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OPEN ARCHITECTURE: TRADITION, POSSIBILITIES AND SHORTCOMINGS

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Jorge Mejía Hernández and Esin Komez Daglioglu, editors

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Openness as a mainstream architecture theory

Tacitly or manifestly, the qualities that characterise open works of art have become prevalent in mainstream architecture theory. Popular professional media constantly reproduce the latest incomplete, incremental, principle-based architectures which can change in size and shape and adapt to shifting conditions.[2] For many of us it now seems completely normal to move into unfinished houses or flats, work in so-called flex-space offices, shop in partially completed depots, and store our belongings on self-built modular shelves. Architects concurrently praise informal, makeshift architectures, and admire colleagues who leave prominent parts of their work pending.[3] Despite the sustainability craze, aiming for complete, durable buildings does not seem too fashionable these days.

As conjectured some sixty years ago by a number of intellectuals and artists from different disciplines, it would seem that openness is a successful architectural theory.[4] On the one hand it appears to have more and better explanatory power (and is therefore able to make more convincing truth claims) than other theories, such as those that argued for univocal relations between a building's configuration and its use. On the other hand, the ambiguity, indeterminacy, and vagueness that are often attributed to open architecture seem to be in tune with broader cultural theories that are currently in vogue. But is this really the case?

The notion that art should be prone to external influence and change is not new, of course. Open works have a long and diverse tradition that has remained latent for several millennia already, with notable antecedents like the venerable *I-Ching*: an authorless book that can be read in different orders and mean many things.[5] Our current academic understanding of openness, however, can be traced back to Heinrich Wölfflin's 1915 *Principles of Art History*, which explains baroque art as a series of open configurational systems, different from the finite and static, and therefore closed forms of Renaissance art.[6] This explanation was further developed in Umberto Eco's 1962 definition of 'the open work' in his book of the same title: a study of the semiotic implications of works of art conceived on the basis of incompleteness and heteronomy.[7]

Simultaneous with Eco's publication, the aim for incompleteness, adaptivity, and heteronomy in construction and design also appeared in post-war and postmodernist architecture, as open configurations meant to achieve flexible and adaptable built environments. In the early 1960s, for instance, Oskar and Zofia Hansen together with other self-proclaimed structuralists designed open modular building systems; Jaap Bakema tried to understand buildings and cities in relation to Henri Bergson and Karl Popper's definition of an open society; and Colin St. John Wilson split modernist architecture into an open organicism and a closed abstract rationalism.[8] Recently, Richard Sennett's article 'The

Open City' has suggested a different interpretation of openness, in order to describe possible futures for a city that, in stark opposition to the over-determination of conventional master plans, should be able to accommodate and foster diversity, adaptability, liveliness and unpredictability.[9] With the advancement of digitalisation, participatory design has evolved into 'open-source architecture' – a notion used by Carlo Ratti and Matthew Claudel in their eponymous book to explain how architects determine and share frameworks and parameters with the public through digital networks, moving ever closer to a radically collective design.[10]

Open architecture's four trajectories

All these examples point to four different yet interrelated understandings of what an open architecture is, where and when it can be situated, what it can do, and what it usually rejects. Together, they suggest that architecture can be open in structural, performative, procedural, and conceptual terms. On these grounds the following research and review articles study past, present, and future open architectures critically and creatively by defining their utility and value (or the lack thereof), explaining the methodological advantages and disadvantages of their use, and justifying alternative conceptualisations of the notion of openness.

Predominantly, this notion has been associated with the in- or under-determination of buildings' shapes and sizes, taken for structural conditions upon which different human actions are expected to take place. Key to these structural conditions is the technology required to build – a topic explored by Ezgi İşbilen in 'The Unbearable Lightness of an Open System'. In her article, İşbilen explores the notion of openness in architecture through the Packaged House project designed by Konrad Wachsmann and Walter Gropius: a prefabricated housing system triggered by pressing housing shortages in the United States after the Second World War. 'Although it was cultivated in the most favourable political and economic landscape for prefabricated building systems,' the author notes, the Packaged House failed to be widely reproduced. The reasons for the endeavour's rise and fall are revealing.

Moving from building technology to the analysis of architectural configuration, Xavier van Rooyen's article 'Free Plan versus Free Rooms' traces architecture's continuous shift towards indeterminacy. Concretely, van Rooyen examines the different ways in which the design processes carried out by four well-known architecture offices (Office KGDVS, MVRDV, Sanaa, and Sou Fujimoto) transcend and transform earlier notions of openness in order to respond to a crucial desire of contemporary society: the need for singularity. While modernist and postmodernist architectures relied on hypostyle layouts (post-and-beam compositions habitually referred to as free or open plans), the author argues that these and other contemporary architects are finding new and exciting forms of openness using the room as elemental unit of architecture.

Aside from structure, openness in architecture is also associated with the performance of collectiveness, flexibility, adaptability, multiplicity, plurality, heteronomy, collaboration, and participation. Transcending commonplace readings of architectural performance as mere function, Armando Rabaça's article '*Spolia* and the Open Work' explores the different ways in which architecture can incorporate historical remnants as sources of new meaning. He notes that the aim is to analyse the association between the creative reuse of and intervention in historical remnants and the multiplication of possible signification' by evaluating the role and nature of *spolia* through 'the structural linguistics upon which Umberto Eco built the post-structuralist concept of open work.

While Rabaça's text examines how to incorporate remnants of the past, Nina Stener Jørgensen and Guillaume Laplante-Anfossi approach openness in relation to new computer technologies in their article 'Closing the Open System', where they examine the algorithm written by Franco-Hungarian

spatial artist Nicolas Schöffer for the Tour Lumière Cybernétique, a cybernetic light tower created for Paris's La Défense district in the 1960s and '70s. The tower's responsiveness to a myriad of external stimuli, we are told, can be understood through the sophisticated computer programme it utilised to (hypothetically) achieve a truly extraordinary performance, which nonetheless failed to avoid stagnation, repetition, and predictability.

While the articles mentioned so far deal with architecture as structure and performance, other approaches to open architecture focus on the role and agency of the architect in society, shifting attention from buildings to the practice of the architectural profession. Here the architect's authorship is contested, and replaced by a flexible, mediating role as negotiator of different interests, often with a user-centred approach.

Such is Esra Akcan's take in 'Writing *Open Architecture* as a book on Human Rights (and against Nation-States)', where she elaborates on some of the fundamental premises developed in her book *Open Architecture*.[11] Specifically, Akcan defines open architecture as a new ethic of welcoming' noncitizens and refugees which determines the architect's work, and guides it towards 'flexibility and adaptability of form, collectivity and collaboration, participatory processes, and multiplicity of meaning. Thus, openness becomes a political action in architecture aimed at expanding 'migrants' rights and social citizenship.

Using elements from Akcan's research, Ecem Sarıçayır's article 'Architect of Nothingness' discusses the work of Dutch architect Frank van Klingeren, with particular focus on his projects for two community centres – De Meerpaal and Het Karregat – built in the Netherlands, also in the 1960s and '70s. To make sense of these two pieces of deliberately unfinished architecture, Sarıçayır takes a close look at the different media used by Van Klingeren to communicate, including some of his poems and essays, but also the interviews he gave to national and international journals and newspapers regarding his designs for these community centres.

While Akcan's entangled historiography meanders between the individual dwelling, the neighbourhood, and across inter-national frontiers, Başak Uçar and Pelin Yoncacı Arslan focus on the instruments that allow us to appraise the larger scales of the environment in their article 'The Open Map'. Based on four examples (namely, Jasper Johns's paintings, Buckminster Fuller's Dymaxion Map and World Game, and MIT's Real Time Rome project), the authors claim that new developments in computer science and information technologies have turned maps into grittier models that define the new granular front of the open map.

Returning to more conventional forms of architectural design, Alberto Geuna and Claudia Mainardi's article 'Contextualising *Liberté d'Usage*' describes the work of Pritzker Prize laureates Anne Lacaton and Jean-Philippe Vassal as influenced by earlier research carried out by their professor and mentor, 'the largely forgotten' figure of Jacques Hondelatte. For the authors, Hondelatte's investigations of openness, especially concerning buildings' performance for enabling alternative uses, explains how Lacaton and Vassal have achieved some of the most powerful qualities of their celebrated work.

Finally, and besides the abovementioned structural, performative, and procedural connotations, the notion of openness has also been strongly associated with a particular form of conceptualising the architectural discipline and its outcomes. In this direction, 'On the Open Style of Architectural Reasoning' by Konstantinos Apostolidis ponders architectural epistemology and methodology through the work of the philosophers of science Ian Hacking and Imre Lakatos. In order to bring their ideas to the field of architecture, Apostolidis compares and contrasts earlier attempts in the same direction by Stanford Anderson and Michael Hays as a basis for an open style of architectural reasoning.

Pushing disciplinary boundaries even further, the article 'Ventotene and Gorizia' by Sebastiano

Fabbrini presents us with a provocative study of two Italian panoptical buildings that straddle the border between different places and times: the prison of Ventotene and the hospital of Gorizia. Like the wings of these panopticons, Fabbrini's account branches out into a series of philosophical, morphological, and ultimately political reflections that exemplify how even the most stable architectural objects can proliferate and open our minds to new and better understandings of reality.

Openness as an effective architectural theory

The sheer diversity of these approaches, ranging from pleas for the dissolution of nation states to the study of algorithms, or from modular construction systems to the ideological foundations of the European Union, reveals the remarkable breadth of the concept we set out to study. A sense of elusiveness remains attached to anything termed open in architecture. Throughout this editorial process we have constantly found ourselves listing several different and often contradictory conditions, in the hope that they somehow – one could even say magically – add up and make sense of what we are trying to grasp.

Trying to elucidate why openness appears to mean so many different things and at the same time remains an ethereal concept, it seems worthwhile to reflect on potential justifications for its use. In the English language, the word *open* (like the German *offen* used by Wölfflin) comes from the Indo-European root *upo*, which refers to something that is raised or brought up from under. The Italian *aperto* used by Eco, on the other hand, comes from the Latin *apertus*: without obstacle.

While the resulting modern words have remained fundamentally unaltered for centuries, beyond their original meanings their use has in many cases become metaphorical. The straightforward actions of revealing and unfettering (as in an 'open conversation', 'opening a door', and so on) are still and unequivocally understood as opening in the Saxon, Germanic, and Romance languages. However, when these words are used to describe complex objects and processes which can't be explained quite so simply, openness turns allusive. It is in this metaphorical role that in the course of the past sixty years the notion of openness in architecture has been notably effective. Nonetheless, it appears to us now that the term's popularity does not equate to its efficiency.

Given the positive moral connotations attributed to any act of revealing, disclosing, freeing, or liberating, describing certain architectures as open has two obvious benefits. For one thing, it has been used as an extremely effective euphemism, able to make certain unpopular innovations more palatable. An open flat seems much more desirable than an unfinished apartment, for example. Even though some of the most challenging innovations introduced by modernist and postmodernist architecture have become mainstream, the term has remained an effective instrument of architectural axiology. Almost automatically, openness continues to ascribe positive values and virtues to architects and their work.

Unfortunately, these positive values and virtues do not always correspond to the architecture they are attributed to. Proneness to multiple forces and change are not necessarily desirable architectural qualities. Flexible, incomplete, or un-authored buildings are not always able to support humane goals and fend off societal evils, as some of our contributors seem to believe. The indeterminacy and ambiguity that characterise some architectures described as open have evidently led to undesirable outcomes. Even if fundamentally open in a diversity of ways, the most aggressive forms of the contemporary slum, the normalising nature of do-it-yourself architectures, and the transience of many participatory commoning practices exemplify the potential setbacks of this idea.

This might be because, at a purely technical level, 'open' remains an elemental word, bound to a very concrete meaning, and therefore unable to account for the complexities that characterise

realities beyond that concrete meaning – architecture included. Past metaphor, the inefficiency of the word becomes evident when additional terms have to be scrambled ad-hoc to further clarify what openness is or does.[12]

On these grounds we can conclude that if a theory of architecture must explain what architecture is, define the principles on which its practice is based, and justify a course of action for its future development, openness in architecture can be effectively and persuasively used to discuss the ethics that should govern our profession. Beyond that concrete, axiological role, its meagre explanatory power suggests that new directions in open architecture might require that we recognise its theoretical shortcomings – its possible obsolescence, even – and start looking for new and better ways to explain exactly what we're talking about when we talk about the architecture of our time (and hopefully also of the time to come). In the meantime, and paraphrasing Colin Rowe, we trust that openness in architecture will persist as metaphor, rather than as prescription.[13]

Notes

1. Colin Rowe, 'The Architecture of Utopia', in *The Mathematics of the Ideal Villa and Other Essays*, ed. Colin Rowe (Cambridge, MA: MIT Press, 1976), 216.
2. Dima Stouhi, 'Incomplete Structures Take the Spotlight in Photographic Series', 10 November 2019, https://www.archdaily.com/927806/incomplete-structures-take-the-spotlight-in-photographic-series; Delia Bayona, 'Architects Propose 120 Incremental Social Houses for Iquitos, Peru', 23 March 2018, https://www.archdaily.com/889897/architects-propose-120-incremental-social-houses-for-iquitos-peru; David Basulto, 'Incremental Housing Strategy in India / Filipe Balestra & Sara Göransson', 8 May 2009, https://www.archdaily.com/21465/incremental-housing-strategy-in-india-filipe-balestra-sara-goransson; Kaley Overstreet, 'Is There a Future for Open Source Architecture?', 9 June 2022, https://www.archdaily.com/983160/is-there-a-future-for-open-source-architecture; Danae Santibañez, 'Incomplete House / estudio relativo', 7 July 2018, https://www.archdaily.com/897012/incomplete-house-estudio-relativo; Joseph Kennedy, '"Permanently Unfinished": The Evolution of Architecture in the Galapagos Islands', 11 January 2017, https://www.archdaily.com/802383/permanently-unfinished-the-evolution-of-architecture-in-the-galapagos-islands.
3. The 2016 and 2021 Pritzker prizes granted to Alejandro Aravena from the practice Elemental, and Lacaton and Vassal, exemplify this recognition.
4. See notes 7 and 8 below.
5. *I-Ching or Book of Changes,* trans. Richard Wilhelm and Cary F. Baynes (New York and London: Penguin, 1989).
6. Heinrich Wölfflin, *Principles of Art History: The Problem of the Development of Style in Later Art*, trans. M. D. Hottinger (New York: Dover Publications, 1950).
7. Umberto Eco, *The Open Work*, trans. Ana Cancogni (Cambridge, MA: Harvard University Press, 1989).
8. Oskar and Zofia Hansen, 'The Open Form in Architecture – the Art of the Great Number', in *CIAM '59 in Otterlo,* ed. Oscar Newman (Stuttgart: Karl

Krämer, 1961), 190–92; Dirk van den Heuvel, ed., *Jaap Bakema and the Open Society* (Amsterdam: Archis, 2018); Colin St. John Wilson, 'Open and Closed', *Perspecta* 7 (1961): 97–102.

9. Richard Sennett, 'The Open City', *Lotus International* 168 (January 2019): 117–29.
10. Carlo Ratti and Matthew Claudel, *Open Source Architecture* (London: Thames and Hudson, 2015).
11. Esra Akcan, *Open Architecture: Migration, Citizenship and the Urban Renewal of Berlin-Kreuzberg by IBA-1984/87* (Basel: Birkhäuser – de Gruyter Academic Press, 2018).
12. For yet another interesting form of open architecture see Charles Jencks and Nathan Silver, *Adhocism: The Case for Improvisation* (Cambridge, MA and London: MIT Press, 2013).
13. Rowe, 'The Architecture of Utopia', 216.

Biography

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Writing Open Architecture as a book on Human Rights (and against Nation-States)

Esra Akcan

When I conducted my first recorded interview with a resident in Berlin's Kreuzberg, which made its way, first, to an article on Álvaro Siza's *Bonjour Tristesse* building (2009), and then, to my book *Open Architecture* (2018), I had not anticipated that this curiosity would turn into a book-length project and occupy me for a decade.[1] [Fig. 1] Nor did I have the concept of open architecture in mind. Indeed, I arrived at this concept while researching the urban renewal of Berlin's immigrant neighbourhood, rather than at the start as if it were a theoretical recipe I had inherited to employ during research. Composing a theory of open architecture felt like manufacturing the key I had been looking for.

The word 'open' had been used in conjunction with other nouns, such as 'open plan' by Mies van der Rohe, 'open work' by Umberto Eco, 'open society' by Karl Popper, 'open city' by Roberto Rosselini, and in a very different sense by Alison Smithson, 'open form' by Oskar Hansen and Zofia Hansen, and yet 'architecture' was curiously absent.[2] I settled on defining open architecture as a new ethic of hospitality toward the immigrant, a new welcoming of the mind that had been hitherto perceived as the 'other'. The book asked what would have happened if the architecture discipline and profession were more welcoming to the immigrant, and called this open architecture. This was a history in the past subjunctive sense, a history of possibility, if you wish, that found clues to open architecture in the past, but also realised how they came up short in matters related to global migration.[3]

The book articulated the formal, programmatic and procedural aspects of latent open architecture, in the sense of prerequisites or inspirations for an open architecture-to-come. These included flexibility and adaptability of form, collectivity and collaboration, participatory processes, and multiplicity of meaning. An astonishingly large number (about 200) of cutting-edge and established architectural offices from Europe and the United States had been invited to contribute to design public housing during Kreuzberg's urban renewal (Internationale Bauausstellung (IBA) 1984/87), including, in alphabetical order, Peter Eisenman, Vittorio Gregotti, Zaha Hadid, John Hejduk, Herman Hertzberger, Rem Koolhaas, Rob Krier, Aldo Rossi, Álvaro Siza, Frei Otto, Oswald Mathias Ungers, and many other important but understudied professionals whose due acknowledgment is hopefully given with this book. Chapters discuss a number of projects from Kreuzberg's urban renewal in relation to one way of achieving open architecture, and by conducting oral histories with the immigrant residents of these buildings. Above all, the book's aim is to make its readers realise that it is the expansion of human rights and social citizenship that would achieve open architecture.

This last sentence might cause a reader to pause and ask what a flexible plan, for example, has to do with human rights (one of the book's reviewers asked what architecture has to do with racism). Looking back, I can see even more clearly how I tried to exist in two very different sets of literatures and audiences: those interested in architecture, and

those involved in migration. And indeed, the book emerged out of my dissatisfaction with the gap between the two. Open architecture as a concept is the result of weaving them together: it calls architects to be more attentive to the issue of global migration, and migration scholars to pay heed to architecture. Migration brings both conflicts to architecture, such as housing shortages and racist discrimination in urbanisation, but also inspiring transformations and potentials for cosmopolitan ethics and sociocultural rejuvenations. The impact of architecture on migration is equally foundational. Hannah Arendt did not fail to notice that housing is the first major human right lost to the refugee:

> The first loss which the rightless suffered was the loss of their homes, and this meant the loss of the entire social texture into which they were born and in which they established for themselves a distinct place in the world.[4]

While there are many layers in the book *Open Architecture*, this article foregrounds the relation between migration, racism and human rights, and how this calls on us to change our conventional ways of designing buildings and writing architecture histories.

Migration and racism

Many agree that the twenty-first century will be the age of migrations as a result of the global challenges of our time, including climate change, political unrest, social and economic inequality, and food insecurity. On the one hand, migration sounds awfully familiar to our ears. On the other hand, we are constantly exposed to its wounds. On the one hand, Germany owes much of its post-war prosperity and cultural richness to immigrant labour and arts, but, on the other hand, it has hardly acknowledged itself as an immigrant country. On the one hand, the United States is celebrated as a nation of immigrants, but, on the other hand, it has deported almost fifty-seven million people since 1882 – more than it has legally allowed as permanent habitants in the last century.[5] I wrote *Open Architecture* in wake of the world's biggest refugee crisis since the Second World War due to the War in Syria and the violation of academic freedom around the globe that pushed countless academics and journalists into exile, and the continuing travel ban, DACA (Deferred Action for Childhood Arrivals) termination and family separation in the US. Among many different fault lines, the Covid-19 pandemic exposed the hypocrisy of immigration policies: we realised once more that the undocumented immigrants that rulers consider deportable and disposable are actually the essential workers who maintain the food supply chain when the rest of the population can stay at home to protect themselves from the virus. I am writing this article in the midst of another refugee crisis as the NATO forces pull out of Afghanistan without accountability for the war damages they have participated in creating. You will probably be reading it during another crisis.

Migration and racist discrimination are indeed long-standing and intertwined phenomena that reproduce each other. They also require our attention because the future is prone to their multiple impacts and possible injuries. Despite the reality of migration that looms over our planet's future, the current international laws that determine the human rights regime fall well short of facing up to this challenge in a way that secures the dignity of the migrants or in a way that brings global, social and environmental justice. World authorities are reacting to this challenge with anti-immigrant and nationalist policies, rather than rethinking the border systems that block migrations, or preparing the legal framework of reparations to refugees.

These issues were already at stake during Kreuzberg's urban renewal throughout the 1980s. Examples abound of the racialisation of and discrimination against immigrant workers, both socially and legally. During the 1960s and 1970s in Berlin, the immigrant workers from Turkey were pushed into the war-torn Kreuzberg, where landlords did not

Fig. 1: View from the exhibition: Esra Akcan, ‘Open Architecture: A Book on Migration’, Hartell Gallery, AAP, Cornell University, 30 September to 9 October 2019, Ithaca, New York.

perform legally required maintenance, since noncitizen families could hardly make official complaints about the decaying state of their apartments. Many other social practices took advantage of immigrants' lack of rights. Toilet decrees explaining how to handle human waste, foreigner classes segregating the education of German and Turkish children, and newspaper advertisements that made it clear that immigrants were not eligible to rent apartments all made clear the social separation and othering of 'guest workers'. There is abundant evidence and examples recorded in the oral histories with immigrant residents in *Open Architecture,* but in order to paint a more concrete picture, let me bring your attention to a movie that is not mentioned in the book. Sohrab Shahid-Saless's *Far From Home* (1975) starts, ends and is rhythmically divided with a scene where the main protagonist repeats the same action in front of a machine, like all factory workers on assembly lines whose labour is alienated from the end product. It is clear that the Turkish-speaking man is in Germany as a worker, and only as a worker. The Germans he encounters away from work, on the street, in the park or U-Bahn, either look down on him, ignore his conversation starters or tell him to go back to his home country. He is a 'guest worker' in legal terms, an *Ausländer* (foreigner) in daily parlance. It is as if he should do his work to help West Germany prosper, but become invisible. It is as if he should not take up any space in the train while commuting to work; as if he should not take the stairs up to his apartment after coming back from work; as if he should not have a family; as if he should not have a decent apartment with a room of his own; as if he should not leave the immigrant neighbourhood during his free time; not take a walk in the park; not socialise; and not have sex.[6]

Nor was there any shortage of racist discrimination in the legal sphere and urban policy that shaped Kreuzberg's urban renewal. This public housing initiative took place in the context of discriminatory housing laws and regulations instituted by the Berlin Senate, such as the ban on entry and settlement, and the moving quota. Justified as the 'integration of guest workers', these Senate laws prohibited the movement of additional migrant families to certain boroughs, and mandated that only 10 per cent of residential units be rented to non-citizens in West Berlin. Mid-way through the realisation of IBA, the majority in the Senate shifted to the Christian Democrats, who mobilised additional anti-immigration policies. These laws were transposed into the functional programme of new buildings during Kreuzberg's urban renewal mandating only a small percentage of new housing to be flats large enough for extended migrant families. In particular, this urban renewal programme would either diminish non-citizen families' chances to move into new public housing, or welcome them only after they had changed their lives to fit German standards of family size. In this context, architects found themselves participating in designs sanctioned from above, policies against equal rights for immigrants, and hindrance of immigrant public housing. But it was important for me to also find out about practices that moved toward a just, collaborative and cosmopolitan understanding despite the regulatory regimes. *Open Architecture* discloses how policymakers used architecture as a mechanism of social control and displacement, but at the same time also discusses how architects responded with varying degrees of complicity, irony, or subversion to these discriminatory housing regulations.

Human rights and nation-states

Looking at migration and architecture together brought me to the realisation of a fundamental and continuing paradox about human rights and nation-states. Despite its omnipresence in daily language, the definition of human rights as a concept has not been settled easily and remains unresolved. The concept of human rights has received its own share of suspicion and reproach from authors at different ends of the political spectrum. The far-right press continues to portray human rights as an alibi

to protect criminals and constrain governments in punishing them.[7] Historically, Jeremy Bentham ridiculed the foundational premise of human rights, that all human beings are born free – perhaps to be expected from the inventor of the Panopticon, who disciplined human bodies with an architectural device – and rebuked the idea that natural and inalienable rights should be distinct from legal rights, because that, he claimed, would be an invitation to anarchy.[8] Karl Marx famously opposed human rights for their egoistic preoccupations that protect individuals instead of political communities, and for reducing the definition of the 'true' human being to a bourgeois.[9] Despite this criticism, many subsequent thinkers from the Left have used the concept of rights to criticise inequality and oppression, in the field of urbanism most famously Henri Lefebvre.[10] As early as Olympe de Gouge's and Mary Wollstonecraft's appeals, feminist critique has exposed the hypocrisy of gender discrimination in the initial declarations that advocated for the rights of 'man and citizen'.[11] Another common objection has been the assertion that the concept of human rights is a Western invention and its universalisation therefore an imperialist expansion.[12] Episodes when Western superpowers used human rights as an excuse for military intervention to serve other interests stand as the worst scandals in human rights history. Gayatri Spivak has formulated a critique of the potential coloniality of human rights activism and proposes to rectify it through a 'suturing' educational programme that revises both Western and local structures.[13] When the same measures and steps are applied universally, international law becomes ignorant of domestic practices and sabotages the fulfilment of human rights. When perceived as a toolkit that can be applied anywhere without translation, human rights activism defeats its own purpose.

With some of these fallacies corrected but others unresolved, the concept of human rights continues to be relevant today for moral commitment to rectify injustice and ensure equality, or for political action to protect human dignity, enable participatory democracy and foster progressive change, or still, for education of the senses to build empathy for the oppressed. Despite numerous challenges from sceptics and authors with different moral philosophical convictions, 'the claim to "natural rights" has never been quite defeated,' as Margaret MacDonald summarises:

> It tends in some form to be renewed in every crisis in human affairs, when the plain citizen tries to make, or expects his leaders to make, articulate his obscure, but firmly held conviction that he is not a mere pawn in any political game, nor the property of any government or ruler, but the living and protesting individual for whose sake all political games are played and all governments instituted.[14]

Open Architecture argues that Kreuzberg's urban renewal exposes one of the remaining paradoxes of human rights. The Berlin Senate's laws and regulations about the immigrants constituted a violation of human rights, but were made legally possible by taking advantage of the fact that a noncitizen's rights are not protected in the contemporary human rights regime. Article 13 of the Universal Declaration of Human Rights reads: 'everyone has the right to freedom of movement and residence with the borders of each State.' Accordingly, the Berlin Senate's laws could not have been instituted for citizens. Moreover, during the time that these regulations were put in place, it was procedurally impossible for 'guest' employees from Turkey to fulfil the immigration requirements and become naturalised, which meant that the laws and regulations easily and consciously targeted this immigrant population by taking advantage of the citizenship law. The collapsibility of race and noncitizenship conveniently served to exert discrimination under the pretext of law.

Hannah Arendt, Giorgio Agamben, Gayatri Spivak and others have exposed the limits of this continuing attachment between human and citizenship rights in protecting noncitizens.[15] Kreuzberg's

urban renewal is a typical case showing the paradoxes of the current human rights regime as it reflects on housing and urbanism. Agamben revisits Arendt's text 'We Refugees,' written in response to the biggest refugee crisis during World War II, precisely because statelessness continues to be prolific, and simultaneously exposes the limits of modern institutions in securing human rights.[16] The stateless put into question the limits of the human rights that presume the condition of being a citizen of a state. Ever since the first declaration of rights, the link between natural and civil rights, 'man' and 'citizen,' and birth and nationhood has continued to define human rights, making it impossible to have rights without citizenship. A refugee who loses citizenship status in a country would immediately recognise that the inalienable rights of being a human – the rights that a human being should have by virtue of being born – are actually unprotected unless one belongs to a nation-state. 'The paradox here,' writes Agamben, 'is that the very figure who should have embodied the rights of man par excellence – the refugee – signals instead the concept's radical crisis.'[17]

It is important to remember that people have been excluded from citizenship throughout the history of citizenship. Slaves, women, colonial subjects, guest workers, legal aliens, undocumented immigrants, and refugees have all been identified as noncitizens at some point in the past, and some of them continue to be identified in this way today. Moreover, when applied to the notion of social citizenship, noncitizens also include people excluded from citizenship because of socially constructed notions of class, race, gender, ethnicity, or religion. Much has been said about T.H. Marshall's tripartite definition of citizenship as civil, political, and social citizenship, and others have challenged him on numerous fronts, especially for his account of the concept's historical evolution and his assumption of a unitary process tied to the British context.[18] Nonetheless, his insight into the three types of rights continues to have an explanatory power. According to this framework, social citizenship rights are those tied to economic welfare and security, such as insurance against unemployment and rights to health care, education, housing and a pension. People who were once noncitizens often continue to be denied social citizenship after naturalisation, as the exclusion of former slaves, colonial subjects, or guest workers is projected onto the present in the form of class difference and white supremacy. Étienne Balibar also theorises the relation between internal and external exclusions from citizenship, to understand the mechanism that denies legal citizens the right to have rights. 'An "external" border is mirrored by an "internal" border,' Balibar writes, to such an extent that citizenship becomes a club to which one is admitted or not regardless of one's legal rights.[19]

> It is always citizens 'knowing' and 'imagining' themselves as such, who exclude from citizenship and who, thus, 'produce' non-citizens in such a way as to make it possible for them to represent their own citizenship to themselves as a 'common' belonging.[20]

Exposing the violability of noncitizens' human rights in *Open Architecture* therefore caused me to question the order of the global nation-state itself. Any nation, as Benedict Anderson made us aware in his foundational work *Imagined Communities,* is by definition constructed and limited.[21] Today, a nation seems to us as a natural, given category that must always have existed. But the concept of nationalism is a product of modern times, and constructed simultaneously with the concept of human rights. Nation-states as new sovereign forces filled in the void that had been left by the decline of dynasties, monarchs or religious communities from the eighteenth century onwards. A nation is a constructed, imagined community, far from one whose members are attached to each other by a biological glue. A nation is by definition limited, because it is restricted to a certain number of people and bound by a territorial and conceptual border, beyond which another nation starts. In the modern world, it is expected

that everybody has a nation, just as everybody has a name or gender. The constructed idea of a nation has been naturalised and normalised to such an extent that nations are regarded as essential, unchanging, and fixed attributes of human beings that are supposedly attached to them from birth. The world is organised as a series of nations, and being a citizen of a nation-state is an international norm.

But isn't it also this premise of a nation-state that produces noncitizens and refugees, and that consequentially deprives humans from their human rights? Agamben also exposes this paradox:

> The refugee must be considered for what he is: nothing less than a limit concept that radically calls into question the fundamental categories of the nation-state, from the birth-nation to the man-citizen link, and that thereby makes it possible to clear the way for a long overdue renewal of categories.[22]

Architecture alone, of course, cannot revolutionise this global norm that is unlikely to change soon, but architects can design open architecture in a way that expands migrants' rights and social citizenship. And some architects have indeed done so, even though our professional history is full of closed works. *Open Architecture* analyses Kreuzberg's urban renewal from the perspective of this criterion, and identifies different ways of achieving open architecture in this sense. It also shows the agency of racialised subjects in the making of cities, buildings and interior spaces. Today, under the threat of gentrification, many immigrants rightfully take credit for Kreuzberg's urban renewal and its symbolic significance in the global imagination by pointing out their own financial and cultural contributions in making the area a pleasant place to live. As a matter of fact, residents appropriated many apartments designed by high-end architects, whether the architect had anticipated, welcomed or prohibited it, confirming the agency of immigrants in shaping the neighbourhood: bridges were repurposed as bedrooms; voids were converted into kitchens; unfunctional winter-gardens were turned into playrooms; additional rooms from buildings next door that were on higher levels were integrated into apartments. [Fig. 2–4]

Studying the relation between migration and architecture as a matter of human rights exposes the historical roots of contemporary racisms, while giving due acknowledgment to the Black and Brown migrants even in the making of places perceived to be the most white. What gets displaced and replaced here, therefore, is not only the individuals – migrant workers and refugees – but also the notions of conventional architecture and architectural history. By paying attention to immigrant appropriations of domestic and urban spaces, we can register architectural design as something that constantly evolves in time, and acquires new forms and meanings with the contribution of resident architects. By honouring the residents' stories equally with those of the architects, we can admit that architectural history does not end when a building leaves the hand of the professional architect. But open architecture as design starts before occupation and makes room for, anticipates or encourages resident appropriation, participation and interpretation. Open architecture can take different forms. Flexibility and adaptability of form is one. Collective urban design, or the collaboration of nonhierarchically positioned architects in a given urban setting, is another form of open architecture, and so is participatory design (even though its process remains unresolved), involving the anticipation of change, user appropriation, and the unfinished or ongoing nature of work. A significant form of open architecture involves viewing the inhabitant as a subject rather than an object who is supposed to behave in ways predefined by the author-architect. Still another difficult but worthy form of open architecture for the global present involves the ultimate welcoming into design of noncitizens: an individual architect welcoming the stateless, and the opening of architectural discourse to the refugee, the diaspora, and the geographical 'other.'

Fig. 2: View of the Karaçizmeli's appropriation of the void space as a kitchen in Álvaro Siza's Bonjour Tristesse in Block 121 for IBA-1984/87. Photo: author, Berlin, 2012.

Fig. 3: View of the Barış's appropriation of winter garden as bedroom in Oswald Mathias Ungers's building in Block 1 for IBA-1984/87. Barış appropriated one of the two dysfunctional entrance bridges into another bedroom. Photo: author, Berlin, 2011.

Fig. 4: View of the Nişancı family's apartment in Block 81, renovated by IBA Altbau (team-architect: Cihan Arın), where a room from the building next door on a higher level is integrated into the living room. Photo: author, Berlin, 2012.

Notes

1. Esra Akcan, 'A Building with Many Speakers: Turkish "Guest Workers" and Álvaro Siza's *Bonjour Tristesse* Housing for IBA-Berlin', in *The Migrant's Time,* ed. Saloni Mathur (New Haven: Yale University Press, 2011), 91–114; Esra Akcan, *Open Architecture: Migration, Citizenship and the Urban Renewal of Berlin-Kreuzberg by IBA-1984/87* (Basel: Birkhäuser-de Gruyter Academic Press, 2018).
2. Karl Popper, *The Open Society and Its Enemies* (Princeton: Princeton University Press, 2013 [1945]); Umberto Eco, 'The Poetics of Open Work', in Eco, *Open Work,* trans. Anna Cancogni (Cambridge, MA: Harvard University Press, 1989 [1962]), 1–24; Roland Barthes, 'The Death of the Author', in Barthes, *Image Music Text*, trans. Stephan Heath (New York: Hill and Wang, 1977), 142–48; Alison Smithson, ed. *Team 10 Primer* (Cambridge, MA: MIT Press, 1968); Oskar Hansen and Zofia Hansen, 'The Open Form in Architecture: The Art of the Great Number', in *Opening Modernism* (Warsaw: Museum of Modern Art in Warsaw, 2014 [1961]), 7–9.
3. For more on the history of possibility, see Stop 6 in Akcan, *Open Architecture.*
4. Hannah Arendt, 'The Perplexities of the Rights of Man', in Arendt, *The Origins of Totalitarianism* (New York: Harcourt Brace and Co., 1973), 293.
5. Adam Goodman, *The Deportation Machine: America's Long History of Expelling Immigrants* (Princeton: Princeton University Press, 2020).
6. Sohrab Shahid-Saless, dir., *Far From Home,* Berlin-Hamburg and Neue Film Gruppe Teheran, 1975.
7. Even though many readers may recognise this perception of human rights in numerous countries, U.K. is a good example. See: Andrew Clapham, *Human Rights* (Oxford: Oxford University Press, 2007).
8. Jeremy Bentham, *Anarchical Fallacies; Being an Examination of the Declaration of Rights issued during the French Revolution,* vol. 2, *The Works of Jeremy Bentham,* ed. J. Bowring (Edinburgh: William Tait, 1843), https://oll.libertyfund.org/title/bowring-the-works-of-jeremy-bentham-vol-2#lf0872-02_head_411.
9. Karl Marx, 'On the Jewish Question', 1843. *Karl Marx. Early Writings* (NY: McGraw Hill, 1964); an online version is available: https://www.marxists.org/archive/marx/works/1844/jewish-question.
10. Henri Lefebvre, 'The Right to the City' [1968], in *Writings on Cities*, trans. and ed. Eleonore Kofman and Elizabeth Lebas (London: Wiley-Blackwell, 1996); an online version is available: https://theanarchistlibrary.org/library/henri-lefebvre-right-to-the-city.
11. Olympe de Gouge, 'The Declaration of the Rights of Woman', in T*he French Revolution and Human Rights: A Brief Documentary History,* trans. and ed. Lynn Hunt (Boston: 1996 [1791]), 124–29, https://revolution.chnm.org/d/293; Mary Wollstonecraft, *A Vindication of the Rights of Women,* 1792. (Mineola: Dover Publications, Inc.1996).
12. Amartya Sen named this as the cultural critique, but he also showed its intellectual weakness. Amartya Sen, 'Culture and Human Rights', in Sen, *Development as Freedom* (New York: Alfred Knopf, 2000), 227–48; Sen, 'Elements of a Theory of Human Rights', *Philosophy and Public Affairs* 32, no. 4 (2004), 315–36; Sen, 'Human Rights and Capabilities', *Journal of Human Development* 6, no. 2 (July 2005), 152–66.
13. 'I am suggesting that human rights activism should be supplemented by an education that should suture the habits of democracy onto the earlier cultural formation … the real effort should be to access and activate the tribals' indigenous "democratic" structures to parliamentary democracy by patient and sustained efforts to learn to learn from below.' Gayatri Spivak, 'Righting Wrongs', *The South Atlantic Quarterly* 103, no. 2/3 (Spring/Summer 2004): 523–81; 548.
14. Margaret MacDonald, 'Natural Rights', in *Theories of Rights,* ed. Jeremy Waldron (Oxford: Oxford University Press, 2009), 21–40; 21.
15. Hannah Arendt, 'We Refugees', *Menorah Journal* 1 (1943): 77. Also see: Giorgio Agamben, 'We Refugees', trans. Michael Rocke, *Symposium* 49, no. 2 (1995): 114–19. For a revised version, see Giorgio Agamben, 'Biopolitics and the Rights of Man', in

Agamben, *Homo Sacer: Sovereign Power and Bare Life,* ed. Werner Hamacher and David E. Wellbery, trans. Daniel Heller-Roazen (Stanford: Stanford University Press, 1998), 126–35.

16. Giorgio Agamben, 'We Refugees', trans. Michael Rocke, *Symposium* 49, no. 2 (1995): 114–19. For a revised version, see Agamben, 'Biopolitics and the Rights of Man', in Agamben, *Homo Sacer: Sovereign Power and Bare Life,* ed. Werner Hamacher and David E. Wellbery, trans. Daniel Heller-Roazen (Stanford: Stanford University Press, 1998), 126–35.
17. Agamben, *Homo Sacer,* 126.
18. T. H. Marshall, *Social Policy in the Twentieth Century* (London: Hutchinson, 1965); see also Richard Bellamy, *Citizenship* (Oxford: Oxford University Press, 2008); Bryan Turner, 'Outline of a Theory of Citizenship', in *Dimensions of Radical Democracy: Pluralism, Citizenship, Community*, ed. Chantal Mouffe (London: Verso, 1992), 33–62.
19. Étienne Balibar, *Citizenship*, trans. Thomas Scott-Railton (Cambridge: Polity Press, 2015), 69–70; Chantal Mouffe, 'Democratic Citizenship and the Political Community', in *Dimensions of Radical Democracy*, 225–39.
20. Ibid., 76.
21. Benedict Anderson, *Imagined Communities: Reflections on the Origin and Spread of Nationalism* (New York: Verso, 1983).
22. Ibid., 134.

Biography

Esra Akcan is a Professor and the Michael A. McCarthy Professor of Architectural Theory in the Department of Architecture at Cornell University. Akcan received awards and fellowships from the Radcliffe Institute for Advanced Studies at Harvard University, Graham Foundation (three times), the Canadian Center for Architecture (twice), American Academy in Berlin, UIC, Institute for Advanced Studies in Berlin, Clark Institute, Getty Research Institute, CAA, Mellon Foundation, DAAD and KRESS/ARIT. She is the author of *Landfill Istanbul: Twelve Scenarios for a Global City*; *Architecture in Translation: Germany, Turkey and the Modern House*; *Turkey: Modern Architectures in History* (with S.Bozdoğan); *Open Architecture: Migration, Citizenship and the Urban Renewal of Berlin-Kreuzberg by IBA-1984/87*, and *Abolish Human Bans: Intertwined Histories of Architecture*.

Ventotene and Gorizia: Opening the Panopticon

Sebastiano Fabbrini

> What am I that I should essay to hook the nose of the Leviathan?
> Herman Melville, *Moby Dick*[1]

Ever closer

Amid the ruins of a war-torn continent, European integration was set up both as a project of openness and as an open project. It was a direct response to the horrors of war and, on a deeper level, it set out to reform the structure of power that had led to that crisis: the state, in its nationalist degeneration.[2] In a spatial sense, it pursued openness by removing borders and connecting previously separated domains. From Locke to Schmitt, enclosure was understood as the basis of statehood.[3] The act of fencing off generated identity as well as conflict. Or, rather, identity through conflict. Rob Walker has described it as the politics of 'inside versus outside.'[4]

The concept of openness also underlay the temporal dimension of European integration. From the very beginning, it was envisioned as an open work of economic and political integration that could move in different directions over time, without a pre-determined destination.[5] In the literature on European integration, this is known as the issue of finality. Joschka Fischer has provided a thorough reflection on this issue, analysing the integration of Europe as 'a gradual process with no blueprint for the final state.'[6] The term 'process' is key in this discourse. Although there are countless diverging readings of European integration, the one aspect on which everyone agrees is that it constitutes a process. This is far from a value-free interpretation. Embracing such open-ended, processual logic meant abandoning the toolkit on which previous polities had relied to establish themselves. For example, the European community does not have a constitution. In his seminal declaration of 1950, Robert Schuman set the tone right away: 'Europe will not be made all at once, or according to a single plan.'[7] The dichotomy between plan and process is at the core of this development.[8] Historically, planning had provided the most effective way to control events in space and time, generating closure.

