 354–58. 356.

¹⁶¹ Integration of house and landscape created a "synthesis of interior and exterior spaces" which cannot be found in the Dymaxion. *Ibid.*

¹⁶² *Ibid.*



131, 132, 133. Le Corbusier and Pierre Jeanneret. *Les Heures Claires*, Poissy-sur-Seine, 1928–1930: the summation of the Latin stream in the International style—a post-Futurist villa, planned around a central ramp, raised on stilts for vehicle circulation, and set down, a pure aesthetic object, in an abstract landscape.

Figure 33 – Page from Banham's *Theory and Design in the First Machine Age* showing photographs of the Villa Savoye.

3.3. Modernism in the Second Half of the 20th Century

End of the WW2 in 1945 brought an urgent need to retool and repurpose factories of both allied and axis nations. Repurposing of military production facilities not only focused on the building of houses for the returning veterans and displaced populations, but also continued the production of numerous surplus materials, instruments, and components of wartime technology to be used for civilian purposes.¹⁶³ The British effort was reportedly remarkable in this respect as demonstrated in the 1946 London exhibition entitled *Britain Can Make It*, which included a “war to peace” section that displayed a wide array of military materials like plastic wrapping, waterproof fabrics and aluminium containers altered to serve peacetime needs, hence paving the way for a transition “from Spitfires to saucepans.”¹⁶⁴

The war production facilities were rarely successfully converted to peacetime use, however, innovative technologies and materials developed for the war did find major commercial markets. New markets coincided with the return to civilian life of citizens whose outlook on life had been changed by wartime technology, preparing them for an era of electronics and automobiles. Massive introduction of women into the workforce as an effect of mobilisation had a significant impact on domestic space. Since women now had less time to do household chores, and were exposed to modern technology at work, they required their homes to be more efficient. To meet these expectations, architects sought to pursue a new modernism with the building industry. There happened a smooth transition from running mega scale construction sites of factories and warehouses to reconstruction and housing. Post-1945 Americanisation of European territories is reinforced by apparent Fordist tendencies which seemingly shaped urban spaces to accommodate the use of automobiles which

¹⁶³ Jean-Louis Cohen, *The Future of Architecture. Since 1889*. (London: Phaidon, 2012), 297.

¹⁶⁴ *Ibid.* The *Supermarine Spitfire* was a successful British single-engine fighter aircraft of aluminium construction. It became a symbol of resistance during the Battle of Britain (1940), and saw action in all theatres of the war. It remained in service of various air forces, including the Turkish Airforce, until the mid 1950s when piston engine fighters were phased out by jet engine fighters. Leonard Bridgman, ed., *Jane's Fighting Aircraft of World War II: A Comprehensive Encyclopedia with More than 1000 Illustrations*, (1989).

rapidly gained popularity.¹⁶⁵ Expansion into suburbia was required and the primary mode of transportation for the new suburban settlements would be the automobile until at least the 1990s in Europe, and the level of suburbanisation was nowhere near as severe as in the case of United States.

The idea of the modern house had been challenged and articulated in the western architectural context, in particular in the United States during wartime as well. It manifested in the form of solar house heating.¹⁶⁶ The studies and debates initiated during this period by architecture journals including *Arts and Architecture*, *Architectural Forum*, and *Progressive Architecture* focused on prefabricated building systems, new materials and other innovations while the *Ladies' Home Journal* and a

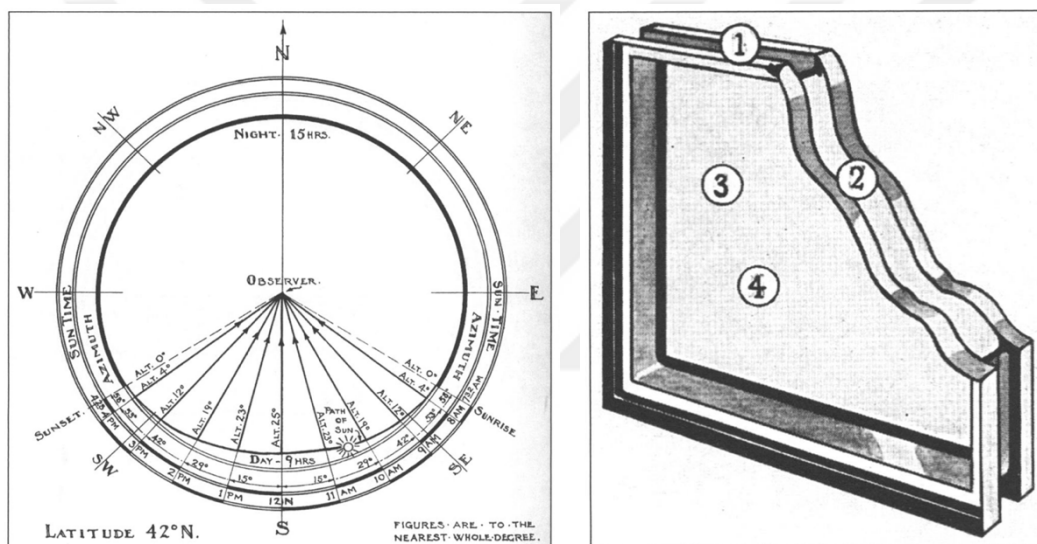


Figure 34 – Left: Howard T. Fisher, "Solar Angles" Right: Libbey-Owens-Ford Glass Company, close-up of "Thermopane."

plethora of other "shelter magazines" looked upon these novel design strategies as a way of constructing the socio-economic life in the suburbia.¹⁶⁷ These journals, in conjunction with a series of exhibitions and publications held at the Museum of Modern Art (MoMA) in New York City, serve as evidence that modern architecture, including the solar house design, was utilised as a vehicle for investigating various avenues of technological modernity within the burgeoning suburbs. Architects,

¹⁶⁵ Herbert, "The Dream of the Factory-Made House." 293.

¹⁶⁶ For more detailed information on the development of solar housing see Barber, Daniel A. "Tomorrow's House: Solar Housing in 1940s America" in *Technology and Culture*, Vol. 55, No: 1, January 2014. 1-39.

¹⁶⁷ *Ibid.*, 1.

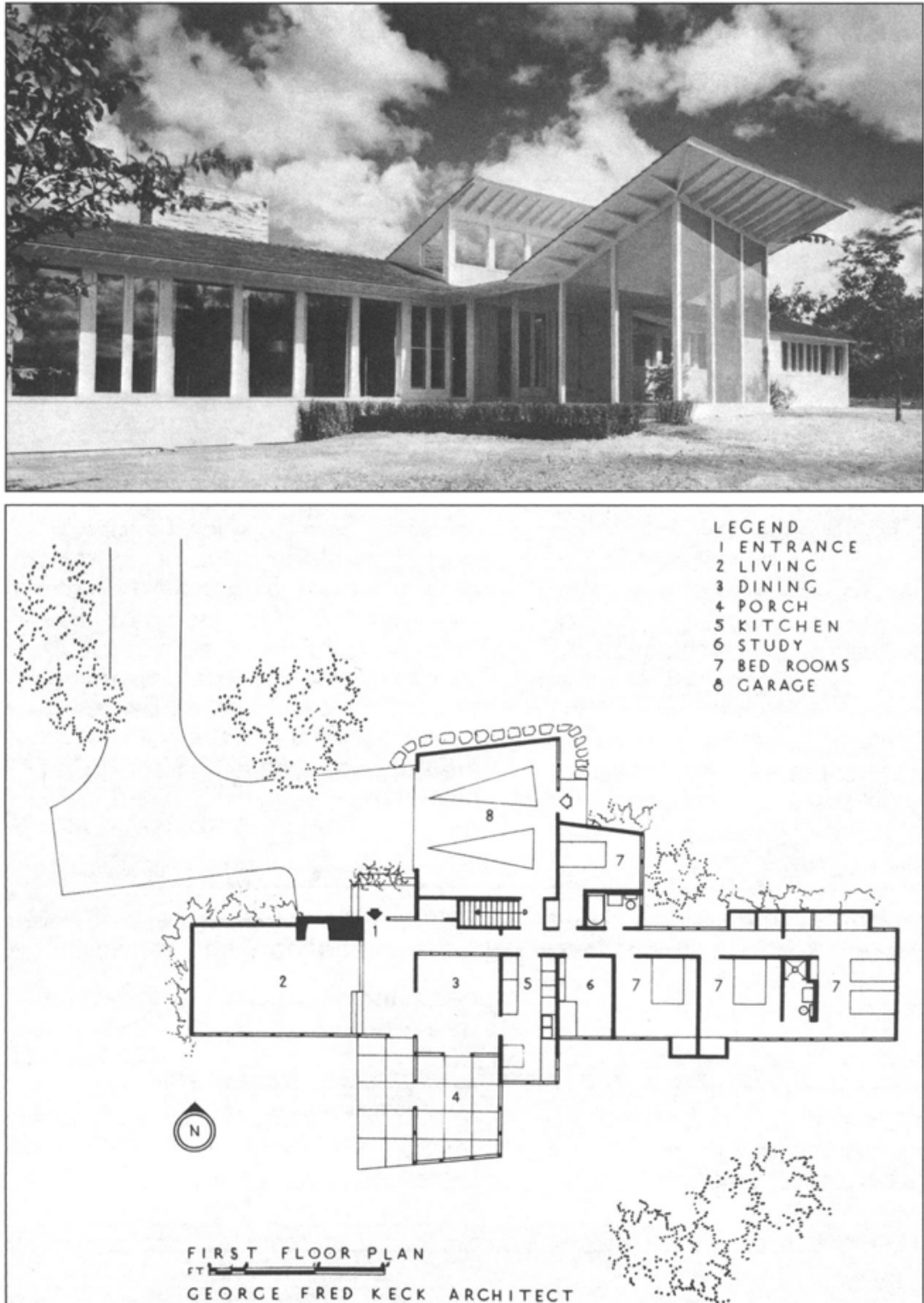


Figure 35 – George Fred Keck, Sloan House, outside Chicago. Photograph of the glass porch and plan of the house.

editors, and curators sought to leverage their research and design expertise to shape the nature of postwar living. The architectural design of passive solar houses in the 1940s emerged as a significant locus for comprehending the intricate interplay between postwar expansion, the technological influences that shaped it, and the

resulting social phenomena. During WW2 and its immediate aftermath, there was a discernible emergence of environmental concerns at advanced levels of practise and analysis. This development was primarily driven by a growing interest in the potential of solar house design.¹⁶⁸ The economic prosperity experienced in the United States after the war was based on several factors, including the expansion of the industrial sector, the provision of full employment opportunities for returning soldiers, and a significant rise in the availability of housing. These developments were heavily reliant on the presence of a dependable energy source. Taking advantage of passive solar energy was the obvious solution to the threat of energy scarcity as most houses in the United States during this period were heated with coal, oil, or natural gas.¹⁶⁹ Houses designed around passive solar heating principles often incorporated roofs angled according to solar angles, and wide windows with “thermopane” insulated glass (Figure 34). Built in 1939, George Fred Keck’s Sloan House outside Chicago provided the full template for later designs (Figure 35).¹⁷⁰

The July 1944 edition of *Arts and Architecture* magazine provided a more detailed explanation of the flexible necessity of postwar expansion and its expected impacts on the future. This was also discussed in relation to the wider postwar system of energy distribution. The article simply titled *What is a House?* published in the journal featured photo collages and graphic design components created by Ray Eames and Herbert Matter, which helped explaining the various possibilities and challenges associated with the anticipated "urgent housing issue" that was to come upon the conclusion of the war.¹⁷¹ The emphasis was placed on prefabrication techniques, which were contextualised within the broader objective of "taking advantage of the best techniques of our highly industrialized civilization."¹⁷² The discourse surrounding the immense magnitude of housing demands following the war was supported by visual representations of contemporary technical advancements, interspersed with statements from architects, engineers,

¹⁶⁸ *Ibid.*, 1-3.

¹⁶⁹ *Ibid.*, 5.

¹⁷⁰ *Ibid.*, 10-11.

¹⁷¹ *Ibid.*, 20

¹⁷² *Ibid.*

manufacturers, and politicians emphasising the necessity of adopting a logical and scientific approach to the provision of shelter.¹⁷³

The diagram appears to be a direct answer to the question "What Is a House?" (Figure 36) It suggests that the envisioned postwar dwelling would serve as a focal point for social interactions and, more significantly, as the fundamental framework

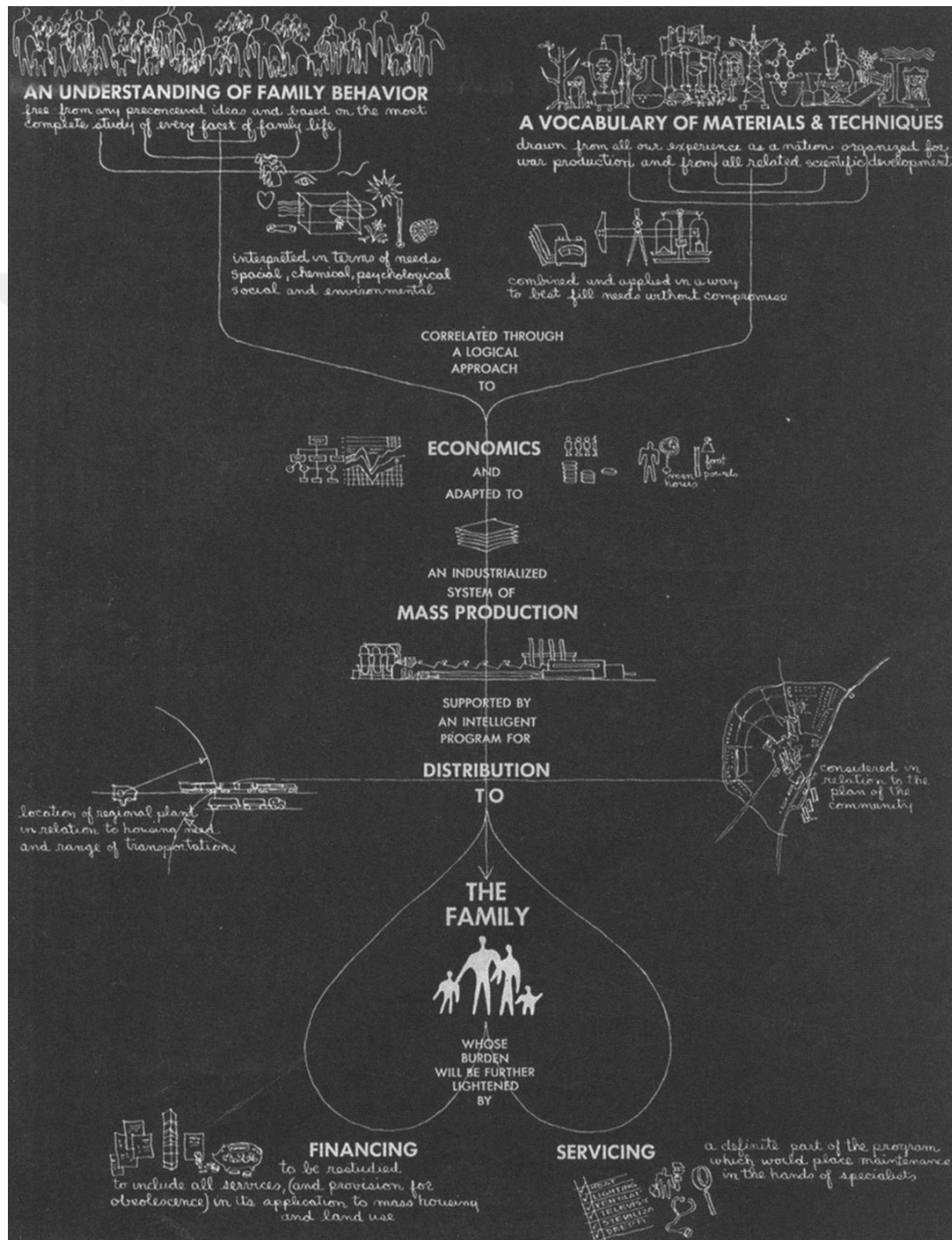


Figure 36 – Herbert Matter and Ray Eames, diagram in *Arts and Architecture* (7, July 1944) detailing the process with which the modern house should be designed.

¹⁷³ *Ibid.*

for the postwar infrastructure. This infrastructure encompasses the distribution of materials, provision of energy, communication systems, political backing, and economic stability. While the solar house was not explicitly discussed, the argument posited that the war effort created favourable circumstances for architectural interventions aimed at modernising the housing industry, encompassing aspects such as energy and economics. John Entenza, the editor of the journal *Arts and Architecture*, together with his colleagues placed significant emphasis on the potential to restructure the funding and production processes, thereby facilitating the provision of high-quality homes to a broader population.¹⁷⁴

Hence, the “Case Study Houses” program was initiated, sponsored and coordinated by the journal between 1945 and 1966. It aimed to provide talented architects a forum to showcase their work.¹⁷⁵ The program gave way to the realization of the most imaginative and experimental buildings designed and built in California in the 1950s, a state with a relatively primitive economy and cheap labour.¹⁷⁶ The houses aimed for the middle-class rather than wealthy clients and were novel in many ways in terms of questioning modernity. *The Case Studies* revolutionised the design of two-bedroom (with two baths) houses for families with one or two children and with no servants.¹⁷⁷

An initial five-acre piece of land was purchased in Los Angeles, on the palisades overlooking the ocean above the Santa Monica Canyon to realize the program. The program later grew in scale, and the majority of houses were built on the scattered sites around the greater Los Angeles area. Concessions were made in price by manufacturers who provided materials and equipment for construction,

¹⁷⁴ *Ibid.*, 22. Originally named *California Arts and Architecture*, the magazine was purchased by Entenza in 1938 and went through a series of changes in name, administration and publisher. By 1943 Entenza had become chief editor and was collaborating with architects and designers such as Saarinen and Charles and Ray Eames. Also see Neil Jackson, “Metal-Frame Houses of the Modern Movement in Los Angeles: Part 1: Developing a Regional Tradition.” *Architectural History* 32 (1989), 160-162.

¹⁷⁵ It was decided that the architects’ works would fare better if shown in context, so the houses were fully furnished with their kitchens, all fitted with the newest appliances. Furthermore, many were installed with novel mechanical systems, such as floor heating systems. Esther McCoy, “Arts and Architecture Case Study Houses” *Perspecta*, vol. 15, Backgrounds for an American Architecture (1975), 54-73, 54-55.

¹⁷⁶ Richard J. Williams, *Sex and Buildings: Modern Architecture and the Sexual Revolution* (London: Reaktion Books, 2013).26.

¹⁷⁷ Esther McCoy, “Arts & Architecture Case Study Houses,” *Perspecta* 15 (1975): 54, <https://doi.org/10.2307/1567014>. 54.

often with scepticism over the appeal of modern design to the broader public. The first six houses that were opened to public inspection however, received 368,554 visitors that exceeded all expectations.¹⁷⁸ The houses owed a lot to the works of Richard Neutra and Rudolph Schindler in terms of the development of steel framed houses in the United States through the 1920s and 1930s.¹⁷⁹ Raphael Soriano, an Eames follower, produced remarkable examples in terms of design and furnishing.¹⁸⁰

A new approach to landscape design was a significant aspect of the Case Study program. This was particularly encouraging for landscape architects who wanted to depart from a romantic heritage that had previously intertwined with Spanish Colonial and other eclectic designs prevalent in the 1930s. The spatial compositions exhibited fragmentation, and were characterised by a diverse array of textured surfaces seen in pathways, walls, and outdoor paved areas. Angles and diagonal lines were observed with regularity in very confined areas, which presented a notable departure from the fluidity and curvature commonly associated with the Romantic period. Another significant transformation occurred with the widespread adoption of plant material that requires minimal care, which seemed to foreshadow the coming of a future era characterised by less reliance on servants.¹⁸¹

Originally designed to be affordable, the costs of the houses saw a significant increase due to rising inflation. Standardised features were commonly utilised, frequently with creative approaches, however they did not result in cost reduction.

¹⁷⁸ *Ibid.*

¹⁷⁹ For more detailed information on the works of Neutra and Schindler see, Neil Jackson, "Metal-Frame Houses of the Modern Movement in Los Angeles: Part 1: Developing a Regional Tradition.", 152–72.

¹⁸⁰ Los Angeles already boasted a collection of remarkable modern furniture. The aluminium tubing and string chairs and chaises, which were designed by Hendrick Van Keppel, possessed a lightweight and sleek appearance. The furnishings were manufactured in the 1930s. Their low scale and linear characteristics harmonised effectively with the architectural style of the Case Study houses. Similarly, Van Keppel's furniture from the 1940s, such as the long, low slat benches for living rooms and outdoor dining furniture, complemented the design aesthetic of the Case Study houses. Notably, the patio of Soriano's 1950 Case Study prominently featured Van Keppel's outdoor dining furniture. Eames had an advantage as well. During his time at Cranbrook, he and Eero Saarinen achieved recognition by receiving Museum of Modern Art honours in 1938 for their innovative furniture designs. Additionally, in the context of the war, Eames collaborated with John Entenza to establish a firm aimed at manufacturing furniture and plywood-based items for wartime purposes. In 1945, Eames had reached a stage of readiness to manufacture lightweight plywood cabinets as well as moulded plywood chairs and tables, all of which were prominently showcased in Case Studies. In 1949, the year in which his personal Case Study was showcased, the metal cabinets he had developed were also prepared for the display he built together with Eero Saarinen for Entenza. McCoy, 56.

¹⁸¹ *Ibid.*

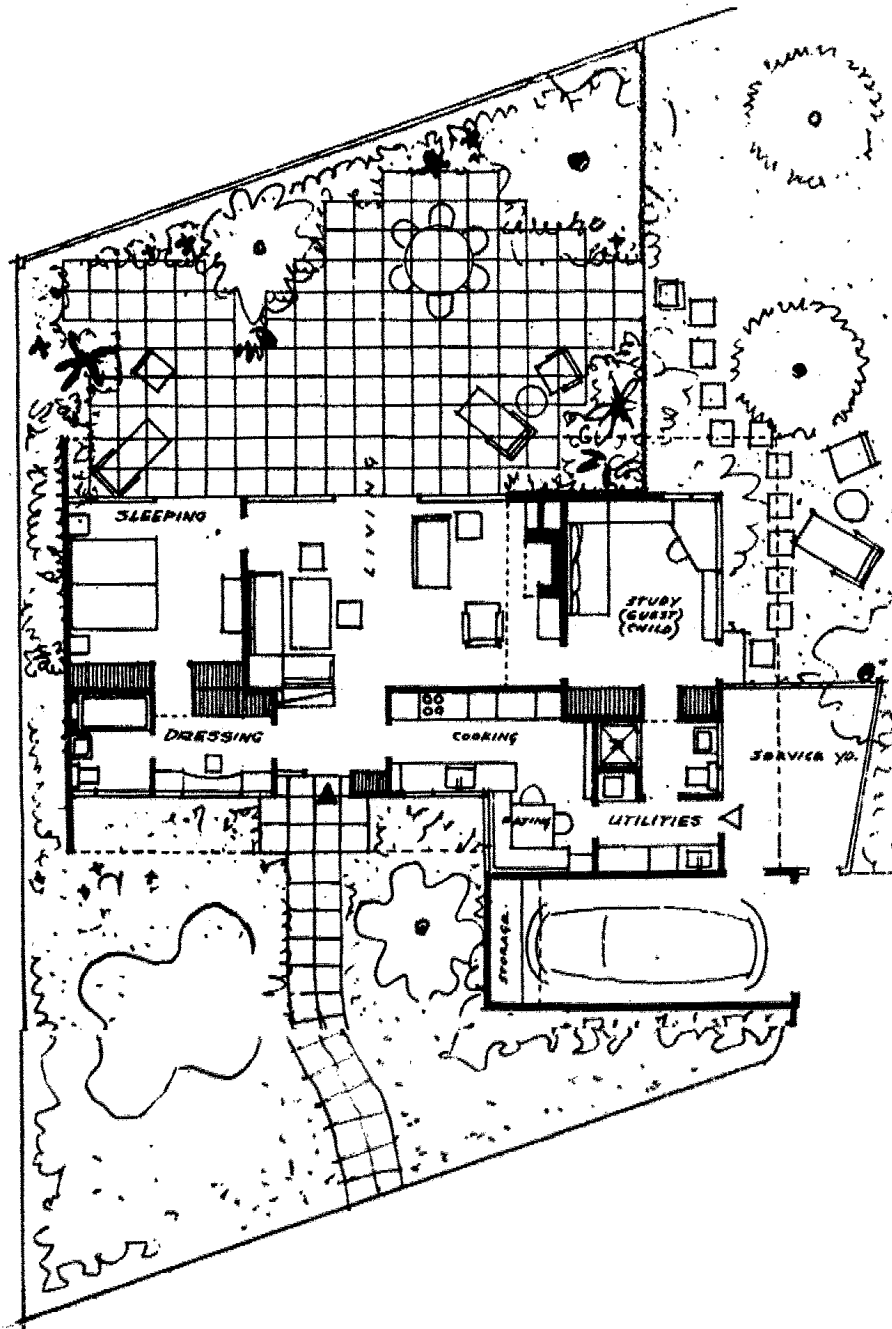


Figure 37 – Case Study House, J.R. Davidson, 1946, plan. From McCoy, 56.

Nonetheless, there was a concerted endeavour to achieve a prototype, particularly in terms of floor design and details. The first house, *Case Study House 1*, constructed by J. R. Davidson in 1946, featured a floor layout devoid of hallways, a design that was widely replicated by developers during the 1950s (Figure 37).¹⁸² It is important

¹⁸² The open floor plan of all the houses was borrowed from Frank Lloyd Wright. The exterior designs are closely akin to Europe, and since most of them were placed on flat pads, are devoid of Wright's principle of topographic integration. McCoy writes: "The service the houses rendered went beyond any experimentation embodied in any of the first eight. It was rather a service to a time and a place. During the 30's the Great Depression severely curtailed building, and when practice wanes, theory

here to note that the first Case study houses were rather haphazardly built (if they were built at all), and did not particularly demonstrate significant industrial and prefabricated work.¹⁸³ Wartime shortage in steel supply extended over a few more years into peacetime. Hence these first houses that were built like Davidson's were of wooden construction. Moreover, even though the use of steel was encouraged, the designs were seldom drawn with intentions of using it. Later houses, however, the ones that were built after the end of WWII – beginning with Eames', actually used steel construction and prefabricated materials, and were thoroughly chronicled.



Figure 38 – Charles Eames, Case Study House 8, The Eames House, Santa Monica, 1949 design (photograph: Julius Shulman) and plan. The some of the exterior wall panels of the house are coloured in red, blue and yellow in European modernist fashion.

flourishes; a major theme of study was lowcost housing, a critical need because of the antiquated and unsanitary quarters generally available to low and lower- middle income families. Architects who matured in the 30's were dedicated to the ideal of architecture as a social art. Wright was dandy but the true path was through standardization. Two battles were being waged simultaneously, one for the facade, one for the structure." *Ibid.*

¹⁸³ Jackson writes that out of the first fourteen houses that had their specification charts published in 1946, only four houses used metal framing: numbers 5, 8, 9, and 10.



Figure 39 – Julius Schulman’s photograph of the Entenza House by Eames and Saarinen, Santa Monica, 1949.
Below: Plan of the house.

Case Study House 8 (1949, figure 38) and the Entenza House (Case Study House 9, 1949 figure 39) are interesting examples because when they were first published in 1945, they were described as “two houses for people of different occupations but parallel interests”.¹⁸⁴ As the renders indicate, the houses were designed for Ray and Charles Eames, and their friend John Entenza (Figure 40). Although the designs were accredited to both Charles Eames and Eero Saarinen, according to Raphael Soriano, Eames’ influence was dominant since they were very close friends with Entenza.¹⁸⁵ Ray Eames recalled that the two houses (Entenza’s and theirs) were done together, and that they originally worked on a cantilevered house (called the bridge house) between two trees:

We had lived in an in an apartment so it would seem nice to have raised from the ground. We liked that, and looking out to sea. It took so long to develop and by the time we were ready to build, you know, we had got to know the property pretty well. At the last moment, it seemed overnight, it was changed'. Charles had said 'You know... this is the smallest volume with the greatest amount of material. Let's see what the largest volume could be with the same amount of material'. That was like a game to him. And almost overnight it was changed from the previous house, because we'd got to love the meadow and the idea of putting a house in the middle of it seemed terrible at that moment. And that gave John much more freedom also to work. So that's how that happened. Very different.¹⁸⁶

The flexibility of steel had apparently enabled such a late and radical redesigning of the Eames House. Previously, the use of steel had been limited due to wartime conditions and architects were free in their choice of material, however, after Eames,

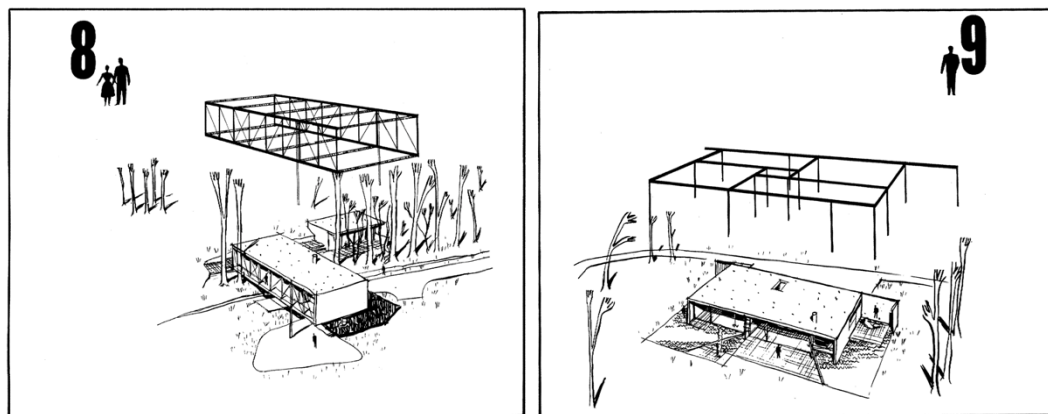


Figure 40 – 1945 renders of the Case Study Houses #8 and #9. Note how the renders display the number of people they are intended for.

¹⁸⁴ Jackson, 166.

¹⁸⁵ Soriano said the following to describe the relationship between Eames and Entenza: “At the time they were absolutely chummy, Entenza and Charlie were just like that: friends. And there was not a word that came from Entenza's mouth that wasn't uttered by Charlie. Everything was Charlie's decisions and sayings. I know that”. Ibid., 164.

¹⁸⁶ Ibid., 165.

the use of steel became much more prominent in houses built after 1950 such as the ones by Raphael Soriano and Pierre Koenig.

The Case Study Houses in general feature a distinct visual language that holds Utopian qualities that can be shown in a rather “heroic” fashion. Julius Shulman’s photograph of the Case Study House #22 by Pierre Koenig (1960, Figure 41) is a good example identified by Dianne Harris. The photograph is taken from such an angle shows both a part of the house, its occupants (all artistically staged), and a spectacular view of the night-time grid of Los Angeles – an image that conveys a postwar utopian ideal. Shulman, “knowingly or not” Harris says, had created “a picture that contributed to the enormous corpus of postwar house imagery whose iconography of white privilege was so pervasive that it became almost invisible, at least in the sense that it went largely unquestioned.”¹⁸⁷ He created an image that had the “optimal balance between reality and a believable fiction, one that pertained to the architecture itself as much as to the unknown lives of those depicted in the photograph and to the city that stretched out below them.”¹⁸⁸ This suspension of disbelief (or cognitive estrangement in SF terms) is achieved by including the city and its lights as an equal subject in the frame. Pierre Koenig himself wrote that he designed the house so that the city of Los Angeles and the house become extensions of each other.¹⁸⁹ Accordingly, the photograph conveys the notion that it is a part of the city, yet it is questionable whether it truly was considering the socio-economic conditions of Los Angeles in 1960 when poverty and violence related to racial tension caused by segregation laws was on the rise.¹⁹⁰

Arts and Architecture magazine, under John Entenza’s chief editorship published frequently on the subject of prefabrication starting in the early 1940s. However, as stated previously, it was not the only magazine. *Ladies Home Journal* also promoted modern design and “factory built” house proposals. Richard Pratt, architectural editor of the magazine, took a position that assumed the readers would be more interested in seeing ideas and homes that they were unfamiliar with. *Ladies*

¹⁸⁷ Dianne Harris, “Case Study Utopia and Architectural Photography,” *American Art* 25, no. 2 (2011). 20.

