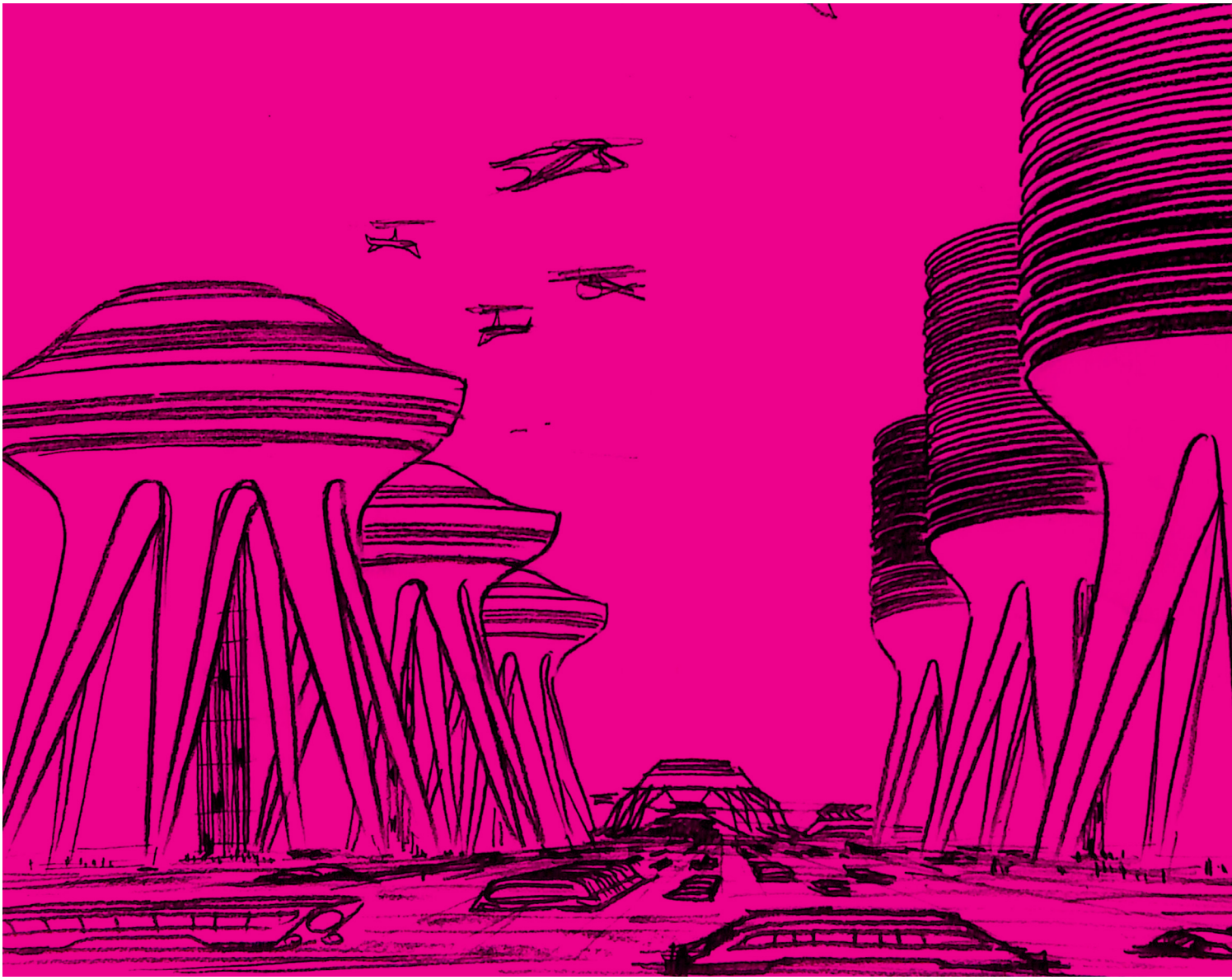

HPA

Histories of Postwar Architecture

n.**1** 20**17**
vol.**I**

Histories of the Future

edited by
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EDITORIAL

Histories of the Future

Matteo Cassani Simonetti, Elena Formia, Ines Tolic

It can be argued that, in the prewar period, the Master Architect's main feature was his (or her) ability to anticipate and to build the future. World War II brought great changes to the global geo-political and socio-economic framework. Architects – the old and new masters as well as an army of lesser-known professionals – found themselves facing a world that had altered both the concept and the structure of the future. The prewar futures envisioned at conventions, exhibitions and fairs, or simply imagined in projects and books, were tested by postwar circumstances, while magazines and journals adapted to a different set of professional needs. Several prewar visions did actually become futures, but many did not. Some were adapted, some have been forgotten and some have been put to one side. As a result of all these transformations, even the prewar Master Architect has been, to some extent, revised. This issue is dedicated to histories of the future that have survived the prewar period in which they were conceived and found their place, conceptually and/or physically, in the postwar era.

The question of how to design the core of the city, a key topic in postwar modernist architectural debates, has been analyzed by Carola Hein, Professor and Head, History of Architecture and Urban Planning Chair at Delft University of Technology. The proposal by Tange Kenzo for a new urban centre for atom-bombed Hiroshima has often been presented as an iconic reference in these debates. *The Urban Core in Japan (1930s-1950s): From Plans for the Colonies to the Mainland* re-contextualizes Tange's project for the city centre of Hiroshima in terms of Japanese planning history, highlighting its particular continuities and discontinuities.

In *Jumbo Architecture*, Thomas Leslie — the Pickard Chilton Professor in Architecture at Iowa State University — deals with transformations in airport design and landscapes brought about in the 1960s and 1970s through the emergence of the 747 and other "jumbo" aircraft. As the author shows, the new requirements for passenger loading and seating and the changes to traffic flow have brought about a series of transformations to terminal buildings and airport landscapes, which have been subsumed into less humane and more disconcerting environments and systems which often produce noxious sensory environments. The sublime scale of the new hardware and its surrounding operations has marked a sudden shift in sensibilities, economies and passenger experience, which remains symptomatic of air travel today.

With the aim of describing an original panorama based on the contaminations between diverse disciplines associated by means of a sensitive attention in the planning of the future, Stefano Setti — researcher in Art History at the University of Milano — has analyzed the Movimento Arte Nucleare and its affiliation within architectural practice, with a focus on the Nuclear Architect Enzo Venturelli in his essay *The Image as Reaction Nuclear Painting and Architecture, Italy 1951-1958.*

Cybernetics' original mission — to predict the evasive manoeuvres of bomber pilots — soon evolved into producing predictions about social systems and game theory, and making inroads into architecture by the 1960s. In *The Cybernetic Hypothesis & Architecture*, Fredrik Torisson — a doctoral student at the Department of Architecture and the Built Environment at Lund University — retraces cybernetics in architecture, discusses Gordon Pask's take on architecture and cybernetics, and aims to express how cybernetics remains both not-present and not-absent to architecture as a subject matter within the "post-critical" architecture that currently dominates (or suffocates) the discourse on architectural theory since the turn of the millennium.

In his essay entitled *Between Science Fiction and Social Sciences. The "Dark Side" of American Cities*, Alain Musset — professor in Geography and Head of the PhD program "Territoire, Sociétés, Développement" at the École des hautes études en sciences sociales in Paris — deals with the city of the future as a "dark side" of the contemporary megalopolis. Musset observed that, in constructing an imaginary geography of fear and reclusion, Latin-American cities often inspire science fiction writers because they seem at the same time both strange and foreign, old and modern, hospitable and dangerous. Therefore, the author concludes, it can be said that science fiction denounces the real or imaginary failings that threaten the very existence of our metropolis as a political object and reduce them to territories dominated by fear.

The Urban Core in Japanese Planning (1930s-1950s): Evolving Perceptions on the Spatial and Social Form of the Metropolitan Center on the Mainland and in the Colonies

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Carola Hein is Professor and Head, History of Architecture and Urban Planning Chair at Delft University of Technology. She has published widely in the field of architectural, urban and planning history. Among other major grants, she received a Guggenheim Fellowship to pursue research on The Global Architecture of Oil. She serves as IPHS Editor for Planning Perspectives and as Asia book review editor for Journal of Urban History. Her books include: *The Routledge Planning History Handbook* (2017), *Uzō Nishiyama, Reflections on Urban, Regional and National Space* (2017), *History, Urbanism, Resilience, Proceedings of the 2016 IPHS conference* (2016), *Port Cities: Dynamic Landscapes and Global Networks* (2011), *Brussels: Perspectives on a European Capital* (2007), *European Brussels. Whose capital? Whose city?* (2006), *The Capital of Europe. Architecture and Urban Planning for the European Union* (2004), *Rebuilding Urban Japan after 1945* (2003), and *Cities, Autonomy and Decentralisation in Japan.* (2006), *Hauptstadt Berlin 1957-58* (1991).

ABSTRACT

The urban core was a key topic in postwar modernist architectural discussions and in urban planning debates internationally. The proposal by Tange Kenzo for a new urban center for atom-bombed Hiroshima was an iconic reference in the CIAM 8 debates at Hoddesdon, England, on the aesthetic and functional design of a community center. But these debates focused on modernism and on a select group of Japanese designers at the expense of questions about the core of the traditional Japanese city and about the works of Japanese urbanists and planners. In contrast to the CIAM modernists, a number of Japanese planners discussed the question of the core in debates on urban, regional, and national structures and in discussions on deconcentrating or decentralizing urban form. This article connects all of these conversations, first briefly investigating traditional Japanese urban form and the role of the core therein. It then considers three pre-war and war-time bodies of work on urban cores that are largely unknown outside Japan but that influenced postwar rebuilding: respectively, proposals for new cities in Manchuria and for the rebuilding of the capital Tokyo, and reflections on the urban core by planner and theoretician Nishiyama Uzō. These proposals take a range of approaches to the urban core, parallel to Tange's internationally recognized postwar designs and the modernist visions of the CIAM group. In conclusion, the article explores continuities and discontinuities in Japanese planning through the lens of the urban core and their relevance for the writing of global urban histories.

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KEYWORDS
Urban Core, Japanese Planning, Tange Kenzo, Nishiyama Uzō, Ishikawa Hideaki

Introduction

In 1951, the CIAM 8 meeting in Hoddesdon brought together designers from around the world to focus on the form and function of the nucleus of the city - the "core" - in its role as a social center, the meeting place for people in conurbations at different scales, from villages to small towns, neighborhoods, and cities.[1] Though the main core was usually near the geographical center, a city might have a network of community centers, they argued, effectively tying their architectural projects to larger debates on the overall form of the city. The projects displayed at the meeting, and included in the proceedings published a year later, all had the secondary aim of popularizing contemporary forms of architecture. Defined by the Spanish architect-planner Josep Luís Sert, who had emigrated to the United States in 1939, as "Centres for Community Life," or "place[s] where people may gather for leisurely intercourse and contemplation," these cores, they proposed, were an essential feature of any true city.[2] The urban core was a standard feature of the traditional European city, and a theme that pre-war CIAM debates had sidelined in their focus on the functional city and its key functions (living, working, recreation and transport); now, as the book's subtitle explained, the CIAM attenders believed that the core furthered the "humanisation of urban life." Contributors at CIAM 8 agreed with historian Siegfried Giedion that a well-defined structure of society was key to the design of the core.[3] Their projects differed in size, historical background, and geographic location, including the village center of Nagele, Holland; the Chandigarh government center in India; Stevenage New Town, England; and – from the Japanese architect Tange Kenzo[4] – the rebuilding of the atom-bombed center of Hiroshima. Together these projects covered a broad range of architectural expressions for core functions—administrative, economic, commercial, cultural, leisure, and community oriented, each adding new aspects to the overall debate.

Tange's project for Hiroshima was a striking addition to the mostly European/North and South American projects presented at the conference. Contemporary professional architects and planners, as well as later scholars, celebrated the Hiroshima project as an iconic modernist statement on the form and function of the urban core and the heart of the city.[5] [Fig. 1 and 2] It was also part of the larger urban project, the city of Hiroshima as a Peace Center, which included multiple centers for the entire city. The site of the project, close to the historic center of the city, was chosen due to its position under the epicenter of the bomb explosion. Tange's project for the Hiroshima Peace Park can be read as interpreted as drawing on the architectural language of the French modernist architect Le Corbusier, in line with Western modernist debates. The realized project includes *pilotis*, or piers, supporting three buildings connected by aerial passageways parallel to the Peace Boulevard. The project can also be interpreted as being inspired by Japanese Shinto architecture, where visitors enter through the Torii gate, symbolizing the transition from the

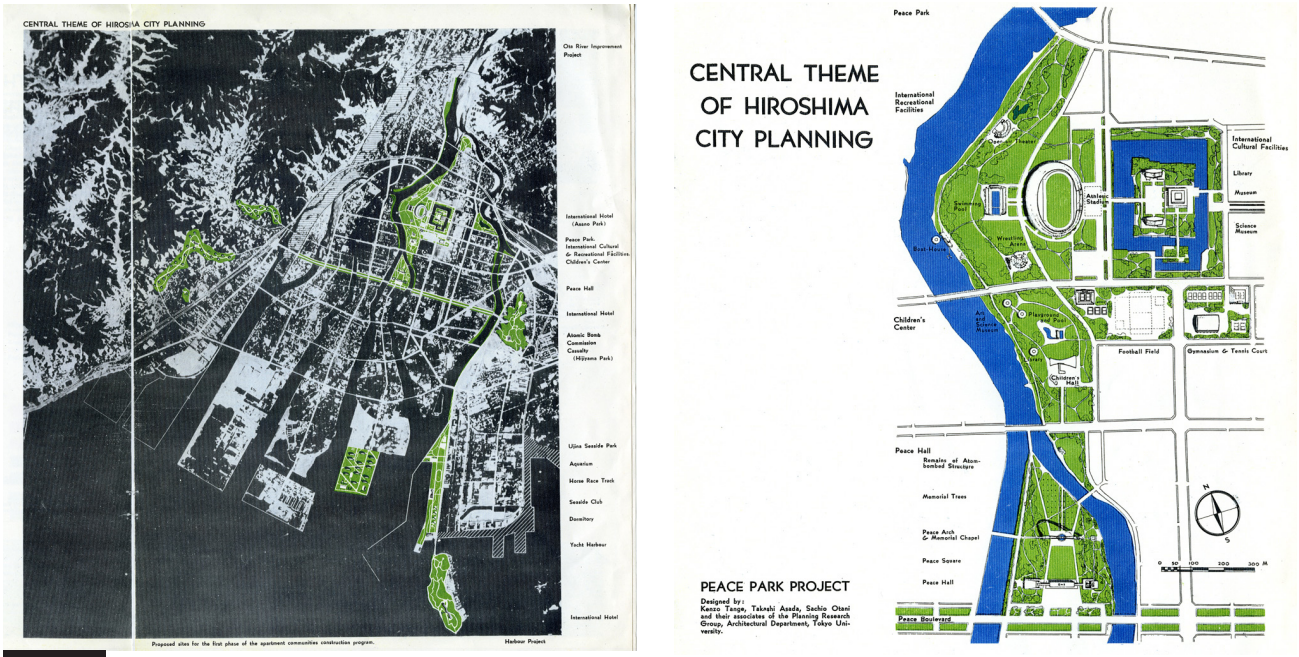
1. Ernesto Nathan Rogers, Josep Lluís Sert, and *Jaqueline* Tyrwhitt, eds., *The Heart of the City: Towards the Humanisation of Urban Life (Ciam 8)* (New York: Pellegrini and Cudahy, 1952).

2. Josep Lluís Sert, "Centers of Community Life," in: Ibid., p. 3-16, 3, and "A Short Outline of the Core," in: Ibid., p. 164-168, 165.

3. Siegfried Giedion, "Historical Background to the Core," in: Ibid., 17-29.

4. In keeping with Japanese custom, Japanese proper names appear in this paper with surname followed by the given or first name. Long vowels are indicated by macrons, but well-known place names, such as Tokyo, are written without macrons as is conventional in English.

5. For example: Tange Kenzo and Udo Kultermann, *Kenzo Tange, 1946-1969. Architecture and Urban Design* (New York: Praeger Publishers, 1970); Seng Kuan and Yukio Lippit (eds.), *Kenzo Tange. Architecture for the World* (Lars Müller Publishers, 2012); Zhongjie Lin, *Kenzo Tange and the Metabolist Movement: Urban Utopias of Modern Japan* (London, New York: Routledge, 2010); Paolo Riani, *Kenzo Tange* (London, New York: Hamlyn, 1970); Kenzō Tange, *A Plan for Tokyo, 1960: Toward a Structural Reorganization* (Tokyo: Shikenchikusha, 1961). Carola Hein, "Tange Kenzo's Proposal for Rebuilding Hiroshima," in *Cartographic Japan: A History in Maps*, ed. Kären Wigen, Sugimoto Fumiko, and Cary Karacas (Chicago: University of Chicago Press, 2016); Norioki Ishimaru, "Reconstructing Hiroshima and Preserving the Reconstructed City," in *Rebuilding Urban Japan after 1945*, ed. Carola Hein, Jeffry Diefendorf, and Yorifusa Ishida (London: Palgrave Macmillan, 2003); Lisa Yoneyama, *Hiroshima Traces. Time, Space, and the Dialectics of Memory* (Berkeley, Los Angeles, London: University of California, 1999).



FIGS. 1 - 2 The Hiroshima project presented by Tange Kenzo at the Hoddesdon 1951 conference, in "Peace Park Project," by Tange Kenzo. 丹下健三, in Peace City Hiroshima, undated.

physical to the spiritual world, before proceeding to a second gate, which is for prayers. The view beyond this gate is obscured and the visitor is not allowed to proceed to the inner precinct.[6] Tange's Peace Memorial Museum serves as the gateway to the inner precinct while the cenotaph functions as the place for prayers. Beyond, shaded by the trees of Peace Park and separated by the river, is the sacred space, the A-Bomb Dome, a brick-and-steel building close to the center of the explosion. It is a surviving remnant of the former Hiroshima Industry Promotion Hall. The similarity to shrines goes further: the *pilotis* can be seen as deriving from traditional Japanese granaries with raised floors.

In 1951, a few scholars were also already considering Tange's proposal as an innovation in Japan's distinctive urban form and social organization. The Japanese architect Maekawa (spelled Mayekawa at the time) Kunio, older than Tange and also present at the CIAM meeting in Hoddesdon, pointed to the challenges of postwar reconstruction and noted that the building of a core as a center for community life now required new societal concepts.

> "When one thinks of the Core in Japan one tends to think of a closed guild or society. Yet today the Core must be built for the open community. The business centre is not a Core, nor can the amusement centre satisfy our image of a human being. The Core must have open space and serve the citizens for recreational and cultural activities. Japan has no such Cores at present, but in the Hiroshima Peace Project one is being built." [7]

6. Carola Hein, "Hiroshima. The Atomic Bomb and Kenzo Tange's Hiroshima Peace Center," in *Out of Ground Zero. Case Studies in Urban Reinvention*, ed. Joan Ockman (New York, München: Temple Hoyne Buell Center for the Study of American Architecture Columbia University, Prestel, 2002).

7. Rogers, Sert, Tyrwhitt, *The Heart of the City*, 40.

This statement deepens when one knows something of the distinctive traditional urban form in which modern Japanese architecture and planning emerged. Pre-modern cities in Japan did not have a core, in the sense of an assembly place such as the Greek agora, but generally consisted of a cluster of small neighborhoods with an inaccessible center. In Edo (today's Tokyo), the core was reserved for the palace of the shogun. Around it were *machi*, a term used for multifunctional neighborhoods and small towns, each with their own center, adding up to a deconcentrated urban structure. As the American historian Henri D. Smith II has argued, traditional Japanese urban form does not embody European concepts of the city, whether as a visualization of political power, as a formal expression of utopian thought, or as an autonomous political entity like the medieval city.[8] Because of the prevalence of *machi*, urban change traditionally happened when individuals made small, local interventions. The concept also captures Japanese urban population density and neighborhood multifunctionality.[9]

It is difficult for outsiders to study a country with a very different language plus a long-standing and long-isolated culture. The historiography of traditional urban form and modern planning in Japan is vast, including many different strands of interpretation: among them are urban or architectural history, planning as a discipline, and urban design. According to the interests and motivations of practitioners and scholars, these different types of studies vary in object of study (physical structures, written documents, drawings, plans), topics of research, sources, and methodologies. Given the difficulty of the Japanese language for outsiders, representations have become a major methodological tool, creating a body of literature that tells a story, often, but not solely for practicing architects and planners and their quest for inspiration. Foreign architects (notably since the 1980s) considered the form of Japanese cities to be exemplary, even ideal.[10] The Japanese architect Ashihara Yoshinobu described the Japanese city as a model of the 21st century.[11]

There is a risk in focusing only on architects such as Tange and his group, modernists whose works have been extensively published in English. Ignoring the broader spectrum of debates on Japanese planning can distort (ideological) historical writing. Similarly, relying on a single and non-native language source can shape the debate, obscuring our understanding of local contexts and parallel developments that have not been presented outside the country. These preferences can also preclude an engagement with other relevant debates inside and outside Japan: on the spatial and social role of the urban center in Japan generally; the contributions made by other Japanese planners on the topic of the urban core; on the role of the core in deconcentration within or the place of the core in decentralization on a regional or national scale;[12] and on the roots

8. Henry D. Smith II, "Tokyo as an Idea: An Exploration of Japanese Urban Thought until 1945," *Journal of Japanese Studies* 4, no. 1 (1978).

9. Carola Hein, "Machi: Neighborhood and Small Town-the Foundation for Urban Transformation in Japan," *Journal of Urban History* 35, no. 1 (2008); André Sorensen, *The Making of Urban Japan. Cities and Planning from Edo to the 21st Century* (London: Routledge, 2002).

10. Barrie Shelton, *Learning from the Japanese City. West Meets East in Urban Design* (London, New York: E and FN Spon, 1999).

11. Yoshinobu Ashihara. *The Hidden Order: Tokyo through the Twentieth Century* (Tokyo, New York: Kodansha International, 1989).

12. See also: Itsuki Nakabayashi "Concentration and Deconcentration in the Context of the Tokyo Capital Region Plan and Recent Cross-Border Networking Concepts," in Carola Hein and Philippe Pelletier, *Cities. Autonomy and Decentralization in Japan*, 2nd ed. (London, New York: Routledge, 2009).

of modernist projects' in prewar debates on urban form.

To remedy these lacunae, and going beyond the attention to Tange and his project at the CIAM conference 1951 as a historical moment of global exchange, this article proposes a closer investigation into two of these dynamics: the Japanese debates on the urban core that preceded the work of Tange, and the interests of Japanese postwar architects who worked in parallel with Tange.[13] This article asks: How did (other) Japanese planners conceptualize and design the urban core in the prewar period, and how did these debates influence postwar design? How did their discussions link to those of their Western peers? Reading Tange's work for Hiroshima and later for Tokyo Bay as part of the history of Japanese planning, we can see the professional architects and planners who framed Tange's education, work, and publication in Japan - a whole community of planners rarely recognized in non-Japanese literature. Exploring the Japanese discussion about planning the core, we can also glean information on Japan-specific continuities and discontinuities in pre- and post-war debates and add to the complex study of transnational urban history.

13. Carola Hein, "Idioms of Japanese Planning Historiography," in *Planning History Handbook*, ed. Carola Hein (New York, London: Routledge, 2017).

Following a brief introduction to Japanese planning history, this article explores the shifting debates on the urban core before, during and after World War II. It uses the lens of select works of three leading Japanese planners whose life and work spanned from the pre- to the post-war era. The oldest among them was Uchida Shōzō (also read Yoshikazu) (1885-1972), a 1907 graduate of the Architecture Department of Tokyo Imperial University. His proposal for Datong in Manchuria is explored here as an example of an urban core inspired by European urban design. Furthermore, the plans by Ishikawa Hideaki (1893-1955) for the Japanese capital Tokyo, established between from 1933 to 1955, are examined as an example of Japanese awareness of European planning debates on the role of the core and on urban decentralization. Finally, select writings on urban, regional, and national form by Nishiyama Uzō (1911-1994), a graduate of Kyoto Imperial University and a key figure in Japanese planning debates in the 20th century, further exemplify the debate over the urban core. Together the projects and writings of these three planners illuminate the shifting debates on the core and its urban, regional and national role(s), showing as the larger context of Tange's architectural and urban-scale approaches to the heart of the city.

Planning in Modern Japan and the Role of the Core

Modern Japanese planning emerged in the mid-19th century, as the nation as a whole began to engage with the rest of the world. Japanese architects and planners now carefully examined foreign practices, and they developed planning approaches and tools addressing the needs of a rapidly industrializing country; they took interest in European cities and their urban cores, notably the streets, places and monuments of Paris

and London. At the same time, they also took into account the particularities of their traditional cities and the specifics of Japanese spatial development. Following the Meiji Restoration of 1868, the new Japanese government was able to reconstruct the very heart of the new capital, Tokyo, because the provincial lords who reigned in the Edo period had departed, abandoning their residences outside the shogunal palace. Here was unprecedented open space for a new government center, business district, a central train station, and other public buildings. Foreign architects Wilhelm Böckmann and Hermann Ende provided plans for this core in 1887.[14] The new Meiji-time government did not realize this or any comprehensive project, however, instead developing the area in smaller parcels that added up to a multi-functional urban core like that of Western capitals. [Fig. 3]

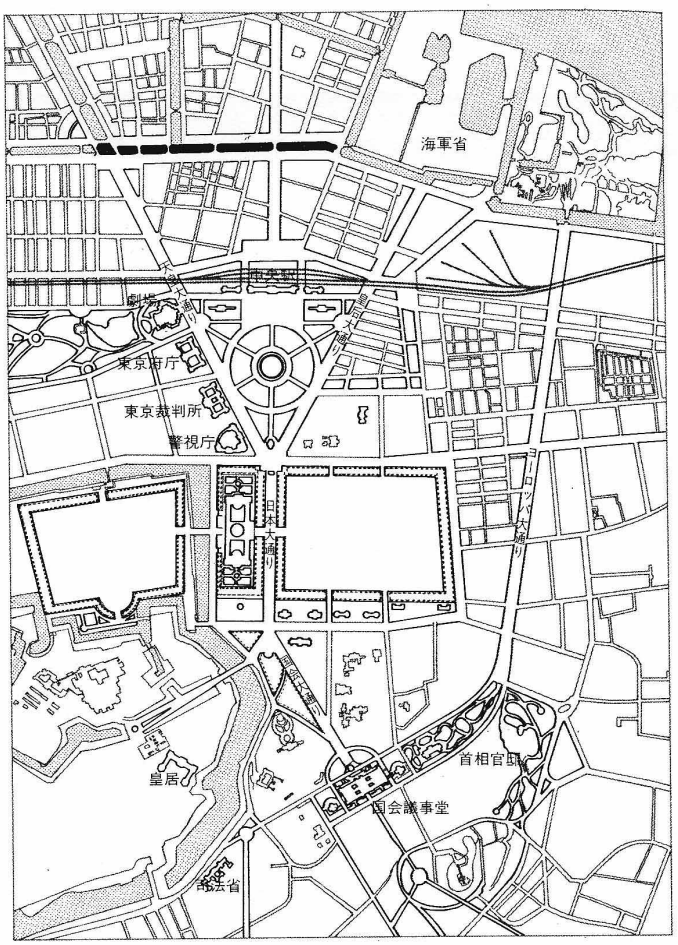


図 1-1 「官庁集中計画」ベックマン案
ベックマンの計画（図中の濃い部分）を当時の地図に重ねたもの。図の上が東。

17 欧化政策の夢のあと

FIG. 3 The project by Wilhelm Böckmann and Hermann Ende for a new monumental center of Tokyo, with room for the Parliament, ministries, and a central train station, 1887, in Ishida, Yorifusa. *Mikan No Tōkyō Keikaku (Unvollendete Pläne Für Tokyo)*. Tokyo: Chikuma Shobo (1992).

This development of the Tokyo urban core as a political and economic capital—a place of control, not a gathering place for the people—was only a small part of the larger urban development steered by the Tōkyō Shiku Kaisei Jōrei [Tokyo Urban Improvement Ordinance] of 1888, aimed at transforming Tokyo into an imperial capital. Comprehensive planning (which was at the root of North American and European planning) was not a dynamic of that change. Rather, Japanese planning focused on urban infrastructure, particularly streets, as the foundation for urban change. The 1889 First Plan for Urban Improvement of Tokyo recommended building or widening 317 streets, and creating markets, a central station, 49 parks, and rivers and canals. This made planning the domain of the engineer rather than the politician. As many authors have emphasized, the City Planning Act of 1919, often called the Old Act, gave Japanese planning its distinct flavour, as it established the main practice of Japanese planning: *kukakuseiri* [land readjustment]—a technique that created continuous land parcels for development while sharing the project costs among landowners. Land readjustment also became a tool in rebuilding, such as after the 1923 Great Kanto Earthquake. Scholars have come to call land readjustment the mother of Japanese planning.[15] As a tool, land readjustment focuses on infrastructural needs rather than the aesthetic or social dynamics that are implied in the theme of the urban core.

Modern Japanese planners thus briefly nodded to the urban and architectural design of the urban core that was the hallmark of 19th century

14. Carola Hein and Yorifusa Ishida, "Japanische Stadtplanung und ihre deutschen Wurzeln," *Die Alte Stadt* 25, no. 3 (1998).

15. Yasuo Nishiyama, J*apanese Town Planning in a Comparative Perspective: Land Readjustment Is the Mother of Town Planning in Japan* (Nagoya: Nagoya Institute of Technology, 1988); Shun'ichi Watanabe, *Toshikeikaku no tanjo: kokusai hikaku kara mita Nihon kindai toshi keikaku* [The Birth of Urban Planning: Japan's Urban Planning in International Comparison] (Tokyo: Kashiwa Shobo, 1993).

European practices and aesthetic concepts, but they did not then see the core as a (democratic) meeting place. Mostly, they saw urban planning as a pragmatic instrument for organizing the city-space, focusing on infrastructure and land readjustment.

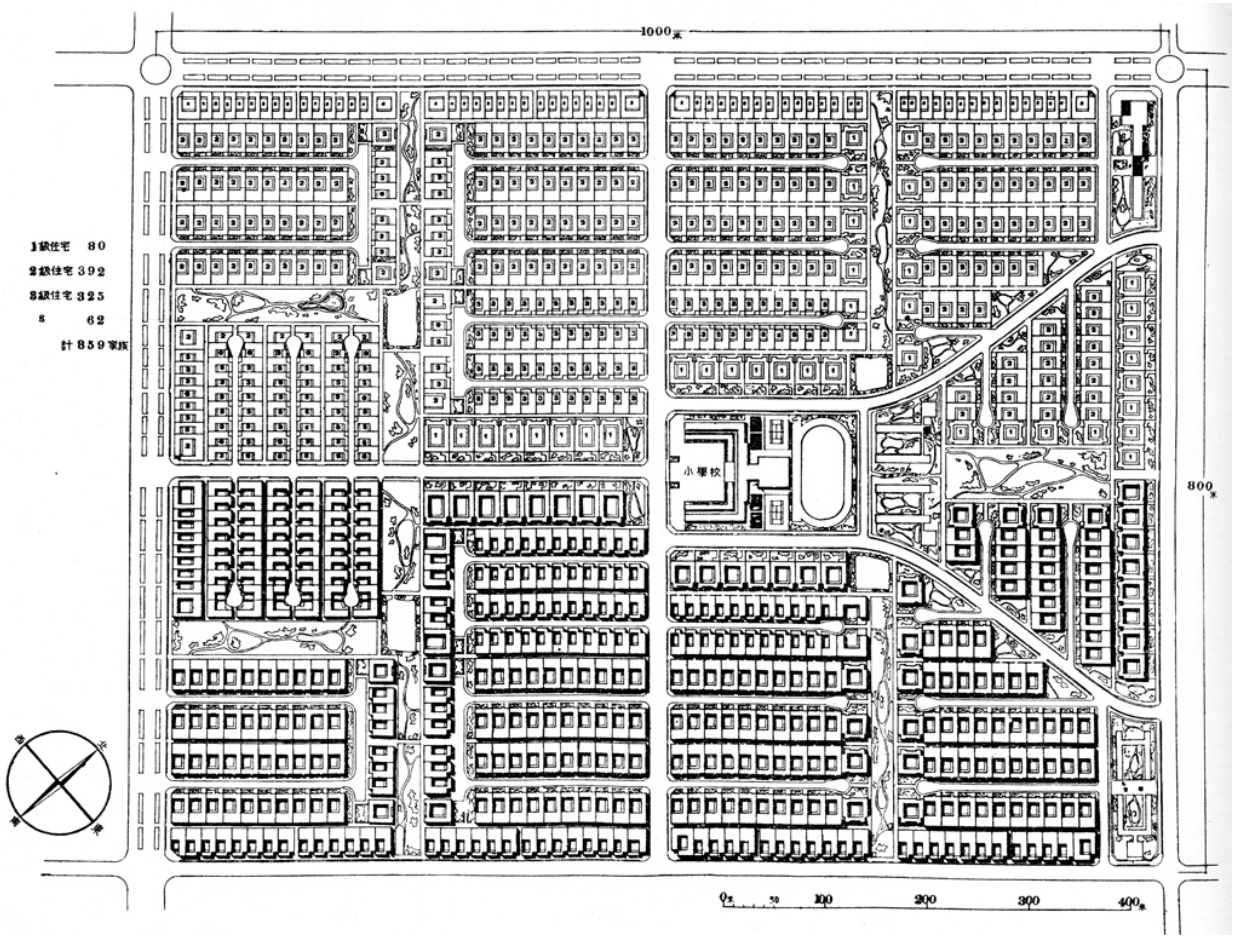
Planning for the colonies and postwar rebuilding offers some insight into the evolving Japanese perception of the form and function of an urban core, one that responded to both Japanese and foreign concepts and to shifting notions of the function of the core.