While many see it as a frustrating shortcoming, the indeterminate unfolding of European integration is not an accident. The openness of the process, its proceeding through gradual spillovers, must be understood in the light of the historical context from which it sprang forth. After two global conflicts, the European project grew out of a profound critique of closed systems of power, which, as illustrated by thinkers like Popper and Hayek, had turned out to be incompatible with freedom and peace.[9]

At the establishment of the European Economic Community in 1957, the foreign ministers of the founding states put in writing their determination to 'lay the foundations of an ever-closer union among the peoples of Europe.'[10] The same formula was echoed thirty-five years later, at the signing of the Treaty of Maastricht, as the member states agreed to 'continue the process of creating an ever-closer union.' The source of inspiration was the notorious reference to a 'more perfect union' in the preamble of the United States constitution.[11] But the focus on perfection gave way to a reflection on spatial

relations, pointing to an increasing degree of proximity and integration within a common house, while recognising that neither complete closeness, nor closure, would ever be achieved.

Can of tuna

The inherent challenge behind European integration is giving form to an open process, somehow anchoring it in an institutional framework. The challenge is made even more complex by the necessity to contend with a pre-existing, extremely well-established foundation, which responds to a different logic: the closed foundation of state power. In light of such complexity, a vast literature has been devoted to the 'institutional architecture' of the European community.[12]

In spite of the constant use of architectural metaphors, the actual role of architecture in the construction of the 'European house' has remained largely unexplored. In previous systems, especially as it pertained to state-building, the institutionalisation of power had been one of the primary domains of engagement. While itself going through a process of institutionalisation, architecture proved to be a valuable contributor in the effort to translate an abstract idea of power into a set of concrete, operative institutions.[13]

Because of their unique trajectory, two buildings in Italy that are commonly associated with this chapter in the history of architecture-power relations, have now come to occupy a new position, intersecting with the dynamics of Europe-building: the prison of Ventotene and the hospital of Gorizia. As such, they provide a rare opportunity to examine the tensions behind the European project, focusing on tangible objects, beyond the metaphorical level. Two panoptical structures, conceived at opposite ends of the nineteenth century, they are now undergoing a radical transformation, as local authorities set out to convert them into EU buildings. If European integration is about openness, then a panopticon – the closed architecture par excellence constitutes the most challenging laboratory to discuss European power and its relation with the aforementioned foundation.[14]

Shortly before these proposals took form, a new movement entering Italian politics famously proclaimed its intention to crack open the parliament like a can of tuna fish – a rallying cry that was eventually toned down when its members came into power.[15] The proposals at work in Ventotene and Gorizia may be reminiscent of this operation, while outlining a very different project of opening. On the one hand, the panopticon is the hardest 'can' to crack open. On the other hand, there is no better site to play out the tensions between the openness of European integration and the closedness of the structures on which (and, partly, against which) it was imagined. In both cases, the question behind the design prompt is simple, yet very difficult: how does an open process engage with a closed plan?

Myopia and the political

Recent studies have questioned a series of long-held assumptions concerning the relationship between architecture and political power. Albena Yaneva made a long list: 'architecture reflects politics and can produce political effects; architects are agents of power; architectural styles mirror political shifts; architecture helps the construction of identities; building types embody politics.'[16] Rather than issues of meaning or representation, scholars are increasingly focusing on what buildings do, underlining the political forces within the process of architecture. Moving away from overshadowing theories of power, the political claim of architecture is given a new, albeit smaller home at the 'myopic, microscopic level of the practice.'[17] The argument is that architecture needs to be refocused on its own inner workings, after having been improperly instrumentalised by (or in the name of) external forces, which made it into a site of projection, mirroring and embedding.

Because of its open, borderline ambiguous articulation, defined by contingencies rather than plans, European integration does not fit into this

understanding of power relations. Since their inception in the 1950s, the institutions of the European community have gone to great lengths to avoid any direct architectural statement – anything that could be interpreted as a projection of power or the representation of a new order. The hodge-podge that is the Quartier Européen in Brussels is the result of such withdrawal.[18]

This is not a case of architecture being manipulated by an overbearing authority for its own purposes. On the contrary, the European institutions have mostly stepped away from the field of architecture, precisely because of its representational baggage, understanding that any misstep in the manifestation of their fragmented, fragile power could lead to a nationalist backlash. Even the apparently simple project of elaborating a set of architectural images for the euro banknotes – a rare attempt by the community institutions to touch an architectural topic, albeit in a very limited, cautious manner, nevertheless generated a major controversy.[19]

As addressing 'big political forces' has increasingly become taboo in architectural theory, some of those forces have already stopped considering architecture altogether, especially in Europe.[20] Only recently, a handful of individuals have started to bridge this gap, trying to explore ways to engage, in architectural terms, with such a reluctant, often cryptic form of supranational power. For example, a group of young architects from Venice has put forward a proposal to create a pavilion of the European Union at the Biennale.[21] Of course, the goal is not to produce a representation of European power, but rather to stimulate a much-needed, critical conversation about that power, employing architectural tools and methods.

Although the nationalist matrix of the Biennale constitutes a radically suitable testing ground, the cases of Ventotene and Gorizia push this conversation into an even more extreme setting, effectively outlining a scenario where some kind of European pavilion may emerge from an existing panoptical structure. As these proposals are starting to gain momentum, the purpose of the following analyses is to take a step back, provide context and trace the history of these two buildings, in an effort to examine both the big and the small political dynamics that intersect with such projects of opening.

The powers of the state

The case of Ventotene has the deeper historical roots, going back to the late eighteenth century. Its relevance to the current discourse, however, has to do with a series of contingencies that, during War World II, turned this remote outpost into an unlikely cradle of the European project.

The Ventotene manifesto, originally titled *For a Free and United Europe*, took form in the summer of 1941. The document that paved the way for the process of European integration, projecting a vision that transcended national borders, was drafted, clandestinely, by a handful of outcasts – political troublemakers who had been arrested by the Fascist regime and confined for years to this small island in the middle of the Mediterranean. Altiero Spinelli, in collaboration with Ernesto Rossi and Eugenio Colorni, wrote the manifesto on cigarette paper and, with the help of Ursula Hirschmann, managed to hide it inside a dead chicken and smuggle it to the continent, where it was eventually disseminated by members of the Italian resistance.[22]

Due to its ideal position and rocky coasts, the island of Ventotene, one of the Pontine islands off the coast of Gaeta, at the border between Lazio and Campania, was one of the main 'colonies of political confinement' during the Fascist period.[23] The individuals detained there were those at the top of Mussolini's list of 'maximum dangerousness' – political prisoners. They were divided into groups, the size of which can be discerned from the number of canteens at their disposal: seven canteens for the communists, two for the anarchists, one for the socialists (led by future president of the Italian republic, Sandro Pertini), one for the

Fig. 1: Map of Ventotene (below) and the *scoglio* of Santo Stefano (above), early nineteenth century. Source: Studurba, Piani Regolatori, Florence.

Fig. 2: View of the interior courtyard of the Santo Stefano panopticon, featuring a fictional glass chapel, first half of the nineteenth century. Source: Società Napoletana di Storia Patria, Naples.

so-called manchurians or political spies and, last but not least, one for the group that revolved around Spinelli, which would later become the European Federalist Movement. It just so happened that the latter was branded with the letter 'E' and, of course, came to be called 'canteen Europe.'

While the regime aimed to isolate its opponents, bringing together all of these activists – almost nine hundred people, including some of the most influential minds of the antifascist resistance – transformed Ventotene into a vibrant political laboratory, a place to workshop ideas and imagine how Italy and Europe could move forward after the war.

Spinelli arrived on the pier of Ventotene in July 1939. He was thirty-two years old and had been incarcerated for most of his adult life: the charge was 'conspiracy against the powers of the state.'[24] He was first arrested in 1927 and, before being sentenced to confinement in Ventotene, he had been detained in the prisons of Milan, Lucca, Viterbo, Civitavecchia, Rome and Ponza. The particularity of Ventotene was that it was a penal colony: the inmates lived in regular buildings near the port, kept small livestock and managed their own canteens. The island itself was the prison.

Panopticon on the rocks

There was, however, a separate structure for the prisoners upon whom the regime wanted to inflict a special level of confinement. It was located on a rock in front of Ventotene's harbour, the island of Santo Stefano. [Fig. 1] The penal history of this archipelago actually started on this *scoglio* (literally: rock).[25] In 1795, when this region was under Bourbon rule, Ferdinand IV (king of Naples) ordered the construction of a panopticon on Santo Stefano, the first and only prison of this type in Italy. The project was carried out under the direction of Antonio Winspear, a military engineer and heir of an aristocratic English catholic family that had moved to Naples after the Anglican schism, along with architect Francesco Carpi, a disciple of Vanvitelli. They were both influenced by Cesare Beccaria's *On Crimes and Punishments* and, more importantly, by the theories of Jeremy Bentham, which had been published only a couple of years earlier. According to Rossanna Bellizzi, this is one of the built architectures that comes closest to the utopia of the English philosopher.[26]

While the building followed Bentham's model quite closely, there was a significant change – somewhat of a Southern European twist. The centre of the composition was occupied by a chapel. In a watercolour painting of the early nineteenth century, this structure appears to be made of glass, which would have undermined the visual mechanism of the panopticon, but historians have agreed to dismiss that representation as fictional: in reality, the chapel was hermetic, with narrow windows.[27] [Fig. 2] What is worth noting, however, is the integration of the work of the guard, who would survey the inmates from the inspection tower located above the entryway, with the work of the priest, who would say mass every day in the middle of the prison, so that every inmate could listen from his cell. In this context, the notion of bringing the prisoner to his knees in an attitude of 'penitential prayer' took on a double meaning.[28] As much as Utilitarianism and the movement for penal reform were on the upswing, they still had to contend with the Catholic Church, whose expertise in the business of surveillance and redemption was second to none. In Santo Stefano, church and state were literally sharing the centre of the panopticon.

The other peculiar aspect of this building was that, in contrast with the trend of detaching punishment from the pre-modern realm of the spectacle, Winspear and Carpi explicitly modelled it after the Teatro San Carlo of Naples.[29] In terms of both size and layout, the plans of the prison and the opera house were perfectly superimposable. The boxes of the auditorium were replaced by cells in an analogous horseshoe-shaped structure, as the prisoners took the place of the spectators.

State building

At the time of its construction, this architecture spoke to an absolutist idea of power, whereby there was no degree of separation between the king and the state. Notably, Ventotene and Santo Stefano were part of the so-called allodial estates of the Bourbon family: these were private properties of the king of Naples. And the funds for the construction of the panopticon came from the allodial coffers – the funds that the Bourbons derived from their private activities, which were separated from the kingdom's public finances. The motivation for building such a unique prison was also quite personal to the royal family: as noted by Gea Eliana Mirenda, the declared objective of this project was to 'dampen the effects of the French revolution' and create a powerful deterrent against the so-called Jacobin contagion that was taking over Naples, posing a serious threat to the Bourbon rule.[30] The short-lived experience of the Neapolitan Republic in 1799 proved that Ferdinand IV's concerns were not unfounded.

The Bourbons were eventually able to hold on to power until Garibaldi's expedition. During the war for the unification of Italy, in 1860, the inmates took advantage of the fact that part of the Bourbon contingent had left, took control of the prison and proclaimed the Republic of Santo Stefano. For roughly a year, until the Italian navy recovered the island, the panopticon itself operated as a small autonomous state, with its own statute and government.[31] After this brief parenthesis, the new Italian monarchy picked up where the Bourbons had left off and used Santo Stefano as a place of detention for its most dangerous enemies, including the anarchist who killed king Umberto I in 1900.

The building-island ceased to be a prison in 1965, precisely as a new wave of thinkers had just started to examine the architecture of panopticons, reading it – to quote Barry Bergdoll – as a 'veritable metaphor for the economy and distribution of power and surveillance in modern society.'[32] During the 170 years it was open, the prison experienced and documented, in a microcosm, a series of fundamental shifts in power dynamics: the absolute monarchy of the kingdom of Naples, the parenthesis as an autonomous republic in 1860, the establishment of the Italian state and its nationalist degeneration in the form of the Fascist regime, up to the planting of the seeds of European federalism. In the end, the prison was closed for rather utilitarian reasons, namely the costs and logistical difficulties of maintaining such a unique structure. In other words, the decision did not come from an official at the Ministry of Justice who had enjoyed reading Foucault or Himmelfarb.

All-seen architecture

From the viewpoint of Ventotene, which was used as a place of confinement for a much shorter period of time (roughly corresponding to the Fascist *ventennio*), the all-seeing architecture towering over Santo Stefano had a profound effect. To this day, it is impossible to go anywhere on the island of Ventotene without being aware of the imposing presence of the panopticon on the other side of a tiny stretch of sea. Although it was conceptualised as an inward-looking apparatus, this structure also had an impact on those who, from the outside, were constantly seeing it. It was an unescapable architectural reminder of the power of the regime and how it functioned. Confinement in Ventotene worked on two levels: in addition to being stuck on a remote island, the prisoners spent all day contemplating an extreme representation of their condition, placed a few yards away on a rocky pedestal.

In the opening section (titled 'The Crisis of Modern Civilization') of his manifesto, Spinelli started by framing the problem that his vision of a united Europe set out to address:

> The nation is no longer viewed as the historical product of co-existence between men who, as the result of a lengthy historical process, have acquired greater unity in their customs and aspirations and who see their state as being the most effective means of organising

> collective life within the context of all human society. Rather the nation has become a divine entity, an organism which must only consider its own existence, its own development, without the least regard for the damage that others may suffer from this. The absolute sovereignty of national states has led to the desire of each of them to dominate, since each feels threatened by the strength of the others. This desire to dominate cannot be placated except by the hegemony of the strongest state over all the others. As a consequence of this, from being the guardian of citizens' freedom, the state has been turned into a master of vassals bound into servitude.[33]

While much has been written about Spinelli's confinement, historians have overlooked the fact that, as he was writing about the 'state-machine' and the project of a European federation during his forced stay in Ventotene, he was looking at a panopticon from morning to night. It was the clearest possible illustration of the 'apparatus of repression' behind Spinelli's object of study: 'the modern Leviathan – the all-powerful, totalitarian sovereign state.'[34]

The Museo Nazionale San Martino of Naples holds a series of cardboard models of the Santo Stefano panopticon, made by inmates in the late nineteenth century, under the supervision of their guards. [Fig. 3] It is unclear how and why this exercise came about. On the one hand, countering the logic of the panopticon, this reversal of roles allowed both the prisoner and the guard to step out and gain an overview of the power mechanism in which they lived, turning the prison into an object of information. One the other hand, the out-of-body experience of looking at a model of one's own domination must have made that condition even more insufferable.

Ship Europe

In 2016, as a way to symbolically relaunch the European project after the Brexit referendum, Italian prime minister Renzi organised a summit in Ventotene with German chancellor Merkel and French president Hollande. The meeting took place on the Italian aircraft carrier *Garibaldi*, which had been anchored between Ventotene and Santo Stefano for the occasion. [Fig. 4] The iconography of European integration as a ship was not new: for example, as far back as 1950, the Marshall Plan was promoted through a poster titled 'All our colors to the mast', which depicted a ship called 'Europe' whose sails were made of all the flags of the European countries. [Fig. 5] Before visiting Spinelli's grave in the Ventotene cemetery, the three leaders convened on the deck of the carrier and held a press conference, which was the main photo-op of the event. Towering in the background of all the photos was not Ventotene, but rather the body of Santo Stefano, surmounted by the panopticon.

In the same year, moved by the spirit that had informed the ship summit, the Italian government launched a project to restore the panopticon, which had been completely abandoned for fifty years, and turn it into a *Scuola di alta formazione Europea* (European school of higher education). Seventy million euros was allocated to the project of transforming the prison into a European school – an endeavour that is currently going through the preliminary design phase. At the beginning of this effort, the prime minister made very clear what the goal was: 'Here we want to educate and form the élite that is going to govern the European Union in the coming decades.'[35]

Ironically, the ease with which the Italian government thought this building could go from being a prison to being a school, without modifying the layout, seems to align with the theory behind the panopticon. In his writings, Jeremy Bentham explained that his 'plan of management' could be applied to a wide range of structures that required the 'inspection' of large numbers of people: in addition to prisons, the list included 'hospitals, mad-houses, houses of correction, work-houses, poor-houses, houses of industry, manufactories and schools.'[36] The point of reference was the work of his brother,

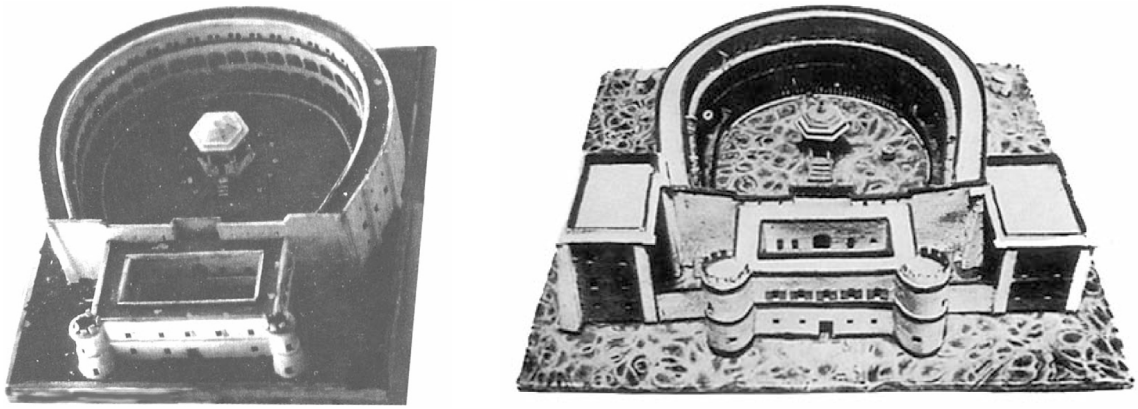

Fig. 3: Models of the Santo Stefano panopticon, built by inmates in the late nineteenth century. Source: Museo Nazionale San Martino, Naples.

Fig. 4: The European summit held on the Garibaldi aircraft carrier, in front of Ventotene, on 22 August 2016. Santo Stefano is visible in the background. Photo: Ansa, Rome.

Fig. 5: Poster for the Marshall Plan, designed by Reyn Dirksen in 1947. Source: Library of Congress, Washington, DC.

Samuel Bentham: the only panopticon he managed to build while working in Russia for Prince Potemkin was not a prison, but rather a school.

Madness and crime

This versatility was one of the aspects that drew the attention of Foucault, who interpreted the panopticon as an archetype that informed a wide range of institutions concerned with discipline through surveillance. As noted by Paul Hirst, at the heart of Foucault's reflections was an effort to relate 'a new form of power and a new class of specialist structures, which both developed towards the end of the eighteenth century.'[37] It was very much a question of architectural typology. While *Discipline and Punish* focused on the birth of the modern prison, the first step into this field centred on another, adjacent 'specialist structure' that featured prominently in Bentham's work: the hospital and, more specifically, the asylum.[38]

From this perspective, the proposed Europeanisation of the panopticon in Ventotene goes hand in hand with a similar proposal that took form during the same time in the city of Gorizia: two years ago, the municipal administration launched a project to turn the local, abandoned hospital into a 'European prison.' Notably, this was not a simple, small-town hospital: it was the hospital where Franco Basaglia began his career in 1961 (incidentally, Foucault published *Madness and Civilization* in the same year) and developed the groundbreaking theory of mental health that inspired the so-called Basaglia Law – a comprehensive reform of the psychiatric system that led to closing all *manicomi* (asylums) in Italy.[39] In June 2020, the city council of Gorizia unanimously approved a resolution to begin elaborating a 'project for the institution of a European prison' on the site of the former hospital.[40]

The historical connection between these types of institutions is well documented.[41] In Santo Stefano, a notable incident shows the degree to which the line between asylums and prisons was far from clear. During the Fascist period, the Ministry of Justice decided to devote a section of the panopticon to an experimental programme for extremely unstable, agitated prisoners, mostly people with mental illnesses, who were brought in from other penitentiaries and 'judicial asylums' to receive special treatment. The experiment consisted in subjecting these individuals to complete isolation, uninterrupted surveillance, daily medical examinations, a special diet, continuous cell searches and other severe disciplinary measures. The goal was to 'tame' the subjects that, because of their conditions, had not been able to adapt to life in other disciplinary institutions. This section was called *Teratocomio*, meaning a place for the treatment of monsters.[42] An inscription in Latin placed above the entrance of the panopticon pressed the point: 'As long as the monsters are in chains, the state is stable and your house is safe.'

Institutional care

Like Ventotene, Gorizia has always been a border area, a place of confinement. Along with Nova Gorica, it delineates a continuous city unfolding on the two sides of the Italo-Slovenian border. After Slovenia joined the European Union in 2004, the two towns constituted a 'European Group of Territorial Cooperation' – one of the most advanced examples of cross-border integration. Notably, the former hospital straddles the line between the two counties. In fact, when the *manicomio* was still operational, one of the problems was that patients would often try to jump over the wall and escape into what, at the time, was Yugoslavia. It was a rare case of people attempting to clandestinely jump towards the east side of the iron curtain – an attempt that, in the eyes of the doctors at the time, consolidated the diagnosis of mental illness.

The hospital had been built when this region was still part of the Austro-Hungarian empire, in 1911. The idea was to group in this remote town all the unwanted and problematic individuals from the western province of the empire. The Franz Josef asylum of Gorizia was modelled after the Steinhof,

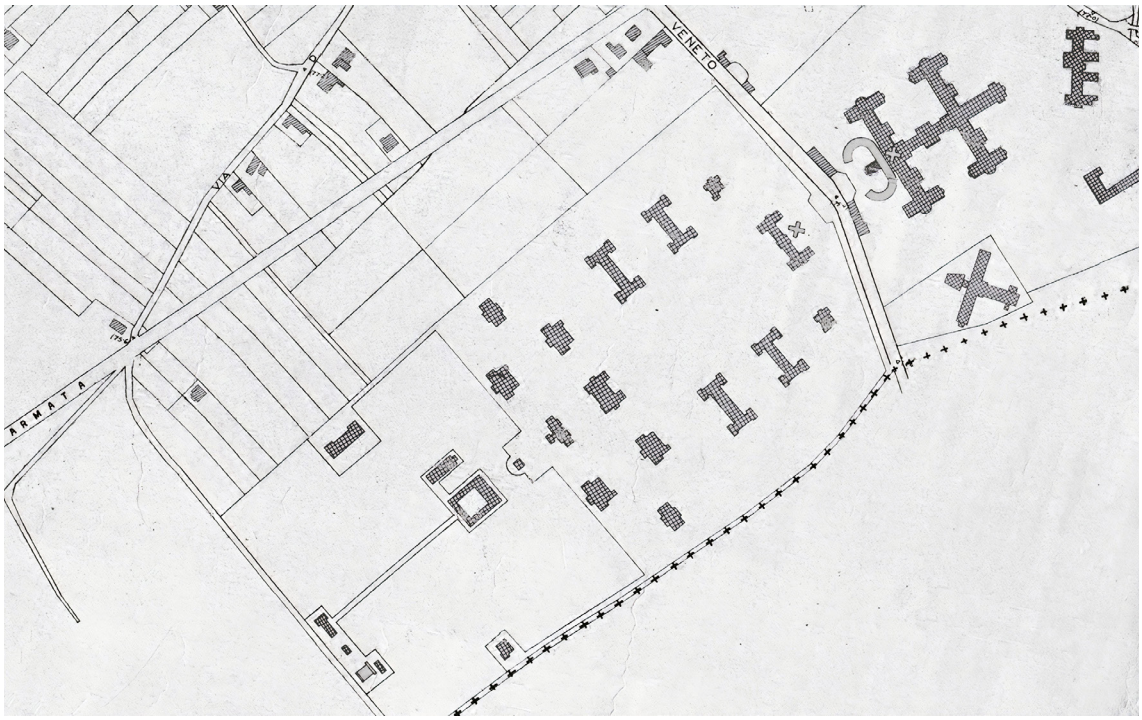

Fig. 6

Fig. 7

Fig. 6: Plan of the Gorizia hospital, excerpt from the *Piano Regolatore Generale* drafted by Luigi Piccinato in 1965. The dotted line in the bottom-right corner marks the border with Yugoslavia, now Slovenia. Source: Università La Sapienza, Archivio Luigi Piccinato, Rome.

Fig. 7: Series of photographs of a patient at the Gorizia asylum, by Carla Cerati and Gianni Berengo Gardin, 1968. Source: Regione Lombardia, Archivi dell'Immagine, Milan.

the Viennese psychiatric hospital designed by Otto Wagner.[43] It was made of a series of pavilions, rigidly arranged around a central open space and subordinated to the director's building on one side and a small chapel on the other. [Fig. 6] At the time, what Florence Nightingale called the 'pavilion principle' (which typically relied on a panoptical layout) was the primary architectural template for this type of institution.[44]

As in the case of Santo Stefano, the Gorizia asylum predated the Italianisation of the region. The city became Italian only in 1919, after World War I. By that time, the hospital had been badly damaged by bombings. Following the rise of the Fascist regime in the 1920s, the building was restored and brought back to its original function, this time confining all the outcasts from what had become the new eastern province of the Italian state.

As noted by Scheper-Hughes and Lovell, when Basaglia took over as superintendent of the Gorizia hospital, he was 'revolted by what he observed as the conventional regime of institutional care: locked doors only partly successful in muffling the weeping and screams of the patients, many of them lying nude and powerless in their excrement.'[45] In his own writings, Basaglia often remarked on the similarity between the asylum and the prison. For example, in an early essay titled 'The Destruction of the Psychiatric Hospital as a Place of Institutionalization', he made the case that the former was even more oppressive than the latter.[46] [Fig. 7] Like Spinelli, Basaglia had experienced the effects of incarceration himself, as he had been jailed during the war because of his contribution to the antifascist resistance.

His views were influenced by Erving Goffman's *Asylums* (also published in 1961) and, specifically, by the concept of 'total institutions' – a term that was meant to define a range of institutions where large numbers of people were 'cut off from the wider society' and forced to 'lead an enclosed, formally administered round of life' in which every activity was conducted collectively 'in the same place and under the same single authority.'[47] As in Bentham's panopticon, everything revolved around a 'single rational plan purportedly designed to fulfil the official aims of the institution.' Again, the question of typology was key. Goffman pointed to five 'types' of total institutions: in addition to hospitals and prisons, he included schools, poor-houses and convents – the same functions that kept being juxtaposed.

Limits to supranational power

On one level, the cases of Ventotene and Gorizia confirm the overlap or continuity between these institutions, which took form in the same period and responded to the same logic. From this point of view, it should not come as a surprise when a prison is turned into a school and a hospital becomes a prison. But these two specific proposals bring about an additional level of complexity, which forces a change of perspective: in both cases, the declared objective is to open these structures to the centrifugal forces of European integration.

The first problem concerns the fact that European integration has not replaced state sovereignty, but has rather reduced it, creating a hybrid system where power is shared between the national and the supranational level. Although the European Union operates in a multitude of areas, there are a few areas where the competence has remained in the hands of the states. The ground-breaking 1963 judgement of the European Court of Justice famously proclaimed that 'the European community constitutes a new legal order of international law, for the benefit of which the states have limited their sovereign rights, albeit within limited fields.'[48] Not included in this set of Europeanised fields were all the affairs that responded to the logic of Bentham's inspection house or Goffman's total institution: criminal law, education and public health. The European Union has no 'legal competence' over prisons, schools and hospitals – the institutions that have historically relied on panoptical models to control, discipline and cure people.[49]

In the latter area, at the very beginning of the process of European integration, in 1952, a committee

of experts (known as the 'white pool' – alluding to the colour of medical coats) was assembled to draft a proposal for the establishment of a European Public Health Community, which would have included the creation of common hospital structures. But this plan was immediately rejected by the member states, as well as by most pharmaceutical companies, which wanted to maintain their consolidated positions within national systems. As it pertains to incarceration, there are no provisions of EU law that say how to administer a punishment or manage a prison. The only agency that the European Union has in this field concerns the effort to help member states 'approximate' or 'harmonise' their national penal codes.[50]

The idea of the promoters of the Gorizia project was to use this first 'European prison' as an opportunity to codify a set of supranational penitentiary standards. As noted in the resolution approved by the city council, the new prison would serve as a 'prototype' and provide a 'model' to which all EU member states could 'conform.' Notably, the person chosen by the mayor of Gorizia to oversee and coordinate this project was the former director of the local prison, Enrico Sbriglia. In his statements, he made clear that the goal was not only to design a prison for Gorizia, but also to establish a new European standard, starting with defining the minimum size of the cells, the width of the windows, the airflow and then addressing all the other aspects of the penitentiary space, including the furniture, the appliances and even the clothes that prisoners should have at their disposal.[51] According to the city council, the new European prison would also function as a 'place of study and research for governments and jurists' – a laboratory for the exploration of new ways to fulfil the 're-educational purpose of punishment.'[52]

Guards without borders

While launching this project, in the autumn of 2020, the mayor of Gorizia also signed an agreement with the Italian Ministry of Justice regarding the expansion of the local prison, a state investment of almost five million euros.[53] Speaking of study and education, this expansion will consist in incorporating the building of the adjacent elementary school *Riccardo Pitteri*, an all-boys' school built in 1909, which is currently unused and abandoned – another fitting reminder of the degree to which schools and prisons are commonly perceived as being spatially compatible and interchangeable.

According to the mayor, the two endeavours would not interfere with each other: the (enlarged) local jail would continue to accommodate 'national criminals', while the proposed European prison would serve to address 'supranational crimes.' Although, from a legal standpoint, European crimes do not exist, Sbriglia pointed to a series of criminal activities characterised by a cross-border dimension, such as the counterfeiting of euro banknotes. Following this line of reasoning, the city council also proposed that each EU member state could send a group of guards to Gorizia, effectively having a rotation of national staffs throughout the year.

The precedent that comes to mind is Spandau, the prison in Berlin that housed the German war criminals sentenced to imprisonment at the Nuremberg Trials.[54] Until 1987, when the last inmate died, the four occupying powers (the United States, United Kingdom, France and the Soviet Union) alternated control of the prison on a monthly basis, each having the responsibility for a total of three months of the year. Every thirty days, a highly choreographed ceremony performed in front of the prison gate marked the changing of the guard. Spandau is also a peculiar case vis-à-vis the panoptical model: while Bentham's ideal was that a single guard could survey a multitude of prisoners, Spandau housed a contingent of one hundred guards, whose task was, initially, to control the seven Nuremberg convicts: during the last twenty-one years, however, there was only one prisoner to watch.

Foucault's diagram

In the Westphalian framework, modern statehood established itself through a theory of power that had at its core a theory of the ordering of space and the

people within it.[55] The North Star was the principle of sovereignty, which went hand in hand with that of territoriality: within a delimited, enclosed space, everything came under a single authority, which took it on itself to survey and shape every aspect of society. As noted by John Howard in *The State of the Prisons*, the state was taking over for God in the business of 'saving men.'[56] Toward the end of the eighteenth century, one of the results of this all-encompassing ambition was, in the words of Barry Bergdoll, the 'rapid proliferation of new kinds of buildings to house unprecedented institutions.'[57] Robin Middleton has argued that the most problematic aspects of society – sickness, madness and crime – actually became the 'grounds of form' for these new public institutions, as they led to the development of the most efficient ways to bring people under the eye of power and discipline them.[58]

In the Foucauldian reading, this type of structure is invested with a diagrammatic quality, due to its ability to represent both a thing and a function – a space and a social regime.[59] For Foucault, the 'closed architecture' of the panopticon is the *esquisse géométrique* of a modern, rational society.[60] In his 1968 manifesto *L'Istituzione Negata* (The Negated Institution), Basaglia echoes this reading, establishing a link between the structure of the asylum and the structure of 'our social system'.[61] However approximate this generalisation may be, it speaks to a deep-seated understanding of the historical connection between the process of state-building, its theory of power and space, the establishment of a set of disciplinary institutions and the architectural mechanism that made them work.

If the panopticon is a diagram of anything, however, it may represent the opposite of the way the European Union works. After World War II, as everyone had seen the consequences of nationalism pushed to its limit, the consensus was to dilute statehood into a fragmented, interdependent, multi-level system of governance. In addition to openness, the most evident characteristic of this system is the absence of a centre. The European Union does not even have a capital city, but rather what Carola Hein has described as a 'polycentric and networked capital' whose decision-making bodies are spread over dozens of cities.[62] Robert Cooper points to this process of decentralisation to make the case that the European Union is 'the most developed example of a postmodern system.'[63]

Form and function

When a building is juxtaposed with a social regime or a form of political power, the risk is to establish an asymmetric analogy, overlooking the nuances that underlay any socio-political system. Furthermore, one must take into account the Rossian understanding of typology and the notion that the same form can be appropriated, over time, by a multitude of different functions.[64] However, in the panoptical architecture of Ventotene and Gorizia, the interdependence between form and function is so deep that, as soon as function was recalibrated, the form was abandoned. Then, when the proposal to reopen it came around, the (unconscious) instinct was to associate it, again, with another disciplinary function, within the same Benthamian pool.

By the same token, the form of this architecture has proved to be very resistant to change. For example, in the case of Ventotene, the governmental commission in charge of this endeavour set it up as a preservation project, partly because the panopticon was listed as a national monument in 2008, but also because it would be very hard to modify a structure that was conceived as a complete, spatial mechanism, in which every single component contributes to the whole.[65]

In the conclusion of his seminal essay 'Bentham's Panopticon: An Incident in the Social History of Architecture', published in 1971, Robin Evans mentions how a group of young dissidents had created an anarchist commune within the panopticon of Isla de Pinos, in Cuba – one of the most repressive disciplinary *dispositifs* in the world.[66] Just like Ventotene, that prison had been closed in the mid-1960s. Shortly afterward, however, the

anarchist project faded away, and it came as no great surprise when the structure was converted into a school and museum. In an effort to underline the educational purpose of the site, Fidel Castro (who had been detained there before the revolution) went as far as to rename the island, which became known as Isla de la Juventud (youth island).[67] Even a revolutionary movement could not 'crack open' this architecture-power mechanism and, after a brief interlude, reactivated its disciplinary gears.

Architectural leviathans

In a not-so-revolutionary context, a group of architects will soon find themselves navigating in even more uncharted waters, around Ventotene and Gorizia, where these tensions are amplified by the question of Europeanisation. In Ventotene, the government-appointed commission has just set in motion an architectural design competition, and Gorizia may follow suit.[68] Perhaps some of the participating architects will take this unique opportunity to reflect on European integration and explore, through a tangible object, the relation between old and new forms of power.

For example, some might suggest that the panopticon should accommodate a different type of function – one of the things the European Union actually does, which is neither education nor incarceration. Others might try to intervene directly in its physical structure, disrupting its closed articulation by means of a series of material openings, despite the preservation requirements. Leaning heavily on the side of symbolism, one might even try to break the structure down as a way to produce an architectural representation of the unfolding of European integration, in its transition from closedness to openness. It might also be possible to reflect on the concept of openness on a different level, reconfiguring the ways activities are performed and people engage with the building. Going in a different direction, a more radically inclined designer might be tempted to exaggerate the structure of the panopticon and emphasise its dystopic character, as a reminder of the reason the European project was created. This might also be an opportunity to make a statement about recent developments in said project, considering, for example, the areas where openness has withered and Europe has increasingly reverted into a 'fortress.'

Understandably, this type of exploration is not likely to come out of an official competition, which, unlike a research studio or a doctoral seminar, must address very concrete, sometimes prosaic issues. Nevertheless, from an architect's perspective, these projects should be seen, first and foremost, as a pretext to reclaim a critical role in the conversation about European integration. On the one hand, the European institutions have systematically avoided or downplayed any engagement with architecture: it is no coincidence that both these initiatives have been promoted by Italian authorities. On the other hand, there is a tendency among architects to revert into an autonomous bubble – a space where politics can unfold only at the micro-level. Ventotene and Gorizia provide the ideal setting to try and bridge this gap. These panopticons can now become critical *dispositifs*, stimulating a set of questions concerning architecture vis-à-vis the open work we call the European Union. For the architects who will get involved, the fundamental challenge is to elaborate a project of opening, capable of subverting the physical and conceptual structure of these architectural leviathans, to the point where, perhaps, they might start doing and meaning something different.

Notes

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Biography

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Spolia and the Open Work

Armando Rabaça

The notion of s*polia* has been broadly understood since the Renaissance as the reuse of old architectural elements and works of art. The term was rekindled in the late 1960s by German historian Arnold Esch, fuelling the interest of art history in the processes of reuse and appropriation.[1] Within this renewed interest in spolia, Esch notes that the archaeologist is primarily concerned with origins, whereas the art historian is inclined towards the context of reuse.[2] In both cases, signification is framed by the past – the history of the spolia's origins for the former, the history of its reuse for the latter. In what follows, spolia will be approached from the point of view of the architect. What interests me is how spolia may integrate and interact with the conceptual procedures of contemporary architectural design, carrying the possibilities of signification beyond the historical value of artefacts.[3] The challenge resides in establishing a dialogue between old and new codes and significations, opening traces of the past to interpretation and simultaneously adding new layers of meaning to the work.

Expanding on the possibilities of signification of both historical remnants and new work as a whole leads us to Umberto Eco's notion of *opera aperta*. According to Eco, the possibilities of signification involved in and offered to interpretation by a work of art – its 'openness' – increases with the contravention of established codes. This is characteristic of modernist avant-garde and contemporary art, by opposition to conventional, 'univocal' meanings of traditional forms of artistic expression.[4] In this essay, I will discuss different attitudes towards historical remnants, relating the openness of architectural interventions to the subversion of their original codes and typological structures.

By concentrating on the poststructuralist notion of open work, I will use structural linguistics as a methodological tool. A reason to implicate structural linguistics in the discussion of spolia is that the contemporary art history debate around it shares a linguistic drive with Eco's concept of *opera aperta*. While the latter builds upon structuralist thinking, the debate on spolia often resorts to linguistic concepts such as those of afterlife, intertextuality, allusion, quotation and citation, sometimes making use of structuralist concepts.[5] A second reason for resorting today to a theory of culture that developed from the early twentieth century to the 1960s is that the central problem of spolia, understood as reuse, lies in the change of the system in which they are inserted. On the one hand, when inserted in a structure and code system different from those of the original work, the meaning of spolia changes. On the other hand, this insertion implies a change of the structure in which spolia is inserted. Against this background, a structuralist focus on the links between the individual and the cultural structure to which it pertains is particularly suitable for thinking of spolia, be it in a historical or a contemporary context; hence its presence in the contemporary debate of art history. Furthermore, as is evident with the concept of open work, structuralism is dialectically necessary to poststructuralism.

Following this linguistic drive, then, I will start by proposing a parallel between the spolium and

a unit of language, the 'sign' (word), exploring the semantic openness of spolia. I will then move to the notion of sign structure, or syntax, as an ordered construct of signs through which to generate signification. After illustrating the 'univocal' dimension of typological syntax through Giorgio Grassi's intervention in the Roman Theatre of Sagunto, I will discuss three cases presenting different degrees of openness, related to the subversion of the established typological codes. Before that, I provide a brief definition of the term spolia and an overview of its condition after the changes brought about by modernity.

Spolia: a definition

The origin of the word spolia lies in ancient Rome, when it meant the spoils of war seized from an enemy. It was common for the Romans to display military booty, works of art and even parts of buildings seized from conquered territories in the cityscape of Rome and in its public buildings as a manifestation of the dominance of the Roman empire. This ideological charge of spolia and its connotation of otherness lingered throughout history, as testified, for example, by the obelisk of the temple of Luxor exhibited by Napoleon at the Place de la Concorde in the early nineteenth century. During the Renaissance, the word became the province of art history, having been reintroduced in Italy to refer to the reuse of architectural elements and sculptures from Greco-Roman antiquity. The original ideological charge of the word thus gave place to practical and aesthetic motivations associated with the reuse of old architectural components in new buildings. [Fig. 1] This practice had begun in late antiquity, although not associated with the term spolia at the time, becoming a common procedure in the post-Roman Mediterranean world, from early Christian architecture to the Renaissance. The Arch of Constantine in Rome, dated from 315 AD, has been pointed out as its inception.[6] It incorporates and transforms sculptures and reliefs from monuments originally dedicated to Trajan, Hadrian and Marcus Aurelius, combining them with new sculptures.

Although the incorporation and adaptation of old components in new buildings implied the recognition of the aesthetic and material qualities of the fragments, their reuse was chiefly pragmatic in nature, allowing for the reduction of costs and of building schedules. In late antiquity, architectural elements from demolished and unfinished buildings, valued for their material, aesthetic, and ornamental qualities, were kept in deposits for later use, providing a source of building materials until the Renaissance. Similarly, elements imported from the East were stored in warehouses, to be later combined with elements produced specifically for the new buildings, often conforming stylistically with the older elements.[7]

Modern studies on spolia have significantly broadened the context and the meaning of the word. The initial focus on late antique and early Christian architecture has expanded to other geographic and chronological contexts. Also, the term is now loosely associated with notions such as the fragment, reuse, and recycling, and it may range from a single ornamental or structural element to a whole building or part of a building. While its common usage relates to ornamental and architectural components removed from their original place and their subsequent reuse in different contexts, spolia may also relate to elements found in archaeological sites, preserved in museums or repositioned in their original place.[8]

In fact, the broadening of the term has been such that the notion has been considered in the absence of a physical fragment, countering the notion of *spolia in se*, applied to the use of concrete, physical elements; to that of *spolia in re*, concerning the reuse of the non-physical, such as ideas, principles, concepts, motifs and visual formulas.[9] This distinction puts in evidence the extent to which the signification of spolia shifted from the realms of ideology and practicality to those of memory, history and creative conceptualisation.

Fig. 1: Incorporation of marble fragments of antiquity in the medieval bell-tower (probably dated from the ninth or tenth century) of Santa Maria Maggiore della Pietrasanta, Naples. Photo: author.

Spolia today

In order to speak of spolia today one has to face, at least, two radical changes introduced by modernity. One is the change in the building industry. The other relates to our changed relation with history. The shift from traditional to industrialised building techniques and materials implies a rupture with the practical, economic, and aesthetic values underlying the historical reuse of old architectural components. Historically, the integration of spolia in new buildings rested in the continuity of building systems and of architectural canons and typologies. To go back to the purported inception of the phenomenon, although the reuse of sculptures in the Arch of Constantine may embody fundamental changes in Roman visual practice, as Jaś Elsner has argued, these are cast in a traditional architectural typology.[10] As for architectural elements, the common reuse of column shafts and capitals in late antique basilicas and early Christian churches is a paradigmatic example. A case in point is the church of Sant'Agnese fuori le mura, in Rome, with different pairs of columns symmetrically disposed along the nave. [Fig. 2] While taking advantage of their material and aesthetic qualities, the incorporation of stylistically and chronologically diverse components maintains the constructive function for which they were originally conceived. And even if an aesthetics of *varietas* might be involved, the process of compliance is particularly visible in the recurrent arrangement of pairs of columns in order to comply with the symmetrical principle presiding over the typological layout of the church.[11]

Modern changes in building techniques and their aesthetic consequences have brought this 'natural' integration of spolia to an end. In practical terms, the reuse of old architectural components in contemporary architecture may constitute a problem related to sustainability and recycling, but hardly an economic or practical problem. In aesthetic terms, it introduces a dialectic between contemporary architectural codes and the codes of the past. This presence of a historical otherness leads us to the second change in the relation between contemporary architecture and spolia; our changed relation with history.