¹⁸⁸ *Ibid.*

¹⁸⁹ *Ibid.*

¹⁹⁰ *Ibid.*

Home sought to “transcend” the debate between “traditional and modern” by showcasing “the best that progressive architects [could] produce.”¹⁹¹ The photographs of the model houses published in the journal became so popular that they were exhibited at the Boston Museum of Fine Arts and at MIT. As evident from both magazines, two types of modernism prevailed in the house architecture in the United States. The first one is represented by the Case Study Houses, which were characterised by an emphasis on “aesthetic production.” These houses had repeated shapes and structures, flat roofs, standardised parts, modular construction, and centralised mechanical services. Their design elements were influenced by the concept of prefabrication and factory production. The second type of modernism focused on patterns of inhabitation, including characteristics like “flexibility, open planning, engineered storage, convenience, and views through large areas of glass.”¹⁹²

The two modernisms, “production aesthetics” and “frictionless inhabitation,” differed in their assessment of the ease with which the language of prefabrication was integrated into the domestic culture industry. This integration was primarily influenced by the housing demands that emerged during and after the WW2. Prewar architectural designs, exemplified by notable buildings like Fuller's 1927 *Dymaxion* House, Kocher and Frey's 1931 *Aluminaire* House, and Keck's 1934 *House of Tomorrow*, on the other hand, had already brought the concept of prefabrication to the public, but because the efforts to market these and similar houses were “under-capitalised and too expensive for low-cost mass production,” they remain mostly invisible in the historiography of the debates on modern architecture.¹⁹³

There was a third approach as well however, represented by the *Architectural Forum* and various guides published by architects Raymond K. Graph and Rudolph A. Matern on the concept of prefabrication. This type sought to achieve an “appropriate” and “honest” modern living by calling for an improvement of the design standards that were lowered for emergency wartime production. Their

¹⁹¹ David Smiley, “Making the Modified Modern,” in *Housing and Dwelling: Perspectives on Modern Domestic Architecture*, ed. Barbara Miller Lane (Oxon: Routledge, 2007), 285–96. 287.

¹⁹² *Ibid.* 288.

¹⁹³ *Ibid.*

designs were mix of traditional and the “Cape Cod” type.¹⁹⁴ Yet, though the appeal of factory-produced housing started to diminish in the early 1950s, the ideals of “individualization” and “variety within standardisation” continued to be the major themes addressed in the design of middle-class housing in the later eras.¹⁹⁵

Multiple distinct modernist movements, respectively, influenced the development of the modern house in the immediate postwar era. In its most comprehensive sense, the modernism “of the mass production and circulation of images” was intertwined with a cultural milieu exposed via periodicals, department shops, and house shows. The defining feature of this type lay in its technical capabilities, which enabled the creation and reception of diverse audiences on an expanding scale, as in Lewittown. Next, is the architectural modernism characterised by a “high” production aesthetic. This particular approach held the belief that by employing new processes, forms, spaces, and materials in an honest manner, a new and contemporary way of living characterised by accuracy and ease would inevitably emerge, as in the Case Study Houses and *Futuro*. Lastly, there was a kind of modernism related to living spaces, which is sometimes disregarded as being of middling taste. This particular modernism embraced adaptable design facilitated by advancements in technology and the introduction of new household devices, resulting in enhanced ease and comfort across “an unprescribed variety of architectural expressions,” as perhaps in Fuller’s case.¹⁹⁶

Finally, in terms of design ideas and application, European and American solutions to the problem of house and housing exhibit certain similarities in their approach to the idea of industrialisation and prefabrication. While the rowhouse was the dominant type in suburban Europe, the American suburb was made up of individual houses that were eclectic in style. Charles Eames was clearly inspired by continental European productions and belonged to the international school as his two Case Study Houses show.

¹⁹⁴ *Ibid.*, 289.

¹⁹⁵ *Ibid.*, 291.

¹⁹⁶ *Ibid.*, 293.



Figure 41 – Case Study House #22, Los Angeles, 1960 by Pierre Koenig. Photographer: Julius Shulman (from Julius Shulman Photography Archive, Research Library at the Getty Research Institute © J. Paul Getty Trust. Dianne Harris, “Case Study Utopia and Architectural Photography” in *American Art*, Vol. 25, No. 2 (Summer 2011), 19.)

CHAPTER 4

THREE RETRO FUTURISTIC HOUSES of the SPACE AGE

This chapter explores three retro futuristic Space Age dwellings: The *Dymaxion* Dwelling Machine, The *Futuro*, and the Nakagin Capsule Tower to solidify the arguments presented so far. These dwellings, taken together, present a rather unique case of domestic architecture with futuristic tendencies built in different parts of the world in the second half of the 20th century. Some shared traits and themes noticeable at a first glance are: mass producibility, symbolic form, utilitarian approach, light-weight construction, mobility (mobility of the building as opposed to mobility of the individual), relation to pop culture and utopianism. They represent distinct deviations from the mainstream [International] modernist approach, yet are archetypal of a highly modern, technological ideal.

4.1. Buckminster Fuller, American Architectural Modernism and *Dymaxion*

Richard Buckminster Fuller was born on 12th July 1895 in Milton, Massachusetts, an affluent suburb eight miles off from Boston. He was born cross-eyed and nearly blind with severe farsightedness, but his parents were advised not to provide him with glasses until he turned four.¹⁹⁷ Although still aware of colours, he relied on his other senses in his infancy, and surely, his inability to clearly see his surroundings must have had lasting effects on him.¹⁹⁸ After the birth of his brother in 1898, Fuller was enrolled in a kindergarten in Milton fashioned after the philosophy of German educator

¹⁹⁷ Alec Nevala-Lee, *Inventor of the Future: The Visionary Life of Buckminster Fuller*, First edition (New York: Dey St., an imprint of William Morrow, 2022). 32.

¹⁹⁸ *Ibid*, 32-33.

Friedrich Froebel, who used toys as instructional tools.¹⁹⁹ One assignment children were given according to the curriculum involved assembling small objects out of peas and pointed rods. Fuller recalls that his teacher was quite impressed when he had made, relying on touch alone, a tetrahedron (a triangular pyramid), followed by an octahedron while most of the other children made square structures. Fuller says: "When I got to the triangle . . . it had a form of rigidity, so I tried finally making a teepee, like an Indian teepee with three of them coming from a triangular base."²⁰⁰ Reportedly, such structures were an established part of the curriculum which indicates that their appearance in classrooms was more common than Fuller implied.²⁰¹ However, Fuller's ability to construct such a structure merely by feel could be what impressed his teacher. Even after getting his glasses and being able to see the world more clearly, Fuller would continue to occasionally remove them to restore his original view of reality. Nevertheless, his newfound clarity of sight expanded his horizons greatly.

Fuller was admitted to Harvard in 1913, but was quickly expelled as the result of his excessive social life. He later worked in a mill in Canada where he took an interest in machinery and learned to make improved modifications to manufacturing equipment. He returned to Harvard in the autumn of 1915, but was dismissed yet again at the end of the semester in January. A month after his dismissal, he landed a job at a New York branch of Armour & Company (the nation's leading meatpacker), where he worked in different positions until 1917.²⁰² After the Lusitania incident he enlisted in the United States Navy despite his poor eyesight.²⁰³ He became a cadet in

¹⁹⁹ These toys included blocks in the shapes of cubes, spheres, and cylinders, and were given to children in the form of gifts, or series of play materials which also apparently influenced future architects such as Frank Lloyd Wright and Le Corbusier. Ibid, 34.

²⁰⁰ Ibid, 34.

²⁰¹ Ibid, 34-35.

²⁰² Around this time, he met his future wife Anne Hewlett, firstborn daughter of socially prominent architect and muralist James Monroe Hewlett. Her father encouraged her artistic side. Anne studied at the pioneering New York School of Applied Design for women, and was a talented artist specialising in watercolours, sketching and needlework. Ibid., 65.

²⁰³ It was a joint endeavour with his friend from Harvard, Lincoln Pierce. Young men of Fuller and Pierce's status could enlist without serving on the front lines. Since ships were needed Pierce suggested that they volunteer a 40 feet long power cruiser named the *Wego*. They tried the Naval Reserve after their ship was rejected by the coast guard for being too short. When war was finally declared on April 6, 1917, Fuller was enlisted after a faked medical examination and was made a chief boatswain, "an unusually high rank for such a young man, and the *Wego* was assigned to patrol Bar Harbor and Frenchman's Bay." Ibid. 75.

the Naval Academy in Annapolis and graduated as an ensign in 1918 and was posted to the USS *Finland*. He engineered a winch for rescue boats to quickly remove crashed planes from water. He resigned in 1919. In the early 1920s he worked together with Anne's father, James Monroe Hewlett in his construction business, marketing Hewlett's patented "Stockade Building System". He was the President of the Stockade Building System Inc. until the failure of the company and his resignation from presidency in 1927.²⁰⁴ It is important to note here that at this point he had nationwide connections with various building and architectural associations like the American Institute of Architects, and companies like the Ford Motor Company.

The story of the conception of Dymaxion is engulfed in a myth of depression: In the winter of 1927, Fuller, thinking himself a failure at thirty-two years old with no job prospects or savings, set out to kill himself in Lake Michigan.²⁰⁵ His wife had just given birth to a daughter, and a life insurance policy he had bought while in the Navy was all that he had to support his family. His plan was to swim until he succumbed to hypothermia. However, as he was preparing to jump, he felt a strange presence and a voice uttered: "You do not have the right to eliminate yourself. You do not belong to you. You belong to the universe." It was revealed to Fuller that his life had a purpose, and that his family would always be provided for, as long as he submitted to the call which demanded that he share his mind with the rest of the world. When he went home to his wife, Fuller broke out the news that he did not need a job anymore, and that he had to think, and would not talk until he knew what he truly thought. Fuller went silent for two whole years, filling five thousand pages with notes and sketches to reveal the secret to making the whole human race successful for all eternity.²⁰⁶

That is how he later characterised his transformation later in various public appearances. The details were often changed, such as whether his daughter was born before or after his epiphany, or how long he remained silent for, or how many pages he had written. In interviews he embellished his tale, claiming he had slept two hours

²⁰⁴ Richard Buckminster Fuller, "Buckminster Fuller," *Perspecta* (Summer 1952), 29.

²⁰⁵ Jonathan Keats, *You Belong to the Universe: Buckminster Fuller and the Future* (New York: Oxford University Press, 2016). 2.

²⁰⁶ *Ibid.*

each night, or had become a vegetarian, or had moved his family into a slum where the neighbour was an Al Capone henchmen. Such details could be adjusted because even the essentials of his tale were essentially invented.²⁰⁷

The *Dymaxion* concept is an important part of his life's work and consists not only of the house, but several other elements intended to complement each other (including the *Dymaxion* car and the *Dymaxion* map) to make-up a larger system. Beginning in the early 1950s, he focused on developing geodesic domes, and continued to work on them for the rest of his career. Introduced in 1952, the geodesic dome, or an "autonomous dwelling facility", was the next stage in his quest for developing the "industrialised house". Coupled with his "standard of living package", it could provide seamless universal inhabitation (Figure 42a, b, c).²⁰⁸ The domes however were arguably more successful in their military application.²⁰⁹ The most famous of his domes is the Montreal Biosphere which was built for the 1967 Expo but continued to operate after it ended. It was damaged in a fire in 1976 when a welding crew sparked the transparent acrylic bubble, which burned away. Hard steel truss structure remained. Figure 43). Fuller authored several books, the most famous of them being the *Operating Manual for Spaceship Earth* (1969) where he describes the

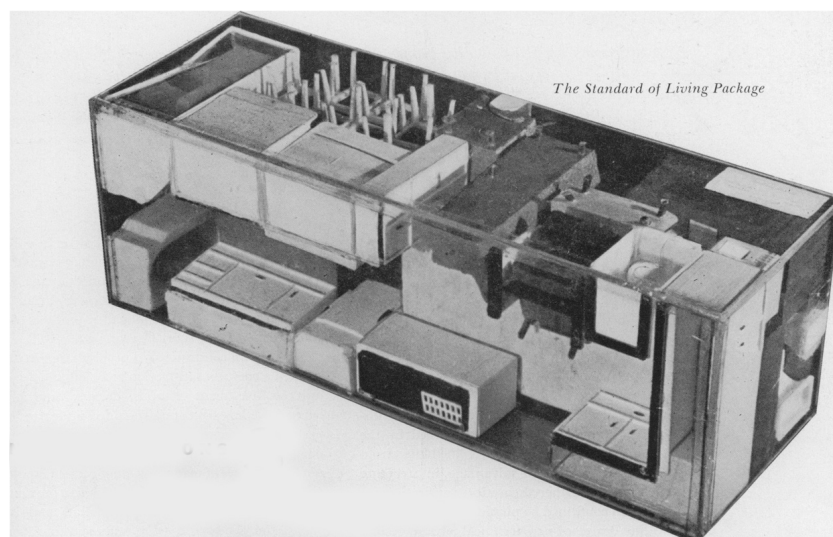


Figure 42a – The Standard of Living Package

²⁰⁷ Ibid, 3.

²⁰⁸ Fuller presented three prototype houses enclosed in geodesic domes: The first, Fuller claims, could be easily built with the technology of the time. The second one was an intermediary design envisioned to be possible in a few years into the future. The third and final prototype was projected for 20 years into the future. See, Fuller, "Buckminster Fuller", (1952). 35-37.

²⁰⁹ For more information on the subject, refer to Peder Anker, "Buckminster Fuller as Captain of Spaceship Earth," *Minerva* 45, no. 4 (December 2007): 417-34.

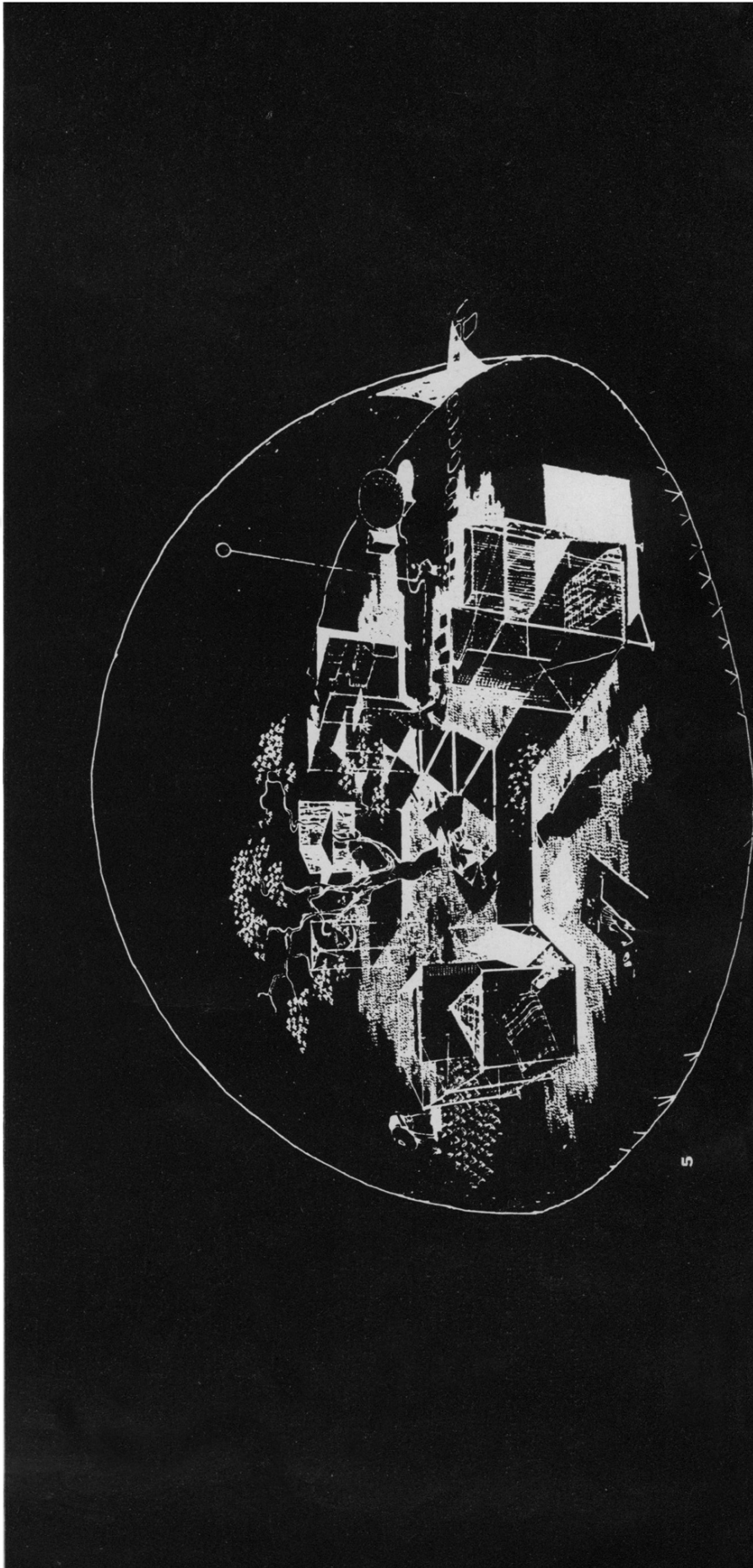


Figure 42b – Drawing of the prototype no.3

integral nature of Earth's living system. According to Fuller the Earth had to be perceived as a whole if its problems were to be solved.

The *Dymaxion* houses offered a universal/all climate, more mechanical solution immediate to the American housing crisis. *Dymaxion*, is an invented term derived from the words dynamic, maximum and tension. It was a mass producible house that could be flown in and placed anywhere because of its light weight and pre-moulded and pre-installed services. The concept is described as follows:

In its simplest form, Fuller's Dymaxion concept is that rational action in a rational world, in every social and industrial operation, demands the most efficient over-all performance per units of input. A Dymaxion structure, thus, would be one whose performance yielded the greatest possible efficiency in terms of the available technology.²¹⁰

Buckminster Fuller designed three iterations of the *Dymaxion Dwelling*: The first one was the *Dymaxion 4D*, published in 1927; second one is the *Dymaxion Deployment Unit* produced in 1941, and the third one is the *Dymaxion Dwelling Machine* of 1947.



Figure 43 – Montreal Biosphere Fire, 1976.

²¹⁰ Robert W. Marks, *The Dymaxion World of Buckminster Fuller* (New York: Reinhold Pub. Corp., 1960). 9.

4.1.1. Dymaxion 4D, 1927

Towards the end of the 1920s, R. Buckminster Fuller planned to build a sustainable and autonomous single-family dwelling, a living machine of the future. His visions of contemporary living patterns were based on spherical systems that were surrounded by an ocean of open air, and hence, required transportation through air, which would be maximized through the use of airlifting. An important problem with this idea is the problem of transporting large units of structures. If shelters were to be built like automobiles, constructed in factories and delivered as totally assembled products, then this would benefit also from the economic advantages of mass production. It is impractical to move a house more than a few miles with the existing transportation facilities we have today, yet it is theoretically possible to do so, since air is a vast and open element for use.²¹¹ For Fuller, aeronautical delivery was possible and practical, and the next step to mass-producing shelter. For this reason, he designed a house that was most effective, something that would produce the most strength while keeping the weight at a minimum for airlifting. This was indeed a timely idea, as *The Graf Zeppelin*, which was the size of a horizontal 30-story skyscraper was already built in 1927. This rigid airship was capable of circumventing the earth and was capable of lifting a payload of up to 15 tonnes (Figure 44).

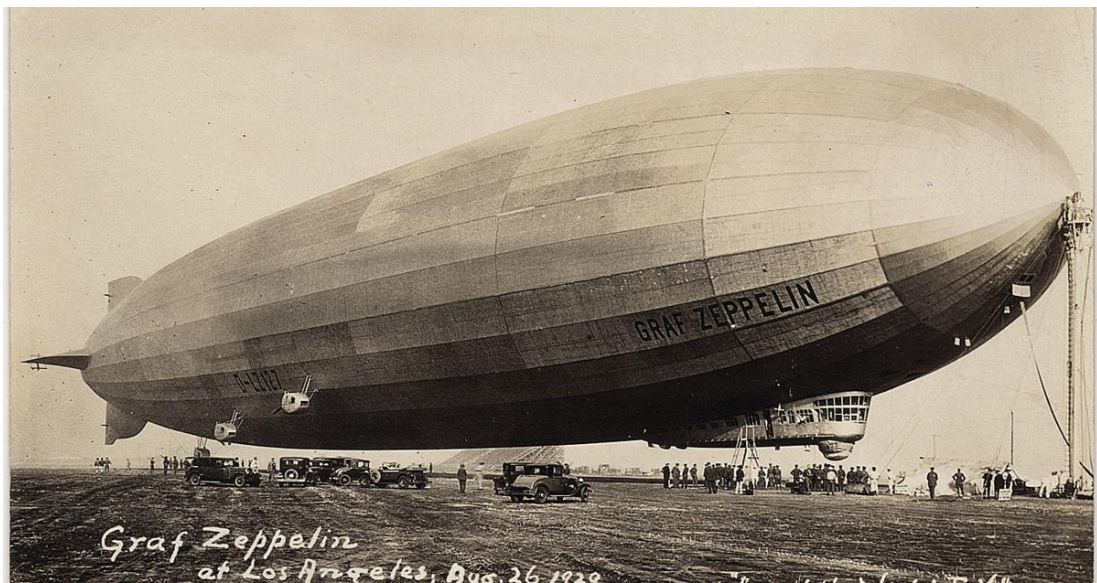


Figure 44 – *Graf Zeppelin* at Los Angeles, 1929.

²¹¹ *Ibid.*, 21

Fuller envisioned a totally new design, that was stressed like a plane, with compression parts and tension parts separable, as oppose to conventional structures that are almost pure compression systems, in which materials like brick and stone that cannot be improved over time in terms of effectiveness. On the other hand, more technologically advanced materials such as steel alloy cables could introduce new potentials and the systems devised with them were open to improvement. Fuller's ideal modern house was cylindrically shaped with a vertical shaft as the foundation. The house had a hexagonal form and was about 100 m² in size. "Though the preferred use of his invention was in the hexagonal plan, his patent indicates that the system could also be used to provide a conventional box like structure." In fact, the system claims to work with any type of "wire-wheel-like" structure hung about a mast.²¹² The house contained a hub that would act as a central, pre-fabricated compression element, an inflatable Duralumin mast, and the rest would be composed of walls, and cable supported floor decks suspended around the mast. This would make the outer-walls non-load bearing. The house would be built on site from top to bottom (Figure 45), or could be airlifted and planted like a tree (Figure 46). Fuller published these ideas in 1927, in a book called *4D*, which stood for the "Fourth Dimension". Two hundred copies of the book were sold and additional material was also published later on, called *4D, Timelock*.²¹³

The house was designed as a structure to resist earthquakes and storms. The idea of using metal-alloy cables most probably was developed as a result of the experiences Fuller accumulated during his time as an officer in the US Navy during World War I.²¹⁴ He had foreseen his design to be as withstanding to the harsh natural elements as a ship would. The design solution made the house look more like a ship's bridge section, yet also allowed the surrounding interior space around the mast to be modular with an open and flexible plan that allowed the tenants to transform it according to their needs. The permanent facilities like the heating, plumbing and lighting were contained in the central mast. Heating and lighting would be distributed through the hollow ceiling where the appropriate reflectors and deflectors are

²¹² *Ibid.*, 81.

²¹³ *Ibid.*

²¹⁴ *Ibid.*, 17.

placed. The house also had wind turbines on the roof, and an extensive system of cisterns to collect and recycle water. For the bathing unit Fuller patented the “*Dymaxion Bathroom*,” a shower that required only one cup of hot water, and a toilet that consumed no water at all. The foundation would house the water, septic, and fuel tanks (Figure 47).

The purpose of the house was not just to meet the basic need of shelter and protect the inhabitants from environmental elements, but also to minimize the “drudgery of human existence.” The central mast came ready to use with basic utility systems that were already installed. There would be no need for windows because the walls would be made of vacuum-sealed glass that could easily be shuttered. The house did not need to use water from pipes; therefore, it could immediately become operational wherever it was placed. In the *4D Dymaxion house*, the inhabitants would

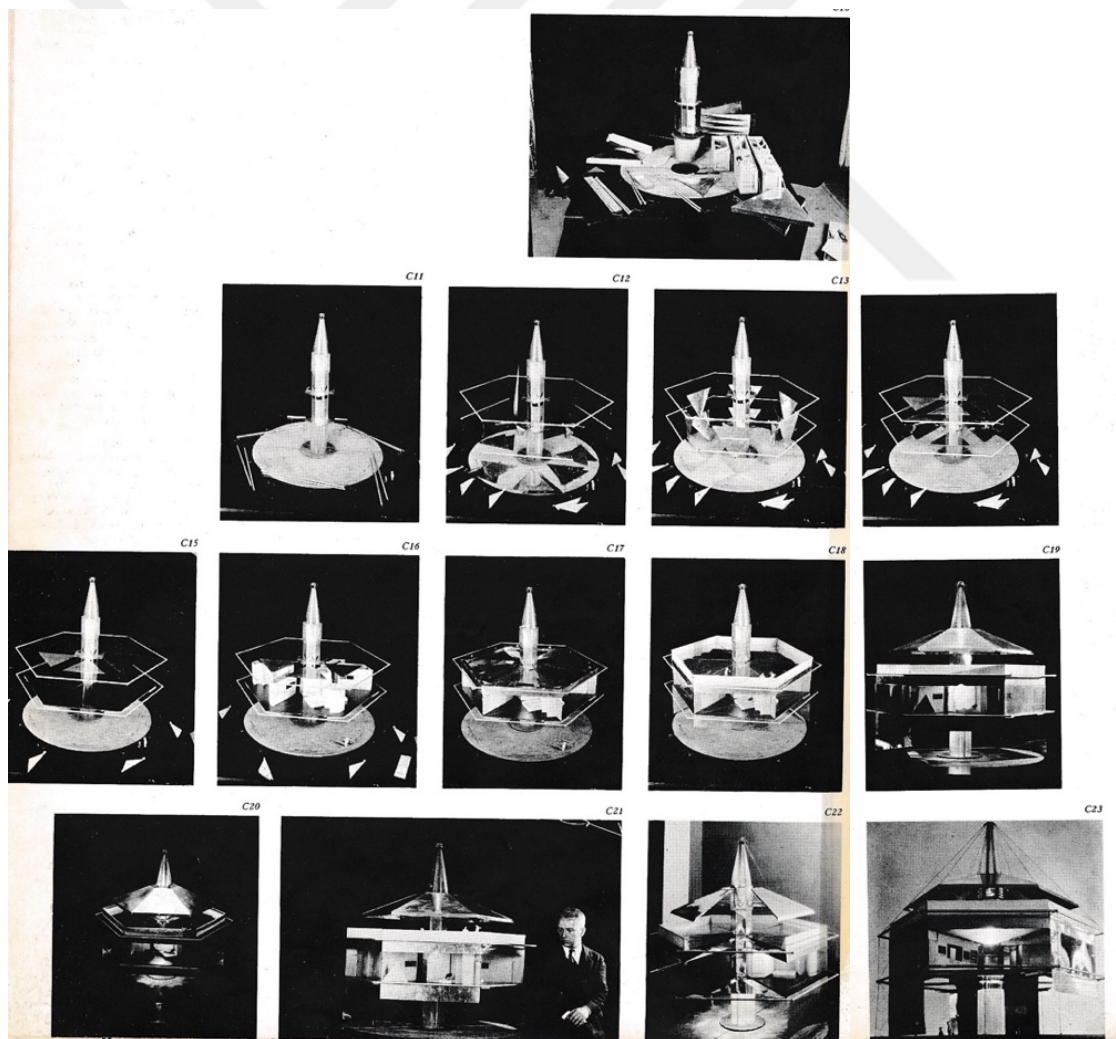


Figure 45 – Sequence pictures showing the construction of the *4D Dymaxion house* on a scale model. Note how the structure is assembled from the top down.
The Dymaxion World of Buckminster Fuller, 84-85.

have had plenty of space, and the placement of the equipment made sure that they had as much privacy as psychologically needed. In Fuller's words, the house was designed to provide "high-standard functioning, unconsciously compatible with man's unconsciously coordinated internal mechanisms and chemistries."²¹⁵

Although it was never built, the *Dymaxion's* design displayed forward-thinking and influential innovations in prefabrication and sustainability. Not only would the house have been exemplary in its self-sufficiency, but it also could have been mass-produced, flat-packaged and shipped throughout the world. Jencks describes the *Dymaxion* as the embodiment of the technical ideals of the 1920s, especially that of Le Corbusier's "house-machine", and that Fuller had refuted the Bauhaus ideals by taking them on a literal level, and also that he took them even much further than they were ever intended by designing the *Dymaxion*. Indeed, the early drawings and models of the *Dymaxion* look more like a piece of machinery than a house, as we came to know the concept.

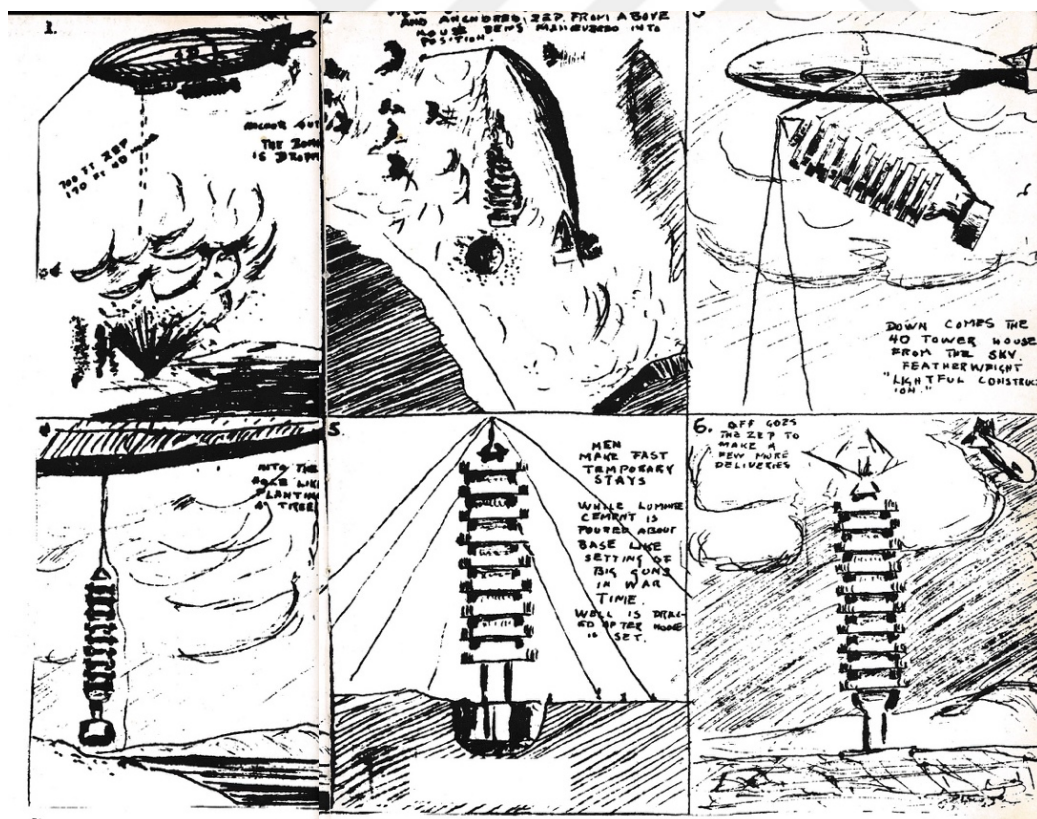


Figure 46 – "Multiple-Deck 4D House; Air Ocean World", 1927. The zeppelin would anchor above the site and drop a bomb to create a crater into which the tower would be lowered and cemented in place. Source: *The Dymaxion World of Buckminster Fuller*, 70-71.

²¹⁵ *Ibid.*, 22-23.