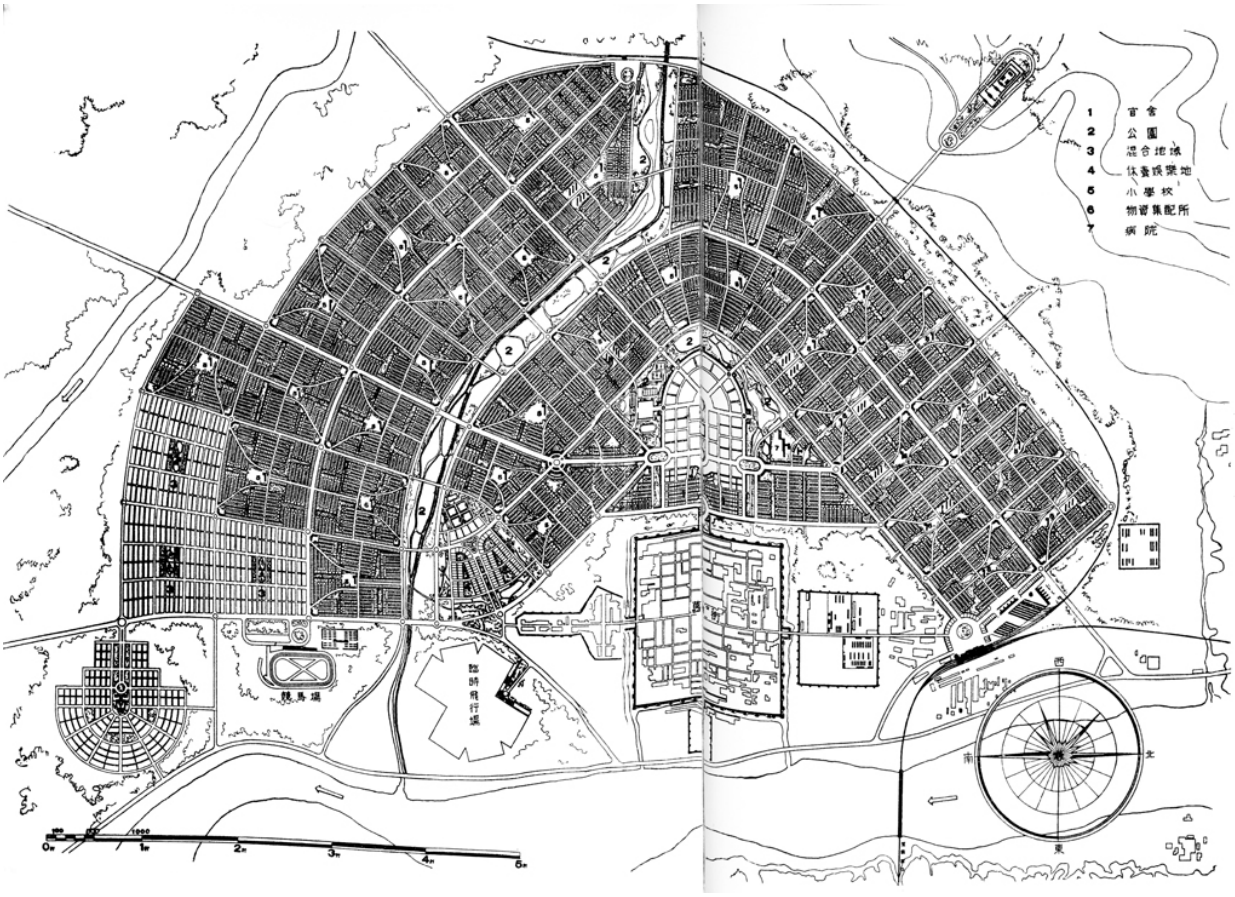
Designing the Core of a Colonial City: Datong

Japanese planners in the later 19th century had the chance to plan entire cities on the supposedly empty terrain of the colonies, and they used this relative freedom to draw up large-scale plans incorporating both foreign and Japanese practices. Even if they never built them, the opportunity also gave planners occasion to comment on the role of the urban center. Plans for cities in Manchuria by a group of architects including Uchida Shōzō, and for changes to Shanghai by Ishikawa Hideaki, stand as examples of attempts by Japanese planners to design new cities or to transform existing ones. In Manchuria, the architects also had unique opportunities to learn from foreign specialists who had built in the existing cities before the arrival of the Japanese. More importantly, in the colonies, planners could try out new planning concepts they had sampled in the West: in neighborhoods modelled on Radburn—a widely celebrated English project that featured advanced planning concepts—green belts and zoning became central design ideas, sometimes combined with modernist architecture. If European projects for colonies often aimed to express the occupiers' culture, Japanese proposals mixed Western concepts with local traditions and added only limited touches of Japanese culture. Military power in the colonies allowed officials to create urban plans impossible to imagine in Japan itself. The proposal for Datong is particularly interesting in this regard, although it was never realized.[16] In 1938, the puppet Northern Shanxi Autonomous Government invited Uchida, then professor at Tokyo University, to prepare a plan for an urban extension of 180.000 people of a colony comprising the Manchurian city of Datong plus two satellite towns. Among Uchida's companions was Takayama Eika (1910-99), who would go on to found the Department of Urban Engineering at the University of Tokyo in 1962.

For Datong, the planners suggested a double core, preserving the historic walled city center west of the Yuhe River and adding a European-inspired new town center further west, with administrative buildings embedded in greenery; it was surrounded by a new half-moon-shaped cluster of neighborhood units, each with its own local core. Along the waterfront, green spaces would host large structures, including (from north to south) a railway station, an airport, and a sports arena. [Figs. 4 and 5] These concepts might well have influenced post-war planning. Uchida published

16. Carola Hein, "The Transformation of Planning Ideas in Japan and Its Colonies," in *Urbanism – Imported or Exported? Foreign Plans and Native Aspirations*, ed. Joe Nasr and Mercedes Volait (Chichester: Wiley, 2003); Carola Hein, "Imperial Visions and City Planning: Visions for Datong in the 1930s," in *Cartographic Japan: A History in Maps*, ed. Kären Wigen, Sugimoto Fumiko, and Cary Karacas (Chicago: University of Chicago Press, 2016).





FIGS. 4 - 5 Regional and urban plan for Datong by the group of Japanese planners around Uchida Yoshikazu, in "Regional Plan for Datong, 1938" [Daido. no toshi kenkakuan 1938 大同の都市計画], from Uchida 内田祥三, "Daido. no toshi kenkakuan ni tsuite 1," Kenchiku zasshi 53 (1939): 1292. And figure 41.2 "Citywide Plan for Datong, 1938," from Uchida Yoshikazu, "Daido. no toshi kenkakuan ni tsuite 1," Kenchiku zasshi 53 (1939): 1290–91.

the Datong project in the Journal of Architecture in 1939; Nishiyama discussed it in 1942 and included in in his 1968 collective writings.[17] We can also see echoes of the Datong project in the central part of Tange's Hiroshima project. Part of his larger strategy to reimagine Hiroshima, this central part is captured in both the 1946 land use plan and his competition entry for the Peace Park. In these plans, Tange suggested freeing up the riverfronts, which had traditionally been built over; locating international facilities in an open green space; and rebuilding the historic castle that had been damaged in the war. At the 1951 CIAM meeting, he displayed this project for the urban core, together with the larger metropolitan project, which located central governmental, cultural, and commercial functions in several clusters in the center of the city as well as in various peripheral locations.

17. Yoshizō (Yoshikazu/Shōzō) Uchida, "Daidō no toshi kenkakuan ni ysuite 1," *Kenchiku zasshi* 53, no. 656 (1939); "Daidō no toshi kenkakuan ni tsuite 2," *Kenchiku zasshi* 53, no. 657 (1939); Uzō Nishiyama, *Chiiki Kūkan Ron* [Reflections on Urban, Regional and National Space], 4 vols., vol. 3 (Tokyo: Keisō Shobō, 1968).

Planning the City and Core of the Japanese Capital: Tokyo

By 1923, when the great Kanto earthquake struck, Tokyo had already taken on a modern form. The devastation of the bombing during World War II would provide yet another opportunity for a complete restructuring of the capital. Personal and professional continuity from the 1930s to 1951 provided an opportunity for conceptual continuity in reflection on urban cores. Ishikawa Hideaki (1893-1955) served as the head of Tokyo planning during these years.[18] An engineer trained at Tokyo University, Ishikawa had also studied European planning; he thought that land readjustment would not create a well-balanced city. Instead, he aimed to emphasize the cultural, humanist, and aesthetic aspects of urban design. He was convinced of the need to allow for leisure in urban spaces and his proposals for amusement districts may be considered a contribution to the larger theme of the urban core.

18. Carola Hein, "Shaping Tokyo: Land Development and Planning Practice in the Early Modern Japanese Metropolis," *Journal of Urban History* 36, no. 4 (2010); Hideaki Ishikawa, "100 nengo no toshi [The City in 100 Years]," in *Toshi no seitai* (Shunjūsha, 1943); Nihon Toshikeikaku Gakkai/The City Planning Institute of Japan, "The Centennial Issue of the Birth of Dr. Hideaki Ishikawa," *Toshikeikaku/City Planning Review* (special issue), no. 182 (1993).

Ishikawa translated these ideas into the Tokyo's War Damage Rehabilitation plan of 1946. He had very specific ideas for the city, suggesting decentralization and deconcentration of the urban population. In doing so, he followed pre-war concepts, including the German idea of *Stadtlandschaft* [urban landscape], developed since the 19th century in conjunction with Anglo-American ideas that sought to transform existing cities by creating smaller neighborhoods separated by green areas. *Stadtlandschaft* seems to have resonated with Japanese planners, who had few legal tools to implement large-scale plans and who faced widespread opposition to any attempts at comprehensive planning. For all of these reasons, their preference was for small-scale, *machi*-like patterns. The works of Walter Christaller (partly discredited later because of the use of his ideas by the Nazis) echoed the desire of the Japanese planners to make regional, metropolitan, and urban plans. First introduced in Japan in the 1930s, Christaller's writings analysed urban services in regional context and pointed to a regularity in the distribution of specific functions

that could be used in the location and planning of new cities.

Ishikawa started to develop the 1946 plan in October 1944, building on earlier plans for a ring infrastructure with deconcentrated cores by the Japanese planner Fukuda Shigeyoshi. He also took up British examples, notably the Greater London Plan of 1944 by Patrick Abercrombie, and specifically recommended the creation of new specialized centers around the city, which would function as a regional network reminiscent of Christaller's central place theory.[19] With his first textbook on urban and regional planning, in 1941, Ishikawa had proposed his own regional planning ideas and had laid them out more extensively in a section on planning for defence in his 1942 book *War and City*.[20] His scheme had divided the city into multiple small units according to daily, weekly, and monthly needs and strongly influenced his proposal for the postwar reconstruction of Tokyo. A sketch from 1946 for the Kanto region highlights the specific connections he envisioned between Tokyo and satellite cities such as Ōta, Utsunoimiya, or Mito.

19. Jun-ichiro Asano, "A Study on Hideaki Ishikawa's Early Thought About City Planning and Practice in Small and Middle Scale Cities —from 'Kyodo-Toshi No Hanashi Ni Narumade' and City Plan of Toyohashi, Okazaki, Ichinomiya," *Journal of Architecture and Planning* (Transactions of AIJ) 74, no. 642 (2009).

20. Ishikawa Hideaki, *Sensoo to Toshi* [War and City] (Tokyo: Nihon Denpo Tsushinsha Shuppanbu, 1942).

Ishikawa envisioned a ward population of around three and a half million people and with new satellite and outer towns all over the Kantō plains to accommodate the growth of population and industry. Ishikawa planned mono-functional towns containing 200,000 to 300,000 people, set apart by greenbelts (an inheritance from air defence planning during the war, not from Western garden cities) and structured by a ring- and radial-shaped road network connecting them. Political and economic functions were to be decentralized to other cities within 40 kilometres of Tokyo, while "culture" was to be concentrated in cities at a radius of one hundred kilometres. All of these cities would work together in a network. Meanwhile, each of these other cities or small towns would itself become a center of 100,000 to 200,000 inhabitants, reducing the Tokyo population from 6.5 million (its population before the war) to a maximum of 3.5 million.[21] [Fig. 6]

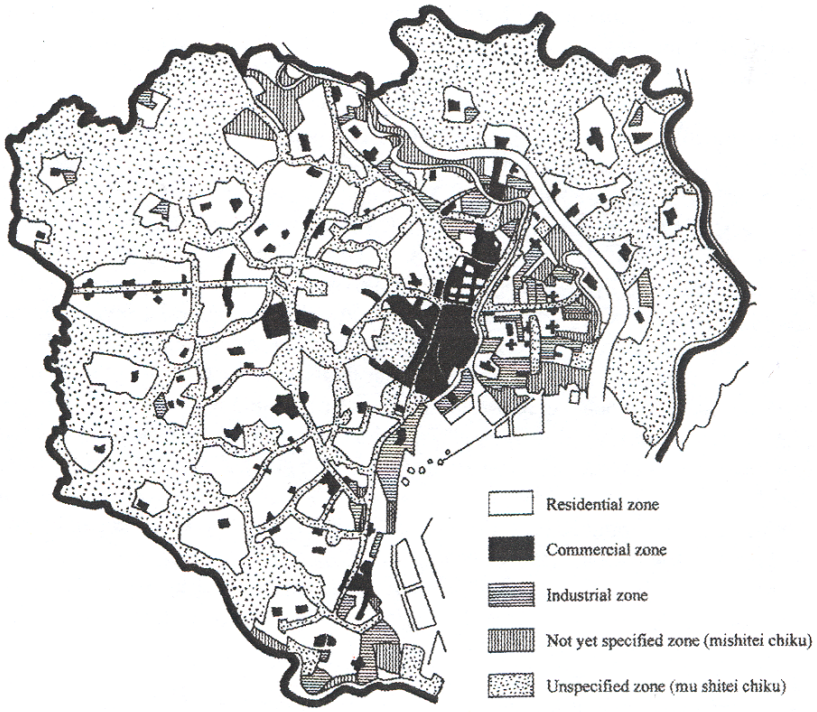


Figure 3.3 Land-use plan as part of the Reconstruction Plan for Tokyo (1946). Source: Ishida (1987: 224). Just after the air bombings of Tokyo in 1946, land use was unclear in many districts, which thus were designated "not yet specified" zones (*mishitei chiku*). Land use in "unspecified zones" (*mu shitei chiku*) was not specified in order to reserve land for the future.

FIG. 6 Tokyo War Damage Rehabilitation Plan of 1946 issued by the Tokyo Metropolitan Government, in Ishikawa's plan advocated deconcentration and lower population numbers than before the war. in: Ishida Yorifusa, Nihon kindai toshi keikaku no hyakunen (1987, p. 224).

21. Ishikawa Hideaki, *Kōkoku toshi no kensetsu: Daitoshi sosan monad* [Constructing the City for the Empire] (Tokyo: Tokiwa Shobō, 1944).

Tokyo proper was to be reconstructed following a strict zoning concept, with industrial functions close to the harbour and the Sumida river. Instead of a single core, Ishikawa continued to promote a multiplicity of cores, notably along the Yamanote loop line, at Ikebukuro, Shibuya, Gotanda, and Omori. He assigned major amusement and commercial functions to different cores—Ginza was the international center, Shinjuku was the amusement area for white-collar workers, and Asakusa was now the old downtown. Big commercial centers would provide mainly specialized goods, while shopping areas for daily use would be close to the transit stations in the middle of neighborhood units. Waseda, Hongo, Mita, Kanda Surugadai, and Ookayama were to become culture and education zones with libraries, museums, research institutions, and housing. Ishikawa's original plan projected land readjustment on about fifty thousand acres, exceeding the burned-out area. But the nation's financial difficulties and the "Fundamental Policy for the Reconsideration of Reconstruction Planning" of 1949, which—based on the American-imposed so-called Dodge line[22]—forced reconstruction projects to be scaled down or abandoned, and curtailed Ishikawa's idealistic concepts. Yet many of these centers in this decentralized form suggested by Ishikawa—and before him by Fukuda on a ring further out—have come into being.

22. The so-called Dodge line was an austerity budget devised by Lt. Dodge and imposed by the GHQ, which targeted national budget allocations for public works projects and especially for the war-damage reconstruction projects.

Debates on the form and function of the urban core were thus prominent in Japanese planning discourse before and during the war. Ishikawa publicized his reconstruction plan with a film presented in 1938.[23] Moreover, he initiated urban planning competitions and consultations to launch these multiple cores. Working on these projects, Japanese planners further developed the concepts for cores and cities they had first considered for the colonies. In two of Ishikawa's competitions for Tokyo sub-centers, Uchida Yoshifumi, a member of the Datong planning group, won first prize. Tange's project matches Ishikawa's architectural proposals for centers in Tokyo. But whereas Tokyo's head planner created multiple centers for a range of functions, Tange's proposal is unique as a single symbolic core and festival place. No memorial sites were built here in the center of Tokyo, the capital where the war had started. Instead, a memorial project is at the heart of Hiroshima, where Japan was the victim.[24]

23. Kari Shepherdson-Scott, "Toward an 'Unburnable City' Reimagining the Urban Landscape in 1930s Japanese Media," *Journal of Urban History* 42, no. 3 (2016).

24. James J. Orr, *The Victim as Hero: Ideologies of Peace and National Identity in Postwar Japan* (Honolulu: University of Hawaii Press, 2001).

Theorizing and Planning the Core as a Function of Urban Regional and National Space

The planner who perhaps thought the most about the core as part of Japanese cities is Nishiyama Uzō, a theorist and planner who was active from the 1930s to the 1980s. His reflections on urban, regional, and national space were originally published in the 1940s in professional magazines, shaping Japanese planning in the second half of the 20th century. In these publications, Nishiyama was carefully studying foreign

planning debates, including the works of Ebenezer Howard, Le Cobusier and Nikolay Alexandrovich Miljutin, and discussing his findings.25

Nishiyama was interested in ideas of the urban core as both an organizational unit and a social one. In 1942, he entered the competition for a monument for the Greater East Asian Co-prosperity Sphere (the Japanese imperial area of control), without concerning himself about the policies behind it. His approach to this topic differed from that of the other competitors. In contrast to Tange, whose competition proposal for a location close to Mount Fuji is better known, Nishiyama situated his proposal in Asuka, in Nara Prefecture. Instead of creating an isolated monument, he envisioned an entirely new city closely connected with the existing village. It would be a kind of permanent Olympic village, a meeting and festival capital offering cultural and sports facilities for all the different people who had come under Japanese authority. The design combines monumental and modern elements, proposing a compact infrastructure connected by green routes.[26]

Nishiyama was also one of the rare planners to reflect on the social dimension and human values of planning. He did not criticize the big city itself. In contrast to Ishikawa, he objected to decentralization and was convinced that further density was better. He specifically tried to maintain multifunctionality in big cities and to make them more liveable, proposing decentralized, self-governed neighborhoods, which he called life spheres, each with its own core. Like Ishikawa, he cited Christaller and Feder as inspirations. As in later CIAM discussions, Nishiyama reserved the city center for commercial and public administrative functions; he located a network of small monofunctional urban units - industrial, cultural, and harbor facilities - along major lines of transportation (principally railway lines), separating them from other urban areas with green strips.

Nishiyama's proposals for post-war rebuilding were largely ignored by Japanese officials, and in response, with his students he launched the concept of *Kōsō Keikaku* [Image Planning].[27] His 1965 urban design project for Kyoto, featuring a high-rise axis through the center of the ancient city, can also be seen as a response to Tange's project for Tokyo Bay, published in 1958, and probably to the megastructure proposals coming from the group of metabolists based in Tokyo.[28] Nishiyama's goal in his visionary proposals was to show the contradictions in the urban living space, including potentially negative features that he termed "inferno."[29] [Fig. 7] Nishiyama's complex relationship to the changing and modernizing post-war city is evident in his approach to the car. He critiqued the negative effects of car traffic, noise, and air pollution, the need for parking spaces, and similar problems that overwhelmed roads in the traditional city, where streets were a place for community activities, and a room to play and to meet, effectively an extension of the home. He proposed "Iepolis" [Home City], a city limited to pedestrian traffic and mechanized public

25. Carola Hein, "Nishiyama Uzō: Leading Japanese Planner and Theorist" in Uzō Nishiyama, Reflections on Urban, Regional and National Space: Three Essays, with an Introduction by Carola Hein (New York, London: Routledge, 2017).

26. Uzō Nishiyama, "Seikatsu No Kōzō to Seikatsu Kichi [The Structure of Life Units and the Base of Life]," *Kenchikugaku kenkyū* (later included in his book *Chiikikūkanron*, Tokyo, Keisō shobō, 1968), no. 110+111 (1942).

27. The World Design Conference Organization, *World Design Conference 1960 in Tokyo* (Tokyo: Bijutsu Shuppansha, 1961).

28. Uzō Nishiyama, "A Plan for Kyoto," *Japan Architect* 105, (February 1965).

29. Andrea Yuri Flores Urushima, "'Everyday Unavoidable Modernization and the Image of Hell: Visual Planning in the Writings of Nishiyama Uzō'," in A*lternative Visions of Postwar Reconstruction: Creating the Modern Townscape*, ed. John Pendlebury, Erdem Erten, and Peter Larkham (London: Routledge, 2014).

transportation.30 The car had to stay on the outskirts; just as the Japanese practice of inhabitants and visitors removing their shoes on entering from outside, cars shouldn't be allowed into the urban center. Nishiyama thus met modern needs (and the concepts of the CIAM leaders) while maintaining housing traditions.

FIG. 7 Nishiyama with members from his research group discussing a model of the Kyoto axis plan, in Uzō Nishiyama Memorial Library

His plan for Kyoto also divides the land into autonomous units and a central plaza, as he had proposed in the 1940s.[31] He suggested a skyscraper axis in the ancient city - strangely echoing Le Corbusier's proposal for a city of 3 million inhabitants, the Cité Voisin, to be built over the center of Paris - destroying a central North-South area of the existing urban structure. As such, it surprisingly contrasted with Nishiyama's earlier negative assessment of Le Corbusier's work and other aspects of his own writings, while also incorporating his notion of displaying "inferno" to the masses.[32]

Nishiyama continued to focus on urban centers, the topic that also led to Tange's post-war fame. In the 1960s, Japan campaigned to bring international events to its cities, which created opportunities for large scale planning. The Tokyo Olympics brought the country a lot of attention, and also public funding for the capital. The Osaka area, a long-time second in receiving funding, campaigned for the next big event, the Expo. Osaka '70 was a unique opportunity for intellectuals from the Kansai area to engage the public sector and to counter the prominence of the Tokyo group. As Andrea Urushima has shown, Nishiyama proposed to make the Osaka site a model city core, and suggested erecting buildings that could be the heart of a new city area after the event.[33] This was a unique opportunity to invest public money into urban construction as Nishiyama had been advocating, and the ultimate confirmation of the ideas he had elaborated in the 1940s. Nonetheless, the final exhibition project was designed by Tange.

In the post-war period, instead of Nishiyama's organized construction, the country saw haphazard urban sprawl, a number of large-scale visionary projects by metabolist architects, and a few architecturally designed buildings—such as the Kurashiki Townhall— that continued Tange's idea of the core and furthered architectural debates on the urban core rather than urban planning ones.[34]

30. Uzō Nishiyama, Hiroshi Mimura, and Toshihide Katayose, "Home City," *Kindai Kenchiku* 14 (1960).
31. Nishiyama, "A Plan for Kyoto."

32. Shinya Katagata, "Ch. 3: Kōsōkeikaku: kūkan no ronri to yosoku," in *Nishiyama Uzō no Jūtaku, Toshiron: Sono Gendaiteki Kenshō,* ed. Shōji Sumita and Nishiyama Uzō Kinen Sumai Machizukuri Bunko (Tokyo: Nihon Keizai Hyōronsha, 2008).

33. Andrea Yuri Flores Urushima, "Genesis and Culmination of Uzō Nishiyama's Proposal of a 'Model Core of a Future City' for the Expo 70 Site (1960-73)," *Planning Perspectives* 22, no. 4 (2007).

34. Reyner Banham, *Megastructure: Urban Futures of the Recent Past* (New York: Harper and Row, 1976); Zhong-Jie Lin, "From Megastructure to Megalopolis: Formation and Transformation of Mega-Projects in Tokyo Bay," *Journal of Urban Design* 12, no. 1 (2007).

Conclusion: Continuities with the Traditional City and its Decentralized Structure of Multiple Cores

Planning for the urban core in Japan has a long and complex history. The neighborhood units proposed for Datong by Uchida's group, the plans for Tokyo by Ishikawa, the analytical proposals for Japanese cities by Nishiyama, and the city-wide plan for Hiroshima proposed by Tange, all built upon the traditionally deconcentrated city and its multiple cores as well as on foreign concepts of deconcentration and decentralization. Ishikawa's plans for Tokyo failed, as the population of the capital rose quickly. Projects that appear to reflect strong European influences often turn out to be less of a break with traditional Japanese ways of organizing urban space and more of an integration with those traditions. Thus, to focus on Tange's Hiroshima center as only a modernist innovation contributing to CIAM debates on the core is to ignore his larger project for the city, and to miss the traditional aspects of his work; by the same token, widening our focus beyond Tange, we can see that planning in Japan had since before the war considered decentralization and the organization of the urban core. Existing centers may have facilitated the emergence of multiple decentralized centers as proposed by foreign planners.

Nishiyama's intervention in favour of the neighborhood, *machi*, was not a direct reaction to wartime destruction; it transcended this period and had a strong influence on *machizukuri*, the 1960s movement for neighborhood or community planning, As Nishiyama had pointed out earlier, there is a special quality to the traditional neighborhood or *machi*, its social and functional diversity, and its distinctive meaning for the Japanese; local participation in decision-making and small-scale urban amelioration programs was a first step towards a more humanized planning, a vision that also drove the planners of CIAM in Hoddesdon. An architectural intervention or an urban design project that is not tied into broader urban, regional, and national structures, however, does not replace Nishiyama's central project: a comprehensive vision based not only on economic concepts, but on a set of social and political ideas for a balanced society.

The recent emergence of architectural, urban, and planning history on Asia (as well as other continents) helps balance and even provincialize the often dominant European/American/Australian narrative. These new global perspectives on what makes a city, what concepts and tools dominate, and how they tie to architectural projects, also help us to reassess the various disciplines, their relation, and the writing of history. In light of the powers of global differences in political and economic planning and in economic forces, we may have to reassess the definition of architectural design as expression of political preferences. Here, the desire to create the core as a site for communal gathering can be seen as modernist and Western, and distinctively of the post-war period. Placing these histories in their local context may help reassess our understanding of global (urban) histories.

Jumbo Architecture

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ABSTRACT

Airport design in the 1960s and 1970s reflected the exponential changes in scale and experience brought about by the 747 and other "jumbo" aircraft. New requirements for passenger loading, accommodation, and circulation meant that the "airy prettiness" that had defined terminal buildings, cabin environments, and airport landscapes in the 1950s were subsumed by less humane and more disconcerting environments and systems that produced more noxious sensory environments. The sublime scale of the new hardware and its surrounding operations marked a sudden shift in sensibilities, economies, and passenger experience that remains symptomatic today.

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KEYWORDS
Airport Design, Aircraft Interiors, Infrastructure, Marketing, Industrial Design

"l'avion accuse."

Le Corbusier

"Just as New York City can now be seen to inhabit a fossil future that was laid down about 1910—the future that was institutionalized by the Futurists themselves—so dinosaur-designs like Dallas/Fort Worth can now be seen to inhabit a fossil future that was laid down in the days of wide-bodied Jumbo Jets, which may themselves prove to be the last of their lines, too."

Reyner Banham,
Megastructure: Urban Futures of the Recent Past.

Corbusier's indicting aircraft eviscerated classic architectural principles on several levels. In its tectonic conception, its remarkable performance, and its god's-eye (or, perhaps more to the point, urban planner's-eye) view of the twentieth century city, the new vehicles were agents of spatial and urban change. The old guard could not maintain against the aircraft's machine-gun efficiency, a swift, violent modernizing force that was so omnipotent, in Corbusier's view, as to verge on the poetic, even the spiritual.

For thirty-five years after Corbusier's pronouncement, developments in aviation and architecture moved forward with new building typologies—the hangar, the air terminal and the control tower—contributing to a streamlined art deco style, and later integrating long span structural engineering with architectural design. Throughout the 1920s and 1930s, aviation's effect on architecture was manifest at three scales: terminals themselves that adopted prototypes from railway architecture, hangars such as those by Eugene Freyssinet at Orly that brought new structural forms to the long spans required by aircraft and airships, and town-sized precincts of runways and tarmacs like those at Chicago's Municipal (later Midway) Airport, the world's busiest airport in 1932 and among the world's largest when it usurped neighboring rail lines and doubled in size ten years later.

FIG. 1 TWA Terminal, Idlewild (later Kennedy) Airport, New York. Eero Saarinen & Associates, 1962.
[Author's collection.]

Through the jet age of the 1950s, aircraft terminals celebrated air travel's dynamism and vaporous aesthetics. Architects offered metaphorical interpretations such as Saarinen's terminals at Dulles and Kennedy airports **[Figs. 1-2]** along with material and experiential tributes such as Tippets-Abbot-

McCarthy and Stratton's "saucer-like" Pan American terminal at Kennedy, a concrete parasol and airy glass curtain wall so elegant that the building was featured in Vogue upon its completion in 1961 [Fig. 3]:

Here's our idea of indispensable: straightforward, independently pretty dresses—and jackets that provide them with the fashion-substance of suits. (Background here is Pan American's new jet-oriented terminal at Idlewild, where suit-substance is clearly indicated; six hours from this point, the scene might be Claridge's in London and the dresses jeweled, tullhatted, wearing furs in place of jackets).[1]

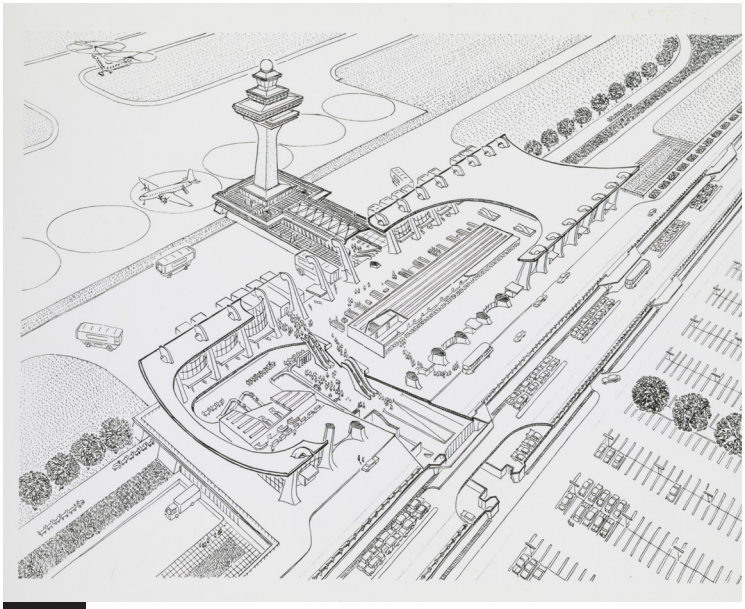

FIG. 2 *Cutaway perspective, Dulles International Airport, Chantilly, Virginia.* Eero Saarinen & Associates, Architect, and Eero Saarinen, 1959. Retrieved from the Library of Congress, https://www.loc.gov/item/2008680884/. (Accessed August 25, 2017.)

The trans- and intercontinental travel that the four-engined 707 spawned led airlines to push manufacturers for further efficiency, larger and faster aircraft that sped the new traveling class to global destinations in increasing numbers. After following up the 707's success with smaller jet aircraft designed to feed larger international hub airports, Boeing transformed an unsuccessful military freighter design into one of the decade's most recognizable icons. Debuting in 1970, the 747 was something new in the skies, a massive, skyscraper-sized aircraft that laid waste to a generation of received wisdom about the economics of jet travel, its associated architecture and infrastructure [Fig. 4].

FIG. 3 Pan American Terminal Building, Idlewild (later Kennedy) Airport, New York. Tippetts-Abbett-McCarthy-Stratton, 1960. *Vogue*, October, 1960. © 1960 Vogue The Conde Nast Publications, Inc.

Boeing's freighter design had relied on a front-opening nose, requiring the cockpit to sit will above the fuselage and requiring a long fairing to its rear. This 'hump,' with all of its aerodynamic inefficiencies, became the plane's signature, along with its ponderous scale, its space- and time-warping abilities and the landside contortions required to service its 350-seat capacity. The 747 was a quintessential artifact of the 1970s, changing the face of airports worldwide and providing new spatial experiences and demands at three scales. The aircraft's interior represented a new space in aviation, one more akin to a movie theater or living room—"the double aisles in a 747 do lead people to walk around and chat for a while," noted humorist Calvin Trillin.[2] Its effect on urban infrastructure was also profound, as its capacity required airports to change from civic precincts to networks of vehicular interchange.[3] Finally, the airport terminal itself faced grave challenges, requiring systemic approaches that replaced the jet age's monumental qualities with efficient but disorienting, antiseptic corridors. The Jumbo transcended human scale, and its disorienting effects on interior, urban and architectural design mark the onset of a Jamesonian hyperspace, a realm in which

1. "New York's Idlewild: The New Look," *Vogue* (October 1960): 190-191. See, too, "Saucer Terminal," *Time*, April 15, 1957, 105.

2. Calvin Trillin, "U.S. Journal: N.Y./L.A./N.Y. A Travelling Person on a Beautiful Place," *The New Yorker*, April 4, 1970, 66-77.

3. See, in particular, Reyner Banham, and Raymond Spurrier, "The Landscape of Hysteria," *Architectural Review*, no. 132, (October 1962): 251-260

FIG. 4 Figure 04. "The Spacious Age is Here." Boeing's 747. Promotional Brochure, The Boeing Corporation, ca. 1969. [Author's collection].

human scale and experience were cast off. Beyond an indictment, the 747 evaporated its predecessors' spatial norms, offering a perceptual warping of time and space. The resulting agonies and pleasures became defining spatial and urban vectors during the Jumbo era.

The Cabin

The Jumbo jets' early reviews focused on their interiors. Twice as wide as the 707, the 747 presented a different air travel experience from the previous decade's crisp elegance. Its cabin's flat ceiling and near vertical walls belied the external shape of the fuselage **[Fig. 05]**. Double aisles and nine (or ten) abreast seating meant that the new aircraft's economy cabins were more akin to small cinemas, or large living rooms, than the previous era's tubular spaces. Intermediate bulkheads, distributed throughout the cabin further concealed the interior's vast scale while providing convenient galley space. With Cinerama movies, seat-side service on hot porcelain plates, and most seats removed from the small porthole windows, the new jets' 'flying rooms' insulated their passengers from flight's visceral sensations, focusing attention inward on meals, movies and music at the seat itself. The 747's ponderous bulk further reduced travel sensations for passengers and pilots. The planes' massive control surfaces had to be maneuvered through cockpit controls connected to hydraulic relays, and pilots spoke of 'flying valves' instead of gaining the direct feedback from rudders and ailerons.[4] The cockpit's location, thirty feet above the ground and well forward of the nose wheel, forced Boeing to build a training rig at their Everett, WA factory so that pilots could get used to the ground handling of the unusual arrangement prior to their driving the $20 million aircraft ($96 million in 2003 terms) through confined airport tarmacs.

FIG. 5 "The 747 is a lot of little nice things." Promotional Brochure, The Boeing Corporation, ca. 1969. [Author's collection].

Economy class' "flying rooms" were supplemented by the 747's most unique feature, the 'hump' that filled the aerodynamic fairing behind its cockpit **[Fig. 6]**.[5] While the Boeing Stratocruiser had been a double-decker plane with a lounge below, the Jumbo's upstairs deck cemented its

4. For a history of the aircraft's most notable feature see Bill Sweetman, "How the 747 Got Its Hump," *Air and Space Magazine*, (May 2003).

5. For a history of the aircraft's most notable feature see Bill Sweetman, "How the 747 Got Its Hump," Air and Space Magazine, (May 2003).

reputation for technological wizardry, and airlines responded by tailoring seating arrangements and (more popularly) lounges to its bulbous proportions. For a time, the spiral staircase leading up to the lounge was the aviation's 'most renowned architectural feature,' a promenade like no other in travel.[6] Upstairs, airlines recognized the opportunity to configure and design the hump's interior to reflect their own brands, targeting their first class passengers with fashionable shag carpeting, wood and laminate bars, and the opportunity to "see from twenty-thousand and fifteen feet what one couldn't see from twenty-thousand." Ubiquitous throughout these lounges were the airlines' stewardesses, whose presence in the male-dominated lair of the frequent traveler in the 1970s was an unspoken amenity. In the words of Southwest's chairman, any 'girl' who couldn't wear 'kinky leather boots and hot pants' was not stewardess material, and the job became the stuff of constant innuendo throughout the decade, quietly encouraged by airlines seeking to attract businessmen's travel.[7]

6. Trillin, "U.S. Journal".

7. Keith Lovegrove, *Airline: Identity, Design, and Culture* (London: Laurence King Publishing, 2000), 32.

Over time, these factors - the room-like interiors and seat-side service of economy class, the upstairs lounge and the winking presence of the airline stewardesses - became elements in a formula designed to placate passengers on the long flights made possible by the 747's new range. While the 707 had permitted the first regular non-stop service across the Atlantic, new routes offered by the Jumbos began to push flight times back into the marathon journeys of pre-war propeller planes, with the longest trans-Pacific flights averaging over ten hours. Adding to these long periods of confinement and inactivity in close proximity to 350 other travelers, the 747 was plagued in its early years by mechanical and logistical delays, leading airlines to devise ways to "prevent outright passenger revolt."[8] In addition to the soporific effects of meals and cinema, alcohol became a staple on long hauls, which became known as "gin flights." Airline strategy on these long-haul routes was, in the words of one stewardess, to "feed 'em steak and give 'em all the liquor they can drink."[9] Where airlines had sold their 707 flights in the 1960s as experiences in themselves, advertising for 747's focused instead on the complete *lack* of stimulus offered by the specially designed seats, the quiet, stable interior, and the endless flow of spirits [Fig. 7]. American described its aircraft's interiors as "beautiful places," while Pan Am sold its economy service as providing "all the room in the world," even though travelers were given brochures full of advice on how to spend most of the flight either asleep or, at worst, mildly intoxicated. Passengers' intentional disorientation was no match for the effects of jet lag on arriving travelers, and the "dysrhythmia" of transpacific 747 travel was more profound than

FIG. 6 The spiral staircase was the 747's most distinctive architectural feature, complemented by full shag carpeting and lounge seating designed to match individual airlines' branding campaigns. Promotional Brochure, The Boeing Corporation, ca. 1969. [Author's collection].