With the modern rise of historical consciousness, spolia came to be valued historically. This also had radical consequences for the reuse of old remnants. The first modern impulse with regard to spolia was that of musealisation, which meant a halt in reuse. Shortly after the relocation of Luxor's obelisk to the Place de la Concorde, the Louvre opened a department for the Egyptian collection. In England, the spoliated marbles of the Parthenon were sold to the British government and entrusted to the British Museum. And the spoliation by the Germans would lead to the creation of the Egyptian collection of the Neues Museum in the mid-century. Spolia maintained its original ideological charge and connotation with the cultural other, adding to it a historical value. In this process, the intimate relationship between the museum and history relocates spolia within a new structure, though not within the realm of reuse. As Donald Preziosi has argued, the institution 'museum', 'one of the most brilliant and powerful genres of modern fiction', is an ideological apparatus that has sustained the narrow epistemological space of historicism and teleology.[12] Exhibited in the museum, spolia become representatives of a given culture, signalling episodes of the historicist fiction, and thus constrained by that fiction's structure.

Although often justified by security and protection needs, and animated by a search for cultural communication, the tendency to keep historically valued spolia in museums has been seen as weakening signification. Structuralist thinking itself, and its historicist background, in arguing that the elements of human culture cannot be understood without taking into account their relationships with the cultural patterns to which they pertain, gave place to the belief that the cultural and physical contexts are integral to the identity and historical value of architectural and artistic artefacts, and that, ideally, these must neither leave their original place

Fig. 2: The seventh-century church of Sant'Agnese fuori le mura, Rome. Photo: author.

nor, if possible, lose their original function. Spolia, it is often argued, must be subject to operations of restoration and preservation in their place of origin whenever possible.

In this context, the relation between architecture and spolia is now largely restricted to interventions in historical buildings, in archaeological sites or, in more particular cases, to the reconstruction of damaged buildings or cities. In these interventions, the aim is to prevent spolia from losing their original value and identity, to preserve their link with history and memory. In this sense, one may speak of a contemporary concept of spolia as old remnants, varying from simple fragments to the remnants of whole buildings and even urban structures, rescued not from an enemy, but from oblivion, and reused or displayed in their original context as far as possible.

A consequence of this displacement of spolia to the realm of history and memory is that modern historical consciousness tends to limit their reuse in new creative processes. My interest, on the contrary, is to understand how the memory value of spolia can go beyond the straightjacket of historicist fiction and interact with the design of the new in conceptual terms, acquiring new meanings and opening the work to new significations and interpretations.

Semantic openness

After this brief definition of the term spolia, and having pointed out the main historical changes that frame the notion today, we may now turn to the linguistic drive that permeates the debate on the open work and propose a parallel between the spolium and a unit of language; the sign.

A sign consists of a signifier and a signified, thus implying an intentional communicative purpose. Signification, therefore, implies intention. Ivana Jevtić illustrates the notion of spolia with the example of a marble capital of late antiquity reused at the entrance of the Rüstem Paşa Han, in Istanbul.[13] The capital is placed on the floor, turned upside down, serving as the base for a water pump. This particular case evinces a purely pragmatic reuse of spolia. The recognition of the capital's material and aesthetic qualities is certainly not alien to its reuse. Yet, its choice is fundamentally a question of economy of means, with no aesthetic intention beyond that recognition. Neither the new condition of the capital nor its inverted reuse embody signification, which means that the capital does not act as a sign. This applies to much of the use of spolia across history, as in the columns of Sant'Agnese fuori le mura.

The historical value attributed to spolia today tends to reverse this eminently practical reuse and lack of communicative purpose. Historical signification implies the binary pair signifier/signified that characterises the sign. Turned into signs, spolia may operate in various ways. Below I will discuss three different explorations of the communicative possibilities of spolia. I will start with Carlo Scarpa's inclusion of a portal in Istrian marble in his design for the entrance of the Tolentini convent, the Venice architecture school (Iuav). [Fig. 3]

The portal had been found in the refectory of the convent during renovation works in the 1960s. When Scarpa was commissioned to design the entrance, he decided to lay the portal on the floor, to the side of the doorway, turning it into a basin. Through the subversion of the portal's verticality and function, Scarpa converted the spolium from a literal into a metaphorical portal. The inverted pyramidal profile of the stepped concrete layers containing the water convey the sense of depth, while the reflection of the water emphasises the notion of the threshold.[14] The rectangle with grass, defining a dark plane, may even convey an interior darker space glimpsed through a wicket or a door left ajar. Moreover, the piece is eloquently placed next to the doorway. Unlike the capital at the entrance of the Rüstem Paşa Han, the subversion of the function and upending of the verticality of the portal has an intentional, communicative purpose. Instead of retaking its natural function within the building, the portal is presented as an object and turned into a sign that amplifies the signification 'threshold.'

Fig. 3: Carlo Scarpa, portal in Istrian marble at the entrance courtyard of the Instituto Universitario di Architettura di Venezia (Iuav), Venice, 1984–85. Photo: Prakash Patel.

If we consider the categories of the sign as defined by the American philosopher Charles Sanders Peirce, we could say that the portal acts symbolically. Peirce divided signs into three categories: icon, index and symbol.[15] A symbol is a sign that is connected with the object it represents 'by virtue of the idea of the symbol-using mind,' that is, when it embodies a general meaning, indicating not a particular thing, but 'a kind of thing' through association or other intellectual operation.[16] By placing the portal on the ground, Scarpa has altered its signification from the particular and the concrete to the conceptual by instilling processes of mental association through its location, the reflecting water and the stepped concrete layers. He turned it into a symbol, the symbol 'portal,' exploring notions such as those of threshold and depth.

A different case is José Ignacio Linazasoro's reuse of a portal in the intervention in the San Lorenzo Church, Valdemaqueda (1998–2001). [Fig. 4] The old church had been destroyed in the 1940s, with only the Gothic apse and a Renaissance portal remaining. The design proposes the construction of a nave and the reuse of the portal to mark the entrance. The contrast between the plain brick walls of the nave and the elaborate classical design of the portal is accentuated by a subversive separation between portal and wall, intensifying the autonomy of the portal as an object and the notion of the threshold associated with it. This contrast and separation explore and enhance the spolium as a sign. Set in contrast to the remaining elements of the building, the spolium says 'I am a portal.' It therefore acts as an icon in the Peircean terminology, as it refers 'to the Object it denotes merely by virtue of characters of its own.'[17] It is a 'natural sign' that enhances an iconic, culturally coded image of a portal, directly communicating the idea 'portal.' I will return to this work further below. For now, I would like to focus on the index, the third of Peirce's categories of the sign.

An index is a sign that manifests a cause, that shows evidence of the object to which it refers. A recurring example is smoke, an index of fire. An example of the indexical use of spolia can be found in the small open-air theatre in Salemi, Italy, by Francesco Venezia, Marcella Aprile and Roberto Collovà (1983–86). [Fig. 5] Built upon the debris of the old Carmine convent, which collapsed in the 1968 Belice earthquake, the small theatre incorporates the debris of the no longer extant building. Reused as raw material, the old fragments have no expression in the new building. All visual presence of the spolia is effaced. One may speak of a simple act of recycling, implying practical, economic and ecological factors, with no communication purposes. While the design of the theatre follows its own logic, independently of the ancient architectural structure, a reference to the Carmine convent is superimposed onto the new design. Three fragments emerge from where they are partially embedded in the stage-like leaning plane: a shaft, a capital and the base of a column of the cloister of the old convent. These operate indexically at two levels. As an index of the old convent, shaft, capital and base signal the no longer extant building and its architectural order. And in being scattered and partially buried in the cobbled leaning ground, they restage the ruins of the old building, acting as an index of the earthquake. They are presented as a trace, or physical manifestation, of the earthquake.

In each of these examples, spolia are open to new significations. To put it in terms of the contemporary debate on spolia, they are endowed with an afterlife. Peirce's categories of the sign have helped us qualify the possibilities of semantic openness. The point to be made, however, is that in all cases spolia entail a communicative purpose, and the exploration of signification – their openness – results from the subversion of their original status.

After looking at spolia as linguistic signs, the following logical step is to consider their

Fig. 5: Francesco Venezia, Marcella Aprile and Roberto Collovà, small open-air theatre in Salemi, Italy, 1983–86. Photo: Roberto Collovà.

incorporation in architecture as part of a syntactical construct.

Syntactical structure

A good place to introduce the notion of syntax in architecture is the legend of the Argonauts, used by Roland Barthes to illustrate the concept of structure. Over the course of their long journey, and with the gradual deterioration of their ship, the Argonauts gradually replaced each of its pieces,

> so that they ended with an entirely new ship, without having to alter either its name or its form. This ship *Argo* is highly useful: it affords the allegory of an eminently structural object, created not by genius, inspiration, determination, evolution, but by modest actions (which cannot be caught up in any mystique of creation): *substitution* (one part replaces another, as in a paradigm) and *nomination* (the name is in no way linked to the stability of the parts): by dint of combinations made within one and the same name, nothing is left of the *origin: Argo* is an object with no other cause than its name, with no other identity than its form.[18]

In short, 'the system [of articulated parts] prevails over the very being of objects' and it is the resulting 'structure of the space which constitutes its identity.'[19]

A parallel in architecture is offered by Giorgio Grassi's intervention in the Roman Theatre of Sagunto (1985–94). The structure of the building is defined by the typology of the Roman theatre: *ima, media* and *summa cavea,* orchestra at the centre, *scaenium*, with *pulpitum, proscenium, scaenium frons* and *postscenium*, and *aditus* between *cavea* and stage.[20] It is the structured articulation of these parts that defines the type. The recovery of the theatre, then, implied the recovery of each part and their articulation according to the original syntactical structure which characterises the type.

The process entailed the demolition of recent interventions that did not comply with the original building, the reinforcement of original elements, the repositioning of the original situation of fragments, and the completion of the essential parts of the theatre necessary to re-establish a minimal structure capable of rendering the typology of the Roman theatre intelligible. It is this structuralist approach to the building that supports the polemical decision to rebuild almost anew the stage equipment (*post-frons scaenium*) to its full height.

The syntactical structure reveals its complexity in the process of re-montage and replacement of the deteriorated and no longer extant parts. For example, the fragments of two columns that once belonged to the stage front are reassembled through *anastylosis*. Placed in the original location, they bring into presence a minimal expression of the original structure of the stage front line. Acting as pars pro toto of the stage front, the fragments allow for the estimation of the original height of the three-tiered *columnatio* by applying the proportional principle commonly found in the type. Fixing the approximate height of the stage front, in turn, provides valuable information for the reconstruction of the body of the stage and, combined with the height of the *summa cavea*, for the top position of the wooden roof covering the proscenium.

It is also the need for bringing into presence each of the parts of the structure that legitimates the rebuilding of the remnants of the lower segment of the exedras at the stage front. The fragment is built anew, revealing the tripartite composition of the original stage, divided into three scenic 'entrances.' Again, by synecdoche, the rebuilt fragment provides a minimal structure through which the typology of the Roman stage front becomes intelligible.

Grassi summarises the process, arguing that the reconstruction meant primarily 'the completion of the principal building structures, of those structures which are essential to its identification.'[21] Architectural completion of the remnants followed the existing data, doubtful cases searching for 'approximation by similarity and comparison with other contemporary examples and/or reference to the canonical elements of the type.'[22] And whenever

he lacked information, Grassi constructed a minimal fragment to make the structure readable.

By re-establishing the associative rules of the different parts that compose the typology of the Roman theatre, Grassi did not seek to restore the original state of the building, but its original structure, that is, the principles and essence of its articulated parts and the resulting substance of the architectural space of the Roman theatre:

> to distinguish its different parts, the relations between them, their hierarchies, individual roles, etc., and lastly the way in which they come together to define an articulate and complicated architectural form, but one that is absolutely unitary.[23]

And he adds,

> This signifies that the project of restoration and historical reconstitution cannot help turning into, to all intents and purposes, the design of a Roman theatre (a theatre 'in the style of the ancient Romans'). In other words, the design of a partially new theatre building founded both on the existing structure (literally, materially) and on an established building pattern whose condition of necessity (utility and function in the broadest sense) is wholly contained within its fixed form. A project, that is, which intends to take from the ancient structure every trace, every hint, every working indication, but above all, its general lesson of architecture, seeking to carry it on with consistency.[24]

In this process, one may speak of openness only in the sense that it implies some degree of interpretation of the remnants. As a creative process, however, the possibilities of signification are limited in the extent to which the design is framed by the unambiguous principles and rules fixed by the typological structure. Spolia are brought to life, not endowed with an afterlife. Like the *Argo*, the Roman theatre of Sagunto 'is an object with no other cause than its name, with no other identity than its form.'[25]

Syntactical openness

I am especially interested in the Roman theatre of Sagunto because it illustrates the transposition of the linguistic notion of structure into architecture. This provides us with a basis to discuss spolia as an agent of new significations in an architectural intervention. I will do so by looking at three different cases with varying relations between typological codes and syntactical openness. To different degrees, each case explores spolia as a design argument in the construction of new significations.

To begin, I would like to return to Linazasoro's intervention in the San Lorenzo Church, where there is an interesting interaction between spolia and type. Here, the attitude towards the existing remnants is not the recovery of the original typological structure, but the playful exploration of the articulation between parts.

Linazasoro's point of departure was not to design a simple rectangular nave, oriented towards the apse, but to generate a more complex space capable of awakening an experience of the sacred and of intellectual reflection, where the phenomenological, the symbolic, and the rationalism of construction should coalesce. The displacement of the entrance to the side, recalling the Arab-influenced pre-Romanesque churches of the Iberian Peninsula, is part of this strategy, which marks the beginning of a contrived inner path offering sequential views and spaces.[26] Consciously or not, this intent led to a conceptual process which, I would like to argue, resonates with the structuralist explorations of synthetic cubism. Before going any further, it is useful to shift from Peirce's understanding of how signs operate to the other founding model of the theory of signs: that of the Swiss linguist Ferdinand de Saussure.

According to Saussure, the articulation between signifier and signified is established by a code. There is, however, an arbitrariness at the core of the linguistic sign, as a signifier may express more than one meaning, just as the signified may

be defined by different signifiers. What determines the semantic value of the sign is its relation with the neighbouring terms, that is, the structure of the sign system in which it is inserted.[27]

The influence of this kind of structuralist reasoning, which had been gestating in the late nineteenth century – as is the case of Baudelaire's symbolist poetry – led Picasso to look at the visual arts in semiological terms, as a montage of arbitrary signs capable of generating an intelligible sign structure.[28] Take the case of the early *papier collé* titled *Guitar, Sheet Music, and Glass* (1912), in which Picasso brings together disparate forms. [Fig. 6] By subjecting these fragments to a specific arrangement, Picasso generates a new meaning, the meaning 'guitar'. Its intelligibility is secured by a minimal structure of associative rules. What matters is not the meaning of each sign, which in some cases is purely arbitrary (that is, the sign bears no visual relation with the referent), but the sign structure. For example, it is only through its particular relation with the neighbouring terms that the black section of a circle at the bottom of the composition will be seen as the bottom of the guitar. Isolated, the shape has no signification. Moreover, in altering the sign structure, the polysemic nature of the sign is revealed. Seen in conjunction with the drawing of the glass, one will read the black shape as a plate. This ambiguity or arbitrariness of the sign is intentionally explored in Picasso's conceptual procedure. Hence the fragment of the newspaper isolating 'LE JOU' (meaning the act of playing or the game) from the original 'LE JOURNAL'; the play of montage opens the work (and the signs) to multiple readings.

The intervention in the San Lorenzo Church can be read by applying the same principle of montage of signs. In writing about the church, Linazasoro himself denounces the modernist lineage of the design in describing the free-standing portal as an *objet trouvé*.[29] In fact, the autonomy of the ready-made object applies to each of its parts – portal, nave and apse – setting the tone of the design principle as a montage of fragments, or signs. [Fig. 4, 7]

If we return to the association between structure and type, we may schematically summarise the structure of the Roman Catholic church as consisting of three key moments: portal, nave and apse. The remnants of San Lorenzo Church provide the apse and the portal. Linazasoro builds the missing element reactivating the articulation between portal, and apse. In re-establishing a sign structure of portal, nave and apse, he intentionally subverts the canonical arrangement of the type. The consequence is that, similarly to the Cubist collage, Linazasoro generates a minimal structure of associative rules that renders the type intelligible through the play of the parts, while upholding their formal autonomy and identity. This results from various subversive strategies: 1) the displacement of the entrance to the side, 2) the physical separation of the portal from the wall, 3) the abstract or arbitrary design of the nave, 4) the L shape of the skylights, generating a diagonal orientation of the volume of the nave, 5) the higher skylight, which allows to reconcile the juxtaposition of and the volumetric distinction between nave and apse, and 6) the stylistic distinction of the parts: Gothic apse, Renaissance portal and contemporary nave.

Parallels with the principles of synthetic cubism and its epistemic connection with structural linguistics do not end here. Like with linguistic signs, there is a certain degree of ambiguity of the parts. Take the portal. Being separated from the wall and treated as an individual sign, the portal does not fulfil the constructive function of a portal, but its formal codification signals a portal. It does not provide the threshold between inside and outside, although one must pass through it in order to go inside. It presupposes depth, yet it is utterly depthless, presenting itself as a flat plane superimposed on the plane of the wall. It is tantalising to compare this ambiguity to that of the white circle in Picasso's guitar. Within the sign structure, it is read as the guitar's sound hole, yet it is materially superimposed on its neighbouring parts.

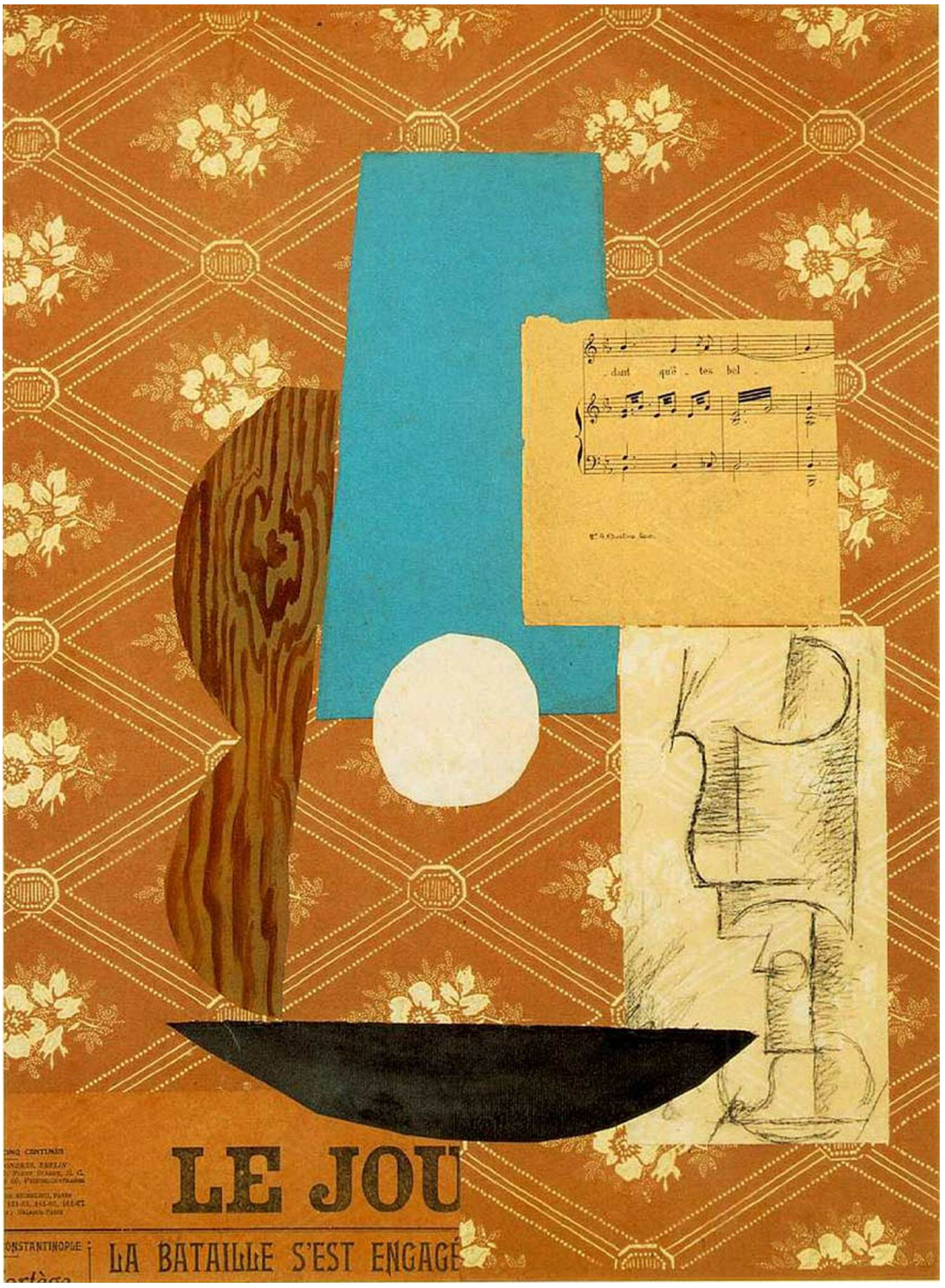

Fig. 6: Pablo Picasso, *Guitar, Sheet Music, and Glass*, 1912. Courtesy of Succession Picasso.

Fig. 4: José Ignacio Linazasoro, San Lorenzo church, Valdemaqueda, Madrid, 1998–2001. Photo: Javier Azurmendi.

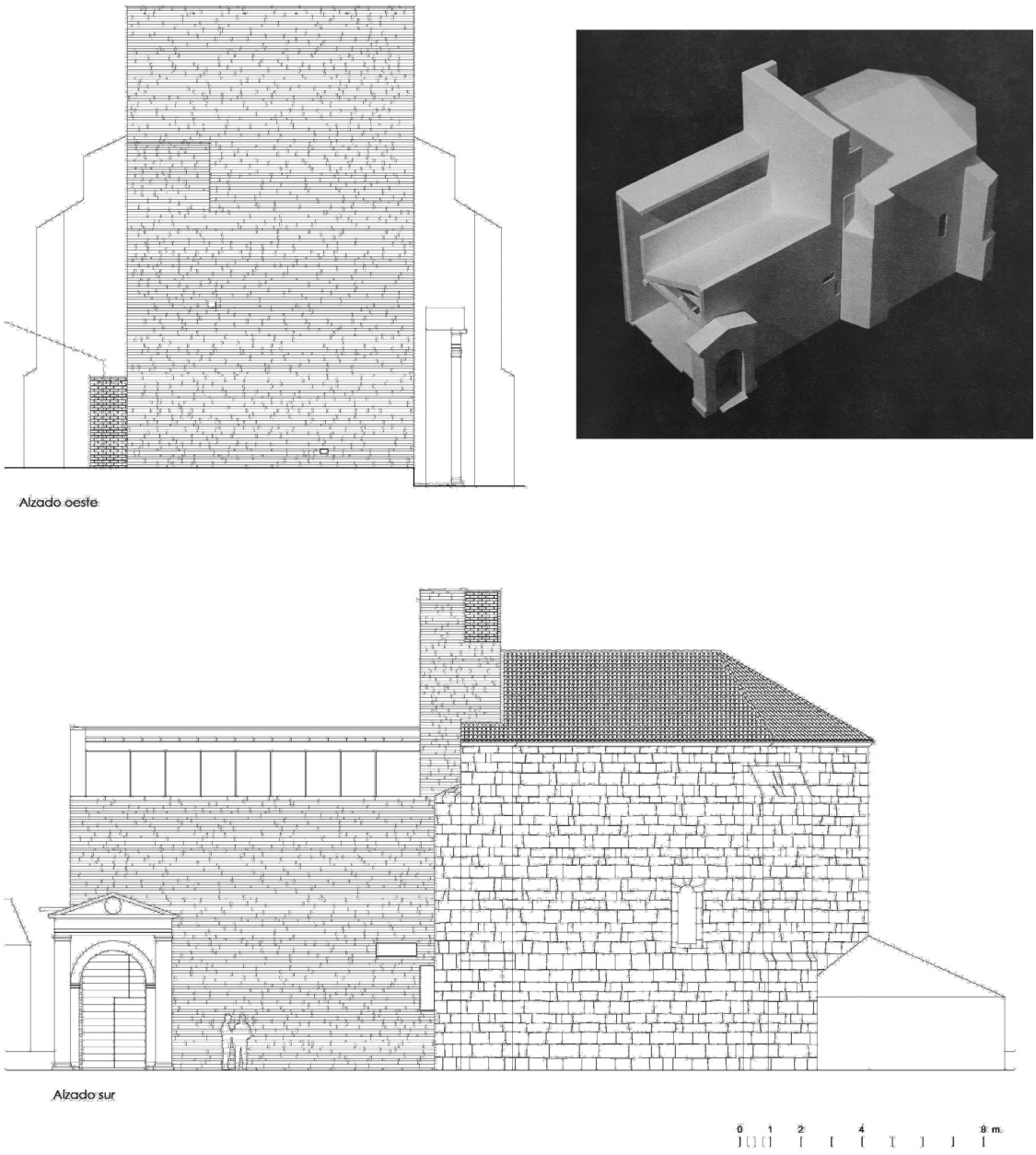

Fig. 7: José Ignacio Linazasoro, San Lorenzo church, Valdemaqueda, Madrid, 1998–2001. West and south elevations and scale model: Linazasoro and Sánchez.

Whereas in the portal signification is expressed through iconic form, and ambiguity results from the relation it establishes with neighbouring terms, in the nave signification emerges from the sign structure, while ambiguity is introduced via 'abstract' formal options offered by the sign. Contradicting usual typological relations, the nave is lower and shorter than the apse, its volume generates a diagonal orientation that negates the axial symmetry of the apse, and the higher skylight conveys volumetric juxtaposition and even fracture, contrary to the expected idea of continuity. Isolated, the nave's body is a purely arbitrary sign, in the sense that it is no longer related to the typology and formal codes of a nave. It is read as such only through the sign structure it establishes with the remaining signs. Looking again at Picasso's collage, we can establish a parallel with tthe rectangular white paper with the drawing of a glass. Its rectangular shape is an entirely arbitrary form that is, however, essential to define the edge of the guitar's body, and without which the minimal sign structure that secures the intelligibility of the guitar would collapse.

The openness of the work thus results from this balanced dialectic between order and disorder in the montage of signs, upholding their individual identity while generating a syntactical structure that, although rendering the type intelligible, subverts it. In the interior, this subversion is expressed in the discontinuity between nave and apse and in the inversion of their proportional relations. The displacement of the entrance to the side, the skylights, and the height of the ceiling, in turn, generate a peripheral route that accentuates the emphasis on the parts. It is this overall subversion of the codes that awakens our awareness of the structure of the type 'church.' As Eco notes, the violation of codes in a work leads, in the first place, to a focus on the structure of the work, then on the codes employed, and finally on the relationship between codes and reality.[30] This generates not only a renewed perception of the beholder himself and of the world, as Eco argues, but also a renewed perception of the type. Put differently, the introduction of a controlled disorder in the typological order increases the level of information conveyed by the message.[31]

Let us now return to Venezia, this time to his museum in Gibellina, Sicily (1980–87). [Fig. 8] Here, the design proposes a totally new structure that, by taking a spolium as the point of departure, establishes indexical links with the original structure. The commission envisioned the disassembly of the extant fragment of the façade of the Di Lorenzo palace of old Gibellina which survived the 1968 Belice earthquake, and its reassembly in the new town of Gibellina, built some eleven kilometres away. The displacement of the fragment from its original context and the end of the 'natural' relationship between spolia and contemporary architecture introduced by the historical schism of modernity left no reasons for reconstruction. What Venezia did was to construct a new reality taking the fragment as a point of departure for the new design.

Stone fragments were mounted on a long façade generating a structure composed of two main parts, a narrow building and a courtyard interiorising the fragment. The ground level of the building houses works of art from the old city – spolia – that must be protected from the weather. The upper level is an open gallery. Circulation starts in the courtyard and develops around the fragment. One enters the courtyard through a narrow, covered pathway, walks along the old façade, turns back along a ramp overlooking it again while ascending. Once on the upper level, a cantilevered passageway gives access to the covered gallery. Like in the inner space of the ground level, a fragment of the façade is now present through the openings, re-establishing visual contact with the courtyard. The rhythm of the old openings is then repeated in the new façade to the opposite side. The circular promenade around the fragment ends in a small secluded space at the top of the gallery on the north side.

Although the syntactical structure is entirely new, the generative role of the spolium creates

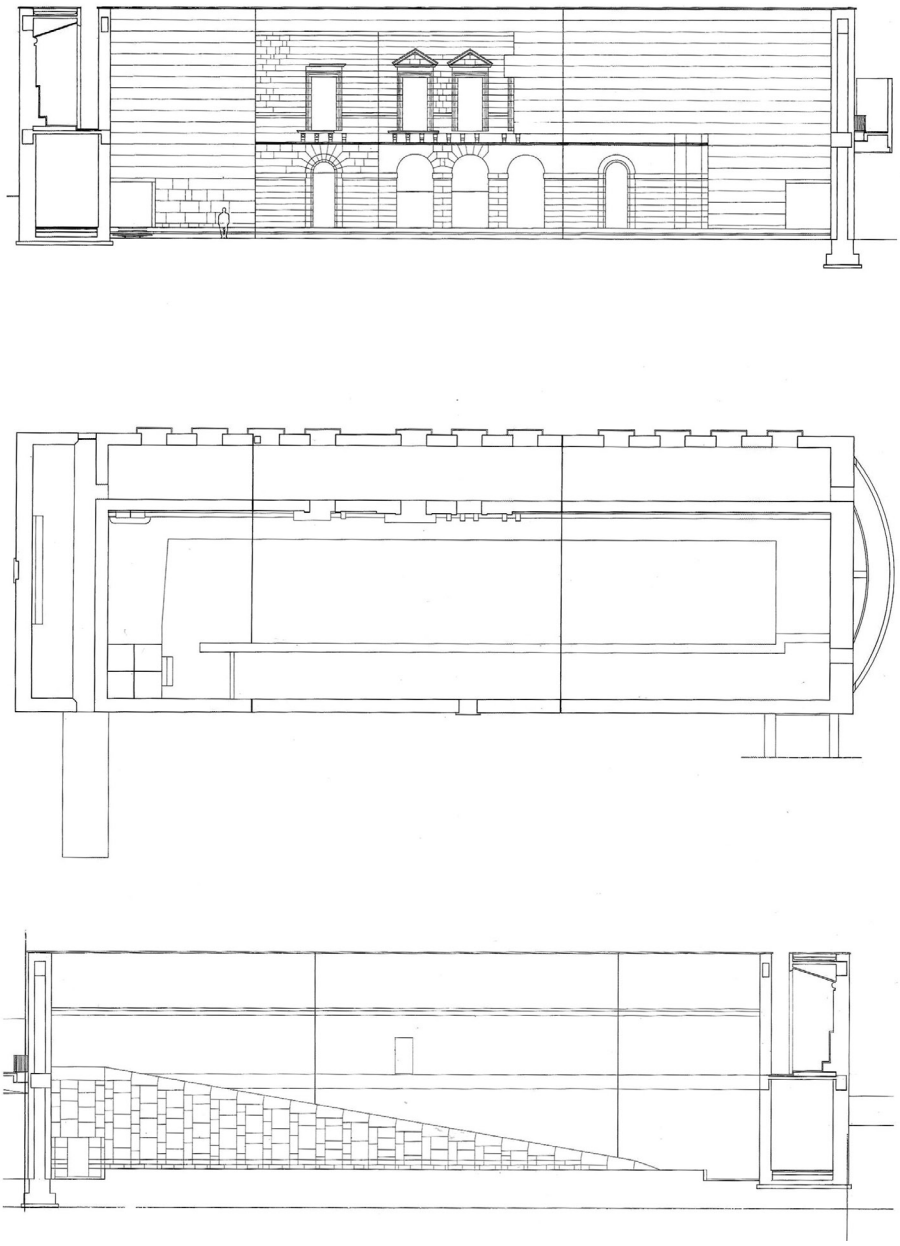

Fig. 8: Francesco Venezia, museum in Gibellina Nuova, Sicily, 1985. Plan and longitudinal sections through the courtyard: Francesco Venezia.

indexical links with the old structure of the palace. For example, the main reason for the courtyard seems to be the recovery of the original urban scale which the new city cannot offer, while avoiding confrontation with a context that does not speak the same language. The courtyard is an index of the original street. Also, the openings and stereotomy of the fragment establish the new building's metrics. The openness resulting from this loose play between new and old structures is then informed by a sense of incompleteness. This autonomous world that Venezia creates around the fragment preserves the tension of a ruin, the tension between past and present, resonating with the Romantic fascination with an aesthetics of ruins. This is particularly visible not only in the way the fragment is presented in its incompleteness, but also in the ambiguous space of the upper floor, where both the old and new openings are left without window frames. As in the small theatre of Salemi, in Gibelina, this sense of ruin operates indexically. But in contrast with the column fragments of the old convent, which are superimposed onto and independent from the new architectural structure, in Gibellina the spolium that justifies the indexical operation is the point of departure for the new structure.

Here the openness of the work is not achieved through the play of parts, as in the San Lorenzo Church, but through a design that takes a spolium as a central motif for a new structure. Moreover, this central motif goes beyond the objectual value of the fragment to encompass indexically absent values of an old order in the conception of a new one.

The last case I wish to discuss is Carlo Scarpa's restoration of the Castelvecchio in Verona (1958–64). If there is an architect of the twentieth century who has been repeatedly associated with the notion of fragment, it is Scarpa. For Marco Frascari, this is due to the influence of the Venetian tradition of an 'architecture of spolia'.[32] In Scarpa's architecture, Frascari argues, 'the possibilities of innovation and invention reside in the building elements and in the manipulation of the visual and kinetic relationships among the various fragments and artefacts.'[33]

Scarpa's interventions in existing buildings never sought a sense of completeness. Rather than aiming at a finished or closed state, Scarpa explored the fragmentary status of those buildings' historical lives, seeing his intervention as an additional historical layer. Despite this fragmentary status, there is always a sense of totality. His architecture, Frascari has noted, is not 'a summary of totalities' but 'an open collection of fragments assembled to generate a legible text.'[34]

This brief note on Scarpa serves as a general frame to approach his intervention in the Castelvecchio. The building complex was mainly developed between the fourth and twelfth centuries of our era: a residential area and a military wing, divided by the twelfth-century Commune wall that limited the city to the southwest, built upon remnants of the Roman rampart. Major alterations occurred in the late eighteenth century. During the Napoleonic occupation, barracks were added along the north and east walls of the military wing, together with a staircase built against the Commune wall. In the same period, five medieval towers were demolished. During the 1920s, the complex was converted into a museum, leading to a major intervention (1923–26) by the museum director Antonio Avena. In his rehabilitation, Avena rebuilt the medieval towers and transformed the façades of the Napoleonic barracks, replacing the original openings with a composition of doors and windows with medieval mouldings salvaged from the demolition of the Palazzo di Camerlenghi.[35] My main interest here is in the way in which Scarpa dealt with the fictitious historical layer of Avena's architecture of spolia in the north barracks – the main body of the museum – particularly the main façade facing the courtyard to the south.

Scarpa's strategy, unsurprisingly, was the opposite of Avena's. Against the sense of completeness conveyed by the state of the building, Scarpa

Fig. 9: Carlo Scarpa, intervention in Castelvecchio, Verona (1958–64). From top to bottom and from left to right: entrance crossed by an L-shaped wall and spolium to the left; view along the façade with projecting volume, low wall, and spolium in the foreground; central loggia with asymmetrical, receded glazing, spolium and terrace; western extremity of the north volume, with Cangrande, communal wall to the left and Roman moat in the foreground. Photos: author.

chose to cast off the consolidated appearance of the barracks and of its gothic pastiche, evincing its fragmentary nature. He transformed the unitary amalgam of historical layers through a set of operations at the volumetric and compositional levels, individuating the volume of the north barracks and its architectural elements. [Fig. 9]

At the volumetric level, Scarpa treated the main body of the museum as a fragment within the whole, creating explicit discontinuities with the adjoining volumes of different historical periods. To the west, Scarpa demolished the Napoleonic staircase at the point where the barracks met the Commune wall, creating a void between them. Excavations revealed a Roman moat, adding further tension to this point of articulation between the parts. To the east, a similar separation was carried out on the north façade facing the river, which Scarpa separated from the tower at the northeast corner in order to achieve independence between the volumes.

At the compositional level, the most notable intervention is in the main façade of the north barracks. What Scarpa did was to shift from a coherent whole to a fragmentary, open status, where the façade becomes a fragment composed of fragments. [Fig. 10] The absence of a corner between the south and west façades, next to the Commune wall, renders the main façade a loose plane. This strategy is extended to the roof through the play of copper and tile layers. The façade is then treated as a support for manifold events. Entrance to the museum, to the east, is marked by an L-shaped wall crossing the entrance door. The larger opening to the left is traversed by a cubic volume that projects into the courtyard. In the central loggia, the receded glazing is countered by a terrace that invades the lawn and a low wall that runs parallel to the façade to the east. The larger opening further to the west is partially filled with an opaque panel that negates an expected transparency. New mullions in the existing openings superimpose an autonomous compositional system on the symmetry of Gothic elements. The profusion of elements is enriched by spolia loosely exhibited in the façade and garden, and by the design of the garden itself.

Through these design decisions Scarpa deconstructed the existing syntactical structure, emphasising the plurality of signs. This overall aesthetics of the fragment returned the Gothic mouldings to their condition of spolia, rendering their cultural meaning ambiguous and indeterminate. They become part of the multiple signs inhabiting the façade, presenting themselves not as a closed unity but as part of a multidimensional space that brings distinct elements into open dialogue.

The montage at the San Lorenzo Church proceeded to construct a minimal structure from the parts, capable of rendering the typological structure of the Catholic church intelligible. At the Castelvecchio, the process is the opposite. Scarpa replaces the unitary amalgam of historical layers by a dismembering at the volumetric and compositional levels that individuates volume and façade elements. The obvious consequence of this design strategy is that, by not alluding to a recognisable syntactical structure, Scarpa radically opens both the existing spolia and the whole to multiple readings.

Emphasis on the continual life of the building through an aesthetics of the fragment is not alien to Eco's *opera aperta* and its links with structuralism's insistence on multiplicity, plurality and polysemy. In fact, Scarpa owned a copy of Eco's *Opera aperta*.[36] His display of a myriad fragments turns them into semantically and syntactically ambiguous signs. As Manfredo Tafuri has argued, Scarpa's work constitutes a poetics of the fragmentary and of the unfinished based on the accumulation of signs. In this respect, he shares with the art of Paul Klee a syntactic looseness that allows for the free play of figures, for a plurality of associative possibilities, and for an experience developing in space and time through related fragments.[37]

Indeed, Scarpa's fragments inhabit the plane of the façade just as the hieroglyphic signs of Klee's late work inhabit the plane of each canvas[Fig. 11]

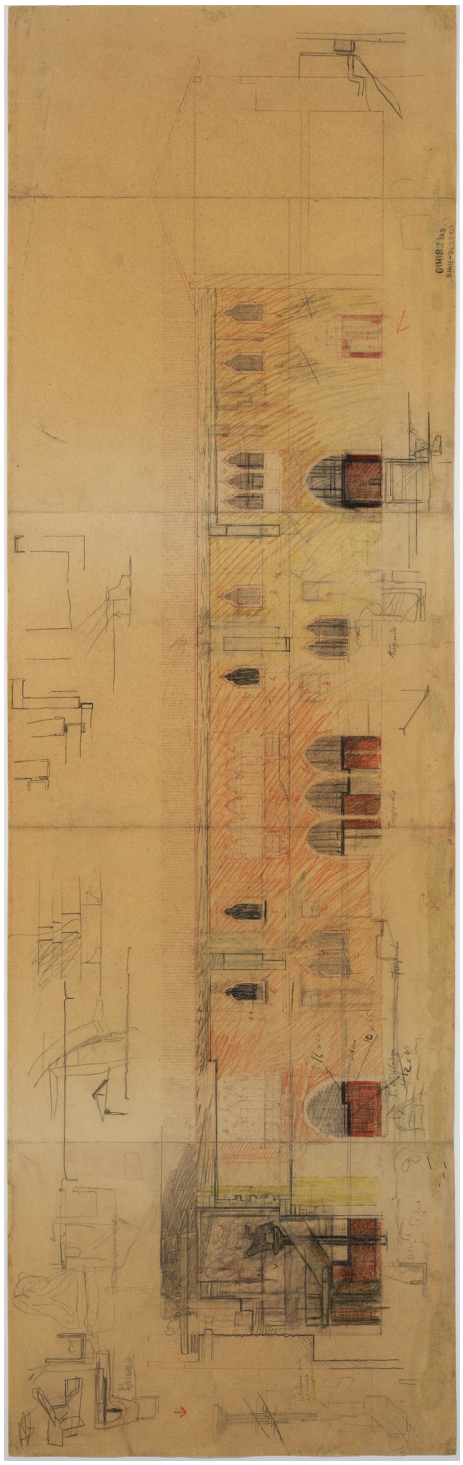

Fig. 10: Carlo Scarpa, study drawing of the main façade of the Castelvecchio Museum, Verona, 1960s. Image: Carlo Scarpa Archive, Castelvecchio Museum.

Klee invokes the utopia of a hieroglyphic, natural language in which signifier and signification are one, rather than relating through convention. And like Picasso, he combines arbitrary (abstract) and motivated (figuratively recognisable) signs. Scarpa's fragments, in turn, are units of architectural signification such as walls, volumes, floors, doors, windows and mullions, with different degrees of arbitrariness and motivation. They constitute *paroles* to be incorporated into a new structural system, or *langue*, where the pre-existing rules of the neo-Gothic façade become diluted and open to interpretation. Whereas in Venezia's museum there are recognisable types (for example, the courtyard, covered gallery, and so on), Scarpa attempted to obliterate every recognisable structure. The typological unintelligibility that results from the *démontage* of the pre-existing elements leads to a radical openness of the work and of its interpretation.