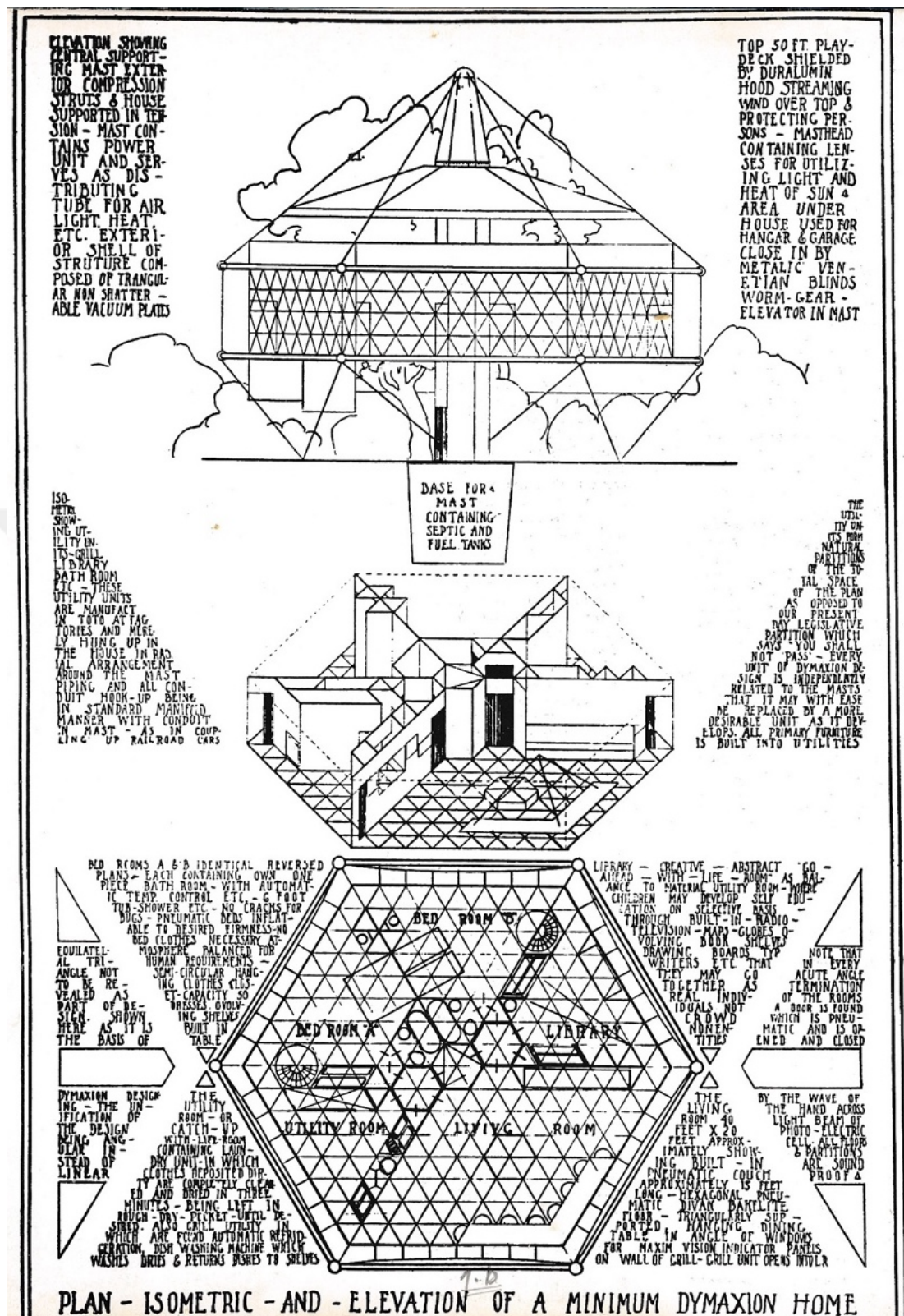


Figure 47 – Plan, isometric and elevation of Dymaxion 4D house, 1927. Source: *The Dymaxion World of Buckminster Fuller*, 82.

4.1.2. *Dymaxion Deployment Unit, 1942*

Fuller's campaign to convince government officials to reuse military assembly lines especially stands out during this period. In 1940 Fuller had applied the construction techniques used to make corrugated metal grain silos to his *Dymaxion* idea and designed the *Dymaxion Deployment Unit*, a precursor, or intermediary to the *Dymaxion Dwelling Machine* to come a little later (Figure 48). In the beginning of 1941, Fuller began presenting his "grain-bin house" to the Division of Defence Housing Coordination and other prospective consumers. In April 1941, the first full-scale prototype was publicly revealed at Haynes Point Park, Washington DC, situated adjacent to the Pentagon, so it was convenient for curious military personnel to take a look. This prototype had a height of twelve feet and a diameter of twenty feet. It included ten porthole windows and fifteen small circular skylights that pierced through the conical ceiling. The inside part of the structure was covered with wallboard and filled with fibreglass insulation. The floors were constructed using Masonite that had a thickness of 1/8 inch. A system consisting of an adjustable skylight and ventilator was installed in the middle of the ceiling to facilitate the circulation of fresh air.²¹⁶

The *Dymaxion Deployment Unit* was priced at \$1,250, as stated in the advertisement. It included utilities and lightweight furniture from Montgomery Ward, such as a kerosene-powered icebox and stove. In October 1941, the Museum of Modern Art in New York placed the second DDU prototype in its sculpture garden at 11 West 53rd Street, alongside its collection of outdoor sculptures. After Pearl Harbor, the US Army Signal Corps acquired several hundred units and transported them to bases in the Mediterranean, the Persian Gulf, and the Pacific. These units were utilised as accommodations for pilots, radar personnel, and aviation mechanics. Furthermore, no fewer than one hundred units were dispatched to Signal Corps bases located within the United States, which notably includes Camp Evans.²¹⁷

²¹⁶ Alastair Gordon, "The Necessity of Ruins: The Lost Dymaxion Deployment Units of Buckminster Fuller," *Wall to Wall* (blog), May 9, 2014, <https://alastairgordonwalltowall.com/2014/05/09/the-necessity-of-ruins-the-lost-dymaxion-deployment-units-of-buckminster-fuller/>.

²¹⁷ Ibid.

Fuller's prefab housing designs were characterised by their simple nature, with the *Dymaxion Deployment Units* being the most basic of them all. These shelters were uncomplicated and affordable, possessing optimal specifications for manufacturing during times of war. They were constructed using galvanised metal, with *Masonite* floors and fibreglass insulation.²¹⁸

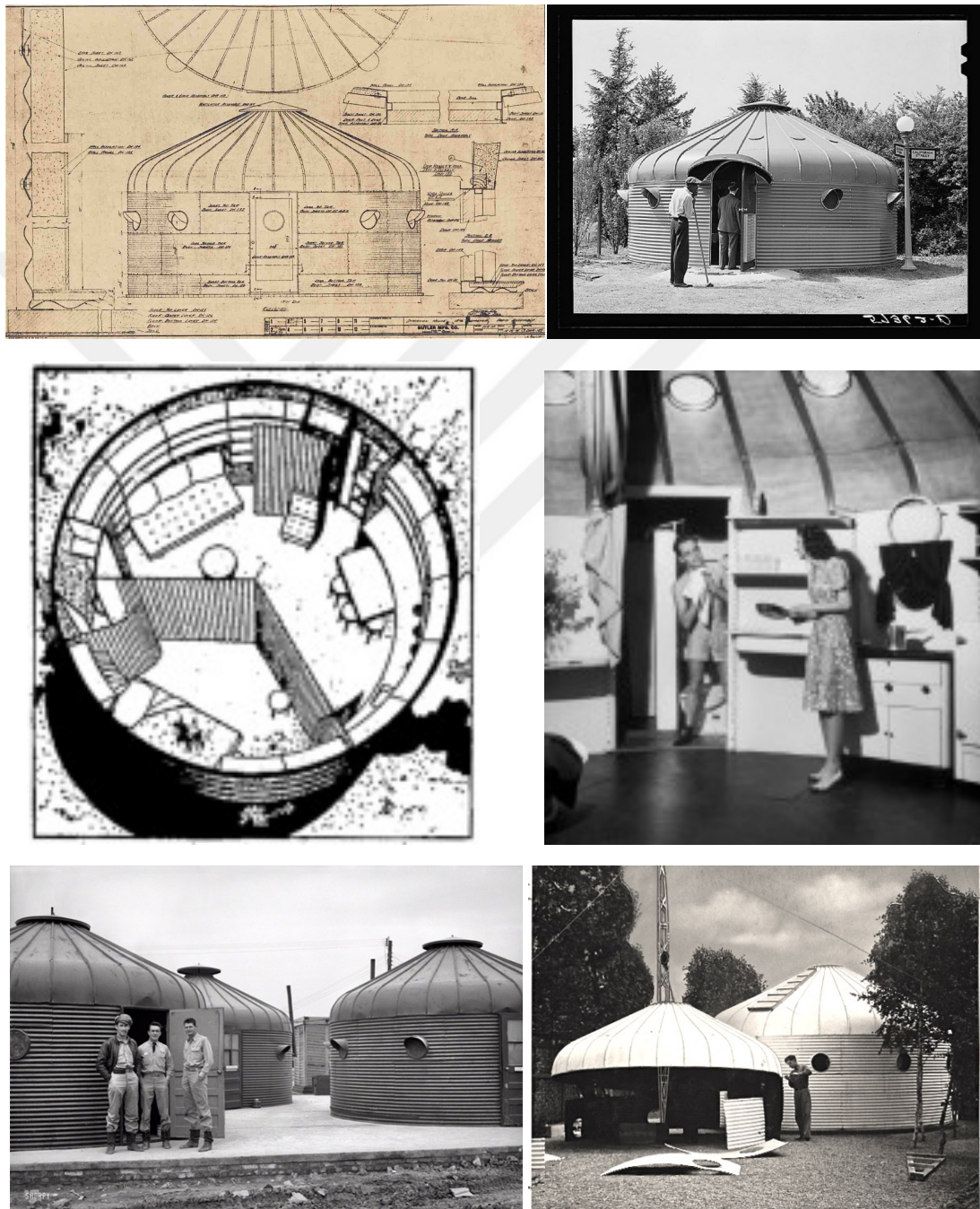


Figure 48 – The *Dymaxion Deployment Unit*, Clockwise: section; first prototype, Washington D.C., 1941; interior; construction; U.S pilots in North Africa, 1944; sketch showing interior.

²¹⁸ Ibid.

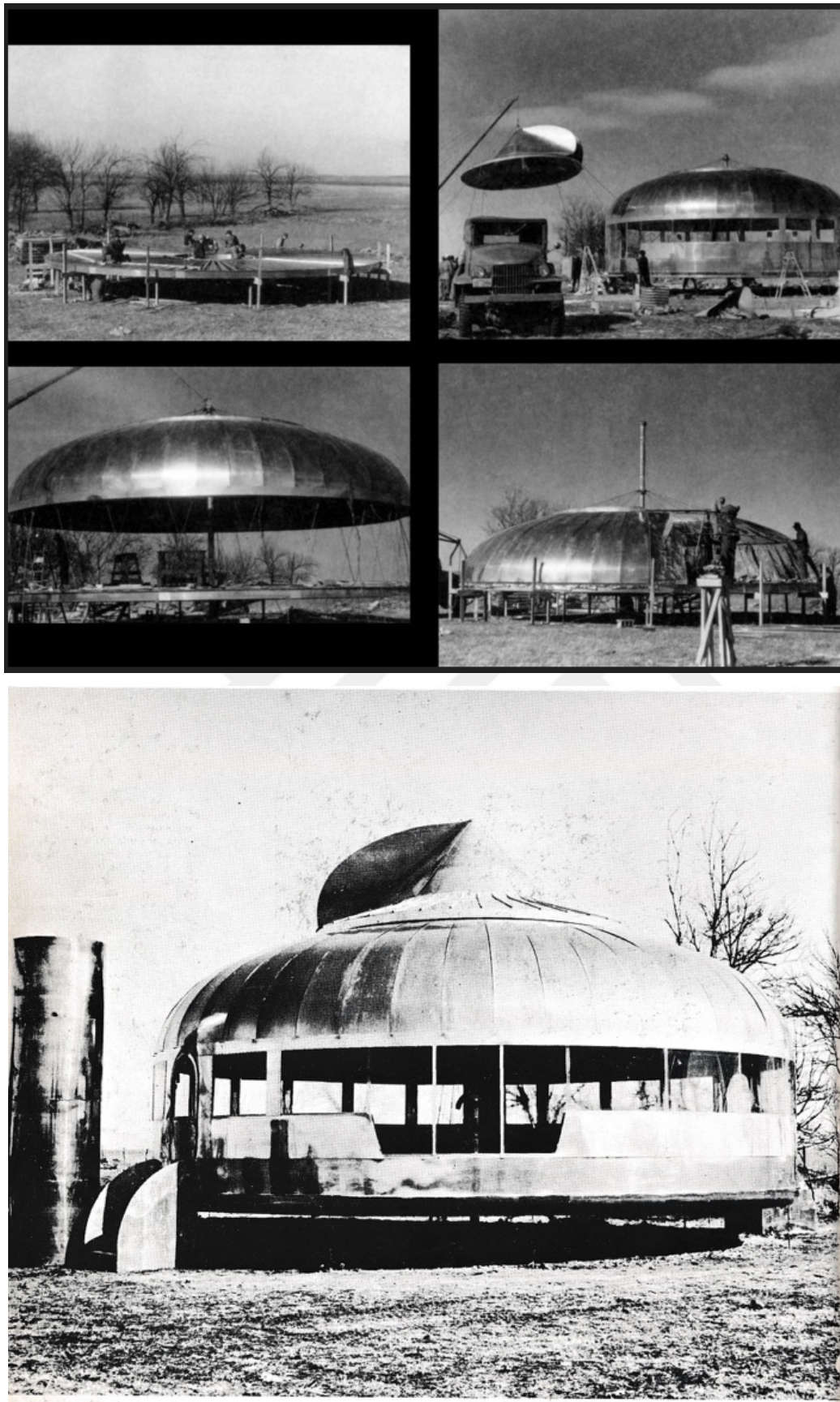


Figure 49 – Photographs documenting the assembly of the the Wichita house, 1946. The components of the house came delivered in the aluminium tube left of the house in the final picture.
Source: <https://images.lib.ncsu.edu/>

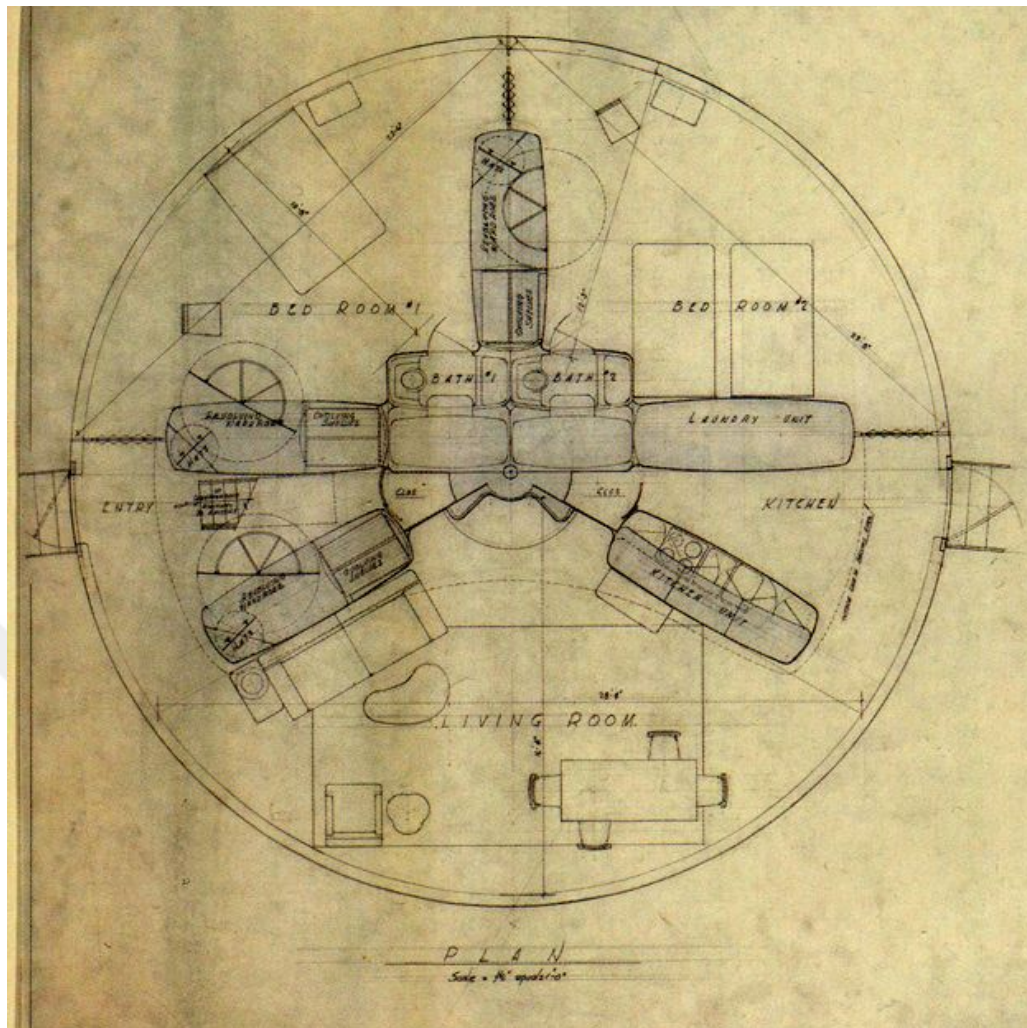


Figure 49 (continued) – Plan of the Wichita House. Source: <https://images.lib.ncsu.edu/>

4.1.3. *Dymaxion Dwelling Machine*, 1947

In 1944, urged by the foreseeable post-war housing shortage, Fuller revisited his previous idea of mass production of residential units. To make his vision house a reality, Fuller signed a contract with Beech Aircraft industries, who held an abundance of aluminium in the aftermath of WW2. In 1946 he completed the *Dymaxion Dwelling Machine*, otherwise known as the *Wichita House*, a prototype of the revamped version of the 1927 *4D Dymaxion*.²¹⁹ Like the 1927 design, the Dwelling Machine was assembled around a central mast (seven 6,7m high stainless-steel tubes clustered together and mounted on a shoe and springs) surrounded by the floor ring and radial beams. Connected to the mast were the diagonal and vertical cables which suspended the three steel rings on which the aluminium dome was assembled and

²¹⁹ Marks, *The Dymaxion World of Buckminster Fuller*. 120-133.

raised. Later, the 35,9m (in diameter) plexiglass windows were installed along with the aluminium outer walls. Finally, the rotating ventilator was placed on top (Figure 49).²²⁰ The house also came equipped with a *Dymaxion Bathroom*, revolving closets, folding doors, and *ovolving* shelf-containers installed in the bedroom walls (Figure 50). The design of the Wichita Dwelling Machine is reminiscent of the curves, metallic shine and sleekness of an airplane, which is only natural given that the house was produced in the same way, and the use of aluminium was a logical choice for constructing a light, prefabricated design. The design weighed approximately 2.700kg.²²¹

For Jencks, the image of the house remains fresh, as it is the result of an “intensive re-study of all the traditional requirements of living in a house.”²²² Yet it also came with issues:

But it is still univalent (as are his domes) because the social values implied are one-dimensional and based on a behaviourist sociology. There is never any idea of the way houses might form a larger group nor of the way political institutions operate in an urban fabric. In fact, there is no social and public realm at all. Presumably the reason for this is that Fuller looks on politics as essentially subjective, irrelevant and corrupt, since whenever he speaks about the political realm it is to point out these negative qualities.²²³

Indeed, Fuller regarded politics as an outmoded activity, “a naïve attempt to achieve through game of words what must ultimately be derived from technology.” In a correspondence in 1960 he said:

...the problems of world peoples have been entirely entrusted to its political masters. The political masters ever and anon meet and get pushed by their respective sides into the word-punching ring called ‘summit,’ only to discover that they can not resolve anything by political statements simply because the world’s problems are not political.²²⁴

The philosophical logic behind Fuller’s total rejection of politics was based on his attempt to progressively subdivide the universe into a generalised mathematical schema, whose end product is a strategy of evolution radically opposed to

²²⁰ *Ibid.*, 128-129

²²¹ *Ibid.*, 131.

²²² Charles Jencks, *Modern Movements in Architecture*, 2nd Revised (Harmondsworth: Penguin Books, 1985). 212.

²²³ *Ibid.*, 213.

²²⁴ *Ibid.*, 53.

Darwinism.²²⁵ As opposed to Darwinism where the strongest prevail, Fuller believed that humanity could be developed and advanced into the next step of our evolution as a whole with the help of technical innovation. He took cumulative experience as a pivotal factor in change, since experience can be stored, studied, and directed to be turned to advantage after a selective and conscious effort. Fuller eventually postulated a comprehensive global economic strategy that was solely concerned with mankind's survival and growth. His assumptions on energy and universe led him to an ultimate philosophy of industrialisation "which permits and implements man's

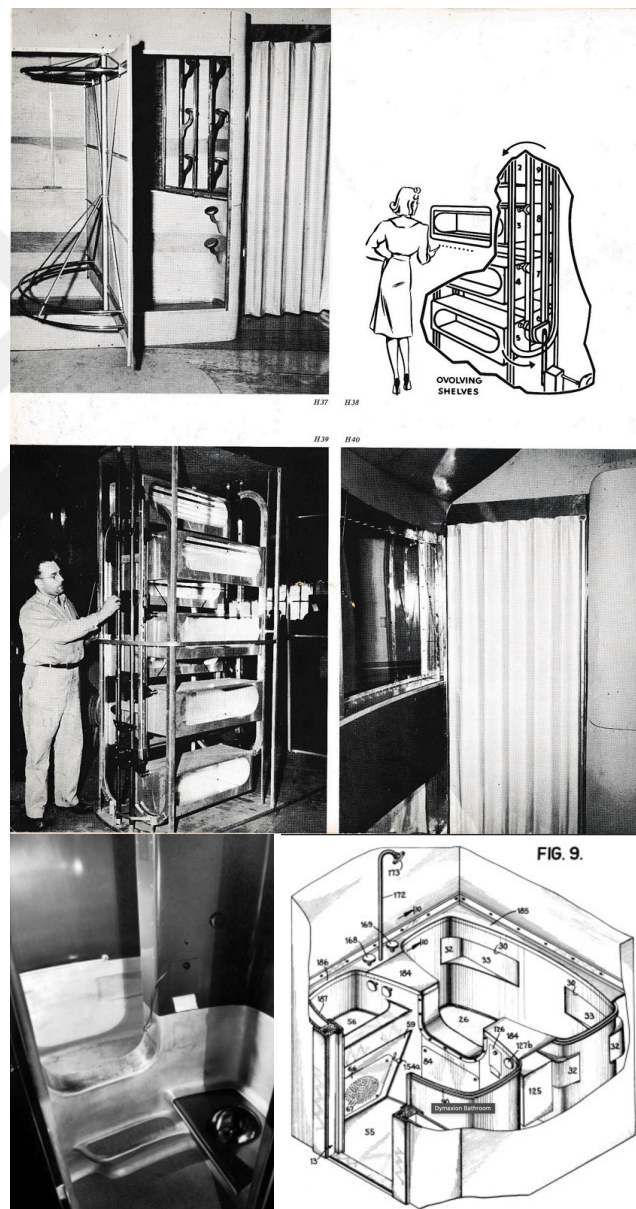


Figure 50 – Top: The *evolving shelf* device of the Wichita house. Bottom: The *Dymaxion Bathroom*. Source: Marks, *The Dymaxion World of Buckminster Fuller*, <https://images.lib.ncsu.edu/>

²²⁵ Ibid.

conscious, though limited, participation in his own evolutionary patterning transformation.”²²⁶

Buckminster Fuller’s *Dymaxion* idea and design was neither long-lasting nor implemented to any significant extent and found resonance in few later critics. Reyner Banham, in *Theory and Design in the First Machine Age*, had pitted Buckminster Fuller’s *Dymaxion Dwelling Machine* against Le Corbusier’s *Villa Savoye* as “the fully acknowledged response to the machine age as opposed to the appearance of mechanization.”²²⁷ Banham further said that he was one of those “few peripheral radicals whose ideas call the whole professional apparatus into question” and still be tolerated by the profession.²²⁸ According to Anthony Vidler, the idea that Fuller’s *Dymaxion* was the true embodiment of the machine age which Banham thematised in *Theory and Design in the First Machine Age* was dismissed by the majority of architects. Vidler states that Fuller was only accepted in the architectural spheres as a “form giver”, rather than a theoretician and researcher whose main body of work focuses on the shelter needs of humanity. He furthermore criticises the architectural history produced between 1960 and 1990 for excluding many works of Fuller.²²⁹ For instance, Kenneth Frampton, while talking about the housing shortages in the United States during the Great Depression of the 1930s, only briefly mentions Fuller and *Dymaxion* house while talking extensively about his influence on functionality and geodesic structures.²³⁰ The work of Fuller thus were ignored in the architectural publications between 1960s and 1990s, except in such fringe publications as Stewart Brand’s *Whole Earth Catalog*, published in 1968. The book/catalogue of practical “do it yourself” information appealed to the dropout hippie communities of the American West, and resulted in Fuller’s rise to prominence as a counter-culture icon.²³¹ Fuller received recognition in the late 1990s, thanks to

²²⁶ Marks, *Dymaxion World*, 10.

²²⁷ Anthony Vidler, “Whatever Happened To Ecology? John McHale and the Bucky Fuller Revival,” *Log* 13, no. 14 (Fall 2008): 139–46.139.

²²⁸ *Ibid.*, 140.

²²⁹ *Ibid.* Vidler states that he had looked at the monographs written by Leonardo Benevelo, Charles Jencks, Manfredo Tafuri, Francesco Dal Co, Kenneth Frampton, William Curtis, and Alan Colquhoun.

²³⁰ His influence can be seen in several works of Louis Kahn, as Kahn and Fuller spent time together at Yale University. Kenneth Frampton, *Modern Architecture: A Critical History*, 3rd ed. (London: Thames and Hudson, 1996). 243-44.

²³¹ Vidler, 140.

an editorial written by Reinhold Martin for *ANY* magazine, entitled “Forget Fuller?”, in 1997. Martin states that in order to rethink and appreciate Fuller, his theorisation of modern architecture, and proposal to “figure architecture as a kind of organism”, it is necessary to ask “the presumptions and politics of [his] universalism and his unflinchingly utopian optimism.”²³² Martin who also states that Fuller has to be forgotten first to be remembered for what he truly acknowledged the unique character of Fuller’s practice as such:

To reconsider Fuller is also to think about him as a most speculative of practitioners, theorizing profusely even as he was negotiating patents for his inventions. It is to ignore - at least momentarily - the swagger of neo-post-, and pseudo- "avant-gardes" and to think instead about the extended courtship between the avant-garde and technology, already institutionalized by the 1920s when Fuller was busy conducting his own techno-aesthetic experiments. It is to recognize Fuller's aesthetic contribution and ask why, in contrast, architects of the official cutting edge have paradoxically and continuously found themselves always already behind the vanguard of technological research, often conducted and sponsored by the military, one of Fuller's most prized clients.²³³

Banham, in his 1965 essay “A Home is Not a House”, advocates some of Buckminster Fuller’s ideas on domestic architecture and asks a critical question:

When your house contains such a complex of piping, flues, ducts, wires, lights, inlets, outlets, ovens, sinks, refuse disposers, hi-fi reverberators, antennae, conduits, freezers, heaters – when it contains so many services that the hardware could stand up by itself without any assistance from the house, why have a house to hold it up?²³⁴

Indeed, Banham observes that buildings have been mechanically invaded to the point that the public often gets confused in distinguishing structure from mechanical services, especially in the 20th century, and that, this is especially true in the case of American architecture. American architecture, Banham states, never really had an established tradition of creating monumental spaces, and this is the reason why many American architects saw mechanisation of buildings as a threat to their cultural existence, which paradoxically relies on monumental construction. The art of monumental construction remained a transplant from the older European

²³² Reinhold Martin, “Forget Fuller?,” *ANY: Architecture New York*, no. 17 (1997): 14–15.

²³³ *Ibid.*

²³⁴ Reyner Banham, “A Home Is Not a House,” *Art in America* 2 (1965): 70–79. 70.

culture, and many architects like Louis Sullivan and Frank Lloyd Wright emulated European architectural tropes in the 20s and 30s, while in the 50s and 60s, Charles Eames and Philip Johnson belonged to the international culture (Figure 51).