8. "Aircraft: Period of Adjustment," *Newsweek*, July 13, 1970, 81.

9. "Aircraft: Period of Adjustment," 81.

that of the transatlantic 707. Even in the airline cabin, there was a conscious attempt to transcend, or rather to suppress space and time themselves, the ideal flight being seen by airlines and passengers alike as one during which the economy traveler would be either unconscious or distracted by on-board movie screens.

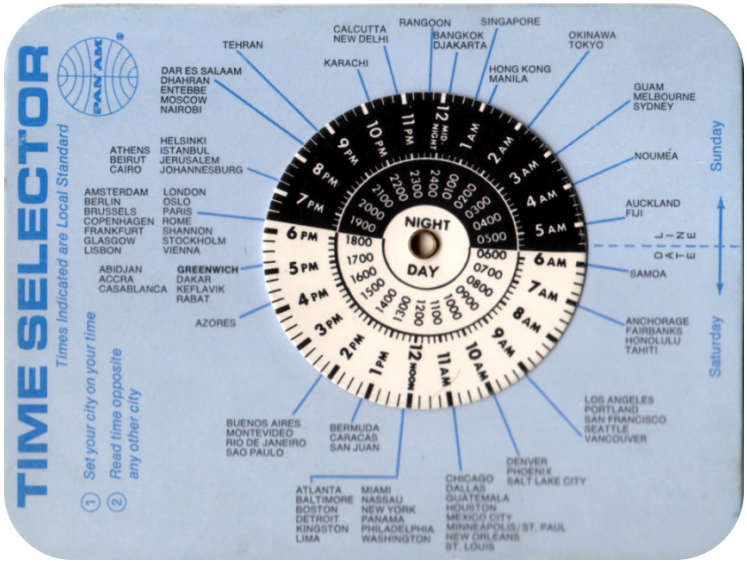

FIG. 7 Spatial dislocation was just one symptom of trans-continental travel. Pan Am issued time zone calculators to passengers in an attempt to ease the cognitive effects of jet lag. "Time Selector," Pan American Airlines, ca. 1972. [Author's collection].

Infrastructure

If the 747 cabin was an anesthetizing, disorienting environment for the human psyche, the Jumbo's effects on the urban landscape were also profound. Doubling the number of passengers per plane at airports built during the early jet age required infrastructural approaches on a scale so massive as to distort and disfigure the surrounding city. Reyner Banham noted this as early as 1961, when his critique of Idlewild (later JFK) airport in New York pointed out that the airport's 'architecture' was confined to a small nucleus in the center, surrounded by a protoplasm of runways, hangars, highway interchanges and radio signal devices that mocked the terminals' airy pretensions.[10] And this was seven years *prior* to the first 747 landing. While larger aircraft promised greater efficiency in long haul flights, the resulting increase in feeder routes airside and vehicular traffic landside proved catastrophic.[11] Ninety-minute delays at JFK became the norm in the early 1970s as aircraft lined up for gate space, while highways leading to the airport became jammed with traffic. Kennedy quickly supplemented its looping, graceful roadway with freeway overpasses and connections requiring arriving passengers to drive beyond their terminal and loop back to dedicated parking lots, following signs rather than finding their way by the landmark terminals **[Fig. 08)**. Chicago's O'Hare, constructed for 707 traffic, benefited from its location by two major interstates, however its surge in popularity as the geographical center of the nation's airline network required a mammoth parking garage, still the largest of its kind in the world, its 13-acre decks still require complex signage to direct baffled arrivals **[Fig. 9]**. "So long as flying and getting to your destination remain two distinct activities," opined *Progressive Architecture* in 1969, "then air transportation problems will not be resolved. Flying is the business of the airline, getting [to the airport] is the sole purpose of the passenger. The two objectives are not necessarily compatible."[12]

10. Reyner Banham, "The Obsolescent Airport," *Architectural Review*, no. 132 (October 1962): 252-253.

11. William Burrows, "Time Runs Out at JFK," *New York Magazine*, July 29, 1968, 14-21.

12. Forrest Wilson, "Editorial," *Progressive Architecture* (November, 1969): 91.

FIG. 8 John F. Kennedy International Airport was an ongoing laboratory for infrastructural and architectural attempts to cope with the scale of the 747. New freeway interchanges produced baffling wayfinding problems for arriving traffic. Informational brochure, The Port Authority of New York and New Jersey, ca. 1980. [Author's collection].

FIG. 9 Parking Garage, O'Hare Airport, Chicago. C. F. Murphy & Associates, 1969. The 'world's largest parking garage,' built to handle the increase in traffic brought about by wide-body jets with over 9000 parking spaces. Contemporary postcard [Author's collection].

Solutions to air and landside congestion repeated the spatial dysrhythmia of the Jumbo's interiors. On the tarmac, the solution for airports constrained by outdated designs was the Plane-Mate, developed by the Chrysler Corporation as a 'mobile lounge' that would keep the massive aircraft far from the terminal. The Plane-Mate was a bus mounted on hydraulic jacks that could dock with standard jetway entrances at either end, boarding passengers at the terminal, dropping down to ground level, trundling across the tarmac while providing a "wide view of airport activity" and then rising to align with the aircraft's main doors [Fig. 10]. The Plane-Mate eliminated the "maze of aisles and corridors" spawned by new jumbo jet terminal construction, even allowing passengers journeying to their aircraft the chance to "smoke, if you wish."[13] The spatial efficiency was impressive, and it was adopted wholesale at Eero Saarinen's Dulles International Airport outside of Washington, D.C. However the Plane-Mate did nothing to decrease boarding time, and airlines balked at parking their $20 million flying billboards at remote boarding positions, far from the captive eyes of potential travelers.

13. T*he Mobile Lounge…A New Concept in Convenience for Air Travelers*, promotional booklet (The Chrysler Corporation, ca. 1965).

Landside, planners recognized the need for new scales to shuttle passengers between urban centers and the waiting 747s. While highway improvements such as Kennedy's offered some mitigation, airports of the 1970s included steroidal freeway approaches and new, futuristic light rail systems that connected to intermodal transit or to distant parking lots connected to interstate highways.

FIG. 10 The "Plane Mate" brought problems of loading and unloading directly to the aircraft themselves. Promotional brochure, The Chrysler Corporation. ca. 1966. [Author's collection].

Kansas City's new airport, designed to cope with the increased feeder traffic brought about by the Jumbos, featured four circular terminals that balanced automotive turning radii with jet wingspans. The result was an exaggerated set of traffic roundabouts with a thin, undulating architectural strip mediating the two vehicular scales **[Fig. 11]**. Tampa, on the other hand, limited the automobile's intrusion into its new airport in 1974, placing its check-in facilities underneath a multi-story parking garage and distributing passengers back across the looping entry highway by light rail to aircraft gates. Liberated from the curbside luggage and ticketing facilities, Tampa's aircraft gates proved efficient, but the counter-intuitive nature of the centralized pavilion and the graceless entry to the ticketing basement by elevator from the car park were disorienting in their own right **[Fig. 12]**. Other airports including Houston and Cleveland proposed similar rail systems, usually monorails with forms derived from supersonic aerodynamics, but traveling at more pedestrian speed.

FIG. 11 Kansas City International Airport. Kivett and Myers, 1972. Contemporary postcard [Author's collection].

FIG. 12 Tampa International Airport. Reynolds, Smith, and Hills, 1971. Contemporary postcard [Author's collection].

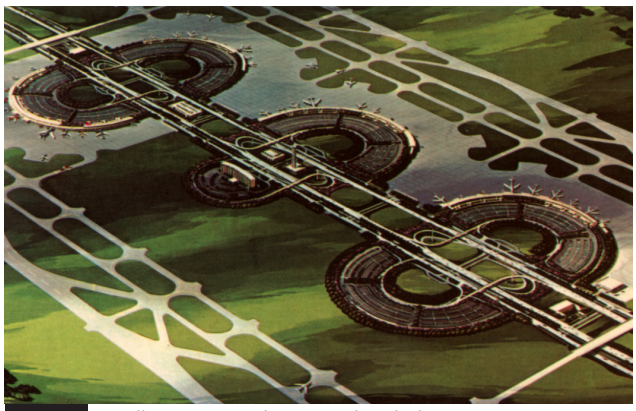

FIG. 13 Dallas-Fort Worth International Airport. HOK, 1973. Contemporary postcard [Author's collection].

Nowhere were the architectural effects of Jumbo-ready urban infrastructure so dramatically manifested as at "DFW" in Texas, completed in 1973. DFW, completed between Dallas and Fort Worth in 1973, was among the late 20th century's greatest urban precincts and infrastructural monuments, an incomprehensibly-scaled megastructure that represented the wholesale systematization of the airport **[Fig. 13]**. Its diffusion of spatial norms into the ether of freeway and aviation was Jumbo Architecture's most extreme replacement of architectural space with systematic vehicular infrastructure—a logic only visible from the air. DFW was built around a new freeway that ran through the airport's center spine, with access to parking and terminals taking the forms of left-exiting offramps. The new sixteen-lane freeway competed against the airside's vertigo-inducing open space, hinting that the terminal, trapped between these two concrete networks, no longer deserved the monumental status accorded to it in the previous jet age, now being just a thin membrane between two forms of vehicular transportation. At DFW, this passenger osmosis occurred in a landscape with no discernible scale whatsoever, the airport occupying a land area the size of Manhattan, transfer between terminals accomplished by subterranean light rail, and the freeway 'front doors' flashing by at 65 mph **[Fig. 14]**.

DFW separated incoming and outgoing passengers through a complex floor plan rather than the more traditional sectional division, reducing the terminal's scale to a single story and moving passenger drop off to within 100 feet of aircraft boarding [Fig. 15]. The airport's experience, however, was not so simple, as departing passengers had to find their way around baggage claim areas to check in desks, and then walk along the security perimeter to security checkpoints, often doubling back once airside to find their gate along the arcing, single story terminal concourse. As with most other airports in the 1970s, DFW employed an extensive graphics program to orient passengers, creating an informationally rich though experientially impoverished visual environment in which the freeway's counterintuitive left exits were duplicated on a smaller scale by maze-like circulation patterns within the terminal.[14] To this day, it is difficult to experience DFW without thinking that Archigram were too conservative in their estimates of the discentering effects of advanced technology. It is, as one contractor described it, "one sumbitchin' airport."[15]

FIG. 14 One of six planned terminals that formed a security and circulatory membrane between automotive and aeronautical infrastructure at DFW.Contemporary postcard [Author's collection].

While press reports detailed DFW's extraordinary scale and intricate mechanisms as a Texas-sized triumph over the problems of servicing 747s, the reality upon its opening suggested that the problem's scale could not be solved even with an ingested land area the size of a county. Writing in *Esquire* in 1976, Molly Ivins reported:

D/F.W.'s designers were understandably defensive. One airport official said, "So Ada Louise Huxtable isn't going to like it. So to hell with her." Tom Sullivan, DFW's first executive director, said, "We did not set out to build a monument. This is a tool." That was the general tenor of the defense: DFW might not be a thing of beauty, but, by God, it would work. But then it opened in January, 1974, and even that thesis got trashed.[16]

14. *How the airport combines colossal size with total passenger convenience is an interesting story of innovative planning and modern technology; Introducing the Airport Designed for People: Dallas/Fort Worth Airport*, promotional brochure (Dallas/Fort Worth Airport Authority: 1973).

15. Molly Ivins, "Biggest Public-Works Project Since the Pyramids," *The New York Times Magazine*, September 16, 1973, 16.

16. Molly Ivins, "The Worst Airport in America is Not O'Hare." *Esquire* 85 (February 1976): 101.

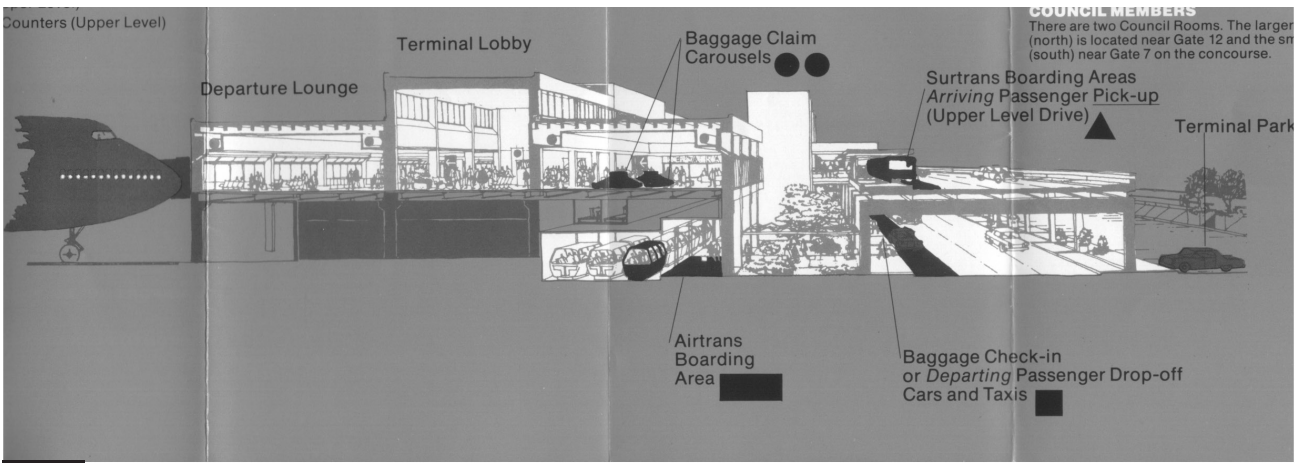

FIG. 15 Dallas-Fort Worth International Airport featured a sectional circulation strategy designed to place cars and aircraft in close proximity—a desire that was never fully realized as security and baggage requirement overwhelmed the simple diagram. Informational brochure, Dallas-Fort Worth Airport, ca. 1975. [Author's collection].

DFW's transportation network, "Airtrans," took years to become operational. It was the subject of workers' strikes and breakdowns that left passengers stranded a dozen or more meters above the ground, watching their departing flights, for hours at a time. For Ivins, however, these mechanical issues weren't even the major problem with the airport:

> So there's DFW: it functions; the p.r. department will be more than happy to tell you how many passengers and planes it has processed. It was born, but it would be a lie to say that it lives. It is a spirit-killing place. Thirteen miles of beige concrete will do in anyone's joie de vivre. Douglas Davis was too kind when he called it 'a Los Angeles of transportation.' It hasn't the faintly decadent funkiness of LA. It's the apotheosis of every interstate, every Howard Johnson's, every Thruway Hot Shop, every concrete and plastic excrescence that has ever afflicted this country.[17]

17. Ivins, "The Worst Airport," 101.

Terminal City

If the 747's most extreme spatial effects were found at the cabin interior and urban network, the middle scale of the terminal building itself also provided troubling architectural issues. Jet age architects had reveled in the 707's sleek lines and ethereal suggestions, creating transparent monuments such as the Pan Am terminal and sculptural celebrations of flight's new accessibility such as Saarinen's TWA building. The functional pressures of scale brought about by the gargantuan Jumbo Jets, however, cast aside such formal and spatial experimentation. The Jumbo terminal was a circulatory problem, demanding architecture derived more from analysis and systemic planning than from any coherent experiential pretense. If the aircraft cabin was a dislocating environment for the human body and psyche, and the infrastructural network surrounding the airport an evisceration of urban scale, the 747 terminal represented an implosion of architectural values and norms into a data-filled, antiseptic, anti-spatial field. Here, in terminals around the world, anthropomorphic space was trumped by the economics of flow and control.

This effect was most notable at terminals that had to be retrofitted to handle the new aircraft. Most distressing was the Pan Am building at Kennedy, which was overhauled eight years after its initial opening.[18] The jetways that had been designed for 707s were too small to handle 747s, and the passenger spaces in the Pan Am terminal's airy interior could not contain the crowds they disgorged. Confined by terminal buildings on both sides, Pan Am built a new wing out into the tarmac, retaining the concrete parasol as an entry pavilion for a new "Worldport," with six 747-sized gates, additional room for smaller, feeder line jets, check in facilities, and rooftop parking [Fig. 16].[19] While efficient, the new structure was disorienting, forcing drivers to pass underneath the original terminal and up a steep ramp to drop passengers off in the center of the addition. The

18. See Thomas Leslie, "The Pan Am Terminal at Idlewild/Kennedy Airport and the Transition from Jet Ageto Space Age," *Design Issues* 21, No. 1 (Winter 2005): 63-80.

19. Richard Witkin, "Pan Am to Expand its Terminal," *The New York Times*, November 14, 1968.

site's tight geometry forced designers to take a simple linear scheme and fold it in on itself, leaving passengers with no clear sight lines through the terminal. Its complicated section meant that disembarking passengers might end up having to walk across the terminal to descend to baggage claim, pass through a maze-like immigration and customs facility deep in the bowels of the building, and then cross back to be picked up in a subterranean cab rank—directly beneath the aircraft they had just left. Despite an extensive graphics program and a complimentary map (titled "Worldport Made Easy"), jet-lagged passengers were faced with a labyrinth of fluorescent-illuminated, low corridors jammed with graphic information but with no clear legibility.[20] While Pan Am suffered the worst of these renovations, Kennedy's TWA terminal did not escape either, its facilities expanding into a neighboring, functional terminal. Other airports scrambled to assemble temporary solutions to new demands for customs facilities and baggage handling, including O'Hare, which converted its original terminal building and then, in the mid 1980s, shoved international arrivals into a retrofitted lower level of its parking garage while a new building was designed and built.

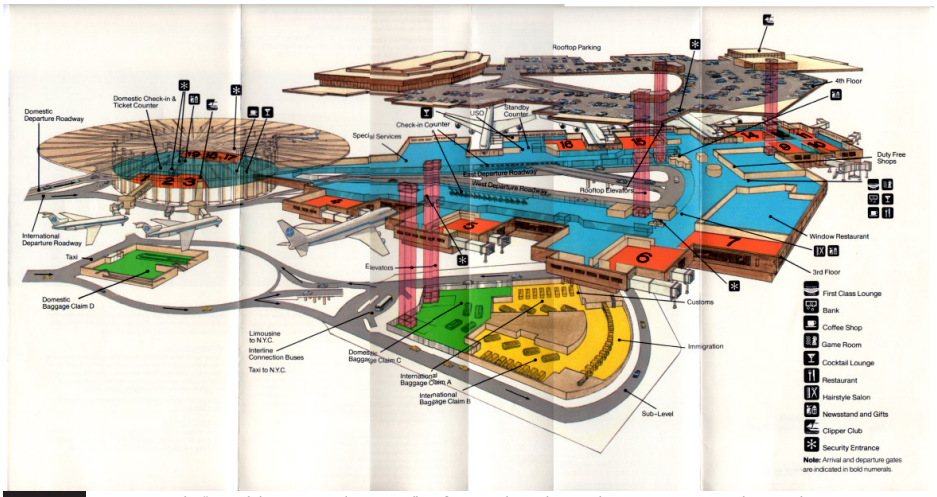

FIG. 16 Pan Am's "Worldport Made Easy." Informational Brochure, Pan American Airways, ca. 1973. [Author's collection].

Immigration and security issues meant that international passengers arriving on 747s had to run a gauntlet of official bureaucracy. Even domestic flights, however, were soon subject to intensive security screening after hijackings and a bombing at La Guardia Airport in December 1975 that killed 11.[21] The transparency and legibility that had been proffered by earlier terminals gave way to an emphasis on the mechanisms of passenger processing, with terminals at Dallas/Fort Worth and Kansas City offering functional diagrams that separated 'sterile' operations of baggage handling and passenger boarding from public, uncontrolled areas. It was, perhaps, no coincidence that the 'airy prettiness' of the 1960s gave way, in terminal design, to fortress-like megastructures that broadcast their origins not in the free flow of tourists but rather in the rigid processing and classification of passengers who now each represented a potential security threat.

The results of this new emphasis were terminal buildings that eschewed open spaces, clear sight lines and easy access, providing instead planometric and sectional barriers, divisions and efficient though mute circulation through security checkpoints, immigration controls and

20. See Leslie, "The Pan Am Terminal at Idlewild/Kennedy Airport," 63–80.

21. "Bombing Damage is Put at $750,000; Police Still Soliciting Clues to La Guardia Explosion," New York Times, Jannuary 6, 1976, 36.

baggage handling. The crystalline visibility through airy curtain walls of the 707 era was replaced by an experiential and visual opacity in the Jumbo era, with concrete forms providing a sterile zone for loading and unloading, in many cases reminiscent of military bunkers emerging from the acreage of surrounding concrete aprons [Fig. 17].

Conclusions—Architecture in the Baroque Machine Age

While the connotations of the 747 were troubling, the evaporation of human scale and experience was seen in a favorable light in the 1970s. In particular, the overwhelming scale of the aircraft and its circulatory tendrils into the city played into the era's fascination with technology's sublimation of human scale and experience. The gantries of Cape Canaveral, and the cramped capsules that they threw into the void of space were only the most extreme examples of the era's technological fetish, which took the frightening implications of applied science and turned them into totems. In particular, popular culture adopted wholesale the perversely pleasurable dehumanization of the 747, a sensibility that also infatuated architects of the era.

FIG. 17 Tampa International Airport was one of many that adopted light rail to overcome the vast distances required by large-wingspanned, high-capacity aircraft such as the 747. Contemporary postcard. [Author's collection].

The gargantuan size of the jumbo jets led to films and books keenly exploring their potential for disaster on greater scales than previously known. While the airline crash had been a staple of news reporting since the disintegration of several Comet jets in the 1950s, the scale of tragedy made possible by the 747 was irresistible to bloodthirsty journalists and savvy film producers. The first documented accident involving a Jumbo occurred in July, 1971, when a departing flight struck a runway light in San Francisco, injuring 18, while the first fatal crash of a 747 occurred in Kenya in 1973. But the potential for a colossal disaster was omnipresent, and 747s featured in the popular "Airport" films throughout the mid-1970s, in which they were put through an increasingly improbable series of nightmarish events. Less popular but more provocative was the science fiction of J.G. Ballard, whose 1973 novel ***Crash*** featured an automobile accident fetishist who circled highways and access roads around Heathrow Airport seeking out violent, staged scenes of vehicular carnage. While Ballard's "technological pornography" proved unreadable for the general public, his subtler fiction of the era focused on the dislocation of the human body and psyche proffered by Jumbo technology, taking as its sites the high-rise apartment tower, the airport and the archaeological site of Cape Canaveral. Space travel

formed the stage set for Stanley Kubrick's epochal essay on technology as a dehumanizing force; the antiseptic interiors of his 1967 film *2001: A Space Odyssey* echoed themes of alienation and post-human artificial intelligence.

If films and fiction explored the grave effects of 747s and their associated technical artifacts run amok, lighter fare still examined the idea of a technological world in which human bodies and emotions were secondary to the drama and visual impact of gargantuan aerospace vehicles and their supporting infrastructure. As early as 1965, *Thunderbird 2* foretold the hyperfunctional shape of the 747 itself, presenting a vehicle so scaleless, so bizarre that it seemed to operate under a different set of physical laws. The dramatic appearance of vehicles and aircraft whose functional parameters transcend our ordinary understanding of structure, aerodynamics, and operations was a constant theme in the science fiction of the 1970s. The spinning space stations and antiseptic cabins of Stanley Kubrick and Arthur Clarke's *2001: A Space Odyssey* and the conceptual heir to the 747s, the Imperial Cruisers of the *Star Wars* series, represented machines and vehicles that offered such complex operations that their forms were counterintuitive or, at the least, unfamiliar—derived from principles of flight or construction far removed from our day-to-day experience or intuition [Fig. 18]. The scales involved and the lack of immediate comprehension marked these proposals as machine-age baroque: grotesque extensions of fundamental principles beyond their inherent sensibility.

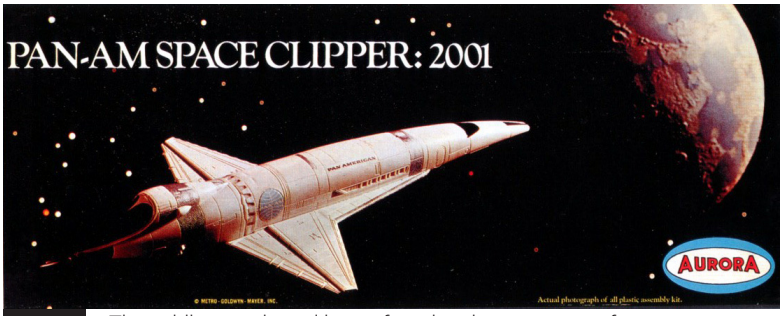

FIG. 16 The sublime scale and hyper-functional appearance of aerospace vehicles and architecture inspired numerous pop culture responses. Stanley Kubrick's *2001* in particular responded to the antiseptic interiors and evocative hardware of the Jumbo era. Retail package, Aurora Plastics Corporation, ca. 1969. [Author's collection].

The neurosis of the era is reflected best by the architectural cousins of the 747 and its accoutrements. The 1970s saw the first realizations of megastructural schemes that had been polemically proposed in the previous decade. Only, perhaps, with the cultural license of the jumbo jet were such mechanically sublime structures such as Centre Pompidou or Place Bonaventure possible. These relied for their architectural effects on aesthetics of bloated technology, the evaporation of the human in the face of our own extensions, the triumph of the tools over the makers and the odd, decadent gratification that comes from such overwhelming scale. Like the 747, their popularity derived from their trans-human scale, and their formal and spatial tastes of space age vastness over jet age beauty.

Faced with the greater likelihood of the species' evaporation in the face of unchecked environmental exploitation, the Jumbos hold a more ambivalent status with forty years' hindsight. Their emphasis on scale alone goes against the mantras of sustainability and balance that occupy

our attitudes toward technology, and the dystopian possibilities inherent in the energy-intensive lifestyle represented by the 747 are all too real. Recent developments have rendered the Jumbo as obsolete as its jet-age predecessors: the debut of the 800+ passenger Airbus A380 in 2005 dwarfed even the largest, 500-passenger variants of the 747. More pervasive developments, however, have followed the smaller jets that came in the 747's wake **[Fig. 19]**. As jet technology has become more reliable, twin-engined aircraft have proven safe and suitable for intercontinental travel, and the dispersion of international air routes to secondary and even tertiary airports led in the 1990s and early 2000s to a change in airline's emphasis to smaller, more agile planes. Both Airbus and Boeing have responded with more efficient, longer range twin-engine jets such as the 777 and the A350, which burn up to 20% less fuel per passenger.[22] Both United and Delta Airlines have announced that they will phase out 747 flights by the end of 2017, and Boeing has hinted that it will cease production of the 747 by the end of 2019 as airlines switch to smaller, more efficient alternatives.

FIG. 19 The Airbus A380. Photograph by the author.

22. Julie Johnson and Michael Sasso, "Boeing Jumbo-Jet Era Ending in U.S. as United Retires 747 Fleet," *Bloomberg Technology*, January 11, 2017.

The impact on terminal design has been profound; where Jumbo terminals brought vast networks of landside circulation to fewer discrete - and crowded - docking ports, the dispersion of more, smaller aircraft has led to layouts like Detroit's or Kansai's; long, linear structures that eschew the Worldport's complex tangle for vast, clear spaces with simpler, more legible layouts. In Detroit's case, over one hundred gates are laid out in a one-mile long terminal, accessible by an indoor tram that shuttles back and forth every three minutes. While airside operations remain immense, the result has been a humanizing of the landside experience, albeit one more fraught than ever with concerns for security. Just as the Jumbo era's sublime scale replaced the 'airy prettiness' of the jet age, the 787's era has refined the steroidal, anesthetic experience of the 747 with more visceral and graspable physical sensations, and a pervasive electronic atmosphere of control and surveillance. But these aircraft and their antiseptic terminals provide their own glimpses of our contemporary and urban subconscious, suggesting that the aircraft's 'indictment' remains powerful and valid eighty years after Corbusier first pronounced it.

The Image as Reaction. Nuclear Painting and Architecture, Italy 1951-1958*

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ABSTRACT

The last act of World War II took place in the Summer of 1945 with the explosions of the atomic bomb. Despite the fact that these events took place far from the "old continent" some European artists were deeply affected by the power of the atomic instrument and they meditated on a possible future dominated by a nuclear manipulation capable of redefining "the representation of man and his space". The goal of this paper is two-fold: firstly to analyze some specific aspects of artists who belonged to the "Movimento Arte Nucleare" and their affiliation with architectural practices, together with their 'dialogue' with the "International Movement for an Imaginist Bauhaus"; and secondly, to introduce the figure of the Nuclear Architect, Enzo Venturelli, in order to describe an original panorama based on the alliances and contaminations between diverse disciplines associated by the sensitive attention paid to the planning of the future and the rejection of Rationalist Architecture.

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Movimento Arte Nucleare, Nuclear Architecture, Baj, Venturelli, Imaginist Bauhaus

While Italy was preparing its exit from the Second World War the magazine *Domus*, in 1944, published an article by Bruno Munari that proposed the question of what "style" in architecture would have characterized the years to come, convinced that the new approach would be derived from technological discoveries and, in particular, from the aerodynamic form.[1] As had already happened long before, at the dawn of a new age that began with the end of the war, also Munari bet on a different development for modern architecture which he preferred not to describe but to represent by way of a graphic sign of surreal suggestiveness. From among the many others, the prediction by Munari that was so lucid and lacking in mediations can here be taken as a starting point for the events that I shall discuss precisely because he correctly "guessed"[2] an orientation that artistic-architectural culture appropriated starting from the latter postwar period also as a reaction to the former tragic events. The visual arts and pictorial language, expressions that were apparently so distant from tectonics, contributed towards reformulating a renewed idea of space and architecture, soliciting and in certain cases superimposing themselves on the research works of the more conformative construction lexicon by way of exchanges which within the context that we shall observe proved to be extremely close. The focus of this intervention is two-fold. Firstly we shall examine the proposals of some Italian artists who in the disarming power of the atomic explosions of 1945 acknowledged the presuppositions for imagining a possible and habitable future as was the case of the "Movimento Arte Nucleare" whose research was initially begun by painters but which was soon also developed by architects. In the second part of this essay, in line with these premises, we shall have the opportunity to introduce and critically rediscover the nuclear architect Enzo Venturelli with the aim of furnishing an extensive and original panorama based on the alliances and contaminations between diverse disciplines associated by means of a sensitive attention to a new ideal of planning. The keystone between this first aspect and the one centred upon a renewed idea of architecture was to be offered by a close dialogue which the protagonists of the nuclear movement established with the nascent "International Movement for an Imaginist Bauhaus" endorsed by the Danish artist Asger Jorn.

1. Bruno Munari, "Come sarà il nuovo stile? Ragione e fantasia si alterneranno al timone dell'ispirazione," *Domus*, no. 194 (February 1944): 64-65.

2. Carlo Perogalli, *Aspetti dell'architettura contemporanea. Cronache, temi, tendenze* (Milan: Libreria A. Salto, 1952), 90.

"Danger Public"[3]

At the Galleria San Fedele in Milan in 1951 the painters Enrico Baj and Sergio Dangelo exhibited a series of works defined by the critic Kaisserlian as being "nuclear paintings".[4] In a distinct way the term had already been used in 1950 by the futurist painter Fortunato Depero who in some excerpts of his "manifesto of nuclear plastic and painting" opened himself to some important considerations that were ideologically in harmony with the new movement: "The atomic and nuclear marvels, the aerodynamic,

3. From the Manifesto *Danger Public / Argument Manifeste*, published for the exhibition *Mostra di dicembre: Dangelo, Baj, Colombo Mariani*. Milan, Galleria dell'Annunciata and Saletta dell'Elicottero, December 16, 1952 – January 6, 1953.

4. Baj e Dangelo. *Pittura nucleare*. Milan, Galleria San Fedele, November 1951.

underwater, terrestrial and stratospheric forces ought to cause to meditate and reflect on the part of the technicians, creators and judges of Art and Aesthetics".[5] For the new artists the name – critically captivating and for this reason supported by literature – arose from a close confrontation with historical actuality and the reference to the atomic explosion allowed the creation on canvas of a compelling correspondence between form and content. In fact, although the subjects were declaredly bound to the contingent themes, on a stylistic level one had the coexistence of so-called informal stylemes and a fantastic rediscovery of reality influenced by surrealist poetics. Notwithstanding the fact that in their writings and manifestoes the reference to technological progress was always present, from the strictly stylistic point of view the nuclear artists in fact remained painters tied to the constructions and sense of the sign and the gesture typical of the day, although detaching themselves from the "personalistic vent" of the informal poetic.[6] [Fig.1]

If on the large scale the results achieved by physics – also by way of its concrete application – were not insignificant, also in the usual day-to-day work the artists had at their disposition and chose to use innovatory materials (industrial enamels and emulsions of water and pitch) and experimental techniques invented also thanks to a confrontation with modern sciences such as "Heavy water", evidently inspired by the lexicon of nuclear physics, functional towards delineating new geological panoramas in line with a broader international context that in the gesture acknowledged a new energy to apply to the painted canvas.[7] As was true in physics, the pictorial materiality was disintegrated in order to render those oneiric as penetrating as possible and sometimes distressing, with direct reference to atomic energy.[8] The consecration of the group took place in 1952, not in Italy but in the Belgian city of Brussels on the occasion of an exhibition held by Baj and Dangelo: this was when they drew up the guidelines of the new-born movement with the publication of the "manifesto of nuclear painting" whose annotation – in a disenchanted way – told the readers that "Truth is not yours. It lies in the ATOM. Nuclear painting documents the search for this truth".[9] [Fig. 2] Starting from this point on a succession of exhibitions marked the exhibition course of the group, immediately joined by Joe Colombo and then by Leonardo Mariani, Enzo Preda and Antonio Tullier. The events and vicissitudes regarding the history of the nuclear movement are quite well known and can be followed thanks to both general and specific writings published about it.[10] Even if it proves difficult to establish clear-cut borderlines within the Milanese artistic scene of those years whose proposals were univocally addressed to imagining or foreseeing a plausible future, there nevertheless existed different groupings with relative manifestoes, together with referential critics and gallerists. During the same years one had the cohabitation of the "Spatialists" whose research was aimed at above all aesthetically investigating a cosmic dimension, side by side with the "Nuclear" artists

5. Fortunato Depero, "Manifesto della pittura plastica e nucleare," *Nuovo caffè. Rassegna di libera polemica artistico-letteraria* (November-December, 1950): 14; For Depero and the usage of the term: Tristan Sauvage [Arturo Schwarz], *Pittura italiana del dopoguerra* (1945-1957) (Milan: Schwarz editore, 1957), 150-166, 278-285; Tristan Sauvage [Arturo Schwarz], *Arte nucleare* (Milan: Galleria Schwarz), 1962.

6. Enrico Crispolti, "Lo svolgimento della ricerca di Baj," in Enrico Crispolti and Enrico Baj, eds. *Catalogo generale Bolaffi dell'opera di Enrico Baj* (Turin: Bolaffi, 1973), VII.

7. Alessandra Tibiletti, "Tecnica e materiali nella pittura nucleare. Un'analisi di alcune opere di Enrico Baj, Joe Colombo e Sergio Dangelo nella collezione Boschi-di Stefano," *L'Uomo Nero*, nos. 4-5, 2006: 479-495.

8. These artists were also inspired by the new pictorical language of the American artists Wols and Pollock, protagonists in two solo exhibitions in Milan respectively in April 1949 at the Galleria del Milione and in October 1950 at the Galleria del Naviglio. With regard to the dripping technique (metaphorically compared by criticism to "atomic fallout"), Pollock declared that he was inspired by the recent events which could not be ignored. Cf. Stephen Petersen, "'Forms disintegrate': Painting in the shadow of the bomb," in Okwui Enwezor, Katy Siegel and Ulrich Wilmes eds., *Postwar: Art Between the Pacific and the Atlantic, 1945-1965*, exhibition catalogue (Munich: Haus der Kunst, 2016-2017), 141.