Conclusion

In this article I have tried to go beyond the debate of art history and archaeology, focusing on the possibilities of signification opened up by spolia through different conceptual procedures. As Eco has argued, although a work is never really 'closed,' its degree of openness goes hand in hand with the subversion of established codes. At a semantic level, we have seen how, through the subversion of the original status of spolia, Scarpa's portal acquired symbolic significations; how Linazasoro expanded signification from the concrete to the abstract concept of portal, and how Venezia conveyed the history of the place indexically. At the syntactical level, the examples illustrate relationships between openness and the dialectics of order and organised disorder. They evince the search for the intelligibility of the work by exploring its freedom in relation to the established codes. Whereas signification in Grassi's intervention in the Roman Theatre of Sagunto is limited to the unambiguous codes of the type, and thus closed to interpretation, in the remaining examples we see an increasing degree of subversion of the typological structure and a corresponding openness left for the interpreter to complete. Linazasoro's reordering of the constituent elements of the Christian church goes beyond the San Lorenzo church, fostering a renovated perception of the typology. In Venezia's museum in Gibellina, new significations arise from the absent order of the spolium, such as those of courtyard, open gallery, and architectural promenade, maintaining indexes of its older context, metrics and scale. By contrast, the closedness of the neo-Gothic façade of the Castelvecchio is opened by the freedom of Scarpa's intervention. Here, an organised disorder is superimposed onto a previous order, pluralising signification.

With these examples, my intention was to contribute to the debate on the creative possibilities in interventions involving historical remnants. In attempting to systematise these possibilities through linguistics, I hardly need to note that this systematisation is far from exhausting the debate. Also, by focusing on the relation between a work's openness and established codes in architecture, I am aware of the limits involved in resorting to structural linguistics as a critical tool in a non-linguistic system. Despite these limits, structuralist thinking has the advantage of focusing on the fundamental condition of communication in architecture involving historical remnants without falling into the semiological discourses of neoconservative postmodernism, to use Hal Foster's term.[38] Independent of the methodology one may adopt, a central problem of architecture in our time is the re-signification of historical structures and elements through new interventions. By multiplying the possibilities of signification, an architectural intervention will foster multiple interpretations, potentiating the awakening of collective values and memories, thus endowing spolia with an afterlife.

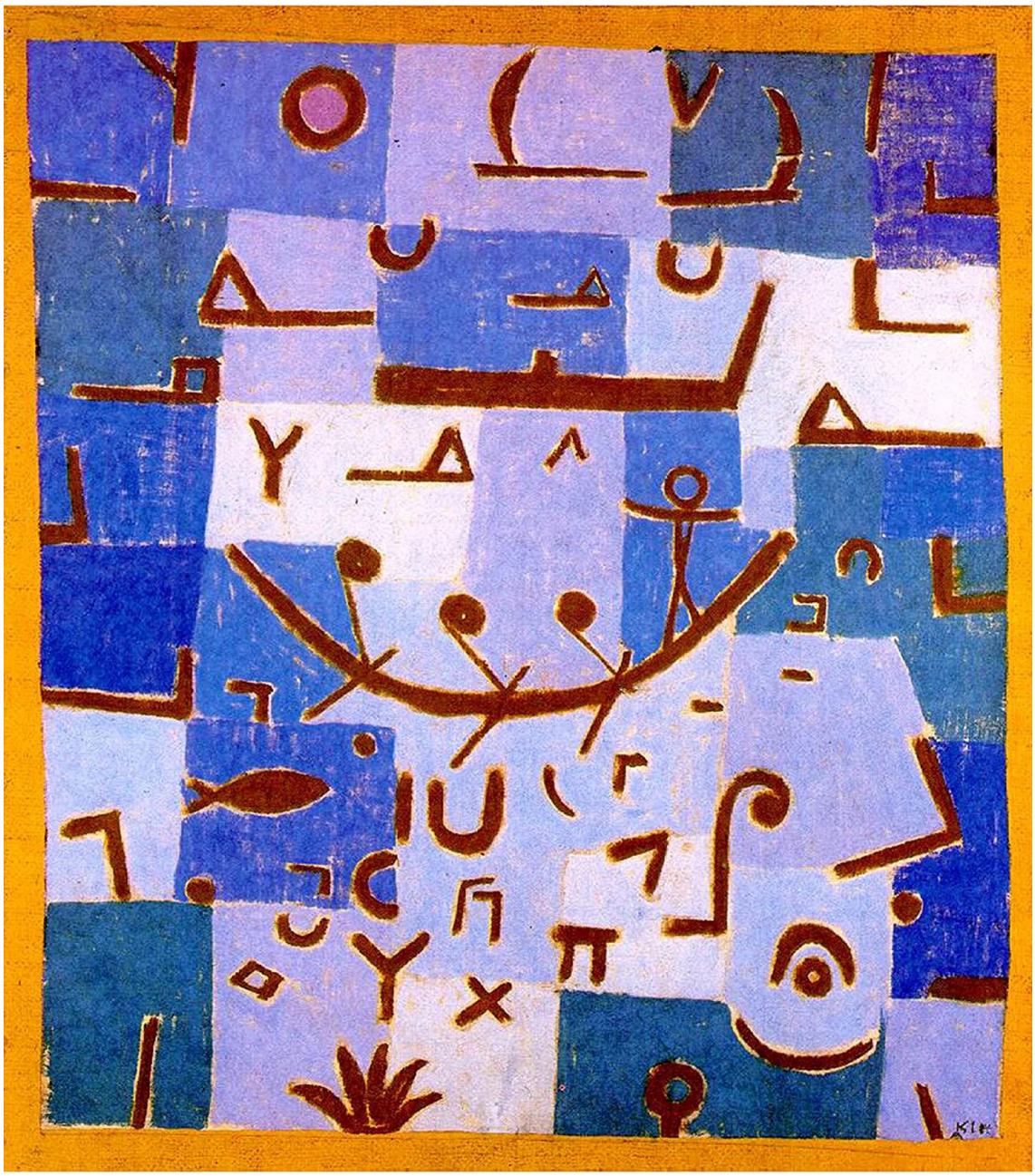

Fig. 11: Paul Klee, *Legend of the Nile*, 1937. Public domain.

Notes

An early version of this essay was delivered as a lecture at the postgraduation programme ALA Master, Architecture, Landscape and Archaeology, at the Department of Architecture of the University of Coimbra, in 29 September, 2021.

1. Literature on spolia in the field of art history is vast. For an overview see Richard Brilliant and Dale Kinney, ed., *Reuse Value:* Spolia *and Appropriation in Art and Architecture from Constantine to Sherrie Levine* (New York: Ashgate, 2011); Ivana Jevtić and Suzan Yalman, eds., *Spolia Reincarnated: Afterlives of Objects, Materials, and Spaces in Anatolia from Antiquity to the Ottoman Era*, 10th International Anamed Annual Symposium (Istanbul: Koç University, Anatolian Center for Anatolian Civilizations, 2018); Maria Fabricius Hansen, *The Eloquence of Appropriation: Prolegomena to an Understanding of Spolia in Early Christian Rome* (Rome: L'Erma di Bretschneider, 2003). Arnold Esch's inaugurating essay is 'Spolien: Zur Wiederverwendung antiker Baustücke und Skulpturen im mittelalterlichen Italien', *Archiv für Kulturgeschichte*, 51 (1969): 1–64.
2. Esch, 'On the Reuse of Antiquity: The Perspectives of the Archaeologist and of the Historian', in *Reuse Value*, 14–31.
3. My main concern here is with the possibilities of spolia in today's architectural practice. For the sake of simplicity, I will use the word 'contemporary' throughout this essay to broadly refer to the period that followed World War II, discussing works ranging from the 1960s to the early twenty-first century. The Second World War marked a definite change in our relation with history, the essence of which continues to this day. Given the historical range of the concept of spolia, and despite the changes of the recent past, it seems legitimate to look at this time span as involving the same fundamental problems with regard to architectural heritage.
4. Umberto Eco, *The Open Work*, trans. Anna Cancogni (Cambridge, MA: Harvard University Press, 1989), esp. 44–83.
5. For an example of structural linguistics in the debate on spolia see Paolo Liverani, 'Reading Spolia in Late Antiquity and Contemporary Perception', in *Reuse Value*, 33–51.
6. See, for example, Liverani, 'Reading Spolia', esp. 37–38. Literature on the Arch of Constantine abounds. For an analysis of the architectural design see Mark Wilson Jones, 'Genesis and Mimesis: The Design of the Arch of Constantine in Rome', *Journal of the Society of Architectural Historians* 59, no. 2 (March 2000): 50–77. For the practical vs ideological reuse of older reliefs and its cultural context see Liverani, 'Reading Spolia'; Jas Elsner, 'From the Culture of Spolia to the Cult of Relics: The Arch of Constantine and the Genesis of Late Antique Forms', *Papers of the British School at Rome* 68 (2000): 149–84.
7. See Hugo Brandenburg, 'The Use of Older Elements in the Architecture of Fourth- and Fifth-Century Rome: A Contribution to the Evaluation of Spolia', in *Reuse Value*, 53–73.
8. For an overview of the development of research on spolia see Kinney, 'The Concept of *Spolia*', in *A Companion to Medieval Art: Romanesque and Gothic in Northern Europe*, ed. Conrad Rudolph (Malden: Blackwell Publishing, 2006), 233–52. On the term spolia and the various concepts associated with it see Kinney, 'Rape or Restitution of the Past? Interpreting *Spolia*', in *The Art of Interpreting*, ed. Susan Scott (Pennsylvania: PSUP, 1995), 54–56; Kinney, 'Spolia, Damnatio and Renovatio Memoriae', *MAAR* 42 (1997): 119–22; Kinney, 'Roman Architectural *Spolia*', *Proceedings of the American Philosophical Society* 145, no. 2 (June 2001): 138; Inge Uytterhoeven, '*Spolia*, *-iorum*, n.: From Spoils of War to Reused Building Materials: The History of a Latin Term', in *Spolia Reincarnated*, 25–50.
9. The notions of *spolia in se* and *spolia in re* were advanced by Richard Brilliant, 'I piedestalli del giardino di Boboli: spolia in se, spolia in re', *Prospettiva* 31 (1982): 2–17.
10. Elsner, 'From the Culture of *Spolia*'.

11. Brandenburg, 'The Use of Older Elements'; Philipp Niewöhner, '*Varietas, Spolia*, and the End of Antiquity in East and West', in *Spolia Reincarnated*, 237–57.
12. Donald Preziosi, 'Collecting/Museums', in *Critical Terms for Art History*, ed. Robert S. Nelson and Richard Shiff (Chicago and London: The University of Chicago Press, 2003), 407–18.
13. Ivana Jevtić, Introduction to *Spolia Reincarnated,* 3–4. The Rüstem Paşa Caranvenserai, or Kurşunlu Han, is located in Galata, Istanbul, and was designed and built between 1544 and 1550 by Mimar Sinan.
14. The entry courtyard to the Tolentino convent was completed after Scarpa's death by his collaborator Sergio Los. On the portal and its metaphorical dimension see Giuseppe Mazzariol, 'Da Carlo Scarpa: due porte, l'ombra, la luce', *Venezia Arti* (1987): 73–81; Federica Goffi, 'Architecture In Conversion: The Singular Door to the Practice of Carlo Scarpa', *Oblique* 2 (2017): 42–53.
15. Charles Sanders Peirce, 'Logic as Semiotic: The Theory of Signs', in *Philosophical Writings of Peirce*, ed. Justus Buchler (New York: Dover Publications, 1955), 99–119.
16. Ibid., 102–103.
17. Ibid., 102.
18. Roland Barthes, *Roland Barthes by Roland Barthes,* trans. Richard Howard (Berkeley and Los Angeles: University of California Press, 1994), 46.
19. Ibid.
20. The *ima, media* and *summa cavea* are the terms for the lower, intermediate and upper sections of the semi-circular amphitheatre developing around the space for the orchestra. The *scaenium*, or stage structure, is basically composed of a *pulpitum,* or stage, above a usually decorated front, or *proscenium,* and two main planes, the front plane, or *scaenium frons* and the background plane, or *postscenium*. Between the two main parts of the theatre, the *cavea* or stepped amphitheatre, and the *scaenium*, or stage structure, there are usually two entrances, or *aditus,* one on each side of the stage.
21. Giorgio Grassi, 'Roman Theatre of Sagunto', in *Giorgio Grassi: Architecture, Dead Language* (Milan: Electa, 1986), 81.
22. Ibid.
23. Ibid., 83.
24. Ibid.
25. Barthes, *Roland Barthes,* 46.
26. Conversation with José Ignacio Linazasoro, Coimbra, 12 November 2021; see also Linazasoro, *Memoria de una búsqueda: Sobre escritos y proyectos* (Valladolid: ETSAVA, 2019), 65–69; Linazasoro interviewed by Daniel Dávila Romano and Leonardo Tamargo Niebla, *TC Cuadernos*, no. 148 (2020): 9.
27. Ferdinand de Saussure, *Course in General Linguistics*, trans. Wade Baskin (New York: McGraw-Hill, 1966).
28. The affinities between structuralism and synthetic cubism were first intuited by Picasso's dealer Daniel-Henry Kahnweiler and have been discussed by several scholars; the literature is too vast to list here. See, for example, Yve-Alain Bois, 'The Semiology of Cubism' and Rosalind E. Krauss, 'The Motivation of the Sign', both in *Picasso and Braque: A Symposium,* ed. Lynn Zelevansky (New York: The Museum of Modern Art, 1992), 169–208 and 261–86.
29. 'Extension of San Lorenzo Church in Valdemaqueda, Madrid, Spain', Linazasoro & Sánchez website, http://www.linazasorosanchez.com/?portfolio=2001_iglesia-san-lorenzo&lang=en.
30. David Robey, Introduction to Eco, *The Open Work*, xxiv.
31. Eco, *The Open Work*, 53.
32. Marco Frascari, 'Carlo Scarpa in Magna Graecia: The Abatellis Pallace in Palermo', *AA Files* 9 (Summer 1985): 3–9.
33. Ibid., 4.
34. Ibid., 9.
35. For a general account of the Castelvecchio, its history and comprehensive documentation on Scarpa's design, see Alba Di Lieto, ed., *I disegni di Carlo Scarpa per Castelvecchio* (Venice: Marsilio, 2006). For a comprehensive analysis of Scarpa's intervention see Richard Murphy, *Carlo Scarpa*

and Castelvecchio Revisited (Edinburgh: Breakfast Mission Publishing, 2017).

36. As noted, for example, by Goffi, 'Architecture in Conversion'.
37. Manfredo Tafuri, 'Il frammento, la "figura", il gioco: Carlo Scarpa e la cultura architettonica italiana', in *Carlo Scarpa, Opera Completa*, ed. Francesco Dal Co and Giuseppe Mazzariol (Milan: Electa, 1984), 72–95. Scarpa met Klee in 1948, when he was designing an exhibition of the painter's work at the Central Pavilion of the twenty-fourth Venice Biennale. See Giuseppe Mazzariol, 'Opere dell'architetto Carlo Scarpa', *L'architettura cronache e storia* no. 3 (1955): 340–41, 347. On the links between Scarpa and Klee also see Robert McCarter, 'Architecture Determined Not by the Whole but by the Part', in *Carlo Scarpa* (London: Phaidon, 2013).

    Klee's syntactic looseness, where the emphasis is on the signs more than on the sign structure, is anticipated by some of Picasso's *papiers collés*, such as *Siphon, Newspaper and Violin* (late 1912). The links between Scarpa's destruction of the normative principles of assembly and the modernist avant-garde, namely the free associations of memory images of cubism, have been discussed by Ellen Soroka, 'Point & Counterpoint: The Art of Interface in the Work of Carlo Scarpa', *Modulus* 19 (1989): 42–65. Soroka approaches cubism mainly from the position of the early writers on the movement (from Albert Gleizes and Jean Metzinger to Apollinaire), with their accent on issues such as simultaneity, transparency and movement, and its association with the Bergsonian notion of duration. I believe that the scriptural nature of Cubism intuited by Kahnweiler, such as discussed in this essay, only reinforces Soroka's arguments. I thank Federica Goffi, who made Soroka's article available to me.
38. Hal Foster, '(Post)Modern Polemics', *New German Critique* 33 (Fall 1984): 67–78.

Biography

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The Unbearable Lightness of an Open System: The Packaged House 1941–47

Ezgi İşbilen

> The system that Wachsmann designed was so open that it was destined to fall apart.
> Alicia Imperiale, 'An American Wartime Dream'[1]

One of the many ways in which architecture is conceptually opened up is by adopting systems theory in building technology. In this context, open systems denote modular design and construction. The holy grail of this line of thinking is modular building systems that induce variety in design within pre-set parameters. They resolve the construction details without designating the final form. A system of standardised, mass-produced parts that can be configured in various ways opens a field of possibilities.

Open building systems position the architect as the designer of the system rather than of singular buildings. They promise to replace construction with assembly that can be handled by unskilled labour. On the professionals' side, this renders 'a completely unified constructed environment, unified by the exercise of professional intelligence, reason, and the scientific method' possible.[2] On the other end, when scaled through industrialisation, manufacturers and consumers see open building systems as high-tech DIY projects that can be produced with low-skill labour. However, there is a significant gap between the high expectations for the implications of the open systems principle and their results.[3]

This essay explores the potentials and consequences of openness in architecture through a historical case study. The Packaged House project (1941–47), designed by Konrad Wachsmann (1901–1980) and Walter Gropius (1883–1969), is a prefabricated housing system devised to meet the housing shortage in the US during and soon after the Second World War. It was an open spatial design system, a modular construction system and a commercial enterprise all in one. During its development, the federal government's investments in public housing proposals resembled a semi-socialist experiment. Although cultivated in the most favourable political and economic landscape for prefabricated building systems, the Packaged House failed to be reproduced in large numbers.[4]

While the existing literature on the project laments its spectacular failure, as Mark Jarzombek asserts in 'Architecture: A Failed Discipline,' failure is the norm in architecture's post-enlightenment status. Hence, we 'celebrate architecture's disciplinary failure … for just because something failed does not mean that it stops being relevant or – just as importantly – stops having a history.'[5] Moreover, open construction systems are hardly a matter confined to history. The sustained proliferation of open systems renders the phenomenon an active technological paradigm.[6] Moving away from the pragmatist position that measures success by the project's materialisation in the manner initially proposed, this essay acknowledges that architecture is as much a field of cultural production as it is of material production, and treats the project as an example of a culturally resonant idea.

Drawing from the conflicting histories of the Packaged House, the discursive formation of the post-war dwelling, changing definitions of

openness, and varied representations that convey mixed messages, I dissect the fantasies of the open building system as well as their practical and symbolic features. The story of the Packaged House reflects the still prevalent ideal of incorporating scientific and technological developments in the design and construction of buildings to increase the financial and spatial benefits for individual users at scale. Although this project was as much shaped by the context as by the intention and skills of its designers, it still offers several lessons to contemporary practitioners. Above all, it demonstrates the risks of responding to architectural problems with solely technological solutions. Moreover, looking at the problem from a critical, temporal distance , and as a historical project rather than a contemporary one with high-stake novelty claims, provides much-needed clarity on the topic.

The entangled histories of the Packaged House

There are two histories of the Packaged House: one a neat intellectual history, the other a messy material history. Both narrate an intellectual transfer from Europe to the US. However, the specifics change depending on which of the Packaged House's two designers the historian is inclined to credit with authorship. Furthermore, the weight given to openness is different in the two stories. In one, openness is the goal. In the other, it is a built-in capacity that may or may not be actualised. The distinct perspectives towards openness also define the rhetoric of these stories. While the first stance only generates neo-platonic accounts of ideal openness that is unattainable with material means, the latter, less interrogated position allows us to see openness in context, as a political and technical capacity.

The neat history places the project as a material reflection of a lengthy intellectual pursuit. It belongs to the trajectory of Walter Gropius's written and built work devoted to industrialised housing. This story starts with a 1910 report Gropius wrote upon Peter Behrens's request on house types and components. Under the title 'Program for the Founding of a General Housing-Construction Company Following Artistically Uniform Principles,' Gropius wrote the gist of his theory of uniting arts and industry, which he kept advocating for, and restated almost verbatim, as an architect, theorist, and educator over the following decades:

> The idea of industrialising house construction can be realised by the repetition in each building of the same standardized component parts. … The possibility of the varied assembly of these interchangeable parts would enable the Company to satisfy the public desire for a home with an individual appearance.[7]

Between military service in the First World War and his tenure at the Bauhaus, it took Gropius a long time to put the theory to the test. While he incorporated some of the methods and qualities of his theory in the Dessau-Törten Housing Estate (1926–28), Gropius's first entirely fabricated house was one of the two houses he designed for the *Weissenhofsiedlung*, the *Deutscher Werkbund* exhibition that included a model neighbourhood (1926–29) in Stuttgart. The house was a two-story structure with a simple rectangular plan. Gropius described its construction system as *Trockenmontage*, a dry assembly system. It was constructed with a steel frame, clad with asbestos sheeting on the outside, and an industrial cellulose-fibre sheeting on the inside. It had wood floors and a roof made of precast cinder concrete blocks covered with metal.[8] The only exception to the dry assembly rule was the concrete foundation. The project was an exhibition model. It was not replicated. And with so many different materials and components involved, it could not have been replicated easily in another location. However, it was widely publicised and proved that the idea of a prefabricated house system with built-in variability suited reasonable material and spatial applications.

In 1931, Gropius approached the Hirsch Copper Works, which produced prefabricated copper houses, also known as knockdown houses.[9] They

were composed of structural elements made at the factory to fit desired dimensions and specifications, transported to the site, and assembled by joining their edges to produce complete wall sections. The Hirsch houses were much closer to the industrial housing solution Gropius advocated for than anything he had produced thus far. Gropius encountered the system through the Hirsh catalogue published for the Paris International Exhibition of 1931, which included model houses made the same year in Berlin. He found their dry panel system technically promising, but its conservative application and imitative styles aesthetically disappointing. He offered to improve their design, eliminating the peaked roof, and introducing a free plan to include the possibility of expansion. The two models Gropius developed for their catalogue, K and M models, were expanded to the K1, M1, and M2, proving that his theory of variation from standardised components was plausible within industrial production.[10]

When Gropius's earlier experiments with prefabrication and his unwavering intellectual commitment to the unification of art and industry are considered, the Packaged House's development becomes an inevitable consequence in an evolutionary process.[11] The neat history is a hero narrative of Gropius fighting the nineteenth-century fear that industrialisation would bring a cruel monotonous world into existence.[12] It also resonates with the mainstream modernisation myth of shedding the baggage of historical conventions and instrumentalising technology towards the humanist goal of a better future for the masses.

Tracing the history of the Packaged House's material and construction technology provides a less coherent and more contingent narrative. In terms of construction technology, the Package House is a highly developed version of prefabricated kit-of-parts panel houses produced in Europe in the late nineteenth and early twentieth centuries to satisfy the needs for shelter in war encampments and colonies. As an erstwhile chief architect of Christoph & Unmack, one of the oldest and largest producers of prefab timber construction in the early twentieth century, Wachsmann facilitated the intercontinental technological transfer from Europe to the US.[13] The panel house was one of the three categories of prefabricated timber construction Wachsmann laid out in his 1930 book *Holzbau.*[14] The book partially resulted from Wachsmann's reorganising of the factory's catalogue. While he designed timber buildings, the knowledge and most of the cases in the book were the result of the anonymous labour of the many technicians the company hired or commissioned.

The military and colonial origins of the technical know-how is largely lost in translation from the anonymised labour of various technicians to the emergence of Wachsmann as a master of industrialisation. Architectural historian Itohan Osayimwese, who traces the links between colonialism and modernism, concludes that along with steamboats, rifles, quinine, and the telegraph, prefabrication was among the critical tools that enabled European territorial expansion. [15] As one of the principal developers and providers of these services as evidenced by records of numerous tropical barracks now buried in the archives, Christoph & Unmack was 'an agent of infrastructural imperialism.'[16]

However, it would be hard to cast Wachsman as an intentional agent of the laundering process of the panel house system from a tool of infrastructural imperialism to a neutral technical know-how that will serve middle class Americans by providing them affordable, customised houses that they can build themselves. For Wachsmann, the road that led to the development of the Packaged House was less a wilful evolution than one caused to meander by chance and misfortune. Once a journeyman cabinetmaker, his architectural education was sporadic. He took a course under Heinrich Tessenow at the Academy of Arts in Dresden and studied at the Academy of Arts in Berlin as a master student of Hans Poelzig. Poelzig's influence on Wachsmann's career is one of those manifestations of chance

that contrasts with the neat history cited earlier. Wachsmann met Poelzig when the former was about ten years old. Wachsmann's grandfather had commissioned Poelzig to design a chemical factory in Luban, a small town in western Poland, which was then part of Germany. The volume of correspondence between Wachsmann and the Poelzigs, his teacher and his teacher's son, indicates a lifelong close relationship. When Wachsmann returned destitute from an unfortunate adventure as an unpaid intern at Le Corbusier's office in Paris, Poelzig set him up with a job at the factory of Christoph & Unmack in Niesky, a small town on the eastern edge of the Free State of Saxony, bordering Poland. The family acquaintance Wachsmann had with Poelzig through his grandfather's factory and the connection Wachsmann's expressionist mentor had to the pure pragmatist prefab construction company are chance encounters that shaped Wachsmann's professional career.

Wachsmann's move from Europe to the US is another instance of how chance, or rather misfortune, comes into play. As a German Jew, Wachsmann was one of the many people who were no longer at home in their homeland due to the rise of national socialism. Although he was spared by chance, having been in Italy with a prestigious fellowship at the height of the persecution, the violence caught up with him soon.[17] As a result, his move to the US was more an escape from turmoil that swallowed family and loved ones than a career move.

Wachsmann's ideas regarding standardisation and openness did not have Gropius's panache. Wachsmann's recollection of the time he spent in Niesky, recorded late in his life, is telling when compared with Gropius's remarks on the subject. He describes the orderly streets of Niesky that were lined with prefabricated houses built to the same height with standardised walls and windows as 'delightfully monotonous.'[18] For Wachsmann, uniformity did not register as an inhuman horror. On the contrary, he found it in perfect harmony with nature as 'even trees seemed to be growing in regular order.' He declared that 'in such a self-imposed, universal system, the people seemed to live in remarkable harmony and contentment.'[19] In his autobiography and treatise on the industrialisation of building Wachsmann treats standardisation as a virtue rather than a risk.[20] He considers flexibility, which manifests openness, a capacity rather than a necessity.

The archival material testifies that the truth lies somewhere between these stories.[21] Authorship can only plausibly be assigned to their collaboration. Wachsmann initiated the project, calibrated it from the metric to the imperial system, refined its details multiple times, and found the initial investors to get it going. Yet, without Gropius's theoretical grounding, advocacy, and the support of his robust network, we would probably not know about the project today. One secured the lightness, and the other provided gravitas. However, the project owes its progress as much to the political and economic context as to the individual strengths of its creators.

In February 1942, the National Housing Agency allocated 153 million dollars for the housing of displaced defence workers. The production target was forty-two thousand houses. Seven months later, Wachsmann and Gropius founded the General Panel Corporation. While the initial funding came from private investors, its realisation depended on securing defence commissions. A few months after the company's foundation, Gropius set up a theatrical demonstration for important government officials. The demonstration took place in a warehouse in Somerville, Massachusetts, owned by the US Plywood Corporation. Five men wearing lab coats and bowler hats assembled and disassembled a simple dwelling unit using only hammers and folding ladders. The success of this show, along with a marketing campaign in the professional and standard press, attracted interest and more funding. However, in 1945, when the war – and the need for defence worker housing – ended, the company had not commenced production.

At this critical juncture, federal funding provided a second chance. In 1946, the Veterans Emergency Housing Program was initiated to provide housing for the returning soldiers. The programme was part of a more extensive economic transition from a defence economy to a peace-time economy. Accordingly, the federal government allocated funds for the housing programme and made the armament factories available for alternative production. The General Panel Corporation raised more money, acquired the former Lockheed rocket engine company in Burbank, California, and set up a semi-automatic production line with a planned production rate of ten thousand houses per day.

The factory never accomplished this goal. By the time they completed setting up the factory in mid-1947, the government had withdrawn its support. The Veterans' Housing Program was cancelled. With the loss of purchase guarantees, the production line never achieved the planned rate. At the rate it did achieve, the houses were more expensive than intended. Soon, with both creators out of the picture, the company went bankrupt. But did the Package House fail?

Discursive Presence

Where the material story ends, the discursive presence continues. In Spring 1947, around the time of the decisive end of their commercial enterprise, Gropius and Wachsmann attended a symposium on 'Planning Man's Physical Environment' at Princeton University.[22] Speaking in the session titled 'Limitations and Possibilities', they were the only speakers who unreservedly argued for the possibilities of material and aesthetic quality at effective cost against a choir warning of the limitations arising from financial, logistical, administrative, and planning issues. While they did not mention the Packaged House by name, the promises they espoused using written and graphic promotional material were all associated with it.

The dynamics of this session – Gropius and Wachsmann cast as Pollyannas against a chorus of Pandoras – echo in most later interpretations. Indeed, the reservations regarding various challenges, especially about the financial limitations, concur with the criticism I have outlined in this essay. However, as the following interpretations of the project's failure also prove, its promises were far too attractive to be eclipsed by practical limitations.

Both Gropius and Wachsmann foreground the economic efficiency prefabrication entails. Under the title 'Prefabrication: Freedom from Limitations,' Gropius frames prefabrication as a democratic solution for the housing shortage, as it creates production volume without prescribing uniformity within affordable means. Gropius believed that this allows for the elimination of housing subsidies and for the issue to be handled within the existing market structure.[23] Wachsmann, on the other hand, concentrates on technological and stylistic aspects. He presents prefabrication as the mode of production and design most in tune with their capacity to control energy at the time. Command of electricity requires machine production. Accordingly, Wachsmann argues, the resulting image of 'lightness' is the expression of the time.[24]

The 'limitations' argued in the same session resurface in the comprehensive, industry-sponsored analysis of the prefabricated housing solutions Burnham Kelly published four years later in *The Prefabrication of Houses*.[25] In addition to the financial, logistical, and administrative issues, Kelly offers two new insights. First, he argues that solutions driven by individuals are not necessarily more democratic, as the maintenance of those new neighbourhoods will still require public funds. Therefore, the efficient use of public resources requires individuals to comply with planning decisions instead of operating in a completely open system. Secondly, as an advantage of hindsight, Kelly can report not only the designers' and producers' perspectives but also the public perception and response. In that sense, Kelly's assessment that in the consumers' minds 'lightness' is associated with weakness is critical. For example, he states that prefabricated houses

are stereotyped as 'dreary shacks.'[26] Despite the high precision and quality of factory production, these houses were perceived as less valuable than conventionally built housing options.

The discursive presence of the Packaged House continues after these mid-century discussions. As histories of and discussions about prefabrication unfold, historians and theorists keep revisiting the Packaged House. Unfortunately, the resulting literature casts it as a spectacular failure. Gilbert Herbert's *The Dream of the Factory House* (1984) records the most comprehensive account of the Packaged House project from pre-conception to the end of production. However, Herbert's interpretation of why the Package House enterprise failed lacks the precision of his assessment of its virtues and advantages. He states that there is no single cause or simple formulation but 'complex interactions of many factors' with cumulative effects.[27] According to Herbert, 'the very high quality of the product contained within it the seeds of failure'.[28] The system was too closed to 'freely incorporate elements from the competitive open market' or to be competitive even at full capacity.[29] Herbert finds the fault in the zeitgeist. The conditions required to fulfil this dream were not only the intellectual capacity of its creators and the proper production tools but also 'a society more amenable to logical discourse, rational decision-making, and creative human interaction.'[30] In other words, this ideal system would require an ideal society ready to embrace such perfection.

Alicia Imperiale, who approaches the Packaged House through a systems theory lens, reasons that the system was too open to succeed. As conceived by Norbert Wiener during World War II, the cybernetic system was a closed system of control to increase artillery targeting. The system required every action to turn into feedback, which made the actions to follow more accurate. With enough repetition, the system would reach perfect accuracy. In other words, Wiener's notion of the closed system specified having 'an end-goal in sight.' As Imperiale puts it, 'the goal would be determined by the performance of the system. The missile would make its mark, the houses would be determined at the outset by the system of parts.'[31] The Packaged House did not have a perfect application at which to aim. Variation was the goal. Without a destination in mind, it was hard to assess which direction represented progress.

Mixed messages and moving targets

Throughout its development, the advertisements of Packaged House reflect the rhetorical perplexity in the critical literature about it. From the very beginning, the project is presented as a conveyor of conflicting qualities. In 1943, when the National Housing Agency granted the General Panel Corporation's proposal approval as a temporary dwelling unit for the defence housing program, the standards specified by the technical department of the agency were far from challenging. Temporary dwelling unit standards specified simple small units that could be assembled and disassembled quickly, and without material loss. It emphasised mobility and efficiency, but not necessarily flexibility. Yet the subsequent publication campaign presents the system as an infrastructure with which one can build anything. [Fig. 1] The drawings of the project look quite different from the eventual housing kits: it has two stories, a staircase, posts and beams that support a second floor.

The project's potential remained a central figure in General Panel Corporation's visual communication efforts. However, what potential meant for the client was not always clear. In its most mature state, the Packaged House system was marketed as ten types ordered from the company catalogue and customised by the consumer as needed. Did potential mean choice from ten options? Was it alteration upon pre-selected kernel sets? László Moholy Nagy included the Packaged House in his book *Vision in Motion* (1947).[32] He juxtaposes the image of a stacked pile of panels with the plan of a two-bedroom house. The plan shows a third bedroom that

the owner could add later. [Fig. 2] While masterfully done in terms of space and material use, this customisation scheme is far from the level of flexibility Gropius had praised.

The implied growth and shrinkage of the house that the plan communicates is directly related to the housing discourse of the time. In 1942, *Architectural Forum* published a special issue with the title 'The New House of 194X.' The issue argues that the success of prefab houses depends on their adaptation to 'different needs resulting from changes in family composition as a family grows older.'[33] In his analysis of the discursive formation around the post-war dwelling, Carlo Carbone characterises the issue as a call for 'open systems capable of achieving multiple design options based on component standardisation and modularity.'[34]

Although it emphasised production technology, materials, and the assessment of contemporary needs, the discourse of post-war dwelling was emotional and political. By the end of the war, the single-family house had become a symbol of the hopes and aspirations of Americans. It was considered an earned reward for surviving the great depression, fighting the war, and sustaining the production lines at home. It was time for 'the same resourcefulness and ingenuity that had served the country so well at war' to serve its citizens by making 'a modern, convenient, and affordable machine for living.'[35]

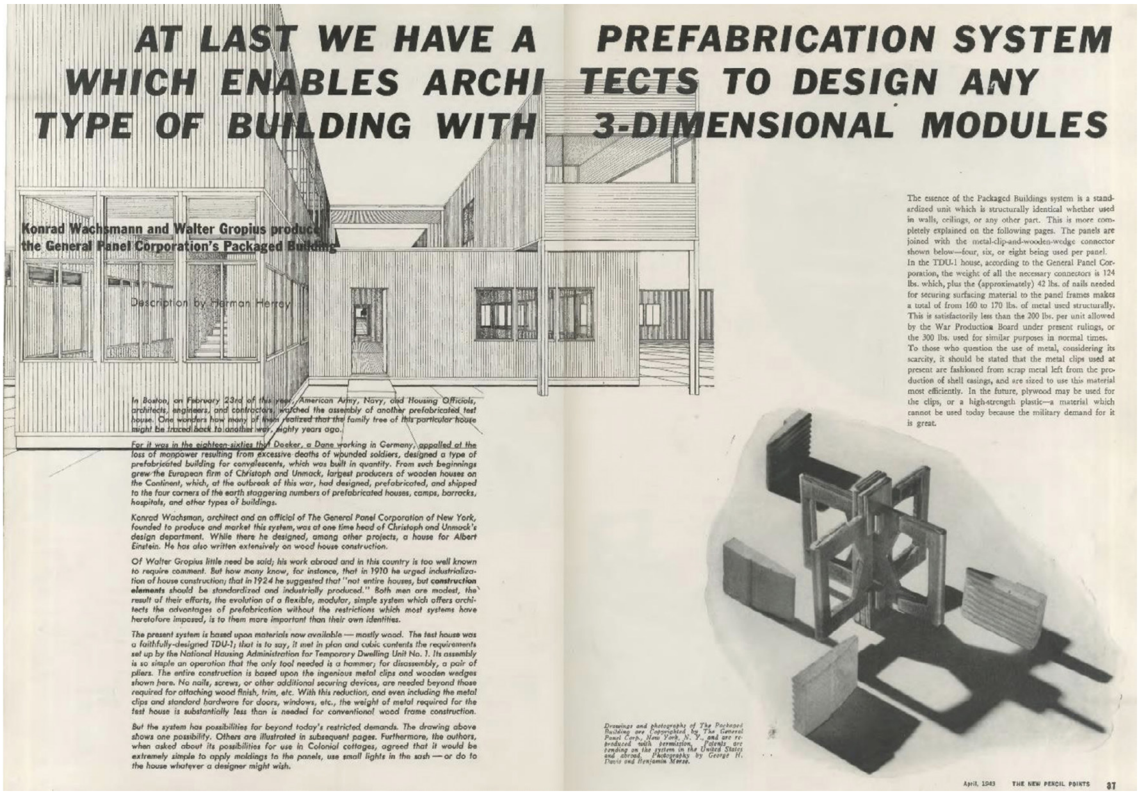
Openness, interpreted as flexibility and customisation, plays a vital role in the symbolic construction of the post-war dwelling. In 1944, Charles and Ray Eames authored a provocative manifesto titled 'What is a house?'[36] In carefully composed words and images, this piece calls for an expansion of what the house serves. It argues that the house was no longer a container of living but the stage of various activities the owners may engage in their lives. Domestic life includes work, entertainment, and play, particulars of which cannot be neatly separated. Openness extends to include an open plan which no longer specifies strict functional divisions.

Along with publications, competitions contributed to the discursive formation of the post-war dwelling. In 1945, John Entenza announced the Case Study House Program, calling architects to design a new house.[37] The Eames's 1944 manifesto called for customisable houses, scalable through factory production. Part of the programme's goal was to match 'good architects' and 'good manufacturers' whose sponsorship was critical in building these exemplary houses. The prefab houses were instrumental in the domestication of industrial materials such as plywood, steel, and plastics. While the fundamental values of the programme – innovation, scalability, reproducibility, affordability, and customisation – were not all expressed in each project, '13 out of 36 of the residential prototypes were built on the conviction that architecture could be both mass-produced and fitted to owners' personalities.'[38]

The symbolic character of the post-war house eclipses its practical applications. The cover of the November 1947 issue of *Arts & Architecture* featured 'the connector', a four-way joint designed as part of the Packaged House system, juxtaposed with part of the iconic image of *the Creation of Adam* from the Sistine Chapel. [Fig. 3] In promoting this new system of construction, the article states:

> All detail is integral with the product. A designer confronted with a building project is relieved of the task of having to start all the details from scratch, then see them cut to pieces on the site. He can now devote himself entirely to the best possible layout. On the other hand, great care and thoroughness can be applied to even the smallest detail which, when developed in the shop, will give it an aspect of finality and perfection.[39]

The description suggests that the product is simultaneously complete and unfinished. It is ready to be assembled in a matter of hours yet has space for adjustments for perfection. Earlier in the article, the system is compared to an Erector set with which the designer can build any variation out of prefabricated



AT LAST WE HAVE A PREFABRICATION SYSTEM WHICH ENABLES ARCHITECTS TO DESIGN ANY TYPE OF BUILDING WITH 3-DIMENSIONAL MODULES

Konrad Wachsmann and Walter Gropius produce the General Panel Corporation's Packaged Building

Description by Herman Herrey

In Boston, on February 23rd of this year, American Army, Navy, and Housing Officials, architects, engineers, and contractors, watched the assembly of another prefabricated test house. One wonders how many of them realized that the family tree of this particular house might be traced back to another war, eighty years ago.

For it was in the eighteen-sixties that Doeker, a Dane working in Germany, appalled at the loss of manpower resulting from excessive deaths of wounded soldiers, designed a type of prefabricated building for convalescents, which was built in quantity. From such beginnings grew the European firm of Christoph and Unmack, largest producers of wooden houses on the Continent, which, at the outbreak of this war, had designed, prefabricated, and shipped to the four corners of the earth staggering numbers of prefabricated houses, camps, barracks, hospitals, and other types of buildings.

Konrad Wachsman, architect and an official of The General Panel Corporation of New York, founded to produce and market this system, was at one time head of Christoph and Unmack's design department. While there he designed, among other projects, a house for Albert Einstein. He has also written extensively on wood house construction.

Of Walter Gropius little need be said; his work abroad and in this country is too well known to require comment. But how many know, for instance, that in 1910 he urged industrialization of house construction; that in 1924 he suggested that "not entire houses, but ***construction elements*** *should be standardized and industrially produced." Both men are modest, the result of their efforts, the evolution of a flexible, modular, simple system which offers architects the advantages of prefabrication without the restrictions which most systems have heretofore imposed, is to them more important than their own identities.*

The present system is based upon materials now available — mostly wood. The test house was a faithfully-designed TDU-1; that is to say, it met in plan and cubic contents the requirements set up by the National Housing Administration for Temporary Dwelling Unit No. 1. Its assembly is so simple an operation that the only tool needed is a hammer; for disassembly, a pair of pliers. The entire construction is based upon the ingenious metal clips and wooden wedges shown here. No nails, screws, or other additional securing devices, are needed beyond those required for attaching wood finish, trim, etc. With this reduction, and even including the metal clips and standard hardware for doors, windows, etc., the weight of metal required for the test house is substantially less than is needed for conventional wood frame construction.

But the system has possibilities far beyond today's restricted demands. The drawing above shows one possibility. Others are illustrated in subsequent pages. Furthermore, the authors, when asked about its possibilities for use in Colonial cottages, agreed that it would be extremely simple to apply moldings to the panels, use small lights in the sash — or do to the house whatever a designer might wish.

The essence of the Packaged Buildings system is a standardized unit which is structurally identical whether used in walls, ceilings, or any other part. This is more completely explained on the following pages. The panels are joined with the metal-clip-and-wooden-wedge connector shown below—four, six, or eight being used per panel. In the TDU-1 house, according to the General Panel Corporation, the weight of all the necessary connectors is 124 lbs. which, plus the (approximately) 42 lbs. of nails needed for securing surfacing material to the panel frames makes a total of from 160 to 170 lbs. of metal used structurally. This is satisfactorily less than the 200 lbs. per unit allowed by the War Production Board under present rulings, or the 300 lbs. used for similar purposes in normal times. To those who question the use of metal, considering its scarcity, it should be stated that the metal clips used at present are fashioned from scrap metal left from the production of shell casings, and are sized to use this material most efficiently. In the future, plywood may be used for the clips, or a high-strength plastic—a material which cannot be used today because the military demand for it is great.

Drawings and photographs of The Packaged Building are Copyrighted by The General Panel Corp., New York, N. Y., and are reproduced with permission. Patents are pending on the system in the United States and abroad. Photography by George H. Davis and Benjamin Morse.