Banham boldly states that Americans, when left to themselves, do not monumentalize or create architecture in the usual sense, and that their understanding of a house is merely a “hollow shell”, that is an inefficient barrier against climate. Hence, Americans gradually mechanised their shelters to pump more power, heat and light into them, compared to other societies. Furthermore, Banham identifies the outdoors, the porch and the terrace as the American monumental

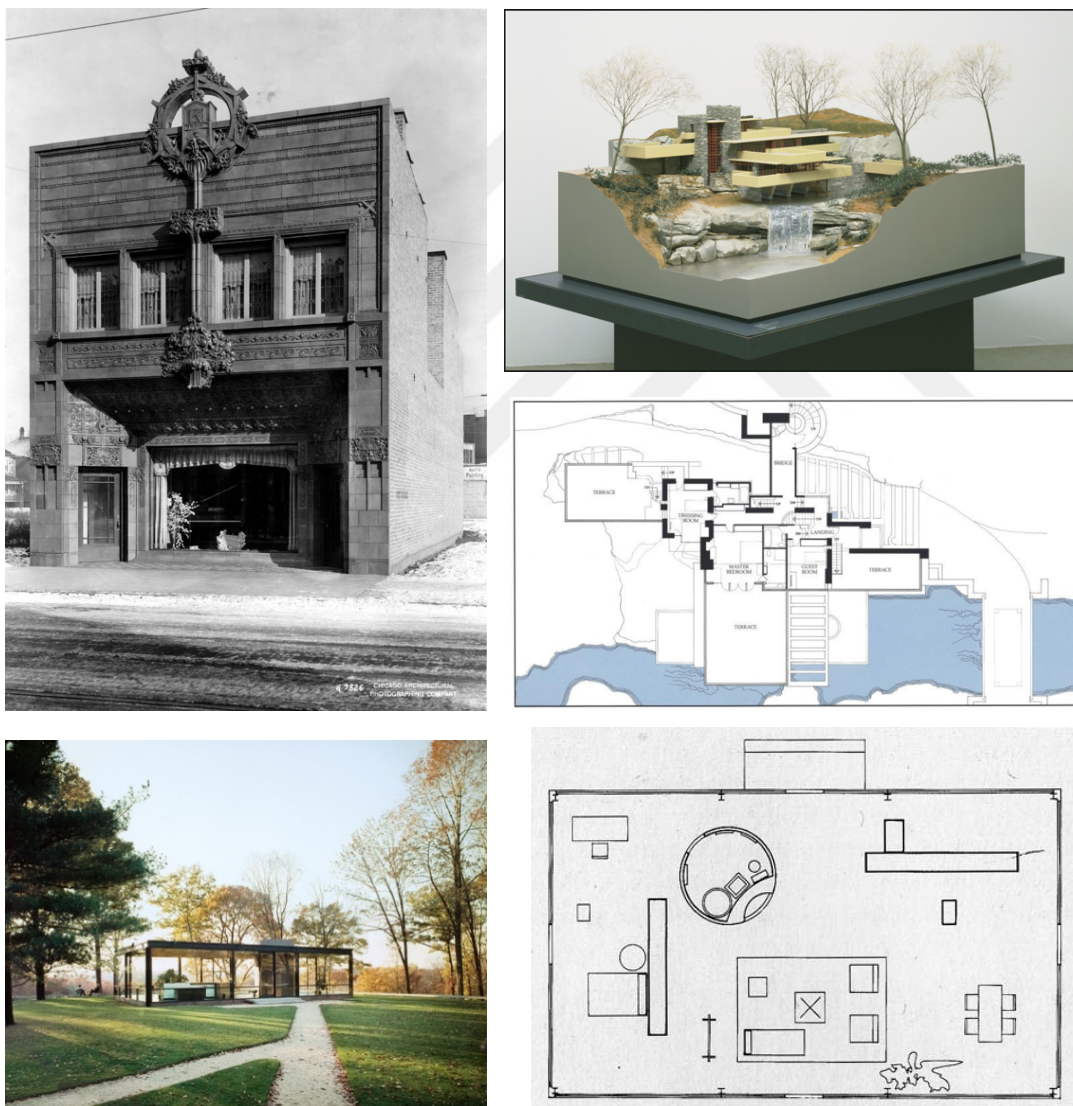


Figure 51 – Clockwise: Krause Music Store, Lincoln Ave. Chicago, Il, 1922. Façade by Louis Sullivan, Frank Lloyd Wright. Fallingwater, Edgar J. Kaufmann House, Mill Run, Pennsylvania. 1934-37. Model (makers: Paul Bonfilio, Joseph Zelvin, Lawrence List, Edith Randel [MoMa]) and plan. View from the south-east of the Glass House, New Canaan, Connecticut, 1949. © Ezra Stoller/Esto and plan. Note Sullivan’s use of European ornamentation and Wright and Johnson’s International Modernism in terms of floor planning and design. Johnson’s design especially is reminiscent of Mies’ Farnsworth House and the Barcelona Pavilion.

space, stating that American houses were adapted to a lifestyle that favours the outdoors, and thus prefers informally planned large, single space interiors (Figure 52). Another point he raised is that from the very beginning, American interiors were lighted and heated in a very different fashion from the European cubic interiors, and amenities such as the Franklin stove or the kerosene lamp had to be serviced better to accommodate a civilised culture.²³⁵ Banham mentions how he had come to the realisation as to why Americans approached architecture in such concepts as informality, indifference to monumentalism, cleanliness, lightweight shell and mechanical services as such:

It finally came clear and legible to me in June 1964, in the most highly appropriate and symptomatic circumstances. I was standing up to my chest-hair in water, making home movies (I get that NASA kick from taking expensive hardware into hostile environments) at the campus beach at Southern Illinois. This beach combines the outdoor and the clean in a highly American manner – scenically it is the ole swimmin’ hole of Huckleberry Finn tradition, but it is properly policed (by sophomore lifeguards sitting on Eames chairs on poles in the water) and it’s *chlorinated* too. From where I stood, I could see not only immensely elaborate family barbecues and picnics in progress on the sterilised sand, but also, through and above the trees, the basketry interlaces of one of Buckminster Fuller’s experimental domes. And it hit me then, that if dirty old Nature could be kept under the proper degree of control (sex left in, streptococci taken out) by other means, the United States would be happy to dispense with architecture and buildings altogether.²³⁶

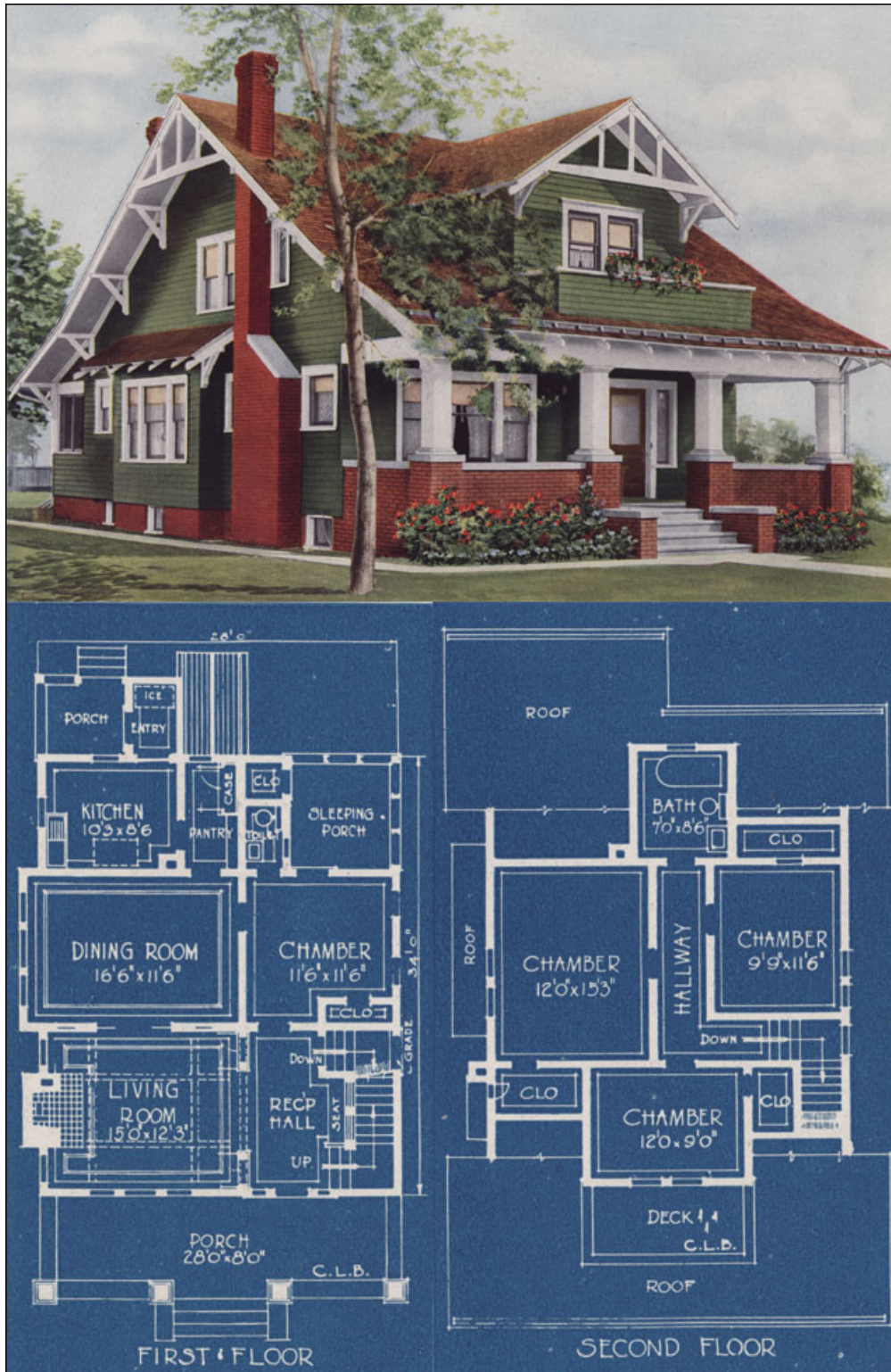
Buckminster Fuller was indeed a staunch supporter of lightweight production. He is famously known for asking, while marketing his *Dymaxion* house, non-rhetorically, “Madam, do you know what your house weighs?” (Figure 53). This question, Banham states, articulated “a subversive suspicion of the monumental” and that many Americans who lived in mobile homes inarticulately shared this suspicion.²³⁷ Americans indeed, are known as automobile admirers, to the extreme point that they tend to use it for pretty much everything. Banham gives the example of the “drive-in movie house”, in which the car is the essential component of this “non-architectural anti-building” which is “just a flat piece of ground where the operating company provides visual images and piped sound”, therefore, the name *house* is merely a “manifest misnomer”.²³⁸ This is because the majority of the

²³⁵ *Ibid*, 73.

²³⁶ *Ibid*, 74.

²³⁷ *Ibid*.

²³⁸ *Ibid*, 76. Americans have ‘drive-in burger houses’ as well.



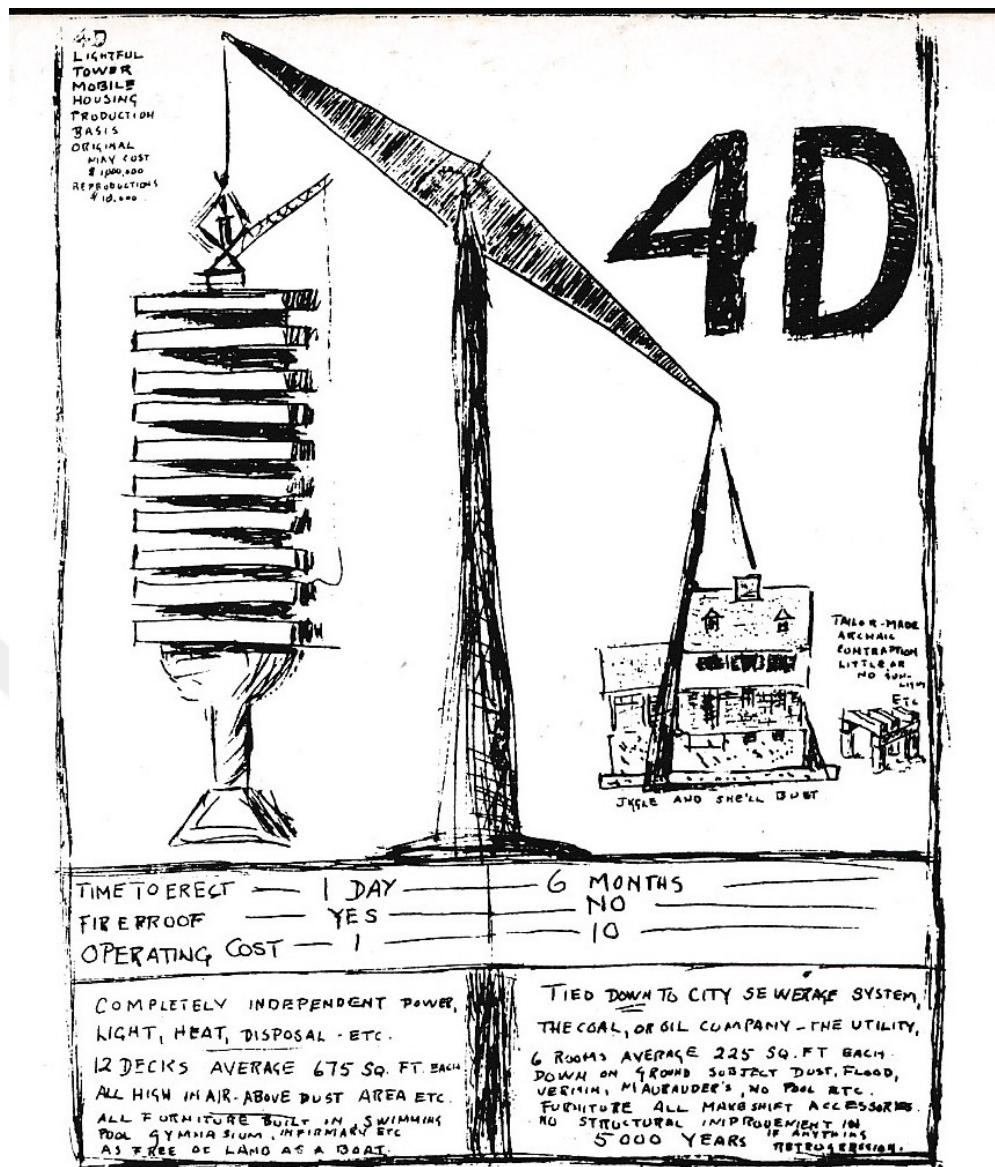
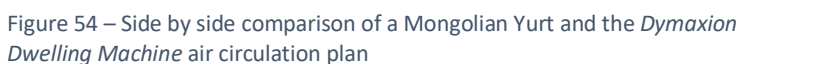


Figure 53 – Sketch and notes by Buckminster Fuller dramatizing the advantages of his 4D Tower House as compared to a conventional house, 1927. Source: *The Dymaxion World of Buckminster Fuller*, 77.

blueprint for this kind of settlement came from a government housing project in Northeast Philadelphia: Lewittown in Bucks County, Pennsylvania developed between 1952 and 1958. Lewittown was the creation of a construction company from New York, called Lewitt and Sons which specialised in prefabrication and have been doing business with the government since 1942. Although Lewittown was a huge success in terms of its scale, its houses are not known to eliminate drudgery from the household.²³⁹

²³⁹ Twenty million Americans moved from cities to suburbs between 1950 and 1960. Lewittown grew to have its own education, health and entertainment services. See Curtis Miner, "Picture window paradise" in *Housing and Dwelling* (2007), 280-85. Despite having all the modern household amenities,



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The Wichita experiment ended because of a lack of funds necessary for reaching 20,000-units-per-year production. Two prototypes were ordered by the Air Force, only to be resold to Fuller as Cold War demanded the aircraft factory to return to its original function. These were ultimately bought by a Kansas oil tycoon, whose “architectural additions and modifications in effect,” according to Fuller, “forever grounded this aeroplane.”²⁴⁰ Today, this prototype (donated by an investor of Fuller in 1990, restored in 2001) can be found in the Henry Ford Museum in Michigan.²⁴¹



Figure 55 – Top: Interior of the *Futuro*. Photo: John Zimmerman / MFA <https://en.docomomo.fi/projects/futuro-house/>. Left: Interior of the *Futuro* displaying oval shaped details. Photo from Centraal Museum, Utrecht Right: detail from the entrance. Photo by Gili Merin, <https://divisare.com/projects/330728-craig-barnes-matti-suuronen-gili-merin-futuro-house>

²⁴⁰ Marks, *The Dymaxion World of Buckminster Fuller*. 133.

²⁴¹ <https://www.thehenryford.org/explore/inside/dymaxion-house/>

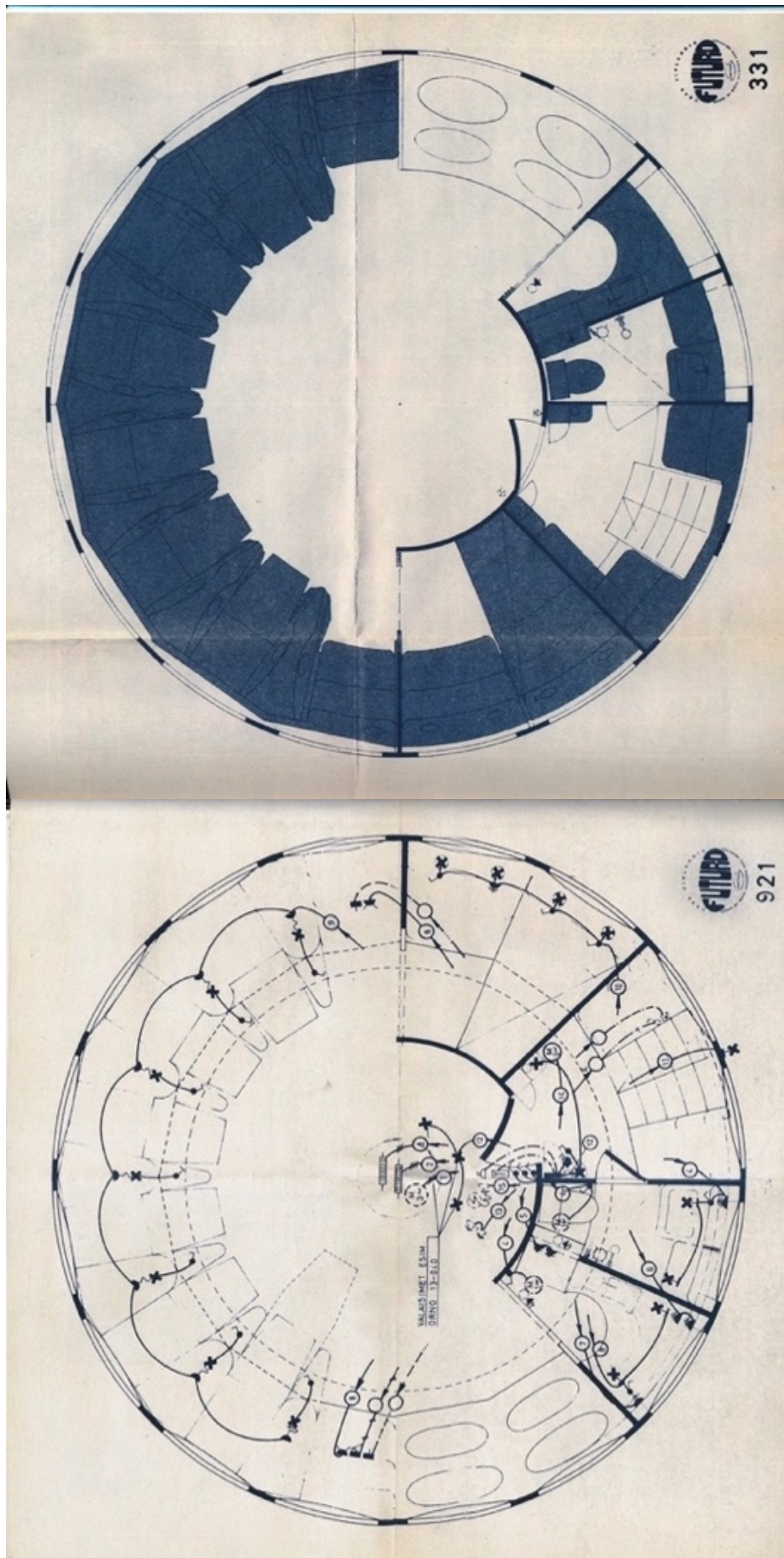


Figure 56 – Matti Suuronen, plan of the Futuro. Source: *Futuro: Tomorrow's House from Yesterday*, 14-15.

4.2. The *Futuro*: A Space Age Pop Icon of Leisure

The *Futuro* house was designed by the Finnish architect Matti Suuronen (b.1933 – d.2013) who was commissioned by a friend in 1965 to design a ski-cabin that would be quickly heated and easily constructed on rough terrain.²⁴² Suuronen chose polyester plastic reinforced with fiberglass as the building material, a material with which he had previously worked with while designing a large, 8m in diameter, plastic dome for the roof of a grain silo. The contract was given to Polykem Ltd., a company that specialised in plastic roof domes and neon lights.²⁴³ After an extensive research and development process, the final design came to be an ellipsoid shell construction of fibreglass elements insulated with polyurethane foam, and the curvature of the exterior was repeated in elliptic details like the acrylic windows, door handles, light fittings and power sockets (Figure 55). The shell itself stood on a steel foundation ring that stood on four legs.²⁴⁴ The geometry of the structure is what is called a “rotating ellipsoid, or spheroid, with key ratios represented by π . Suuronen indeed, is known to have employed mathematics in his designs, even though the prototype of *Futuro* was constructed merely from rough sketches.²⁴⁵

In March 1968, the unfurnished and yet nameless white prototype (no. 000, currently in a museum in Rotterdam, the Netherlands) of the *Futuro* was unveiled to the press at Polykem’s plant at Hiekkaharju. From there it was transported to the town of Turenki near Kalpalinna, and was set up on a ski-slope, on a property owned by the commissioner of the project, Dr. Jaakko Hiidenkari in June 1968.²⁴⁶ The prototype measured 8m in diameter and 4m in height, and had 140m³ volume.

²⁴² The main source used for the *Futuro* house is, *Futuro: Tomorrow’s House from Yesterday*, published in 2003. This collection of articles, edited by Marko Home and Mika Taanila, not only provides extensive information on the *Futuro* but also a speculative look at the futuristic past. A DVD of Mika Taanila’s 1998 film *Futuro, A New Stance for Tomorrow*, and another 45 minutes film are also used. Taanila and Home’s study is dedicated to Suuronen’s *Futuro* house. It covers the history of the development process, technical details, and marketing of the house, and places *Futuro* in architectural historiography by emphasising its experimental value and cultural significance. The accompanying film with the same name is also a valuable visual documentation.

²⁴³ Marko Home and Mika Taanila, “From Snowy Slopes to the Foot of Minarets - The *Futuro*’s Journey from Ski Cabin to International Art Icon,” in *Futuro: Tomorrow’s House from Yesterday* (Helsinki: Desura, 2003), 12–47. 12.

²⁴⁴ *Ibid.*, 13.

²⁴⁵ *Ibid.*

²⁴⁶ *Ibid.*, 16

Having 25 m² floor area it occupied a 50m² lot area and weighed around 4000kg in total. The standard interior fittings consisted of six special bed-chair combinations, a double-bed recess, a combined fireplace and slab that also served as a grill, a kitchenette, and a bathroom with a toilet (Figure 56). The polyurethane insulation and the electric heating system allowed the house to be warmed up to comfortable temperatures in just thirty minutes. The access door was moulded, and like in a jet plane, served as the front steps when opened. In favourable conditions, the house could be assembled and dismantled in two days, or airlifted as a whole by helicopter (Figure 57).²⁴⁷

A second cabin (no. 001, still unnamed) was made in bright yellow. The marketing firm Lomanotko Ltd., hired by Polykem Ltd arranged a public relations project in which the house was gifted to Matti Kuusla, a Finnish television celebrity, along with a sizable lakeside property in the municipality of Hirvensalmi (Lake



Figure 57 – A *Futuro* being airlifted by the Swedish Air Force on October 22, 1969. Source: *Futuro: Tomorrow's House from Yesterday*, 30.

²⁴⁷ *Ibid*, 16-17. However, it should be noted that the *Futuro* was not intended as a movable object. The misconception comes from the few spectacular instances, notably when it was airlifted in Sweden. Transportation of this sort would not be practical in any urban context, and the notion that the *Futuro*, constructed as a modular system kit, was originally intended to function as a genuine mobile home, capable of sustaining regular assembly and disassembly, is proved to be wrong by the deteriorated condition of the Prototype and the architect's statements on this matter. See, Lydia Beerkens, "Matti Suuronen's 'Futuro' - Prototype 1968 After 50 Years," *Docomomo Journal*, no. 66 (n.d.): 60–67., 131.

Puulavesi in Paaskyniemi region; the house is still in the same place (Figure 58).²⁴⁸ To get the building permits from the local governor, the marketing team had apparently used the idea that the construction of the cabin would trigger the emergence of a thriving new community at the site, complete with dance halls and playgrounds. As projected, the sight of a bright yellow house with its unmistakable shape aroused much curiosity among local tourists, attracting visitors from many locations who were eager to witness the peculiar architectural design resembling a structure from outer space. Due to its prominent visibility on Lake Puulavesi, the structure was readily discernible to boaters over a considerable distance. In September 1968, the weekly magazine *Apu* featured a cover article on Kuusla's "outer-space villa," which was titled "*Matti Scrambles the Landscape*" in a quite negative manner. According to Kuusla, the bubble house may be considered as a visionary architectural concept that was not fully appreciated at its time. The negative reaction from the public can be seen as indicative of the conservative attitudes prevalent in Finland. Kuusla found



Figure 58 – Matti Kuusla's Futuro in Hirvensalmi, Finland, 1968. Source: *Futuro: Tomorrow's House from Yesterday*, 20.

²⁴⁸ Another study dedicated solely to the *Futuro* is an undergraduate thesis written by Anna-Maija Kuitunen in 2010, in the Department of Conservation in Metropolia University of Applied Sciences at Helsinki. The thesis is a meticulous documentation of *Futuro* no. 001, the first *Futuro* manufactured following the 1968 prototype. The author has compiled information on the design, technology, materials, and the damages about this particular *Futuro* (which was not well-maintained), and states that even though the houses were more than forty years of age (exceeding the manufacturer's guarantee of thirty years by a decade) they can withstand for even more years with regular maintenance. See Anna-Maija Kuitunen, "Futuro No. 001 – Documentation and Evaluation of Preservation Needs" (Metropolia University of Applied Sciences, 2010), <https://www.theseus.fi/handle/10024/15865>.

amusement in the strong opposition, to the extent that there were rumours of local citizens planning to destroy the structure with dynamite. Thus, the house was never electrified, and the dynamic new community that was supposed to sprawl around it never became a reality.²⁴⁹

Suuronen's design was first dubbed *Futuro*, when the third house (no. 002) was displayed at the Finnfocus Export Fair held in London in October 1968 (Figure 59). Set up and displayed on top of a ferry on the Thames, the cabin caught the eye of the British, with *The Daily Mirror* praising its sense of humour for being "the Finnish idea of a perfect weekend cottage" while looking like "everyone else's idea of a flying saucer from outer Space".²⁵⁰ The *Futuro* was thus, on its way to becoming a global cultural phenomenon.

The *Futuro* received ample publicity in Finland. Some reviews were cheerful, calling the house a "home from another planet", and the "holiday home of the future", while often praising its "bold and promising departure from run-of-the-mill housing design."²⁵¹ One particular criticism pointed towards it came from the architect Reijo Jallinoja, who complained that the *Futuro* was exorbitantly expensive in view of its cramped floor space, the lack of a terrace, and generally being out of context in relation to its surroundings. Jallinoja also marked that the "only possible explanation for its success is its unusual appearance, which might perhaps satisfy the eccentric quirks of a small handful of buyers."²⁵²

Several companies started to purchase production rights for the house, like the *Futuro Corporation* in the United States (est. 1969). Polykem continued to process international orders, and responded to production rights coming notably from

²⁴⁹ Matti Kuusla, who was 35 years old at the time, said that "I think it's cool [...] It turns me on to think what a shock you get when you drive down this narrow road and discover this extraordinary vision at the end of it [...] But that's just my thing, someone else might be turned on by an expensive sports car." We are informed that Kuusla's statement is in association with Jean Baudrillard's analyses of consumer society which date from the same period: "If the man is a man, he will choose his wife among other objects/signs (his car, his wife, his eau de toilette) [...] Woman, whose fate lies with the paraphernalia (household objects), fulfils not only an economic function, but a prestige function, deriving from the aristocratic or bourgeois idleness, attested to the prestige of their masters [...] [Woman] remains an attribute, reigning over those secondary attributes, the household objects." Hari Kalha, "A House of Ill Repute: Figuring Out the Futuro," in *Futuro: Tomorrow's House from Yesterday* (Helsinki: Desura, 2003), 130–75.

²⁵⁰ Home and Taanila, 21.

²⁵¹ *Ibid.*, 26.

²⁵² *Ibid.*

Australia, New Zealand,²⁵³ Germany, Sweden (the Swedish Air Force bought a number of reinforced versions to use as observation posts), Japan, and the USSR. Given *Futuro's* success, Polykem later decided to launch a full-blown line of durable prefabricated structures made out of plastic under the brand *Casa Finlandia*, all designed by Suuronen (Figure 60).²⁵⁴

During the late 1960s, the robust growth of the U.S. economy presented a significant opportunity for the investors who aimed to get into the American market. The "fibreglass Funhouse" *Futuro*, while being built and constructed in Helsinki, had then exhibited certain Space Age aspirations prevalent in America. Approximately one month before Neil Armstrong's momentous moon landing, the *Futuro* made its inaugural appearance in the city of Philadelphia. The *Evening Bulletin* labelled the news as "Work is Taboo in 'Space Ship' Homes of the Near Future" The piece showcased H. Leonard Fruchter, the *Futuro Corporation's* president, and the sole licensee in the United States and the Caribbean, who promoted the "carefree vacation home that would be wonderful at the shore, or in the Poconos." Fruchter

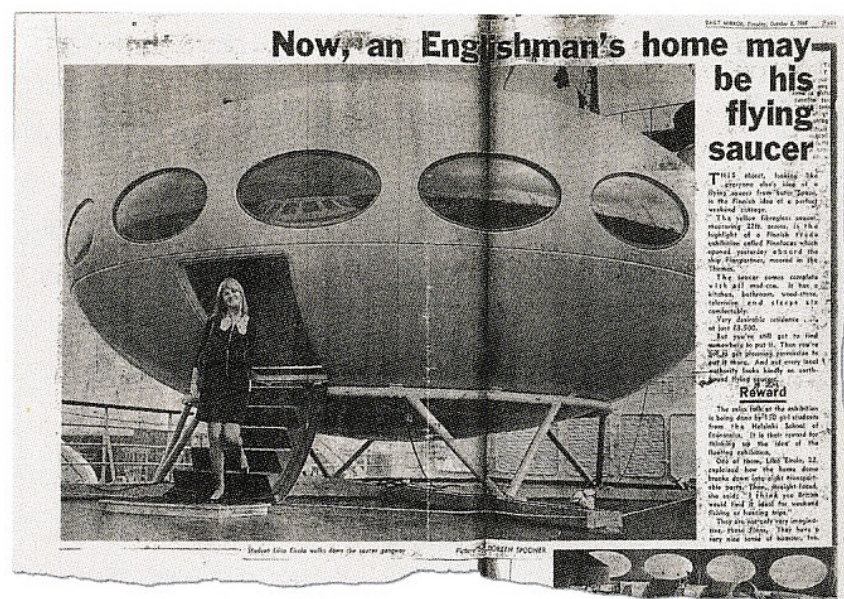


Figure 59 – Newspaper clipping from *The Daily Mirror*, October 8, 1968.
Source: *Futuro: Tomorrow's House from Yesterday*, 149.

²⁵³ One particularly interesting thing about the *Futuros* produced in New Zealand by the *Futuro Homes (NZ) Ltd.* is that the licensing for construction only included the outer shell. This meant that the interiors were left to local interpretation, and could be customised and catered for individual tastes, which relatively increased customer demand for the house. Paul McNeil, "It Will Stand!," in *Futuro: Tomorrow's House from Yesterday* (Helsinki: Desura, 2003), 120–29. 124.

²⁵⁴ Home and Taanila, 27.

however, reportedly underestimated hard science and concentrated on jet age conveniences: “we would like to think that you can just plug the place in like an appliance.” He was still trying to appeal to the American housewife’s fantasy of a toil-free environment, an “obsession” that *Popular Mechanics* celebrated in 1950, with an article predicting airtight, water-proof abodes, where “the housewife of 2000 can do her daily cleaning with a garden hose.”²⁵⁵

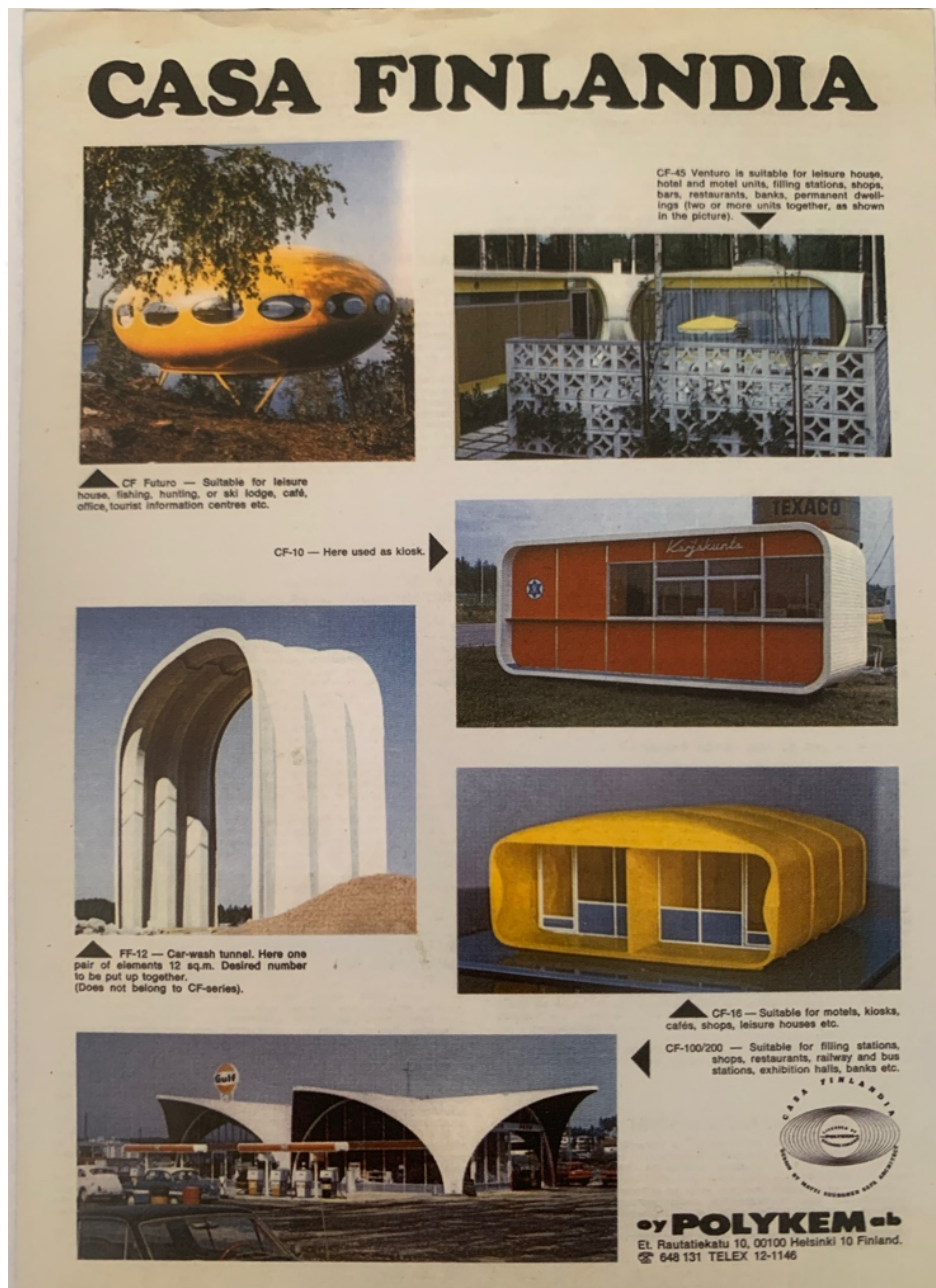


Figure 60 – Page from Polykem brochure showing their line of prefabricated buildings. Source: *Futuro: Tomorrow's House From Yesterday*, 29.