9. *Baj et Dangelo. Peinture nucléaires*. Bruxelles, Galerie Apollo, March 4-17, 1952. From the French: "Le vérité ne vous appartient pas: elle est dans L'ATOME. La peinture nucléaire documente la recherche de cette vérité".

10. In addition to Sauvage, *Pittura italiana and Sauvage Arte nucleare*, for further detailed studies see: Giovanni Anzani ed., *Arte nucleare 1951-1957. Opere – testimonianze – documenti*, exhibition catalogue (Milan: Galleria San Fedele, 1980); Martina Corgnati ed., Arte a Milano 1946-1959. *Il movimento nucleare*, exhibition catalogue (Milan: Galleria San Fedele, 1998); and, except Édouard Jaguer, *Enrico Baj* (Milan-New York: Edizioni Schettini, 1956), the last monographs: *Enrico Baj. Opere dal 1951 al 2001*, exhibition catalogue (Rome: Palazzo delle Esposizioni, 2002); Martina Corgnati ed., *Enrico Baj. Opere 1951-2003*, exhibition catalogue (Milan: various locations, 2003); Chiara Gatti Chiara and Roberta Cerini Baj eds., *Enrico Baj. L'invasione degli ultracorpi/L'invasion des ultracorps*, exhibition catalogue (Aosta: Museo Archeologico Regionale, 2016); Francesco Tedeschi ed., Sergio Dangelo. *Les Rendez-Vous/The Dates/Gli appuntamenti*, exhibition catalogue (Pavia: Spazio Arti Contemporanee, Broletto, 2016); Also see the recent catalogue: Luca Bochicchio, Maurizio Cattelan, Carrie Pilto, *Enrico Baj: Play as protest*, exhibition catalogue (Amstelveen: Cobra Museum of Modern Art and Cobra Museum voor Moderne Kunst, 2017).

FIG. 1 Enrico Baj, *Figura atomica (Atomic figure)*, 1951. Oil on canvas, 100 x 70 cm
Private collection

FIG. 2 Invitation-Manifesto for the exhibition, *Baj et Dangelo. Peinture nucléaires*, Brusselles, Galerie Apollo, March 4-17, 1952

FIG. 3 Enrico Baj, *Due bambini nella notte nucleare (Two children in the nuclear night)*, 1956. Oil on canvas, 70 x 100 cm
Private collection. Courtesy Fondazione Marconi, Milan

whose investigations were instead immersed in more plausible post-atomic scenarios. Whereas the "Spatialists" were subject to the abstract fascination of "lunar landscapes", the nuclear artists described a landscape of the Earth modelled on the deformation of a real space due to the then recent disasters.[11] [Fig. 3] In having established this schematic distinction – in many cases disregarded by the artists themselves[12] – both were profoundly attracted by technological and scientific advances as being the necessary instruments for hypothesizing possible "scenographies" of the future because space "is no longer a passive container of happenings but space itself takes part in the events", as was underlined by Carlo Cardazzo – promoter of the spatialist artists at the Galleria del Naviglio – on the occasion of the Gianni Prize dedicated to "spatial and nuclear paintings inspired by the atom bomb".[13] From the bombs sprang the impulse for rebirth and in the front line it was the artists who zeroed every distinction between the disciplines because with the new means an already present future was attentively planned, one no

FIG. 4 *Domus*, no. 233, 1949. Cover with Lucio Fontana's *Ambiente spaziale a luce nera (Spatial Environment in Black Light)*, 1949

11. Cf. Stephen Petersen, *Space-age aesthetics. Lucio Fontana, Yves Klein, and the Postwar European Avant-Garde* (University Park: The Pennsylvania State University Press, 2009). All of the book is important but relevant for our dissertation is chapter 2: *Avant-Garde alienation. Enrico Baj and Interplanetary Art*, 103-152; Chiara Gatti, "Enrico Baj: dalla terra alla luna. Paura e fascino dell'altrove," in Gatti and Cerini Baj, *Enrico Baj. L'invasione degli ultracorpi/L'invasion des ultracorps*, 11-24; For a historical introduction to the spatialist artists see: Giampiero Giani, *Spazialismo. Origini e sviluppi di una tendenza artistica* (Milan: Conchiglia, 1956). For our dissertation also see Sileno Salvagnini, "Possibili fonti iconografiche nel Fontana degli anni cinquanta," in Silvia Bignami and Giorgio Zanchetti eds., *Klein Fontana. Milano Parigi 1957-1962*, exhibition catalogue (Milan: Museo del Novecento, 2014-2015), 144-163. In particular see page 154 and relative notes for the debate regarding Spatialism between Agnoldomenico Pica and Giulio Carlo Argan who in differing from Pica acknowledged a correlation between nuclear physics and abstract forms.

12. "Nuclearists" and "Spatialists" were frequently represented in the same exhibitions. Lucio Fontana, always interested in discovering young artists, introduced Nuclear artists to the exhibition: *Peinture nucléaire*, Bruxelles, Galerie Saint-Laurent, 1953. The text by Fontana is now published in Angela Sanna ed., *Lucio Fontana. Manifesti, scritti, interviste* (Milan: Abscondita, 2015), 58

13. In 1952 the Galleria del Naviglio in Milan (Representative Gallery for spatialist artists and managed by Carlo Cardazzo) estabilished an award (Premio Gianni) dedicated in its first edition to the Atomic bomb. The spatialist artist Gianni Dova won the contest with the canvas entitled Nucleare, confirming the close relationship between "Spatialists" and "Nuclearists". See: Carlo Cardazzo, *Premio Gianni. 125^ Mostra del Naviglio*, exhibition catalogue (Milan: Galleria del Naviglio, 1952); Marco Valsecchi, "Nucleari e spaziali a confronto," *Tempo*, July 16, 1953; Paolo Campiglio ed., *Gianni Dova*, exhibition catalogue (Milan: Galleria Il Castello, 2008), 18-20.

longer only controlled by the work of architects who were in their own right involved in an important action of postwar reconstruction. Lucio Fontana was the anticipator of this last aspect and as "father" of the spatialist movement supported the need to appropriate space "by way of new means which technology made available to artists"[14] as he lay claim to in 1951 when invited to take part in the conference titled *De divina et humana proportione* (IX Triennial of Milan, 1951). He saw the possibility of a modern creative process that combined/associated art and "architecture based on new techniques, technologies and means",[15] firmly convinced that the "divine proportion" was set in motion by the concept of modern and future architecture"[16] and that "the conquest of space and the atomic bomb cancel all the theories of modern architects".[17] As an artist Fontana talked in a free and emancipated manner before an audience primarily made up of protagonists of the field of architecture, intrigued by those suggestions which would have closely involved them as happened at the BBPR which in their studio had for years hosted the meetings of the spatialists. Guaranteeing the popularization among those involved in architecture of these "bizarre" theories one had the same architectural magazines which dedicated considerable space to these "extreme" research works as was true on the part of Lisa Ponti in *Domus* (1949) with an article significantly titled "First graffiti of the atomic age" with reference to the first "spatial environment" by Lucio Fontana presented at the Galleria del Naviglio of that same year. For Lisa Ponti the work was "an example still a little grotesque of what the architects could be able to do by using luminous forms in their spaces, in their perspectives.[18] [Fig. 4] This contributed towards "inverting" the still standardized hierarchy of the arts given that in opposition to what happened in the past for mural (decorative) painting that developed from the "skin" of architecture one now – in an antithetical way – had managed to arrive at architecture by way of exclusively artistic expedients. Notwithstanding the fascination inherent in the desired or called for overcoming of categories, it is however necessary to consider how these discussions regarding new techniques, new technologies and spatial perceptions more easily found their effective development within a theoretical sphere rather than in architectures, even if the latter paid greater attention not only to the way of perceiving spaces but also to the "psychic processes" of the inhabitant as suggested by the protagonists of the visual arts.[19] In a different key, the involvement of the human dimension was a central aspect within the post-atomic panorama as delineated by the protagonists of the "Movimento Arte Nucleare" who, differing from their spatialist colleagues, reasoned on the indisputable predominance of scientific conquests for a new figuration and appropriation of space. Baj maintained how the nuclear theme was "fundamental for our times in all the implications of hope and fear. The call/lure to the nuclear also took on an anti-abstract importance so that the artist, on having abandoned the concept of "art for art's sake", returned

14. Lucio Fontana, *Proposta di un regolamento*, Milan, April 2, 1950. The document which synthesizes the foundamentals of the spatialist movement is now published in Sanna, *Lucio Fontana*, 25-26.

15. Lucio Fontana, *Manifesto tecnico*, text read during the conference *De divina et humana proportione*, Triennale di Milano, September 27-29, 1951. Now in Sanna, *Lucio Fontana*, 27-30. Fontana also said: "On having passed various millennia of its analytical artistic development the moment has arrived for synthesis [...] Colour the element of space, sound the element of time and movement that develops in time and space [...] Architecture is volume, base, height, depth, contained in space, the 4th ideal dimension of architecture is art". Speakers at the conference were also: James Ackerman, Max Bill, Gillo Dorfles, Le Corbusier, Sigfried Giedion, Pier Luigi Nervi, Ernesto N. Rogers, Georges Vantongerloo, Rudolf Wittkower, Bruno Zevi, among others. Cf. Anna Chiara Cimoli and Fulvio Irace, *La divina proporzione. Triennale 1951* (Milan: Electa, 2007).

16. In this letter sent by Fontana to Carla Marzoli, curator of the exhibition "Mostra di Studi sulle Proporzioni" during the same Triennale in 1951, the artist confirmed his willingness to partecipate at the conference in order to assert "the possibility to establish the importance of Spatial art in future architecture". Cf. Anna Chiara Cimoli, "Il primo Convegno Internazionale sulla proporzione nelle Arti: una storia interrotta," in Cimoli, and Irace, *La divina proporzione*, 214, note 47.

17. Transcription of the Sketch 51 D TS 7 MTS recto, Milan, September 14, 1951, Milan, Archivio Fondazione Lucio Fontana. Already published in Luca Massimo Barbero ed., *Carlo Cardazzo. Una nuova visione dell'arte*, exhibition catalogue (Venice: Peggy Guggenheim Collection, 2008-2009), 240.

18. Lisa Ponti, "Primo graffito dell'era atomica," *Domus*, no. 233, 1949: 44. Cf. also Luca Massimo Barbero, "Nero. L'Ambiente Spaziale come straordinaria avventura nella scienza," in Sergio Casoli and Elena Geuna eds., *Fontana. Luce e colore*, exhibition catalogue (Genoa: Palazzo Ducale, 2008-2009), 37-41. Barbero writes: "It's as if the discovery and going into what we now call the post-atomic age had concretely created or caused the need to restart, to reconsider man, his condition on earth, his own position. A beginning that has its bases in the atomic drama but also in its infinite possibilities, in the supercession of the very concept of Humanism".

19. Anna Costantini, "Arte tetradimensionale e maisons passionnantes: la crisi dei presupposti della modernità tra situazionismo e superamento dell'Informale," in Germano Celant ed., *Arti e Architettura 1900/1968*, exhibition catalogue (Genoa: Palazzo Ducale and surroundings, 2004-2005), 65-68.

to establish relationships with the world and with its future".[20] Precisely inside some pictorial works the nuclear theme was translated in a violent landscape description – "Paesaggio atomizzato" ("Atomized Landscape"), "Paesaggio ultrasonico" ("Ultrasonic Landscape"), "Esplosione" ("Explosion") – in the search for "real and not 'abstract' worlds",[21] although as recently noted by Pethersen, these artistic proposals above all during the initial period could only result from imagination, literary suggestions and debates concerning possible genetic mutations given that the photographic descriptions of the recent events which had taken place in the Pacific were in part subject to censorship.[22] The protagonist of the new pictorial landscapes was the primigenial aspect besides being "element in movement" that was openly polemical with respect to abstraction, distant from mankind therefore incapable of responding to a "Danger Public" (Public Danger), as the nuclear manifesto of 1952 was ironically titled. In the first Brussels manifesto the nuclear artists confirmed that "The forms disintegrate: the new forms of mankind are those of the atomic universe; the forces are electronic charges. Ideal beauty is no longer the property of a stupid hero cast, nor of the robot. But it coincides with the representation of nuclear man and his space". As proposed by the nuclear painters a space certainly not made architectural but which mirrored the expectations of that precise moment "oscillating between the enthusiastic exaltation and reflective dismay with respect to the indisputable rule of science".[23] **[Fig. 5]** A duality well represented by that fetus – here human iconography is recurrent, together with skulls,

20. Enrico Baj, *Movimento nucleare*, now in Angela Sanna ed., *Enrico Baj. Ecologia dell'arte* (Milan: Abscondita, 2013), 171 (*sub voce*).

21. Leonardo Borghese, "Arte nucleare," *Corriere della Sera*, November 24, 1951. "Painters [...] of mysterious marine depths, of geological strata, of celestial meteors and rings of Saturn, of spatial abysses and infinities, of crystals, of radiological introspections, of spectra and rays and vibrations etc., etc.; and finally of visions or 'sensations' or 'nuclear emotions'".

22. Stephen Petersen, 'Forms disintegrate', 140-145.

23. Antonello Negri and Carlo Pirovano, "Esperienze, tendenze e proposte del dopoguerra," in Carlo Pirovano ed., *La pittura in Italia. Il Novecento/2* (Milan: Electa, 1993), 120.

FIG. 5 Enrico Baj, *Senza titolo (Untitled)*. Lithography
Published in Jaguer Édouard. *Enrico Baj* (Milan-New York, Edizioni Schettini 1956)

galvanized bodies and anthropomorphic investigations[24] – roughly outlined like an atomic mushroom cloud and reproduced in the "Bum manifesto" drawn up on the occasion of the third exhibition of nuclear art organized in the rooms of the Associazione Amici di Francia in Milan in the Spring of 1952. **[Fig. 6]** Even though in general there existed a pronounced attention paid to scientific representation, testified to for example by some precise in-depth investigations,[25] for the Spring exhibition of the nuclear group Kaisserlian specified how the interest of these painters regarded the ability to grasp those atomic consequences which the scientists "do not care to 'see' [and] which perhaps only the artist is able to extend or prolong in view of powers of action that science offers us" given that "Matter has more imagination than we do [...] and nuclear painting wants to be the intuitive vision of a world in which matter becomes energy that indefinitely reproduces itself [...] What can be born tomorrow from an uninterrupted dialogue with nuclear reality?"[26]

FIG. 6 Enrico Baj, *Manifesto Bum (Bum Manifesto)*, 1997. Remake from the original of 1952. Acrylic paint and oil on canvas, 100 x 90 cm Private collection. Courtesy Fondazione Marconi, Milan

The Nuclear City

The post-atomic scenarios became the occasion for imagining a "prefiguration" of the future given that "To destroy and be reborn are actions that are almost combined in time".[27] As has in part been seen in the previous paragraph, different conditions looked for by painters took on connotations close to those of architectural research in its more general aspect. The intentions of the nuclear artists were to look for new iconographies not necessarily for a space of dangers but for a space of possibilities where human presence and the surrounding nature would not have been adapted but modified: a capability proximate to the principle of resilience, a term become the protagonist in the lexicon and theories of town (urban) planning precisely in referring to the transformation of a place following expected or sudden – and often traumatic – events.[28] In a Milan engaged in thinking and reconstructing the urban fabric, Joe Colombo, a component of the movement beginning from 1952, hypothesized urban scenarios for a new atomic era.[29] If his first activity fully retraces the tendencies of the movement with the interest to register on the canvas "exploded" compositions, landscapes lacking in geometry,

24. "[...] New bodies charged with energy, lights that will be neons, surreal arabesques of incandescent and dripping colour that seem to disintegrate rather than obey the spreading of the usual and sometimes too loving hand of man. This reaction constitutes the palpitating testimony of the atomic experience in its reflections on the sensitive world; for new human experiences Baj and Dangelo with humble and patient research find new language". Dino Fabbri ed., *Baj e Dangelo*, exhibition brochure (Milan: Galleria San Fedele, 1951).

25. See for example the drawings by the spatial artist Mario Deluigi, in particular *Studio dell'atomo*, published in Barbero, "Nero. L'Ambiente Spaziale," 39.

26. Georges Kaisserlian, *Arte Nucleare. Baj, Dangelo, Colombo*, exhibition brochure (Milan: Associazione Amici della Francia, 1952).

27. Enrico Brenna, *Prefigurazione. Prospettive del movimento di pittura nucleare*, exhibition brochure (Milan: Studio B24, 1953).

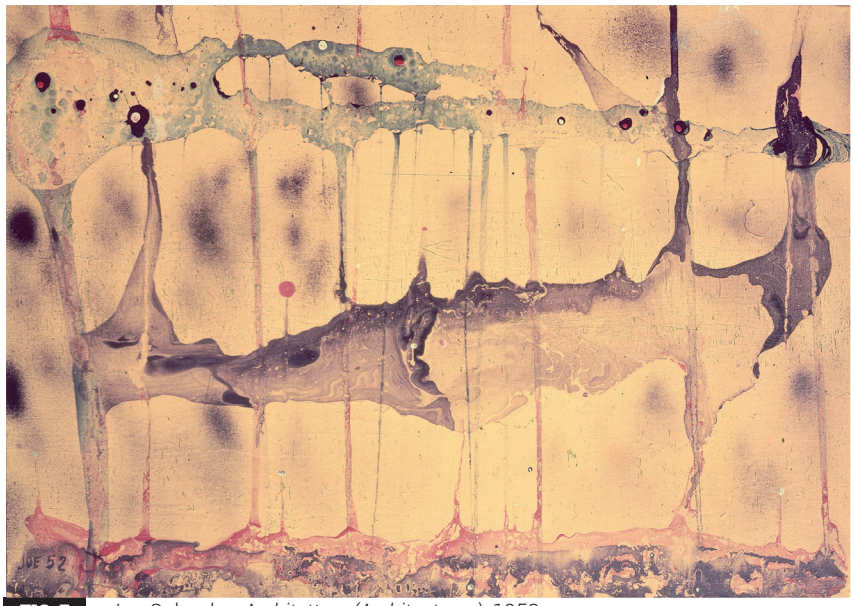

FIG. 7 Joe Colombo, *Architetture (Architectures)*, 1952.
Mixed media on canvas, 70 x 100 cm
Private collection

emblematically entitled "Architectures" [Fig. 7], running parallel to his attending the Brera Art Academy, between 1949 and 1955 he followed the courses at the Polytechnic in support of his interest in planning. Starting from 1952 Colombo took part in all the exhibitions of the movement and in the same years, together with Baj, made a trip to Paris where the Téâtre National Populaire was staging Nucléa "Nuclear", a play by Henri Pichette about the nuclear era whose stage-setting ideated by Alexander Calder was made up of an abstract landscape with "Stabiles" and black clouds in the form of "Mobiles", inhabited by actors curiously very similar to the "extras" painted by Baj,[30] interested in representing the play in Italy as part of the nuclear manifestations.[31] [Figs. 8-9] In fact, Colombo's studies on the "Nuclear City" date to 1952, a utopian city with visible and pragmatic peculiarities that couldn't be compared to the Parisian painted backdrops or stage-settings. The imaginative dimension of nuclear art made him want to concretely organize reality, translating creativity into technical enquiries in order to conjecture plausible habitats. [Fig. 10] Numerous construction details characterized the graphic corpus of the "Nuclear City", with typological variety describing the technologically innovatory functions bound to an optimistic vision of the future thanks to the possibilities furnished by atomic science. Transferred below ground one would have had the services and all of those complementary activities for the needs of citizens who would be called upon to live on the surface in the elevated futuristic structures, most of which spherical and therefore capable of rotating in order to exploit solar energy, and having different functions: homes, primary services and cultural places, also reachable thanks to aerial circulation. The new city would have been built on the ruins of the former one with respect for "artistic monuments and buildings" [Fig. 11] (from amongst others we recognize the cathedral of Milan) incorporated, it's true, but survivors: a new capital that dynamically would

28. On the occasion of the XV Milan Trienniale of 1968 the Japanese architect, Arata Isozaki, was called upon to interpret the theme of the "Large number: the macro-transformations of the territory". Inside the work-installation entitled "Electrical Labyrinth" the artist also reflected on the destruction of Hiroshima with the presentation of historical photographs, photomontages and projections of cities of the future although, here, described as ruins developed out of the rubble. Cf. "2. Grande numero: le macrotrasformazioni del territorio," in *Quattordicesima Triennale di Milano: esposizione internazionale delle arti decorative e industriali moderne e dell'architettura moderna*, exhibition catalogue (Milan: Palazzo dell'arte al Parco, 1968), 39-40; Paola Nicolin, *Castelli di carte. La XIV Triennale di Milano, 1968* (Macerata: Quodlibet Studio, 2011), 161-170; Yasufumi Nakamori, "Imagining a city through photography: Japan from 1945 to 1968," in Okwui Enwezor, Katy Siegel and Ulrich Wilmes eds., *Postwar: Art Between the Pacific and the Atlantic, 1945-1965*, exhibition catalogue (Munich: Haus der Kunst, 2016-2017), 134-139.

29. There are several sketches by Joe Colombo which depict the "Nuclear City". Some of them are published in the main monographs on the author. See Ignazia Favata, *Joe Colombo designer, 1930-1971* (Milan: Idea Books Edizioni, 1988 /London: Thames and Hudson, 1988 / Cambridge: The MIT Press, 1988); Vittorio Fagone ed., I Colombo. *Joe Colombo 1930-1971. Gianni Colombo 1937-1993*, exhibition catalogue (Bergamo: Galleria d'Arte Moderna e Contemporanea, 1995); Giovanni D'Ambrosio, *Joe Colombo. Design antropologico* (Turin: Testo & Immagine, 2004); Vitra Design Museum and Triennale di Milano in collaboration with Studio Joe Colombo eds., *Joe Colombo: inventing the future*, exhibition catalogue (Milan: Triennale di Milano, 2005). Also Leonardo Mariani, another protagonist of Nuclear painting, did some architectural experiments. See: Leonardo Mariani, "Piccola storia del mio ingresso nel gruppo e perché," in Anzani, *Arte nucleare*, 146.

30. "…Dans cette pièce, la terreur atomique succède aux horreurs de la guerre, et la cauchemar se prolonge à l'infini. A l'uniforme près, ce sont les mêmes capitaines qui comandent la foule aveugle, cependant que les robots bardés de métal défilent, et que l'injonction 'en masse' fuse aux quatre coins du ciel […] sur ce fond de banalité tragique déambule Gladior, personnage sans âge et presque sans sexe qui représente l'intellectuel tel que Pichette se plaît à le concevoir". Maurice Sailette, in "Autour de "Nucléa," *Numero*, no. 3 (May-June, 1953): 5. Also see Dorothy Seiberling, "Calder, his Gyrating 'Mobile' Art Wins International Fame and Prizes," *Life*, no. 8 (August 25, 1952), 86; Alex J Taylor, "Unstable Motives. Propaganda, Politics, and the Late Work of Alexander Calder," *American Art*, no. 26, (Spring 2012): 3-25; Achim Borchardt-Hume ed., *Alexander Calder. Performing Sculpture*, exhibition catalogue (London: Tate Modern, 2016), 157.

31. Enrico Baj, "L'amico Joe," in Fagone, *I Colombo*, 77.

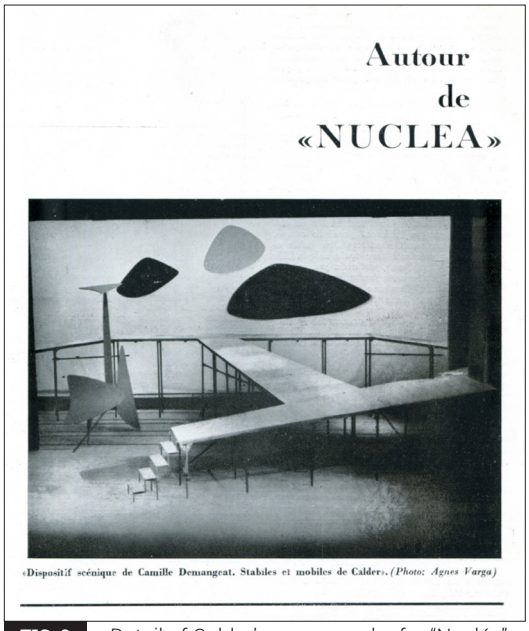

FIG. 8 Detail of Calder's scenography for "Nucléa", Paris, Téâtre National Populaire. Published in "Autour de "Nucléa," *Numero*, no. 3 (May-June, 1953)

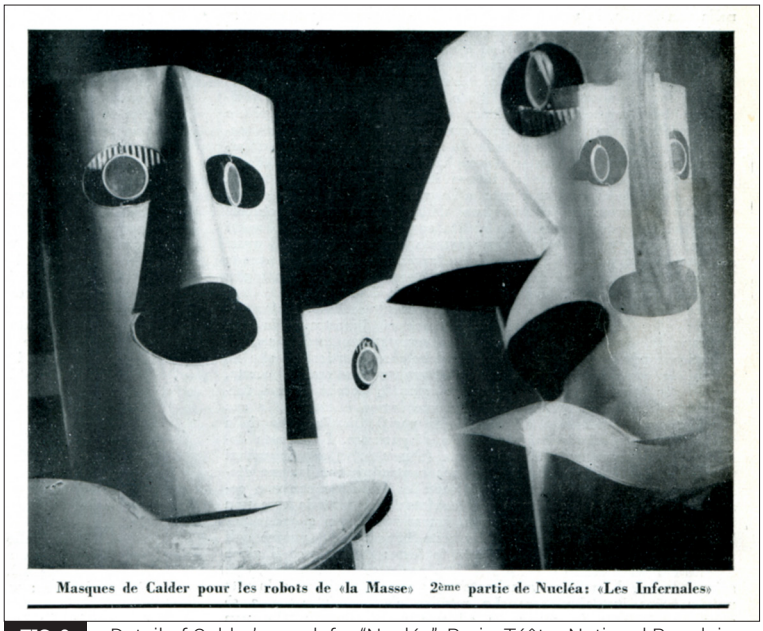

FIG. 9 Detail of Calder's mask for "Nucléa", Paris, Téâtre National Populaire. Published in "Autour de "Nucléa," *Numero*, no. 3 (May-June, 1953)

have taken on form in the air. That of the nuclear is no longer an unknown destiny: the metropolis of the future is in fact calculated down to every minimum detail. From this moment on Colombo's attention would always be addressed to hypothesizing concrete living and residential solutions and would be confirmed by his work as a designer, a choice that would make him abandon the painter's palette in order – and in a totally new way – to interpret forms.[32] Clearly the city of Colombo is in line with experimentations on the theme which had previously taken place and which in a diversified way – above all starting out from the myth of industrial progress – reflected upon the potentialities of new materials in order to be imagined as visions both dynamic and in movement, also as the antidote to the static nature professed by Cartesian rationalism. Two particular aspects are often evidenced in this context: on the one hand an undoubted belief in technological progress as the medium necessary to make concrete the visions of the future, at least from the planning point of view; and on the other hand the interest and study of solutions capable of responding to the threat of war and the most alarming contingencies. Organization for defence was a theme treated by artists and architects who reflected on threats of war by calculating possible solutions such as those described in 1933 by the Florentine architect Cesare Augusto Poggi who in the evolutive wake of the futurist march forward foresaw possible applications for an "Anti-war architecture" and a "defence from war and bacterial attacks and from telluric and meteoric evolutions".[33] In returning to the context under examination, it is precisely this last aspect which was also investigated by Lucio Fontana who as an artist meditated on this theme and who like Colombo designated reinforced concrete to solve these operations (as a new material even though widely known and employed).[34] The idea of a city capable of reflecting upon the potentialities

32. In 1956 Colombo joined the MAC/Espace group to then dedicate himself exclusively to design following the suggestion by Bruno Munari.

33. Luciano Caruso ed., *Manifesti e documenti teorici del Futurismo* (1909-1944) (Florence: SPES, 1990), no. 239.

34. Besides appearing in the graphic notes, reinforced concrete was also the protagonist of the "Manifesto tecnico of Spatialism" (1951) in which Fontana maintained how "reinforced concrete (the means) revolutionizes the styles and the static nature of modern architecture [...] to the static nature the freedom of building not dependent on the laws of gravity [...]". Also Colombo, in the sheets published here, annotates "building in reinforced concrete". Cf. Sanna, *Lucio Fontana*, 29.

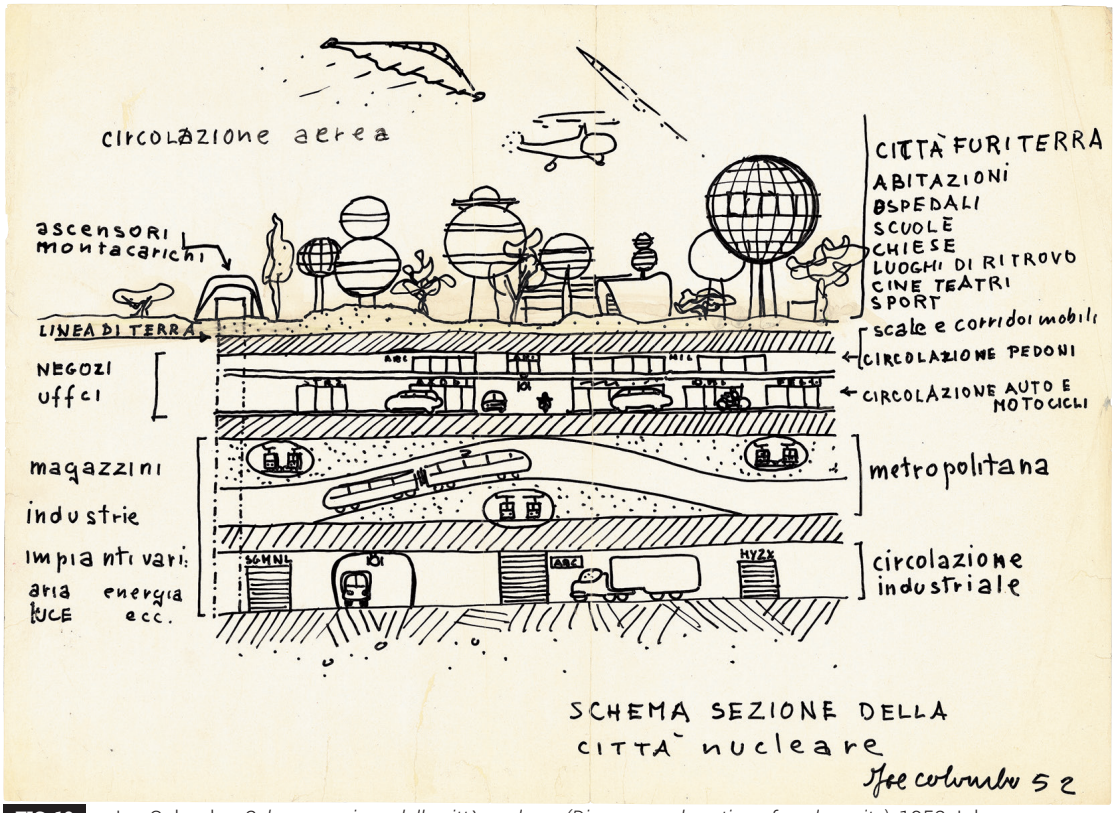

FIG. 10 Joe Colombo, *Schema sezione della città nucleare (Diagram and section of nuclear city)*, 1952. Ink on paper
Courtesy Ignazia Favata – Studio Joe Colombo, Milan

of new materials in order to respond to the threats of the time had in fact been proposed – also graphically – by Lucio Fontana in preparation for the already mentioned "Divine Proportion" intervention of 1951 [Fig. 12]. In syntony with the studies of his Argentinian friend Gyula Kosice of the Madì Group, an important representative for the spatialists and that starting from 1946 proposed the concept of a city beyond the threshold of gravity at a height of 500 metres ("Ciudad Hidroespacial"),[35] in the numerous notes for the technical manifesto of spatialism Fontana maintained the need to construct centres of the future detached from the line of the horizon[36] even if he does specify that for "nightly rest and atomic defence"[37] underground shelters would be fundamental. In fact, in addition to the sketches there is an explanatory text that in detail describes how "Man begins to fear atomic war, his awareness sends him to protect himself below ground [...] enjoying all the forms of modernity and beauty of modern technology [...] villages will be created and the underground cities will be able to be composed of infinite cells of from 16.000 to 20.000 inhabitants [...]"[38] and one will be able to enjoy the planet "in its complete beauty" only when "man stops defacing nature with his horrendous architecture".[39] If Colombo's articulated sketches complete the context faced with brushes by way of a decidedly more Euclidian vision, during the same period also the nuclear painters reasoned concerning possible planning solutions thanks to the contacts had with the "Movimento Internazionale per un Bauhaus Immaginista" ("International Movement for an Imaginist Bauhaus") (IMIB) by way of the Danish artist Asger Jorn who starting from 1953 established a close relationship with Baj and the

35. Cf. Gyula Kosice, *La Ciudad Hidroespacial. Manifesto*, in Buenos Aires, Museo Nacional de Bellas Artes ed., *Kosice. Obras, 1944-1990* (Buenos Aires: Museo Nacional de Bellas Artes, 1991), 71; Frederic Migayrou, "Kosice: Une physique de l'architecture / Una Fisica de la Arquitectura," in Camille Morineau ed., *Gyula Kosice*, exhibition catalogue (Paris: Centre Pompidou 2013), 48-57.

36. Lucio Fontana in "Manifesto tecnico dello spazialismo" ("Technical manifesto of Spatialism") wrote: "The real conquest of space done by man is *the detachment from earth, from the line of the horizon*, which for millennia was the basis of his aesthetic and proportion". Cf. Sanna, *Lucio Fontana*, 30.

37. Sketch 51 D TS 7 MTS verso. Dated on recto September 14, 1951, Archivio Fondazione Lucio Fontana, Milan. Cf. note below and note 17 in this paper.

38. Transcription of sketch 51 D TS 7 MTS recto, September 14, 1951, Archivio Fondazione Lucio Fontana, Milan.

39. Cf. note 37 in this paper and Sanna, *Lucio Fontana*, 27-30.

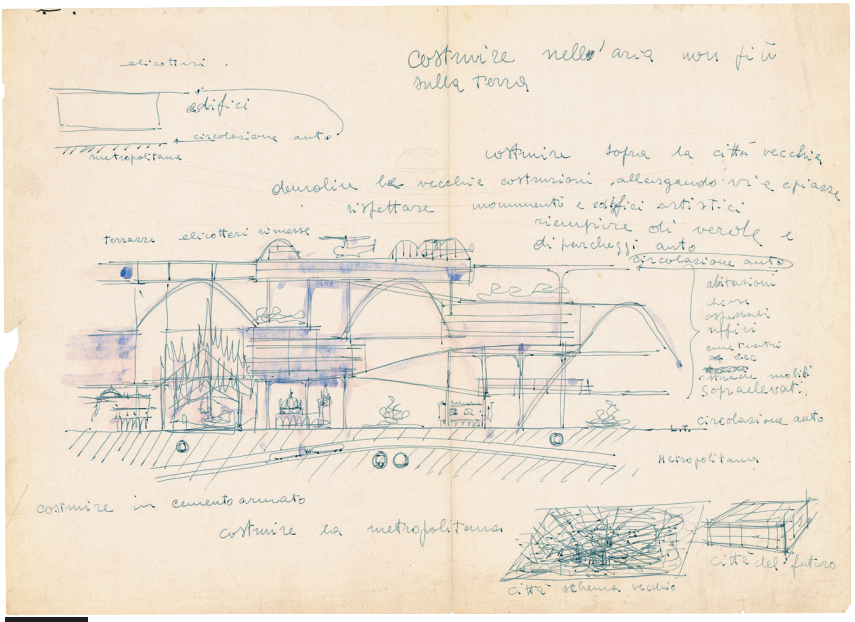

FIG. 11 Joe Colombo, *Costruire nell'aria non più sulla terra (Building on air and no more on earth)*, 1952. Ink on paper
Courtesy Ignazia Favata – Studio Joe Colombo, Milan

Milanese group following initial contacts which had come about as the result of the Belgian exhibition of 1952.[40] And in a moment in which Jorn was interested in recording on canvas alarming situations as if in expectation of an imminent catastrophe caused by war. IMIB was an important experience and in some respects is autonomous regarding what is written here but which, nevertheless, confirmed a clear interest addressed to questions that go well beyond the painted canvas. In fact, in the propulsive nuclear "thrust" – "le plus vivant en europe"[41] – Jorn saw the possibility of crowning his dream that contemplated an active involvement of painters and artists inside the architectural debate in order to once again establish the primacy of the image over form and freedom with respect to the structure, also arriving at hypothesizing a "BAUHAUS MILANO" thanks to the nuclear support.[42] IMIB was founded in an open polemic with the rationalist and functionalist theories of the so-called "imaginary Bauhaus"[43] advocated by the Hochschule für Gestaltung founded in 1953 in Ulm and managed by Max Bill: an ideal continuation of the historic institution of Weimar which, according to Jorn, in its new form did not respect the basic premises of free pictorial experimentation and the integration between the arts in that it was "hostile to whatever attempt at 'self-expression'".[44] As we have tried to demonstrate, the alternative proposals of the nuclear artists could also – and in different forms – control a new idea of planning, undoubtedly contrasting with the desire for geometrical order supported in Milan from 1948 by the MAC painters (Movimento Arte Concreta) which in the wake of Bill's lesson[45] were interested in abolishing "relationships with the vulgar sensitive world"[46] and in establishing a new order in agreement with rationalist architecture. In being absolutely contrary to these opinions, Jorn heartily supported the involvement of the Milanese nuclear group in order to inaugurate a new laboratory of architecture and he asked Baj to write an article to challenge

40. The contacts between Asger Jorn (among the founding members of the CoBRA Group) and the nuclear artists of Milan began in 1952 following the exhibition by Baj and Dangelo at the Galerie Apollo in Brussels. For health reasons Jorn moved to Italy in 1954 (to Albisola).