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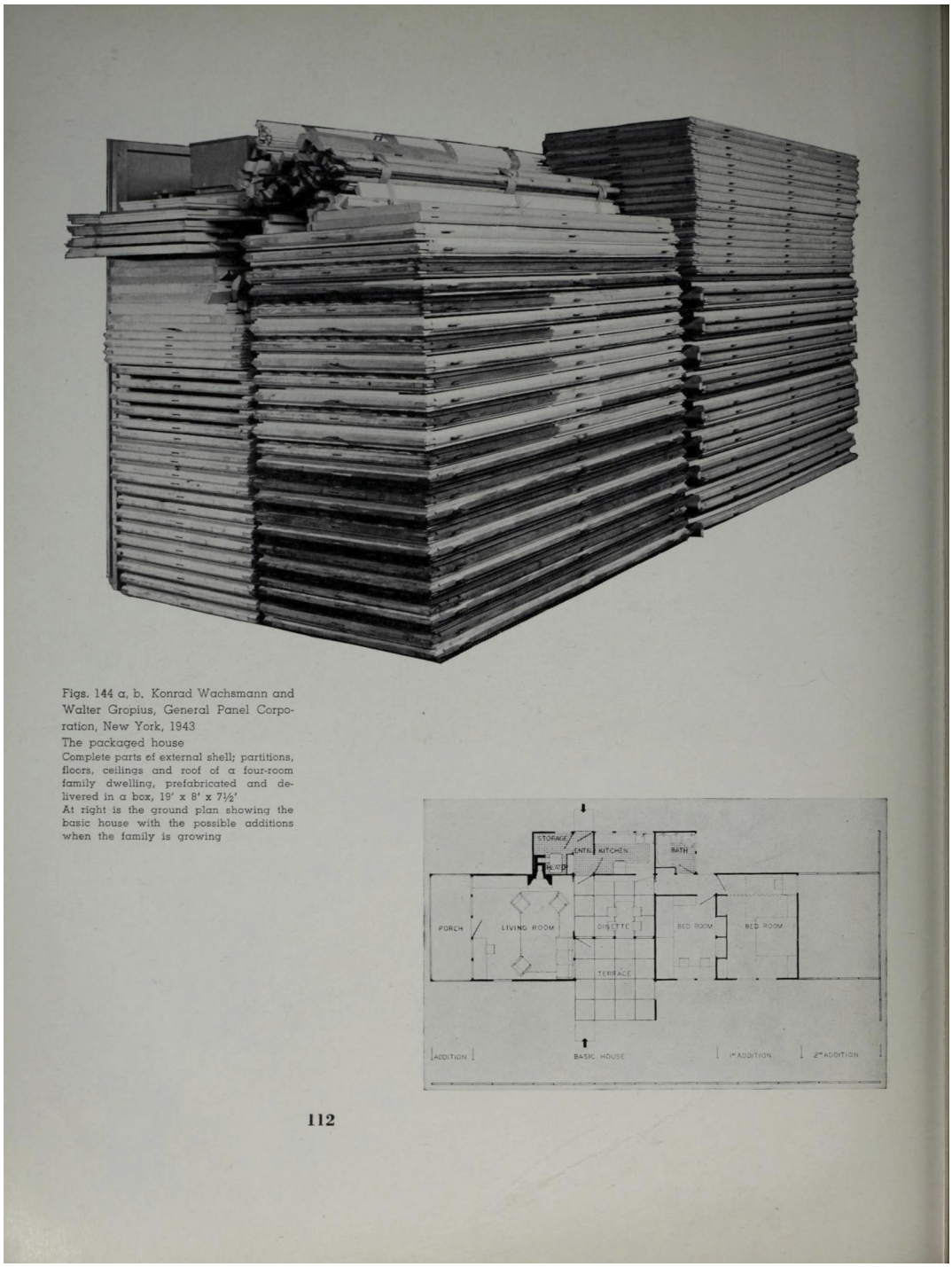
Fig. 1: Presentation of the Packaged House as a flexible construction system. Source: Herman Herrey, 'Prefabrication System for Architects: Konrad Wachsmann and Walter Gropius produce The Packaged Building System, which enables architects to design as they please, on a modular basis' *New Pencil Points* (April 1943): 36–37.



Figs. 144 a, b. Konrad Wachsmann and Walter Gropius, General Panel Corporation, New York, 1943
The packaged house
Complete parts of external shell; partitions, floors, ceilings and roof of a four-room family dwelling, prefabricated and delivered in a box, 19′ x 8′ x 7½′
At right is the ground plan showing the basic house with the possible additions when the family is growing

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Fig. 2: The Packaged House System in László Moholy-Nagy, *Vision in Motion* (Chicago: Paul Theobald, 1947), 112.

elements. The system is strategically associated, à la Eames, with toys instead of industrial products, to create an illusion of creative agency for the consumer. Unfortunately, at this point, the General Panel Corporation was on borrowed time. For a faster prefabrication process, the connector was 'inserted into panels mechanically and then fixed between layers of finish material.'[40] As a result, the system lost its operability, and 'openness' became a pure symbol.

Financing the open system

In *The Prefabricated Home* (2005), Colin Davies argues that the failure of the Packaged House was the fault of its inventor, Konrad Wachsmann, because he kept tweaking the design even after the production line was up and running. Furthermore, Davies stresses that the Packaged House missed the post-war construction boom due to a tardy production process.[41] Davies values result over ambitions. He suggests that the company could have settled for any one of the progressive patents. Instead of insisting on geometric purity, Wachsmann could have accepted specific accommodations such as using industrial sheet materials for floors and ceilings instead of the patented panels. Then, Davies argues, the company could have been successful, like many that produced prefabricated houses under the same conditions.

Davies accuses Wachsmann of being obsessed with the abstract mathematical system that he keeps polishing towards perfection instead of seeing the Packaged House as a human dwelling. Unfortunately, while he criticises Wachsmann for essentialism, he falls into a similar fallacy. Indeed, the delays made the house substantially more expensive than intended, but the project could have continued with a different marketing strategy targeting another customer group. Thinking along these lines, Wachsmann sought new, better-paid commissions that could keep the production line running until it reached critical mass and became profitable. And he found it too. What failed, however, was the financial infrastructure serving the construction sector. Wachsmann explained:

> Even after I had left General Panel, I was sent to the Atomic Energy Commission site in Los Alamos. They needed 3 000 houses immediately. They could only issue a letter of intent if the company was able to produce a bank credit. But the bank in turn said that since this was a very unorthodox case, they wanted a letter of intent first. It was a vicious circle which never could be resolved. And thus the 3 000 houses were never produced.[42]

The openness of the project made it an 'unorthodox case' for credit. The financing of construction projects or purchase of buildings, also known as the mortgage system, depends on the financed entity's continued presence. If a borrower cannot make timely payments, within the rules specified in the contract, the creditor has the right to take legal possession of the asset. This system depends on the continuity of asset's use-value, or the value concentrated on the land. With non-existent buildings, without fixed addresses, the system fails as there are no assets to re-possess. There was no way to fund a potential project. From a creditor's perspective, only tried and proven types or a guarantee from the developer aligned with a reasonable calculation. Crediting a 'potential' was akin to gambling.

It is clear that even if the Packaged House could have overcome the difficulty of financing, more challenges would await at insurance or reselling. The General Panel Corporation developed the Packaged House for the expected housing shortage. The federal funds to finance individual projects – in addition to the grants to manufacturers and developers – were going to be low-interest mortgages. Since the variety of zoning codes and land prices would change the value of the assets funded, it is hard to imagine the financial infrastructure supporting the construction of individual Packaged Houses. While many prefabricated houses were produced during

Fig. 3: Graphic depiction of the connector on the cover of *Arts & Architecture*, designed by Herbert Matter. *Arts & Architecture* (November 1947). Source: Travers Family Trust. Used with permission.

this period, it was only possible by the clients having the necessary funds or a third party assuming the developer's position and taking on the risk.

The issue of financing went beyond individual cases and the purchase alone. The term 'housing shortage' is slightly misleading as it primarily refers to lacking reserves. However, as discussed earlier, the shortage was also an outcome of expected demand. The ordinary people that fought the war and manned the armament production deserved their share of the peace-time economy. A house is a shelter, a means for self-expression through its customisation, and an instrument of wealth accumulation. Therefore, housing shortage or housing demand is directly linked with potential housing fetish, making the housing market vulnerable to speculation regardless of how the houses are produced – even more reason for creditors' scrutiny.

Taking stock of the discussions

Modular housing projects that incorporate open systems have a theoretical appeal to architects for offering a systemic solution to the systemic problem of housing shortage. The system typically includes 1) a grid, 2) a set of components or modules that comply with the grid, and 3) a manufacturing scenario that specifies materials, the scale of the components, and the speed of production. Open systems promise the user lower prices, self-representation, and even partial creative authorship. The architect/producer and client/customer engage in a customisation game with pre-drafted rules. In exchange for a product that is overall of higher quality than one-off on-site construction and that is available sooner, consumers choose certain product features and accept the default limits of the system.

The history of Gropius and Wachsmann's Packaged House shows that the literature on open systems in building technology is replete with confusing and contradictory definitions. A system can be deemed both open and closed depending on how we define openness. Unfortunately, there is no consensus or conventional distinction between open and closed systems in architecture and construction. The partial distinction we have is hard to sustain, because regardless of which definition one follows, openness indicates an ideal state rather than an objective one.

Systems talk suffers from 'a severe limiting of the actual complexity of artifacts.'[43] Open systems' claim of universality eclipses their messy material histories. Technologies collectively produced over long periods appear as unique intellectual feats of genius inventors. In order to make the subject consistent with scientific and testable methods, assessment criteria are limited to the functional attributes reducible to quantitative measures. Praise of abstraction and purity in the name of geometric perfection or mathematical elegance obscure internal contradictions and built-in redundancies.

The eventual commercial failure of the Packaged House demonstrates the consequences of responding to architectural problems with solely technological solutions. Architectural production involves material, cultural, bureaucratic, and financial aspects. Idealising one element can cost the realisation of another. The correlation between the Packaged House projects' level of development and how it was communicated to professional and nonprofessional audiences shows an inverse proportion. When the system qualified for the simple standards specified for temporary dwelling units, it was presented as an infrastructure that would allow one to build any structure. Later, when the universal joint could sustain flexible organisations, its pure potential was reserved for housing and facilitated the addition or subtraction of rooms. The project's potential was presented as an epic quality superimposed on the Biblical creation myth, but it did not have any capacity for flexibility. The joints that provided flexibility were fixed in the panels.

The more resolved the production scenario was, with its semi-automated production line, the more

compromises were made in its flexibility by the addition of specified types and extensions, and the less sense the project made financially. The project was not only incompatible with other products in the competitive open market; it was also inconsistent with the credit system that financed construction projects. The intention to create radical openness produced a highly exclusive closed system. A claim of universal validity based on the promise of flexibility is hard to justify in the politically and culturally charged field of architecture. However, the concept is far from being exhausted.

In a purely technocratic vision, the appeal of modular construction systems reflects the idealised technology that will help us innovate our way out of societal problems and smooth frictions caused by human interaction or human systems such as land zoning. It is this promise that makes prefabricated open system construction an evergreen idea. Whether the housing shortage is due to the reservation of industrial material and facilities for war efforts, increased demands triggered by political investment in the house as a symbol, or current overpopulation in cities where supply cannot keep up with demand, an open system remains a popular solution.

Open systems today

Recent incarnations such as Michelle Kaufmann's Glide House and Charlie Lazor's FlatPak prove that the concept is just as appealing in the twenty-first century as it was in the twentieth.[44] However, these recent examples are distinct from the Packaged House in two regards. First, their origin story, therefore their rhetoric, is substantially different. Instead of the ingenious solution devised by an inventor, both contemporary architects cite personal struggle in finding reasonable housing options, turning to prefabrication, and discovering an answer they would like to share with like-minded people.[45] Their offer is not for everyone. The second distinction is about the assembly. Composed of units much larger than the Packaged House panels, assembling these houses requires sophisticated equipment to level, join, and seal their components.

The contemporary vigour of the open system concept extends beyond successful applications. If the status of the Packaged House is a measure, the idea is still praised by theorists. In *Architecture and Labor*, Peggy Deamer criticises the phenomenological sensitivity to craft and tectonics that prizes traditional and local building methods, as such labour-intensive practices work 'only for the rich who could afford these indulgences.' She investigates how architects who care for the craft can embrace new and less labour-intensive technologies. In her analysis of the contemporary place architectural detail occupies in the theory and practice of architecture through labour issues, Deamer calls the Packaged House 'the most experimental project of prefabrication.'[46] Contrasting the Packaged House with idealised local crafts practice, Deamer argues that experiments such as the Packaged House system demonstrate 'how far one can go not only in designing the repeatable object (or the repeatable component) but also in making factory labour a thing of both economic and cultural value.'[47]

Like the visible index of the hand in craftwork, details like the universal joint demonstrate a condensation of labour. The universal joint 'indicates precisely how one detail is evidence of and witness to the plethora of procedures that have taken place elsewhere by the factory worker and resolved by the local craft builder in a manner that allows his work to be both repeatable and unique.'[48]

In *Graphic Assembly*: *Montage, Media, and Experimental Architecture in the 1960s,* Craig Buckley makes a slightly different observation regarding specialised joints, such as the one in the Packaged House project. For Buckley, 'redesigning the nature of joints and connections went hand in hand with the redesign of construction labour.'[49] The efficiency gained by more abstract, homogeneous, and simplified forms of assembly also circumvented the trade-protected manual skills. As such, it was not an emancipatory tool for all. Deriving

his assessment from the practice in 1950s Britain, Buckley suggests that the elevation of assembly to the state of an intellectual endeavour carefully curated by architects was, in fact, a response to the reality of practice in a flood of industrially produced materials. Seeing that they do not design most of what is used in a building, architects reformulated their position to protect their disciplinary authority.

Both Deamer and Buckley's ideas are informed by a plethora of other observations than the story of Packaged House alone. Deamer, who has been the leading force of The Architecture Lobby, a Brooklyn-based international organisation, argues that design work is precarious work, and 'architects refuse to acknowledge their role as laborers at their own peril.'[50] Buckley's observations, which rest on the representational practices such as collage, montage, and the industrialisation of building through building systems, assemblies, and discussions of prefabrication, shows that the power struggle Deamer affiches is neither new, nor costs only the expanse of architects. While they both project onto the Packaged House joint these extra layers of interest, their framing of architects' interest in designing building technologies as part of a professional class struggle in the construction sector casts a new light on the ongoing discursive presence of the project. As an architecturally designed industrial object, the system was more than a housing solution. The project's openness, defined as its extreme efficiency, was celebrated as a hallmark of disciplinary exclusivity, adding yet another layer to the inner contradictions of open architecture.

Conclusion

Despite the system's failure to be taken into widespread production within a robust industrial production sector during an exceptionally favourable economic programme, the Packaged House can not be considered a total failure. Neither of its designers suffered reputation damage from their ill-conceived enterprise. On the contrary, it provided financial and social gain. Wachsmann went so far as to say it was a tremendous opportunity for growth.[51] He implied that the insights the project provided him could only be gained through the experience. To share this valuable lesson, he transitioned to teaching. Moreover, both Wachsmann and Gropius concentrated their efforts separately on the issue of teamwork. While the idea of distributed authorship did not come to fruition in the Packaged House, it fed the imagination of their many students in Chicago and Boston. During the development of the Packaged House, Gropius repeatedly used the Packaged House system in architectural design studios. Variation created from standard units may not have materialised, but it did wonders at the drawing table and the design studios.[52]

Is production, the successful marriage of the idea and material, the sole measure of design success? Is the search for an architecture that is both 'repeatable and unique', mass-produced and customisable, 'complete and unfinished', leaving space for personalisation in vain?[53] For Davies, who mocks the often-cited distinction between architecture and building, architectural concepts that fail to materialise or spatialise are failures.[54] Considering that architecture is as much a field of cultural production as a field of material production, it is hard to claim in good conscience that a project that occupied our imagination and thinking as profoundly as the Packaged House is a failed project. Furthermore, as Jarzombek reminds us, the status of architecture for the last two hundred years has been chasing enlightenment ideals, not catching them.[55] We should not miss the journey over a teleological obsession with the destination.

Despite Herbert's disappointment and Davies's dissatisfaction, we can approach the Packaged House and the open system paradigm not as a concluded story but as a continuous force that kept pushing architects. The inner contradiction of creating architecture that is mass-produced but variable, to express individual identity or address individual needs, is a productive cultural force.

It is not necessarily a bad thing to fall for such contradictions. As Yuval Noah Harari notes, such contradictions are 'culture's engines' that generate 'the creativity and dynamism of our species.'[56] He reaffirms their power with a resonant metaphor: 'Just as when two clashing musical notes played together force a piece of music forward, so discord in our thoughts, ideas and values compels us to think, re-evaluate and criticise. Consistency is the playground of dull minds.'[57]

Deamer's recent praise for the project affirms that the dream of the unison of standardised industrial production and individual expression still has the charge to stir our imagination. As a technological paradigm, open construction systems are here to stay. Like the puzzle that inspired Milan Kundera's novel *The Unbearable Lightness of Being*, the heaviness of the seemingly impossible task may crush us, but when we do not try, the lightness of the insignificance of our actions becomes equally unbearable. [58]

Notes

1. Alicia Imperiale, 'An American Wartime Dream: The Packaged House System of Konrad Wachsmann and Walter Gropius', in *Offsite: Theory and Practice of Architectural Production*, ed. Ryan E. Smith, John Quale, and Rashida Ng, Proceedings of the ACSA Conference (Philadelphia, fall 2012), 39–43.
2. Stephen Kendall, 'Notes on "Open Systems" in Building Technology', *Building and Environment* 22, no. 2 (1987): 93–100, 93.
3. Ibid, 93.
4. Almost seventy American companies produced more than 200 000 prefabricated lodgings during the war. For a brief discussion of mobility, and material choices over some of the other successful projects see Jean-Louis Cohen, *Architecture in Uniform: Designing and Building for the Second World War* (Montréal: CCA, 2011), 266–70.
5. Mark Jarzombek, 'Architecture: A Failed Discipline', *Archis* 19, no. 1 (Jan. 2009): 42–43, http://archis.org/volume/architecture-a-failed-discipline/.
6. The concept of 'technological paradigm' is analogous to Thomas Kuhn's notion of 'scientific paradigm'. It was formulated in 1982 by economist Giovanni Dosi. He defined a technological paradigm as a 'model' and a 'pattern' of solution of selected technological problems. 'Accordingly, a technological paradigm contains a belief system that justifies the relevance of problems and a puzzle-solution that justifies the technical solution(s)'. Giovanni Dosi, 'Technological Paradigms and Technological Trajectories', *Research Policy* 11 (1982): 147–62.
7. Walter Gropius, 'Programm zur Grundung einer allgemeine Hausbaugesellschaft auf kunstlerlich einheitliche Grundlage', reprinted in Sigfried Giedion, *Walter Gropius: Work and Teamwork* (New York: Reinhold publishing, 1954 [1910]), 74.
8. Gilbert Herbert, *The Dream of the Factory-Made House: Walter Gropius and Konrad Wachsmann* (Cambridge, MA: MIT Press, 1984), 56.
9. The system was designed by Friedrich Förster, who later developed it further with Robert Krafft.

10. Herbert, *The Dream of the Factory-Made House*, 105–38.
11. Ibid, 87.
12. For the neatest version see Dora Epstein Jones's doctoral dissertation, 'Architecture on the Move: Modernity and Mobility in the Postwar', UCLA, 2004. Jones sees the Packaged House as the last attempt Gropius makes in his search for the factory house that is capable of individual expression. Wachsmann is credited as the engineer who aided Gropius. For a reflective, blended version see Herbert, *The Dream of the Factory-Made House*.
13. In his autobiography Wachsmann describes the Christoph & Unmack factory as the place where he learned his trade. Konrad Wachsmann, *Timebridge 1901–2001: Konrad Wachsmann: An Autobiography* (Graham Foundation, 1981), 52.
14. See Konrad Wachsmann, *Building the Wooden House: Technique and Design* (Basel: Birkhauser, 1995).
15. Itohan Osayimwese, *Colonialism and Modern Architecture in Germany* (Pittsburg: University of Pittsburg Press, 2017), 189.
16. Ibid., 187.
17. In 1932, Wachsmann won the Prix de Rome, along with eleven other promising artists. He left Germany in the early autumn of that year and took a leisurely journey, arriving in Italy around Christmas. Due to Hitler's rise to power and the following the political unrest, he had to leave the German Academy in Rome only a few months into his residency. Except for a short period in Granada, Spain, Wachsmann was based in Rome until 1938, when it became unmistakably clear that he was no longer welcome. Due to Hitler's visit of 3–9 May 1938, Wachsmann was deemed an enemy alien and briefly jailed. Soon after Hitler's return to Germany Wachsmann decisively left Italy. Wachsmann, *Timebridge*, 77–95.
18. Wachsmann*, Timebridge,* 30.
19. Ibid.
20. Konrad Wachsmann, *Turning Point of Building: Structure and Design* (New York: Reinhold, 1961).
21. Wachsmann and Gropius developed a coding system for the drawings. As they developed the project, whoever contributed to the phase, detail, or deliverable had their name first on the label.
22. The symposium took place in spring 1947 as part of Princeton University's bicentennial celebrations. Thomas Creighton, who organized the event, compiled a book that captured in print some of the discussions that took place during the event, as well as those that emerged in preceding meetings and correspondence. Thomas Creighton, ed., *Building for Modern Man* (New Jersey: Princeton University Press, 1949).
23. Ibid., 41–45.
24. Ibid., 46–48.
25. Burnham Kelly, *The Prefabrication of Houses: A Study by the Albert Farwell Bemis Foundation of the Prefabrication Industry in the United States* (New York: The Technology Press of MIT and John Wiley and Sons, 1951).
26. Ibid., 62.
27. Herbert, *The Dream of the Factory-Made House*, 307.
28. Ibid., 309.
29. Ibid., 311.
30. Ibid., 325.
31. Imperiale, 'An American Wartime Dream', 43.
32. László *Moholy-Nagy*, *Vision in Motion* (Chicago: Paul Theobald & Co, 1947), 112.
33. 'The New House of 194X', *Architectural Forum* (September 1942): 66.
34. Carlo Carbone, 'The Kit of Parts as Medium and Message for Developing Post-War Dwellings', *Histories of Postwar Architecture* 2, no. 4 (2019): 54–74, https://doi.org/10.6092/issn.2611-0075/9648.
35. Mathew W. Fisher, 'Prefabrication and the Postwar House: The California Manifesto', in *The Value of Design: Design is at the Core of What We Teach and Practice*, ed. Phoebe Crisman and Mark Gillem (Washington, DC: ACSA Press, 2009), 403.
36. Charles Eames and John Entenza 'What is a House?', *Arts & Architecture* (July 1944): 22–39.
37. John Entenza, 'The Program', *Arts & Architecture* (January 1945): 37–41.

38. Carbone, 'The Kit of Parts as Medium', 63.
39. Konrad Wachsmann and Walter Gropius, '"House" in Industry', *Arts & Architecture* (Nov. 1947): 28–37, 36.
40. Elizabeth Andrzejewski, 'The Wedge Connector: from Function to Symbol', in The Art of Joining: Designing the Universal Connector, *Bauhaus Taschenbuch Volume 23* (Dessau: Spector Books, 2019), 29.
41. Colin Davies, *The Prefabricated Home* (London: Reaktion Books, 2005).
42. Wachsmann, *Timebridge*, 160.
43. Kendall, 'Notes on "Open Systems"', 97.
44. The first Glide house was built in 2002. The first FlatPak House was built in 2006.
45. For Glide House see William Booth, 'House Proud: High Design in a Factory-Made Home? Michelle Kaufmann believes she holds the key', *Smithsonian Magazine,* January 2007, https://www.smithsonianmag.com/energy-innovators/house-proud-142552310/?page=1. For the story of the Flatpack house see: Allison Arieff, 'How to Play FlatPak', *Dwell*, 1 May 2009, https://www.dwell.com/article/how-to-play-flatpak-dd73f653.
46. Peggy Deamer, *Architecture and Labor* (New York: Routledge, 2020), 17.
47. Ibid., 18.
48. Ibid.
49. Craig Buckley, *Graphic Assembly: Montage, Media and Experimental Architecture in the 1960s* (Minneapolis: University of Minnesota Press, 2019), 49.
50. Kate Wagner, 'People Power: In *Architecture and Labor*, Peggy Deamer Recognizes Architects are Workers', *The Architect's Newspaper,* 11 January 2021, https://www.archpaper.com/2021/01/architecture-and-labor-review/.
51. Wachsmann, *Timebridge*, 161.
52. From 1943 to 1947, every semester at least one studio at Harvard GSD was devoted to the panel housing system. According to Dora Epstein Jones, by framing the inquiry as school-wide collaborative assignments presented as 'problems' to exercise 'scientific methods', Gropius used GSD as a research laboratory. Jones, *Architecture on the Move,* 85.
53. The seemingly incompatible characteristics stand out in the Packaged House literature. The emphasis on its capacity to build 'repeatable and unique' works of architecture is in Deamer's description. It is presented as a 'complete and unfinished' kit of parts by its creators in a 1947 article in *Arts & Architecture*. Deamer, *Architecture and Labor,* 18. Wachsmann and Gropius, 'House in "Industry"', *Arts & Architecture* (Nov. 1947): 36.
54. In addition to his criticism of Wachsmann regarding the failure of the Packaged House, Davies also states that 'The early modernists put the prefabricated house at the centre of their programme of reform. Architectural history may pretend otherwise, but the fact is that their prefabricated house projects all failed.' Davies, *The Prefabricated Home*, 9.
55. Jarzombek, 'Architecture: A Failed Discipline'.
56. Yuval Noah Harari, *Sapiens: A Brief History of Humankind* (London: Vintage, 2011), 183–84.
57. Ibid.
58. Milan Kundera, *The Unbearable Lightness of Being* (New York: Harper Perennial Modern Classics, 1999), 5.

Biography

Ezgi İşbilen is an architect, researcher and educator. Her research encompasses the production of buildings, the entanglements between architectural theory and contemporary modes of production, tectonics, and architectural representation. She teaches architectural design studios and interdisciplinary courses on architectural drawing and the history of the built environment. She is a PhD candidate in the Architecture and Design Research programme at Virginia Polytechnic Institute and State University with a doctoral research project on Konrad Wachsmann's works.

Free Plan versus Free Rooms: Two Conceptions of Open Architecture

Xavier van Rooyen

From the mid-twentieth century onwards, architects have widely questioned the static and perennial nature of architecture. Kisho Kurokawa, co-founder of the Metabolist movement, saw this static conception of architecture as a constant in Western societies, where monuments emanate 'an aesthetic of eternity.' While in Japan 'the Ise shrines are rebuilt every twenty years in the same form, or spirit', in the West we aim to preserve 'the actual Greek Temple, the original material, as if it could last for eternity'.[1] A paradigm shift from considering the monument as eternal to an impermanent architecture gives architecture an indeterminate, open-ended character – a trend that was widely developed in the 1960s, particularly by the structuralist movement, which represents what we now understand as open architecture. One of the pioneers of Dutch structuralism, Herman Hertzberger, notes how

> structuralism in its authentic guise opens up all perspectives in which a building is able to hold its ground and at the same time attune itself to the programmatic uncertainty that holds sway over all our designs from start to finish. Essential to structuralism is the openness of the system, a fundamental incompleteness, more like a city that keeps changing than a well-rounded architectural composition, which is how architects like to see their buildings.[2]

In Hertzberger's words we can identify a tendency towards indeterminacy in architecture, both as a means to reflect programmatic uncertainty and to provide a stable framework that remains open to functional instability. We can also detect a critique of compositions that result in fixed architectures, incapable of incorporating change. Hertzberger's acknowledgment of the temporal dimension of architecture requires that buildings break free from the ideal of imperishability and become open to change. 'It is certainly not true that there is always one specific form that fits one specific purpose.'[3] Quite on the contrary,

> the future of architecture depends on its competence to be transformed … The notion that buildings are objects complete in all their parts, with a final form expressing a static condition and clearly circumscribed entity, has long been at odds with today's dynamic culture of democracy, where decisions are a concerted effort, as are the urgent calls for change.[4]

The adaptability of architecture frees space from fixity and makes it possible to reconfigure it without 'significant effort, disturbance and expense' from its users.[5] Striving for an indeterminate architecture therefore requires that from the outset, flexibility and change are taken into consideration in the design of new projects. Although it is obvious that every building can undergo alterations during its physical existence, what makes indeterminacy special is its capacity to maintain an overall coherence without altering the building's dimensional structure.[6] In this regard, another Dutch architect, John Habraken states that open architecture 'seeks to respond to users' preferences by offering the flexibility needed for adaptation of individual units over time'.[7] In his

brief introduction to *Open Building*, relayed on the Open Building website, he notes how 'the idea that built environment is in constant transformation and change must be recognized and understood'.[8] Architects who subscribe to Habraken's open building approach 'seek to formulate theories about the built environment seen in this dynamic way and to develop methods of design and building constructions that are compatible with it.'[9]

Currently, many commissions presented to architects reveal 'the growing importance of managing flexibility and unpredictability in the design process'.[10] Although it is well known that unpredictable future uses and necessary transformations can always result from economic, social, and cultural change, few studies focus on understanding the design processes that are implemented to deal with them. The ambition of this article is therefore not to trace the origin of indeterminate thinking in architecture, together with its social conditions.[11] My aim is instead to grasp 'the logic underlying the making of a form, the logic of a generative process' of indeterminate architecture.[12]

In order to apprehend the logic underlying the making of an indeterminate architecture, I will investigate the principles that actually give shape to indeterminacy in architecture. The research is thus anchored in the field of formal heuristics.[13] The different case studies presented here are carried out via diagrams that are 'almost reduced to a simple line intended to indicate the form and arrangement of objects'.[14] This allows our attention to remain focused on the relationships between the different buildings' elements and parts rather than on the elements themselves. Knowledge of design processes is part of what Julien Guadet considered 'the science of architecture.'[15] On these grounds I will investigate a number of research objects as alternatives to conventional forms of open architecture, in order to provide knowledge in the field of formal heuristics for the use of researchers, students of architecture, and architects interested in indeterminacy and openness in their profession.

In his 1988 book *Raumplan versus Plan Libre,* Max Risselada notes how 'comparison is one of the means through which design can be discussed – of vital importance in a situation in which the educational program can no longer be constructed around one all-encompassing architectural theory'.[16] Risselada's book focuses on the pre-World War II period, and compares the work of Adolf Loos and Le Corbusier. The essential distinction we make between 'room' and 'plan' is based on his comparison. Whereas Le Corbusier sought to liberate the plan from the static, fixed conception of the traditional bourgeois house by proposing the free plan, Adolf Loos proposed a 'building of rooms'.[17] Based on this example we can establish an opposition between an architecture composed of an assembly of rooms and the conception of an open plan within which a series of functions will be arranged. According to Risselada, Adolf Loos never theorised his concept of the Raumplan. Nevertheless, in 1929, in his obituary for Josef Veillich, Adolf Loos wrote:

> When I attempted to have a house exhibited in Stuttgart (in the Weissenhofsiedlung), I was turned down flat. I would have had something to exhibit: the solution of how to arrange the living rooms in three dimensions, not in the flat plane.[18]

It was Heinrich Kulka, an architect and a student of Loos, who promoted the idea of the Raumplan. In 1931 he noted how the plan, with Loos, is 'not confined to a single storey, composing related rooms into a harmonious, indivisible whole'.[19] Although the design of a Raumplan can be taken for a novelty in the way rooms are linked in the third dimension of space, those same rooms still retain a specific, and therefore static, character. Risselada confirms this when he notes that 'the bourgeois residence with its specialized, separate room is thus transformed into a house with rooms which open into one another but without losing their own identity'.[20] Although the specific character of each

room is maintained, it is interesting to note that Loos had become critical of the closed form of total works of art as early as 1924:

> A home should never be finished. Is man ever complete, finished in physical or mental terms? Indeed, does he ever come to a stop? And if man is in constant motion and development, if old needs pass and new needs arise, if the whole nature itself and all around us is in a state of change, is the thing closest to man, his home, to stay unchanged, organized for all eternity? No. It is ridiculous to specify where people should put a thing, to organize everything for them from the lavatory to the ash-tray.[21]

These words, as they were written more than thirty years before the founding of Team 10, seem prescient of Oscar Hansen's lecture at the first Team 10 meeting in Otterlo in 1959. Hansen introduced his lecture criticising the shortcomings of architecture as it was practiced theretofore, and then denounced 'closed architecture' for promoting the 'decay of environmental features' and for its inability to adapt to 'life changes'.[22] According to Hansen, it was Josef Hoffman who had explicitly conceptualised 'closed form' in architecture with the construction of the Palais Stoclet in Brussels in 1904. Hoffman's is one of those cases in which a super-specialised architect has to solve a relatively small problem and is therefore able to 'determine the order of all things – from the urban scale to the door knob'. For the speakers at the Otterlo conference, this could not be the architectural solution for what they referred to as the 'greater number'. The concept of total art should stop at the borders of private space.

On these grounds I intend to continue the debate initiated by Risselada by discussing alternatives to open architecture in terms of 'free plan' and 'free room'. I will explore these two conceptions in the work of Office KGDVS, MVRDV, Sanaa, and Sou Fujimoto, who have explicitly set the stage for an open conception of architecture in our time, and who implement these two conceptions in the way they conceive their architecture.

Free plan

At the beginning of the twentieth century, modernist architects questioned the compositional unity of the room, and moved towards the quest for an 'absolute freedom of plan'.[23] For Le Corbusier, the plan's freedom that resulted from the development of the column-slab framing system was a fundamental questioning of the 'paralysed plan of the stone house'.[24] In other words, it was the fixity of things that Le Corbusier was questioning when he proposed free plans in which 'the organs have become characterised; have become free with respect to each other'.[25]

In Le Corbusier's proposal of the *Plan Libre* – as he referred to the free plan – the structuring of space is made possible by the secondary system of non-loadbearing elements, or partitions. In an article from 1959, Georges Candilis notes how, in an indeterminate space, fixed elements form 'a system of permanent reference points, necessary for the stability of the individual'.[26] Meanwhile, the organisation of spaces and the separation of functions are not characterised at all. The structure of the free plan – a column-slab system – thus 'refers to what the individual user cannot change, while the infill is what the individual user can freely decide' and alter.[27] According to Bernard Leupen, in order to provide maximum flexibility the architect must focus on permanent elements, understood as 'the framework within which change can take place; while the framework is specific, the space within the framework is general'.[28] By acting within this framework, the individual is able to reconfigure space and remodel the initial order. In other words, spatial flexibility escapes composition whenever 'the structure and exterior shell is fixed and designed to accommodate the flexible and changeable infill systems based on users' needs and desires.'[29]

Clearly, the modernists' ideals in this regard failed, when applied to the scale of housing. In fact,

dwellings and large housing estates cannot escape the need to enclose certain rooms. In Le Corbusier's celebrated residential units, based on the principle of a bottle rack, the frame virtually reconstructed the walls he wanted to avoid. When developed for other programmes, though – particularly the office building – the free plan did manage to free itself from the need for creation of rooms for each user or use. In his study of New York, Rem Koolhaas praised the typical New York office building plan:

> Beyond a certain scale it is important that a building has its own integrity, its own clarity and its own sculptural or architectural quality and that within this enormous envelope of the building, the different programs are established almost like grottos or like autonomous projects, so that the building has an envelope that plays its own role in the life of the city and that answers all the demands the context asks.[30]

For Koolhaas, 'interior and exterior architecture become separate projects, one dealing with the instability of programmatic and iconographic needs, the other – agent of disinformation – offering the city the apparent stability of an object'.[31] In order to meet the internal challenges of an indeterminate programme, or to cope with unstable demands, the plan must be essentially 'neutral'[32] and 'undefined'.[33] It must also be multiplied so that 'the typical plan' can imply 'indeterminacy'. The only elements that must be defined within are vertical circulations, loadbearing structure, and the geometric layout of the perimeter, undermining any spatial configuration or hierarchy and therefore making it undetectable. Regarding the perimeter, this is an 'architecture of the rectangle; any other shape makes it atypical'.[34] Within this constraint the typical plan is repeated vertically to allow for the insertion of various programmatic 'grottos', which can accommodate change and thereby lead to programmatic indeterminacy – a clear evocation of Le Corbusier's Dom-Ino system where each plateau becomes the support for an unlimited number of independent programmes.[35] [Fig. 1] It is essential to highlight the importance of defining a stable envelope as support for the indeterminate platforms which allow Koolhaas to 'combine actual indeterminacy with architectural specificity'.[36]

The simple proliferation of columns in a regular grid on the plan, supporting stacked floors, allows for perpetual mutations with minimal interference in the perception of the architectural envelope. Like in the Dom-Ino system, slabs are smooth. There is no directional suggestion, no beam drops, 'no ribs. This device allows the construction of completely free partitions on each floor, without being superimposed on each other: the principle of "free plan".'[37] Koolhaas's fascination with this structure found a symbolic embodiment at the 2014 Venice Biennale, which he curated. Right in front of the exhibition's central pavilion he had the Dom-Ino structure reconstructed to celebrate its hundredth anniversary, according to the dating given by Le Corbusier.

More recently, the architects of MVRDV have questioned the necessary unity of the envelope and the rectangular regularity of the plan, which according to Koolhaas ensures the neutrality of the whole. Concretely, MVRDV has tried to take the question of specificity to the so-called greatest number by exacerbating singularity within multiplicity – a theme which the group has explored in a whole series of projects. For these architects, focus on multiplicity implies a paradigm shift, especially in the case of housing.[38] In their words, 'contemporary architectural thinking observes a shift from the pursuit of a singular housing solution to the need for variety and (climate, economic and cultural) idiosyncrasy'.[39] Based on this premise contemporary architects can move away from 'the modernist project (which) has seen architects doggedly pursue the design of an "ideal" dwelling'.[40] Singularity that is still able to express multitude thus becomes central to MVRDV, as they move away from neutrality and homogeneity. With the realisation of their pavilion for the World Exhibition in Hanover in 2000, MVRDV asserted that their work can 'serve as a symbol for

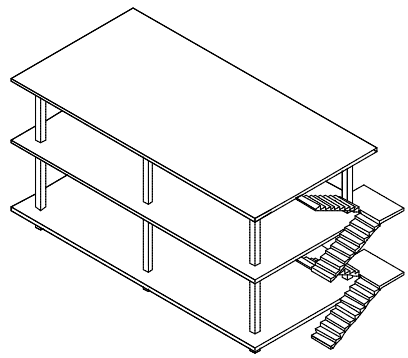

Fig. 1: Axonometric view of the Dom-Ino structure designed by Le Corbusier (1914). Drawing: author.

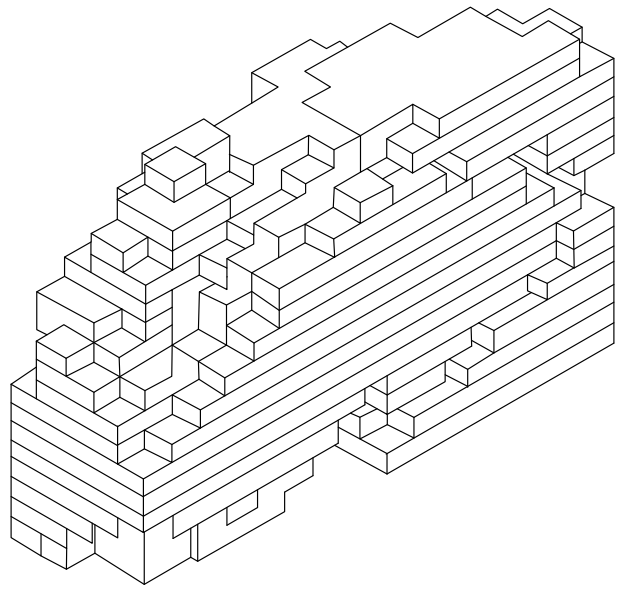

Fig. 2: Pixelated volume diagram of MVRDV's DNB headquarters, Oslo (2012). Drawing: author.

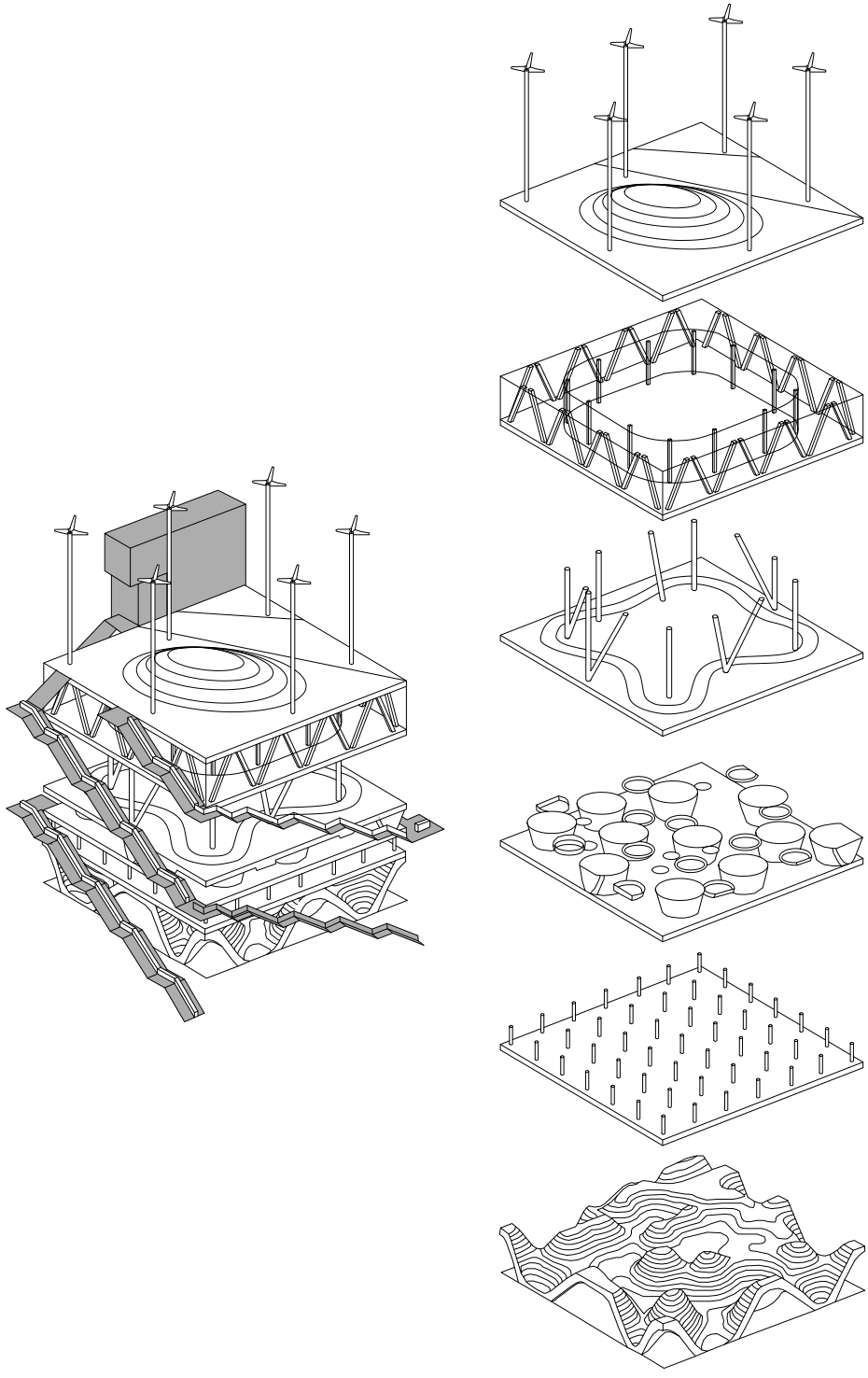

Fig. 3: Diagrams of MVRDV's Hanover pavilion (2000). Left: peripherical circulations; right: free plans. Drawing: author.

the multi-faceted nature of society: it presents the paradoxical notion that as diversity increases so too, seemingly, does cohesion'.[41] This statement is ironically in line with Koolhaas's observation that the cohesion of a system is strengthened by its multiple natures.