²⁵⁵Joseph Lanza, “Architecture You Can Swallow,” in *Futuro: Tomorrow's House from Yesterday* (Helsinki: Desura, 2003), 100–119., 107-108.

The *Futuro*'s popularity continued to rise towards the end of the decade, with MoMA's *Department of Architecture and Design* requesting photographs of the house for its collection in 1969, and several highly popular magazines like *Playboy* publishing articles about it in the 1970s (Figure 61). However, despite its media backing, two major oil crises (first between 1971-73, second in 1979) gradually killed the production of the *Futuro*.²⁵⁶



Figure 61 – “Portable Playhouse” from September 1970 issue of *Playboy* <https://thefuturohouse.com/Futuro-House-Books-Magazines-Memorabilia-My-Collection-Magazines-ps.html>

After its production ceased in the late 1970s, the *Futuro* became a collectible art object, getting featured in various exhibitions, its design getting praise from artists, until finding its way into the 7th International Istanbul Biennale in 2001, which culminated its transformation from utility building to art icon (Figure 62).²⁵⁷ It still gains attention today which shows that there is more to *Futuro*'s cultural significance than it merely being an art object, that lies in its design, use of material, and the futuristic image it projected. First of all, the design is rather friendly, as the architect himself remarked in an interview in 1969:

People shouldn't live in black and white boxes. Nature's own shapes are much friendlier, [and] wouldn't you agree that [the Futuro] takes its shape from nature? You don't come

²⁵⁶ For more information about the oil crises see Judt, *Postwar*, 454-456.

²⁵⁷ *Home and Taanila*, 43.

across any square rocks in nature, but you can certainly find plenty of round or ellipse-shaped ones. And besides, you see bright colours in nature, too, sometimes in dazzling combinations. Why shouldn't man use colour as well? ²⁵⁸

Matti Kuusla's portrayal of his former vacation home highlights the nuanced connections between the (cognitive) environment of the *Futuro* and concepts of gender, sexuality, and the emancipated values prevalent during the late 1960s: "It [the *Futuro*] was like a womb, a fantastic vibe. It took you in its arms... It was a heavenly feeling of action on togetherness, the here and now!"²⁵⁹



Figure 62 – Futuro at the grounds of Topkapi Palace, during the 7th International Istanbul Biennale, 2001.
<https://thefuturohouse.com/Futuro-Kauhava-Finland.html>

The linguistic framework employed by Kuusla exhibits elements of nostalgia, while also including a socio-cultural and phenomenological encounter with the *Futuro*. The physical space might be seen as having feminine qualities, and can even be seen as being "hystericized" in a metaphorical sense. During the period when Kuusla acquired his *Futuro*, philosopher Gaston Bachelard, in his work *Poetics of Space* (1969), developed the notion of the house as a mother entity that provides nourishment and shelter. Bachelard conceptualised the house as a "uterine" space, including both a physical location and a mental state characterised by nostalgic contentment. According to Kuusla, the *Futuro* may be described as a "mood" that

²⁵⁸ Harri Kalha, "A House of Ill Repute: Figuring Out the Futuro", 137.

²⁵⁹ *Ibid.*, 154-155

envelops individuals, however it should be noted that this embrace is not of a maternal nature, at least from his perspective. The space is infused with a profound sense of desire. In an alternative context, Kuusla characterised the *Futuro* as a "butterfly," so reinforcing the perception of the dwelling as a dynamic and feminised environment. This comparison evokes thoughts of the female protagonist in Puccini's opera (*Madama Butterfly*, 1904) who is both attractive and disposable. She is shown as being confined inside the confines of the theatrical setting, symbolising the exotic portrayal commonly found in operas.²⁶⁰



Figure 63 – Promotional brochure: *Leisure House Futuro*. Note the use of the circle for framing the photographs, also the women posing invitingly in different places in the house. Source: *Futuro: Tomorrow's House from Yesterday*, 138-139.

This "friendly" spaceship that looks like it might have just landed on the seaside, or in a forest also symbolises departure/adventure, appropriation and closure, precisely because it is a spaceship. The roles of men and women, in the concept of the *Futuro*, are also well defined, with the male being the adventurer, and the woman his companion.²⁶¹ This is evident in the advertisements for the house in which the pictures of the *Futuro* are framed in circles, the ideal geometry of modernization, while also giving it a feel of being a "peephole" (Figure 63). It invites the viewer to look onto the house while not being a part of the picture. In four out of the seven photos, there are different women, posing invitingly at the door of the bedroom, in a reclining chair, or on the bunk. The invisible viewer, is obviously a man,

²⁶⁰ *Ibid.*, 155

²⁶¹ *Ibid.*, 140.

and the woman, is another decorum in the design of the *Futuro*. The design suggests that the inside space is designed to be enticingly feminine, but reserved exclusively for male use.²⁶² Furthermore, according to the “*Futuro Hostesses*” it was mostly men interested in the *Futuro*.²⁶³ Indeed, it was a house that raised issues on sex, as it was conceived at the height of the sexual revolution of the 60s. Richard J. Williams’ 2013 book *Sex and Buildings: Modern Architecture and the Sexual Revolution* is one useful source to interpret the *Futuro*’s prominent features. His study begins with the early 20th century settings where designers and others envisioned sex as a “health regime.” He continues to present the faith of the erotic space in the middle of the twentieth century in America, when sex was openly commercialised and made into a commodity in both hotel design and private homes, and examines how relatively recent challenges to conventional sexual identity may have influenced design thinking.²⁶⁴ Williams points out that houses with high modern aesthetics like John Lautner’s houses in Los Angeles were highly sexualised through motion pictures and photographic media (especially by publishers such as Taschen and Playboy).²⁶⁵ Having been featured in the most ideal bachelor pads list of *Playboy* in 1970, the *Futuro* can well be placed in this category too as a complementary piece of modern architectural commodity.²⁶⁶ Yet, the role of the *Futuro* in masculine adventure fantasies was truly crystallised when it was used as a setting for a pornographic story in 1971 (Figure 64). *The Goddesses of Galaxia* published in *Private* magazine, tells a story about two “perfect, tall, blonde, better-than-human” aliens (a nod to Aryan ideals) who come to Earth for their anthropological studies, since ironically on their planet, men and women are treated as equals and trained in the same way. Just as in the advertisements, no men are seen in the photos, and the women are given an active role, just as long as it fits the confines of the male fantasy.²⁶⁷

²⁶² *Ibid.*, 141.

²⁶³ “While men in their early thirties were excited, while women – ever practical and down-to-earth – pointed out shortcomings like the *Futuro*’s conspicuous lack of storage space.” *Ibid.*, 151.

²⁶⁴ Williams says in the introduction that he “was searching throughout for a frank representation of sex in architecture something that proved surprisingly difficult to find” and that, “That it was so hard was a function of the societies I was writing about. In a highly developed market economy, buildings are commodities as much as living spaces, their cost and enduring value as investments, inhibit experimentation.” Richard J. Williams, *Sex and Buildings*, 26.

²⁶⁵ Williams calls this type of depiction of modern domestic space *pornomodernism*. *Ibid.*, 107-109.

²⁶⁶ Kalha, “A House of Ill Repute: Figuring Out the *Futuro*.” 157.

²⁶⁷ *Ibid.*, 160-161.

The material of the *Futuro* was plastic. According to Roland Barthes, the “chemical” colour of plastic made it less desirable than organic materials: “A luxurious object is still of this earth, it still recalls, albeit in a precious mode, its mineral or animal origin.” Plastic was also associated with pop culture and more importantly the Americanization of culture, which was feared by Europe after WW2. The revolutionary aspect of plastic was the reason it was treated suspiciously; it could potentially replace all other substances.²⁶⁸ In 1954, Douglas Haskell, a representative from the *American Institute of Architects*, posed a rhetorical question on the potential impact of atomic processes on the field of architecture: “In architecture will atomic processes create a new plastic order?” In the subsequent three-year period, the *Monsanto Corporation* made notable progress in the field of lightweight homes, as evidenced by the introduction of a plastic “*House of the Future*” at Disneyland (Figure 65). The creators of the product, supported by the research undertaken at the Massachusetts Institute of Technology, utilised the polyester body and fibre glass reinforcements as a model, drawing inspiration from architect Charles Eames’ iconic moulded plastic chairs. Within the context of thinking, synthetic fibres emerged as a widely embraced solution, serving as a testament of technological expertise and the affluence of the middle class.²⁶⁹

The 1960s and early 70s were very much under the cultural domination of plastic, as the material was extensively used in every aspect of daily life, especially in the United States. It was the era when Andy Warhol declared that he “not only loved plastic, but also wanted to be plastic.”²⁷⁰

The *Futuro*, despite being elevated to a pop icon never became popular in its native Finland for both economic and cultural reasons. First of all, the energy crisis and global recession increased its manufacturing costs. Secondly, it clashed as an idea and design, with the home culture of the country; it failed to fulfil the expectations from a summer home. Would it have been more desirable if created in a different time or place? Maybe not even then, since the design was a personification of many things that artists cringe at: it was popular, politically incorrect, posey, and

²⁶⁸ *Ibid.*, 134-135.

²⁶⁹ Lanza, “Architecture You Can Swallow.”, 109-110.

²⁷⁰ *Ibid.*

pornographic. More than anything, it was an object of representation instead of functionality. The *Futuro*'s form follows fantasy instead of function.²⁷¹ The *Futuro* references mid-century housing experiments by incorporating prefabrication and the use of plastic as a novel material. Its elliptical form and circular plan offer a continuous living space to its inhabitants along with a panoramic view of their surroundings. Its primary function as a vacation home shows that it shares the same upper-middle class utopian ideal as the Case Study Houses. An owner of a Case Study House could very well afford a *Futuro* as a second home. Yet it could very well function as a primary house for bachelors or couples without children. From a cultural standpoint, its distinct shape makes it an object suitable for SF fantasies and there have been productions that have used it as a backdrop for such fantasies. The *Futuro*'s story contains the history of a "vain, hope-inebriated, and hubris-prone" period from the "swinging prosperity of the high-industrial age with its vision of colonizing outer space" in the mid-Sixties to the "oil crisis crash landing that made the idea of a plastic house seem criminally insane" in the mid-Seventies.²⁷²



Figure 65 – Monsanto's House of the Future in Disneyland, built 1957, removed in 1967. Source: <https://www.invisiblethemepark.com/2017/03/monsanto-house-of-the-future-when-the-future-was-made-of-plastics/>

²⁷¹ Kalha, "A House of Ill Repute: Figuring Out the Futuro." 163-167.

²⁷² Olaf Möller, "Picture-Perfect Future," *Film Comment* 41, no. 3 (June 2005): 12-13. 13.

4.3. Metabolism, Kisho Kurokawa and Capsule Houses

As perhaps the most imaginative of architectural movements, the Japanese *Metabolists* have the strongest of ties to science-fiction. William O. Gardner's *The Metabolist Imagination* can be considered as David Fortin's eastern counterpart with regards to its subject matter. Gardner's study is important because it outlines in detail the post-war Japanese economic developments and the reconstruction of Japanese cities that were shaped according to those economic policies. Furthermore, it highlights the intersection between architecture and its relationship to technology in the form of Expos, particularly in the case of the 1970 Osaka Expo, which not only displayed *Metabolist* creations in the form of exhibition pavilions, but also showcased the upcoming technologies of the information age. In addition to that, Gardner also thoroughly analyses the influence of *Metabolism* on science-fiction products of the 1970s until present day, especially in Japan.

The fact that the first hand sources on the *Metabolists* include writings by the architects themselves is a fortunate case in architectural historiography.²⁷³ Kenzo Tange's architecture laboratory in the university of Tokyo assembled a study group

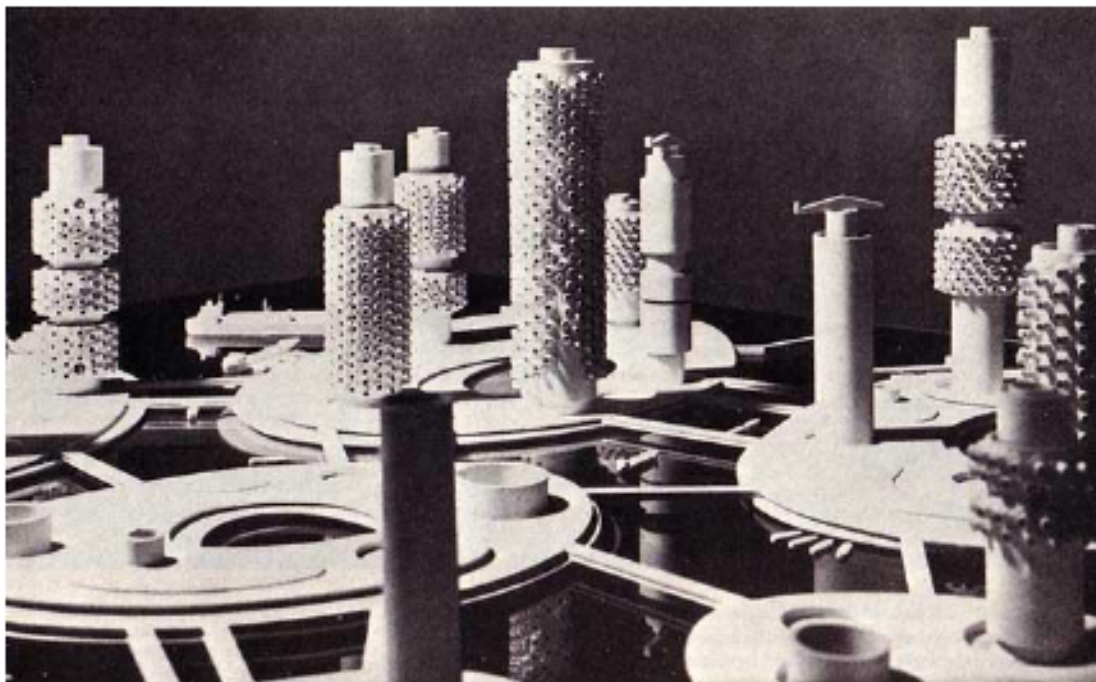


Figure 66 – Kiyonori Kikutake, “City over the Sea”, model, 1962 Source:
https://www.researchgate.net/figure/Kiyonori-Kikutake-Ocean-City-1962_fig1_273204741

²⁷³ Since the main case study is the Nakagin Capsule Tower, the edition of Kisho Kurokawa's *Metabolism in Architecture* with an introduction by Charles Jencks is used as the main reference.

of young architects and designers, including Kisho Kurokawa to produce a theoretical statement which would originate in Japan but would become applicable worldwide.²⁷⁴ An architectural movement and philosophy of change, *Metabolism* was thus created almost as a propaganda for the *World Design Conference* held in Tokyo in 1960, and the manifesto publication *Metabolism 1960: The Proposals for New Urbanism*, was distributed at the conference, which was sponsored by the Japanese Chamber of Commerce.

Kurokawa was then twenty-six years old, and the other architects were in their early thirties. They had studied the politics of European avant-garde movements and were determined to create an “ism” to rival those in the West.²⁷⁵ The group met every two weeks at night to discuss designs, such as Kiyonori Kikutake's utopian project “City over the Sea,” a series of massive cylinders located on what they referred to as “artificial land” (Figure 66).²⁷⁶ The idea of the city as an organism that changes at different rates arose from such utopian designs. According to Kurokawa, who aspired to be a doctor before becoming an architect, the name *Metabolism* was coined for their credo and philosophy by first evolving their concepts of plug-in buildings and megastructures and then consulting a lexicon for inspiration.²⁷⁷ Kenzo Tange became a spokesperson, via his works, such as the *City for Ten Million* (Figure 67) based on a tertiary economy, as well as his statements:

In challenging reality, we must prepare and strive for a coming era which must be characterized by a new type of technological revolution... the control and planning of the production and distribution of energy while creating productivity far surpassing that of the present... In the not-too-distant future the impact of a second technological revolution will change the basic nature of overall society...²⁷⁸

Metabolism was thus defined as an attempt to address such urban problems as overcrowding, poorly planned infrastructure, loss of green space, and the

²⁷⁴ William O. Gardner, *The Metabolist Imagination: Visions of the City in Postwar Japanese Architecture and Science Fiction* (Minneapolis: University of Minnesota Press, 2020), 32.

²⁷⁵ Charles Jencks, “Introduction,” in *Metabolism in Architecture* (London: Studio Vista, 1977), 8–22. 9.

²⁷⁶ No wonder the project was entitled as such, considering that 80 percent of Japan is mountainous and habitable space has always been scarce and valuable. Ibid.

²⁷⁷ Ibid.

²⁷⁸ Jencks, *Modern Movements in Architecture*. 72.

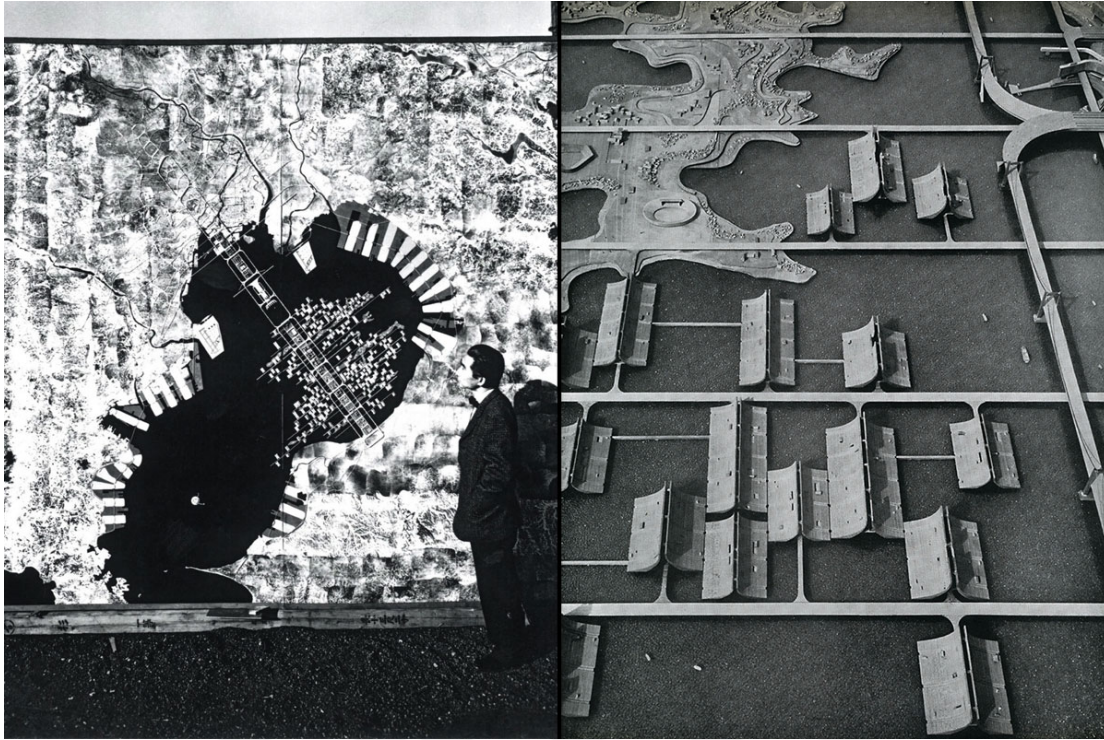


Figure 67 – Model and plan of City for 10 million, Kenzo Tange, 1960. Source: <https://archeyes.com/plan-tokyo-1960-kenzo-tange/>

hierarchical, top-down nature of architecture and city planning.²⁷⁹ It was hoped that the *World Design Conference* would unite the various professions responsible for Japanese trade and provide them with a unified style and coordination that could be recognized by the outside world.²⁸⁰ *Metabolism* evolved into a more comprehensive biological analogy to replace the mechanical analogy of traditional contemporary architecture. It equated the cycles of change, the ongoing renewal and destruction of organic tissue, to an energy process seen in all of life. This metaphor, however, was not as novel to the West as it appeared. In many ways, it was simply an extension of the ancient Taoist idea of cosmic change and perpetual evolution, which creates an infinite number of variations on the same topic.²⁸¹ Although like their European counterparts, there seems to be a disregard for tradition amongst the *Metabolists*, there is still ample evidence of traces of traditional design. Traditional Japanese architecture, indeed was characterized by constant change; the wood buildings and Shinto shrines are recreated every twenty years. These shrines dedicated to the

²⁷⁹ *Ibid.*

²⁸⁰ Incidentally, this economic motive led to the formation of the German *Werkbund* in 1907, with comparable results: a new style fusing art and industry, which would increase 'good taste' at an ever-increasing profit. *Ibid.*

²⁸¹ *Ibid.*

emperor cult are not revivals or imitations in the Western sense. Instead, they are nearly perfect duplicates that precisely replicate the original shape, effectively freezing time and eradicating any historical alterations. Similarly, the *Metabolists'* change philosophy paradoxically stops the clock. They allowed certain structures to remain undisturbed when others wear out, by clearly separating parts of a building or city that have different rates of change. Their ideal was to create a city with connections that were supposed to be so adaptable that its parts could grow, transform, and die while the whole animal continued to live. The *Metabolist* theory distinguished between different rates of obsolescence (mechanical equipment wears out faster than structure, for example) so that one did not have to destroy an entire building or part of a city every time a single part failed. The *Metabolists* also took many ideas and images from different sources and consistently perfected them so that they became better than the originals, like in the case of Kenzo Tange's *Theme Pavillion* at Expo 70 (The Festival Plaza, Figure 68), which was a realization of *Archigram's Plug-in-City* (1964, Figure 69), and Yona Friedman's *Spatial City* (1959-



Figure 68 – Kenzo Tange, Festival Plaza of the 1970 Osaka Expo, featuring stage devices such as the robot *Deme*, designed by Arata Isozaki, and the “Black Sun” face of the Tower of the Sun by Tarō Okamoto. Photograph copyright Shinkenchikusha/DAAS. Source: *The Metabolist Imagination*.

60, Figure 70). Utopian visions of the early sixties effectively ended up becoming a rationalised method by the seventies.²⁸² The Osaka Expo, as an environment that was collaboratively created stood out as the most remarkable and important SF-like portrayal of a utopian "future city" in postwar Japan. The country was showcased as a simulated location for a future society by using the latest technologies, immersive multimedia locations, and astounding architecture. Concurrently, the Osaka Expo set up a subtle presentation of Japan's relationship with the world at large.

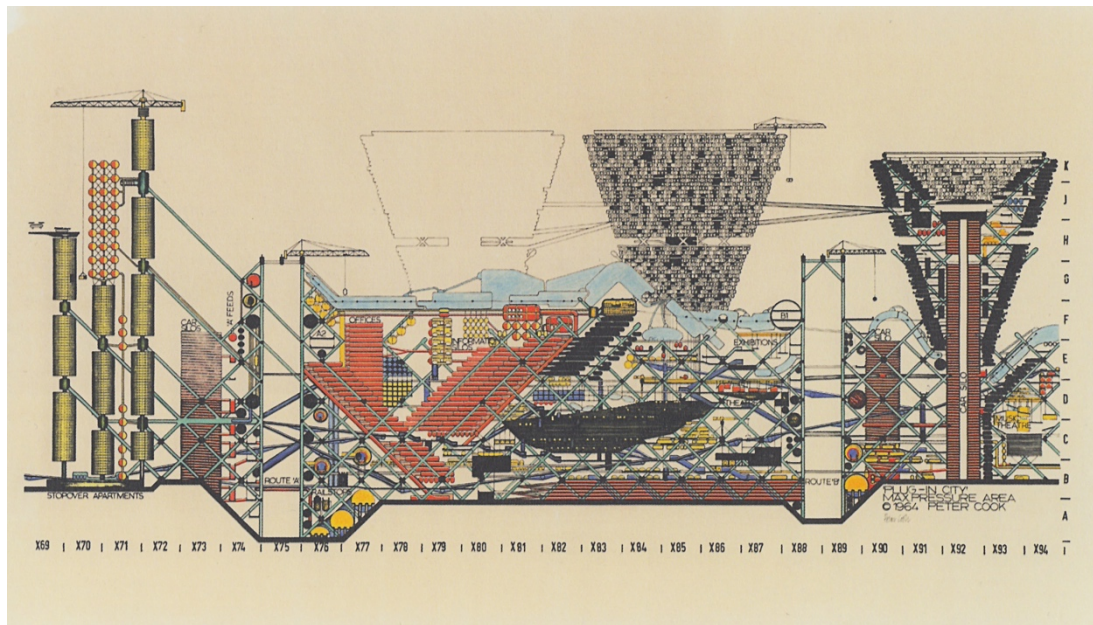


Figure 69 – Section of Plug-in City Maximum Pressure Area, Peter Cook, 1964 / ©MoMA

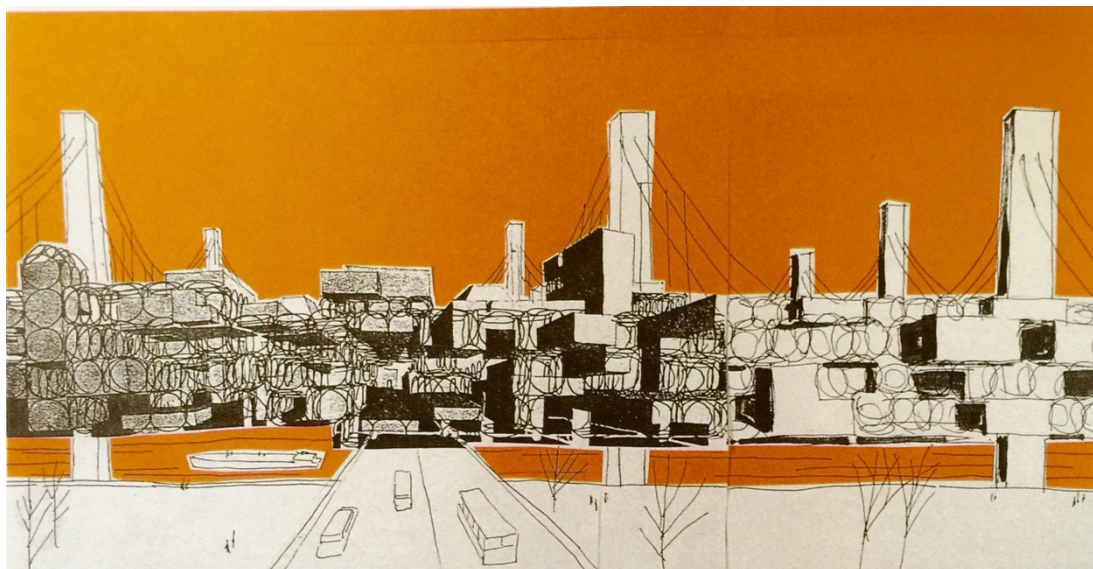


Figure 70 – Yona Friedman, sketch "Spatial City", 1959-1960. Photography: François Lauginie (Collection Frac Centre)

²⁸² Jencks, *Modern Movements*, 68.

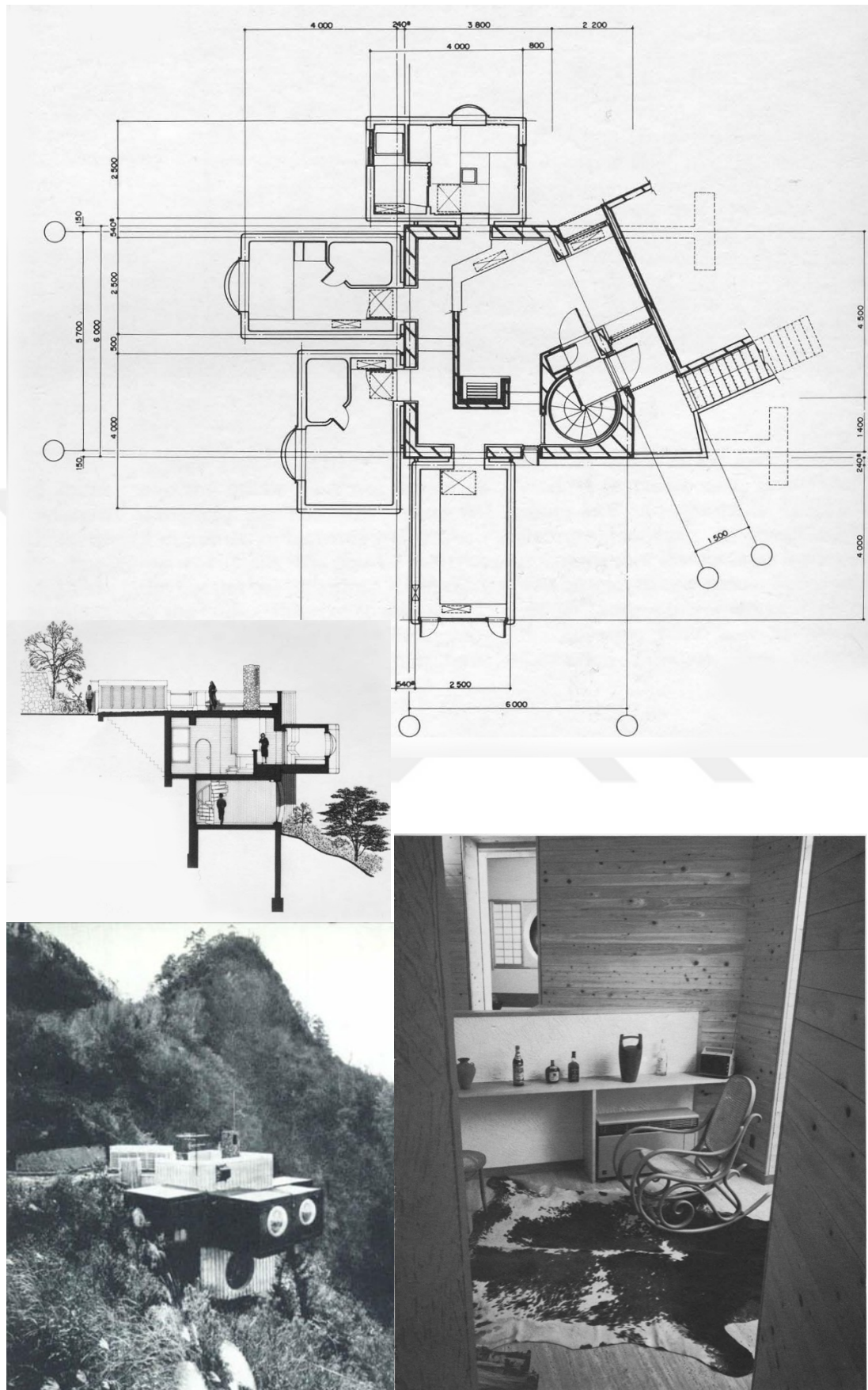


Figure 71 – Capsule House K (Kurokawa's summer house in Nagano, plan, section, view from north and living room. From *Metabolism in Architecture*.