41. Letter from Jorn to Baj, March 7, 1954 now in *Baj Jorn. Lettres 1953-1961* (Saint-Étienne: Musée d'Art Moderne, 1989), 53.

42. Letter from Jorn to Baj, March 7, 1954: "J'ai aussi pense si sur la base du Mouvement Nucleari on pourrait faire une BAUHAUS MILANO. Ca ne doit pas s'occuper a instruir des eleves, ni faire des outiles pour l'industrie, mais il doit etre un lieu ou institut ou les artistes experimentaux pourrit comparer et discuter leurs experiences et arriver a des resultats theoriques durables et plus exactes (Sic!)". Cf. *Baj Jorn. Lettres*, 52-53.

43. Asger Jorn, *Immagine e forma. Bollettino d'Informazioni del Muvement International pour un Bauhaus Imaginiste*, no. 1 (Milan: epi. Editoriale periodici italiani, 1954). The Italian edition was edited by Enrico Baj. The text was translated into Italian by Sergio Dangelo. The second issue of the IMIB bulletin will be the first number of the magazine *Il Gesto. Rassegna Internazionale delle Forme Libere*. It was edited by the Movimento Nucleare and the French review *Phases* by Edouard Jaguer and published for the exhibition *Il Gesto* (Milan: Galleria Schettini, 1956). One should also see: Mark Nicholls and Anthony White, "*Il Gesto*: Global Art and Italian Gesture Painting in the 1950s," *Humanities Research. The Journal of the Research of Humanities & the Arts* ("The world and world-making in art"), no. 2 (2013): 81-97.

44. Jorn, *Immagine e forma*, [9]. From 1953 Max Bill managed the Hochschule für Gestaltung, founded in Ulm in the same year as the ideal continuation of Bauhaus. Mindful of the teachings of Klee and Kandinsky at the group's historic seats, Jorn contacted Bill in order to be accepted as a teacher in the sector of the free arts. Bill declined the request given that the organization of the new school was aimed at developing concrete forms of art and functional objects to be produced on an industrial level. For this reason Jorn founded a sort of anti-Bauhaus which he called the "International Movement for an Imaginist Bauhaus". An endless bibliography exists regarding the IMIB. I shall therefore limit myself to indicating the works in relation to the Italian context. Mirella Bandini, *L'estetico il politico. Da Cobra all'internazionale Situazionista 1948/1957*, 2nd ed. (Milan: Costa & Nolan, 1999), 67-99; Anzani, *Arte nucleare 1951-1957*, 15-20; Sandro Ricaldone ed., *Una mostra: Jorn in Italia. Gli anni del Bauhaus immaginista 1954-1957. Jorn a Moncalieri*, exhibition catalogue (Moncalieri: Biblioteca civica "A. Arduino", 1997); Nicola Pezolet, *"Le Bauhaus imaginiste contre un Bauhaus imaginaire": la polemique autour de la question du fonctionnalisme entre Asger Jorn et Max Bill*, thesis specializing in the History of Art, Departement d'Histoire, Faculte des Lettres Université Laval, Québec, 2008; Denis Laoureux and Matilede Amaturo ed., *CoBrA e l'Italia*, exhibition catalogue (Rome: Galleria nazionale d'arte, 2011); Ruth Baumeister, *L'architecture sauvage. Asger Jorn's critique and concept of architecture* (Rotterdam: nai010, 2014); Cf. Karen Kurczynski, *The Art and Politics of Asger Jorn. The Avant-Garde Won't give Up* (Farnham: Ashgate Publishing Company, 2014), in particular chapter 3; Luca Bochicchio, "Build to Destroy: Enrico Baj, CoBrA and the possible revolution," in Enrico Baj: Play as protest, exhibition catalogue (Amstelveen: Cobra Museum of Modern Art and Cobra Museum voor Moderne Kunst, 2017), 120-123.

the purists and delineate the programme of a nuclear architecture conceived by painters and sculptors "comme tout le grande architecture", seeing in Michelangelo – as the extreme protagonist of the synthesis between the disciples – as being "le peintre nuclaire de son temps".[47]

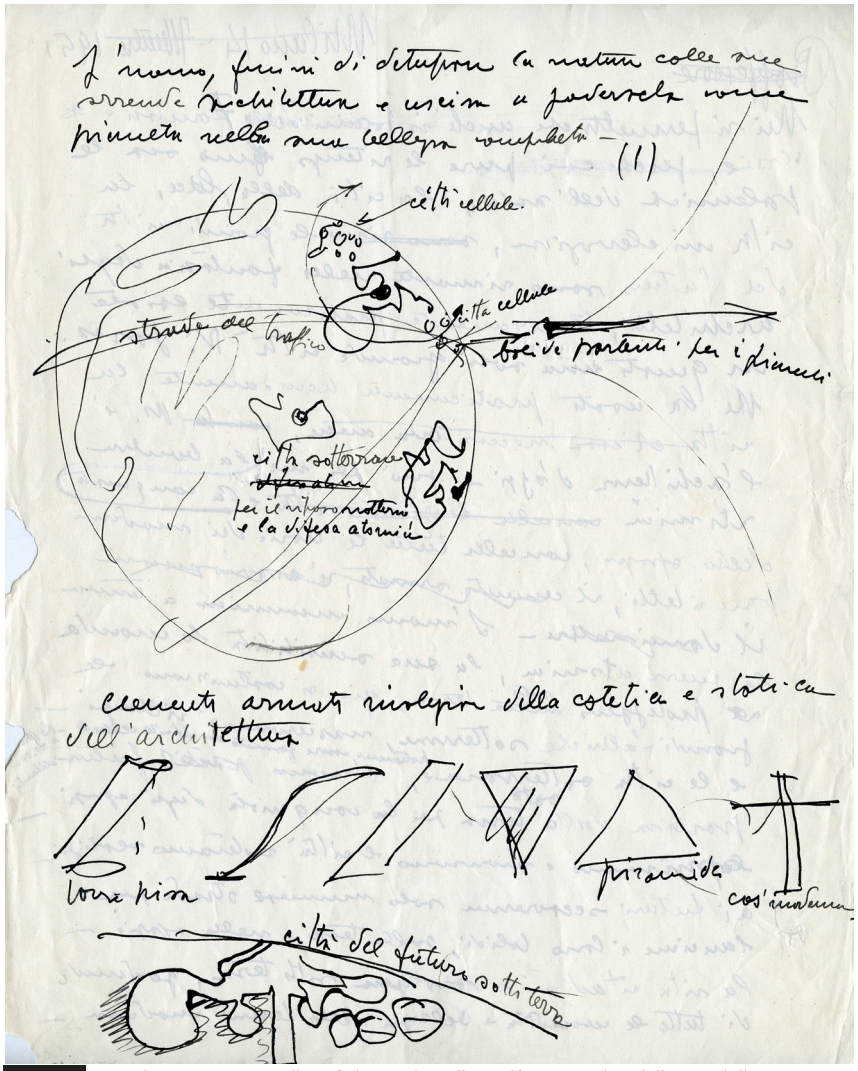

FIG. 12 Lucio Fontana, *Studi grafici e testi per il Manifesto tecnico dello spazialismo (Graphic studies and texts for the technical manifesto of Spatialism)*, 1951.
Ink on paper
Courtesy Fondazione Lucio Fontana, Milan

Enzo Venturelli: a Nuclear Architect

In total agreement with the theories of the IMIB and responding to the explicit request of the Danish artist, Baj outlined an initial invective against the work of the ethereal purist architects who in his opinion, on having declared war on the figurative arts, had stupidly ignored their own origins which were clearly traceable to Mondrian's painting: paradigm of an anticipation of painting over architecture.[48] IMIB passed into the annals of history as one of the most significant alternative experiences for European architecture notwithstanding the fact – and irrespective of what Jorn wanted – that the Milanese group never specified the characteristics of a nuclear architecture which apart from and beyond the

45. Max Bill will be one of the promoters of the Milanese exhibition *Arte astratta e concreta* (Milan: Palazzo Reale, 1947).

46. Borghese, *Arte nucleare*. Despite several controversies, MAC welcomed many others artistic groups including the Movimento Nucleare. The Nuclear manifesto, "Danger public", was prensented inside the "Bollettino Movimento Arte Concreta," no. 10 published on the occasion of the exhibition *Arte organica, macchinismo, Arte Totale e Dis-int-egr-ismo*, Milan. Galleria dell'Annunciata, saletta dell'elicottero, 1952. Cf. note 3 in this paper and also Luciano Berni Canani and Giorgio Di Genova eds., Mac/Escpace. *Arte concreta in Italia e in Francia 1948-1958*, exhibition catalogue (Rome: Acquario Romano, 1999).

47. Letter from Jorn to Bay, December 1953, now in: *Baj Jorn. Lettres*, 40-41. "J'ai ecrit la même question aux autres artistes de tendence libre pour lever un protestation vif *contre l'oppression de l'art et la peinture libre par l'architecture abstraite et fonctionalliste*. Je veut faire paraitre une petite revue: 'Bauhaus immaginaire' et j'espere que j'aura un article de vous qui *attaque l'architecture puriste et trace le programme d'une architecture nucleaire formee par les peintres=sculpteurs comme tout le grande architecture*. Je vois chez Michel Ange le peintre nucleaire de son temps. (Sic!)".

48. "Je suis parfettement d'accord avec toi: tes convinctiones sont aussi les miennes et pour ce-la je suis ancore plus heureux de ta lettre et de la coincidence des nos intentions. Tu peus donc être bien sûre de mon accord et de l'accord de tout le Movimento Nucleare, dans le lutte que tu va conduire contre le nouveau Bauhaus de Max Bill. […] En effect c'est justement pour combattre contre le purisme, abstractisme, inutilisme, stérilisme etc.; que j'ai organisé ici notre Movimento: nos manifestation ont eu souvent le but éxclusive de combattre la stupidité présomptueuse des abstraites-conscrets et des leurs petites trouvailles geometriques. De cette situation les architectes sont coupables au moins trois fois: avant tout parce que, même s'ils ont fait des grands progrès dans l'hygiène, les water-closed, etc., ils ont complétement oublié (et même cherché à supprimer) l'art. Et encore: ils supposent dans l'homme des qualité que l'homme heureusement n'auras jamais. Enfin au present les architectes déclarent la guerre à la peinture-sculpture et ils oublient que au present et en retard ils batissent les maisons que nous voyons, puisque ils ont vue les éxpériments picturales de Piet Mondrian et tous les tableaux du formalisme geométrique. (Sic!)" Letter from Baj to Jorn, Milan, January 2, 1954. Now in: *Baj Jorn. Lettres*, 44-45. In a following letter (January 14, 1954) Baj confirmed to Jorn that the Italian editor for the IMIB bullettin could be the Movimento Nucleare. Cf. *Baj Jorn. Lettres*, 46 and note 43 in this paper. Sic.

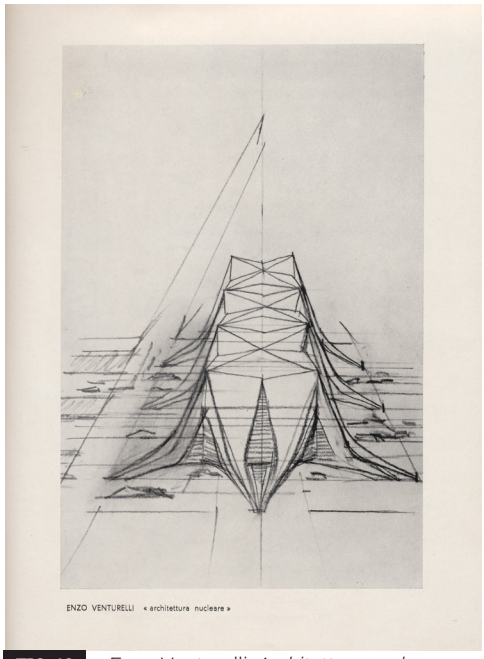

FIG. 13 Enzo Venturelli, *Architettura nucleare (Nuclear architecture)*, in *Il Gesto* 3, September 1958

coordinates which identified the places frequented by the artists of the movement instead assumed a form in Turin thanks to the architect Enzo Venturelli.[49] To date we do not have the terms to establish if in this first period there existed direct contacts between the Turinese architect and the Milanese exponents who only in 1958 published his own "Architettura Nucleare" in the official publication of the movement *Il Gesto*.[50] [Fig. 13] In whatever case, it would not surprise us to think that the terminology adopted by the architect was not also inspired by the artistic movement that at the time enjoyed international recognition and that precisely in Turin in December 1953 inaugurated an exhibition at the Galleria Alle 4 Pipe introduced by Jorn's text "Fare segno" ("Carrying out sign"), a text in which it was reaffirmed how "The scientists who in the atom discover a force of destruction have to be replaced by men gifted with a creative spirit".[51] [Fig. 14] Effectively speaking, while official recognition by Venturelli of the Milanese group did not exist, above all in the first period one can nevertheless certify significant affinities translated in stone and lime. Following a personal adhesion to characteristics close to the rationalist language, starting from the 1950s Venturelli's career carried out a brusque

49. The work by Enzo Venturelli (1910-1996) gave rise to considerable interest, above all when the architect was still alive, as is shown by his international recognition. However, up until the present it is only possible to cite two monographs and a few in-depth research works. See Mario Marchiando Pacchiola ed., *Enzo Venturelli*. (Pinerolo: Q.30, i quaderni della Collezione Civica d'Arte, 1992); Roberto Gabetti, Aimaro Isola, and Benedetto Camerana, "Echi fuori d'Italia: architetture a Torino, 1950-1970," in Germano Celant, Paolo Fossati, and Ida Giannelli eds., *Un'avventura internazionale. Torino e le arti 1950-1970*, exhibition catalogue (Turin: Castello di Rivoli 1993), 60-75, in particular 62; Marco Parenti and Angelo Mistrangelo eds., Enzo *Venturelli Architetto* (Alessandria: Edizioni dell'Orso, 1999). Regarding the representations to define an ideal town also see: Andreina Milan and Margot Pellegrino, *"'Futurama II'. Tracking the 'Presence of the Future' in Contemporary Architecture Representations,"* *Cahiers Thématiques*, no. 12 (2013): 31-38, which compare works by Enzo Venturelli, Claude Parent and Roger Anger. Monographic exhibitions and autonomous investigations were also dedicated to his activity as a painter in order to underline an important continuity of formulation between architecture and the visual arts. For this aspect I refer the reader to: Angelo Mistrangelo, "l'immagine tra architettura e pittura," in Parenti and Mistrangelo, *Enzo Venturelli*, 115-118. All the documentation regarding Venturelli is today conserved in the Archivio di Stato in Turin, Inventory no. 312 - Archivi privati - Archivio Architetto Enzo Venturelli. Another collection of documents regarding Venturelli is conserved at the Università Statale of Milan, Biblioteca di Storia dell'arte, Fondo Brizio.

50. *Il Gesto 3. Rassegna internazionale delle forme libere*, (Milan: epi, September 1958).

51. Asger Jorn, presentation for the exhibition: *Pittura nucleare (Baj, Colombo, Dangelo, Mariani, Rusca, Serpi)*. Turin: Galleria Alle 4 Pipe, December 3-16, 1953. Also see some articles of the local Turinese press: "I nucleari," Gazzetta del popolo, (December 10, 1953); "In Galleria. I nucleari alla 'saletta delle 4 pipe'," *Il popolo nuovo*, (December 6, 1953).

FIG. 14 Invitation-brochure for the exhibition *Pittura nucleare (Nuclear painting)*, with presentation by Asger Jorn and drawing by Sergio Dangelo, Turin, December 3-16, 1953
Rovereto, Mart, Archivio del '900, fondo Baj, Ba.1.1.2.6.20

inversion in tendency. The graphic corpus of those years registered buildings that were formerly non-conformist, "of new expression", although ideated in order to solve concrete problems of reality and comply with precise functions from the residential and urban points of view (elevated structures so as to leave the ground free for traffic and parking).[52] The architect's interest ranged from the study of futuristic television stations to blocks of flats with alternate grid-plan floors – in order to break with the classical curtaining of the street and guaranteeing light and openings – or else even circular in such a way as to also take advantage aesthetically. And then in a slightly later project he also found himself exalting the possibility of detaching the buildings from the urban ground in order to enjoy "free spatial visions", far from noise and smog with everything, obviously, accompanied by a modern system of aerial circulation. [Fig. 15] The role of nature which stylistically shows convincing affinities with the hallucinated detail of organic structures in the first sheets already seems determinant: an oneiric and at times menacing landscape in agreement with the apocalyptic and post-atomic scenarios depicted by the nuclear painters. [Fig. 16] These reflections on a "re-naturalized" universe led him to develop a personal idea of architecture, defined as nuclear. It is difficult to establish the exact time that Venturelli decided to use the term, to be found in various typewritten documents – not all uniform – preceding a text on nuclear architecture presented in 1958 on the occasion of a one-man exhibition.[53] It is nevertheless certain that one began to talk about nuclear architecture much earlier, certainly from 1954-1955 with the finishing of a building that became its manifesto: the home-studio for the sculptor Umberto Mastroianni planned starting from 1953 on the city's high ground. [Fig. 17] According to Venturelli's intentions the new building was to have represented an architecture embodying "rapid and progressive variability, contemporary of the nuclear era from which it draws its origin and motivation" in "opposition to the building system of the abused linear and flat boxed forms".[54] In the wake of

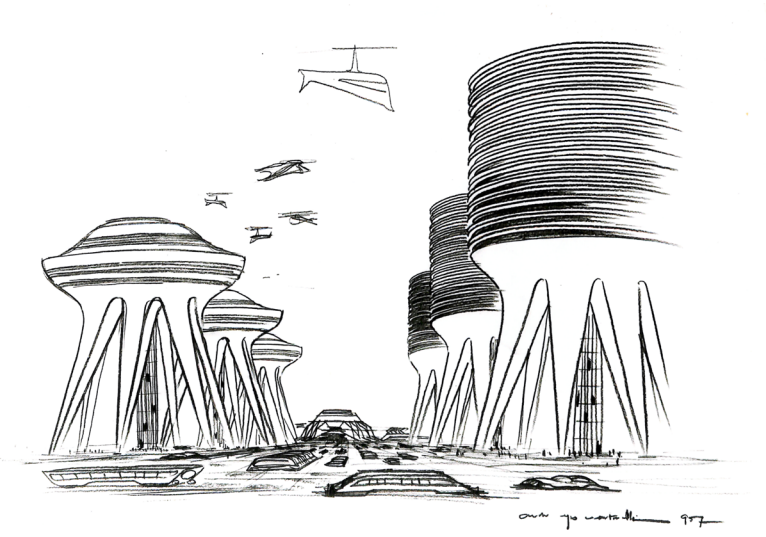

FIG. 15 Enzo Venturelli, *Studio di edifici per il futuro (Study on buildings of the future)*, 1957. Copy on paper
Archivio di Stato di Torino, Archivio Architetto Enzo Venturelli, Box 23

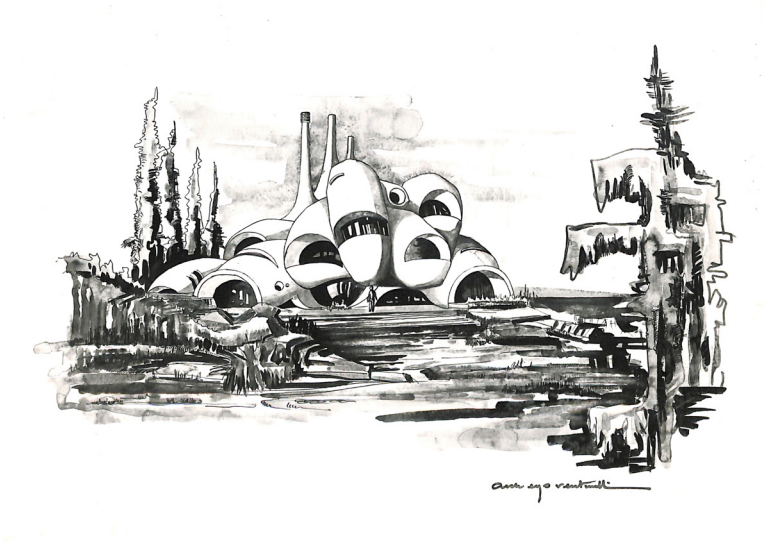

FIG. 16 Enzo Venturelli, *Villa nella foresta (House in the forest)*, 1953. Copy on paper
Archivio di Stato di Torino, Archivio Architetto Enzo Venturelli, Box 23

52. The urban theories will be the protagonists of an autonomous study by him published in 1960: Enzo Venturelli, *Urbanistica Spaziale. Integrazione dello spazio nella città* (Turin: Editori Fratelli Pozzo, 1960). Also see Bruno Zevi, "Urbanistica spaziale. Recise le caviglie a tutti i fabbricati," in *Cronache di architettura IV. Dai laboratori medici di Kahn al piano di Tange per Tokio* (Bari: Editori Laterza 1971), 174-177.

53. Travelling exhibition *Enzo Venturelli, Architecture du temps Nucléaire*. Paris: Office national Italien de Tourisme, 1958 and Milan: Galleria d'arte Selezione, 1958. The exhibition was featured in important Italian and international newspaper and magazine articles. For a complete bibliography see: Marchiando Pacchiola, *Enzo Venturelli*, 34-40.

54. Enzo Venturelli, "Premesse" ("Foreword"), in *Casa studio per lo scultore Mastroianni,* ("Home-studio for the sculptor Mastroianni"), typewritten dated Turin, September 1958, in the Archivio di Stato di Torino, Archivio Architetto Enzo Venturelli, Box 12, folder 180, page 1.

the controversies already encountered with regard to rationalist poetics, as an architect also Venturelli disassociated himself in order to support a new idea of architecture capable of emancipating itself from the "planned form" and "the polished structure".[55] The premises of the change were to be found in the potentialities of the new energy capable of upsetting the possibilities of daily lives, therefore architectural occasions. "With 'nuclear' architecture the external elements of architecture are integrated with a new element which takes its inspiration from the various intellectual manifestations of man's life; and from the free imagination and brain of the artist innumerable forms and creations flow out, and depending on the cases and the feelings of the artist, architecture will also be able to include philosophical, musical, scientific or sentimental concepts, it will be able to be painting, music, literature etc.; so in the creation of the home-studio for the sculptor Mastroianni I was able in a complete form to apply the inspiration of the new architecture".[56] [Fig. 18]


NAZIONE SERA

E' NATA L'ARCHITETTURA NUCLEARE

Questo edificio è stato costruito sulla collina di Torino: è la casa-studio dello scultore Mastrojanni. Il progettista ha inteso dar vita a una nuova architettura che si svincoli dalle forme attuali impostate sul razionalismo e la funzionalità. « Architettura nucleare » è stata chiamata perchè concepita e sviluppata nell'era della bomba « H ».

FIG. 17 "È nata l'architettura nucleare" ("Nuclear Architecture is born"), in *Nazione sera*, December 12, 1955 (Detail of Mastroianni Home-Studio, Turin)

In line with the principles advanced by Jorn, in the definition of the new nuclear architecture as furnished by Venturelli, a key role was taken on by the figure/imagination of the architect-artist who as interpreter of the new age delineates a style suited to it given that "it is mistaken to affirm that by exclusively following the internal form without the addition of other elements one defines an architecture or a style, otherwise there would never have been a style".[57] In 1953 Jorn invited Baj to reflect on how the house had no longer to be a "machine for habitation" but a machine to shock and impress, a machine of human and universal expression.[58] Also in the text of 1954 entitled "Image and Form" that ratified the guidelines laid down by the IMIB, Jorn observed how the exterior of an architecture "must not reflect the interior but [be] a source of poetic sensation for who observes it".[59] A result overtly followed also by Venturelli in his search for a poetic "whole" in which the dynamicity of the surface at the same time respected skillfully combined "supporting" functions. For the architect the Mastroianni Home-Studio was to represent an important point of arrival

55. Enzo Venturelli, *Appunti sull'architettura nucleare* ("Notes on nuclear architecture"), undated, typewritten, in the Archivio di Stato di Torino, Archivio Architetto Enzo Venturelli, Box 12, folder 180, page 2.

56. Enzo Venturelli, *Architettura nucleare* ("Nuclear architecture"), undated, typewritten, in the Archivio di Stato di Torino, Archivio Architetto Enzo Venturelli, Box 21, folder 5, page 5. Text partially published in Bruno Zevi, "Torino irrazionale. L'architetto Enzo Venturelli," *L'architettura. Cronache e storia,* no. 8 (June 1956): 114. See illustration 18 in this paper. The Home-studio for the sculptor Mastroianni was recently published in Martin and Werner Feiersinger, *Italomodern 1. Architecture in Northern Italy 1946-1976* (Zürich: Park Books, 2016), 44-45.

57. Enzo Venturelli, *descrizione dell'autore sull'architettura "nucleare"* ("Description by the author on 'nuclear architecture'"), undated, typewritten, in the Archivio di Stato di Torino, Archivio Architetto Enzo Venturelli, Box 21, folder 5, page 4.

58. *"La maison ne doit pas etre une machine a habiter. mais une machine a chocquer a impressioner. une machine d'expression humaine et universelle"*. Letter from Jorn to Baj, December 1953, now in *Baj Jorn. Lettres*, 41.

59. Jorn, *Immagine e forma*, [3]. In that same year (1954) Jorn advanced his adverse reasons regarding the standardization of forms at the X Triennial in Milan where besides the exhibition of his ceramics he also took part with Lucio Fontana in the "1st International Congress of Industrial Design" where he criticized the position of Max Bill, the protagonist of the entire event. Cf.: Paola Valenti, "Lo sguardo 'libero' di Asger Jorn su Le Corbusier, Max Bill e Lucio Fontana," in Luca Bochicchio and Paola Valenti eds., *Asger Jorn. Oltre la forma. The form and Beyond*, exhibition catalogue (Savona and surroundings, 2014), 55-56.

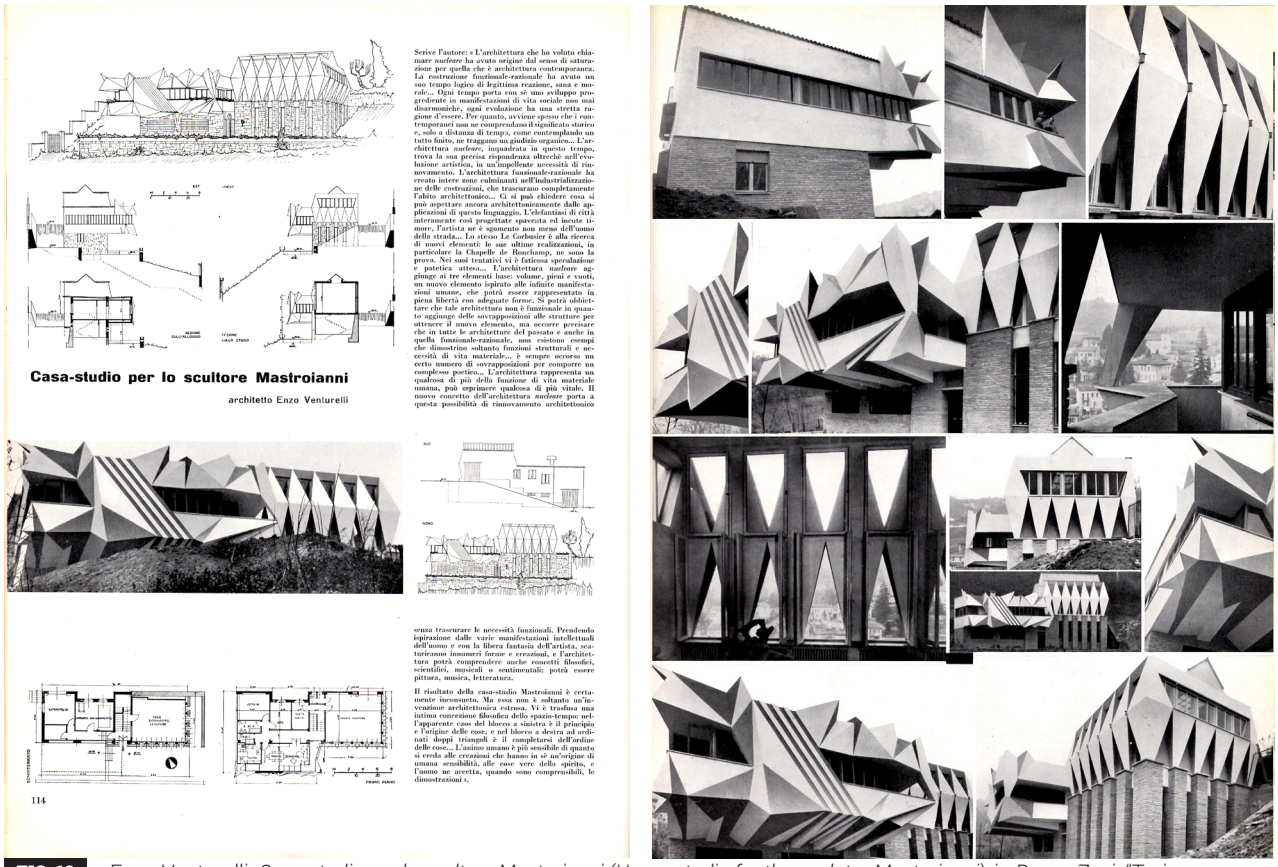

FIG. 18 Enzo Venturelli, *Casa studio per lo scultore Mastroianni (Home-studio for the sculptor Mastroianni)*, in Bruno Zevi, "Torino irrazionale. L'architetto Enzo Venturelli," *L'architettura. Cronache e storia*, no. 8 (June 1956), 114-115

as one can also deduce from his writings which consider this creation as being a manifesto that clearly lays out his idea of architecture. In order to define the form of this new project (of which no trace remains of a direct contribution of the client-sculptor) Venturelli avoids the superimposition of decorations in order to work directly on the volume of the structure in such a way as to give the building a clearly plastic and "exploded" connotation as was reported by numerous Italian and international newspapers and magazines which in an equivalent way approved and in some cases "slammed" the work as Bruno Zevi did, complete with a drawn-out polemic with Venturelli (seeing in his proposals an act of pure decoration), notwithstanding the fact that on various occasions Zevi chose to present it in the magazine directed by him.[60] In 1958 an itinerant exhibition – first in Paris and then at the Galleria d'arte Selezione in Milan – honoured Venturelli's nuclear architecture presented in the manifesto by means of a revolutionary – and not too distant – Fallingwater now in the form of a spaceship[61] **[Fig. 19]**: certainly an occasion for the Milanese painters to get to know his work as is also shown by the book of signatures which, amongst others, includes Baj.[62] As already mentioned, it is not fortuitous that in the same year the drawing/design of an "Architettura nucleare" was given a full page at the end of *Il Gesto* 3,[63] testifying recognition on the part of the Milanese milieu and also confirmed by friendly comments written by the members of this same milieu to that "architect of nuclei", as Baj defined Venturelli.[64] **[Fig. 20]**

60. Notwithstanding the fact that Bruno Zevi decided on various occasions to consider Venturelli's work, it was above all in the first articles that he did not miss the chance of disagreeing with the latter's architecture. With time the polemics abated as is confirmed by the friendly written correspondence between the two: Archivio di Stato di Torino, Archivio Architetto Enzo Venturelli, Box 36. Also see: Bruno Zevi, "Noia e stravaganza di Enzo Venturelli," *Espresso* (March 4, 1956) and Zevi, "Torino irrazionale", 112-115. The Mastroianni Home-Studio was featured in important Italian and international newspaper and magazine articles. For a complete bibliography see: Marchiando Pacchiola, *Enzo Venturelli*, 34-40.

61. Cf. Luisa Perlo, "La casa sul ruscello," *Afterville*, no. 0 (fall-winter, 2007): 5. For the exhibition cf. note 48 in this paper.

62. The book of signatures for the exhibition is now preserved in the Archivio di Stato di Torino, Archivio Architetto Enzo Venturelli, Box 25.

63. Cf. note 50 and illustration no. 13 in this paper.

64. Dedication by Enrico Baj to Enzo Venturelli appearing on the first page of Baj's monograph written by Jaguer and belonging to Venturelli. Lucio Fontana also dedicated one of his catalogues to Enzo Venturelli. Both books which belonged to Venturelli are now preserved in the Archivio di Stato di Torino, Archivio Architetto Enzo Venturelli, Box 124.

Conclusion

This treatise has evidenced two essential aspects regarding nuclear architecture. The first has focussed on its aspects strictly connected to alarming situations which as found in the "nuclear cities" has led some people to study and plan solutions for an imminent atomic era. The second, on the other hand, proposed nuclear architecture as alternative research and critical evaluation with regards to the project discipline in a moment of crisis of the rationalist premises typical of the later postwar period. Nuclear energy was certainly an impulse for believing in a technological future which even today still remains a chimera that dogs the minds of many architects but which above all became an expedient in order to go beyond a condition of architecture no longer widely accepted and no longer capable of coping with contingent demands and a planning of the future. Jorn himself affirmed how the artists could take part in a "new and more profound understanding of the real nature of the matter obtained from scientific and philosophical research works, nuclear and universal"[65] and how his interest for the Milanese protagonists derived from an ability on their part to "[...] mould forms, images and symbols, as if from a primitive chaos, [...] symbols which from 'nuclear' are converted into 'natural' ones. In these symbols lies the nucleus of the artistic language that is necessary for the expression of this new world which we feel being created around us, day by day".[66] The "triangulation" proposed – Movimento Nucleare, IMIB and Venturelli – while not being characterized by linear coordinates in different forms does evidence this latter aspect of the polemic initially begun by protagonists tied to the system of the figurative arts and to painting in particular.[67] Also Enzo Venturelli in nuclear architecture recognized the possibility of disintegrating the construction vocabulary exactly as painting had done in following the rules of its grammar. In this sense the architects tried to free themselves from a status quo that tied their work to methods which were sometimes inflexible in order to move closer to a creative process that was certainly more in line with pictorial experimentations as Jorn warned in his guiding text for the IMIB titled "Image and Form", not to mention the first number of the IMIB information bulletin "Image and Form", for the Italian edition curated by Enrico Baj and translated from the French by Sergio Dangelo: "Painting and sculpture are 'arts that create images'; although architects ought to be aware that all the forms created by man are necessarily and first and foremost imagined; for this reason painting always precedes architecture".[68] A text on architecture which I would like to think has been read by all the protagonists named, as probably it has been. A treatise that in its title reveals a clear desire for synthesis in which "image and

FIG. 19 Brochure for the exhibition, *Enzo Venturelli. Architecture du temps nucléaire (Architecture of the nuclear period)*, Paris-Milan, 1958

65. Jorn, *Immagine e forma*, [6].

66. Asger, Jorn, "The Meaning of the Nuclear Plastic Experience," a [1954] manuscript quoted in Sauvage, *Arte nucleare*, 36

67. In 1956, enriched by the support of European experimental groups but no longer having Baj and the Movimento Nucleare, in the town of Alba IMIB promoted the *1° Congresso Mondiale degli Artisti Liberi* (1st World Congress of Free Artists) arriving at theorizing an increasingly more refined idea of architecture based upon the construction of forms of behaviour. On that occasion also an already consecrated exponent of architecture in the person of Ettore Sottsas Jr. proposed an interesting vision of architecture which for him was not easily assimilated with regard to structural questions given that in so doing "every plastic deviation [...] will end up always being a superstructure, a 'decoration'" for transferring a central role to artistic research. See Ettore Sottsas jr., "Relazione al I Congresso Mondiale degli Artisti Liberi," in Bandini, *L'estetico il politico*, 254-259.