In their project for the central bank building for DNB's headquarters in Oslo, MVRDV continued investigating the neutrality of the 'typical plan' for an office program. Although the architects consider office floors to be generic, they 'pixelate' different floors in a differentiated way to increase their specificity within a system. In doing so, 'the pixelated design allows this specific response while being highly efficient and flexible. As a result, every floor of the building is both unique and generic: the pixelated volume makes the generic specific'.[42] The programmatic indeterminacy of the typical layout now takes place in superimposed plans of diverse nature, asserting specificity – also at the level of the envelope, which is no longer the result of a unitary component, but multiple. [Fig. 2]

This reference to the multiple is also hightly significant of change in the axis of thought concerning the universalist model, which rather envisages architecture from solutions applicable to the mass. If we stick to the definitions later given by Negri and Hardt, the multitude is 'an open and expansive network in which all differences can be freely expressed and, at the same time, a network that allows us to work and live in common'.[43] The multitude differs from the mass in that it is not homogeneous, and is as much an expression of the many as of its diversity. This assertion is essential in MVRDV's approach.

Superimposition of singular free plans

In 2000, at the World Expo in Hanover, MVRDV made a remarkable proposal. While Koolhaas saw in the New York tower the possibility of superimposing typical and neutral plans, contained in a specific envelope, MVRDV appropriated the language of superimposed plans as a plastic expression of multiplicity. The resulting whole offers the architectural spectacle of a 'monumental multi-level park'.[44] Each level of this park is designed independently and incorporates different forms of nature on each plateau. The neutrality of the typical plan, which Koolhaas advocated for and which allowed for the free development of any programmatic scenario, finds a specific impregnation here. By singling out each floor, the overall becomes 'specific' in form, and furthermore, moves away from the initial neutrality of the typical stacked plans. The proposal superimposes different landscapes, including dunes, greenhouses, forests, dikes, and polders. Each form of nature finds its own structural expression, reinforcing the singularity of each stratum. Thus, the more 'diversity increases, so too, seemingly, does cohesion'.[45] Staircases, on the other hand, are pushed out to the building's periphery. [Fig. 3]

Twenty years later the architects were invited to give new life to the pavilion. Utilising the potential offered by the large superimposed free plans, the conversion of the pavilion confirmed the openness of each plateau's programmatic indeterminacy, and their ability to receive varied programmes. 'The original design was certainly a unique design for a very specific purpose, but despite its outspoken design its core structure is highly reusable and more flexible than originally imagined'.[46] In its 2020 conversion, the plastic expression of the multiplicity of programmes was maintained. This time around, the proposed programme included a 'functional office environment that nevertheless retains the unique experimental features of the Expo Pavilion.' Within that environment users are able to 'work on the dunes, or in the forest, or between the tree-pots',[47] affirming the architects' desire to design 'objects that are capable of modifying their qualities and characteristics in the future.'[48]

Through the superimposition of specific free plans with multiple expressions and the insertion of specific infills, the two versions of MVRDV's Hanover pavilion transcend the expressive uniformity of the Dom-Ino structure – a neutral plane

simply repeated vertically. Instead, they express an aesthetic of multitude, generating a second degree of indeterminacy which can be perceived at the aesthetic, rather than at the programmatic level of the building (MVRDV's Silodam project offers another good example of this strategy). The programmatic and aesthetic freedom achieved on each floor can be perceived individually, and allows users to express themselves according to the passing of time via successive decorations. In this sense this architecture is able to anticipate aesthetic obsolescence by incorporating a degree of plastic indeterminacy. The plasticity of the architectural object is in constant change, and evolves piecemeal. Fragments develop independently of each other without breaking the system, just like Koolhaas theorised of the New York archipelago: 'The more each "island" celebrates different values, the more the unity of the archipelago as system is reinforced. As such "change" is contained in the component "islands", such a system will never have to be revised'.[49]

These 'islands' are exactly what MVRDV conceptualised at the architectural rather than at the urban level, engendering an open-ended, indeterminate aesthetic which questions our plastic perception of architecture's capacity to evolve without increasing a building's initial volume or altering the system that presided over its design. Since this capacity to evolve is largely due to unforeseeable interventions by users it also offers a degree of individuation of the architecture; a freedom of appropriation that allows each user to make 'the maisonette his habitat'.[50] Elaborating on some of the principles developed in the Hanover pavilion, the project for the new headquarters of Flemish television by Office KGDVS also superimposes different forms filled with different layers. According to the architects, 'the architecture is both open and specific', and each unitary volume within the project offers a specific free plan, different from the others.[51] Once assembled, these different geometries propose a multiplicity of aesthetically specific free plans.

Free rooms

So far we have seen how indeterminacy and openness in future appropriations have been made possible at the scale of the free plan. Through the design of the plan itself, we can identify a similar ambition at the level of the quintessential architectural fragment and compositional element: the room. As Nathaniel Cortland Curtis notes, 'the room is the nucleus and starting point of the architectural composition. ... the arrangement of rooms in a logical sequence and order may then be said [to be] the primary object of architectural composition'.[52] This observation is shared by Louis I. Kahn, for whom 'the room is the beginning of architecture',[53] which can then evolve into 'a society of rooms. The rooms talk to each other and decide on their position.'[54] The term 'room' thus acquires a double meaning, as both building-fragment and space, and raises the question of the different ways in which fragments can be assembled in order to achieve 'the realization of the form in an order'.[55]

A key figure in the architectural postmodernism of the 1960s, Robert Venturi, also questioned the room as an indeterminate, uncharacterised vehicle for flexibility, departing from earlier conceptions. In *Complexity and Contradiction in Architecture* he states that

> the multifunctioning room is a possibly truer answer to the Modern architect's concern with flexibility. The room with a generic rather than a specific purpose, and with movable furniture rather than movable partitions, promotes a perceptual flexibility rather than a physical flexibility, and permits the toughness and permanence still necessary in our building. Valid ambiguity promotes useful flexibility.[56]

The generic aspect of the room – the fact that it has no fixed character – encourages multiple uses. One could even say that rooms are, as Peter Cook would say, 'infinitely open'.[57] Their indeterminate character allows us to advance the concept of the free room, which complements the free plan. Free rooms have

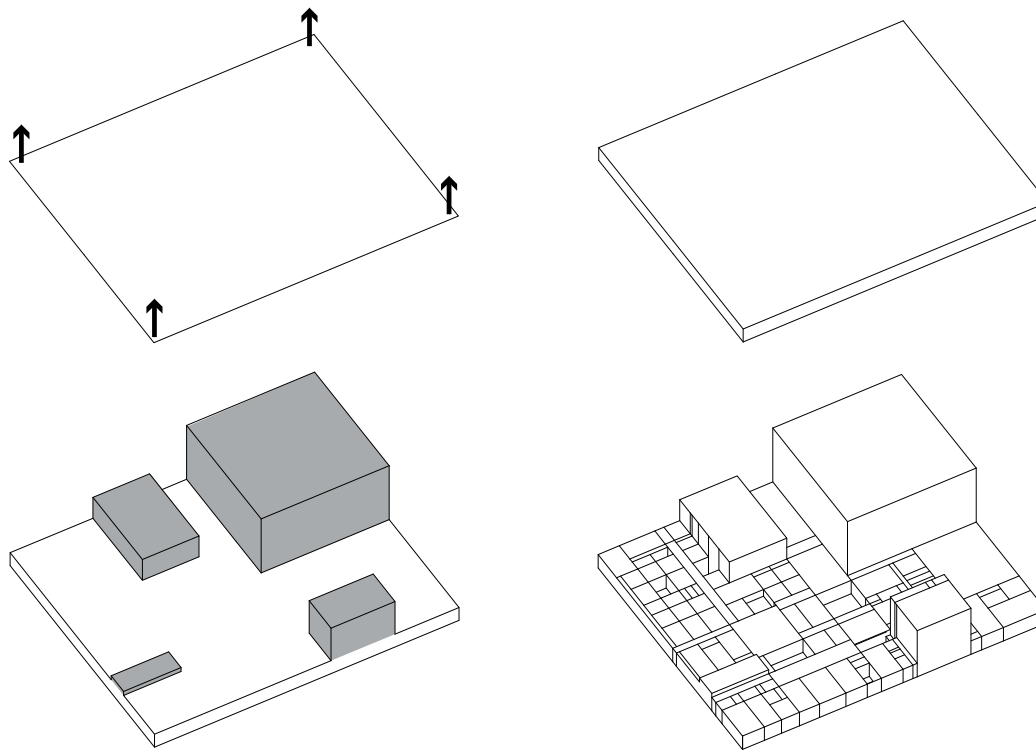

Fig. 4: Diagrams of Sanaa's Almere Stadstheater (1998-2006).Top left: plot delineation; top right: plot extrusion; bottom left: studios; bottom right: society of free rooms. Drawing: author.

a multifunctional character, and when assembled with other rooms of the same nature generate plans that can be reconfigured continuously. This reconfigurable character can be observed in some of Sanaa's projects, such as the theatre De Kunstlinie in Almere. In this latest project, the plan seems to be inscribed in a banal rectangular shape, but its division does not seem to proceed by cutting up the total figure. Instead it results from the assembly of rooms that are combined to define a figure. This particular ensemble tries 'to generate something like the flexibility of a system or method through the repetition of units of space'.[58] In such a random associations of rooms, 'which goes next to which is impossible to decide'.[59] The plan, on the other hand, only evokes a transitory state – one possible configuration among many others. In this context, rooms are contiguous, linked together amid different possible circulations. The whole is just a 'collection of different rectangular rooms'.[60] For Cédric Schärer, the plan of this particular project

> is inscribed in a banal form: a rectangle. Its layout is not based on the division of the total figure, but is reconstituted almost naively into a whole by conglomerating simple parts combined in such a way as to fill the perimeter, in the manner of a jigsaw puzzle/origami.[61]

Within such plan, parts 'are connected without hierarchies allowing a more flexible use of the service centre'.[62] This way the indeterminacy of each free room promotes 'more flexible relationships between a program and its users'.[63] This transformative, permutational logic defines an indeterminate universe where each part can take a different place and each room has 'a generic rather than a specific purpose'.[64] [Fig. 4]

To circulate through this system and its fragmented plan, the Almere theatre imagines users wandering around, in order to conceive 'a sort of interior public park', which offers users a diversity of interactions and possible encounters, as well as different possible movements without apparent hierarchy or centralisation.[65] On the outside, the horizontality of the overall figure responds to the landscape – a lake in front of which the project is located. However, one aspect of the programme is strongly determined: the three performance rooms and the recording studio. Their volumes emerge from the horizontal landscape of the lake, from the banal and generic form of the interior public park. As a result, these items of the programme acquire the status of stable elements.

Contrasting with free plans, this assembly of generic rooms is achieved by using a grid of walls rather than columns. In the Almere project, the loadbearing and infill elements are all of the same thickness, making the difference between them indistinguishable. An interest in the wall grid, and therefore in the rooms that are formed by that grid, is also evident in the work of Office KGDVS, as we can see in the house they built in Buggenhout. The plan of this house is also made up of a set of rooms of the same size, which add up to a figure divided into nine squares. These rooms do not have a conventional character, but the experience of rooms 'en enfilade' on both floors merely suggest ways of living, leaving it to the owners to find an identity for each. Each room is related to its neighbours but has no particular status; none of them stands out or predominates over the others.[66] All elements of the plan are equivalent. The plan is similar to John Hejduk's Nine Square Problem – a proposal for a series of houses in Texas, albeit structured by a grid of columns. By turning the columns of that scheme into walls, Office KGDVS marks the shift from free plan to free room.

For the Arvö Part Centre competition, located near Kellasalu in Estonia, the firm also proposes a 'set of rooms' which generate an environment of 'closely connected spaces, each with a unique relationship to the surrounding nature and the other rooms close by'.[67] This time the wall grid system allows for a free appropriation of spatial entities, within which a permutation of functions can easily

take place. Through its relative neutrality, the system allows for the emergence of vertical elements that contrast with the horizontal character of the project. These elements act as singular landmarks, while the rest of the plan remains attached to the ground and seems blurred, transitory, awaiting for definition – the expression of one possible form of organisation among many others. Notably, the collages assembled by the architects to communicate this project do not reveal any functions, but express instead the way in which users are expected to contemplate rooms and nature.

Contrary to the Buggenhout project, in the Arvö Part Centre the grid is no longer a simple 'waffle', but substantially grows and varies.[68] The dimension of every room is specific, but the overall programme is generic. The sloped roof underlines the growth defined by the plan, rising as much as the different rooms can grow. The grid pattern is thus subtly extended to the outside, giving the impression that the whole is still a fragment of something larger, or evoking the open-endedness of the grid. [Fig. 5]

Between these rooms, Office KGDVS allows visitors to wander freely and sinuously, erasing the rigid layout of the grid. Adjoining rooms open on three or four vertical planes, offering a multitude of routes that can be reconfigured from room to room. The programmatic indeterminacy of each room and the society of free rooms it allows for offer an interesting alternative to both free plan and to Kahn's clusters, resulting in a wealth of combinations and appropriations. This concept is remarkably illustrated in this project, which only evolved to the competition stage.

We can see how in the aforementioned projects by Sanaa and Office KGDVS design does have a clear focus on the plan. Loos's insistence on the need to arrange three-dimensional rooms, however, will find further development in the work of Sou Fujimoto.[69] In the 2008 project for House H, located in a residential area of Tokyo, Fujimoto refers to nature in order to conceptualise space. The tree-like architecture he refers to allows for the deployment of several branches that 'are simultaneously equipped with mutual relationships that allow one to sense the presence of others through the branches, interweaving a network of relationships across many points'.[70]

The plan of this dwelling is simple: a rectangle of 9.27 by 5.45 metres, divided, by two perpendicular walls, into four rooms of the same size. By contrast, the section is complex and the complex spatiality conceived by Sou Fujimoto consists of what the latter considers 'an imaginative Escher-like three-dimensionality'. Through openings in the perpendicular walls, 'staircases are installed at varying angles, insinuating the entrance within this geometric tree'.[71] The circulation crosses the different spaces and the staircases accommodates the crossing of half levels. This project crystallises the potential of the free room in section. [Fig. 6]

Free Plan versus free rooms, a synthesis

In his latest book *Contextes*, Bruno Marchand identifies strong morphological divergences in contemporary Swiss architecture that tend towards the definition of a heterogeneous fabric. By way of extension, this can be extrapolated to a number of European cities. Concretely, Marchand specifies that

> the architecture of housing is indeed subject to an expressive singularisation, which was still mostly reserved for public and representative buildings until the turn of the century, to make them 'remarkable' within the more anonymous built mass of private buildings.[72]

This necessary expressiveness of the multitude within the mass, which we already identified in the work of MVRDV and office KGDVS, is far removed from what architects were considering in the 1960s. The current focus on diversity is aesthetically assumed by MVRDV, or by Office KGDVS, via the superimposition of different universes – an evident update in the way openness is conceptualised for

architectural design. Collage, aggregation, and the stratification of free plans that are programmatically generic but aesthetically specific, are means towards flexibility of use and against the necessary obsolescence of contemporary programmes.

Another way in which contemporary architects proceed regarding openness, as we have seen, is to redefine the status of the room. While both Hertzberger and Venturi already realised the potential of polyvalence, nowadays that polyvalence is read at the scale of the room. To escape determinism of use some of the contemporary architects have chosen to get rid of any designation for their rooms, granting them instead a generic, non-determined character. Adaptability, or functional flexibility, leads to the removal of furniture from plans, as 'the function (of rooms) should not be predetermined by built-in furniture'.[73] Plans with standardised furniture and equipment are representative of a 'static, monofunctional' architecture. [74]

According to Jacques Lucan in his latest book *Habiter: Ville et architecture*, an urgent task for contemporary architects is to update the way in which we understand flexibility of use.[75] The shortcomings of most architecture – of housing, in particular – lie in its incapacity to assimilate multiple configurations and appropriations. Architecture must now make possible 'uses that will undoubtedly be even more diversified tomorrow than they were yesterday'.[76] In order to encourage those uses, architecture must be able to make the most of the possibilities that currently exist. In a recent article Bruno Marchand notes how 'for a long time, we were looking for fluidity, which resulted in the opening up of spaces. Today, we realise that this configuration makes it difficult to have multiple uses'.[77] In order to conform to new habits, we have to dismantle constructive automatism and look instead for versatility, modularity and reversibility. To escape fixity and obsolescence, a revision of the status of rooms, or more precisely of the relationships between them, is necessary. In addition to Sanaa's project for Almere, or to Office KGDVS's project for the Arvö Part centre, designing societies of free rooms can be understood as a search for singular expression within the multitude, especially for housing programmes. Sophie Delhay's 2019 project *La Quadrata,* situated in Dijon, is defined as a 'collection of identically sized rooms' which are freely assembled without any particular assignment.[78] More than ever, indeterminate uses, together with open systems and design processes, constitute the essence of contemporary projects, and lay the foundations for an approach to architectural design that is no longer oriented towards the homogeneity of parts, but towards the search for the multitude. The heterogeneity of programmatically indeterminate rooms goes well beyond Adolf Loos's formal explorations, and in that sense reassesses the potential of his work to generate a society of potentially three-dimensional indeterminate rooms. The Arvö Part and the Almere theatre are both two-dimensional projects, while the Buggenhout house offers a richer three-dimensional experience, reminding us that a plan is 'not confined to a single storey, composing related rooms into a harmonious, indivisible whole.'[79] In turn, Sou Fujimoto goes beyond the two-dimensional model, as he develops a three-dimensional society of interchangeable rooms. By convening the image of a tree within which the user can move, he reincorporates the complexity Loos attempted with his work. Fujimoto's work no longer unfolds in the simple plan, though; it involves a complex indeterminacy in section.

The projects discussed above, used to illustrate the shift from free plan to free room in the quest for an open architecture, are not to be understood as models to be reproduced. Nevertheless, the analyses developed in this article can serve as a basis to identify trends in the open design approach to architecture. Ideally, these trends will contribute to a better understanding of indeterminacy and help researchers and architects respond to the architectural and urban challenges they will face in the next few years.

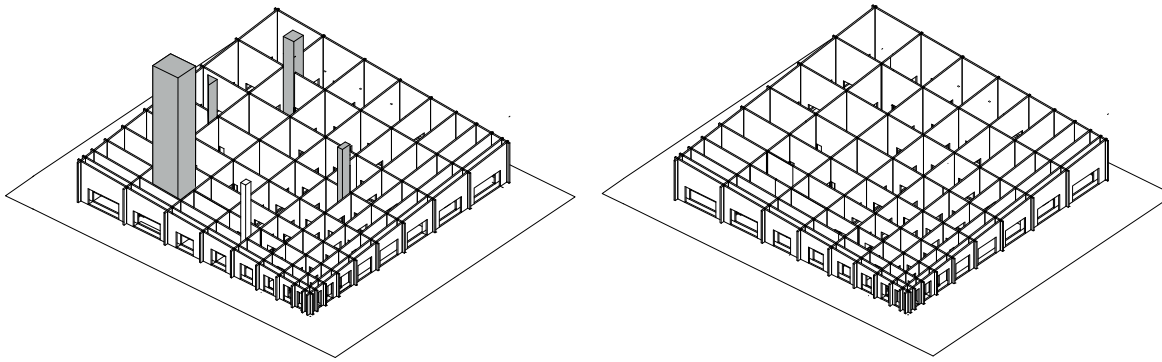

Fig. 5: Diagrams of Office KGDVS's competition entry for the Arvo Pärt Centre, Laulasmaa (2014).Left: wall grid society of free rooms; right: specific volumes. Drawing: author.

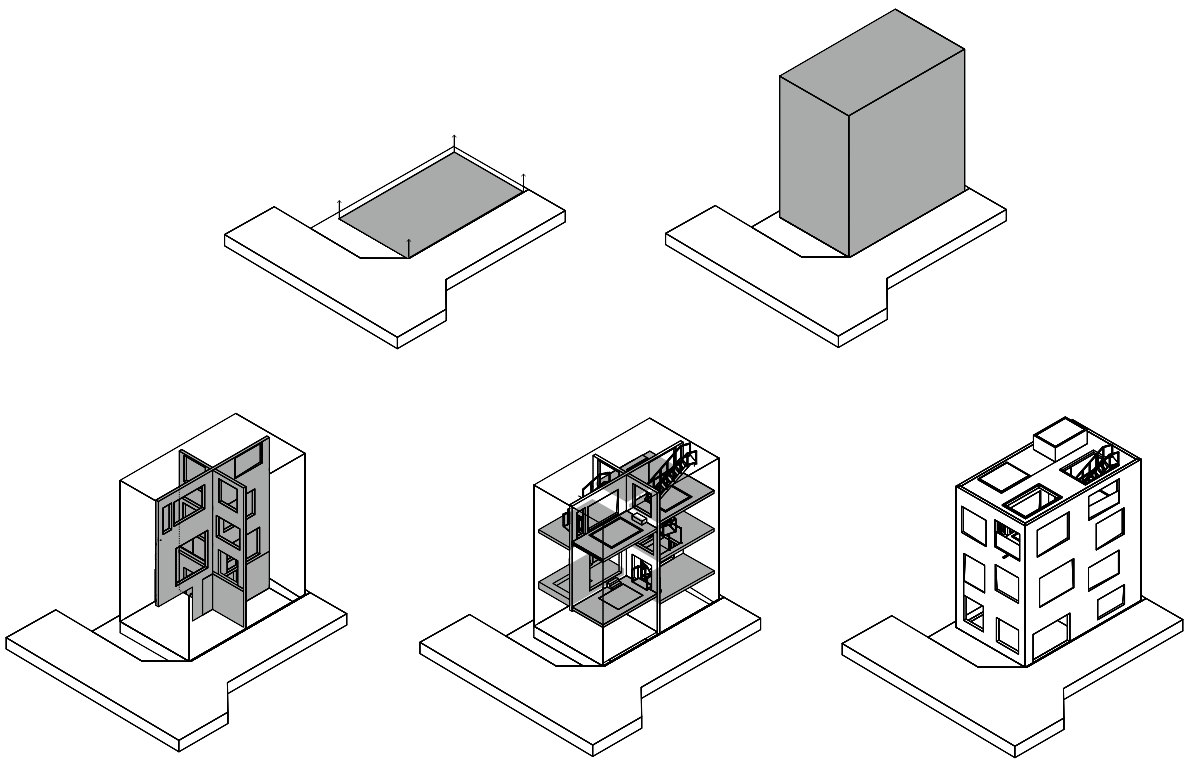

Fig. 6: Diagrams of Sou Fujimoto's House H, Tokyo (2008). Top left: plot delineation; top right: volume; bottom left: wall grid, bottom middle: three dimentional society of free rooms. Drawing: author.

A case in point is the inhabitability of vacant office spaces, whose specific free plans can anticipate obsolescence, as has already been noted in a 2011 editorial in the journal OASE. Such spaces still allow for singularity in a fabric that no longer has any homogeneity. In Brussels, for instance, 7.5 per cent of office buildings are currently vacant, adding up to a whopping 954 870 m2 of potentially inhabitable space.[80] By fragmenting the floors of these vacant office buildings, both in surface area and in their external plastic expression, architects could achieve an easy spatial and aesthetic reappropriation and absorb currently deserted free plans. Improving the capacity of office buildings to mutate is a challenge for architects and urban planners who must anticipate the obsolescence of previous forms of open planning. The free room, as described above, affirms a renewed interest in the adaptability of spaces and architects' ability to take into account the evolution of uses and users' preferences. The wall grid system, on the other hand, opens up new perspectives to supersede the flat plan that Loos and Kulka envisioned, but also to overcome the fixity of the 'paralysed plan' described by Le Corbusier. The development of a three-dimensional free room system offers architects a spatial structure with which they can address users' changing habits and patterns of inhabitation. As alternatives to open architecture, the free plan and free room still hold enormous potential to meet the architectural challenges of the coming decades.

Notes

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4. Hertzberger, 'Transformation + Accommodation', 5.
5. Robert Kronenburg, *Flexible: Une architecture pour répondre au changement* (Paris: Norma Editions, 2007), 13. All translations from the French are by the author.
6. John Weeks, 'Indeterminate Architecture', *The Transactions of the Bartlett Society,* Volume 2 (London: Bartlett School of Architecture, 1964), 91.
7. N. John Habraken, 'Open Building as a Condition for Industrial Construction' (lecture published in the Proceedings of the 20th ISARC, Eindhoven, 2003), 37.
8. N. John Habraken, 'Open Building: Brief Introduction', https://www.habraken.com//html/introduction.htm/html/introduction.htm.
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13. In agreement with Royston Landau's interpretation, Jorge Mejia Hernandez indicates that at the level of formal heuristics, the instruments and methods employed operate in at least four well-known areas of architectural exploration, evaluation and discovery: geometry, patterns, configurations and the processes that occur in forms. Jorge Mejia Hernandez, 'Transactions; or Architecture as a System of Research Programs' (PhD dissertation, TU Delft, 2018), 91.
14. Jean-Nicolas-Louis Durand, *Précis des leçons données à l'Ecole polytechnique* (Paris, 1802), foreword, VI.
15. Julien Guadet in the foreword to Henry Guesdy, *L'Enseignement à l'Ecole nationale et spéciale des beaux-arts – section d'architecture* (Paris, 1899), III.
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17. Max Risselada, 'Documentation of 16 houses', ibid., 78.
18. Adolf Loos, 'Obituary for Josef Veillich' quoted in Risselada, ibid.
19. Heinrich Kulka quoted in Risselada, ibid., 79.
20. Ibid.
21. Adolf Loos, 'The Principle of Cladding', trans. Francis R. Jones., ibid., 141. Original text 'Von der Sparsamkeit', compiled by Bohuslav Markalous from *Wohnungskultur* 2/3 (1924).
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32. Rem Koolhaas, 'Typical Plan', in *S, M, L, XL,* 340.
33. Ibid, 342.
34. Ibid., 338.
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63. Ibid., 206.
64. Venturi, *Complexity,* 34.
65. See project description in *El Croquis,* no. 77(I)+99, 289.
66. The choice of measurement is in line with the functional indeterminacy of the room evoked by Aldo Rossi and referred to by the architects. The Belgian architects refer to Rossi in an interview between Joachim Declerck and Office KGDVS, and insist, based on Aldo Rossi's description of a room, that it is 'a room with a table and a few chairs, with no particular destination. This room is beautiful because it is spacious and nicely proportioned. It frames the space'. This relationship to the circumscription of space is important to Office KGDVS, as is the attention to experience within defined spaces. 'Architecture Is Itself. Une conversation entre Joachim Declerck, Kersten Geers et David Van Severen', in *35m3 Installatie/Installation/Installation. Office Kersten Geers David Van Severen*, exhibition catalogue (Antwerp: 2005), 46. Rossi describes the room that Office KGDVS refers to in: Aldo Rossi, *A Scientific Autobiography* (Cambridge, MA: The MIT Press, 1981), 29.
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76. Ibid.
77. Quoted in Aurélie Toninato, 'Faire de la ville une salle polyvalente', *Tribune de Genvève* no. 7 (April 2021).
78. See project description for Unité(s) +, http://sophie-delhay-architecte.fr/portfolio/lov-2/.
79. Heinrich Kulka quoted in *Raumplan versus Plan Libre*, ed. Risselada, 79
80. 'Observatoire des bureaux. État des lieux 2016, 2017 et pipeline – Zoom sur la ZIR Louise', *perspective. brussels* no. 38 (June 2019): 75.

Biography

Xavier Van Rooyen graduated as an architect from the School of Architecture in Liège. He has practiced architecture with JDS/Julien de Smedt Architects and Pierre Hebbelinck, and then in his own office where he has developed several public commissions. He joined the Department of Architectural Design at the University of Liège as an assistant professor in 2012, where he developed his PhD with Jacques Lucan and Bernard Kormoss. His PhD project has a special research interest in the public realm and the theory of architecture in Western and non-Western contexts of the 1960s. His research examines architectural precedents, design attitudes, methods, and instruments, with the explicit ambition to construct a historiography of the structure of indeterminate architecture since the 1960s.

The Open Map: A Granular Structure for Performative Readings

Başak Uçar and Pelin Yoncacı Arslan

As abstract systems that translate and reconstruct reality, maps have a long history of recording and interpreting space and time. Using different techniques across different periods and contexts, mapmakers have offered preeminent ways of collecting, organising, verifying, historicising, and on occasions even mystifying territorial knowledge. Mapping and its outcomes have been structured and restructured throughout history. Despite changes in society, technology, and design, maps' exploratory potential persists and enables them to successfully foster possible futures. Since the 1980s maps have been acknowledged, not as mere representations but as visual arguments that can be used to structure, extend and diversify our knowledge systems. Advances in technology and the everyday use of digital tools have increased 'resolution' in every aspect of our lives, altering our social, political, and economic structures.[1] Increased resolution through discrete data sets, simultaneous data inputs, and participatory network conditions have also altered the way we conceptualise maps. High-resolution participatory maps, for example, allow us to achieve ambient readings of both tangible and intangible aspects of reality. Without a fixed meaning, digital maps involve multiple data entries from numerous authors, which may constantly be arranged and connected to generate new collectives and networks. By altering the definition and conceptualisation of the map to embrace multiple data, authors and readings, digital practices of mapping become infrastructures in continuous transformation. This moment coincides with what Umberto Eco identified as open works, in which authors deliberately leave their work open to interpretation and completion by performers in order to maximise the number of possible readings.

Eco, Johns and Fuller

Openness, and more particularly open works of art were introduced as notions by Umberto Eco in the 1962 book *The Open Work*, where he links both notions to the multiplicity of meanings and audience participation.[2] According to Eco, an open work is contingent and can be interpreted at different levels and from different perspectives.[3] Open works of art are in continuous progress, rather than aiming for fixed conclusions or meanings.[4] Referring to scientific appraisals of reality, especially in relation to Einstein's work, Eco states that the indeterminacy and discontinuity of quantum physics' spatiotemporal conception of the universe have influenced artists' inclusion of emergence and multiple perspectives in their work.[5] A multiplicity of viewpoints is privileged over an absolute view, emergent interrelations are preferred to prescribed structures, and ambiguous conditions are deliberately included rather than excluded from art. To argue for the relevance of Eco's openness in contemporary mapping practices we can begin with a false start – in Jasper Johns's terms – and look at Johns's highly unconventional process of mapping (and remapping) on fragmented large-scale canvases.

The opening scene in Hans Namuth and Judith Wechsler's 1990 film *Jasper Johns: Take an Object* shows the artist repainting one of his largest

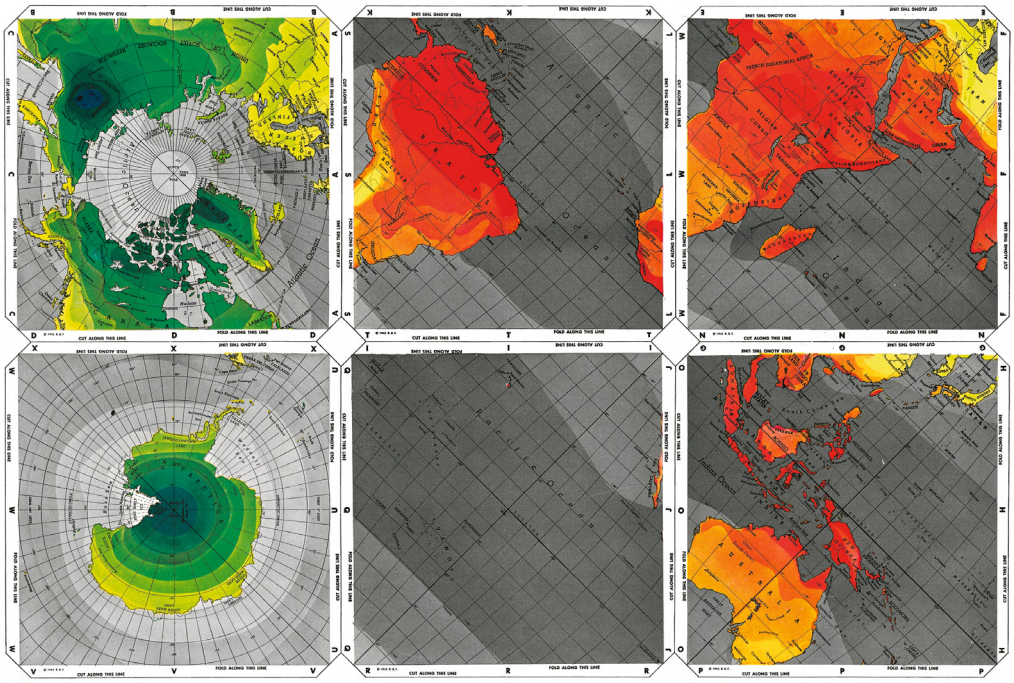
paintings, entitled *Map (Based on Buckminster Fuller's Dymaxion AirOcean World),* in his New York Houston Street studio.[6] [Fig 1] The painting was created in 1966 for the *American Painting Now* exhibition at the United States Pavilion at the 1967 Montreal International Exposition, under the theme 'Man and His World' (inspired by Antoine de Saint-Exupéry's book).[7] Johns was invited by the curator Alan Solomon to participate among many other leading American artists of the post-war era. The exhibition was famously housed in Buckminster Fuller's 62-metre high geodesic dome. The vast space was filled with four enormous staggered platforms joined by lengthy escalators, each filled with enormous display objects: American satellites and their parachutes, including an Apollo space capsule, large-scale paintings, and huge photographs.[8] Attempting to reflect upon the size and the problem of scale inside the gigantic dome, along with his well-established interest in maps and map paintings, Johns borrowed Fuller's *Dymaxion Airocean World Map* and transferred it onto twenty-two separate triangular panels. In the abovementioned film scene, Johns explains how he painted each panel separately based only on a copy provided by Fuller to indicate what the painting should resemble when the panels fit together.[9] A 1965 photograph from his studio shows a number of panels of different sizes on the wall and four panels leaning against the wall at an angle; a printed copy of the *Dymaxion Map* is discernible on the floor.[10] When Johns saw his own *Map* fully assembled and exhibited vertically for the first time (despite its intended horizontal layout), he decided to re-do the whole thing. A year after the exhibition, Johns moved to a bigger studio with a wooden support structure to install the panels so that he could have his whole 'globe' in view while working on individual panels. In five years, he edited the painting in three significant ways,

> adding a layer of collaged media and encaustic to the surface of each panel; redrawing geographic elements in a fragmented manner so that the overall projection appears less coherent and more distorted; and abandoning the vertical orientation for a horizontal one.[11]

The considerable autonomy given to the artist to create this work of art mirrors the original compositional arrangement of the *Dymaxion Map*. Published in sections (with instructions for assembly) in *Life* magazine in 1943, Fuller's patented map presented the earth as a cluster of essentially uninterrupted landmasses. [Fig. 2] Its several editions (for example, a cuboctahedron edition and an icosahedron edition) enabled the *Dymaxion Map* to unfold the projected image of the globe on the surface of a polyhedron with minimum distortion, as well as to distribute negligible distortions evenly on each piece. Compared to other examples of world maps that aim to project the globe on a flat surface with much larger distortions, Fuller reproduced the shapes of the earth's landmasses with a minimum of distortion as he breaks down the globe into triangular parts. By defining an alternative structure for the representation of the world, the *Dymaxion Map* can be rearranged to provide alternative readings according to the reader's interpretation. Unlike many other maps it does not propose a privileged orientation, as it does not indicate the north as a dominant pivot point. According to Fuller, the expansion of global mobility in the twentieth century demanded a flexible map accounting for many different readings and relations.[12] His near-precise projection of the globe was achieved through a mathematical structure in which the different facets of the icosahedron can be reassembled without any distortion to expose well-known, but also new or unexpected relationships.[13] To exemplify the near-infinite amount of possibilities offered by his map, Fuller provided six templates, noting that 'by means of these elective arrangements, our thinking may be realistically insinuated within the special geographical environment of the people of any one world area as predicated upon their own set of conditions.'[14] [Fig. 3]

Fig. 1: Jasper Johns working in his New York Houston Street studio. Still from the short documentary *Jasper Johns: Take an Object*, directed by Hans Namuth and Judith Wechsler, 1990.

Fig. 1



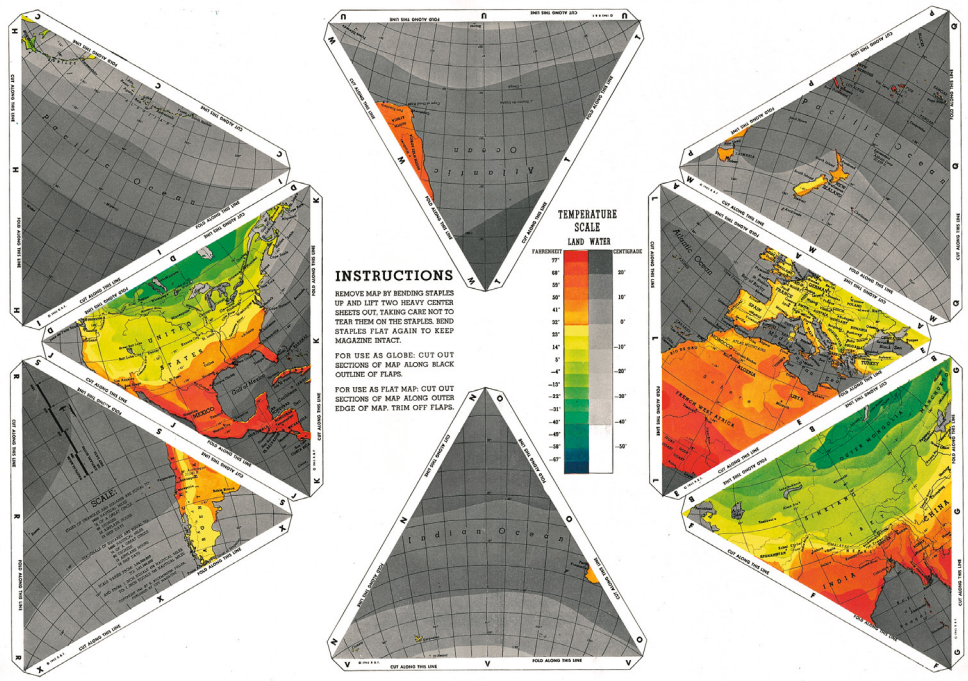


Fig. 2: The original two-page pull-out pattern insert of B. Fuller's Dymaxion Map published in *Life Magazine*, March 1943. Source: The Estate of R. Buckminster Fuller.

DYMAXION WORLD (continued)

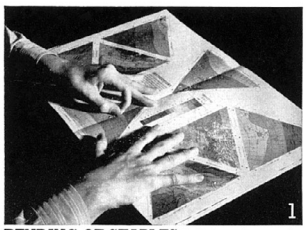
HOW TO ASSEMBLE THE GLOBE

Here demonstrated is the simple procedure by which the segments of the Dymaxion World map are assembled into a visual approximation of a round globe. The opposite page is the reverse side of the second of the two heavy center sheets on which the map is printed.

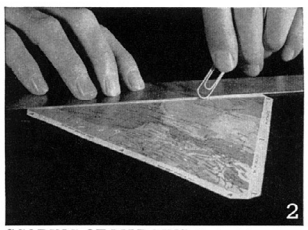
First step, removal of center sheets from magazine, must be taken with care to avoid tearing map on staples. Segments cut out are best fastened together by paste or mucilage. Because they warp the paper, pins should not be used. For neatest product, sequence of assembly here illustrated should be followed. Marginal letters of triangles match marginal letters of squares.

The map, thus assembled into a 14-faced solid, has many of the advantages of a globe. Like a globe it can be viewed from any perspective to bring geographical relationships into new relief—to show that the Southern is the water hemisphere, that Chicago and Sverdlovsk are fairly close together over the top of the world, that Dutch Harbor lies closer to the shortest San Francisco-Tokyo route than Pearl Harbor.

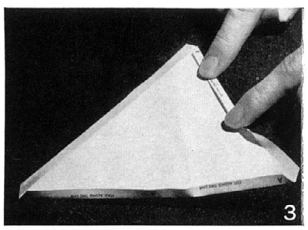
Before they are hidden inside globe, statistics on reverse of each segment are worth inspection. For example, the North Pole square's 8.9% of world population contrasts dramatically with the South Pole's .0004%.



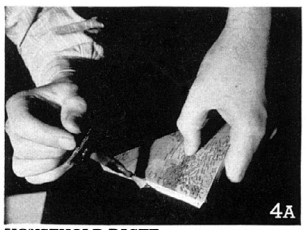
BENDING OF STAPLES is first step in removing map from copy of LIFE. Bent back, staples hold copy intact.



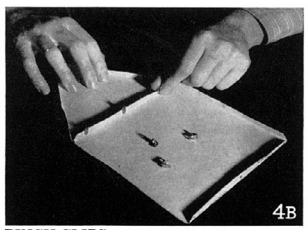
SCORING OF MARGINS of colored face of segment with clip or dull knife facilitates folding of flaps (*right*).



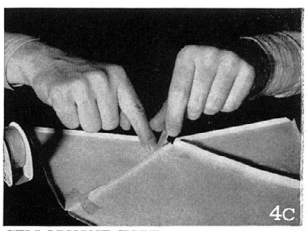
FOLDING OF FLAPS should follow margin of map precisely. Flaps of segments to be joined are keyed by letters.



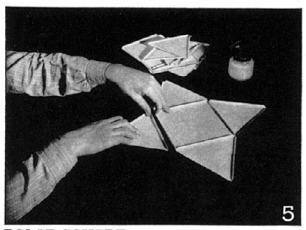
HOUSEHOLD PASTE or mucilage is best means for fastening flaps. It should be spread thinly to avoid warping.



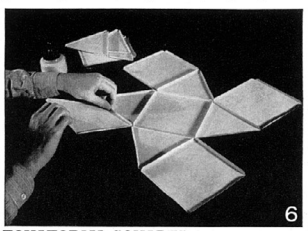
PINCH CLIPS, easy to apply, permit disassembly of globe. If clips are used last segment must be taped or glued in.