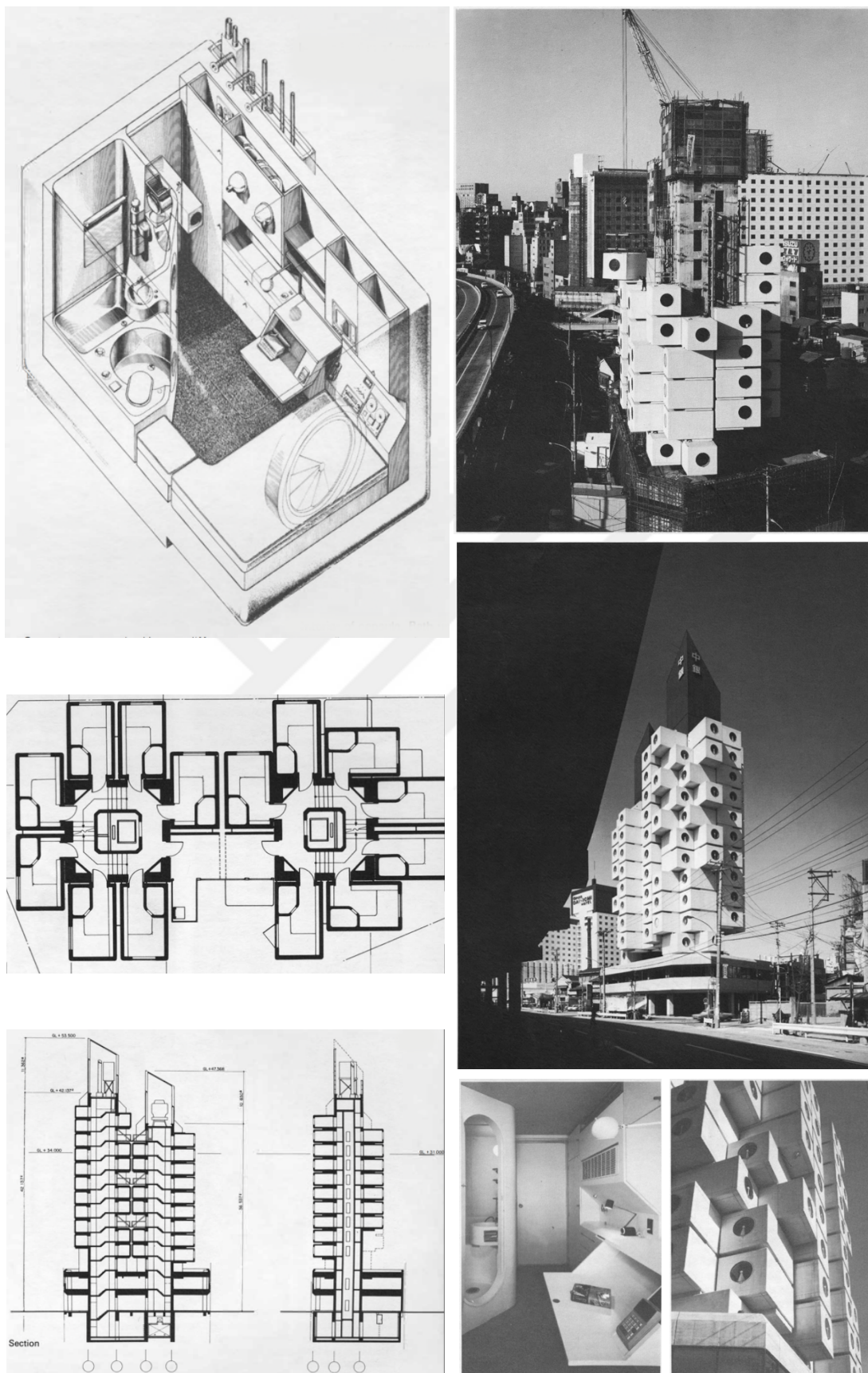


Figure 72 – Kisho Kurokawa, Nakagin Capsule Tower, Tokyo, 1972. Collage consisting of general views of the building, façade detail, capsule interior, section, plan, and isometric plan. From *Metabolism in Architecture*.

At the age of thirty-six Kurokawa had already designed numerous buildings, including three pavilions at Expo 70 as well as two new towns that were under construction then. His work typified the Japanese “economic miracle”, as was the case for other *Metabolists*, and unlike the avant-gardes of Europe, his architecture was actually built and accepted by the society. Kurokawa is frequently referred to as the “capsule architect,” a moniker he both endorsed and despised. “Capsule architecture” sprang out of his *Metabolist* prefabrication research in the late 1950s, which resulted in an idea for a huge block that could integrate standard pieces; basically, five equal elements fitted together like a meccano set.²⁸³ While the elements and picture were mass-produced, they were based on traditional farmhouse and *tatami* mat models which was a classic result of modern Japanese design, with all the ambiguity of the figure-ground illusion: from one aspect, it was completely futuristic, while from another, it appeared completely traditional.²⁸⁴ Kurokawa first published the “Capsule Declaration” in 1969, which envisioned a mobile future in which humans would dwell in capsules and defined the capsule architecture as follows:

The capsule is cyborg architecture. Man, machine and space build a new organic body which transcends confrontation. As a human being equipped with a man-made internal organ becomes a new species which is neither machine nor human, so the capsule transcends man and equipment. Architecture from now on will increasingly take on the character of equipment. This new elaborate device is not a 'facility', like a tool, but is a part to be integrated into a life pattern and has, in itself, an objective existence.²⁸⁵

Among his projects thus, his own summer house built in the Nagano Prefecture in 1972 (Capsule House K, Figure 71) and the Nakagin Capsule Tower built in Tokyo in 1972 stand out as representative of this approach. The Nakagin Capsule Tower project consisted of concrete towers with attached pre-fabricated housing units intended for a single resident, measuring about 9m² (2.5mx4mx2.5m total measurements) in floor area and containing a pre-assembled bathroom, double bed, table, chair, a convertible kitchen, audio system, television and clock radio (Figure

²⁸³ *Ibid*, 15.

²⁸⁴ *Ibid*.

²⁸⁵ Kishō Kurokawa, *Metabolism in Architecture* (London: Studio Vista, 1977). 75.

72).²⁸⁶ 140 steel capsules adapted from shipping containers were blended with a variety of existing conventional components. All of the furniture was built-in, including the bedside control panel, stereo tape player, and calculators, yet the space and measurements were standard. The idea was a practical solution to post-war housing demands, and overpopulation that have been plaguing Japanese cities ever since. Since all the capsules were interchangeable, the building, in true *metabolist* fashion, was intended to grow and change over time just as a living organism would, as required.

Kurokawa's second truly *metabolist* structure was the *Takara Pavilion* he designed for Expo 70, which consisted of a series of prefabricated steel capsules suspended within a cage of twisted steel tubes (Figure 73). Flexibility, growth, and



Figure 73 – Takara Pavilion, Expo'70, Osaka by Kisho Kurokawa. Photograph by Sir James Maude Richards (1934-2007) https://www.ribapix.com/takara-pavilion-expo70-osaka_riba24129#

²⁸⁶ Marko Home, "Alternative Futures," in *Futuro: Tomorrow's House from Yesterday* (Helsinki: Desura, 2003), 80–99. 92.

change, which had been discussed by the group for ten years now, had finally arrived. The entire structure was built in a week and promptly removed after Expo. Different systems and their rates of development were clearly separated visually and technically. Above all, the unfinished image, with its open flange ends waiting to grasp on to new structures and capsules, finally demonstrated to the world what *Metabolism* would look like when completely *metabolic*. Nonetheless, the design was unsettlingly traditional. The capsules were actually no different than the traditional pavilions, the *shoin*, in design approach and the flange ends were these ornate brackets that were found beneath the eaves of every Buddhist temple.²⁸⁷

The antagonistic coexistence manifests in the works of Kurokawa in the seams of structures and the collision of two structural systems. It may be found in the Nakagin Tower capsules where the room's *tatami* size (approximately 4 by 2.5m) exist “antagonistically” with the hardware of a completely self-sufficient space capsule yet again.²⁸⁸ Meaning that the traditional size of the room can be made to fit, and enhanced with modern equipment even if it was not meant to house any of them that creates a strange duality in Kurokawa’s architecture. The idea of stimulation, and the belief that Japanese life is best when challenged from the outside, whether from China in the ninth century or Europe and America today, is behind this philosophy of confrontation. In a way, Kurokawa’s capsules open up a confrontation between local traditions and international modernism which was fundamentally an outside influence. His structures frequently demonstrate this aesthetically; while mostly harmonious, they have unfinished sections, discordant tones, and uneven balance. They may be attractive to a Westerner, but they are aggressive and flawed when contrasted to the sublime integration of traditional architecture. As opposed to his recognition as one of the most modern, Kurokawa, hence, was very conventional (in the Japanese context) in his attempt to reconcile the traditional with the modern. As Jencks points out: “Tea pavilions must always be asymmetrical and incomplete in order for the imagination to finish the job.”²⁸⁹

²⁸⁷ Kurokawa, *Metabolism in Architecture*, 15.

²⁸⁸ Ibid.

²⁸⁹ Ibid, 17.

Homo movens, the human who spends a lot of time traveling and moving, is a modern American and Japanese phenomenon, but there is a classical precursor, as Kurokawa? pointed out. "Traveling is a type of home," said the sixteenth-century poet Basho. Kurokawa spent around 20% of his time outside of Japan and another 20% in the local communities outside of Tokyo, which means he spent a significant portion of his time in hotels, vehicles, and airplanes, a concept he refers to as "capsule architecture".²⁹⁰ At the time of its erection, out of 140 units, roughly 20

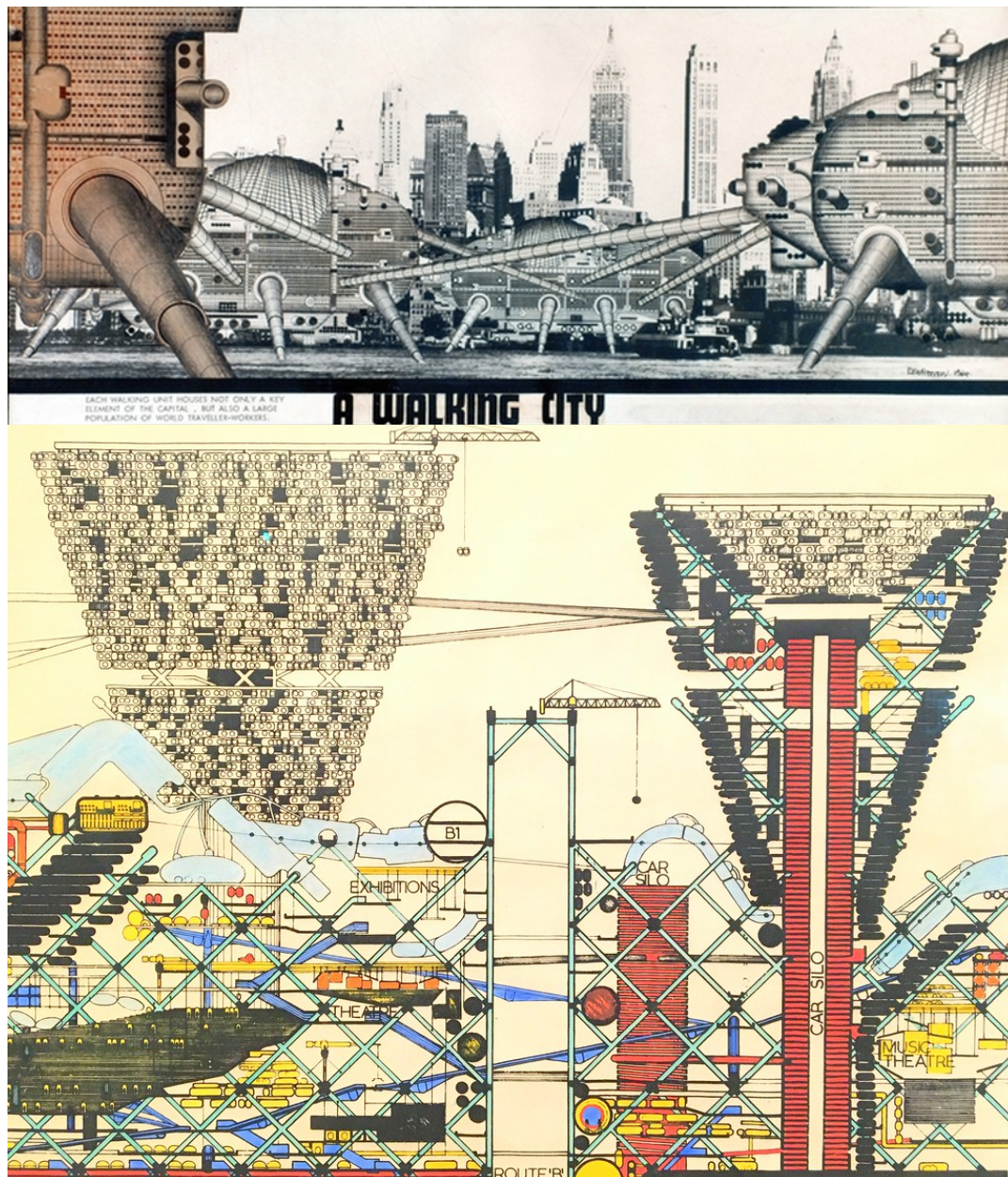


Figure 74 – Top: Ron Herron, *A Walking City*, 1964. Bottom: Peter Cook, *Plug-in City*, detail, 1964. Source: *Futuro: Tomorrow's House From Yesterday*.

²⁹⁰ *Ibid*, 18.

percent of the capsules in the Nakagin Tower were used by bachelors, 30 percent were bought by companies whose headquarters were in another city, another 30 percent by families who needed extensions to their homes, and the remaining 20 percent were used for miscellaneous purposes. The tower was especially convenient for businessmen since it was located near the Ginza, the entertainment district of Tokyo.²⁹¹ In spite of mass production, the capsules were no cheaper than conventional rooms and Kurokawa did not offer them as an economic alternative but rather as forms for a new way of living.

In the mid-century modern context, Kurokawa's inspirational use of space exploration technologies and forms (such as portholes for windows) is, as previously hinted at, a nod to global architectural tropes, albeit in a very Japanese way considering all the influences of traditional Japanese way of perceiving the world.

4.4. *Capsule House, Futuro, Dymaxion: Science Fiction/Architecture as "Zero World" and Novum?*

The architecture of the Space Age was a key interest for the new avant-garde that emerged in the 60s in Europe, America and Japan. Giant scale, lattice frameworks and moveable parts of American and Soviet rocket assembly buildings and launchpads were an inspiration for mid-1960s concept projects, such as Ron Herron's *Walking City* and Peter Cook's *Plug-in City* (Figure 74). The astronaut's space capsule and suit were sources for Warren Chalk's *Capsule Home*, David Greene's *Living Pod*, and Michael Webb's *Cushicle and Suitaloan* (Figure 75).²⁹²

Kisho Kurokawa compared his own capsule designs to the life-support environments for astronauts. He drew on the conceptual repertoire of cybernetics that developed in close proximity to the US space program. Furthermore, Arata Isozaki cited his own experience of touring NASA's mission control centre in the States in 1967 as inspiration for his design of the cybernetic environment of the 1970 Osaka Expo's *Festival Plaza*. Truly, Architecture, the Space age and Science Fiction collided most spectacularly at the 1970 Osaka Expo. First of all, the Expo grounds

²⁹¹ *Ibid.*, 19.

²⁹² Gardner, 5.

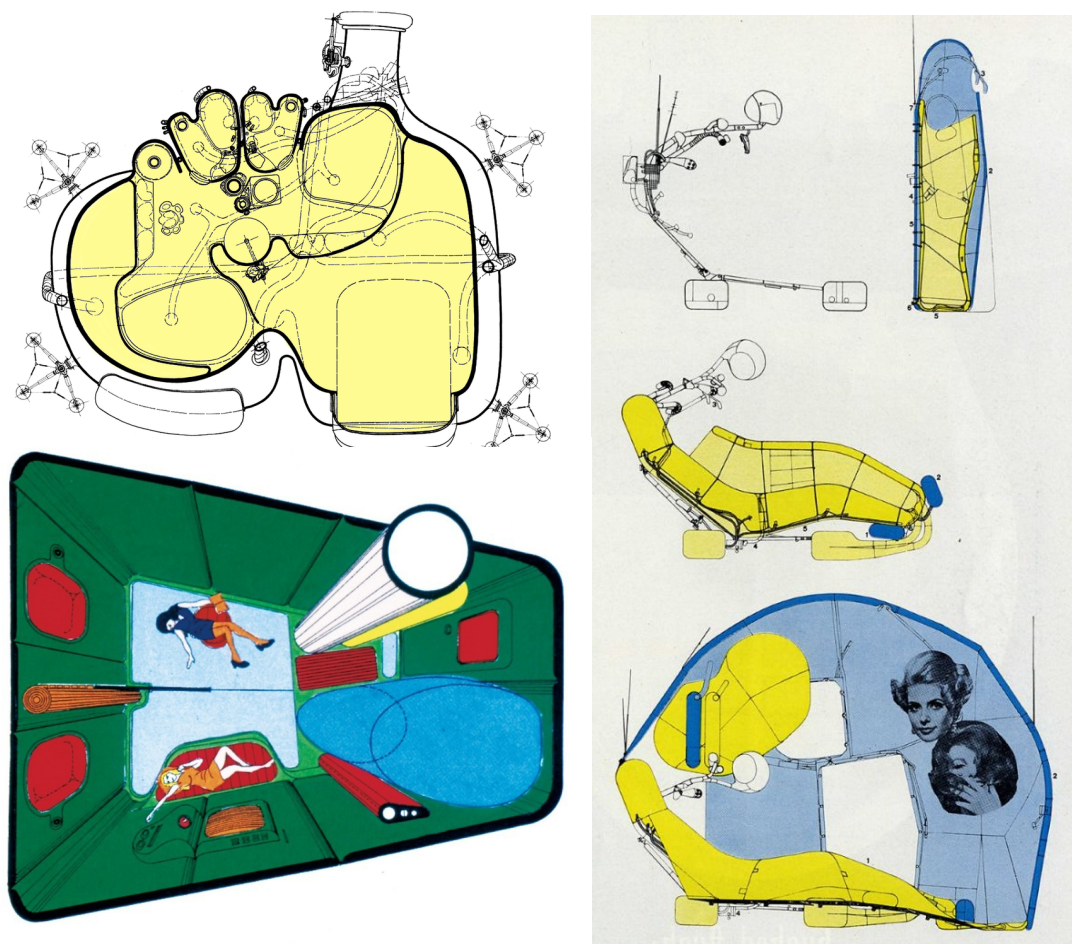


Figure 75 – Counter clockwise: David Green, *Living Pod*, 1967; Warren Chalk, *Capsule Home*, 1964; Michael Webb, *Cushicle and Suitaloon*, 1967. Source: <https://proyectos4etsa.wordpress.com/>

were designed as the “core of a future city”. Next, Cold War space race was at its climax: American and Soviet pavilions exhibited their respective achievements, The Americans displayed an example of a moon rock collected by the *Apollo 12* crew, while the Soviets displayed a life size model of a *Soyuz* space craft. Finally, the Expo proved to be a showcase for the information society that many futurologists predicted.²⁹³ Another interesting aspect of the Osaka Expo was that an *International Symposium of Science Fiction* was deliberately timed to coincide with the Expo. Held in Japan, the symposium featured events in Tokyo, Nagoya and Otsu, as well as a tour of the Expo site. It also represented one of the first meetings between SF authors from both sides of the Iron Curtain with some renown names of the genre attending the events, like Brian W. Aldiss and Arthur C. Clarke from Great Britain; Judith Merril and Frederik Pohl from North America; and Vasilii Pavlovich Berezhnoi, Yulii Iosifovich

²⁹³ *Ibid.*, 6-7.

Kagarlitskii, Ieremei Iudovich Parnov, and Vasilii Dmitrievich Zackharchenko from the Soviet Union.²⁹⁴

Andrei Tarkovsky's 1972 SF film *Solaris* features a scene where the viewer is put in the passenger seat of a self-driving car cruising in a very busy highway. Filmed in Tokyo in 1971, the scene is a 4-minute, unsettling and disorienting ride through a future city. According to film critics Graham Petrie and Vida Johnson, Tarkovsky asked for permission from the USSR to film in Japan and his original intention was to film the Expo in Osaka. However, he was only granted permission to leave in 1971, thus, rather unfortunately ended up filming everyday traffic in Tokyo instead. Akira Kurosawa praised the scene: "By a skilful use of mirrors, [Tarkovsky] turned flows of head lights and tail lamps of cars, multiplied and amplified, into a vintage image of a future city."²⁹⁵

William Gardner identifies three recurring motifs that are shared by *Metabolist* architecture and SF: the "megastructure," the "capsule," and the "apocalypse."²⁹⁶ The "megastructure" is identified simultaneously as the unique architectural form in *Metabolism* and as a fundamental picture defining science fiction ideas of the future city. *The Tower of Babel* in F. Lang's 1927 film *Metropolis* and the colossal pyramidal headquarters of the *Tyrell Corporation* in Ridley Scott's 1982 film *Blade Runner* exemplify the megastructure element of science fiction urban imagery (Figure 76).²⁹⁷ In Japanese SF, the motif of the megastructure can be found, for instance, in the early literary works of Sakyo Komatsu, an author to whom Gardner devotes special attention in his study, such as *Kuchu Toshi 008 (City in the Air 008)* of 1969, as well as in the animation films of the 1980s, such as Katsuhiro Otomo's *Akira* of 1988 (Figure 77).²⁹⁸ Moreover, the fictional realms of these films

²⁹⁴ *Ibid.*, 89.

²⁹⁵ The use of mimicry as a thematic element in Tarkovsky's film is evident through the uncanny discovery made by the protagonist, Kris Kelvin, on *Solaris*, when he encounters an entity like his dead wife, Hari. This deliberate employment of mimicry serves as a distinctive technique employed by Tarkovsky to create a sense of confusion within the narrative. Lisa Gulesserian, "Real World Metropolis, Future City on Film: 'Almost the Same, But Not Quite' Tokyo in Solaris," Academic, *Viz.* (blog), November 17, 2011, <https://viz.dwrl.utexas.edu/old/content/real-world-metropolis-future-city-film-%E2%80%9CAlmost-same-not-quite%E2%80%9D-tokyo-solaris.html>.

²⁹⁶ Gardner, *The Metabolist Imagination*, 7.

²⁹⁷ *Ibid.*, 21.

²⁹⁸ *Ibid.*, 12.

exhibit a distinct historical consciousness in the form of a cyclical view of time that is both dystopian and utopian.²⁹⁹

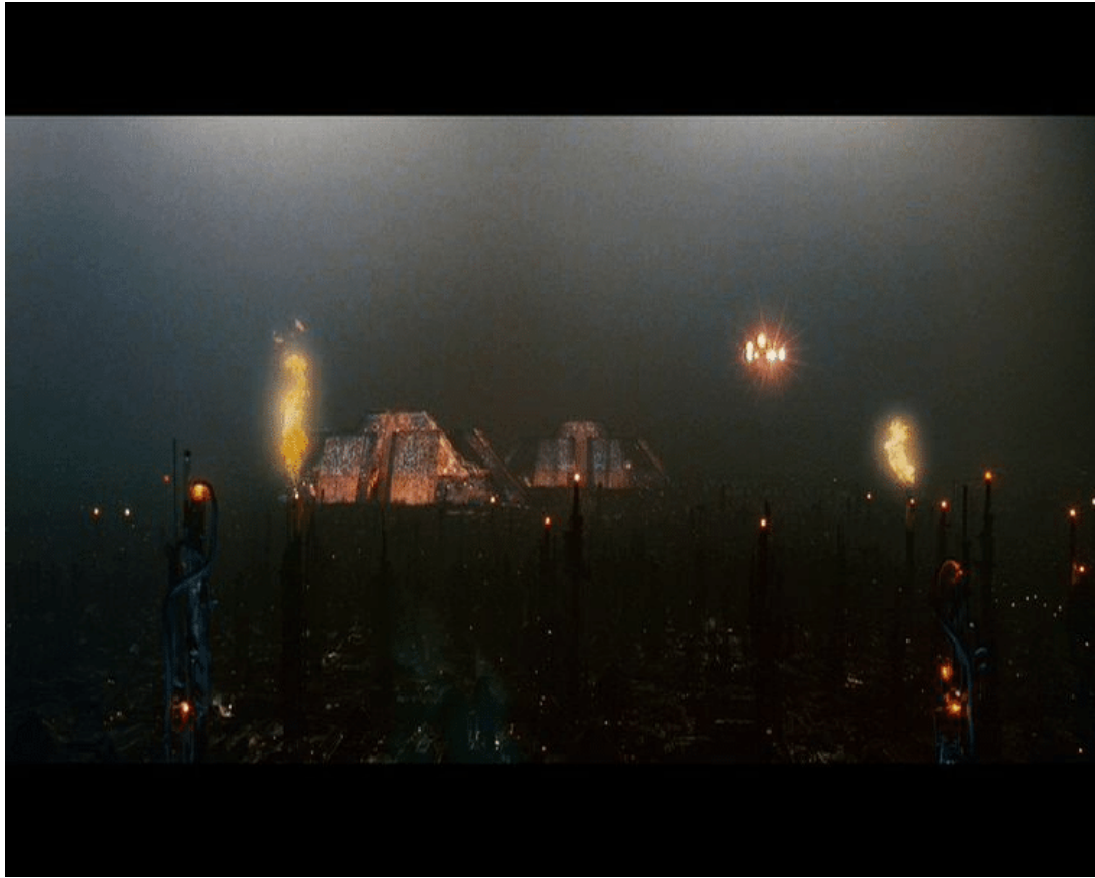


Figure 76 – The cityscape of Los Angeles 2019 in Ridley Scott's *Blade Runner* (1982). Note the megastructures of the Tyrell Corporation rising like mountains in the background. Source: https://www.researchgate.net/figure/Cityscape-of-Blade-Runners-2019-Los-Angeles-1982_fig2_326689273

The concept of capsule, as mentioned before, was synthesized by Kisho Kurokawa's definition of the capsule as "cyborg architecture." The "capsule" is viewed in its dual meanings as a protective device and a prosthesis for surviving and thriving in the urban environment of the information society. In science fiction, the capsule motif recurs, for instance, in Mamoru Oshii's animation films *Patlabor* and *Patlabor 2* as the *mecha* (piloted robot, Figure 78).³⁰⁰ The third metaphor shared by post-war science fiction and *Metabolism*, the "Apocalypse," alludes to the inevitability of annihilation. The fundamental themes with which the intellectuals of the "Charred Ruin Generation" (those born between 1926 and 1934) come to terms

²⁹⁹ Gardner argues that Akira's cyclical treatment of historical time is very different from the usual postmodern modes of *pastiche* that are typical of the treatment of time described as the "perpetual present" by Fredric Jameson. It has more depth to it. *Ibid.*, 147.

³⁰⁰ *Ibid.*, 154.

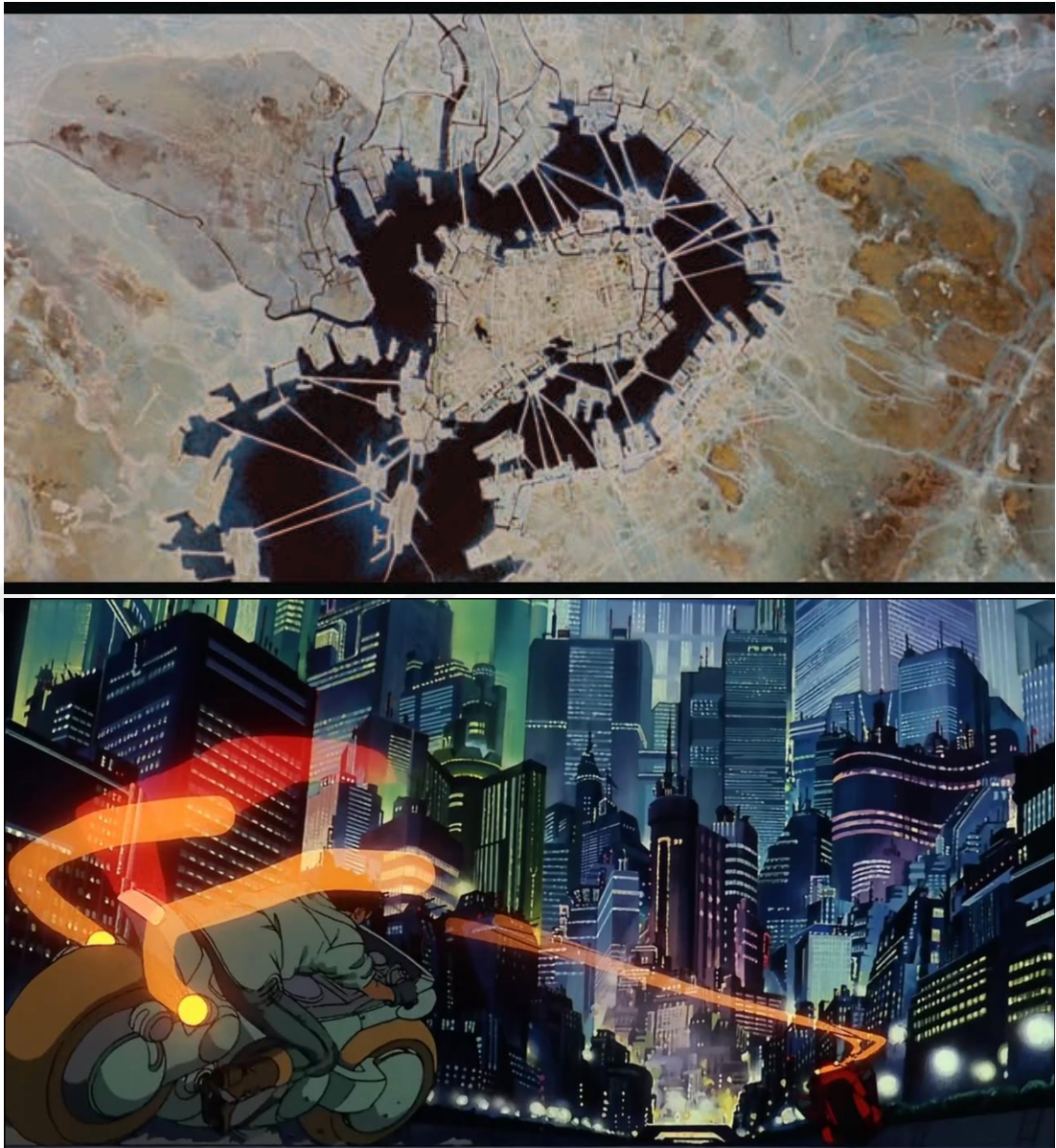


Figure 77 – Scenes from Katsuhiro Ōtomo’s *Akira* (1988); first one showing Neo Tokyo from a birds-eye view, and the second one, the high-rise megastructures of the city. Source: *The Metabolist Imagination*.

are the recollections of ruined cities following World War II, Japan's active engagement in the Cold War system, and the atomic threat.³⁰¹ This philosophical backdrop generates a variety of positions ranging from utopian optimism to catastrophic nihilism. Many of the city concepts created by architects such as Kisho Kurokawa and Kiyonori Kikutake, for instance, feature a positive response to destruction, which they view as a *metabolic* process.³⁰² The architectural form they design comprises of a long-term frame and short-term, interchangeable capsules,

³⁰¹ *Ibid.*, 53-55.

³⁰² *Ibid.*, 34.