68. Jorn, *Immagine e forma*, [2]

FIG. 20 Dedication by Enrico Baj to Enzo Venturelli appearing in the first page of the Baj's monograph written by Jaguer in 1956
Archivio di Stato di Torino, Archivio Architetto Enzo Venturelli, Box 124

form" are explicitly the paradigm of "painting and architecture". Moreover, and confirming an important exchange of information which goes beyond whatever disciplinary distinction, in a letter to the Italian editors Jorn insists that at the end of this first bulletin they insert a bibliographical reference which he came across at the last minute but which for him was very important: two significant interventions that the architect Luigi Moretti dedicates to the theme of "structure-form" included in his journal entitled *Spazio* in which he maintained how the various "moments" of architecture must be indistinguishable given that "a work of architecture is therefore in every point reality and representation" that has "to hold still the structure in the continued existence of a form".[69] An "original" dialogue that evidences elective affinities between different protagonists firmly convinced of the expressive value of the image as an inevitable instrument for every type of research, more so if the question is that of thinking about the future.

69. Luigi Moretti, "Struttura come forma," *Spazio*, no. 6 (December 1951 – April 1952): 30 and 110; Luigi Moretti, "Strutture e sequenze di spazi," *Spazio*, no. 7 (December 1952 – April 1953): 9-20; 107-108.

The Cybernetic Hypothesis & Architecture

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ABSTRACT

Whatever happened to cybernetics in architecture? **Cybernetics swaggered from day one. Its original mission, to predict the evasive manoeuvres of bomber pilots, soon evolved into making predictions in social systems and game theory, as well reconfiguring architecture as a system. Then, one day, the moment passed, and cybernetics vanished without fanfare. Or so the story goes.**

What if**, on the contrary, *cybernetics disappeared in name only*, and its principles still thrive in architectural practices? Tiqqun's "L'Hypothèse cybernetique" (2001) argues that the cybernetic hypothesis replaces the liberal hypothesis of sovereignty with one of control. The article traces cybernetics in architecture with the aim of articulating how cybernetics remains in the "post-critical" turn.**

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Cybernetics, Post-critical, Architecture, Neoliberalism

Introduction

If the seventeenth and early eighteenth centuries are the age of clocks and the later eighteenth and the nineteenth centuries constitute the age of steam engines, the present time is the age of communication and control.[1]

> L'*hypothèse cybernetique* est donc une hypothèse politique, une fable nouvelle qui, à partir de la Seconde guerre mondiale, a définitivement supplante l'hypothèse libérale. A l'oppose de cette dernière, elle propose de concevoir les comportements biologiques, physiques, sociaux comme intégralement programmés et re-programmables. Plus précisément elle se représente chaque comportement comme «pilote» en dernière instance par la nécessite de survie d'un «système» qui le rend possible et auquel il doit contribuer.[2]

The history of cybernetics is wild and multifaceted, carrying itself with utopian swagger until, suddenly, it vanished – or so they say. To document the presence of cybernetics is itself a task far larger than the scope of this article; what I strive to do here is something different: I am searching for what we could call the *virtual agency* of cybernetics. How does cybernetics affect *how we think* beyond those instances of architectural practice that explicitly reference a cybernetic discourse? I am interested in the aspects of cybernetic thought that have become habits of mind without being recognized as cybernetic as such. This issue will be discussed with an eye on architectural theory and practice focused on architecture since the turn of the millennium and the "post-critical" moment in architecture. More specifically, my purpose is to open up a discussion on the relationship between architecture and the cybernetic notion of control. Control can in this context be said to be double-sided: on the one hand, there are technological aspects of control (surveillance, tracking, access cards, etc.); and, on the other hand, there is a social aspect that I will argue is far more insidious, forming not only how we understand the world, but arguably also how we believe the world to be configured.

Cybernetics allegedly vanished as a defined discourse in the early 1970s, but this non-presence does not equal absence.[3] If we instead follow the French collective Tiqqun's 2001 "L'Hypothèse cybernétique," the very opposite is true. Tiqqun postulate that since the end of WWII, the world left the "liberal hypothesis" – here defined in terms "'private vices' to be guarantees of the 'common good'" – in favor of a *cybernetic hypothesis*.[4] This latter operates under the flag of liberalism, and what we are living in is a world of *cybernetic capitalism* rather than any version of liberalism.[5] The cybernetic hypothesis argues that cybernetics disappeared in name only, and that its principles dominate how we think the world works.

Architectural discussions on cybernetics tend to focus primarily on architects who consider themselves to be approaching architecture

1. Norbert Wiener, *Cybernetics: Or Control and Communication in the Animal and the Machine* (Cambridge: MIT Press, 1985 [1948]), 39.

2. The *Cybernetic Hypothesis* is thus a political hypothesis, a new fable that after the second world war [sic] has definitively supplanted the liberal hypothesis. Contrary to the latter, it proposes to conceive biological, physical, and social behaviors as something integrally programmed and reprogrammable. More precisely, it conceives of each individual behavior as something "piloted," in the last analysis, by the need for the survival of a "system" that makes it possible, and which it must contribute to.' Tiqqun, "The Cybernetic Hypothesis," 42. All English translations in this document are from "The Cybernetic Hypothesis," https://theanarchistlibrary.org/library/tiqqun-the-cybernetic-hypothesis.pdf. This translation is uncredited.

3. With many notable exceptions, such as the continued presence of Gordon Pask at the Architectural Association in London.

4. Tiqqun, "The Cybernetic Hypothesis," 41.

5. Since neoliberalism and cybernetics both emerged out of the post-war context, the two can certainly be considered related. In an analogous argument, Douglas Spencer in a recent book considers cybernetics as neoliberal science, whereas Tiqqun consider neoliberalism a cybernetic ideology. Douglas Spencer, *The Architecture of Neoliberalism: How Contemporary Architecture Became an Instrument of Control and Compliance* (London: Bloomsbury, 2016).

through cybernetics, explicitly referencing cybernetic theory and architectural undertakings. Such an approach may fail to detect or understand a wider cybernetic influence, one that can be traced through other disciplines as much as through architecture.[6] This article will follow Tiqqun's hypothesis to move beyond such restraints, and it will explore the non-absence of cybernetics in the contemporary architectural discourse with an emphasis on the notion of "control."

The article's contribution to the broader field of cybernetic architecture is a broadening of this discussion beyond the explicit cybernetic tradition. In the more general field of architectural theory, a discussion on cybernetic presuppositions and control cybernetics appears timely in the post-critical discussion of criticality and critical spatial practices.

The text is divided into two main parts. Part 1 discusses very briefly the development and concepts of cybernetics as they emerged, as well as the explicit presence of cybernetics in architecture. Part 2 brings the discussion to the present and analyses how the concepts and presuppositions of cybernetics remain present and relevant in the contemporary architectural discourse in everything but name, and problematizes this situation. Following these two main parts, the final part contains a conclusion and is an overture for further research and discussion.

6. See, for example, the discussion on cybernetics and counterculture in Hugh Dubberly and Paul Pangaro, "How Cybernetics Connects Computing, Counterculture, and Design," in Andrew Blauvelt ed., *Hippie Modernism: The Struggle for Utopia* (Minneapolis: Walker Art Center, 2015).

Part 1: A Brief Account of Cybernetics

Cybernetics exploded with Norbert Wiener's publication of Cybernetics: On *Control and Communication in the Animal and the Machine* in 1948 and the publication of Claude Shannon's "A Mathematical Theory of Communication" that set out the principles for the related field of study information theory in the same year.[7] Cybernetics, once the word caught on, promised to unite all sciences, to a universal system of understanding everything as one system by – as Tiqqun dramatically put it – making living things into machines and making machines out of living things.[8] Although the velocity with which cybernetics and information theory caught both academic discourses and public imagination suggests that this was a sudden appearance, there is a much longer history behind the principles that came to be claimed as cybernetic.

The most common reference backwards, also prominent in *Cybernetics*, is an article from 1943, co-written by Wiener, that attempted to predict evasive manoeuvers of enemy aircraft pilots in order to shoot them down.[9] However, depending on how far back one wants to trace the legacy of cybernetics, one encounters a variety of different precedents. Media theorist Seb Franklin traces the heritage of cybernetics back to Herman Hollerith's principles for machine tabulation in the 1890s;[10] and Wiener himself refers back to Clerk Maxwell, who wrote of feedback mechanisms and "governors" concerning James Watt's steam engine in 1868, but

7. The distinction between information theory and cybernetics shifts with perspective and time, although proponents of cybernetics would argue that information theory is included in cybernetics, which has a more general approach. For a detailed discussion of this issue, refer to Ronald R. Kline, *The Cybernetics Moment: Or Why We Call Our Age the Information Age* (Baltimore: John Hopkins University Press, 2015), 4 and 11.

8. Tiqqun, 46.

9. Arturo Rosenblueth, Norbert Wiener, and Julian Bigelow, "Behavior, Purpose and Teleology," *Philosophy of Science* 10, no. 1 (1943); Seb. Franklin, *Control: Digitality as Cultural Logic* (Cambridge: MIT Press, 2015), 166-67.

10. Franklin, *Control*, 28-32.

suggests that the term cybernetics itself is new.[11]

Wiener defined cybernetics as an "entire field of control and communication theory, whether in the machine or in the animal."[12] This was the typical cybernetics swagger, promising a universal system that would unite all sciences and make politics a relic of the past. The word cybernetics itself, Wiener notes, from Greek, means "steersmanship." Cybernetics can be considered the art of piloting (or controlling) systems, with etymological reference to governing. The systems are here comprised by agents; each agent (human or non-human) affects the system in one way or another, and the agents defined in terms of input and feedback within the system.

The perhaps most central concept in cybernetics is the feedback loop, succinctly described by media theorist Alexander R. Galloway as "an internal message loop in which messages originating within the system also effect the operation of the system. This results in dynamic change, and, as a result, systems use feedback in order to mitigate imbalance and pursue homeostasis."[13] The negative feedback loop permits a system to adapt itself and remain in balance as it compensates for fluctuations, and, in theory, permits the system to evolve. Originally, in the relationship between the cybernetician and the system, the cybernetician was on the outside, very literally a controller of the system. This perspective changed with what became known as s*econd-order cybernetics* (sometimes described as second-wave, or social cybernetics), which included the cybernetician in the feedback system. Second-order cybernetics was an approach articulated by Heinz von Foerster (the cybernetics of cybernetics), and advocated by Gregory Bateson, Margaret Mead, and Gordon Pask, among others. N. Katherine Hayles notes that if first-order cybernetics was concerned with the flow of information within a system, second-order cybernetics concerned itself with the interaction between system and observer.[14] The system thereby becomes not only self-regulating, but also self-organizing, or even *autopoietic*, as it would be claimed. As Kline notes, second-order cybernetics resonated with the counterculture movement in the US at the time, bridged by Gregory Bateson's "ecology of the mind."[15] Seemingly paradoxically, in counterculture, cybernetics became associated with freedom *from* control rather than control itself, a curious twist that has arguably served to obfuscate the naturalization of the cybernetic hypothesis that Tiqqun suggested has replaced the liberal hypothesis.

The cybernetic hypothesis starts from the presumption that the world is a system (in a network model). This serves as the starting point for thinking through a network-oriented system, of edges and nodes, as Galloway reminds us, the cybernetic hypothesis "refers to a specific epistemological regime in which systems or networks combine both human and nonhuman agents in mutual communication and command."[16]

11. Norbert Wiener, *Cybernetics: Or Control and Communication in the Animal and the Machine* (Cambridge: MIT Press, 1985 [1948]), 11-12, 97.

12. Wiener, *Cybernetics*, 11.

13. Alexander R. Galloway, "The Cybernetic Hypothesis," *Differences: A Journal of Feminist Cultural Studies* 25, no. 1 (2014), 113.

14. N. Katherine Hayles, "Cybernetics," in *Critical Terms for Media Studies*, eds. William J. Mitchell and Mark B. N. Hansen (Chicago: The University of Chicago Press, 2010), 149.

15. Kline, *The Cybernetics Moment*, 197-98.

16. Galloway, "The Cybernetic Hypothesis," 111.

Tiqqun, relating it back to the cybernetic aspiration of making machines out of animals and animals out of machines, put it rather pointedly in the following terms:

> Il ne s'agit plus d'arracher le sujet à des liens traditionnels extérieurs comme l'avait commandé l'hypothèse libérale mais de reconstruire du lien social en privant le sujet de toute substance. Il faut que chacun devienne *une enveloppe sans chair*, le meilleur conducteur possible de la communication sociale, le lieu d'une boucle rétroactive infinie qui se fasse sans nœuds.[17]

The individual subject is thus primarily considered through her part in the system, as an agent, and Tiqqun focus on the social aspects whereby minimum distortion in social communication is considered desirable and facilitating control.

Second-order cybernetics could be considered, as von Foerster put it, a "*cybernetics of cybernetics*" [emphasis in original]),[18] or, as the British cybernetician Gordon Pask put it in relation to architecture: "design is control *of* control."[19] The keyword here is "control." Control, as Alexander R. Galloway and Eugene Thacker note, should not be understood in terms of something exercising control over something else (which is perhaps the most common understanding), but as *the premises according to which the system functions*. They write: "One does not simply control a device, a situation, or a group of people; rather, 'control' is what enables a relation to a device, a situation, or a group."[20] Control, in this sense, conditions interaction rather than disciplines subjectivities. Control is furthermore always on different levels and can be considered twofold: "*it is both an apparatus that facilitates networks and a logic that governs how things are done within that apparatus.*" [emphasis in original].[21] There is, in other words, no cybernetic system where there is no control, but control varies from protocol to protocol and system to system.

There is a distinction that must be emphasized here: that between the system as a pre-existing system observed by the cybernetician, and the system designed by the cybernetician. The role of the cybernetician differs significantly between the two, and so does the definition of control. Architects for the most part design systems, or, at the very least, define and activate systems that were not considered systems prior to the architect's instigation. In the latter case, the architect still defines the premises of the system, the rules and extent of the system, as well as stabilizing it. I would argue that such a system be considered designed rather than pre-existing.

In these designed systems, the cybernetician designs the rules for interactions inside the system, which we, with Galloway, can call the protocols of the system. Once these conditions or protocols are in place, the cybernetician becomes included in the feedback loop and the self-generating capacity of the system as a participant. It is precisely here that

17. "It's no longer a question of removing the subject from the traditional exterior bonds, as the liberal hypothesis had intended, but of reconstructing the social bonds by depriving the subject of all substance. Each person was to become *a fleshless envelope*, the best possible conductor of social communication, the locus of an infinite feedback loop which is made *to have no nodes*." Tiqqun, "L'Hypothèse cybernétique," *Tiqqun* 2 (2001), 49. English translation uncredited.

18. von Foerster in Kline, 196.

19. Gordon Pask, "The Architectural Relevance of Cybernetics," *Architectural Design* (September 1969), 496.

20. Alexander R. Galloway and Eugene Thacker, *The Exploit: A Theory of Networks*, vol. 21, Electronic Mediations (Minneapolis: Minnesota University Press, 2007), 35.

21. Ibid., 29.

the social aspects of cybernetics become problematic, as the architect in effect occupies two positions within the system: acting as the catalyst/arbiter of the architect that defines the extent and protocols of the system; and, at the same time acting as a participant within this system that steers it according to the protocols, seemingly with no greater authority than other participants. The definition of the system is the level of control, the protocols of interaction make up the system's form (which is a topological form), and the system is consequently social and cannot exclusively be associated with modes of technological surveillance; this social level is both more elusive and more influential since the control of the system (as opposed to control within the system) becomes less visible and less comprehensible.[22] With this in mind, we turn to the cybernetic moment as it played out in architecture.

22. The social side of cybernetics, where the observer is invariably part of the system s/he observes, was central to second-order cybernetics. See Hugh Dubberly and Paul Pangaro, "How Cybernetics Connects Computing, Counterculture, and Design," in *Hippie Modernism: The Struggle for Utopia*, ed. Andrew Blauvelt (Minneapolis: Walker Art Center), 2015.

Cybernetics in Architecture

The influence of cybernetics in architecture during the second half of the 1960s was substantial. We can consider architects such as Buckminster Fuller to belong to the cybernetics club, as proposed by Jonathan Massey in a discussion on the cybernetic qualities of the US pavilion for Expo 67 in Montréal.[23] Other architects, such as Christopher Alexander, also discussed cybernetic principles, e.g. in "Systems Generating Systems," published in *Architectural Design* in 1968.[24] And, at MIT, Nicholas Negroponte developed his "Architecture Machines" in the second half of the 1960s. In the UK, there was Cedric Price, Joan Littlewood and Gordon Pask's Fun Palace, which although unbuilt exerted a great influence.[25] There are, in other words, multiple entry-points into the discussion of cybernetics in architecture, and if one adds the countercultural narrative to the cybernetics discourse, as Hugh Dubberly and Paul Pangaro do in their "How Cybernetics Connects Computing, Counterculture, and Design," we could readily expand the discussion on cybernetics in architecture much further.[26] I will here delineate the field sharply, and focus on two specific articles that address the role of the architect as system designer working with social systems, as a catalyst or arbiter: Gordon Pask's "The Architectural Relevance of Cybernetics" (1969) and Sean Wellesley-Miller's "Self-Organizing Environments" (1972).

23. Jonathan Massey, "Buckminster Fuller's Cybernetic Pastoral: The United States Pavilion at Expo 67," *The Journal of Architecture* 11, no. 4 (2006).

24. Christopher Alexander, "Systems Generating Systems," *Architectural Design* 12 (1968).

25. For a nuanced insight into the complexities of Fun Palace, see Mary Louise Lobsinger, "Cybernetic Theory and the Architecture of Performance: Cedric Price's Fun Palace," in *Anxious Modernisms: Experimentation in Postwar Architectural Culture*, ed. Sarah Williams Goldhagen and Réjean Legault (Montréal: Canadian Centre for Architecture/MIT Press, 2000), 119-39.

26. Dubberly, Hugh, and Paul Pangaro, "How Cybernetics Connects Computing, Counterculture, and Design," in *Hippie Modernism: The Struggle for Utopia*, ed. Andrew Blauvelt (Minneapolis: Walker Art Center, 2015).

27. Among texts discussing the relevance of cybernetics in architecture and Pask's legacy, we find: John Hamilton Frazer, "The Cybernetics of Architecture: A Tribute to the Contribution of Gordon Pask," *Kybernetes* 30, no. 5/6 (2001); Usman Haque, "The Architectural Relevance of Gordon Pask," *Architectural Design* 77, no. 4 (2007); Luciana Parisi, "Cybernetic Thought," in *Contagious Architecture: Computation, Aesthetics, and Space* (Cambridge: MIT Press, 2013); Andrew Pickering, "Ontological Theatre: Gordon Pask, Cybernetics and the Arts," *Cybernetics and Human Knowing* 14, no. 4 (2007), 43-57.

28. There have also been exhibitions dedicated to Pask after his passing, e.g., 'Pask Present' in Vienna in 2008, see http://paskpresent.com (accessed August 14, 2017).

29. Haque, "The Architectural Relevance of Gordon Pask," 54.

Gordon Pask

In terms of British cybernetics and architecture, Gordon Pask was – and, to some extent still remains – a central figure.[27] Pask's relevance is usually associated with the machines he constructed (e.g. MusiColour), perhaps most notably in exhibitions like "Cybernetic Serendipity" (ICA, London, 1968), "Evolutionary Architecture" (Architectural Association, London, 1995),[28] and through his notion of "conversation theory."[29] Pask

was also a continuing presence at the Architectural Association in London, running a project there called "Morphogenesis" until his death in 1996.[30] Pask belonged to what has above been introduced as "second-order" cybernetics, where the cybernetician is part of the system himself/herself, and took a specific interest in the architect as a system designer.[31]

Pask was continuously interested in architecture and authored one of relatively few cybernetic texts explicitly discussing the role of the (cybernetic) architect: "The Architectural Relevance of Cybernetics." Herein, Pask notes that architecture is similar to engineering, as both professional roles "prescribe artefacts," but that architects are "first and foremost system designers," and have become forced to "take an increasing interest in the organizational [..] system properties of development, communication and control." [32] Pask notes that one significant difference is that architects design artefacts that interact with humans, whereas the engineers design material configuration alone. The architect's role as a system designer, in other words, extends beyond the material and into the social realm. Here, control and protocols become central tenets of the systems designed by the architect. Pask writes:

> a building cannot be viewed simply in isolation. It is only meaningful as a human environment. It perpetually interacts with its inhabitants, on the one hand serving them and on the other hand controlling their behaviour. In other words structures make sense as parts of larger systems that include human components and the architect is primarily concerned with these larger systems; they, (not just the bricks and mortar parts) are what architects design. I shall dub this notion architectural 'mutualism' meaning mutualism between structures and men or societies.[33]

Pask goes on to note that this architectural mutualism "must be imaged as continually regulating its human inhabitants."[34] Pask's "mutualism" begins to become associated with self-governing systems, and ultimately, evolution. He is adamant that "architectural design should have rules for evolution built into them" and that "a responsible architect must be concerned with evolutionary properties; he cannot merely stand back and observe evolution as something that happens to his structures."[35]

Pask suggests that the architect's "aim is to provide a set of constraints that allow for certain, presumably desirable modes of evolution," and continues: "the architect determines what properties will be relevant in the man-environment dialogue."[36] Towards the end of the article, Pask notes how the architect's role shifts with a cybernetic approach: "design is control *of* control, i.e. the designer does much the same job as his system, but, he operates at a higher level in the organizational hierarchy."[37] Ultimately, Pask notes that the architect as controller is no longer authoritarian, but rather some form of benevolent mechanism in the background, "an odd mixture of a catalyst, crutch, memory and arbiter."[38] This is a role of the

30. Frazer, "The Cybernetics of Architecture," 641-42.

31. Parisi, *Contagious Architecture*, 197; Kline, *The Cybernetics Moment*, 236.

32. Pask, "The Architectural Relevance of Cybernetics," 494.

33. Ibid.

34. Ibid.

35. Ibid., 495.

36. Ibid., 496.

37. Ibid.

38. Ibid.

architect that is multifaceted and extends beyond the singular perspective of the architect as playing one role within the system designed.

Sean Wellesley-Miller

In a 1972 article in *Architectural Design* entitled "Self-Organizing Environments," the MIT professor Sean Wellesley-Miller argues for what he refers to as "tactical design" rather than "strategic design." Wellesley-Miller argues that design should be considered an "online system" – like a traffic system, adapting in real time to overcome obstacles – rather than an "offline system," where, for instance, improvements in manufacturing processes are calculated toward a stable optimization off-site. As the world is becoming increasingly complex, and with it the future, there is no need for strategies of the offline variety, since what we hold true now is by no means synonymous with what we will hold true a few years down the road. Design of the urban realm should consequently operate based on the information relevant there and then, rather than assume the task of solving the underlying problems.

In one passage, Wellesley-Miller suggests that a tactical design of a park would hypothetically amount to so much as: "we went to the site and scattered some seeds around, placed some saplings in pots at random and went home leaving the gate open." In this process, the job of the architect or designer would be to "stimulate, steer and stabilize the process."[39] The designer could make a path that enables prams to navigate the park, place a bench along the path, and possibly a telescope on the top of the hill, and so on. And should the process fail, he could introduce some stimulant to spur on the process according to different parameters. Wellesley-Miller is adamant that the designer is necessary. However, he emphasizes that: "In place of designing finished objects or structures, we design systems or environments in which structure becomes equipment and equipment is responsive to variable needs."[40] The design is, in other words, conceived of as a system, and the designer is a caretaker or pilot of this system, evening out some of its bumps and keeping the process in motion. In many ways, Wellesley-Miller has a way of prefiguring the passage from cybernetic design to participatory design very bluntly, while still emphasising the role of the architect within the process.

39. Sean Wollesley-Miller, "Self-Organizing Environments," *Architectural Design*, 5 (1972), 315.

40. Ibid., 316.

Part 2: Contemporary Cybernetics

At an unspecified moment in the 1970s, cybernetics as an identifiable discipline disappeared, the term fell out of fashion, and it vanished from sight. The question then is: where is cybernetics today? Everywhere, Tiqqun argue, but it is now disguised as a form of liberalism (neoliberalism). According to Tiqqun, neoliberalism is based on cybernetic principles and it is thus pointless to critique neoliberalism in relation to liberal values,

as neoliberalism is cybernetic rather than liberal at its core.[41] In turn, an implication of this is that critique of neoliberalism starting out from an equally cybernetic perspective – although ideologically oppositional – misses the point. To test Tiqqun's theory in the realm of architecture, we would have to establish a cybernetic non-absence both in architectural theory and practice that operates with an explicit neoliberal framework and in architectural theory and logic that explicitly critiques this framework. In this sense, we must establish two categories: architecture operating under the umbrella of "post-critical" architecture, which will here be considered neoliberal, and, in the other category, architecture defining itself as critical of the neoliberal hegemony in post-critical architecture.

41. Tiqqun, "L'Hypothèse cybernétique," 42.

Post-critical Architecture

Considering the close affinity between neoliberalism and post-critical architecture, and between neoliberalism and cybernetics, it is perhaps not surprising to find several overlaps that seemingly confirm a lasting influence of cybernetics in everything but name. The "theoretical" foundation for the post-critical or the projective is essentially an argument against theory as such.[42]

In a series of articles around the year 2000, Michael Speaks argued for the superiority of "design intelligence" over "theory;" he considered the latter redundant. Speaks considered design intelligence to be a feedback-based system whereby architects act in an unstable world according to the latest information available, adapting their actions to intelligence as it emerges. In his distinction between theory and intelligence, Speaks notes that:

> Philosophical, political, and scientific truth have fragmented into proliferating swarms of "little" truths appearing and disappearing so fast that ascertaining whether they are really true is impractical if not altogether impossible. No longer dictated by ideas or ideologies nor dependent on whether something is really true, everything now depends on credible intelligence, on whether something might be true.[43]

Theory, according to Speaks, has thus come to outlive its usefulness. All that remains is to respond (architecturally) to the intelligence constantly revealing little truths. The architect must inhabit this dynamic and complex system accordingly, or herself face redundancy. In this way, Speaks's argument seems to directly mirror Wellesley-Miller's argument some 30 years earlier concerning the need for tactical on-line architecture. The same justifications are presented: the speed with which the future approaches makes the question of truth irrelevant; all we can do is tactically manoeuver according to the information or intelligence visible to us at this particular instant. Speaks' argument also echoes Pask's

42. In this context, I consider Michael Speaks's and Somol & Whiting's articles as foundational texts; this is arguably an over-estimation of their importance. We can identify many other texts in the same vein, but the ones selected here can readily be considered representative of the architectural discussion in the early 2000s.

43. Michael Speaks, "Design Intelligence and the New Economy," *Architectural Record* 190, no. 1 (2002), 12.

notion of the architect as system designer, where "[d]esign problems were coped with as they cropped up,"[44] rather solved from the bird's eye-view of the strategist.[45]

Along parallel lines, architectural theorists Robert Somol and Sarah Whiting sought to replace the "indexical" of critical architecture with the "diagrammatic" in their 2002 article "Notes Around the Doppler Effect and Other Moods of Modernism." Such an architecture would, according to Somol & Whiting, be an architecture that "actually respects or reorganizes multiple economies, ecologies, information systems and social groups" rather than be "reflective, representational and narrative."[46] The diagram focuses on the organizational, privileging relations and their organization over anything else. The diagram defines relations within the system, protocols rather than a plan in the traditional architectural sense. The nodes in a diagram are here *agents* of one form or another, and these agents may be human, or not. Again, the affinities with Wellesley-Miller's tactical design are palpable; the architect operates as a design-expert in the context in which she finds herself, working with the tactical rather than the strategic. Pask, on the other hand, noted that architects are required to design "*dynamic* rather than *static* entities" with an emphasis on form rather than material.[47] Somol and Whiting argue in a parallel note that what they term "projective architecture" should be considered in terms of "design and its effects rather than a language of means and material."[48]

In the article "Big Forking Dilemma," architectural theorist Wes Jones distinguishes between two different kinds of practices, both of which consider architecture in terms of a system where the architect is not so much the authoritarian of form, but the instigator of a process generating architectural form.[49] Jones distinguishes between form-generating practices – including what is habitually referred to as parametric architecture – and program-generating practices – including the "Superdutch" movement/moment, as well as its acolytes.[50]

In form-generative practices, the parametric design process constitutes a system of its own, continuously morphing in response to feedback. In one way, these systems work well as long as they remain in the design, as diagram or as parametric design, but once they become buildings, they lose these system-like qualities to a more static reality. In this sense, they lose the dynamics characteristic of a system; one might possibly think of the built edifice as a representation of a system. Where we (architects) habitually consider the design process to work with representations of the built edifice, this is here reversed: the edifice then becomes a representation of the system in the design process. This does not hold true for all architecture, but there is perhaps a grain of truth in some instances of post-critical design. In program-generative practice, on the other hand, the form of a building is generated through a ("witty") programmatic gesture, which serves as the organizing protocol of the

44. Pask, "The Architectural Relevance of Cybernetics," 494.

45. It should be noted that both Wellesley-Miller and Pask consider modernism to be the exception in history, and both maintain that pre-modern architecture was for the most part, in Wellesley-Miller's term, on-line and tactical rather than off-line and strategic.

46. Robert Somol and Sarah Whiting, "Notes around the Doppler Effect and Other Moods of Modernism," *Perspecta* 33 (2002), 77.

47. Pask, "The Architectural Relevance of Cybernetics," 494.

48. Somol and Whiting, "Notes around the Doppler Effect," 75.

49. Wes Jones, "Big Forking Dilemma," *Harvard Design Magazine*, no. 32 (Spring/ Summer 2010).

50. See Tahl Kaminer, *Architecture, Crisis and Resuscitation: The Reproduction of Post-Fordism in Late-Twentieth-Century Architecture* (Oxon: Routledge, 2011), 159-164.

system then generated around this gesture. In both cases, the architect functions as the controller of the system rather than the author of form, working in a way that resembles first-order cybernetics.

Critical Spatial Praxis

If the broad category of post-critical practice primarily considers the design process as a system, another group of architects that can perhaps – again sloppily – be classified as "critical spatial praxis" takes a different approach, one more reminiscent of second-order cybernetics. I take the term "critical spatial praxis" from the introductory chapter of the 2011 *Spatial Agency: Other Ways of Doing Architecture*, edited by Nishat Awan, Tatjana Schneider and Jeremy Till. The book and the examples discussed in it have become increasingly influential in recent years, particularly within architecture education, and the authors suggest that the critical spatial praxis constitutes a different paradigm of practice.[51] Essentially, the authors posit their position as a way to critically engage with architecture rather than as a negation of post-critical practice.[52] There is however a clear tone in the introduction, juxtaposing their "paradigm" to neoliberal capitalism and "traditional architecture" that focuses on buildings as well as contrasting their approach to "traditional theory." The authors instead focus on architecture as the development of a system. They write: "Buildings and spaces are treated as part of a dynamic context of networks. The standard tools of aesthetics and making are insufficient to negotiate these networks on their own, and so the examples collated here use other priorities and ways of working as part of their toolkit."[53] The view on architecture echoes Pask's view of architecture as a dynamic system that evolves: "In other words, structures make sense as parts of larger systems that include human components and the architect is primarily concerned with these larger systems; they (not just the bricks and mortar part) are what architects design."[54] Similarly, the architect is a system designer who cultivates, rather than designs, a system.

The role of the architect in critical spatial praxis is of one who empowers others; the architect makes it possible for these others "to engage in their spatial environments in ways previously unknown or unavailable to them, opening up new freedoms and potentials as a result of reconfigured social space."[55] There are once again affinities here with Pask's view on architecture, where: "His [the architect] aim is to provide a set of constraints that allow for certain, presumably desirable, modes of evolution."[56]

One key term in critical spatial praxis is the notion of agency, borrowed from Anthony Giddens.[57] Following Giddens, Awan, Schneider & Till argue that agency can be considered in terms of an ability to act otherwise, of transforming a system; the agent is consequently one who initiates a transformative act.[58] Pask, on the other hand, maintained a second-order-cybernetics view on the cyberneticist (the architect) as first an instigator

51. "The work presented here ... [is] presenting a new paradigm as to how to operate – a paradigm that has thus far been largely written out of the standard histories of architecture." N. Awan, T. Schneider, and J. Till, *Spatial Agency: Other Ways of Doing Architecture* (Routledge Chapman & Hall, 2011), 27.

52. Ibid., 28.

53. Ibid.

54. Pask, "The Architectural Relevance of Cybernetics," 494.

55. Awan, Schneider, and Till, *Spatial Agency*, 32.

56. Pask, "The Architectural Relevance of Cybernetics," 496.

57. Anthony Giddens, *The Constitution of Society: Outline of the Theory of Structuration* (Cambridge: Polity Press, 1984); Awan, Schneider, and Till, *Spatial Agency*, 31.

58. Awan, Schneider, and Till, *Spatial Agency*, 31-32.

and later a part of the system as a whole, a system that is composed of a variety of agents that all affect the system according to their capability. Both Awan, Schneider, & Till and Pask view the architect as an agent within this larger system, and hold that the role of the architect in this contingent system is to move beyond hierarchies and open up for (self-governed) evolution to take place. This requires an interaction with the environment, and defines architecture as invariably contingent on external factors. Awan, Schneider & Till outline a "mutual knowledge," again from Giddens, where the architect is considered an "expert citizen" rather than a protected professional.[59] Mutual knowledge is considered the "defining feature of the agent's makeup."[60] Pask considers architecture to be contingent in relation to other systems:

> Once a rudimentary version of the functional/mutualistic hypothesis has been accepted, the integrity of any single system is questionable. Most human/structural systems rely upon other systems to which they are coupled via the human components. By hypothesis, there are organizational wholes which cannot be meaningfully dissected into parts.[61]

To Awan, Schneider & Till, the intent of the architect remains valid; critical spatial praxis, they argue, "starts with an open-ended evaluation of particular external conditions, out of which action arises with no predetermined outcome but with the intention to be transformative."[62] The system is too complex to contain any truths, predetermined ideologies are to be shunned and the process guides itself through the contingencies imposed on the system. Pask's take on the intent of the architect appears in some ways reminiscent, as shown below:

> An immediate practical consequence of the evolutionary point of view is that architectural designs should have rules for evolution built into them if their growth is to be healthy rather than cancerous. In other words, responsible architect must be concerned with evolutionary properties; he cannot merely stand back and observe evolution as something that happens to his structures.[63]

In Pask's view, the intent of the architect is to enable a system to auto-evolve, where the architect is no longer the power of control, but rather the agent who makes the evolution possible by determining the system and situating it in relation to other systems. He notes that: "In all of the cases so far considered the primary decisions are systemic in character, i.e. they amount to the delineation or the modification of a control program. This universality is typical of the cybernetic approach."[64] Awan, Schneider & Till would not use that precise terminology, and while they emphasise the importance of the political – all architecture is political – and have a short discussion on the subject of power relations. In it, they recast the architect as an agent within a system who catalyses and enables without elaborating further on what kind of control (in the sense

59. Ibid., 32.

60. Ibid.

61. Pask, "The Architectural Relevance of Cybernetics," 494.

62. Awan, Schneider, and Till, *Spatial Agency*, 29.

63. Pask, "The Architectural Relevance of Cybernetics," 495.

64. Ibid., 496.

discussed above, through establishing protocols that define the system) the architect wields, and how this makes the empowering agent an agent with a somewhat different power to act than the others. However, it is precisely in the realm of the political that their approach and its cybernetic legacy can be considered problematic.