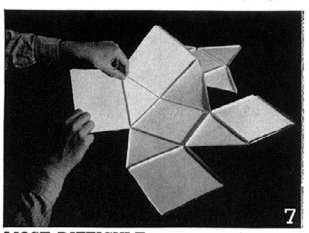
CELLOPHANE TAPE is substitute for paste and clips. It must be applied inside and out to keep edges together.



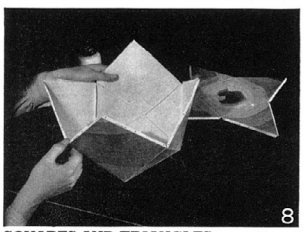
POLAR SQUARE and triangles should first be assembled into unit. Care should be taken to keep edges in register.



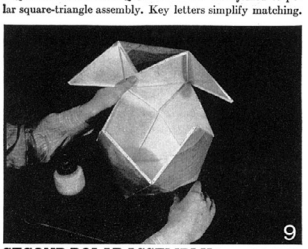
EQUATORIAL SQUARES are then joined to polar square-triangle assembly. Key letters simplify matching.



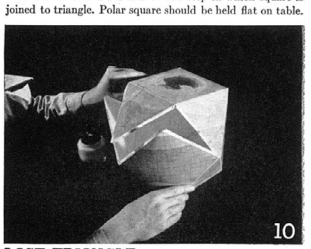
MOST DIFFICULT is this step in which square is joined to triangle. Polar square should be held flat on table.



SQUARES AND TRIANGLES are now fastened and structure is self-supporting. Paper has surprising rigidity.



SECOND POLAR ASSEMBLY is mounted. Paste should be allowed to dry a little before the flaps are joined.



LAST TRIANGLE is left unfastened until other flaps are secured. It can then be set by pressure from the outside.

—OR YOU CAN USE SEGMENTS FOR A FLAT, MOVABLE MAP (SEE PAGE 53)

Fig. 3: The original page from the Life Magazine article published in March 1943. Source: The Estate of R. Buckminster Fuller.

Fuller's map allows its readers to assemble or open all facets of the icosahedron in different ways. Thus, it allows them to achieve partial readings and alternative interpretations of the world, as well as to produce visions of other possible worlds. A map is always an incomplete and insufficient description, 'a surface on which is laid out an assemblage of the world', according to Svetlana Alpers.[15] By deploying triangles that could be fitted together to form a globe, Fuller offers a new descriptive map that directly challenges mapping on two fronts. First, it expands the relationship between a two-dimensional map and the three-dimensional world it signifies; and second, it unfolds the user-generated dynamic relationship between the map's parts and whole. Challenging the conceptualisation of the map as a representational tool that depicts reality, the *Dymaxion map* is endowed with agency; as a productive, proactive, and provocative medium that – by shuffling relations without a fixed depiction – extends the boundaries of representation and enables mapping to function as an interpretative medium with an incomplete and ever-changing organisation of visible and invisible relations. [16]

Considering the highly politicised landscape of the post-war era, the particular context of the Montreal Expo, and Fuller's uniquely utopian perspective, we could see both the *Dymaxion Map* and Jasper Johns's mural version of it as significant examples of openness that shift the observer's attention from object to performance. Each of Johns's murals (objects) must also be understood as an act or process of mapping a 2D map. In that sense they not only represent, but also physically rework, interpret, and interact with the 3D content (the globe) that is common to all. The fact that the paintings don't obviously look like conventional maps reveals that mapping is always an 'ongoing process of picturing, narrating, symbolizing, contesting, re-picturing, re-narrating, re-symbolizing, erasing, and re-inscribing a set of relations.'[17]

Part-to-whole relations

A work of art's openness – or 'suggestiveness' in Eco's terms – largely depends on whole-to-part relationships.[18] For centuries historical maps have provided their readers with multiple, real and fictive layers of information. For instance, Boundelmonti's fifteenth-century Constantinopolitan views or Jacopo de Barbari's map of Venice mediate between real and possible urban configurations. As a generative instrument, cartographic practice makes and remakes the urban conditions over and over, and thus offers alternative readings where 'fact' (factum, something made) and 'fiction' (fictio, the act of making) delimit a continuum rather than an opposition. According to James Corner, the act of mapping neither reproduces nor forces knowledge.[19] Instead, every reception of a map is an interpretation of the complete original work whose parts are countlessly reconfigured by a mental and aesthetic contribution by the observer – as Eco emphasises. Even an unquestionably definitive map, such as the fourteenth-century Jericho map from the Farhi Bible, 'opens up' in similar ways in the eyes of the beholder. [Fig. 4]

The map depicts the biblical city mentioned in several Old Testament episodes. The circular pattern represents 'the need to circumambulate the city seven times to enter it because of its seven walls.'[20] Jericho is illustrated as a circular maze; a continuous blue trail lined with a fortification wall that constitutes the meandering walkway defended by many watchtowers. The walkway begins at the closed city gate and ends at the centre. In that sense it is complete. However, as explained by Reed Dobb, labyrinths 'simultaneously incorporate order and disorder, clarity and confusion, unity and multiplicity, artistry and chaos.'[21] Thus, even though the Jericho map might look like a perfect finite work (a straight path created by a set of specific repetitions applied on predefined structural coordinates) this relatively static view becomes dynamic from a walker's perspective. The round pattern, its impenetrability (and the disorientation it causes), and a sense of

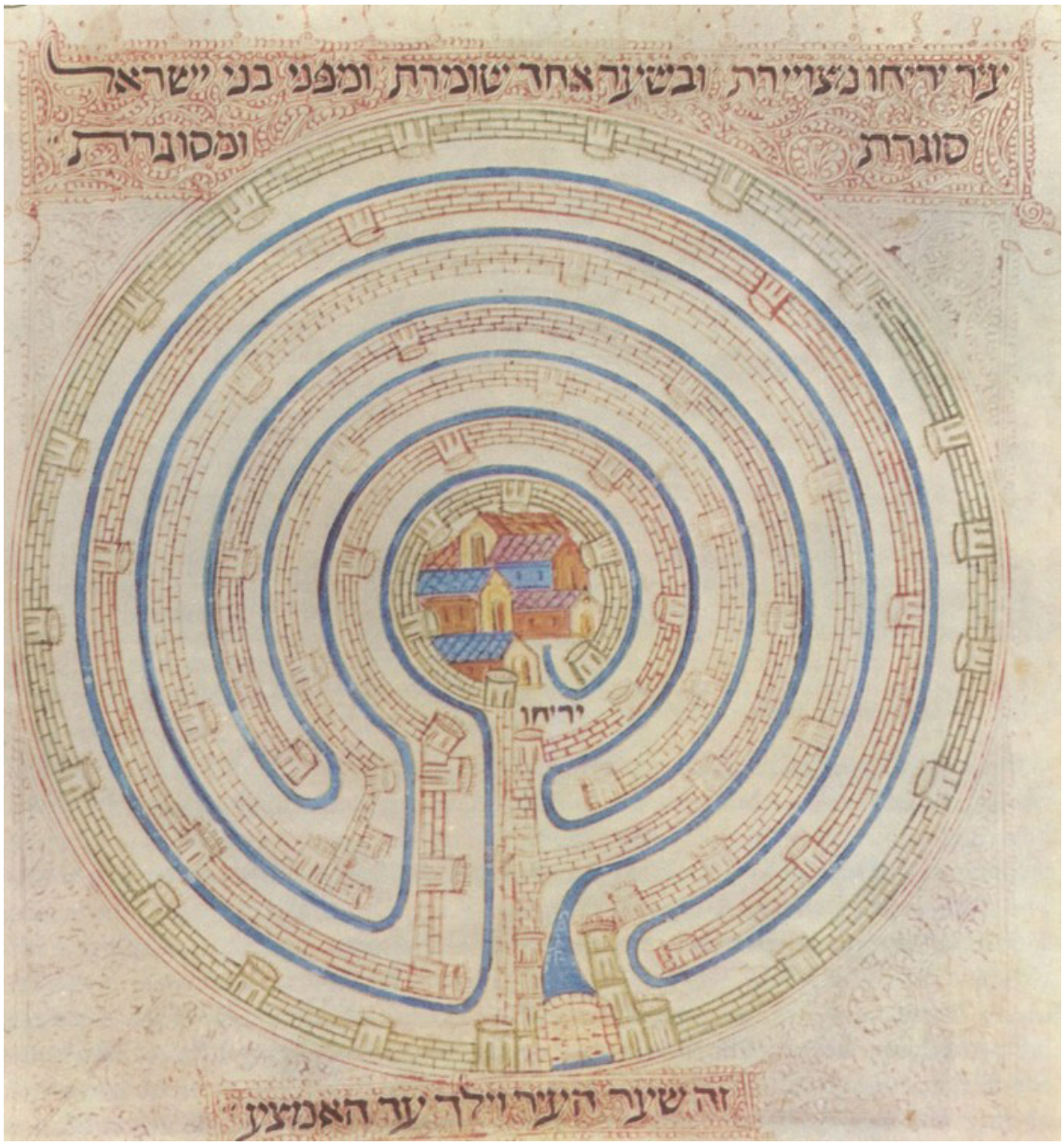


Fig. 4: Maze map of the Palestinian city of Jericho, by Elisha ben Avraham Crescas, in the Farhi Bible, fourteenth century. Source: Wikipedia.

enforced circuitousness, demand that one decides between two paths at any given movement, just like Eco's 'works in motion'.[22] The maze's embedded 'perceptual ambiguities' allow the observer to conceive the world as a new potentiality before habit and familiarity kick in.[23] Just as the 'blank space surrounding a word, typographical adjustments, and spatial composition in the page setting of the poetic texts' create 'a halo of indefiniteness and to make the text pregnant with infinite suggestive possibilities,' in Eco's words, the embedded 'perceptive ambiguities' of the maze are 'a deliberate move to "open" the work to the free response of the addressee.'[24] As such, part-to-whole and part-to-part relations range from static to dynamic, from multi-scalar to multi-dimensional, and from ambiguous to interactive. Reading the Jericho map offers us an opportunity to ponder part-to-whole relations in the digital age.

In light of technological developments such as the printing press, aerial photography, global positioning systems (GPS) and geographic information systems (GIS), mapping has been redefined as an act of accessing, deciphering, visualising, and producing tangible or intangible data, which is always in continuous transformation.[25] More specifically, digital maps enable extensibility and polyvocality.[26] The large scale of data input, polyvalent authorship, unfinished and indefinite readings, and stratified realities do not define a giant map made of bytes, but rather an unfinished model open to new constellations and interrogations. Loaded with data from different sources and authored by different participants, digital maps are intrinsically incomplete and unstable. They achieve a sense of depth by 'recording and representing the grain and patina of place through juxtapositions and interpenetrations of the historical and the contemporary, the political and the poetic, the discursive and the sensual' and embrace ambiguity, uncertainty, contingency, and incompleteness in order 'to provide a platform for a spatially-embedded argument.'[27]

A map's stratification and grain come together in order to create meaningful readings or emerging existences that do not necessarily merge in a single reading. The discretisation and the part-whole relations implicit in mereological thinking define a theoretical framework for digital mapping practices.[28] Mereology is the study of relationships between parts and wholes. By focusing on the connections and collections that explain wholes, it facilitates the consideration of increased resolution and its subsequently produced realities.[29] Mereological thinking allows us to understand how different parts define and structure the whole they are part of, but also function as discrete entities at different scales. According to Edmund Husserl, part-whole relationships take place at different scales.[30] Interdependency, discreteness, distinctiveness, and individuality define the specific conditions that articulate parts and whole. In the case of the above-mentioned Jericho map, for example, the whole is defined by the absence of identifiable parts.

Such dissolution of interrelations between parts is what Manuel DeLanda calls a 'flat condition,' in which the emergent wholes are liberated from the drive to become unified and the interaction between parts – circumstantial and/or evanescent – is emphasised.[31] Within emergent wholes, parts 'retain a relative autonomy so that they can be detached from one whole and plugged into another, entering into new interactions.'[32] Thus, flatness dissolves the distinction (and dependencies) between parts and wholes; connections intensify and focus on the conditions that define emergence as well as on the coincidental occurrences of parts and wholes. This departure from conventional definitions of part-to-whole relationships offers us a better framework to gather, store, and process information on maps composed of different layers and multiple interactions.

The contemporary city and the open map

Computers have enabled us to acquire, interpret and use complex data. With continuous data input from various sources, increased intensity and saturated processes disturb and redefine conventional

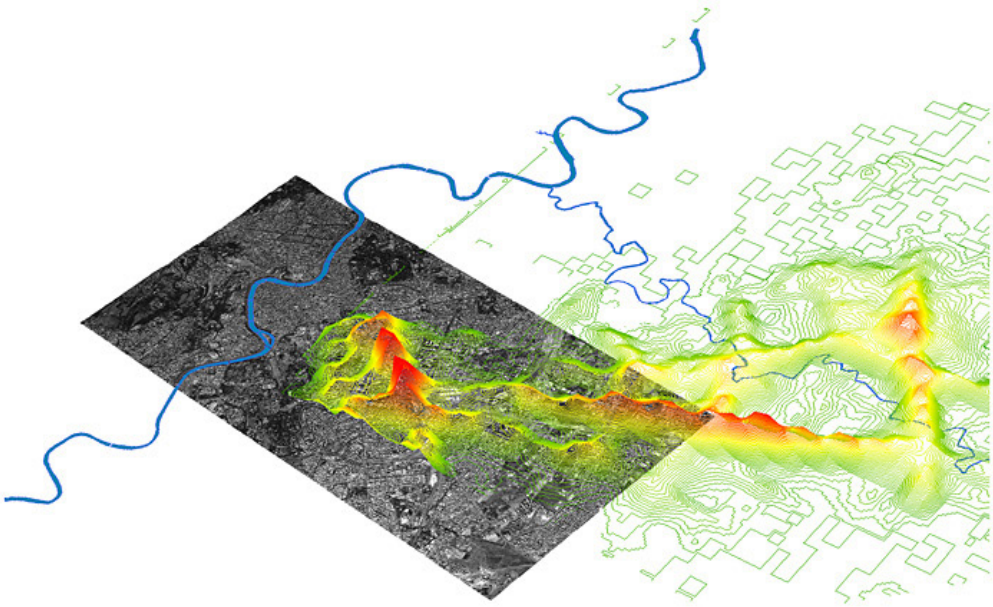
mapping practices. In order to respond to these transformations, as well as to complex cities and their ever-changing relations, the contemporary map must overcome overdetermined, stable structures and fixed dependencies. Instead, it must be defined by diversity, incompleteness and unpredictability. Such qualities bring the map close to DeLanda's definition of a flat condition, which triggers and embraces evolving, dynamic, unpredictable, and indeterminate processes. In constant re-definition, flat conditions transform and maximise themselves by connecting and reconnecting different layers of information, and by initiating uninterrupted interactions between them. Continuous reorganisation is part of a flexible, ever-changing and unstable process, constantly rearranged via new inputs from various authors. Even when a particular mapping process is over, the resulting map remains open, as it can be re-interpreted from various perspectives and become a part of another map through whole or partial transfer.

The World Game, an educational simulation tool created by Buckminster Fuller in the 1960s as a comprehensive and cooperative approach to the world's problems, illustrates this open process. Fuller proposed the game as part of the curriculum at Southern Illinois University, and initially played it with his colleagues and students. [Fig. 5] Seen as a tool accessible to everyone, the game was Fuller's response to technological advances (cybernetics and computerisation), political and physical changes (the post-war period and environmental problems) and social shifts (the impact of human activity).[33] Furthermore, the game was also seen as an alternative to war games, as it allows participants to discover a series of relationships by indicating their runs and decisions on a constantly evolving map. Using the *Dymaxion Map* as basis, the World Game requires the spontaneous participation of a group of players who are expected to cooperate and propose solutions to a given problem (usually a global problem) such as overpopulation or the distribution of resources.[34] The process allows participants to provide personal interpretations and solutions in a non-hierarchic organisation, and to interact with each other's decisions, vis-à-vis the map, as they reach decisions collectively, using a distributed rather than a holistic approach.[35] Through a distributed network that redefines itself with each data input from every participant, the model also redefines itself as part of an indeterminate, unfinished process. By folding and unfolding the map in various ways according to a series of predetermined relationships, the game 'introduced indeterminacy in the form of competition and chance and allowed for the operation of free will, democracy (the will of the majority), and interactive influence (synergy)'.[36]

Fuller's World Game allows for the reconfiguration of decisions and fosters multiple perspectives by encouraging spontaneous cooperation between participants. The connections and networks generated by the game are extended to include multiple interpretations, establishing an obvious connection between the indeterminate structure of the World Game and Eco's definition of the open work: 'the more improbable, ambiguous, unpredictable, and disordered the structure, the greater the information – here understood as potential, as the inception of possible orders.'[37] It is in this sense that the World Game can be taken for an open work, based on mapping practices and yet altering them through participatory and collaborative definitions. Like the *Dymaxion Map*, the World Game also opens the map to multiple readings which can be arranged in several alternative ways, turning users and readers indiscriminately into authors, participants and spectators of the resulting unstable outcomes and their meanings.

Just like the game's hands-on performance, contemporary digital maps also have a granular front. Recent developments in computer science and information technologies have transformed the game's open approach and its multi-layered readings into grittier digital city maps that register enormous amounts of interrelated information and

Fig. 5: Playing the World Game at New York Studio School of Painting and Sculpture in 1969. Photo: The Estate of R. Buckminster Fuller.



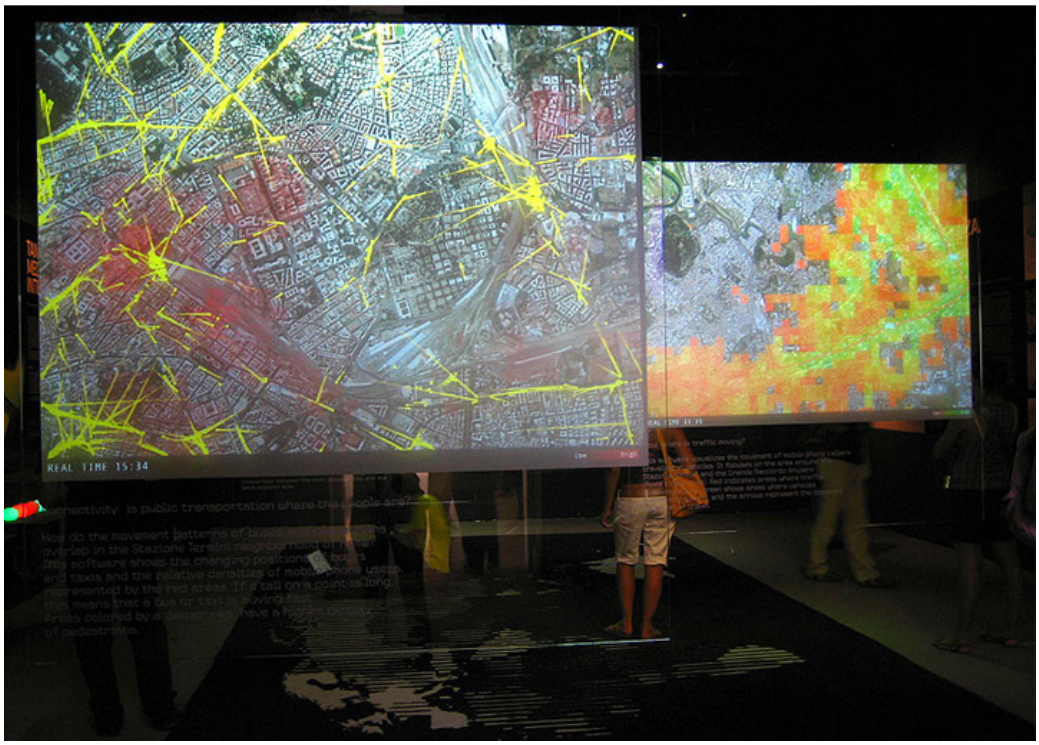


Fig. 6: In the Real-time Rome project, different datasets are overlaid in a single model. Source: MIT Senseable City Lab website.

allow many different parties to track that information simultaneously. Introduced by Panagiotis Michalatos, granularity is the condition that characterises available data recorded and represented through a model that is accessible, transmissible, and observable.[38] As already noted, new technologies allow many users to participate simultaneously in the same digital model, which, in return, records their acts as forms of concurrent authorship.[39] In other words, a digital model becomes a granular structure when it is able to register the totality of all participants' actions. In the granular model, any manipulation – even the faintest click from a single user – can be isolated, removed, copied, and moved, allowing the model to continue evolving despite the absence of any users. Granularity is therefore not about holding various layers of information together, superimposed on a single map, but about keeping all layers of information constantly open to operation and manipulation. The result is an evolving map that is literally in continuous redefinition. Every piece of information, every act understood as information, increases the content of the map and enables multiple interactions between these information bits.

As a granular structure, the Real-time Rome project developed by MIT's SENSEable City Lab for the 2006 Venice Biennale was able to read urban dynamics in real time and therefore to reveal the city's pulse.[40] The project provided a highly granular map of Rome, combining information gathered from various real-time networks in a single database and offering instantaneous visualisations. [Fig. 6] Taking advantage of ubiquitous connectivity and urban informatics, data was gathered from the city and citizens through mobile phones and transportation networks.[41] Traces of information and communication networks, movement patterns of both people and transportation systems, and spatial and social use of streets and neighbourhoods were all mapped to understand the real-time city. Citizens became active participants in the process, consciously or unconsciously.[42] By matching mobility information with data of Rome's geographic and socio-economic context, the map visualised the use of neighbourhoods, the distribution of goods and services, and the different inhabitation patterns that coexist in the city.[43] These different mapping processes continued even after the initial visualisation processes, since the layers of data could be rearranged, reshuffled, reorganised, removed, or isolated to provide alternative viewpoints and readings. Therefore, the potential number of different maps resulting from this process is infinite and always in progress. In this case, each map's parts do not necessarily define a foundational part-to-whole relationship but rather a flat condition. Hence, the granular structure embraces a flat organisation, which can reorganise itself according to new interactions and does not propose a hierarchic dependency between the parts, that is, the information bits stored in the model. Different from the kind of openness described in Fuller's World Game, the Real-time Rome map is open to near limitless inputs provided by unknown participants, and does not dictate any kind of structure, organisation, or foreseeable visualisation.

Endings

In *The Open Work*, Umberto Eco registered artists' shared decision to leave the arrangement of some of the constituent parts of their art either to the public or to chance, shifting from a single definitive order to a multiplicity of possible orders.[44] In Namuth and Wechsler's film, we see Jasper Johns working and re-working his *Map*, layer upon layer, while constantly checking Fuller's *Dymaxion Map*; scraping the surface and adding another layer, fixing the paint with heat and removing layers of colour; and finally, stepping down from the ladder to zoom out and see the earth all at once. We can also notice the traces of his decisions and revisions in the different reconstructions of the *Map*. It would appear that, more than an author, Johns acts like a participant, performing upon the structure provided by Buckminster Fuller, which remains deeply inscribed on the plane. This shift in the role

of the artist is not different from the granular condition imposed by the contemporary open map. The mapping practices, we have considered in this article, although traced over different periods and with different intensities, all contain some degree of openness through a multiplicity of meanings and the participation of viewers. The non-linear reading of Fuller's *Dymaxion Map* through Johns's wall-size paintings and the World Game epitomise different forms of openness in different mediums. As open works, they have different degrees of openness. The concept of openness here is constant, but the method of satisfying it varies according to society's available technologies and current conditions.

On these grounds we can criticise conventional mapping techniques for not responding to the complexity and the fluidity of contemporary cities, but also for not being structured to include the many exigencies, defects, uncertainties, intentional or unintentional deviations, and the inevitable arrays of the current urban condition.[45] An augmented granularity of the open map, on the other hand, holds the potential to accommodate the visible and invisible, related and unrelated, existing or yet-to-come conditions that define every context. In this respect, granular open maps could render the complexity of the contemporary city and define the fluidity of the relations as a critical input for performative mapping practices.

Reconceptualising the map as an open work also allows us to revise the position of the architect as designer, and dissolves dependencies between designers and maps. The flat condition defined through granular open maps includes designers as part of a network of relations made up of many other actors. The dissolution of the authority of a single author in the definition and visualisation of the map makes room for multiple other actors – especially those who have historically been rendered invisible. The uninterrupted gathering, processing, and visualising of multidimensional and massive amounts of data could reveal heretofore unacknowledged features of the city, and make them visible. This way, open maps could allow designers to construct spatial narratives which official data sources do not (or cannot) reveal. Rather than reflecting on politically or ontologically visible statistics, open granular maps would allow designers to overcome legacies of inequity and underrepresentation, and constitute a performative tool for the creation of comprehensive and collaborative environments that are able to incorporate different values.

Notes

1. Daniel Koehler defines resolution in relation to discretisation and discusses the concept in reference to mereology. Daniel Koehler, 'Mereological Thinking: Figuring Realities within Urban Form', *Architectural Design* 89, no. 2 (2019): 30–37.
2. Umberto Eco, *The Open Work* (Cambridge, MA: Harvard University Press, 1989).
3. Guy De Mallac, 'The Poetics of the Open Form: (Umberto Eco's Notion of "Opera Aperta")', *Books Abroad* 45, no.1 (Winter 1971): 31–36.
4. Eco, *The Open Work*, 23.
5. Ibid., 18.
6. *Jasper Johns: Take an Object,* directed by Hans Namuth and Judith Wechsler (1990), 26 min., https://judithwechsler.com/films/jasper-johns-take-an-object.
7. For the art and architecture at Expo 67, see Lynn Sherr, 'Expo 67', *Art in America* 55, no. 1 (January 1967): 76–79, and Mahonri Sharp Young, 'O Canada! O Expo!', *Apollo* 86, no. 67 (September 1967): 234–38.
8. Virginia M. G. Anderson, 'A Map and a Painting: The Re-Working of Jasper Johns's Map (Based on Buckminster Fuller's Dymaxion AirOcean World)', *American Art* 32, no.1 (Spring 2018): 52–73.
9. Jasper Johns, Kirk Varnedoe and Christel Hollevoet, *Jasper Johns: Writings, Sketchbook Notes, Interviews* (New York: Museum of Modern Art, 1996).
10. For the photograph taken by Rudolph Burckhardt, see Varnedoe Kirk, *Jasper Johns: A Retrospective* (New York: The Museum of Modern Art: Distributed by H.N. Abrams, 1996, 231).
11. Joseph Ramsey, 'A Fuller Map: Latent Meanings within Jasper Johns' Map (Based on Richard Buckminster Fuller's Dymaxion AirOcean World)', *Athanor* 35 (2017), 77–84.
12. R. Buckminster Fuller, 'Fluid Geography', in *The Buckminster Fuller Reader*, ed. R. Buckminster Fuller and James Meller (London: Cape, 1970), 131.
13. Christine Macy and Sarah Bonnemaison, *Architecture and Nature Creating the American Landscape* (New York: Routledge, 2003), 317–18.
14. Fuller, 'Fluid Geography', 133.
15. 'Like the mappers, [Dutch painters] made additive works that could not be taken in from a single viewing point. Theirs was not a window on the Italian model of art but rather, like a map, a surface on which is laid out an assemblage of the world.' Svetlana Alpers, *The Art of Describing: Dutch Art in the Seventeenth Century* (Chicago: University of Chicago Press, 1984), 133.
16. James Corner, 'The Agency of Mapping: Speculation, Critique and Invention', in *Mappings*, ed. Denis E. Cosgrove (London: Reaktion, 1999), 218.
17. Todd Presner, David Shepard and Yoh Kawano, *Hypercities: Thick Mapping in the Digital Humanities* (Cambridge, MA: Harvard University Press, 2014), 15.
18. Eco, *The Open Work*, 8.
19. James Corner, 'The Agency of Mapping', 228.
20. *Encyclopedia of the Bible and Its Reception* vol. 13 (Walter de Gruyter, Berlin/Boston, 2016), 964. For a discussion of the Jericho-labyrinth tradition see Hermann Kern, *Through the Labyrinth: Designs and Meanings over 5,000 Years* (Munich: Prestel, 2000 [1982]), 171–182. For the fourteenth-century map, see https://en.wikipedia.org/wiki/Jericho#/media/File:Map_of_Jericho_in_14c_Farhi_Bible_by_Elisha_ben_Avraham_Crescas.jpg.
21. P. Reed Doob, *The Idea of the Labyrinth from Classical Antiquity through the Middle Ages* (Ithaca, NY: Cornell University Press, 1992), 12.
22. Eco, *The Open Work*, 9.
23. The term *perceptive ambiguities* is taken from modern psychology and phenomenology.
24. Eco, *The Open Work*, 9.
25. For contemporary definitions and interpretations of mapping, see Mark Dorrian, 'Architecture's Cartographic Turn', in *Figures de la Ville et Construction des Savoirs*, ed. F. Pousin (Paris: CNRS Editions, 2005), 61–72; Jeremy W. Crampton and John Krygier, 'An Introduction to Critical Cartography', *ACME: An International E-Journal for Critical Geographies* 4, no. 1 (2006): 11–33; and Jacques Lévy, *A Cartographic Turn* (Lausanne: Epfl, 2016).

26. Presner, Shepard and Kawano, *Hypercities,* 18.
27. Mike Pearson and Michael Shanks, *Theatre/ Archaeology* (Abingdon-on-Thames: Routledge, 2001), 64–65.
28. Within the scope of this article, mereology is introduced not to frame the entire mapping discussion within the part-whole relationship, but rather to introduce the concept of discreteness that increases with the maps' resolution.
29. Daniel Koehler, 'Mereological Thinking: Figuring Realities within Urban Form', *Architectural Design* 89, no. 2 (2019): 35.
30. Edmund Husserl, 'Investigation III – On the Theory of Wholes and Parts', *Logical Investigations*, vol. 2, trans. J. N. Findlay (Abingdon-on-Thames: Routledge, 2001), 4.
31. Manuel DeLanda, *Intensive Science and Virtual Philosophy* (New York: Continuum, 2002), 47.
32. Manuel DeLanda, *Assemblage Theory* (Edinburgh: Edinburgh University Press, 2016), 226.
33. Timoty Scott, *Buckminster Fuller's World Game and Its Legacy* (Abingdon-on-Thames: Routledge, 2021), 5.
34. R. Buckminster Fuller, 'World Game', *Critical Path* (New York: St. Martin's Publishing Group, 1982), 398.
35. Ibid., 400.
36. Christine Macy and Sarah Bonnemaison, *Architecture and Nature Creating the American Landscape* (New York: Routledge, 2003), 317–18.
37. Eco, *The Open Work*, 93.
38. Panagiotis Michalatos, 'Design Signals: The Role of Software Architecture and Paradigms in Design Thinking and Practice', *Architectural Design* 86, no. 5 (2016): 110.
39. Ibid., 113.
40. Real-time Rome, MIT, SENSEable Lab, https:// senseable.mit.edu/realtimerome/.
41. Ibid.
42. Ibid.
43. Ibid.
44. Eco, *The Open Work*, ix.
45. Arie Graafland, *Understanding the Socius Through Creative Mapping Techniques* (Delft: Delft School of Design, 2008), 7.

Biography

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On the Open Style of Architectural Reasoning

Konstantinos Apostolidis

In the field of thermodynamics, a system is defined as an assemblage of 'devices containing a quantity of matter that is being studied'.[1] A control volume contains the matter and the devices inside a control surface that separates the system from its surroundings.[2] A thermodynamical system can be isolated (when no mass, heat, or work crosses the boundary of the system), closed (when heat and work can cross the control surface but the mass is fixed), or open (allowing the flows of both energy and mass).[3]

These three kinds of thermodynamical systems do not represent three diverse material ontologies, but different scientific methods of inquiry towards the growth of knowledge – a given material structure is studied through different methods and apparatuses, which may result in different interpretations of its nature. Likewise, the methodologies used to study different forms of scientific and institutional research determine our perception of architecture. On these grounds it becomes clear that the use of different theories, methods, and apparatuses in architectural research results in equally different understandings of what open architecture could be.

The reference to thermodynamics above stresses the fact that, even in the hard sciences, the way matter is examined determines the very nature of that matter. Likewise, openness can be grasped as a question of method rather than as an objective ontological category. From this perspective, we can achieve a better understanding of openness in architecture by focusing on the theoretical devices used to appraise our discourse on the subject. By shifting our attention from architecture to the methods we use to analyse it, openness stops being a property common to certain objects and becomes a potentiality that can appear in a broader spectrum of architectures. Granted that theories and methodologies have a life of their own, they can evolve beyond concrete objects and eventually alter our perception of architecture, liberating architectural practice from rigid interpretations and fixed characterisations that are often unable to acknowledge and manifest architecture's potential.

My argument follows Karl Popper's distinction between two types of knowledge: individuals' subjective knowledge and knowledge situated in an autonomous 'third world' that comprises theoretical systems, hypotheses, problems, journals, libraries, and critical arguments.[4] Based on this distinction, we will examine if there is anything to say about the openness of architecture's 'third world'.

The styles project

My hypothesis is rather simple: throughout history different ideas regarding architecture have shared a Foucauldian a priori basis.[5] Michel Foucault's archaeology points out that in any given society the configurations of knowledge, practice and thought owe their existence to an a priori order, which he calls episteme. These configurations have changed as history unfolds. Ideas, sciences and rationalities have emerged and vanished, since 'the mode of being of things, and of the order that divided them up before presenting them to the understanding, was profoundly altered'.[6] Foucault thus states that even truth itself is a product of these a priori orders:

'"Truth" is linked in a circular relation with systems of power which produce and sustain it, and to effects of power which it induces and which extend it. A "regime of truth".'[7]

It seems appropriate to assume that there is an epistemological field within which the idea of open architecture becomes possible prior to its implementation. This proposition requires that we come up with clear-cut concepts that allow us to render the function of those methods that make openness in architecture possible.

After falling under Foucault's spell (especially regarding transformations of truth in Western traditions), and influenced by Paul Feyerabend's *Against Method,* the philosopher of science Ian Hacking drew on A.C. Crombie's concept of 'styles of scientific thinking'.[8] Based on this idea, Hacking claims that 'different methods of inquiry used in the sciences have their own historical trajectories, and have moulded scientific reason and even what counts as true'.[9] His argument is that societies operate according to 'styles of reasoning', understood as strategies that have been developed by our species to understand and alter the world.

> Styles of reasoning, eminently public, are part of what we need to understand what we call objectivity. This is not because styles are objective (i.e., we have found the best impartial ways to get at the truth), but because they have settled what it is to be objective (truths of certain sorts are just what we obtain by conducting certain sorts of investigations, answering to certain standards).[10]

The 'styles project' developed in Hacking's work questions whether reason authenticates itself by determining what is true or false.[11] Societies, he notes, don't actually have a good reason to use several styles of inquiry. They simply use those styles because they are taken for standards of good reason and establish criteria for truthfulness.[12] Specifically, three points from Hacking's 'styles of reasoning' appear as pivotal for implementing his ideas in architecture. These are: style, truth and reason.

A style of reasoning is an analytical tool, comparable to the well-known Kuhnian paradigm, in the sense that it pursues the emergence of new modes of reasoning in the history of knowledge. Generally, styles of reasoning are concerned less with the content of science than with its methods. This is why Hacking notes that styles of reasoning are more in line with Foucault's episteme than with other conceptualisations of style in the history of knowledge.[13] Although Hacking admits that alternative notions such as 'ways of finding out (how to)' seem preferable to style, it is also clear that the term allows us to establish a distinct connection with art and architecture.[14] Concretely, style allows us to recognise that there is a paradoxical social nature in the originality and the individuality of both art and reasoning.

Reference to style is frequent in architectural discussions and usually refers to the distinctive formal virtues and qualities that characterise certain buildings and projects. In his *Modern Architecture: a Critical History,* Kenneth Frampton describes the international style as 'a general rule towards the hypothetical flexibility of the free plan, and to this end it preferred skeleton frame construction to masonry.'[15] He then uses a series of projects to illustrate the way the international style and its variations became actualised by the many different compositions that share a series of distinct and innovative architectural positions. Regarding Brazilian architects' modifications of the international style, for example, he notes how Oscar Niemeyer's Casino at Pampulha 'reinterprets the Corbusian notion of *promenade architecturale* in a spatial composition of remarkable balance and vivacity'.[16] What is evident here is that style is used to distinguish a population of architectural projects that share and develop certain common features. Ultimately, the international style transcends individual architects and is instead contained in the particular methods and decisions of an architectural synthesis that

continues to operate and evolve beyond the authorship of any single architect.

In his *Principles of Art History* Heinrich Wölfflin had already noted how the notion of style cannot be assigned to separate individuals, but characterises a population of works of art.

> The course of the development of art (…) cannot simply be reduced to a series of separate points. Individuals fall into larger groups. Botticelli and Lorenzo di Credi, for all their differences, have still, as Florentines, a certain resemblance when compared with any Venetian.[17]

Wölfflin suggests that in the development of any art form one can distinguish different universal representational forms that have been used in different manners by the various artists of an epoch. These forms constitute the abovementioned a priori for a particular group of artists. The art each of them produced in a particular epoch remains bound to these forms. Evidently, Wölfflin did not care about 'the beauty of Leonardo but (about) the element in which that beauty became manifest'.[18]

The origins of the word style can be traced back to literature. The Latin *stilus* refers to the pen as the quintessential tool for writing, and eventually came to be used figuratively as something that characterises an elegant writer.[19] Until the dawn of the twentieth century style was mostly used as a means of periodisation, identification and analysis of works of art and architecture, but after Wölfflin and the appearance of abstract styles it became a generating principle – the inner creative force of a period.[20]

Philosopher Arnold Davidson developed his own idea of styles of reasoning, based on Wölfflin's conception of style. 'A style of reasoning is primarily concerned not with the ideas of individuals, but rather with a set of concepts and the way that they fit together.'[21] Davidson's work discusses the emergence of a new style of reasoning in psychiatry since around 1870, which has turned homosexuality, masochism, sadism and fetishism into central topics of sexuality. Before the nineteenth century, he argues, the concept of perversion (and the concomitant figure of the pervert) did not exist. A whole new style of reasoning about psychiatry was necessary for these notions to appear.[22]

The second point from Hacking's 'styles of reasoning' I will draw upon concerns truth. According to Hacking, 'truth has no history, while truthfulness – the possibility of telling the truth about a specific topic – does have a history'.[23] He explicitly refers to Bernard Williams's book *Truth and Truthfulness,* which argues that Thucydides's historiographic style introduced a fundamental change in the way we conceive of history, by adding new criteria for telling the truth about the past. As the first scientific historian, Thucydides produced a conceptual shift in what it means to tell the truth regarding a historical account.[24] To say that a statement about an event is historically true is to imply that it is determinately located in the temporal structure.[25] He goes on to say that

> Thucydides imposed a new conception of the past, by insisting that people should extend to the remoter past a practice they already had in relation to the immediate past, of treating what was said about it as, seriously, true or false.[26]

A fundamental characteristic of any myth is that it is atemporal. Thucydides confronted this interpretation by imposing a specific chronological system on his narration of the Peloponnesian war. His main problem was that the Athenian and Spartan calendars were different, so he invented his own based on the years a war lasted and then subdivided them into summers and winters. True, he could not point at exact dates, but his history remained structured around a series of events. Additionally, Thucydides's historiographical method consisted of recounting public speeches, such as Pericles's famous funeral oration. While Homer depicted the great heroic achievements of the past as myths that were meant

to entertain, warn and remind, Thucydides looked at the past as a means to confirm his views of the present. He was not interested in great events per se, but rather in the political and societal causes of those events. Nor did he strive to amuse the reader. His recording of political speeches was meant to help the reader understand the deeper motives of rival cities and their politicians.

As we can see, truth in history emerged as an outcome of historiographic methods. Similarly, Hacking notices that when the notion of 'proof' appeared in geometry, it also became the gold standard for truth in the field of mathematics.[27] The point here is that there are different criteria of truthfulness in different areas of thought, and that these criteria are determined by the ways of thinking and doing that are intrinsic to each area.

This assertion leads us to the third and last among Hacking's points that I want to address: styles of reasoning are not referred to any superior authority, nor do they answer to truth-prescribing canons. Their only standard is that they work.[28] But styles of reasoning are not to be confused with styles of argumentation.

By using the term 'reasoning' Hacking initially aimed to replace Combrie's 'thinking' with a notion that recognises the role of both processes of thinking and doing in the pursuit of knowledge. While it might seem that this understanding equates logic to scientific reason, Hacking made a clear distinction between both terms. For him logic corresponds to Aristotle's form of argumentation, which was formulated in syllogisms. Scientific reason, on the other hand, is made up of experimental explorations together with hypothetical modelling.[29] These two different processes are significantly creative, in the sense that they are able to overcome mere argumentation as means to defend or refute a scientific theory. In fact, in the sciences certain phenomena only appear within experimental processes carried out with distinct apparatuses.[30] Reasoning is not a priori. It is conceived instead as part of a practical, collaborative process among the different practices (such as speculation, calculation and experimentation) that come together during scientific research.[31]

Two 'third world' architectural studies can help us understand the growth of knowledge in architecture further. Both studies express independent views regarding architectural development, but they both acknowledge (albeit to different degrees) that architectural design is openly related to a cultural environment that inevitably defines architectural possibility. It is in this sense that Stanford Anderson's understanding of architectural design as a series of research programmes, and Michael Hays's idea of critical architecture, establish methodologies and illustrate styles of reasoning that issue in truth claims for distinct architectures.

The notion of style summarises the common ground between the various concepts and ideas that determine a set of architectures. As Nelson Goodman has noted, the qualities that define a particular style can only be revealed by juxtaposing different works.[32] In order to approach an open style of architectural reasoning we must examine more than one example of architectural reasoning. We will therefore try to diagnose the statements and ideas that are common to the work of Anderson and Hays, and thus portray an open style of architectural reasoning.

Stanford Anderson's architectural research programmes

It has been suggested that Stanford Anderson's implementation of Imre Lakatos's *Methodology of Scientific Research Programmes* overcomes notable limitations in traditional architectural historiography by offering a nuanced way of telling the truth about modernist architecture.[33] In fact, Anderson's reference to Lakatosian reasoning shapes a discrete image of architecture, whose type and degree of openness are framed by method.

Anderson claims that 'the architect's problem is not how to find his knowledge positively but how to make his knowledge grow'.[34] To that effect he looks into the philosophy of science and applies

Lakatos's theory of knowledge to architecture. Lakatos proposed a methodology to explain the growth of scientific knowledge as a refutation of Thomas Kuhn's theses, according to which knowledge changes by irrational 'conversions' from one paradigm to another.[35] Although Lakatos seemed to worry about rationalism in science, his ultimate concern was truth itself: 'one cannot simply water down the ideal of proven truth.'[36] Aiming to develop scientific truth and to appraise the growth of knowledge, his method is no different from historiography. Lakatos's methodology for the philosophy of science certainly can't be exhausted and properly presented within the limits of this article, so let us focus on two aspects of his style of reasoning, which appear to be instrumental to our argument.