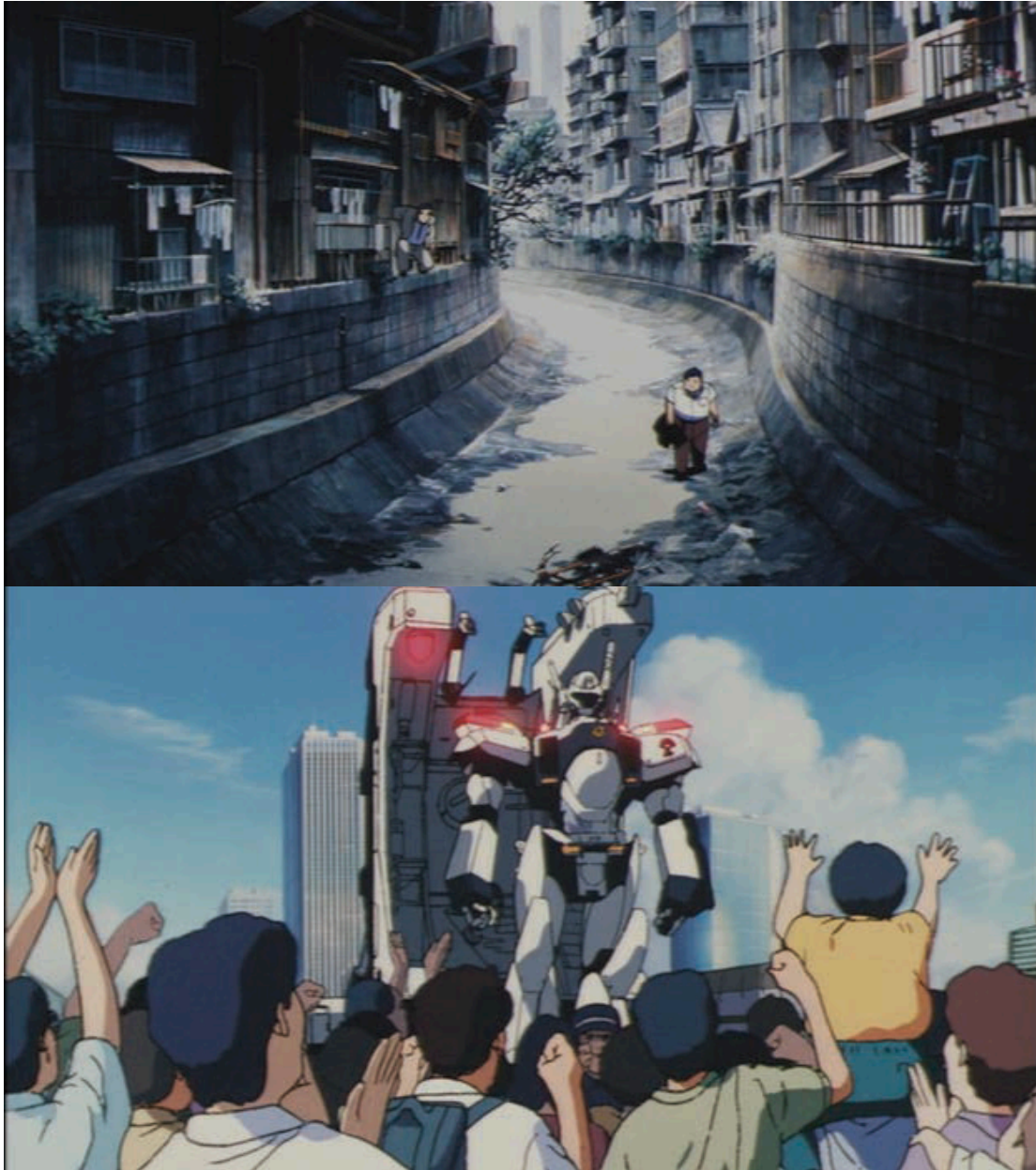


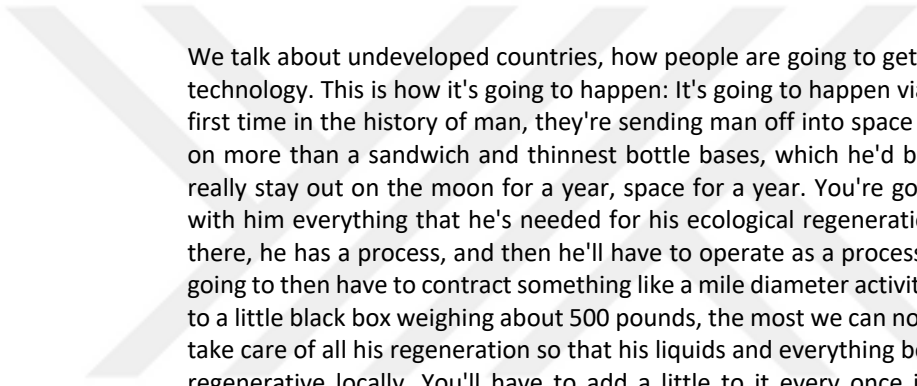
Figure 78 – Scenes from Mamoru Oshii's *Patlabor: The Movie* (1989) showing apartments in desrepair lining a canal and a *Patlabor Mecha* blending in with the cityscape. Source: *The Metabolist Imagination*.

mechanically conveying the concept of the city's cyclical growth and decay. In their dramatic stories, essays, and city renderings, architect Arata Isozaki and author Sakyo Komatsu participate in a "cyclical dance with doom" in which the final destination is destruction.³⁰³ The ruin is considered as both the beginning and the conclusion.

Experimental architectural production in the 60s and early 70s, as evidenced by the works of *Archigram* and the *Metabolists* provide a strange newness that puts them into the category of SF with ease. Although the relationship of architecture to

³⁰³ *Ibid.*, 57-61.

SF is seemingly more obvious during these decades, almost every building covered in this study can be included in the genre's scope/territory simply because from Gropius to Fuller and to Kurokawa, every architect, with Utopian impulse, has sought to change their environments with distinct Utopian programs. We should also note that the only exception to this might be the *Futuro*, but then again, the *Futuro*'s utopian nature could be revealed in its intention of being a unit in larger programs. As we have mentioned in the section regarding Fuller, his concept of *Dymaxion* was the primary program of his Utopian impulse to standardise domestic living on a global scale. Fuller presents a very interesting future in his interview with Cronkite in "The Futurists":



We talk about undeveloped countries, how people are going to get the most advanced technology. This is how it's going to happen: It's going to happen via the moon. For the first time in the history of man, they're sending man off into space to finally stay there on more than a sandwich and thinnest bottle bases, which he'd been using so far, to really stay out on the moon for a year, space for a year. You're going to have to send with him everything that he's needed for his ecological regeneration. The air must be there, he has a process, and then he'll have to operate as a process. In doing so, we're going to then have to contract something like a mile diameter activity of the earth down to a little black box weighing about 500 pounds, the most we can now. which is going to take care of all his regeneration so that his liquids and everything become satisfactorily regenerative locally. You'll have to add a little to it every once in a while, because entropy is at work and systems always really do run down. But he'll be able to operate for a long, long time and the capsule that he's in will be the first *scientific house* in the history of man. So, with two billion people looking at him all the time, little black box operating there, everybody in the world is going to realize that you can have one of those little black boxes. You don't need any sewer systems and you don't need You don't need any water supplies. You don't need any separate generators in the city. This little black box will just keep you going.

After the intermission, to Cronkite's question of "Are we in the future likely to have a great increase in the scientific knowledge to a magnitude we can't even dream of today, taken from brawn work to do simply brain work?" Fuller answers in a very detailed way how people would become consumers and producers of pure wealth in the future by basing his thoughts on laws of energy and entropy:

I see humans around the world having one very, very important function. That you cannot have mass production unless you have mass consumption. The more consumers the bigger your undertaking. As we really come to automation which can really do the physical work, people do not have any significance whatsoever anymore as muscle or automations, muscle machines. They have only significance as consumers. Whoever has the most customers is going to win in the great industrial battles. This is very important. China... we lost enormous numbers of customers when we lost China as a friend. Whoever is going to get India and

Africa and South America to be the patrons of their industrialization needs them as consumers, not as producers. They don't have to pay for anything. They pay by just being there as regenerative consumers. Because now I'll have to talk about something which will be one of the very big new realizations by 2000 AD, which will be a realistic scientific accounting system of his wealth. We now know that wealth isn't the goal that the old pirates used to have. Wealth is energy, and we have it in Einstein in the world in which the scientists found that when energy left any local system, energy was engine, it only did so by joining another system. It did not go out of the universe. But experiment after experiment, they found the energy never got lost. So they had to write an entirely new law of energy, called the law of conservation of energy, which said energy can neither be created nor lost. So, all of a sudden, we got a new clue to wealth. Wealth is not something that's going to deteriorate and get lost, which was a great way of thinking about economics. Next thing I discovered that wealth consists of something more than energy considers. So I find that every time we use it, we say I make an experiment. Now every time I make experiments you always learn more. You can't learn less. You may learn that what your thought was happening isn't happening. That saves you a lot of your time. and then increase the effectiveness of our time. So, I then say that the intellectual factor in wealth is one which every time we use it, it always improves. We always learn more. I've discovered that the energy part can't run down and the intellectual factor every time we use it improves. Therefore, wealth, I discovered, is something that always increases. So I would then point out to you that we are going to be able to afford to make everybody customers. And we're going to be able to afford then to bring in your Africa. This answers your question. We talk to the whole world, all the world, we're going to have to make all of our humanity successful or none.

What Fuller describes here is a future world with total automated production where humans are no longer being exploited for their labour. In such a world you could provide shelter in the form of Fuller's own design principles for every household around the globe. Even though our timeline differs from what Fuller envisioned, his idea of global standardisation in domestic architecture is as Utopian as it gets. If we consider the design features of the *Dymaxion Dwelling Machine* we shall come to the conclusion that treating a house as a machine fully equipped and automatised for convenient, drudgery-free living was an idea that could very well be considered science fiction at the time. As we have previously inferred in Chapter Two, Fuller's house was modular enough to be expanded infinitely just like how Asimov imagined the Spacer houses would be in the *Naked Sun*. Hence, in a fully roboticized world, Fuller's house could easily become the norm.

On the other hand, Kurokawa argued that every device introduced to human society since the Industrial Revolution performed the role of a tool to make life more convenient, such as automobiles replacing horses as transport and electric power as tool for illumination. He argues that "cyborg architecture" is, in contrast, an object in itself claiming that "The human being in the capsule and the film which protects his

life constitute a new existence which did not exist in the past.”³⁰⁴ This does not mean that human beings would actually have to transform, or remodelled into cyborgs. They would instead equip themselves with various devices to be able to perform complicated roles they would not normally be able to do. Kurokawa stated that, “A device which has become a living space itself in the sense that a man cannot hope to live elsewhere is a capsule” and that, “signs of such a development are beginning to appear around us” since people constantly move homes (*Homo Movens*) due to the necessities of the job market.³⁰⁵ Thus, Kurokawa argued that the capsule would be the ideal home for such a mobile lifestyle. Considering the car as an extension of a house, a room where people spend most of their time, Kurokawa considered the capsule as an expanded form of house:

If we assume that the capsule is a moving house of Homo maven, it need not necessarily be a wheeled home like a mobile home. We should think, rather, in terms of what was considered a tool in the past being converted into architecture.³⁰⁶

Architecture turns into a tool, and tools turn into architecture – both are considered as extensions of each other in the architecture of all three case studies. Houses are considered to be machines, both literally and metaphorically. Here, we cannot stress enough the shape and form of the *Futuro*: a UFO which is often considered a machine of fiction in the modern context – but a machine nonetheless, and a peculiar product of human imagination thrilled by the global socio-political conjecture of the Cold War era. Renowned psychiatrist and psychoanalyst Carl G. Jung took the UFO phenomenon rather seriously. In his analysis of the “UFOs as Rumours” in *Flying Saucers* (1958), regarded the phenomena as a “golden opportunity” to observe how a legend is formed, and how a “miraculous tale” emerged out of attempted interventions by extra-terrestrial “heavenly” powers at a uniquely dark and difficult time in human history when “human fantasy [was] seriously considering the possibility of space travel and of visiting or even invading other planets.”³⁰⁷ Jung

³⁰⁴ Kurokawa, 75.

³⁰⁵ *Ibid.*, 76.

³⁰⁶ *Ibid.*, 77.

³⁰⁷ Carl Gustav Jung, *Flying Saucers: A Modern Myth of Things Seen in the Sky*, Routledge Classics (London: Routledge, 2002).11.

observed that the living space of humans were gradually shrinking and for many “races” the optimum had been exceeded, and the danger of catastrophe increased as growing populations infringed upon one another. Fear that is created by congestion, Jung says, “looks for help from extra-terrestrial sources since it cannot be found on earth.” Hence appeared the “signs in the heavens”, the superior beings in kinds of spaceships devised by “our technological fantasy.”³⁰⁸ Jung claims that a mass rumour triggered by an unconscious fear whose cause cannot be fully understood yet, would continue to remain so if tried to be understood through “rational and superficially obvious motives”. “The universal mass rumour” Jung says, “was reserved for our enlightened, rationalistic age.”³⁰⁹

Suvin suggests that “cognition is wider than science”, and if his “zero world” also applies to human sciences in SF; the inexactness and unknowability of science becomes more apparent.³¹⁰ This further extends to architecture in the case of domesticity since in an “increasingly mobile and multicultural world” where one can encounter countless interpretations of home, and hence of “estrangement”, the possibility of a “zero world” to exist is questionable. Yet, the answer would be that it is possible since SF cannot solely be interpreted as a “logical methodical process”

³⁰⁸ Ibid., 12. Ever since the first major sightings that occurred during WW2 (mysterious projectiles seen over Sweden that were attributed to the Russians, and the “Foo Fighters” that followed American bombers over Germany) it had been impossible to find an earthly base for the UFOs and a lack of explanation for their physical peculiarities further strengthened the notion of extra-terrestrial origin. Jung claims that the obscurity behind the phenomena got linked up with the famous great panic of New Jersey that happened just before the outbreak of the war when a radio adaptation of H. G. Wells’ *War of the Worlds* caused a stampede and numerous car accidents. Jung says that “the play evidently hit the latent emotion connected with the imminence of war.” Ibid., 3. Hence, the motif of an extra-terrestrial invasion was picked-up by the rumour and UFOs were interpreted as machines controlled by intelligent beings from outer space here to observe us. Sightings occurred around airfields, and atomic installations. This showed that the dangerous developments in atomic physics and nuclear fission had piqued the interest of neighbouring planets. As a consequence, people felt they were being spied upon from space. Ibid.

³⁰⁹ Ibid., 13. Jung states that UFOs were rarely observed curiosities in previous centuries that only created local rumours. He casually argues that the root of the problem must lie within our existence and dedicates a great portion of his book to explaining the metaphysical and theological aspects that could be used to explain it. He also analysed dreams, artwork and included a short history of sightings from medieval times.

³¹⁰ Suvin also notes the importance of the influences of sociology, psychology, history, and anthropology, on such authors as Isaac Asimov, Robert Heinlein, Frederik Pohl, and Philip K. Dick. Furthermore, the unknowability of science and truth is a popular theme in SF as addressed in Stanislaw Lem’s *Solaris* and Arthur C. Clarke’s *Rendezvous with Rama*. See Fortin, *Architecture and Science Fiction Film*, 23.

since SF narratives exist in the unknown that allows for “individual reflection and interpretation.”³¹¹

Thus, it would not be too far-fetched to say that the *Futuro*’s form inherently makes it a part of SF as broader genre. Though the strange newness (*novum*) it provides to its audience is quite subtle. As a piece of architecture, it provided pleasant feelings like safety and comfort to its inhabitants. It was part of a utopian ideal, a product of optimism with a friendly message. Yet, when used as a prop, i.e. a UFO from outer space as it was in the erotic adventure *The Goddesses of Galaxia*, it takes on a strange hostile appearance. The dominatrix featured in the story represents the extreme opposite of cosy domesticity: she is the embodiment of lust and dread. Furthermore, the interior furniture of the *Futuro* is used in *sadomasochistic* bondage and the *Futuro* becomes the backdrop for a story of forceful abduction by superior beings that eventually turn into pleasurable voyeurism.³¹² In a peculiarly sexual way, its architecture provides both the “zero world” and the *novum*.

³¹¹ Ibid. 24.

³¹² Kalha, “A house of Ill-Repute”, 162. Also, the story can also be considered as an erotic interpretation of the UFO phenomena where the sexually frustrated earthman is relieved by enticing off-worlders.

CHAPTER 5

CONCLUSION

It is reasonable to assert that humanity has advanced more rapidly in the last two hundred years compared to the preceding thousand, thanks to the mechanisation of the world which began with the industrial revolution. There was a remarkable increase in the rate at which new technologies were invented during the 19th century, the impact of which we still experience today. While the steam engine enabled faster factory production and faster travel, the invention of wired electronics has enabled faster communication between distant realms. The long-term result would be an increasingly globalised world in which certain cultural and material trends were to be adopted quite quickly around the globe, leading to the advent of consumerism. Faster communication and faster travel had opened up the minds of the intellectuals during this era to the possibilities of what the future might bring. The production of adventure novels, scientific fantasies and speculation on urban development increased. New York at that time was the leading city in showcasing the building technologies, in particular in the form of skyscrapers. The development of the skyscraper was also related to the developments in aircraft technology, as humanity was taking the skies via airships and balloons, in addition to the material and detailing novelties in construction.

As a result of the competition between the leading industrialised powers, the world saw two major wars in the 20th century which resulted in great destruction. The First World War was the first truly mechanised war that caused great destruction and misery, especially in Europe. The inter-war period saw progress in defence architecture, with factories built to withstand shelling and bombing, urban planning proposals that suggested dispersed residential areas to be built to withstand air raids and gas attacks, notably Le Corbusier's *Plan Voisin*. The war displaced thousands in civilian population with several whole towns razed to the ground. Hence, the post-

war period saw the emergence of a housing shortage, for which the ideas and projects were proposed by architects and planners. The destruction caused by the Second World War was on an unprecedented scale, greater than that of the first one. It was after 1945 that reconstruction of cities and providing housing for displaced populations became a priority for nations worldwide. The policies of reconstruction differed from nation to nation, and different views on house and urban design emerged. Furthermore, establishment of the United Nations marked the beginning of a new post-war era in which global peace would reign. This was to be short lived however, as the world soon descended into bipolar global politics with the United States and the Soviet Union launching a nuclear arms race and an ideological expansion of influence.

The time between the end of WW2 and the Cuban Missile Crisis (1961) was a time of relative economic prosperity for much of the globe, and the transition from wartime production to civilian production, coupled with wartime technologies made available to the civilian population has opened up new potentials for architectural output. This era usually defined by optimistic viewpoints regarding the future of humanity, as evident in the literary outputs of the time, and as demonstrated in the second chapter. Buckminster's Fuller's *Dymaxion* is one such product, but fell victim to the Cold War upon the termination of Fuller's deal with the Beech Aircraft Industries, when the factory was ordered to continue aircraft production instead of the aluminium parts of the *Dymaxion*. Frank Lloyd Wright's *Broadacre* project, on the other hand, was one other innovative idea but it too fell victim, this time to American market economy and its guidance of architectural production. The general aura of optimism continued in the 1960s though it gradually faded due the increasing threat of a nuclear war. The Space Age formed an important international context and served as a medium for developing projections of future of life in the few decades to come.

Cold War paranoia greatly influenced the 20th century works of Science Fiction (SF) as evidenced by numerous examples of plots exploring post-apocalyptic scenarios caused by nuclear war. Although exceptions are found, SF produced in the interwar period has a generally optimistic tone about the future, even though H. G. Wells had predicted a devastating world war in 1936, his story concluded that under

an enlightened technocracy humanity could rebuild and prosper. Same attitude can be observed throughout the 1950s as evident from the seminal works by Isaac Asimov and Arthur C. Clarke. Idealist modern architecture of the 1950s, and to a certain extent, the 1960s transmit the same optimistic feelings as evident from the *Futuro* house. The *Futuro*'s unmistakable shape of a flying saucer is what whimsically connects it to the realm of SF. Its designer Matti Suuronen was a young man during the "Golden Age of SF", and also at a time when UFO sightings were a public phenomenon in the western world. Thus, it would not be out of place to claim that he was subconsciously affected by the phenomena.³¹³

Fuller's *Dymaxion* was rather ahead of its time and represent the ideal that machinery would eventually provide the ultimate convenience. Also conceived during the "Golden Age of SF", the *Dymaxion Dwelling Machine* stands as a unique dwelling that could possibly be fully *roboticized*.

Buckminster Fuller's rather enigmatic *and* eccentric worldview, and his commitment to meeting the necessities of the Machine Age on a literal level may have diminished the value of his unique idea, the *Dymaxion*. The *Dymaxion* certainly does not look cosy from the outside but the ideas it put forward, sustainability, automation, and cost-effectiveness, surely have become values that the architectural world today tries to uphold in the face of the environmental crises. The *Dymaxion*, is the literal embodiment of the Machine Age ideals, created by a genius obsessed with innovation and perfection. In that respect, one may consider its extreme pursuit of technical efficiency devoid of rather faulty human sensibilities.

The *Futuro*, on the other hand, stands opposite to *Dymaxion* in that regard. Even though it retains a distinct level of modern technology, it is as human as it gets, catering to fantasies of a more entertaining nature. The power of the *Futuro* comes from its uniqueness, its pill-shape that lacks a distinct façade, an "architecture that can be swallowed" as a whole.³¹⁴ At a time when space exploration and UFO sightings

³¹³ See Carl G. Jung, *Flying Saucers* for detailed information. Interestingly, Matti Suuronen himself staunchly denied that the *Futuro* was inspired by any kind of "futuristic utopian vision" and insisted that his design was "based purely on mathematics". Hence, the space age look of the *Futuro* was purely coincidental. However, even if it was coincidental, the *Futuro* represented something that was previously unseen in Finnish architecture, and is considered among the most unique examples of utopian space-age design. See, Home, "Alternative Futures", 94.

³¹⁴ Lanza, *op. cit.*, 105

were at their peak, *Futuro*'s aesthetic appeal was high, and relevant to the spirit of the era. However, were it to be mass-produced and commercialized, as it was intended to be, it would lose that aspect which made it interesting in the first place, and all that we would be left with would be a field covered in bubble houses.³¹⁵ Thus, the *Futuro* remains today as a collector's item, a reminder of a bygone era when high ideals like zero population growth, economic prosperity, and leisure over work were sought after.

The *Dymaxion* and the *Futuro* are two designs of house that have relatively remained obscure in architectural historiography. Buckminster Fuller is known mostly for his geodesic domes, and Suuronen's *Futuro* does not seem to get mentioned often either. This is because the *Futuro*, was a rather a politically incorrect design, and just as the Futurists and Expressionists were once left out of the canon of architectural history,³¹⁶ it seems to have been left out to a certain extent. However, today, one can find dozens of websites dedicated to tracking down and documenting the remaining *Futuros*. Perhaps it was for the best that the *Futuro* turned into an art icon, and not a standard way of living, which, indeed, was never intended to be.

Japanese *Metabolism* was perhaps the most successful of the cases presented in the study in terms of number of conceived buildings and longevity. *Metabolist* creations were at the apex of the intersection of science-fiction and architecture. First of all, they were central to the realisation of perhaps the single most important event organised in the century that showcased the future: the 1970 Osaka Expo. Japan was arguably the most traumatised nation of all after WW2, and the memories of destruction, inevitably guided the *Metabolist* approach to architecture. The Expo grounds were designed according to *Metabolist* architectural principles and philosophy of cycles of change. The Expo effort is especially significant because it symbolises Japan's rapid comeback after the war as an economic and technological powerhouse. The Expo's main theme was decided by its organization committee after considering in detail the importance of the concepts of *information* and *information society*. The Expo's main theme was decided upon the optimistic, yet often times trivialised theme of "Progress and Harmony for Mankind", and it was

³¹⁵ *Ibid.*, 163.

³¹⁶ Jencks, 1985, *Modern Movements*, 13.

overwhelmingly successful in promoting an international image of Japan that had not only survived being ravaged, but could be seen as an “avatar of a high-tech global future”³¹⁷

Metabolist structures were fundamentally intended to be temporary since their design philosophy embraces Shinto-Buddhism and natural cycles of life. This means that the capsules of Kisho Kurokawa were never intended to be perpetually maintained, but rather replaced once they grew old and fulfilled their purpose. And, as of 2022, the Nakagin Capsule Tower, after half a century of existence is demolished.³¹⁸ Aesthetically speaking, *metabolist* creations have visually inspired *cyberpunk* SF works of post-1980. Pioneered by Philip K. Dick in the 1960s, the “*New Wave*” of SF drew a dreary picture of the future when human lives would be made miserable by corporate greed in neo-liberal economies. William Gibson’s 1984 novel *Neuromancer* is an acclaimed example that explores a globalised digital world ripe with cyber-crime and rampant corporate capitalism.

Referring to the questions that were asked in the beginning of this study, we can perhaps conclude by saying that self-fulfilling prophecies have been in motion since the industrial revolution began in the 19th century. Humanity has become obsessed with technology, automation and progress, and dwellings all around the world were tried to be shaped by these ideals. The role of mass media in this process cannot be ignored. Most of the houses that were covered in the study are *seen* as being futuristic only because they were dubbed *futuristic* by contemporary media. Most of the time they failed to deliver on their promises, and the most radical ideas remained as mere design fictions.

The following conclusions can be drawn from the design principles of the three houses:

³¹⁷ Numerous journalistic accounts described the expo as “city of the future”, just like the 1939–40 New York World’s Fair was called the “World of Tomorrow.” See Gardner, *The Metabolist Imagination*, 87-88. Furthermore, a subsequent subtheme committee further developed the primary motto by introducing a set of supporting themes that aligned the official values of the expo with the economic growth and consumer capitalism promoted by Prime Minister Ikeda Hayato's Income Doubling Plan of 1960 with slogans like “Toward the Realization of a Richer Life,” “Toward the Utilization of a More Bountiful Nature,” “Toward the Design of Better Lifestyles,” and “Toward Deeper Mutual Understanding.” also see *Ibid.*, 93.

³¹⁸ <https://www.archdaily.com/979591/nakagin-capsule-tower-building-to-be-demolished-mid-april>

1. Planning aspects: all three designs were rather flexible in terms of spatial expansion towards every axis. They were light enough and modular enough that they could become parts of larger structures (Figure 79). The circular plans of the *Dymaxion Dwelling Machine* (or polygonal in *Dymaxion 4D*) and *Futuro* engaged its users with a continuous movement in space (The *Dymaxion* does this especially well as the core of the house can be circumnavigated, moving from one room to the next without interference. It gives a sense of infinite motion, a universal quality to their interior spaces which makes them stand out from mainstream “box” shaped designs. Kurokawa’s Capsules are more “traditional” in that sense (Figure 80). Their approach to furnishing is similar, albeit with differences in nuance: The essentials of all three designs are provided *encastré*. The capsules and the *Futuro* were fully furnished by default while the *Dymaxion* offered total freedom in the size, purpose and furnishing of the living space by only providing integrated lighting, plumbing and storage.

2. Technical aspects: in terms of infrastructure, and environment and energy consumption sensitivity the *Dymaxion Dwelling Machine* was seemingly more advanced of the three since the house was designed to be self-sufficient in every possible way in any environment and terrain. The *Futuro* too was a flexible design in that regard and could heat and insulate itself. The two capsule projects of Kurokawa however were exclusively designed for an urban context and they had to be connected to the city grid to function properly. Among the three the *Dymaxion Dwelling Machine* seems to be the most sustainable of them all in terms of energy and environmental impacts.³¹⁹

3. Construction aspects: all are prefabricated which was the modern trend. However, the materials used were uncommon in construction and were often expensive - aluminium used in the *Dymaxion 4D* and the *Dymaxion Dwelling Machine* was especially a costly material; so was the plastic moulding used in the *Futuro* at that time. The cheapest construction was perhaps the Nakagin Capsule Tower as it relied on concrete and steel. The construction systems of the three cases are slightly

³¹⁹ For more detailed information see, Katarina Mrkonjic, “Environmental Aspects of Use of Aluminium for Prefabricated LightWeight Houses: Dymaxion House Case Study,” *Journal of Green Building* 2, no. 4 (Fall 2007): 130–36.

different all across, yet they share the same principles: prefabrication and assembly on site. The *Dymaxion Dwelling Machine* and the *Futuro* came in a package of parts to be assembled in a few days on location, while the capsules were prefabricated to be installed to the concrete main-frame. Transportability is limited in every case and the houses themselves were not designed to be physically mobile, although the *Futuro* could be airlifted under the right circumstances. The concept of mobility thus, was interpreted differently; Kisho Kurokawa's approach is perhaps the most challenging in terms of the logic behind the capsule idea, as it definitely echoed a new understanding of living.

To summarise, the analysis and the discussion presented in the study developed along two interrelated research tracks: the design understanding of the



Figure 79 – The many variations of the *Futuro*: the *Futuro Hotel*, observation tower of the Swedish Airforce, and the two-storey café version. Note the resemblance of the *Futuro Hotel* to the Nakagin Capsule Tower. Source: *Futuro: Tomorrow's House From Yesterday*, 32-33.

future that takes its cue from elements of SF and in which aspects this understanding featured in the selected cases from the post WW2 era, that are often rendered futuristic in historiography. Although these buildings have fulfilled some futuristic tendencies to a certain extent and captivated the imaginations of the people, they failed to become highly demanded alternatives to what mainstream modernism was

already offering. And hence they remained as fringe examples. One reason which seems to have been influential in this regard is that, they could not be mass produced and hence mass consumed, given the economic realities of their times.

So then comes the critical question: did the *Futurists* of the 20th c. accomplish their goals, or did their predictions hold up? Daniel Bell largely predicted in 1967 that society would eventually transform from a “business society” into an “intellectual one”, in which intellectual institutions would take leading roles in policy making. He identified a “change in the character of knowledge” that was happening in which theoretical knowledge was valued. His major criticism towards where technology was going at the time and whether it would drastically change our lives is directed at the rapid rate with which gadgetry was being developed. He said that “fractional horsepower” was an idea (which was hoped to be “life transforming” in the future) that was extensively discussed in the technical journals of the 1930s that eventually led to the creation of little electric motors that enabled the invention of gadgets such as “electric toothbrushes and carving knives”. However, he said that “gadgetry do not affect our lives in any meaningful way” and that one should look at “structural changes in society” such as “changes in pattern of occupation, changes in sector distribution of economy, and changes in the character of knowledge as overall determinative of the kinds of jobs and lives people will have.”³²⁰ The 21st century society is still a fundamentally business society where global policies are being determined by *big business* every year in Davos, Switzerland under the guise of *science* and *knowledge*.

The mid-century “modern house” was mainly a ground for experimentation in new building methods, furnishing, appliances, and in the long run, sought to improve living standards. The three case studies were experiments, among many others, that were short lived due to their expensive nature (fluctuations in material cost) and global economic instability caused by the constant state of conflict the world is in. The “modern house” or the “modern home” was fundamentally designed to accommodate the nuclear family for reasonable prices, and the designs were often

³²⁰ “The Futurists.”

aimed at strengthening the notion of family as seen and propagated in the historical phenomenon of expansion into suburbia. Fuller's designs are no exception to this.

The psyche and lifestyle provided by the *Futuro* and Kurokawa's capsules are the totally opposite of the family-oriented domesticity that was so often promoted. Both cases promoted an individualistic lifestyle – the life of a bachelor who is constantly on the move in the case of the *capsule* which was a tool for accommodation, an extension of the *homo movens*. The *Futuro* in this regard is perhaps the most interesting case as it is a home of retreat, a space of fun seclusion that could be enjoyed by anybody, yet it was mostly preferred by single individuals instead of families. The Nakagin Capsule Tower stood erect for 50 years until it was demolished in April 2022. As the case with the highest longevity, can it be considered a success as a true house of the future? Kurokawa's capsule architecture was a highly relevant and promising concept in a post-modern global world where mobility of individuals and access to technology are very high, as a capsule was the home of a "cyborg". So, if we consider the Nakagin Capsule Tower as the final example, the apex of mid-century modernism and the beginning of the post-modern; in a world where a "global lockdown" has happened recently, and there are talks of new ones for new "emergencies", does its demolition symbolise the coming of the end for *homo movens*? That is, is it comparable to the destruction of the Pruitt-Igoe, which is taken to symbolise the death of modernism, which coincidentally happened the same year Nakagin was constructed? Does its demolition symbolise the death of futurism and science-fiction? ³²¹ In the end, all three remain as museum pieces today.

³²¹ Charles Jencks, *The Language of Post-Modern Architecture* (1978), 9.

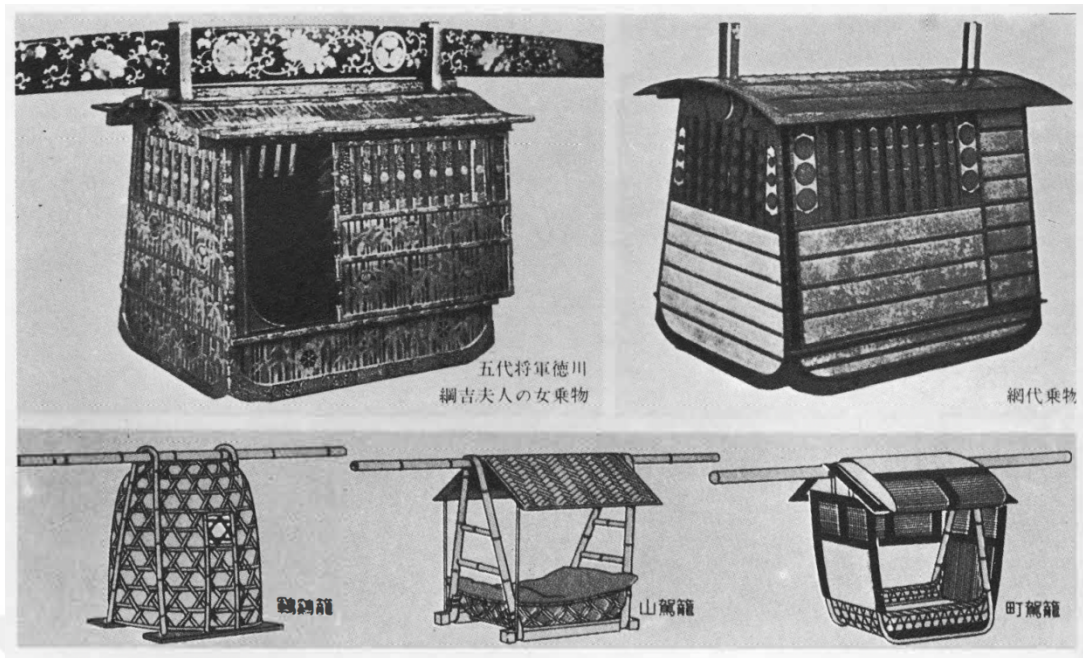


Figure 80 – *Kago*, a traditional capsule for carrying people around. One of the inspirations for Kurokawa's capsules.