Conclusions

The echoes of cybernetics are in other words multiple, in post-critical architecture as well as critical spatial praxis. What we could hesitantly call a cybernetic ideology is not-absent in architecture that finds itself liaised with neoliberalism as well as architecture in opposition to this dominant order. This omnipresence would, at least provisionally, attest to a certain validity of Tiqqun's cybernetic hypothesis, and appears as something that merits further discussion and research.

Architecture is habitually considered as a system; in all the examples above it is either the design process or the architectural assemblage itself that has systemic characters and evolves over time. A system can here be understood as "an aggregation of things brought together to form a complex whole."[65] The systems envisioned, both in cybernetics and in contemporary architectural practice, are basically of a network model; i.e., understood in terms of nodes and links; communication between nodes passes through the links. In both "post-critical" architecture and critical spatial praxis, the feedback loop plays an important role – it is feedback that permits the design or the system to evolve and become generated rather than authored, that is, the architect authors the parameters or protocols according to which the system evolves.

65. Galloway, "The Cybernetic Hypothesis," 113.

In terms of post-critical practice, the system in question appears to be limited to the design process in many cases, whereas in critical spatial praxis, it is the protocols that define the system that is defined and subsequently co-evolved with participants whose agency is *within* the parameters of the system-defining protocol. In both post-critical architecture and critical spatial praxis, the generated system is contingent on external factors; this is what makes each project unique, and incidentally also what lends a certain democratic legitimacy to the project in terms of critical spatial praxis.

Agency within these systems is often emphasized within critical spatial praxis, and this is also one of the areas where one may have certain objections to this form of practicing architecture. One of the key tenets in cybernetics is to consider the world in terms of agents that affect the operations of a system, and agents are thus included in analysis regardless of their relative power. As Galloway reminds us, "while agents may be wildly different in their relative size and power, each agent is endowed with the power of local decision according to the variables and functions

within its own local scope."[66] Galloway notes, with reference to an aircraft and a pilot as a system, that "while the pilot and the instruments are not equal in power or type, they interoperate as equal peers to the extent that each may accommodate inputs and outputs and each may influence the outcome of the overall system."[67] Such a conception of agency appears similar to how critical spatial praxis focuses on the agent (as distinguished from the architect). Critical spatial praxis does not recognize figures of authority within the system. The architect, for example, is recast as an "expert citizen," an agent who is a citizen, but at the same time an expert. This double nature, where the architect is on the one hand equal to every other participant, and on the other hand an expert with specific authority in these matters, arguably obscures the power invested in those who instigate and define the protocols, i.e., the architect.

66. Ibid., 114.

67. Ibid.

One could readily argue that critical spatial praxis is a form of *prefigurative politics*, i.e., based on an embodied ideology enacted through the system itself. The act of evolving the system is both political means and ends in one, meaning that the system replaces politics to an extent.[68] The focus in prefigurative politics is on the decision-making process, which simultaneously functions as means and ends; it is what it does, an ideology enacted rather than something to be implemented after victory.[69] If we view critical spatial praxis as a form of prefigurative political architecture, the system is both the tool employed to enact change and representative of the change intended to be enacted. As it is both means and ends, we must keep track of the system itself, and particularly the power relations within the system, which become very difficult to perceive. The double role of the architect and the double protocols of the system: the system-defining protocols defined by the architect and the protocols defined *within* this system by participants – become an enactment of a form of politics that presupposes the system. Or, more precisely, the system is politics – politics of a specific kind however: a cybernetic politics. And one could be inclined to agree with Tiqqun, who argue that in terms of politics: "Nous ne voulons pas plus de transparence ou plus de démocratie. Il y en a bien assez. Nous voulons au contraire plus d'opacité et plus d'intensité."[70] Cybernetics has, as mentioned, a tendency to render power relations invisible, power is no longer anywhere special, but this does not mean it is absent, only that it is in the *framing* of the system rather than the active enforcement of discipline within the system. What Tiqqun argue is that power should be made visible. It is in the very act of establishing the protocols for interaction that the enactment of ideology that is critical spatial praxis becomes a *re*-enactment of cybernetic ideology, rather than an effective resistance to neoliberal ideology.

68. See Awan, Schneider, and Till, *Spatial Agency*, 55.

69. Prefigurative politics dates back further however, and one can readily consider the counter-culture movement of the late 1960s and the early 1970s as prefigurative politics in their own right.

70. "We do not want more transparency or more democracy. There's already enough. On the contrary—we want more opacity and more intensity." Tiqqun, "L'Hypothèse cybernétique," 61.

It would appear that Tiqqun's "L'Hypothèse cybernetique" is worth keeping in mind as we continue to struggle with the possibility of an ethical role and civic responsibility/mandate of the architect. Cybernetics presented a worldview which has permeated many perspectives on the

world, perhaps also including architecture. Opposing the doxa that is the cybernetic hypothesis is difficult as we are situated within it, rather than occupying an outside position. However, a greater awareness of the presence and pretense of the cybernetic hypothesis enables thinking against the cybernetic system, and perhaps beginning to work with noise rather than assuming that the cybernetic ideology of control is somehow emancipatory.[71]

71. Tiqqun, "L'Hypothèse cybernétique," 69-72. Tiqqun's recipe for resisting the cybernetic hypothesis: panic as the constructive antidote to cybernetic risk-management. All revolt, they argue, must be based on noise in the feedback loops. Criticality is then not the positive adaptation of cybernetic logic and the attempt to use it for other purposes – such an act will merely reinforce and naturalize the hypothesis further – but instead through the very act of going against the cybernetic system itself, producing what cybernetics has attempted to eliminate all along: noise.

Between Science Fiction and Social Sciences: The "Dark Side" of American Cities[1]

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ABSTRACT

From the Metropolis of Fritz Lang to the city-planet of Coruscant, capital of the Star Wars galaxy, the city of the future (or of another universe) seems designed to reflect the "dark side" of our contemporary megalopolis which suffer problems presented as insurmountable: traffic jams, contamination, environmental degradation, ethnic conflicts, deficient public services, rising social and spatial disparities, daily violence… In order to develop this imaginary geography of fear, Latin American cities are often a source of inspiration for science fiction authors because they seem to them simultaneously weird and well-known, old and modern, welcoming and dangerous.

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science fiction, social sciences, imaginary cities, american cities, geography of fear

Introduction: Urban Imagery and Imaginary Cities

From Fritz Lang's *Metropolis* to *Coruscant*, the city-planet devised by George Lucas as the capital of the *Star Wars* galaxy, the cities of the future or set in a distant world seem only to reflect the "dark side" of a contemporary megalopolis. These cities are up against a seemingly unsurmountable series of problems and failings, with a list of difficulties that include traffic congestion, pollution, degradation of the natural environment, inadequacy of urban services, increase in social divide and spatial inequality, ethnic conflict, violence on a daily scale and so on.

Mexico City in the 1980s focused the attention of academics, journalists and novelists on this topic. In 1986, one year after the earthquake that flattened the Mexican capital's historical centre, the French review ***Autrement*** provocatively described Mexico City as being "between hope and damnation". In 1987, Miguel Messmacher published a study on Mexico that shone light on a dysfunctional and essentially ungovernable urban sprawl.[2] In the following year, Claude Bataillon and Louis Panabière exposed the problems faced by "the largest city in the world" to ensure the necessary housing, organize employment and manage the travel arrangements of its 20 million inhabitants.[3] Along similar lines, North-American researchers contributed extensively towards exposing the imminent disasters threatening their hapless Southern neighbours and, through their writings, stoked the imagination of science fiction writers.[4]

Particularly evocative neologisms have been invented to describe Mexico City in all its fame (or rather infamy), which can also be applied aptly to the capital of the *Star Wars* galaxy. According to François Thomas, the Latin-American megalopolis has become the prototype of a "monsteropolis", a city overpowered by all the evils of modern society, "overpopulation, slums and shantytowns, under-employment, informal working practices and poverty, abandoned children, delinquency and organized crime, ecological pollution and disasters, and so forth".[5] In his remarkable *History of Mexico City*, Serge Gruzinski placed the life of current-day inhabitants of the ancient Tenochtitlan under the banner of a "daily Apocalypse".[6]

Clearly, it is no coincidence that the action of the famous science fiction film *Total Recall* begins in a not wholly invented futuristic city. When Arnold Schwarzenegger emerges from the city's subway system, chased by his enemies, a knowing viewer will note that the scene chosen by Paul Verhoeven as the backdrop to his subject matter is the Metropolitan Insurgentes station at the centre of the Mexican metropolis [Fig. 1]. The objective, according to the director, was to present a particularly oppressive world, out of human scale. Mexico City's underground metro system was built in a style inspired by the New Brutalist movement that had originated in Britain the 1950s and was first given this name by Alison Margaret and Peter Smithson. It matched Verhoeven's intentions perfectly

1. The translation presented here is the work of the author and has been professionally revised. This article was initially published "Entre la ciencia ficción y las ciencias sociales: el 'lado oscuro' de las ciudades americanas", EURE XXXIII, no. 99 (August 2007): 65-78.

2. Miguel Messmacher, *Mexico: Megalopolis* (Mexico: Secretaría de Educación Pública, 1987).

3. Claude Bataillon and Louis Panabière, *Mexico aujourd'hui, la plus grande ville du monde* (Paris: Publisud, 1988).

4. Jonathan Kendell, *La Capital. The Biography of Mexico City* (New York: Random House, 1988).

5. François Thomas, "Villes d'Amérique latine: plus grandes que leurs problèmes?", *Revue de géographie de Lyon* 74, no. 4 (1999): 283-289 (all English texts quoted from non-English sources have been translated by the author and revised by a professional translator).

6. Serge Gruzinski, *Histoire de Mexico* (Paris: Fayard, 1996), 390.

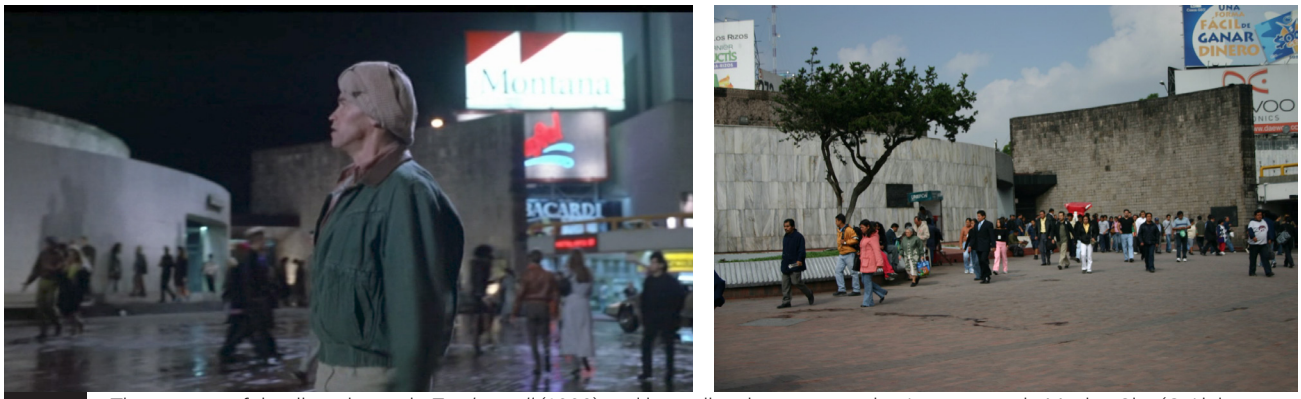

FIG. 1 The scenery of the distopic movie *Total Recall* (1990) and its reality: the metro station Insurgentes in Mexico City (© Alain Musset, 2005).

because, as he explained, they found another style called New Brutalism, and this very heavy, mainly concrete architecture gave the film its strongly defined style and production design[7] The production team only had to repaint all the corridors, walls and train carriages in metallic grey to create the illusion of an imaginary metropolis when it was in reality an actual city. It is then only a matter of a few steps to go from Mexico City to Coruscant via the planet Mars...

Latin-American cities are often the inspiration for writers of science fiction when building this imaginary landscape of fear and seclusion, because they are at the same time both strange and foreign, old and new, hospitable and dangerous. In his novel of 2000, *Mantra*, Rodrigo Fresán recalls that, in 1953 and 1954, FBI inspectors had approached Philip K. Dick and his wife offering to pay for them to study for one year at the University of Mexico, UNAM, in exchange for information on the most politically active student groups. Fresán stresses that the future author of *Blade Runner* (originally entitled *Do Androids Dream of Electric Sheep?*) had refused this "generous" offer, imagining however that, plunged into the hallucinating universe of the new Tenochtitlan, he could have written three or four science-fiction novels a month.[8]

In this work, we propose to explore the close connection between the representations[9] or portrayal of Latin-American cities and the reality of imaginary cities, in a geo-fictional study based on decoding the virtual mirrors that, consciously or not, reflect two parallel urban worlds and influence how we perceive them. At the core of our thought-process is to examine how our perception of the city is influenced both by science fiction and by studies on urban sociology and social geography, as well as through the daily experience of areas that are lived in less and less yet receive more and more media attention. As a first step, we will look at how the virtual towns of science fiction draw upon Latin-American cities and the pre-Columbian world (*Aztec Pyramids and Cities of Tomorrow*), then we will examine how workers of today are transported to universes that may appear very distant but which are merely a deformed image of reality (*Galactic Maquiladoras*). In the final chapter covering the city and its dangers, we will see how science fiction exposes the real or imaginary

7. Interview with Paul Verhoeven, *Total Recall*, Studio Canal - Universal, 2003, disc 2. The New Brutalism evoked by Verhoeven is inspired mainly by the work of Le Corbusier and in particular his Unité d'Habitation of Marseilles. Its hour of glory came in 1960 to 1970, with architects such as Paul Rudolf (United States) and Kenzo Tange (Japan). One of the best examples in France of this style marked by massive forms and right angles is the National Employment Agency (BCMO) of Dunkirk by J-P. Secq and inaugurated in 1971.

8. Rodrigo Fresán, *Mantra* (Albi: Les éditions du passage du Nord-Ouest, 2006), 198.

9. Here we use the term "representation" within the framework of "geography of representations" defined by André Bailly: "The study of space representations thus questions us about the methods for understanding the world and the status of reality, i.e. the problem of adequacy between reality, what we perceive and our speeches about reality". André Bailly, *Encyclopédie de géographie* (Paris: Économica, 1995), 372.

failings that threaten the existence of our metropoles as a political object and reduce them to territories dominated by fear.

1. Aztec Pyramids and Cities of Tomorrow

In the wide universe of science fiction, the city-planet of Coruscant (in *Star Wars*) is most probably the best and most thoroughly described urban world. This is mainly because, as well as being the setting for three films directed by George Lucas (*The Phantom Menace*, *Attack of the Clones* and *Revenge of the Sith*), it is also used in many novels, comic strips, electronic and role-playing games where the heroes all are emanations of the original saga.[10] Coruscant, the capital of the Star Wars' Republic, and subsequently that of the galactic Empire, is at the same time a model and a foil where the landscapes and social structures are inspired not merely by the gigantic cities along the Atlantic coast of the United States of America but also by the large metropolises of Latin-America, Mexico City, Lima, São Paulo... with more than a nod to the frontier cities of northern Mexico and the shantytowns of Caracas and Rio de Janeiro.

10. Alain Musset, *De New York à Coruscant, essai de géo-fiction* (Paris: PUF, 2005).

At a first glance, Coruscant, strikes us with its forest of high-rise buildings extending as far as the eye can see in an extraordinary urban sprawl to a never-ending skyline: "They sat at a table in a balcony cafe three kilometres above the surface of the planet Coruscant, the world that was a city without end. Just beyond the balcony rail was a vista made up of skyscrapers extending to the horizon, an orange sky threatening rain, and the sun setting beyond one of the more distant thunderheads"[11] If we needed to find an equivalent example or model for this imaginary world with its distinctive vertical architecture, the first port of call would undoubtedly be São Paulo, the economic capital of Brazil, with its panorama of skyscrapers stretching across three hundred and sixty degrees into the far distance. From the top of the Edificio Italia, the view is of a vast ocean of buildings, often with dozens of storeys, which mask the lower parts of the city, so that the regular pattern of streets and avenues disappears and the urban landscape is transformed into a labyrinth like that of Coruscant.

11. Aaron Allston, *Les chasseurs stellaires d'Adumar* (Paris: Fleuve noir, 2003), 13.

Regarded as one of the greatest built-up areas in the world, the metropolitan area of São Paulo is home to "only" 18 million residents (according to the census taken in 2000), a mere nothing compared to the one trillion inhabitants of the galactic capital. Since the mid-20th century, the processes by which the ancient Jesuit mission of 1554 is morphing into an urban sprawl curiously reflect those described and expounded by the *Star Wars* authors. Moreover, the comparison does not stop there. After New York, São Paulo is thought to have the largest park of helicopters in the world, proving fast and safe transport to the local elite, not keen to venture into the permanently traffic-bound streets of city with record-smashing criminal levels. Above the city, a kind of air ballet is

performed in the sky, which can certainly match the spectacle of the *airspeeders* revolving between the towers of Coruscant. In the city centre, the most recent buildings have private heliports, allowing a few rich and privileged to become totally disconnected from the city in which they live, travelling from one gated location to another (home, work, leisure) without ever using the public areas that are thus abandoned to the common people. In 1930, when he wrote about the skyscrapers of New York, Paul Morand predicted that a new revolution in transport was soon to transform our way of life: "Roofless, crowned with terraces, they seem to be awaiting the rigid balloons, the helicopters, the winged men of the future."[12]

12. Paul Morand, *New York* (Paris: Flammarion, 1930), 36.

In evolving, post-modern societies are engendering a loss of communal meeting spaces, the streets, parks and squares, a fact that drives the *Star Wars* authors to establish a close connection between a city's morphology and the forms of sociability supported or precluded by it, between the urban landscapes and the political thought which they represent, reproduce and perpetuate. The reaction of those newly arriving on the planet highlights the ambivalence of their feelings, as they stand in awe of an outsized city, beyond human scale: "Once out of the turbolift, Bria looked around her in wonder and growing claustrophobia. Everywhere buildings loomed over her, so high she had to crane her neck to see their tops."[13] The behaviour of the young Bria on first arriving on Coruscant recalls that of the Europeans who discovered North-American urban civilization in the early part of the 20th century, with its bold architectural innovation and both marvellous and menacing features. In 1930, George Duhamel exclaimed that he was disgusted by the urban landscape of Chicago ("Chicago! The tumour city! The cancer city!"), with its over-sized buildings, streets that reminded him of trenches cut into a mass of steel and concrete and its glut of stinking cars.[14]

13. A.C. Crispin, *The Paradise snare* (Paris-New York: Bantam Books, 1997), 265.

14. Georges Duhamel, *Scènes de la vie future* (Paris: Mille et une nuits, 2003; Paris: Mercure de France, 1930), 72. Citations refer to Mille et une nuits edition.

As can be seen in the films belonging to the second *Star Wars* trilogy, the buildings on Coruscant are constructed in a wide range of structures, forms and facades, giving the city a highly varied and cosmopolitan character. In order to accentuate this exotic impression, which drives the audience towards strange worlds without losing their roots entirely, the authors of the saga use a contrivance that has been known for a long time, that of alluding to architectural models whose names have entered common language but which are loosely identified in order to authorize all manner of interpretation, or any urban daydream. This technique was used by Michael Reaves in *The Shadow Hunter*: "Practically all of Coruscant's landmass – which comprised almost all of its surface area, its oceans and seas having been drained or rerouted through huge subterranean caverns more than a thousand generations ago – was covered with a multitiered metropolis composed of towers, monads, ziggurats, palazzi, domes, and minarets."[15] By using terms like "palazzi", "ziggurats" and "minarets", the extra-terrestrial architecture of Coruscant is linked to major civilizations

15. Michael Reaves, *Darth Maul: Shadow Hunter* (London: Arrow Books, 2001), 16.

which are very distant, in time and space, from North-American people. While a "palazzo" evokes the Italian Renaissance and a "minaret" the old and contemporary Muslim world, the "ziggurat" takes us back to the dawn of civilization and recall the most ancient towns in the world. The famous terraced step pyramids of Mesopotamia symbolizes the first cities built by humans. The place they occupy in our imagination is all the more important in that they inspired the mythical Tower of Babel, of which Coruscant is, apparently, the ultimate expression.

FIG. 2 The skycrapers of Manhattan from the top-terrace of the Empire State Building (© Alain Musset, 2011).

Drawing his inspiration from the same vein, Paul Morand did not hesitate to identify pre-Columbian pyramids among the profusion of disparate buildings that form the urban landscape of New York: "Skyscrapers! Some are women and others are men; some are like sun-temples, others recall the Aztec pyramid of the Moon."[16] [Fig. 2] In the same way, in *Blade Runner,* the future urban landscape of Los Angeles is dominated by a gigantic construction which is used as a refuge by Tyrell, the most powerful man in the city; this imposing building is simply an architectural extrapolation of the pyramid of the Sun in Teotihuacan. The new Jedi temple built on the planet Ossus after the Yuuzhan Vong War[17] is clearly inspired by Maya architecture, as the artist of the comic strip *Legacy* acknowledges: "For the Jedi temple, I wanted to evoke an ancient Mayan temple, but with landing platforms. I also added zones covered with transparent steel reflecting the sky and the surroundings. I believe that the Jedi planted a meditation garden down there."[18]

The stylistic devices used by science fiction writers to anchor their imaginary cities in reality are not very different from those used by 16th century explorers and conquerors in their own stories. Under many aspects, the discovery of the New World was as big a shock for the Europeans at that time as the discovery of a new inhabited planet would be for us. The accounts by the conquistadors appeared so extraordinary that they often raised doubts and mocking remarks on the part of some, while engendering admiration and respect in others. Bernal Díaz del Castillo acknowledges in his memoires that, for a long time, he could not believe what he was seeing with his own eyes, thinking that he had been transported into one of these tales of chivalry where the marvellous always beats reality.[19]

16. Morand, *New York*, 36.

17. This new galactic war is reported in the cycle of the New Jedi Order. It is held 25 years after year 0 of the *Star Wars* chronology, marked by the destruction of first Death Star (*A New Hope*, 1977).

18. *Lucasfilm Magazine*, no. 62 (November-December 2006): 17. It is clear that in episode IV (*A New Hope*, 1977), the rebel base of Yavin 4 is none other than the Mayan city of Tikal (Guatemala).

19. Bernal Díaz del Castillo, *Historia verdadera de la conquista de Nueva España* (Mexico: Porrúa, "Sepan Cuantos", no. 5, 1983), 159.

In trying to explain the Amerindian cities in an intelligible manner to the Spanish king, Cortés used the same stylistic device as the authors of the Star Wars saga, converting the Aztec pyramids into mosques and the temple towers into minarets. In his second letter to Charles V, he thus evoked the town of Churultecal: "I can confirm to your Highness that, from the top of a mosque, I counted more than 430 towers in this city, all of which belong to mosques."[20] Equally, the first large town discovered by the Spaniards on the coasts of Yucatán was renamed "The Great Cairo" in an attempt to convey its size and richness to those who had never left the Hispanic peninsula. By making such a reference to a familiar civilization, to a known culture in a foreign context means placing a seal of authenticity on descriptions that, without these carefully chosen phrases, could appear highly fanciful.

20. Hernán Cortés, *Cartas de Relación, Segunda Carta* (30 October 1520) (Mexico: Porrúa, "Sepan Cuantos", no. 7, 1983), 45. A little further on, Cortés stresses that Mexico City has "many mosques". Cortés, *Cartas de Relación, Segunda Carta*, 64.

2. Galactic *Maquiladoras*

In describing the global city of Coruscant, the writers of the *Star Wars* saga are not happy with simply portraying a futuristic megalopolis where the urban landscape is dominated by extraordinary buildings, the symbol of a dominant civilization; they clearly wish to expose the operational mechanism of a society which no longer needs any tangible output to affirm its power, in fact, quite the contrary. Despite being a simple extrapolation of an evolution in progress, albeit pushed to the extreme, the fictional city-planet of Trantor described by Asimov in the early 1950s had already perfectly met the standards for a global city defined later on by Saskia Sassen[21], who wrote that the planet had only one function, the administration; one goal, the government and that it produced one manufactured asset, the law.[22] In a similar fashion, the *Star Wars* Coruscant is first and foremost a political centre that is continuously producing the legislative arsenal and legal framework that can effectively manage a global world. Like all global cities, the imperial capital bases its economic prosperity and its political power on services of a high standard. Apart from constructing the plants to generate energy and reprocess urban waste, there are only a few production hubs, such as the shipyards for repairing interstellar vessels[23] and several factories which, for strategic reasons, had not been relocated to peripheral planets.

21. As emphasized by Saskia Sassen, the global city is not only a pole of strategic decision-making: it is also a place where immaterial goods are produced, above all the services intended for multinational corporations, in a series of fields as varied as insurance, law, accountancy, tax, publicity and public relations. In addition, they are shaped by new political, technical and financial instruments that allow "good global governance" to be put in place. In combination, these two sectors form the heart of the "new urban economy". Saskia Sassen, *The Global City: New York London Tokyo* (Princeton: Princeton University Press, 1991).

22. Isaac Asimov, *Le cycle de Fondation II. Vers un nouvel Empire* (Paris: Omnibus, 1999), 63.

23. Aaron Allston, *Aux commandes: Yan Solo!* (Paris: Fleuve noir, 2000), 15.

In an economic system inspired by our current international division of labour, some workshops-planets with specialized functions fuel the principal consumer markets in the galaxy, i.e. the worlds unable to provide for their own needs. As in any liberal economy, the best way for *Star Wars* businessmen to reduce costs while increasing profit is to relocate production facilities to zones with good relative benefits, including qualified and cheap labour, a favourable local legislation, excellent transport systems... On this point, James Luceno explains why there is no industrial sector on Coruscant: "The Works had been a booming manufacturing

area until escalating costs had driven the production of spacecraft parts, labor droids, and construction material offworld."[24] The planet Kuat belongs to the system that benefitted from this process of globalization for exchanges across the entire galaxy. Under the Old Republic and at the instigation of the reigning families, Kuat became a gigantic production pole for interstellar vehicles. Gathering together a workforce of several million individuals in factories located in the planet's orbit, the Kuat Drive Yards were shipyards specialized in manufacturing very large units for the military sector in particular (imperial class stellar destroyers). In the same way, Bilbringi became the most important centre for the production of hunters and destroyers for the Empire, due to its highly advanced industrial facilities gathered within well-defended production units ("X-7 Factory Stations").

24. James Luceno, *Labyrinth of Evil* (New York: Ballantine Books, 2005), 174.

In order to restrict any manufacturing trouble (noise, congestion, pollution...), the most substantial operations were installed on planets where the ecosystem then suffered from the consequences of devastating industrial development. The Fondor system, for instance, was totally upturned by the shipbuilding workshops that exploited the abundance of minerals extracted from its subsoil, moons and asteroids: "But where the colossal corporations that dominated Bilbringi, *Kuat, Sluis Van*, and other shipbuilding centres made a pretence of picking up after themselves, no such efforts had ever been made at Fondor."[25] And again, uncontrolled industrial exploitation converted the planet Duro into a vast desert whose inhabitants fled to orbital cities. Experiments to clean marshes, purify grounds and make the air breathable only gave limited results because of the lack of technical and financial means. This is the reason why the princess Leia, who was sent to orchestrate the regeneration of the planet, was transformed into the spokesperson for North-American environmental lobbyists. On the dead planet of Duro, she was permanently up against the Republic's central administration, which refuses to grant the necessary means to set up this vital programme.

25. Id., *L'éclipse des Jedi* (Paris: Fleuve noir, 2001), 268.

In the imagination of North-American readers, the situation on Fondor or Duro is based on some level of reality (although mainly of a phantasmagorical kind). When describing the prevailing economic system in the *Star Wars* galaxy, the saga authors largely drew their inspiration from the international division of labour which has predominated on both sides of the US/Mexico border since the mid-1960s, as a result of a type of industry known as "maquiladora" **[Fig. 3]**. North of the border, the administrative and management functions are grouped together in one establishment (this is the role reserved for Coruscant). South of the border (the geopolitical and economic equivalent of Fondor), the assembly factories are restricted to the role of production facilities focused on manual work, while exploiting significantly more advantageous legislation than in the United States. Indeed, from a survey carried out by the prestigious Mexican institute of higher education, El Colegio de la Frontera

Norte, in the early 1990s, 10% of the companies operating in the frontier zone acknowledged that they had been attracted there by the more flexible Mexican environmental legislation. More than a quarter of the *maquiladora* factories regarded this part of the legislation as the main reason for them setting up their operations south of the international border. [26]

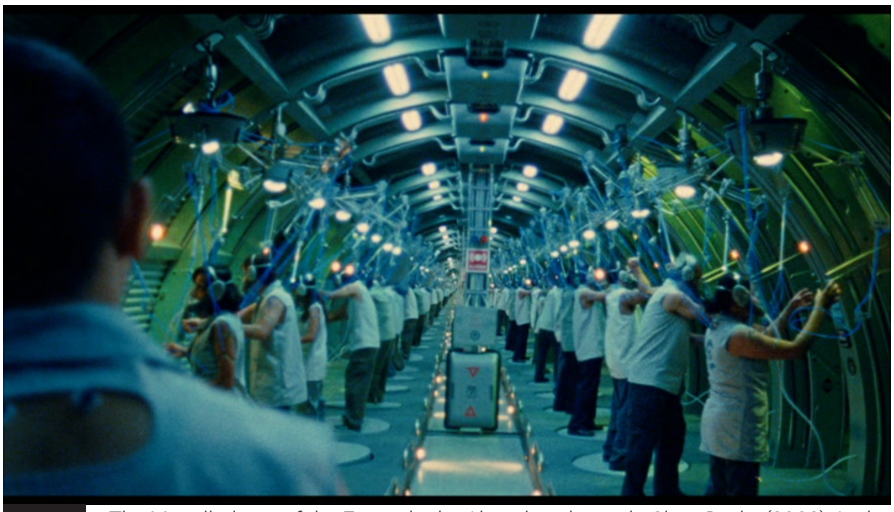

FIG. 3 The Maquiladoras of the Future in the Alex Rivera's movie *Sleep Dealer* (2008). In the city of Tijuana workers are connected to their job on the other side of the border. As says the boss to the new recruits: "The United States are given everything they have always wanted: the workforce without the workers".

In reality, the same arguments are put forward in the *Star Wars* novels to explain why the most polluting industries are located on planets far from Coruscant: removal and distance are, in this way, presented as a good solution in a society marred by the NIMBY (Not In My Backyard) syndrome. In *Rebirth,* a novel in the New Jedi Order cycle, the New Republic pilots gather together on the planet Eriadu and are immediately greeted by a repulsive atmosphere, with dollops of ammonia, ozone, sulphur and hydrocarbon vapour. The urban landscape is bristling with immense industrial skyscrapers that cut out the pale yellow sky, darkened by factory smoke. The explanation of this ecological disaster is provided by Corran Horn, who heads the group deployed to fight the invading Yuuzhan Vong. According to him, international companies are producing manufactured goods at lower cost, without taking any notice of the environment. This means that the smell is merely a by-product of industry.[27] It is easy to understand why this environmental issue matters so much in a "remote galaxy" seeing that reflects all the concerns of North-American society. For somebody living in Austin (Texas) or Phoenix (Arizona), the planets Fondor and Duro are not located many light years away from their homes, but are close at hand and are called Matamoros (Tamaulipas) and Nogales (Sonora). Kathy Tyers, author of the apocalyptic descriptions of the planet Duro, comes from Long Beach, California, a state sharing a frontier with Mexico, and the writer Michael Reaves, who began his career in *Star Wars*, was born in San Bernardino, 40 km west of Los Angeles. Even James Luceno, a former carpenter, admits he often goes to the other side of the border to draw his inspiration from there. [28]

More worryingly for the *Star Wars* authors is the fact that millions of workers are looking for distraction after a long and hard working day, which led to the construction of many pleasure stores that tarnished the entire planet, transforming it into a kind of poor Las Vegas. The destruction of the natural environment is therefore coupled with a real moral problem – a particularly thorny issue for North-American writers often troubled by ethical and religious concerns. Kathy Tyers, the author of *Balance Point*,

26. Although the capital of the maquiladora industry is Ciudad Juárez (217,000 employees and 291 factories in 2005), Baja California also occupies a crucial place in this system, as Tijuana, Mexicali and Tecate are among the Mexican cities with most factories located in their territory (574, 135 and 115, respectively).

27. Greg Keyes, *Renaissance* (Paris: Fleuve noir, 2002), 101.

28. See http://www.starwarschicks.com/books/Books/authors/luceno.html (accessed December 21, 2017).

is a member of the Christian Writers Guild and regularly talks at public conferences on religious topics. Correspondingly, on the Mexican side of the border, many establishments are engaged in more or less legitimate leisure activities, the bars, casinos, hotels used by prostitutes that encourage the image of a country populated by prostitutes and gangsters. This tradition dates back to the time of the prohibition and puritan leagues, when alcohol-deprived *gringos* went to Ciudad-Juárez or Tijuana to drink their whisky in safety. This dark episode in American history was often used as the framework for science fiction, and the evil-looking night clubs of Fondor can easily be seen as the cantinas of Mexicali or Nuevo Laredo transported to the planet under another guise.

3. The City and its Dangers

In North-American science fiction, hyper-concentration of industrial and commercial operations, excessive population density and the loss of the privileged link established from time immemorial between man and nature are placed in opposition to the ideology that has roots dating back to the 19th century and is found in the naturalist novels of H. J Thoreau[29] and the poems and essays of Ralph W Emerson.[30] This negative vision of the urban world is not restricted to a North-American setting, as Joelle Solomon Cavin pointed out in her book La ville, mal aimée, describing how for a long time western society scorned the great built-up cities, preferring an idealized rural way of life and honouring the sturdy countryside dwellers.[31] By insisting on the extent and diversity of the problems encountered when managing the galactic capital, the *Star Wars* authors only spread pessimistic speeches about the future of our own cities. The step from a megalopolis to a "monsteropolis" is quite easy to take, especially when reality is on the shirt-tails of science fiction.

In Coruscant, as in the real cities that are its model, traffic saturation causes an exponential increase in air pollution: "Traffic clogged the Coruscant sky, flowing slowly about the meandering smoggy haze."[32] By presenting an identical situation, Claude Bataillon and Louis Panabière chose to rename the Mexican capital calling it "Smogopolis", perpetually wrapped in a yellowish cloud that blocked out the nearby mountains. According to studies carried out in the early 1980s, air pollution had then reached the point of no return, with factory smoke causing physical and mental health issues for the weakest and most exposed. "Every day at 7 a.m., 12 noon and midnight, the soap and dogfood factories release pollutant gases that have disturbing effects on the head and stomach and which cause hair to fall out".[33] For William Sandell, the production director for *Total Recall* (produced at Churubusco Studios in 1989), living in this city replete with escaped gases and factory smoke was like living in the world capital of pollution. According to him, breathing the air of Mexico City was like smoking forty cigarettes a day.[34]

29. Henry David Thoreau, *Walden*, ed. J. Lyndon Shanley, introduction by John Updike (Princeton: Princeton University Press, 2004).