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APPENDICES

A. TURKISH SUMMARY / TRKE ZET

Mimarlık, zellikle savař gibi felaketler sonrası, yksek teknolojik ilerleme gsteren dnemlerde kendini eřitli ideolojilerin ve hayat tarzlarının sınıandığı bir deney alanı olarak kendini gstermektedir. Bu durum zellikle 20. yzyıl domestik mimarisinde gzlenebilmektedir. Sanayi Devrimi'nin bir etkisi olarak bu dnemde zellikle Batılı mimarlar "Henry Ford Sendromu" denebilecek bir durumdan muzdarip bir řekilde konut mimarisine belli standartlar getirmeye bařlamıřlar ve zellikle prefabrikasyona odaklanarak seri řekilde ev retmeyi amalamıřlardır. Prefabrikasyon her ne kadar inřaat alanında 19. yzyıldan beri kullanılsa da sistematik hale gelmesi ve Batı lkelerinde konut mimarisinin disipliner bir parası haline geliři 20. yzyılın ilk eyreğine tarihlendirilebilir. Bu seri retim amacının arkasında iki dnya savařının kresel lekte yol atığı yıkımların eřitli sosyal, kltrel, iktisadi ve siyasi boyutları vardır. Savařların arkasında hi řphesiz Sanayi Devrimiyle birlikte seri řekilde geniřleyen pazarların hammadde arayışı yatmaktadır. Makine ağı olarak da adlandırılan bu dnem ilgin olgulara gebedir.

Bu dnemde eřitli teknolojik geliřmeler ve icatlar insanlık iin hızlı, grnřte daha konforlu ve hareketli bir yařam dngs yahut tarzını ne ıkaran bariz bir modern durum yaratmıřtır. Bařta buhar makineleri ve iten yanmalı motorlar olmak zere enerji retimi alanında yařanan geliřmeler ve bunlara bağılı olarak geliřtirilen ulařım araları; tren, otomobil, uak, zeplin, okyanus gemileri mesafe srelerini kısaltmıř ve tedarik ağılarını geliřtirmıř ve hızlandırmıřtır. Aynı řekilde, elektrik ve elektronikteki geliřmeler iletiřimi neredeyse anında kablosuz ve hızlı hale getirmiřtir. Bunun sonucunda dnya medya teorisveni Marshall McLuhan'ın tabiriyle adeta "kresel bir ky" haline gelmiřtir. Gnn sonunda sermayeye deęer veren bu modern durum, grnřte sonsuz bir retim ve tketim dngs bařlatmıř ve halen devam ettirmektedir. Bu durum eřitli alan ve mesleklerden entelektelleri, vizyonerleri, bilim insanlarını, mimarları, planlamacıları ve yazarları bu modern durumun eřitli

yönleri ve bunun olası sonuçları üzerinde düşünmeye iten olgudur. Örneğin 19. yüzyılda ünlü bilim adamı Nikola Tesla, kablosuz teknolojinin mevcut sonuçlarını öngörmüştür. İngiliz şehir planlamacısı Ebenezer Howard, yoğun sanayi şehirlerinin olumsuz etkilerine karşı koymak için bahçe şehir fikrinin öncülüğünü yapmıştır. Jules Verne ve H. G. Wells gibi yazarlar bilimsel romana veya bilimkurguya öncülük etmişler ve 20. yüzyılın ortalarında, Alvin Toffler, John McHale, Isaac Asimov ve Arthur C. Clarke gibi gelecek çalışmaları yapan entelektüeller gelecek hakkında spekülasyonlar yapmış, teknolojinin avantajlarını değerlendirmiş, toplumsal faydalarını teorik hale getirmiş ve uzun vadeli olası olumsuzluklara karşı uyarılarda bulunmuşlardır. Çoğu zaman statükoya meydan okuyan bu entelektüeller koşulların daha iyiye doğru değişmesi için fikirler üne sürmüşlerdir. Başka bir deyişle, modern koşullar, bugüne dair bir sorgulamayı gündeme getirmiş, gelecekte yaşamın, bugünden hareketle, nasıl olacağı ve bu spekülasyonların nasıl somut hale getirilebileceğine dair düşünceleri harekete geçirmiştir.

Modernitenin teknolojiyle yüzleşme haricinde bir meydan okuma ve dönüşüm gündemi haline geldiği bir diğer bağlam ise savaş sonrası dönemlerdir. Aslında savaş tarihlerine de bakarak insanlığın teknolojik ilerlemesi kolaylıkla takip edilebilir, zira icatlar bu dönemlerde hızlı gelişir. Savaş; yol açtığı yıkımlar, büyük trajedi ve dramların yanı sıra, neredeyse her zaman yeniden inşa etme, yeniden başlama fırsatını da beraberinde getirir. Savaş sonrası dönemler bu açıdan özellikle kentsel, mimari ve toplumsal değişimlerin yeniden ele alınması açısından verimli dönemlerdir. Çoğu zaman hem hızlı hem de verimli bir şekilde karşılanması gereken acil talebin baskısı altında şekillenen yeniden inşa süreçlerinden en büyük payı, başta konut olmak üzere şehir planlaması ve mimarlık almaktadır.

Yeni ve özgün tasarım fikirlerinin savaş sonrasında daha sık ortaya çıktığı gerçeği hem Birinci Dünya Savaşı'ndan hem de İkinci Dünya Savaşı'ndan sonra ortaya çıkan insanlara barınak sağlama dürtüsünün yoğun olduğu dönemlerde iyi bir şekilde gözlemlenebilmektedir. Her iki dönemde de sosyal ve mekânsal yeniden yapılanma, modern ve çağdaş olanı hayata geçirmeye ve savaş öncesi günlük yaşamın kalıplarını dönüştürmeye yöneliktir. İkinci Dünya Savaşı sonrası dönem, bu bakımdan, R. Buckminster Fuller, Ron Herron, Peter Cook, Matti Suuronen ve Kisho Kurokawa gibi yaratıcı beyinleri, yeni malzemelerin, yapısal sistemlerin ve teknolojinin

potansiyellerini keşfetmeye dayalı; konutu, ev hayatını ve özel alanı dönüştürmeye yönelik vizyoner fikirler ve projeler geliştirmek üzere harekete geçirmiştir.

Bunun yanında Avrupa, Japonya ve ABD'deki birçok şehir, 2. Dünya Savaşı'nın yıkılmasından sonra yeniden tasarlandı ve arabalara uygun şekilde planlanmıştır. Arabalar mikro düzeyde hareketliliği artırarak ailelerin ve bireylerin önceki yüzyıla göre daha fazla özgürlük ve hızla hareket etmelerini sağlamış; ayrıca, tren ve uçak gibi daha hızlı ulaşım araçlarının popüleritesi de özel altyapılarının onarılması ve genişletilmesi nedeniyle artmıştır. Tren istasyonları ve havaalanları 20. yüzyıl kentsel modernliğinin ayrılmaz mekanları haline gelmişlerdir. Bununla birlikte bu tip binaların formları da kullanım amaçlarını çağrıştıracak şekilde stilize edilmeye başlanmıştır. Buna en iyi örnek Eero Saarinen'in 1950'lerin sonlarında New York (John F. Kennedy'de TWA Uçuş Merkezi) ve Washington D.C. (Dulles Havalimanı) için tasarladığı iki binadır. Uçak kanadı şeklinde tasarlanmış bu iki terminal binasının ziyaretçilerine uçuş fikrini hatırlatmalarının yanında, bunu mümkün kılan formda inşa edilebilmeleri tamamen savaş döneminde geliştirilen yapı teknolojileri sayesinde. Havacılığın yanında uzay araştırmaları da İkinci Dünya Savaşı sonrası dönemde hız kazanmıştır. Uzay programları Soğuk Savaş döneminde ciddi bir propaganda aracı olmuş ve popüler kültürü etkilemiştir. Özellikle bilimkurgu edebiyatı ve sinemasına etkileri ön plandadır ve 1960'lı ve 70'li yıllarda belirgin bir uluslararası "Uzay Çağı" estetiğinden söz edilebilir. Bu estetik, özellikle 1960'lı yıllarda yaygınlaşmaya başlayan, savaş sonrası bir yenilik olan plastikten yapılmaya başlanan ev eşyaları ve mobilyaların tasarımını etkilemiştir. Ancak daha önemlisi, dönem mimarisinde de bu tarzda örneklerle rastlanmaktadır. Özellikle ev mimarisinde bu tarzda değerlendirilebilecek örnekler prefabrikasyona dayalı deneysel yapı teknikleri, yeni malzemeler ve altyapı sistemleri kullanmışlardır. Bu örnekler aynı zamanda alışılmışın dışında plan anlayışları, tefriş ve kullanım felsefelerinde esneklik ve adaptasyonu ön plana çıkaran tasarım anlayışları sergilemektedir. Bu bakımdan uluslararası modern tarzdaki konutlardan büyük ölçüde ayrılmaktadırlar. Bu evler aynı zamanda bazen dönemin medyası tarafından, bazen de doğrudan mimarları tarafından "geleceğin evi" olarak nitelendirilmişlerdir. Son olarak uzayın keşfedilmeye başlandığı bu dönemde dünyanın ciddi bir nükleer felaket olasılığıyla da karşı karşıya kalmış olduğunu göz önünde bulundurmak gerektiği hatırlatılarak bu tez çalışmasının konu

edindiği Uzay Çağı tasarımlarının nükleer kıyamet ihtimaline rağmen *ütöfik* bir dünya geleceği tahayyül etmiş oldukları söylenebilir.

Bu bilgilerin ışığında, bu tez çalışması şu soruları sormaktadır: 20. yüzyılda gelecek hangi şekillerde tasavvur edildi? 20. yüzyılda gelecek, mimari düşünce ve bilimkurgu hangi noktalarda kesişmişlerdi? Geleceğin evinin tasarlandığı ve tartışıldığı yönler nelerdi? Peki, bir evi geleceğin evi yapan şey neydi? Bu doğrultuda tartışma üç ana örnek üzerinden yürütülmektedir: R. Buckminster Fuller'ın Dymaxion'u, Matti Suuronen'in Futuro'su ve Kisho Kurokawa'nın (Nakagin Kapsül Kulesi başta olmak üzere) kapsül evleri inşa edildikleri dönemin kurgusal düzlemlerine ve tarihsel dinamiklerine referansla temsil ettikleri fütüristik ve ütopyacı özlem açısından ele alınarak karşılaştırılmakta ve bu bağlamda tartışılmaktadır. Her üç bina da İkinci Dünya Savaşı sonrasında hafif prefabrikasyon ve esneklik ilkelerine bağlı kalınarak tasarlanmış ve hayata geçirilmişlerdir. Ek olarak, savaş sonrası dönemde ev hayatını dönüştürmenin bir yolu olarak en uygun yaşam deneyiminin tasarımına ilişkin zorlu fikirleri temsil etmektedirler. Örneğin, *Futuro* bir tatil evi olarak tasarlanmıştır ve bu nedenle kentsel bağlamdan tamamen yoksundur; Nakagin Kapsül Kulesi ise otele benzer bir rol üstlenmek üzere tasarlanmıştır. Dymaxion ise, İkinci Dünya Savaşı sonrası Amerika Birleşik Devletleri'nde ucuz ve hafif konut talebini karşılamayı amaçlayan bir aile evi olarak tasarlanmıştır. Her üç tasarım da tasarlandıkları dönemde form, malzeme, yapı ve döşeme mantığı açısından çeşitli kaynaklarca “fütüristik” kabul edilmişler ve “geleceğin evi” olarak tanımlanmışlardır. Birçok ortak fikir temsil etmelerine rağmen, mimarlık tarihi yazımında üçüne beraber çok az kaynaktan rastlanabilmektedir. Araştırmamızın amacı okuyuculara bu üç mimari örneği anlaşılır, ortak bir tarihsel çerçeve içerisinde sunmak ve gelecek araştırmalar için bir girizgâh yapabilmektir.

Tezin ikinci ana başlığı altında geleceğin tasarım ve kurgu bağlamlarına nasıl yansıdığına dair bir çerçeve oluşturmak ve ana örnekleri açıklamak için kullanılan kavramları belirlemek amacıyla mimarlık ve bilimkurgu arasındaki ilişki incelenmektedir. 19. yüzyılda Sanayi Devriminin getirdiği yeni inşaat malzemelerine, uygulamalarına ve bina türlerine değinilmekte; bununla beraber çelik, beton ve cam gibi yeni malzemelerin ve bunların bol miktarda üretilmesinin sonucunda gökdelenlerin yeni bir arketip olarak ortaya çıkmasına yol açtığı vurgulanmaktadır. 19.

yüzyılda özellikle Amerika Birleşik Devletleri'nde görülen gökdelen olgusu, iletişim ve ulaşım alanlarındaki diğer teknolojik gelişmelerle (telefonun, telgrafın, buharlı lokomotifin ve zeplin icadı) birleştğinde görsel sanatlar, tasarım ve edebiyat alanlarında çalışan profesyonellerden oluşan bir nesil insanın hayal gücünü beslemiş ve büyülemiştir. 19. yüzyıl sonlarının düşünürleri, yazarları, tasarımcıları, sanatçıları, planlamacıları ve mimarları gelecekte şehirlerin, evlerin ve gündelik hayatın nasıl görüneceği üzerine spekülasyonlar yapmış, fantezi olarak nitelendirilebilecek eserler yayınlamışlardır. Bu bağlamda bilimkurgu türü, 19. ve 20. yüzyıllarda geleceğin nasıl hayal edildiğini ve kavramsallaştırıldığını göstermek ve eleştirmenler tarafından fütüristik kabul edilen sanat ve öngörü işlerinin mimarlık üzerindeki etkisini tartışmak için kısaca örneklendirilmiştir. Bu bağlamda “ev sorunu” da fantastik ve fütürist fikirlerin deneme alanı olarak ele alınmaktadır. Bilimkurgu teorisinin mimariyle birleştiği önemli alanlardan biri sinemadır. Mimarlık tarihçisi David Fortin'in *Architecture of Science Fiction Film* kitabı özellikle 1960'larda popülerite elde etmiş *Yeni Dalga* Bilimkurgu yazarı Philip K. Dick'in eserlerinden uyarlanan filmleri esas alarak “bilimkurgu mekanları”nın ve ayrıca domesticite (*domesticity*) kavramının Dick'in bilimkurgu eserlerine nasıl yansıdığı hakkında detaylı bir inceleme sunmuştur. Bu analiz, büyük ölçüde, edebiyat tarihçisi ve eleştirmeni Darko Suvin'in bilimkurgu teorisiyle temellenmektedir. Suvin'in 1972 yılında yayımlanan *Metamorphoses of Science Fiction* kitabı bilimkurguyu gayet ciddiye alınması gereken tarihsel bir edebi tür olduğunu kanıtlamaktadır. Bilimkurgu edebiyatının Suvin tarafından başlıca tanımlanan özelliği bir “yabancılaşma edebiyatı” (*literature of alienation/estrangement*) oluşudur. Bilimkurgu hikayeleri okuyucularını ampirik olarak gözlemleyebildikleri dünyada temellenmiş, ancak bu dünyadan bariz şekillerde farklı olan dünyalara bir nevi yolculuk imkânı sunarak onları bilişsel olarak yabancılaştırmayı hedefler (*cognitive estrangement*). Okuyucu her zaman bir “tuhaf yenilikle” (*strange newness*) karşılaşır; karşılaştığı tuhaf yeniliği beğenip beğenmemesi yahut *ütopik* ya da *distopik* olarak tanımlaması ona bırakılmıştır. Bilimkurgu, “ötekinin” edebiyatıdır, bünyesinde eleştiri, uyarı ve isyan barındırır. Suvin'e göre ütopya ve karşı ütopya (distopya) yazını bilimkurgunun bir alt türüdür. Edebiyat eleştirmeni ve filozof Fredric Jameson da dahil olmak üzere birçok akademisyen bu görüşe katılmaktadır. Benzer bir şekilde, bu çalışma da

bilimkurgunun bir tür olarak esnekliğini ve kapsayıcılığını kullanarak incelediği örnekleri mimari bilimkurgular ve bilimkurgunun mimari temsilleri olarak kabul etmektedir (bu bağlamda mimarinin bilimkurguyla döngüsel bir ilişkisi olduğu iddia edilebilir). Bunun arkasındaki sebep Fuller, Suuronen, ve Kurokawa'nın ütopyacı oluşları ve tasarımlarının zamanlarının ilerisinde oluşudur. Özellikle İlk Makine Çağı'nın önde gelen mucit-mimarı Fuller'ın Dymaxion tasarımı ve "jeodezik kubbeleri" (*geodesic dome*) döneminin bilimkurgu romanlarında tasvir edilen otomatik evleri anımsatmaktadır. Buna örnek olarak Isaac Asimov'un *Çelik Mağaralar* (*The Caves of Steel*, 1954) ve *Çıplak Güneş* (*The Naked Sun*, 1957) romanlarında basitçe tasvir ettiği mekanlar verilebilir.

Çalışmanın takip eden bölümünde "modern ev" kavramının gelişimi, bu alanda yeni olanaklar ve ev içi yaşam biçimleri etrafında dönen tartışmalar ele alınmaktadır. Bu bölüm iki alt başlıkta incelenmektedir: İlk olarak iki dünya savaşı arası dönem (*interwar*) mimarisi Adolf Loos, Le Corbusier ve Antonio Sant'Elia'nın çalışmalarına da değinerek Weimar Cumhuriyeti özelinde prefabrik sosyal konut projeleri odak alınarak anlatılmaktadır. İkinci Dünya Savaşı sonrası (*postwar*) dönem ise Amerika Birleşik Devletleri'ndeki prefabrik yapı sistemlerini ve banliyölere genişlemeyi konu edinmektedir. Avrupa'da iki savaş arası dönemde konut mimarisi geleneksel yapı yöntemlerinden sıyrılmaya başlamış ve Birinci Dünya Savaşı'nın hızlandırdığı endüstriyel üretim ve inşaat yöntemleri, başta Walter Gropius olmak üzere diğer *Bauhaus* okulu mensubu mimarlar tarafından sivil üretimi hızlandırmak amacıyla sistematikleştirilmeye başlanmıştır. Gropius ilk kez 1910 yılında prefabrikasyon üzerine bir manifesto yayınlamış, ancak manifestosunda yayınladığı fikirlerini hayata geçirebilmesi ancak savaştan sonra mümkün olabilmiştir. 1925-1930 arası dönemde Almanya'da Stuttgart, Frankfurt ve Berlin gibi şehirlerde birçok toplu konut projesi gerçekleştirilmiştir. Bu konutların yapımında yeni teknolojiler kullanılmış, inşaat süreçleri titizlikle belgelenerek sistemleştirilmiştir. Özellikle Stuttgart'daki proje Avrupa'daki birçok mimarın katılımıyla gerçekleşmiş olması açısından, Frankfurt'taki proje ise Grete Lihotzky'nin "Frankfurt Mutfağı" olarak adlandırılan modern mutfak tasarımının uygulamaya konulduğu proje olarak önemlidir. Avrupa'daki toplu konut çalışmaları uluslararası modernizm olarak tabir edilen tarzın ortaya çıkışında öncü olmuştur.

Amerika Birleşik Devletleri'nde ise modern ev fikri, İkinci Dünya Savaşı sırasında yeniden tartışmaya açılmıştır. Bu dönemde *Arts and Architecture*, *Architectural Forum* ve *Progressive Architecture* gibi mimarlık dergilerinin başlattığı çalışmalar ve tartışmalar prefabrik yapı sistemleri, yeni malzemeler ve diğer yenilikler üzerine yoğunlaşırken, *Ladies Home Journal* ve diğer popüler ev dergilerinin çoğu bu yeni tasarım stratejilerine banliyölerdeki sosyo-ekonomik yaşamı inşa etmenin bir yolu olarak bakmışlardır. Mimarlar, editörler ve küratörler, savaş sonrası yaşamın doğasını şekillendirmek için araştırma ve tasarım uzmanlıklarından yararlanmaya çalışmışlardır. Bu doğrultuda, 1940'lardaki pasif güneş evlerinin mimari tasarımı, savaş sonrası genişleme ve onu şekillendiren teknolojik etkiler ve bunun sonucunda ortaya çıkan sosyal olgular arasındaki karmaşık etkileşimi anlamak için önemli bir odak noktası olarak karşımıza çıkmaktadır. İkinci Dünya Savaşı sırasında ve hemen sonrasında, ileri düzey uygulama ve analizlerin sonucunda çevresel kaygılarda da gözle görülür bir artış yaşanmıştır. Bu gelişmenin öncelikle pasif güneş enerjili ev tasarımının potansiyeline olan ilginin artmasından kaynaklandığı söylenebilir. Amerika Birleşik Devletleri'nde savaştan sonra yaşanan ekonomik refah, sanayi sektörünün genişlemesi, geri dönen askerler için tam istihdam fırsatlarının sağlanması konut arzının sağlanması gibi çeşitli faktörlere dayanıyordu. Bu gelişmeler büyük ölçüde güvenilir bir enerji kaynağının varlığına bağlıydı. Bu dönemde Amerika Birleşik Devletleri'ndeki çoğu ev kömür, petrol veya doğal gazla ısıtıldığından, pasif güneş enerjisinden yararlanmak enerji kıtlığı tehlikesine karşı açık bir çözüm olarak görülmüştür.

Bu bağlamda Kaliforniya, doğudakilere kıyasla daha geç şehirleşmiş, ancak ekonomik potansiyeli yüksek bir eyalet olarak konut mimarisi açısından ilginç örnekler barındırmaktadır. 1920'ler ve 1930'lu yıllarda Rudolf Schindler ve Richard Neutra'nın çelik konstrüksiyon tasarımları, 1946'dan itibaren *Arts and Architecture* dergisinin sponsorluğunu yaptığı *Case Study Houses* programı dahilinde tasarlanıp Los Angeles bölgesinde inşa edilen evlerin yapı mantığının temelini oluşturmuştur. *Case Study* evleri orta sınıf, beyaz yaka olarak tabir edilebilecek aileler için düşük maliyetli olması için tasarlanmış, ileri modern estetik değerlere sahip prefabrik yapılar olarak karşımıza çıkmaktadırlar. Öne çıkan özellikleri topografyayla ilişkilenme biçimleridir. 1966'ya kadar süren program dahilinde inşa edilen evler arasında, 1945 yılında

tasarlanıp 1949 yılında yapılan, Charles Eames ve Eero Saarinen ortak imzalı 8 ve 9 numaralı evler çelik konstrüksiyon olarak tasarlanıp inşa edilen ilk evler olmaları bakımından öne çıkmaktadırlar. Bu iki evde her ne kadar Saarinen'in imzası olsa da neredeyse bütün tasarım kararlarını Eames'in almış olduğu eşi Ray Eames ve meslektaşı Rafael Soriano'nun verdiği demeçlerden anlaşılmaktadır; zira 8 numaralı ev Eames'in kendisi için, 9 numara ise derginin editörü John Entenza için düşünülmüştür. Eames Evi'nin tasarımı 1949'da aniden değiştirilmiştir. İlk tasarımla aynı miktarda malzeme kullanarak en yüksek hacmi kapatmayı başaran ikinci tasarımı mümkün kılan ise çeliğin esnekliğidir.

Dördüncü ana başlıkta çalışmanın ana örnekleri kronolojik bir sırayla anlatılmaktadır. İlk alt başlık kütlece hafif *Dymaxion* sistemlerine özellikle odaklanarak Buckminster Fuller'ın tasarım anlayışına değinmektedir. *Dymaxion 4D* isimli ilk tasarım 1927'de ortaya çıktığında dönemin modasına kıyasla çığır açan bir ev konsepti olduğu Banham tarafından hali hazırda ortaya konulmuştur. "Dinamik maksimum gerilim" (*Dynamic maximum tension*) teriminden türetilen *Dymaxion*, Fuller'in daha azıyla daha fazlasını yapma felsefesini somutlaştırdığı bir sistemiydi (bileşenler arasında harita ve otomobil de vardır). Buna göre *Dymaxion* evlerinin kolayca taşınabilecek, enerji tasarruflu ve çeşitli bağlamlara uyarlanabilecek şekilde tasarlanmış prefabrik, hafif bir yapılar olmaları hedeflenmiştir. Fuller'ın en son teknolojiyi, verimli alan kullanımını ve sürdürülebilir tasarım ilkelerini birleştirerek konut konusundaki geleneksel yaklaşımlara meydan okumuş olduğunu söylemek mümkündür. Dahası, mimariye yaratıcı yaklaşımı ve küresel zorlukları çözme konusundaki kararlılığı, *Dymaxion* evlerini gerçekten de mirasının ikonik bir sembolü haline getirmektedir.

Bölümün ikinci kısmı deneysel tasarımlarıyla tanınan Matti Suuronen'in tasarladığı *Futuro* evine odaklanıyor. Çeşitli yerlere yerleştirilebilen, teknik olarak taşınabilir, kolayca monte edilebilen bir konut olması amaçlanmış *Futuro* aslen ısı izolasyonu yüksek bir kayak kulübesi olarak tasarlanmıştır. Bu yenilikçi prefabrik yapının formu bakımından 20. yüzyılın fütürist ruhunu, dönemin Uzay Çağı iyimserliğini yakaladığı iddia edilmektedir. Kendine özgü uçan daireye benzer şekli ve plastik ve fiberglas gibi malzemelerden yapılmış oluşu onu geleneksel mimari normlardan ayırmaktadır. Nispeten az sayıda inşa edilmiş olmasına rağmen *Futuro*

20. yüzyıl ortası avangart modernizmin ikonik bir sembolü ve Suuronen'in ileri görüşlü vizyonunun bir kanıtı olarak değerlendirilebilir. *Futuro*'yu ilginç kılan olgu 1970'lerin sonuna doğru üretiminin durdurulmasından sonra bir koleksiyoner objesine dönüşmüş olmasıdır. *Futuro* üretildiği yıllar arasında da "geleceğin eğlence evi" olarak tanıtılarak medyada kendine fazlaca yer bulmuş ve kademeleri olarak dönemin popüler kültür öğelerinden biri haline gelmiştir. Bu şekilde popülerlik kazanmasının tesadüfen gerçekleştiği büyük ölçüde söylenebilir. Binanın tasarımının her ne kadar mimarı tarafından saf matematik temelli olduğu söylene de uçan daireye benzer şekli mimarın bilinçaltının bir ürünü olduğu psikiyatr Carl Jung'un *Flying Saucers (Uçan Daireler, 1958)* kitabında fenomenin psikolojik boyutu üzerine anlattıkları göz önünde bulundurulduğunda hayli mümkün gözükmemektedir.

Üçüncü alt başlık, Kisho Kurokawa'nın Kapsülleri aracılığıyla Japon *metabolist* mimarlığına değinmektedir. Nakagin Kapsül Kulesi, hızlı kentleşmeye ve toplumun değişen ihtiyaçlarına cevap verebilecek, uyarlanabilir ve modüler yapılar yaratmayı amaçlayan Metabolist hareketinin (2022'de yıkılana kadar) dikkat çekici bir örneği olarak ayakta durmaktaydı. Tokyo'da bulunan kule, birbirine bağlı iki beton çekirdekten ve bunlara bağlı 140 ayrı kapsülden oluşuyordu. Fütüristik uyku kapsüllerini andıran bu kapsüller, çok yönlü ve sürekli hareket halinde olan bir yaşam tarzının ihtiyaçlarını karşılayabilecek şekilde tasarlanmıştır. Kurokawa'nın teknolojiyi, prefabrikasyonu ve gelecekteki kentsel yaşam vizyonunu harmanlayan yenilikçi yaklaşımı, farklı ve ileriye düşünen bir mimari ikonla sonuçlanmıştır. Her ne kadar Kurokawa'nın tasarımı kendisinin insanlık için öngördüğü hareketli, sıkça seyahat edilen bir hayat tarzının gerekliliklerine cevap verebilecek bir tasarım olsa da gerçek hayatta tam bir karşılık bulabildiğini söylemek güçtür. Zira uzun vadeli oturulacak konutlardan ziyade bir otel görevi görmesi amaçlanmış olan Kapsül Kulesi kullanıcılarına sıradan bir otelden farklı hiçbir avantaj sunmamaktadır. Kurokawa'nın kapsülleri her ne kadar teoride birçok farklı bağlama adapte edilebilecek tasarımlar olsalar da uygulamada yetersiz kaldıkları iddia edilebilir. Ancak, Kurokawa'nın kapsüllerinin değeri tıpkı *Futuro* örneğinde görüldüğü gibi kültürel bağlamda ortaya çıkmaktadır. Mimaride *metabolizm*, geleneksel çağdaş mimarinin mekanik analogisinin yerini alacak daha kapsamlı bir biyolojik analogi ortaya koymuştur. "Değişim döngülerini" (*cycles of change*), organik dokunun sürekli devinim halinde

olan yenilenme ve yok oluş işlemlerini tüm yaşamda görülen bir enerji sürecine eşit gören bu felsefenin bilimkurguda karşılığına sıkça rastlamak mümkündür. Ancak bu metafor Batı için görüldüğü kadar yeni değildi. Birçok yönden, aynı konu üzerinde sonsuz sayıda varyasyon yaratan eski Taocu kozmik değişim ve sürekli evrim fikrinin bir uzantısıydı. *Metabolistler* Japonya'nın İkinci Dünya Savaşı'nda yaşadığı yıkımdan sonra yeniden inşasını ve küresel ekonomi-politik düzende yeniden yerini bulmasını mimari yünden temsil etmeleri bakımından önemlidirler. 1970 Osaka Fuarı'nın akımın öncü mimarları tarafından tasarlanmış olması bunun somut bir örneğidir.

Son bölüm, tüm önemli noktaların özetiyle sona ermektedir. Fütürist fikirlerin temel motivasyon kaynağı olan sanayi devrimi ve dünya savaşları, yazarların gelecekteki mimariyi ve yaşamı anlatan ve görselleştiren fantastik kurgular yaratmalarına, mimarların ise bu kurgulardan ilham alarak alternatif konut konseptleri ve evcilik biçimleri geliştirmelerine zemin hazırlamıştır. Yüzyılın ortasındaki "modern ev" esas olarak yeni inşa yöntemleri, mobilyalar ve aletler üzerine uzun vadede yaşam standartlarını iyileştirmeye yönelik deneyler için bir zemin oluşturmuştur. Ele alınan üç ana örnek, diğer pek çok şeyin yanı sıra, malzeme maliyetindeki dalgalanmalardan kaynaklı pahalı oluşları ve dünyanın içinde bulunduğu sürekli çatışma durumunun neden olduğu küresel ekonomik istikrarsızlık nedeniyle kısa ömürlü olan deneylerdi. Modern ev temel olarak çekirdek aileyi makul fiyatlara barındıracak şekilde tasarlanmıştı ve tasarımlar genellikle banliyölere yayılma olgusunda görüldüğü şekliyle aile kavramını güçlendirmeyi amaçlıyordu. Fuller'ın tasarımları da buna bir istisnası değildi. Ancak, *Futuro* ve Kurokawa'nın kapsüllerinin sağladığı halet-i ruhiye ve yaşam tarzı, sıklıkla teşvik edilen aile odaklı evcimenliğin tam tersidir. Bu vakalar, bireyci bir yaşam tarzını teşvik etmişlerdir. Hepsinin ütöpik düzeyde yeni hayat tarzları yaratma gibi bir iddiaları olmuş, ancak 20. yüzyılın gelecekle ilgili çalışmalarının idealleri, sonuçta hedeflenen refah toplumlarını yaratmakta yetersiz kalmış gibi görünmektedir.

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