30. *The Essential Writings of Ralph Waldo Emerson*, introduction by Mary Oliver (New York: The Modern Library Classics, 2000).

31. Joëlle Salomon Cavin, *La ville, mal aimée. Représentations anti-urbaines et aménagement du territoire en Suisse: analyse, comparaisons, évolution* (Lausanne: Presses Polytechniques et Universitaires Romandes, 2005).

32. R.A. Salvatore, *Attack of the Clones* (London: Arrows Books, 2003), 53.

33. Bataillon and Panabière, *Mexico aujourd'hui, la plus grande ville du monde*, 37.

34. *Total Recall, Making of*, Studio Canal - Universal, 2003, disc 2.

Since the original environment of Coruscant has almost entirely disappeared, children whose parents have chosen to live in the galactic capital can only see animals, fish and plants in museums or "holographic zoos", and have no real connection with them. So that children can gain an idea of what they would have known elsewhere or in another time, a great botanical garden was set in place on the roof of a skyscraper. As well as imported plant species from across the known universe, they cultivated plants and flowers that had become extinct on the surface of the planet hundreds of generations previously. Kevin J Anderson intentionally called this gigantic terrarium a "Skydome", in a direct allusion to the "Biodome" of Montreal. This gigantic cupola of glass and steel35 recreates four great "natural" ecosystems accessible all visitors: the tropical rainforest of the Americas (even when it is snowing outside); a Laurentian maple forest which changes season by season; a marine ecosystem replicating the estuary and gulf of the St. Lawrence river; the Sub-Arctic and Sub-Antarctic polar worlds . The Biodome opened in June 1992 (i.e. two years before *Jedi Search* was published in the United States), and is described officially as an oasis in the heart of the city. This means that it plays the same role in Montreal as the Skydome does on Coruscant. For a mere 8 to 20.25 Canadian dollars (as per the published rates for January 2017 to February 2018), visitors can take an educational walk travelling the length of the American continent without the need to leave their own home.

35. The Biodome is built in the old cycling track built for the 1976 Olympic Games.

Among the dangers threatening science fiction towns, the most significant is apparently insecurity. Indeed, the juxtaposition of different races and social classes with conflicting interests is presented as a factor of permanent tension, and the cause of increased criminality, mirroring the Northern or Latin American cities that serve as models for scenario writers and novelists. Writers sometimes have no hesitation in transposing well-known situations to an immediate future without changing the names of the districts where their imaginary heroes are living. This is exactly the position of the French author Fabrice Colin, who described the deeply entrenched socio-economic inequality of Rio de Janeiro in 2020, at a time when androids are in charge of law enforcement and local authorities want to eliminate social freeloaders and criminals. His main character, a young orphan called Tiago Pericles Edelson, works for a particularly violent gang and lives with his grandfather in a miserable hovel in Rocinha, "the largest favela of Brazil, wedged between two arms of mountain, flowing down the hill like a deluge of cubic houses, a tide without end". In a cynical way, Fabrice Colin stresses that the government is unconcerned with the murders and the drug traffickers, as long as their crimes remain within the favela. At the opposite end of this dire world are the rich and beautiful districts, including Ipanema's "Rua Viconde de Pirajá" overflowing with shops, restaurants and exorbitantly priced art galleries."[36]

36. Fabrice Colin, *Invisible* (Paris: Mango, 2006), 26, 31.

With "Le Petit Monde (The Small World)", a poetic and violent European

manga comic, J.D. Morvan and Toru Terada replicate the socio-spatial divisions typical of large metropolises in under-developed countries. Whereas the rich people of the future live in well-protected districts, the poor are confined to a gigantic shantytown that covers the nearly vertical walls of the crater where waste from the modern city accumulates. Toru Terada's landscape, depicting this universe of violence and misery, in a strange way points to the favelas of Rio de Janeiro. Chased by death squads financed by the upper classes and tolerated by the official police, the street children try to survive through an ever-expanding cycle of sordid dealings: "robbery, prostitution and drug trafficking are the only means of earning their living here. Children start early in this business and the longer it goes on, the less scruples they have."[37]

37. Toru Terada and J.D. Morvan, *Le petit monde, T. 1, Vamos, vamos!* (Dargaud, 2005), 9.

Since *Star Wars* reflects as well as denounces the problems posed by an out-of-control development of modern metropolises, delinquency, in all its forms, is logically introduced as a normal part of everyday life. In the United States and Latin America, TV viewers are showing a growing interest in programmes whereby the viewers witness live scenes of brutality and criminality under the cover of denouncing the shortcomings of central administration and the misguided clemency of the courts. These programmes specialize in presenting vile news stories in a sensational way (attacks on banks or grocery stores, kidnappings, assassinations, car pursuits...). In prime time, they attract millions of TV viewers fascinated by the institutionalized violence that is hidden behind the pretence of a "journalistic report".

The characters in the *Star Wars* novels feel the same anguish as their readers even thinking about going through the streets of a city transformed into a trap for passers-by. "Mahwi Lihnn trekked through the back streets and alleys, searching for the Dewback Inn. She was certainly not overimpressed with this area of Coruscant. The surface streets in this sector were all twisted turnings and narrow byways, teeming with gutter scum looking for an easy mark."[38] The recurring impression of the slums and dross of the galactic capital, seen as a dangerous place where the anxiety of being attacked has replaced the desire of meeting one another, helps to build the collective image based on a fear of the other and on the expectation of daily violence. In Mexico City, this is the role played by the Tepito district, which encompasses all the apprehension of the ordinary citizen, as noted ironically by Rodrigo Fresán: "Tepito is the Mexican capital of fast smuggling and even more expeditious death."[39]

38. Reaves, *Darth Maul: Shadow Hunter*, 85.

39. Fresán, *Mantra*, 434.

Having just arrived in the depths of the city-planet, the young Han Solo must face a group of teenagers who seek to mug him: "Down again. He was five hundred stories down, by now. The streets grew ever seedier. One time, a gang of kids approached him as he hurried along."[40] Highlighting, in a somehow distorted way the stereotypes that typify street gangs, the leader is "a huge dark-skinned kid with a black fall of greasy hair",

40. Crispin, *The Paradise Snare*, 273.

the prototype of a young *Chicanos* whose parents crossed the border between Mexico and the United States illegally. This youngster expresses the strength and ubiquity of these ethnic gangs (made up of Blacks and Latinos) who frighten North-American middle classes, the quintessential WASPS (White Anglo-Saxon Protestants). In December 2005, according to police statistics, there were 463 gangs in the municipality of Los Angeles (including 246 of Hispanic origin) and 38,974 affiliated members (21,790 Latinos). In 2002, according to another official census,41 the County of Los Angeles was home to more than 1,300 street gangs with over 150,000 members, a sufficiently large number to keep the inhabitants of this Californian metropolis permanently on edge. One gang alone, 18th Street (Mara 18), had a membership of almost 20,000 young people in the city, scattered among several dozen sub-groups in the downtown area and across most metropolitan districts.

41. Alejandro A. Alonso, *Staff Writer, Streetgangs.Com Newsletter*, updated December 22, 2002.

The link between Hispanic youth and gang member becomes all the stronger when the bonds woven among young criminals on both sides of the border led to the North-American street gang model exported to the great Mexican cities. Since the mid-1980s, the *bandas* operating in the outskirts of Mexico City and the *cholos* of the border cities took full advantage of factors such as industrial de-structuring, growth in unemployment and school failure to expand and multiply. They replaced the old gangs and groups (*gavillas, palomillas, pandillas*) that traditionally brought together young boys from popular districts, importing fashion and values from "the other side": clothing, graffiti, various drug use, ritual violence – and also coded language and hybrid music. In Central America, the violence of the *maras* (local street gangs) was out of control. According to the Guatemalan police, Mara 18 and Mara Salvatrucha (both with origins in Los Angeles) could count on a membership of over 160,000 young people between 12 and 25 years of age. Conflicts between the two group often concluded in mass slaughter with tens of youngster killed. [42]

42. See http://www.libertaddigital.com:83/php3/noticia.php3?fecha_edi_on=2005-09-20 (accessed December 21, 2017).

In actual fact, neither the place or the time matters. It is the modern city in itself, with its architecture, the way its space is organized and its landscapes, that is fuelling this delinquency. All the authors in the *Star Wars* universe agree on the point that the urbanism of Coruscant is likely encourage crime: "With its countless dark canyons, precipitous ledges, hidden recesses, and jutting parapets – its surfeit of places to hide in plain sight – Coruscant invited corruption. Its very geography inspired secrecy."[43] With all its nooks and crannies and shady zones, the large city seems to provide a secure refuge for twisted individuals and delinquents who want to hide their criminal activities. This is why contemporary town-planning insists on open urban areas and on keeping watch in public spaces, so that it is possible for everybody to look all around themselves, with communities monitored at all times and in all places.[44] The goal of these systems is to unsettle potential criminals, while the modern city, seen as both deaf and blind, is supposed to pose a threat to honest

43. James Luceno, *Cloak of Deception* (London: Random House, 2001), 123.

44. Jean-Pierre Garnier, *Le Nouvel Ordre local. Gouverner la violence* (Paris: L'Harmattan, 1999).

citizens.

The solution can pass muster by re-ordering society, i.e. by introducing more effective police control. A nostalgia for "the good old times" when the State knew how to subdue rebellious groups or delinquent gangs can certainly seduce part of the population, frightened by the excesses perpetrated in a democratic system considered to be too permissive. The floodgates then open to populist, reactionary or security-conscious speeches, similarly to the way that Brakiss acts to attract the young Zekk towards the Shadow Academy: "The empire had very little political chaos. Every person had opportunities. There were no gangs running wild through the streets of Coruscant."[45] Nowadays, we are used to hearing these same speeches during election campaigns designed to entice voters terrified by the rise of daily violence. Manuel Andres Lopez Obrador, the PRD candidate in the last presidential elections in Mexico (2006) even requested assistance from the former mayor of New York, Rudolph Giuliani to set up a "law and order" programme to fight crime in the federal district of Mexico City.[46]

45. Kevin J. Anderson and Rebecca Moesta, *The Lost Ones* (New York: Boulevard Books, 1995), 109.

46. Giuliani received the tidy sum of 4.3 million dollars for his consultancy work, mainly paid by Mexican businessmen.

Conclusion: Back to the Ghetto and Death of the City

For those who do not believe in a political or police solution to the problem, the potential answer is to escape and lock oneself up protected areas, even at the price of draconian restrictions to personal freedom. This is the urban model chosen by the inhabitants of Coruscant. In order to flee from the real or imaginary dangers waiting for them in the street, they preferred to withdraw into locked-up buildings like in a castle encircled by barbarians. As a consequence, a gated community is seen to be the outcome of a long urban history marked by the impossibility of getting social classes with divergent interests and ethnic groups whose ways of life are incompatible to cohabit in the same territory.

Although we see each building in the galactic capital as a gated community, the small community of Dometown, built by Lando Calrissian in the basement of the megalopolis is the closest approximation to this system. Visitors must go through a maze of seemingly long-abandoned tunnels and passages to reach the entrance of this underground paradise, built at almost two hundred meters below ground level. The only access to the area is protected by an enormous armour-plated gate controlled through a complex and fool-proof electronic code. Once through this barrier, visitors will find themselves facing an urban landscape similar to those of the gated communities that are scattered across the suburbs of great American cities: "They stepped onto a terrace overlooking a huge subterranean cavern, a hollow dome, easily a kilometre across. Luke, quite astonished, found himself on a platform that looked down into a complete pocket city of low stone buildings and cool green parks. The dome was brightly lit, the air sweet and pure, the walkways and byways clean and

tidy. The buildings were widely spaced, their stone walls brightly painted. Pathways snaked through neatly kept lawns, and the roof of the dome was painted a royal blue."[47]

Along the same model, the principle of self-seclusion has been largely adopted in Latin America to ensure the well-being of the social categories who feel themselves imperilled by the rise in violence and the lack of security. It follows that these *condominios cerrados* (in Spanish) or *condominos fechados* (in Portuguese) are presented as the urban panacea for solving the immediate problems of a massive social crisis. Gated communities are also multiplying in the suburbs of the great Latin-American cities, such as in the area around Toluca where large billboards extoll the merits of protected allotments built to shelter the middle classes dismayed by the awful spectacle of a city they rediscover every night on TV: "The home your family deserves" proclaims one of the advertisers, while another company has no qualms is naming themselves as "City Builders".

In the imagination of city dwellers, these protected spaces are an oasis at the heart of a violent and insecure world. The French comic strip Moréa, where the action takes place in 2082, exploits the same tone, stressing that high society Cubans seldom, if ever, leave the protected perimeter of the downtown area and prefer to patronize enclaves like the "Cubana County Club" (similar to the "Country Clubs" of Buenos Aires), where they enjoy playing golf and polo. This self-seclusion enables them to escape from the sad reality of the external world: "Among poor people, unpleasant things occur in the street, one calls that insecurity [...] Among the rich, there are lawns, thick gates and pretty things fixed on the walls".[48]

According to this point of view, science fiction both introduces and denounces one of the threats that, in our collective imagination, weighs most on American cities: the progressive disappearance of public spaces and the end of the city as a political body. In Coruscant, the streets have gone from the surface: they are only found in the lower city, where outlaws reign and the poor hide away in their slums. In the upper city, the only crossing points are footbridges stretching between skyscrapers, a fact that severely restricts circulation but ensures the maximum sense of peace and security. As already pointed out by Jane Jacobs in 1961: "Streets and their sidewalks, the main public places of a city, are its most vital organs. Think of a city and what comes to mind? Its streets. If a city's streets look interesting, the city looks interesting; if they look dull, the city looks dull."[49] Her warnings against technocratic and inhuman town planning, the destroyer of urban forms that encourage inhabitants to meet (traditional districts, seen by developers and urban architects as an obstacle to modernity), have without doubt influenced the *Star Wars* authors pessimistic vision of their world.

As a consequence, Coruscant appears to be the deformed image of a

47. Roger MacBride Allen, *Ambush at Corellia* (New York: Bantam Books, 1995), 96.

48. Christophe Arleston, Dominique Latil and Thierry Labrosse, *Un parfum d'éternité* (Toulonù: Soleil Production, 2011), 35.

49. Jane Jacobs, *The Death and Life of Great American Cities* (New York: Random House, 1993; New York: Modern Library, 1961), 37. Citations refer to the Random House edition.

reality found everywhere in our world: overly-large cities that had become simple "living machines" where new ways of life and social practices heighten the divide between the mere city dweller and the engaged citizen. The galactic capital is only one exasperated representation of the post-modern Los Angeles described by Mike Davis in his famous book, *City of Quartz*.[50] Even more worrying is that solutions for making make megalopolises such as Coruscant, Mexico City or São Paulo bearable do not take in the causes of the crisis (poverty, racism, social and spatial injustice) but are only interested in its consequences (loss of social bonds, insecurity, violence). Since the Virgilian dream that inspired Thoreau has proven to be a failure and the megalopolis has reached its point of no return, from now on, it seems necessary to adapt the practices used by social groups faced with the architecture imposed by modern times: the city is dead, long live the ghettos!

50. Mike Davis, *City of Quartz: Excavating the Future in Los Angeles* (London: Verso, 1990).

Yona Friedman. Mobile Architecture, People's Architecture

Review of the Exhibition Curated by Gong Yan and Elena Motisi (MAXXI, Rome, 23 June 2017 – 29 October 2017)

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ABSTRACT

This review aims to summarize the highlights of the exhibition "Yona Friedman. Mobile Architecture, People's Architecture", curated by Gong Yan and Elena Motisi and displayed at MAXXI, Rome, between 23rd June and 29th October 2017. Thanks to models, drawings and installations, the exhibition has retraced the steps of Friedman's lifelong architectural experimentations and theory.

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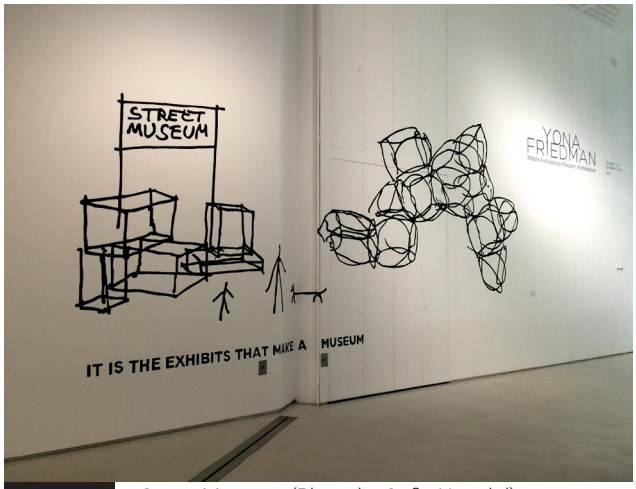
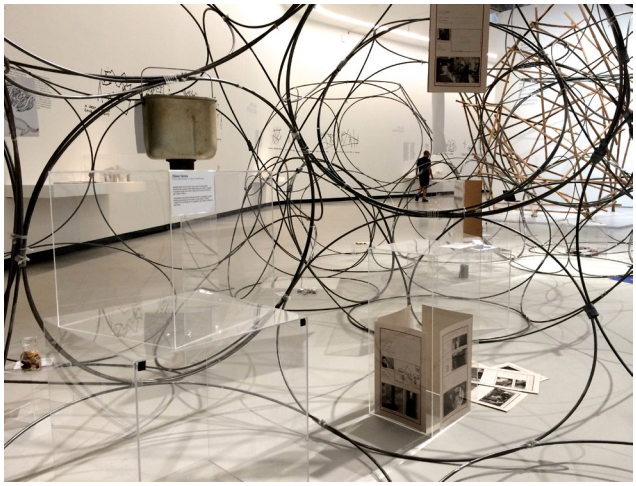
KEYWORDS
Yona Friedman, MAXXI, mobile architecture, space frames, ville spatiale

Entering *Gallery 4* of Zaha Hadid's curvy and well-known MAXXI Museum in Rome, one encounters a thin spatial structure displaying several objects, in apparently random order. This so-called "street museum" is the result of an open *call for objects*, which was published by MAXXI in May 2017, some weeks before the opening of its *Yona Friedman. Mobile Architecture, People's Architecture* exhibition. "It is the exhibit that makes a museum", writes Friedman on the entrance wall: similarly to his theories on the adaptation of buildings to their inhabitants (and, the curators claim, "not the reverse") it is the museum which has to adapt to the objects displayed. Sixteen "symbolic and important" objects were sent to the museum by those who answered the call. They were then selected and collected within a "space chain" designed by Friedman himself. The objects range from photographs to books and a student's architectural mock-up for a failed exam, and are gathered within a thin wire structure, which transforms them into works of art. This "street museum" is nothing new in the work of Yona Friedman: the first attempt was made in 2004 and a similar collection of personal objects was displayed at the Shanghai Power Station of Art, during the first edition of the exhibition in 2015. The Shanghai exhibit[1] is thus re-displayed in Rome, by modulating some of its features according to the spatiality of MAXXI.

1. *Yona Friedman. Mobile Architecture* was displayed in Shanghai Power Station of Art between May 16, 2015 and August 16, 2015.





FIGS. 1-2 Street Museum (Photo by Sofia Nannini).

Born in Budapest in 1923 and living in France since the 50's, Yona Friedman is indeed one of the most influential architectural theorists of our times. The "mobile architecture" celebrated by the curators was born almost 60 years ago, in 1958, and has influenced studies by Archigram, Metabolists and on the so-called *Megastructures*. The exhibition at MAXXI shows the infectious irony and lightness that Friedman uses in explaining his theories, which are never banal or predictable. It is indeed interesting to properly *see* the work of an architect who has always been defined as "utopian" or "theorist", but who is nevertheless utterly interested in the real world and its built environment.[2]

2. Yona Friedman's main publications can be found in his official website (www.yonafriedman.nl). Recent Italian publications are: Friedman, Yona. *Tetti*. Macerata: Quodlibet, 2017; Friedman, Yona. *Villes Imaginaires / Città immaginarie / Imaginary Cities / Imaginären Städte*. Macerata: Quodlibet, 2016.

In addition to the "street museum", the exhibit embraces several

architectural proposals, corresponding to Friedman's research paths, such as "Architecture Mobile", "Space Frames" and "Ville Spatiale", covering not only the walls of the gallery – with drawings and sketches of the architect – but also its spatiality, thus creating a three-dimensional effect able to define the architectural character of his experiments. "Architecture Mobile" mirrors his widely known *Manifesto*, whose main results can be seen in the definition of the so-called "Ville Spatiale". The exhibition, through Friedman's sketches, highlights the steps that make this *spatial city* possible, also transforming it into an architecture for the people. "There are 3 preconditions for *People's Architecture* – It must be easy to assemble for a layman – It has to be an assembly of inexpensive technical components – And easy to dis-assemble and re-assemble into a different pattern".

FIGS. 3-4 Space Frames (Photo by Sofia Nannini)

Moreover, the curators show how tangible the works of Friedman are, regardless of their utopian features: structures such as "Rod Nets", "Gribouilli" and "Crumpled Sheet" are all part of the wider group of "Irregular Structures", which – in Friedman's mind – can be designed, built and used by citizens and inhabitants themselves. According to the architect, "I see architecture as a process. We all can participate in that process. Anybody can build something, anybody can *do* an architectural act". It would seem that architecture is doomed to disappear within the void, framed by these structures; on the contrary, as Friedman writes, "When I think of architecture as an art, I think of it as sculpting the void: the prime material of architecture is emptiness".

Friedman's visions are not only represented by mock-ups and frame structures, but also through unpublished drawings and collages, including photomontages of MAXXI covered by a forest of space chains.

The exhibition also shows all manner of objects found in Friedman's apartment in Paris – the section is called "Boulevard Garibaldi", after the Parisian address of the flat -, including first editions of books, sketches, projects and Friedman's ironic "Noble", "Fundamental" and "Simple Truths" (among which: "We Can Not Understand The Universe – We Do Not Need to Understand The Universe"). Defined as "the rescuer of memory", the curators show the importance of Friedman's personal living space for "its stratification and identity dimension, which is in a constant state of becoming", in close relation to his way of thinking architecture.

Finally, a small room hosts a non-stop slide-show of the architect's comics, taken from the chapter "Architecture" of the book *The Human*

Being Explained to the Aliens (2016). These playful, yet serious, comics show all aspects of Friedman's way of analysing the world, underlining his recurring topics: the changing of cities, from being something enclosed and limited to the explosion of huge "nets of cities linked by fast trains"; the overbuilding of the Earth, linked to the much-ignored truths that "most functions do not need buildings" and that "Earth is overbuilt / Earth is overplanned"; the transformation of life conditions between 1950 and 2000; void as "raw material of architecture"; urban space as something "not created by architects", yet defined by the "use-pattern deployed by its inhabitants".

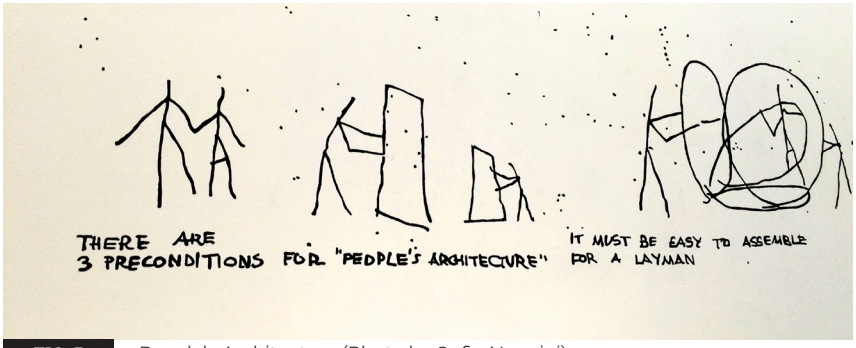
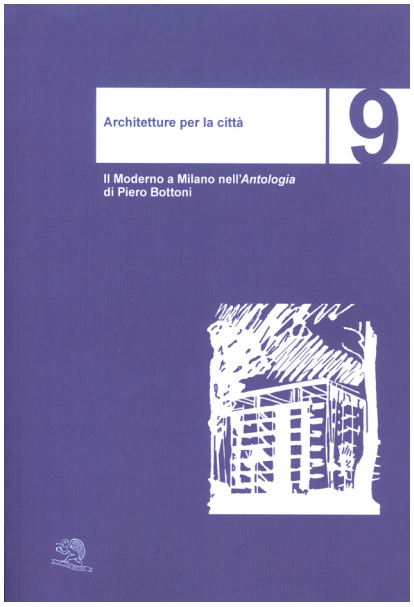


FIG. 5 People's Architecture (Photo by Sofia Nannini)

FIGS. 6-7 Boulevard Garibaldi (Photo by Sofia Nannini)

Far from being merely utopian, the exhibition helps to understand the roots of Friedman's theories and his down-to-earth approach to architecture and society, which is both deep and light, mirroring the architect's feelings of constant curiosity and cheerfulness, no matter one's age or background. Moreover, the exhibit also echoes today's interest for ephemeral architectures – such as shelters – and a renewed, almost nostalgic, attention to the so-called architectural "megastructure".

This exhibition is part of the great effort made by the MAXXI Institution to promote knowledge and stimulate curiosity on contemporary architectural projects and theories. MAXXI is indeed one of the few Italian stages for this kind of display and visitors are never disappointed when it comes to the variety of set-ups and the richness of the selected topics.



Attualità dell'*Antologia di edifici moderni in Milano* di Piero Bottoni

REVIEW OF

G. Tonon,
***Architetture per la città. Il Moderno a Milano nell'Antologia di Piero Bottoni*,**
Quaderni dell'Archivio Piero Bottoni,
(Milano: La Vita Felice, 2014)

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Laureato in architettura presso la Facoltà di Architettura di Ferrara, consegue nel 2014 il Dottorato di ricerca in architettura presso il Dipartimento di Architettura dell'Università di Bologna con una tesi sull'opera di Piero Bottoni a Ferrara. Nel 2015 ha vinto una borsa di studio post-dottorato presso il Department of Arts of University of Haifa (Israele) e una menzione speciale al Premio Gubbio 2015 per la sua tesi di Dottorato. Dal 2017, è ricercatore a tempo determinato (a) di Storia dell'architettura presso il Dipartimento di Architettura dell'Università di Bologna. I suoi principali temi di ricerca riguardano l'architettura del XIX e XX secolo.

ABSTRACT

Piero Bottoni edited his Antologia di edifici moderni in Milano in 1954 and, by that moment, it become a classic book about the history of modern architecture in Milano. Graziella Tonon analyzes the genesis of this book under the light of the influences of contemporary architectural debate and in the Bottoni's work. After the essay by Tonon, the book contains thirty drawings by Bottoni.

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KEYWORDS
Antologia, Milano, Guida, Architettura, Città, Bottoni, Tonon

Vivo appare tutt'oggi l'interesse per l'*Antologia di edifici moderni in Milano* compilata da Piero Bottoni e pubblicata dall'Editoriale Domus nel 1954. Occasione primigenia a Milano per la sperimentazione di un genere letterario ancora non diffuso in Italia – quello della guida all'architettura di una città – l'***Antologia*** rappresenta il riferimento per ogni analogo lavoro.

Testimonianza di questa vitalità, dopo la riedizione del 1990 e del 2010 del piccolo libro, appaiono tre volumi molto diversi per caratteristiche e finalità pubblicati negli ultimi anni: *La Milano moderna di Piero Bottoni 1954-2014. Storia e attualità di un patrimonio architettonico e urbano* di Silvana D. Basile, Lucia Tenconi, Stefano Vazzana (Maggioli 2014), *Guida all'architettura di Milano 1954-2014* curata da Marco Biraghi, Gabriella Lo Ricco e Silvia Micheli (Hoepli, 2013) e *Architetture per la città. Il Moderno a Milano nell'Antologia di Piero Bottoni* di Graziella Tonon (Quaderni dell'archivio Piero Bottoni, La Vita Felice, 2014).

Mentre il primo assume l'*Antologia* come pretesto per un lavoro didattico svolto nelle aule del Politecnico di Milano proponendo una schedatura integrativa dei settantadue edifici individuati da Bottoni, il secondo si pone in dichiarata continuità con l'*Antologia* del 1954 adottando come spartiacque della nuova impresa compilativa l'anno della conclusione di quella di Bottoni. Solo il dato di partenza è l'affinità che lega i tre volumi: diverso è il carattere che governa gli studi.

Mentre nel testo di Basile, Tenconi, Vazzana l'elenco degli edifici è accolto come dato di partenza, nella *Guida* di Biraghi, Lo Ricco, Micheli la selezione dei nuovi edifici, fortemente lontana dall'ideologia sottesa alle scelte dell'architetto milanese, è invece indirizzata a un pluralismo apertamente inclusivo. Per rimanere all'ultimo, del resto, già la distinzione dei termini che compongono il titolo lo distingue dal lavoro di Bottoni: *Antologia*, ovvero rassegna di un'esperienza, selezione, stato di fatto, raccolta di esperienze tra loro legate da un filo comune che, seppur vive nel presente, si sono compiute nel passato, mentre *Guida*, costatazione più o meno aderente ad uno stato contingente più o meno attuale, così come recita il vocabolario.

Graziella Tonon, invece, non si pone il compito di aggiornare l'*Antologia* o di impiegarla come struttura significativa per la lettura di una compagine architettonica composta di episodi isolati e neppure di impiegare il pretesto di uno studio puntuale su quest'opera per ricostruire attraverso i meccanismi collaudati di una microstoria un profilo biografico o autoriale di Bottoni. Ella è interessata, piuttosto, a verificare l'idea che indirizza il lavoro dell'autore milanese: «quale "fede" e quali "insegnamenti" voleva trasmettere e tuttora trasmette l'*Antologia* compilata da Piero Bottoni? E quale "critica" incentiva?» si chiede l'autrice avviando l'indagine.

Impegnato in prima persona nella ricostruzione della cultura architettonica italiana nel secondo dopoguerra, Bottoni fu tra i primi aderenti al Movimento di studi per l'architettura (MSA), costola milanese

FIGS. 1-3 P. Bottoni, Schizzi di edifici milanesi. Dall'alto: casa al villaggio dei giornalisti di L. Figini e G. Pollini; casa Tognella di I. Gardella; edificio in corso Buenos Aires di P. Bottoni e G. Ulrich.

Archivio Piero Bottoni, Dastu, Politecnico di Milano.

di un multiforme fermento intellettuale che attraversava tutta la cultura italiana in cerca di una nuova vitalità dopo il ventennio fascista e i drammi della guerra. Dal «comune orientamento» che caratterizzava la ricerca di buona parte della cultura architettonica milanese scaturirono iniziative volte a stabilire una complessa e sfaccettata continuità con la stagione del moderno come appare per esempio, a livello editoriale, nelle iniziative dei milanesi Rosa e Ballo – i *Pionieri* di Pevsner, *Architettura e democrazia* di Wright o la raccolta curata da Alfonso Gatto degli *Scritti critici e polemici* di Edoardo Persico editi tutti tra il 1945 e il 1947– o nella collana de Il Balcone *Architetti del movimento moderno* il cui avvio con la monografia di Giancarlo De Carlo su William Morris stabiliva già una precisa rotta editoriale e poi storiografica. All'interno di questo contesto e riconoscendo una precisa genealogia, operava Bottoni che dal 1951 iniziava a lavorare alla sua *Antologia* «espressione di un pensiero personale […] indicazione di un determinato orientamento critico», «angolata», come la definì recensendola Bruno Zevi, tesa a dimostrare l'esistenza di una «linea ideale» di congiunzione ed evoluzione della costruzione architettonica della Milano moderna a partire da Giuseppe Mengoni per arrivare fino alle esperienze più recenti degli Albini, Asnago e Vender, Latis, Bottoni stesso, Minoletti, Ponti…

Animato dalla stessa volontà che fu di Alessandro Pasquali nel rappresentare la Milano moderna sulle pagine di *Domus* già nel 1938, Bottoni ritrasse nella sua *Antologia* gli esiti costruiti nella compagine della città meneghina realizzati da chi aveva preso parte alla «battaglia per l'architettura moderna» a cui egli partecipò tra le due guerre: realizzazioni che andavano a partecipare alla configurazione moderna del mutevole volto della città.

Una guida che si costituiva dunque, nell'idea di Bottoni, come un'opera corale tesa alla costruzione collettiva dell'immagine moderna di Milano e, al contempo, come utile strumento rivolto allo studioso come al «visitatore medio» interessato a conoscere le ultime realizzazioni architettoniche, nuovo personaggio – quello del turista – che si stava affacciando sulla scena negli anni del benessere economico. Non appare quindi un caso isolato che negli stessi anni – nel 1952, precisamente – Cesare Zavattini stesse progettando la collana *Italia mia* coinvolgendo i più grandi intellettuali italiani – da LuchinoVisconti a Carlo Levi, da Alberto Lattuada a Alberto Moravia, da Michelangelo Antonioni a Vasco Pratolini – in un'impresa di rappresentazione fortemente autoriale della penisola italiana – ma dal sapore neorealista – utile al «turista di passaggio»: in quest'ambito si può leggere anche il lavoro di Bottoni, opera militante e non classificatoria e comparativa della maggior parte degli avvenimenti architettonici della città come sarà, per esempio, quella di Maurizio Grandi e Attilio Pracchi, di quasi trent'anni successiva e rivolta a usi e studi differenti. Una guida, dunque, che come sottolineava ancora Zevi colmava una lacuna nella conoscenza dell'architettura della città inserendosi in

una tradizione formata da illustri antecedenti inglesi come *New Sights of London* di Hugh Casson del 1938 o *A Pocket Guide to Modern Buildings in London* di Ian MacCallam del 1951.

Probabilmente però, al di là delle necessità divulgative dell'opera, della forma del genere che Bottoni felicemente inaugura descrivendo ciascun edificio attraverso dati tecnici e letture critiche, fotografie e planimetrie del contesto urbano senza tuttavia accedere in un tecnicismo da specialisti, ciò che perseguì l'autore con maggior ostinazione fu il proseguimento di una tradizione moderna condivisa sulla quale fondare la ricostruzione della cultura architettonica di respiro non solo milanese: proprio nel 1954 Enrica e Mario Labò curarono per i tipi di Hoepli l'edizione italiana di *Space, Time and Architecture* di Sigfried Giedion mentre Ernesto Nathan Rogers era impegnato nella messa a punto della complessa ipotesi della *continuità*; l'anno successivo il MSA promosse un dibattito sulla tradizione in architettura nel quale lo stesso Bottoni rimarcò l'importanza di un'esperienza che affondasse le proprie radici nelle vicende del periodo eroico dell'architettura moderna italiana. Questa necessità storiografica anima il testo di Bottoni compilato in un momento di forte attività professionale: erano quegli gli anni dei progetti per il quartiere QT8 (illustrato in un volume pubblicato quasi in concomitanza dell'*Antologia* sempre dall'Editoriale Domus), per il palazzo Ina in corso Sempione a Milano, per diversi complessi di case popolari commissionate dall'Ina-Casa, per i piani regolatori di Siena e Mantova, per le sistemazioni di edifici antichi nel centro di Ferrara e anche quelli dell'insegnamento al Politecnico di Milano e all'Università di Trieste.

All'esegesi della struttura del testo che indica un lineare progresso delle vicende della modernità secondo una prassi consueta nella storiografia del movimento moderno, è affiancato da Tonon il racconto affidato al carteggio Bottoni-Zevi, vicenda ricca di momenti di contatto ma anche di intense distanze, da quelle sulla valutazione dell'opera di Wright alle convergenze su Terragni o agli apprezzamenti – e alle critiche – al lavoro dell'architetto milanese.

Quello che emerge evidente nel lavoro dell'autrice è la ricerca dei caratteri dell'attualità e della militanza dell'insegnamento di Bottoni sospeso tra impegno sociale e politico, appartenenza alla tradizione razionale e ricerca interiore di un'architettura che non si configurasse come mera aderenza a effimere mode. È forse questo una delle parti più importanti dell'insegnamento di Bottoni che la penna di Tonon acutamente rileva e sottopone al lettore.

Il volume, bilingue (italiano-inglese), è illustrato da una serie di trenta disegni di edifici milanesi tracciati da Bottoni in occasione della pubblicazione dell'*Antologia*.