First, Lakatos replaced the single scientific theory or hypothesis as 'the typical descriptive unit of great achievements' with the 'research programme' – a historical notion that encompasses a continuum of theories which might last for centuries.[37] Theories last as long as they can continue making novel predictions compared to their rivals; a theory is 'falsified when it is superseded by a theory with higher corroborated content'.[38] This is how research programmes evolve. As long as new theories can predict new facts, the research programme they are part of generates progressive 'problem shifts'. Otherwise, that theory degenerates. Lakatos does not demarcate between scientific and non-scientific theories. Instead he makes a distinction between progressive and degenerating research programmes, with particular stress on the important relationship that exists between theories in the quest for knowledge:

> If falsification depends on the emergence of better theories, on the invention of theories which anticipate new facts, then falsification is not simply a relation between a theory and the empirical basis, but a multiple relation between competing theories, the original "empirical basis", and the empirical growth resulting from the competition. Falsification can thus be said to have a "historical character".[39]

Lakatos further describes a complex correlation between competing theories during the development of research programmes. Specifically, he writes that the 'proliferation of theories' drive the program forward and not the empirical anomalies which trigger counterexamples.[40] In this he agrees with Feyerabend, who has argued that

> proliferation is required both in order to strengthen our tests and in order to bring to light refuting facts that would otherwise remain inaccessible. The progress of science is unthinkable without it.[41]

The previous demarcations clearly shape an unrestrained form of scientific growth that is grounded on the complementary relationships that different theories establish with each other. The typical unit of scientific achievement is no longer a singular, undivided entity, but an assemblage of theories that is intrinsically open to constant challenge via its immanent components – the different theories within the programme. It becomes clear that the social nature of science is essential for the growth of knowledge. The parallel work of different scientists and institutions who produce series of theories is pivotal to the process that drives knowledge forward.

Anderson assumed that the work of an architect can also be understood as a research programme, within which works of architecture are not isolated, but rather parts of a continuum or series. From this perspective, part of Le Corbusier's work grew as a series of fragmentary conceptual architectural research programmes, such as the *promenade architecturale* (apparent in Le Corbusier's drawings of the Acropolis) and his Maison Dom-Ino.[42] Anderson also proposed a distinction between conceptual programmes (abstract architectural concepts) and artefactual programmes (physical built architecture – such as the Maison La Roche), which supposedly operated in parallel as the work of the architect evolved.[43]

Although the typical division between theory and practice is possibly misleading, this

methodological decision allowed Anderson to illuminate the reciprocal dynamics that underlie architectural form and transform the work of the architect from within. Maison Dom-Ino is not seen as a still image, but rather as perpetually incomplete and open to continuous change:

> The Maison Dom-Ino bore meanings in the mid-1920s which it could not have possessed before. In a full exposition I would like to continue this story down to the Carpenter Center for the Visual Arts at Harvard. By that time Le Corbusier's understanding of architecture and cognition was sufficiently different that a much fuller exploitation of the freedoms of the Five Points was necessary and, with that, the acceptance of another reading of the Maison Dom-Ino.[44]

The possibility of an open architecture emerges when works of architecture have been put in a historical sequence and have been examined in terms of their reciprocal relations. It is telling that Anderson remains focused on the work of a single architect, even after new hypotheses have emerged within the research programme it is part of. Architectural form becomes a form of research in its own right, which is open to new questions and modifications by the architect who experiments with and develops the work.

In other words, Anderson believed that this kind of open architecture could be observed in a limited number of works within the research programme carried out by a single architect. Although Lakatos's style of reasoning presumed that it is the proliferation of rival theories that drives science forward, Anderson studied and presented Le Corbusier's work as isolated from other architectures. Years later, Anderson seems to have become aware that his interpretation is actually incompatible with Feyerabend's 'proliferation principle'.[45] Thus he notes that

> Lakatos, concerned with science, speaks of rival research programs, and looks to those occasions where one program defeats another. Looking to architecture, for the word "rival" I would substitute "competing," as it would be more common that multiple programs can thrive.[46]

In that respect, Jorge Mejía Hernández has studied Anderson's shortcomings regarding broader architecture research programmes.[47] Rather than different fragmented research programmes within the work of a single architect, different hypotheses can be identified within the work of Le Corbusier, while still recognising that 'knowledge is the result of the interrelations or transactions that are established between several architectures that compete and collaborate with each other for it, as Lakatos noted regarding the growth of knowledge in science.'[48] This recent interpretation describes a free-for-all development of the architectural discipline, which is still derived from Lakatos and Feyerabend, but which Anderson does not fully follow.

Historiographical style

The second aspect of Lakatos's methodology that I want to address marks a different understanding of openness. It is truth itself that is open. This is why history can be reconstructed, and why the growth of knowledge can be made visible if one looks back through the lens of the history of science. But Lakatos's methodology is retrospective, and therefore cannot help us foresee the future. It is only possible to tell whether a research programme is progressive or not after the fact.[49]

> The methodology of scientific research programmes constitutes, like any other methodology, a historiographical research programme. The historian who accepts this methodology as a guide will look in history for rival research programmes, for progressive and degenerating problemshifts.[50]

Rather than qualifying the style of his historiography, it is crucial to assert that Lakatos's style of reasoning is historiographical. Like Thucydides, Lakatos introduced criteria for telling the truth about the past of science and named that process a 'rational reconstruction of history'.[51] The history of science is constantly enriched via perpetual reconstructions.

> Progress in the theory of scientific rationality is marked by discoveries of novel historical facts, by the reconstruction of a growing bulk of value impregnated history as rational. In other words, the theory of scientific rationality progresses if it constitutes a "progressive" historiographical research programme.[52]

Stanford Anderson invokes these rational reconstructions of history by presenting Le Corbusier's research programme as one of them.[53] His argument even reproduces Lakatos's confusing distinction between the 'internal' (scientific) and 'external' (cultural) histories of a research programme; where the 'internal history provides the rational explanation of the growth of objective knowledge'.[54] As Lakatos notes earlier, 'in constructing internal history the historian will be highly selective: he will omit everything that is irrational in the light of his rationality theory'.[55] It is not entirely clear what relevance external history can have in Anderson's interpretation – probably owing to Lakatos's vague assertion that 'historians and philosophers of science must make the best of the critical interplay between internal and external factors.'[56]

For Lakatos, negotiations between internal and external factors play their part in the development of science. Following this logic, the internal history offers the basis for the construction of a rational history, and therefore endorses the supposedly rational practices that belong exclusively to the field of science. Similarly, in architecture Anderson understands the interplay between rational decisions and irrational environments as part of professional practice: 'Especially in a field like architecture, it is precisely because some material matters must be assigned to the program and its internal history that I prefer to speak of the *quasi-autonomy* rather than the autonomy of architecture.'[57]

Anderson invokes Lakatos to reflect on the autonomy of the architectural discipline, but also acknowledges the different ways in which architecture remains open to its environment.[58] This allows him to ensure that history can be reconstructed rationally while architectural historiography can remain open, in the sense that truth claims regarding the growth of architectural knowledge can change according to the historian's methods.

Rather than using the idea of a rational reconstruction of history to tell a transformed truth about the past of architecture, Anderson presumes that Le Corbusier was fully aware of the internal history of his work, and was therefore able to reconstruct it rationally.[59] While architecture is seen here as a discipline with its own rationales and methods of growth, it is the historian who must bring before us the rational architectural choices of the architect and thus reveal to us progress within a research programme. It becomes evident that Anderson mobilised Lakatos' methodology as a war machine, in order to make truth claims about architecture.

So far we have considered two distinct statements about openness in architecture derived from Lakatos's methodology of scientific research programmes. The first is that knowledge results from the proliferation of architectures within one or more research programmes. The second is that architectural history remains open to new problem shifts and must therefore be constantly and perpetually reconstructed. These statements emerge from (and make sense within) the system of concepts that shaped Lakatos's reasoning. The idea of an open architecture has remained within a Lakatosian universe, which still implies a definite understandings of openness, such as the two

noted above. A truly open style of reasoning, on the other hand, would require that we fit together concepts that address openness in diverse studies on architecture.

Lakatos attempted to rewrite history based on a series of progressive incidents in the history of science. Concretely, he was determined to refute Kuhn's proposition that knowledge changes by irrational reconstructions, shifting from one paradigm to another.[60] According to Hacking, Lakatos's distinction between what is proper for the historian to choose as rational, and what is not proper, is only grounded on his style of reasoning, which is itself historically framed. Given this understanding, we are left with a pressing question: can we make statements about architecture without committing to prearranged axioms in our examinations of architecture?

Michael Hays's critical architecture

As we have seen, open architecture is a matter of representation, determined by theoretical mechanisms of appraisal. Anderson's implementation of Lakatos's historiographical style within the field of architecture cultivated two distinct conceptions of open architecture. Nonetheless, Hacking's comments on Lakatos quoted above hint at a different approach towards openness in architecture.

In his essay 'Critical Architecture: Between Culture and Form' Michael Hays understands open architecture as the capacity of the architectural object to be free from any external cultural and formal order – that is, to be intrinsically open.[61] To elaborate on this claim let us draw again on Hacking's philosophy of science:

> Maybe there are two quite distinct mythical origins of the idea of "reality". One is the reality of representation, the other, the idea of what affects us and what we can affect … We shall count as real what we can use to intervene in the world to affect something else, or what the world can use to affect us.[62]

Hacking reflected on Francis Bacon, who 'taught that not only must we observe nature in the raw, but that we must also "twist the lion's tail", that is, manipulate our world in order to learn its secrets.'[63] According to this interpretation, the evaluation of science does not need external methods of appraisal. Instead, the experimental method has a life of its own and it is what drives knowledge forward.

Michael Hays made a similar claim about architecture using a series of works by Mies van der Rohe as 'examples of a critical architecture that claims for itself a place between the efficient representation of preexisting cultural values and the wholly detached autonomy of an abstract formal system.'[64] Hays's plea for a critical architecture can be comprehended as the possibility of an architecture that remains open to both external cultural authority and internal logic; adopting an in-between position vis-à-vis well-known architectural discussions. On the one hand there are those who declare that architecture and its development are to be understood solely as cultural epiphenomena, or products. On the other are those who proclaim the autonomy of architectural form. Hays situates Mies van der Rohe's work in between, and is therefore able to discuss the development of architecture in relation to its environment without imposing on it any fixed methodological rule or predetermined interpretation. For Hays architecture is not a built representation of reality. Architecture does not manipulate reality, and cannot be said to be alienated from it either.

Hays places the early work of Mies van der Rohe against the metropolitan dilemmas faced by many intellectuals at the dawn of the twentieth century. His early skyscraper projects stand between individuals' despair within the setting of the new metropolitan life, as expressed by Munch and Kafka, and the 'unreasoned order' of the metropolis, acknowledged by Dadaism.[65] Departing from the 1919–1922 skyscraper studies, Hays argues that these projects cannot be reduced to some compositional formal logic. Such an order would be exhausted by their distorted glass surfaces, which

at the same time produce various refractions and reflections of the world, and therefore construct different and distorted images of metropolitan life. In Hays's view, Mies's skyscrapers deliver a critical interplay between architectural form and its cultural environment. Although they appear as distinct objects within their built environment, they are dependent upon their context and are 'open to the chance and uncertainty of life in the metropolis'.[66]

Hays describes Mies's 1929 German Pavilion in Barcelona as an assemblage without compositional order, and therefore free from any transcendental form of authority. 'There is no prescribed logic of passage; the composition is neither a relational hierarchy of component parts nor a series of identical units repeated in a potentially endless chain.'[67] Instead, the pavilion is presented as the temporal experience of its material components:

> Mies has constructed a labyrinth that denies us access to the ideal moment of organization lying beyond the actual experience of this montage of contradictory, perceptual facts. The work itself is an event with temporal duration, whose actual existence is continually being produced.[68]

This moving image of the pavilion is not to be reduced to single rule, but rather presents us with a collage of different fragments of experience. Hays does not try to identify a formal order to describe this architecture, but rather presents Mies as a sort of film editor, in charge of the montage of the different parts and materials that make up the building. 'Architectural reality takes its place alongside the real world, explicitly sharing temporal and spatial conditions of that world, but obstructing their absolute authority with an alternative of material, technical, and theoretical precision.'[69] The pavilion adopts the qualities of a film that is projected in a three-dimensional reality.

We can see how Mies van der Rohe adopts the role of Hacking's experimenter. He does not manipulate reality in the laboratory, though. As a filmmaker, he offers us different, manipulated realities, parallel to those that already exist. Scientific experimentation does not merely explain phenomena. It intervenes in reality and creates new regularities. Architecture operates at the level of cultural reality. According to Hays, Mies's architecture must be understood as part of that reality as much as it can also generate alternative worlds, like a glitch in the matrix.

Common grounds

By analysing several projects Hays sees how 'Mies's architectural program was a persistent rewriting of a few themes. Mies rationalised his initial choice of themes by demonstrating the range of their applicability. He reused them in changing circumstances; he modified and refined them over time.'[70] Notably, a set of architectural propositions appeared and evolved many times in his work, suggesting that openness operates at the epistemological level of architecture, where it explains the growth of knowledge within the programme. On these grounds we can acknowledge a first feature of open architecture that is common to both Anderson's and Hays's reasoning: internal proliferation is crucial for an architecture programme.

Besides proliferation, repetition also reveals a way of accumulating knowledge based on a programme's own authority.[71] In Mies's work Hays recognises 'an ability to initiate or develop cultural knowledge… alternative to the dominant culture.'[72] In other words, Hays sees Mies's architecture as alienated and still working as a mechanism of culture. While Anderson thought that the external history of a programme is only complementary to its internal (that is, purely architectural) history, Hays argues that rather than merely being affected by it, architecture's interaction with culture is meant to distort it. But how can this distortion of culture become part of architectural knowledge?

The answer is not obvious. Perhaps we could find it in Lakatos's rational reconstructions of history? As we've seen, Hays's reasoning is

grounded on the view that architecture can shape the conditions of its own appraisal. 'Each architectural object places restraints upon interpretation … because contingent and worldly circumstances exist at the same level of surface particularity as the object itself.'[73] Accordingly, one would need to come up with a critical historiography focused on these 'intrinsic conditions through which architecture is made possible.'[74] That is exactly what Hays does when he reconstructs Mies's work as an alternative truth, leading us to a second shared statement by both Anderson and Hays: historiography is fundamental to an open style of architectural reasoning. Setting aside individual methodological differences, both authors acknowledge (to different degrees) that history is not a given. For architectural knowledge to grow, history must be reconstructed.

Finally, Hays insists on the absence of a compositional authority in the projects he analyses. For him architecture operates free from any predetermined formal order; it is open only to its own immanent properties. Consequently he does not speak of proliferation between different architectures, like Anderson, but presumes instead that Mies's programme was independent from any formal frame of reference. He rejects, for instance, the suggestion that the Barcelona Pavilion is 'the most immaculate transcription of the modern spatial conception' – in the sense that it drew on ideas from Wright, Suprematism, Loos, Berlage, Schinkel and De Stijl.[75] Such a statement would depict the pavilion as a mere conceptual construct rather than a concrete material object.

Beyond these external influences, for Hays the development of Mies's programme can be traced back to a repetitive reconstruction of particular themes and concepts. Actually, he is not too concerned with descriptions that portray the pavilion as a mere conceptual scheme, but rather with the external origins and the authoritative nature of such a scheme. While both Hays and Anderson presuppose that there is indeed a relationship between architecture and culture underlying the growth of architecture knowledge, their understanding of that relation differs. At the formal level of architecture, for example, each offers a different explanation of the relationships that exist between a particular architecture and a population of different architectures. As we have seen, Hays considers Mies's work in isolation from that of other architects.

This notable discrepancy between the two authors does not affect our attempt to approach an open style of architectural reasoning. As defined above, styles of reasoning do not answer to any authority and therefore do not presuppose uniformity of criteria. Open architecture is not to be understood as opposed to closed architecture, but rather as a spectrum of possibilities, or different degrees of openness. Of course, an open style of architectural reasoning cannot be exhausted by studying two speculations on architecture. On the contrary, it must perform as a lasting research programme in its own right, perpetually juxtaposing and embodying shared statements from different individual understandings of architecture with their own forms and degrees of openness.

Unstable modernisms

Based on a brief examination of modernist architecture's open nature, Stanford Anderson and Michael Hays articulated their approaches to the work of two of modernism's central figures. Like them, Kenneth Frampton also acknowledged associations between different modernist architectures and discourses. For him, the *promenade architecturale* can be seen as a shared and evolving investigation that links the Athenian Acropolis with the work of Le Corbusier and Oscar Niemeyer, among others. Would this mean that an open style of architectural reasoning automatically implies modernist architecture is also open? We could conclude in the affirmative, especially if we consider that Anderson and Hays did not just narrate the great achievements of their heroes in Homer's terms, but instead constructed new images and thoughts and eventually came up with a Thucydidean reconstruction of the past.[76]

The creative force of such an open style of architectural reasoning resulted in the demarcation that includes well-known modernist architectures (that have actually been built), as well as potential, theoretical modernisms that remain latent. The latter only anticipate the emergence, via different understandings, of the former. We are thus faced with a fundamentally unstable, yet productive image of many juxtaposed modernisms which together form an open body of knowledge.

Notes

1. Richard Sonntag, Claus Borgnakke and Gordon J. Van Wylen, *Fundamentals of Thermodynamics* (New York: Wiley, 2003), 14.
2. Ibid.
3. Ibid., 15.
4. Karl Popper, 'Epistemology without a knowing subject', *Studies in Logic and the Foundations of Mathematics* 52 (1968): 333–73. In Popper's view, 'there is a physical world and a world of states of consciousness, and that these two interact.' Ibid., 334. He argues that 'traditional epistemology with its concentration on the second world, or on knowledge in the subjective sense, is irrelevant to the study of scientific knowledge…what is relevant for epistemology is the study of scientific problems and problem situations, of scientific conjectures (which I take as merely another word for scientific hypotheses or theories), of scientific discussions, of critical arguments, and of the role played by evidence in arguments ; and therefore of scientific journals and books, and of experiments and their evaluation in scientific arguments; or, in brief: that the study of a largely autonomous third world of objective knowledge is of decisive importance for epistemology.' Ibid., 337.
5. Michel Foucault, *The Order of Things*, trans. Alan Sheridan (London and New York: Routledge, 2005), xxiii.
6. Ibid, xxiv.
7. Michel Foucault, 'Truth and Power', in *Power/ Knowledge*, ed. and trans. Colin Gordon (New York: Pantheon Books, 1980), 133.
8. Ian Hacking, '"Language, Truth and Reason" 30 Years Later', *Studies in History and Philosophy of Science* 43 (2012): 599–609, 599; Ian Hacking, 'Foucault's Immature Science', *Nous* 13, no. 1 (1979): 39–51; A.C. Crombie, *Styles of Scientific Thinking in the European Tradition: The History of Argument and Explanation Especially in the Mathematical and Biomedical Sciences and Arts, vol. 3* (London: Duckworth, 1994).
9. Hacking, '"Language, Truth and Reason" 30 Years Later', 600.

10. Ian Hacking, '"Style" for Historians and Philosophers', *Studies in History and Philosophy of Science* 23 (1992): 4.
11. Ian Hacking, *Language, Truth and Reason* (Place: Publisher, 1982).
12. Hacking, '"Language, Truth and Reason" 30 Years Later', 601.
13. Hacking, '"Style" for Historians and Philosophers', 3.
14. Hacking, '"Language, Truth and Reason" 30 Years Later', 600–1.
15. Kenneth Frampton, *Modern Architecture* (London: Thames & Hudson, 1996), 248.
16. Ibid., 255.
17. Heinrich Wölfflin, *Principles of Art History: The Problem of the Development of Style in Later Art,* trans. M. D. Hottinger (New York: Dover Publications, 1950), 6.
18. Ibid., 13.
19. Willibald Sauerländer, 'From Stilus to Style: Reflections on the Fate of a Notion', *Art History* 6, no. 3 (September 1983): 253–70.
20. Ibid., 265.
21. Arnold Davidson, *The Emergence of Sexuality: Historical Epistemology and the Formation of Concepts* (Cambridge, MA: Harvard University Press, 2001), 127.
22. Ibid., 136.
23. Hacking, '"Language, Truth and Reason" 30 Years Later', 605.
24. Bernard Williams, *Truth and Truthfulness: An Essay in Genealogy* (Princeton: Princeton University Press, 2002), 152.
25. Ibid, 161.
26. Ibid, 161–64.
27. Hacking, '"Language, Truth and Reason" 30 Years Later', 606.
28. Ibid., 605.
29. Ibid., 602–3.
30. Ian Hacking, *Representing and Intervening* (Cambridge: Cambridge University Press, 1983), 226.
31. Ibid., 210–19.
32. Nelson Goodman, 'The Status of Style', *Critical Inquiry* 1, no. 4 (June 1975): 799–811, 810.
33. Imre Lakatos, *The Methodology of Scientific Research Programmes, Philosophical Papers I* (Cambridge: Cambridge University Press, 2001); Jorge Mejia Hernandez, 'Transactions; or Architecture as a System of Research Programs' (PhD thesis, TU Delft, 2018), https://doi.org/10.4233/uuid:8e4e1df7-716b-40d8-bb38-3fd9f03bdda4.
34. Stanford Anderson, 'Introduction', in *Planning for Diversity and Choice*, ed. Stanford Anderson (Cambridge, MA: The MIT Press, 1968), 6.
35. Ian Hacking, 'Imre Lakatos's Philosophy of Science', *The British Journal of Philosophy of Science* 30, (1979): 401; Lakatos, *The Methodology of Scientific Research Programmes*, 9.
36. Ibid., 8; Hacking points out that '[Lakatos] is important precisely because he is addressing, not an epistemological issue, but a metaphysical one. He is concerned with truth or its absence. He thought science is our model of objectivity. We might try to explain that, by holding that a scientific proposition must say how things are. It must correspond to the truth. That is what makes science objective.' Hacking, *Representing and Intervening*, 112.
37. Ibid., 4.
38. Ibid., 34.
39. Ibid., 35.
40. Ibid., 37.
41. Paul Feyerabend, 'Outline of a Pluralistic Theory of Knowledge and Action', in *Planning for Diversity and Choice*, ed. Stanford Anderson (Cambridge, MA: The MIT Press, 1968), 283.
42. Stanford Anderson, 'Architectural Design as a System of Research Programmes', *Design Studies* (1984): 146–50; Stanford Anderson, 'Architectural Research Programmes in the Work of Le Corbusier', *Design Studies* (1984): 151–58.
43. Ibid., 151.
44. Ibid., 158.
45. Feyerabend, 'Outline of a Pluralistic Theory of

Knowledge and Action', 280.
46. Stanford Anderson, 'Rational Reconstructions and Architectural Knowledge', in *Architecture in the Age of Empire / Die Architektur der Neuen Weltordnung. 11th Internationales Bauhaus-Kolloquium*, ed. Kristian Faschingeder, Kari Jormakka, Norbert Korrek, Olaf Pfeifer and Gerd Zimmermann (Weimar: Universitätsverlag, 2011), 163–75, 165.
47. Mejia Hernandez, *Transactions; or Architecture as a System of Research Programs*, 86.
48. Ibid., 91.
49. Hacking, *Representing & Intervening*, 118.
50. Lakatos, *The Methodology of Scientific Research Programmes*, 114.
51. Ibid., 102.
52. Ibid., 133-34.
53. Anderson, 'Rational Reconstructions', 163–75.
54. Lakatos, *The Methodology of Scientific Research Programmes*, 102.
55. Ibid., 119.
56. Ibid., 138.
57. Anderson, *Architecture in the Age of Empire*, 166.
58. Ibid., 173.
59. Ibid., 169.
60. Hacking, *Representing and Intervening*, 126.
61. K. Michael Hays, 'Critical Architecture: Between Culture and Form', *Perspecta* 21 (1984): 14–29.
62. Hacking, *Representing and Intervening*, 146.
63. Ibid., 149.
64. Hays, 'Critical Architecture: Between Culture and Form', 15.
65. Ibid., 18.
66. Ibid., 20.
67. Ibid., 24.
68. Ibid.
69. Ibid., 25.
70. Ibid., 27.
71. Ibid.
72. Ibid.
73. Ibid.
74. Ibid.
75. Ibid., 22.
76. Royston Landau, 'The History of Modern Architecture that Still Needs to be Written', *AA Files* 21 (1991): 49–54.

Biography

Konstantinos Apostolidis obtained his diploma as an architect from Democritus University of Thrace in 2013, and the degree of Master of Science in Architecture and the Building Sciences (cum laude), from TU Delft in 2016. Since 2018 he is a PhD candidate at the National Technical University of Athens. He works as an architect and has won several prizes in architectural competitions.

Review Article

Closing the Open System: Review of Nicolas Schöffer's La Tour Lumière Cybernétique (1973)

Nina Stener Jørgensen and Guillaume Laplante-Anfossi

Although never built, La Tour Lumière Cybernétique, the cybernetic light tower planned by Franco-Hungarian spatial artist Nicolas Schöffer (1912–1992) for Paris's La Défense business district in the 1960s and '70s, remains a compelling precedent of how a computational programme was thought to support a continuous and indeterminate design.

As tall as the Eiffel tower and illuminating the city with four thousand different light combinations calculated by its own computer, Schöffer imagined creating a spectacle on the Parisian horizon. [Fig. 1] By fixing blue, red, yellow, orange, violet and white light projectors and two thousand electronic flashes on a steel frame, together with 330 rotating mirrors and thirty-two propellers, the TLC tower was intended to simultaneously function as a work of art, a medium of communication and a cybernetic governmental tool.[1]

With no physical boundaries, as seen in the section, Schöffer reflected the tower's programmatic openness in the structure. [Fig. 2] The steel structure was intended to accommodate seven platforms reachable by elevators. The platforms would provide different typical 1960s leisure activities for visitors, among them a museum and a restaurant. However, the tower's main role would be to function as a cybernetic work of art, casting light and shadow over the city by extracting its data.

Although Nicolas Schöffer saw himself as a programmer, a role he deemed necessary for the artist to operate in a technologically advanced society, little attention has been paid to the algorithm he wrote for the TLC tower. In order to understand how Schöffer effectively imagined the tower to function, we turn towards the mathematical description of the programme that can be found in the appendices of *La Ville Cybernétique* (1969) and *La Tour Lumière Cybernétique* (1973).

In the text that accompanies the programme, Schöffer shows how the open-ended nature of the tower runs through the project on both a programmatic and conceptual level. Schöffer writes in 'La Tour Lumière Cybernétique' with regard to the aim of the project:

> The tower will certainly not be an end, but an example and a beginning. It will be a detonator opening the way to other achievements on other scales, which will be able to weave ever closer links between people and life with a view to their greatest success, that is to say their greatest happiness.[2]

However, in the mathematical description, the limits to the tower's openness and indeterminacy, bordering on programmatic abstraction, begin to reveal themselves. By definition, an open system is a system that has external interactions and is kept open through perturbations received from its surrounding environment. A perturbation is a disturbance that alters the behaviour of the system, and these are necessary in order to sustain the evolution of the system. Schöffer writes how the 'random coefficients', the perturbations, can be compared to the 'fantasy' or 'mood' of the tower, which he sees as necessary to ensuring that the tower's 'behaviour will

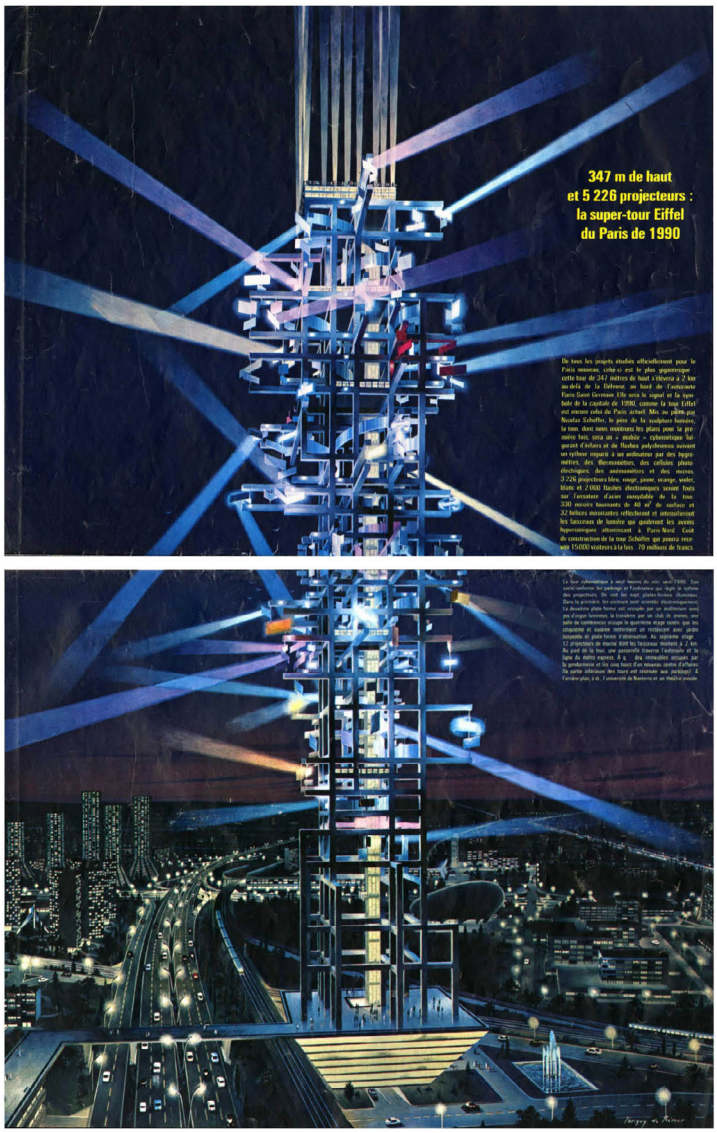


Fig. 1: La Tour Lumière Cybernétique in *Paris Match*, July 1967. Source: Paris-Match/Scoop.

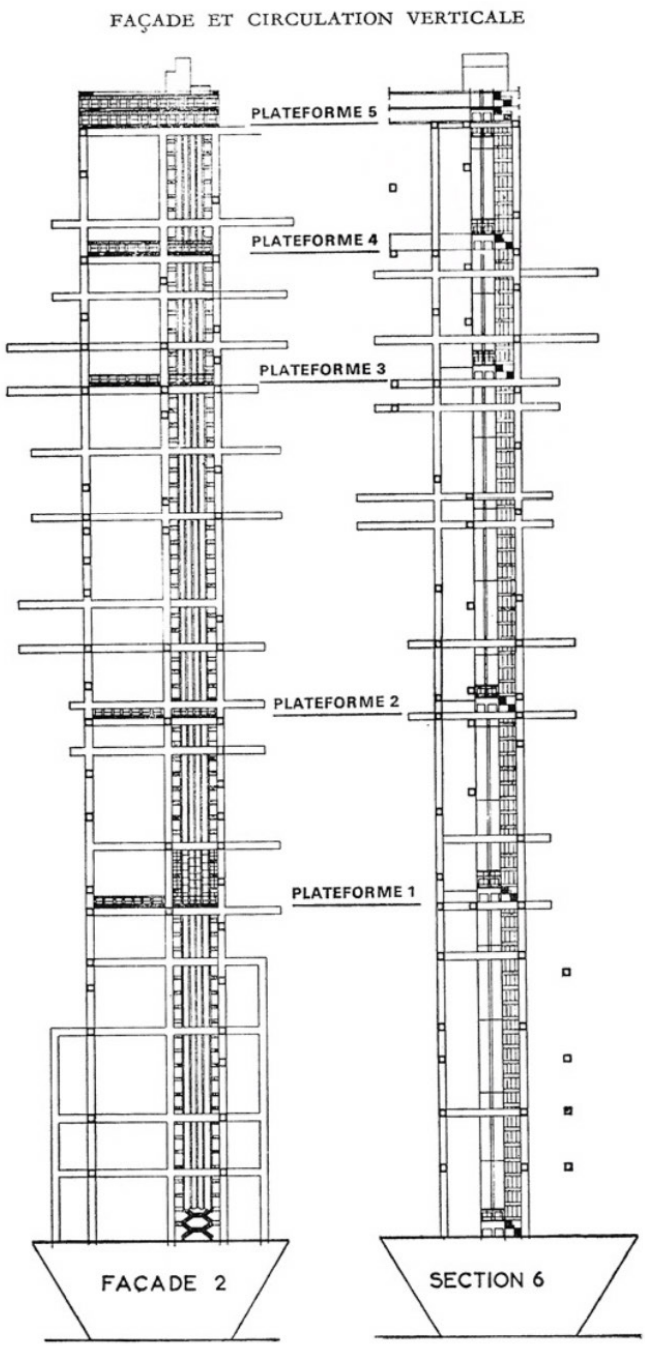


Fig. 2: A facade and a section of the tower of the tower as seen in Schöffer's *La Tour Lumière Cybernétique*, 1973. Source: ADAGP, Paris, 2022.

be unpredictable and non-repetitive'.[3] Yet, the way Schöffer deals with the system's need for disruption by treating all the incoming predictable data randomly suggests a potential for gradual monotony and saturation of the programme, precisely the effects which he sought to avoid.[4] In the simulation of the programme, Schöffer shows how the treatment of data is likely to create a monotonous blend of colours, light and sounds, an artistic choice, that we do not aim to criticise. Instead, we want to direct attention toward the choices Schöffer decided *not* to make, and to put forward the idea that in order to sustain an open system on both a conceptual and programmatic level, choices in the programme had to be made.

Between input and output

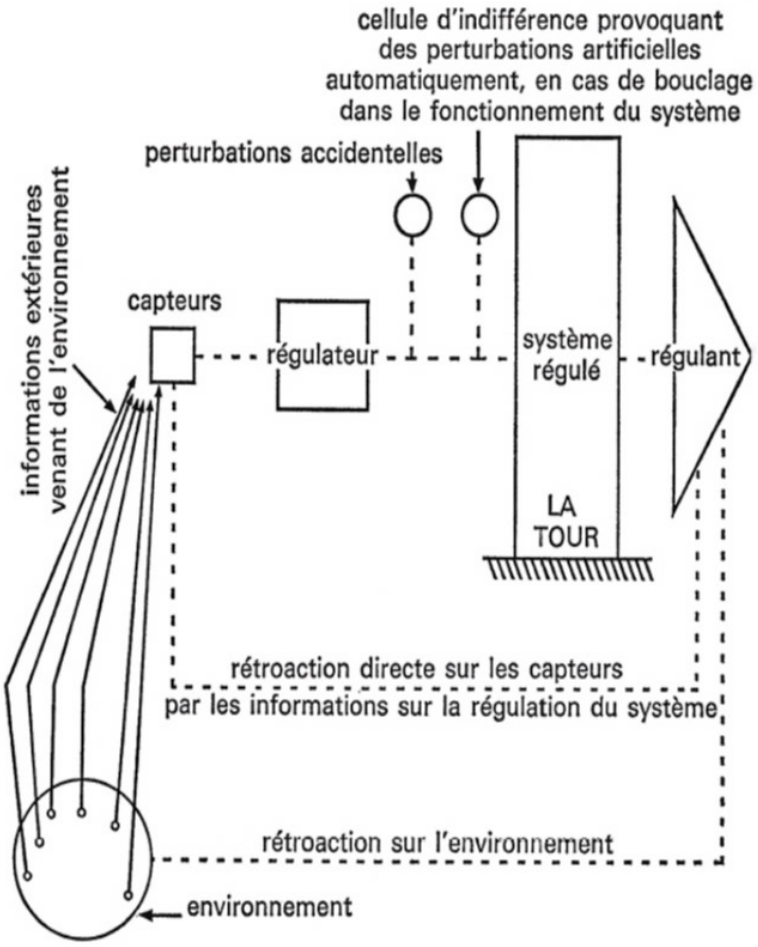
The arrival of cybernetics in 1948 with Norbert Wiener's *Cybernetics: Or Control and Communication in the Animal and the Machine* was especially important for the development of Schöffer's aesthetic theory.[5] When he presented the TLC tower as a 'cybernetic tower' he also presented it as a 'system' due to its reliance on the data it would retrieve from its surroundings.[6] To Schöffer the real gain of cybernetics was how it explained the relationship between information and feedback. He regarded it as 'the organised control of all information' and wrote about how cybernetics is the 'awareness of the vital process that keeps all phenomena in balance'.[7] Ideally, The TLC tower would keep Paris in check through an optimised feedback loop. In addition to the mathematical description and the written simulation he provided of the programme, Schöffer described the tower's interaction with the city through a feedback loop. [Fig. 3] In a diagrammatic way the loop described how the city's data was intended to interact with the tower, effectively illustrating what he saw as happening between input and output.

The input the tower would receive can be divided into two categories: immediate and remote. Input from its immediate environment would be grasped with the help of photocells, microphones, colour-sensitive cells, a thermometer, an anemometer (to measure wind speed), a hygrometer as well as an apparatus for the auscultation of the stresses in the tower's structure, that all would be attached to its steel frame. From the remote environment the tower would receive second-hand data such as the average of prices on the stock exchange, weather forecasts, information from the metro, the French press, traffic information from the police, information from hospital services, the post office, telegraphs and telephones, as well as the sound intensity from the back of the Chamber of Deputies.[8] Air navigation and information from the national radio and television would also be communicated to the tower via teletype and comprise all the input controlling and programming blue, red, yellow, orange, violet and white light projectors, electronic flashes, rotating mirrors and propellers that were imagined to be distributed all over the structure of the tower.

In the diagram, the tower is described as the loop's main system and its environment as its source of input. [Fig. 3] We see the sensors used to collect the data as well as the two controlling elements on either side of the tower, these refer to the orders of Schöffer's computer programme. In addition to the probability elements mentioned earlier, which are incorporated in the programme and do not appear in the diagram, we find two other small components that rely on probability and are meant as perturbations. Their job is to prevent repetition or stagnation in the output, and to go against too much excitation or relaxation by introducing a change to the received input. They are unfortunately not explained in full detail, and remain a conceptual element in the diagram.

In the following, we provide a description of what happens to the input when it enters the loop. It can be seen as a written translation of Schöffer's theoretical description achieved by a close reading of the written visualisation of the tower. It is worth mentioning that the written simulation does not incorporate all the elements of the theoretical description, and even

2. Schéma théorique du fonctionnement de la T.L.C. [1]



1. T.L.C. = Tour Lumière Cybernétique. Dans la suite nous emploierons toujours cette abréviation.

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Fig. 3: Nicolas Schöffer described the TLC tower as a feedback loop in *La Tour Lumière Cybernétique*, 1973. Source: ADAGP, Paris, 2022.

some of the elements that are incorporated are modified. In a sense, it seems to be Schöffer's intention to keep the rules rather simple and the method flexible in order to adapt the programme to any situation. However, reading the programme provides its own set of challenges: many details are missing and mathematical notations are used ad hoc, resulting in apparent contradictions and ambiguities. We have tried to adhere to Schöffer's choice of using mathematical language to express his idea, but we attempt to make it accessible by relating it to the imagined functioning of tower. We retain the formulas and formal language, should anyone wish to programme it further.

The computer's programme

In the programme, the tower's inputs at any given time are denoted x_1, x_2, x_3 and so on, up to x_n, the letter n signifying the number of inputs. The input x_1 could represent the number of trains in Gare du Nord, while the input x_2 could represent the number of visitors at the Louvre and x_3 the intensity of sound recorded around the tower. Each of these inputs is represented by a number between 0 and 1, mirroring the degree of activity of the associated data. To compute x_1 in the programme, the computer divides the number of trains at Gare du Nord at a given time by the maximum number of trains. This number will be used to activate output. In order for the computer to figure out how to activate the large amount of output available (the rotating mirrors, the coloured lights, the tower's propellers), Schöffer divided them into groups; in the programme, the letter q stands for the number of groups. At a given time, the programme receives the inputs x_1, x_2, x_3, …, x_n and according to these numbers, some groups of outputs are activated while others are not. For the purpose of determining which groups are activated, Schöffer designed a set of functions X_1, X_2, X_3, …, X_q; each of which is assigned to a group of outputs (not to be confused with the lowercase x_i that denotes input).

The functions X_1, X_2, X_3, …, X_q, which can be seen as the disposition of the outputs, do not change, but are assigned to different groups of output over time. The functions are computed according to the inputs and return either the number 1 or the number 0, indicating whether the corresponding group of outputs should be activated or not. Returning either 1 or 0 is determined by the function's sensitivity to the inputs. For example, the function X_1 could be very sensitive to the trains at Gare du Nord, moderately sensitive to the number of visitors at the Louvre, while not taking into account the decibel level around the tower. However, the design of the function X_i (the letter i stands for any number between 1 and q), also involves a range of sensitivity, meaning that the output controlled by this function can be either easy or difficult to activate, depending on parameters that are set a priori by a programmer.[9] Mathematically, the programme computes the value of a function X_i according to the following formula:

$$(*)\sum_{j=1}^{n} A_{ij}x_j - B_i = A_{i1}x_1 + A_{i2}x_2 + \cdots + A_{in}x_n - B_i$$

If this sum is positive, meaning greater than zero, then X_i is set to 1 and the group of output is activated. If it is below 0, meaning negative, X_i is set to 0 and the group remains disabled. In the formula, the x_j are the input at the time of computation, the coefficients A_{ij} are numbers between 0 and 1, and the coefficient B_i is a positive number (it can be greater than 1). The coefficient A_{ij} can be interpreted as 'the sensitivity of the function X_i to the input x_j'.[10] For instance, if $A_{ij} = 0$, the input x_j does not contribute to the sum (*) since it is multiplied by $A_{ij} = 0$, and thus it is not taken into account for the sake of activating the outputs (associated with X_i). In a similar way, if $A_{ij} = ½$, the input x_j is partially (one could say 'half') taken into account, and if $A_{ij} = 1$, it is completely taken into account. The result of the sum (*) is the cumulative contribution of the different inputs, weighted by the different 'sensitivities' A_{ij}.

The coefficient B_i represents 'the global sensitivity of the function X_i to the input'.[11] This means that if the coefficient B_i is large, then the function X_i needs the inputs x_j to be large in order for the sum (*) to be bigger than B_i, so the function X_i is in this case not very sensitive to the activity in the city. On the contrary, if B_i is small, only a few of the inputs x_j needs to increase in order for the sum (*) to be bigger than B_i, so the function X_i is in this case very sensitive to the activity in the city.

Schöffer writes that the coefficients A_{ij} and B_i should be chosen either randomly or according to an 'artistic criterion', which unfortunately he does not specify.[12] Here, 'choosing randomly' means 'choosing according to a probability distribution', which is a simple task for the computer, but Schöffer does not say which probability distribution to choose, and instead uses in the simulation a uniform distribution, one where all numbers between 0 and 1 are equally likely to be chosen.

As we explained before, the coefficients A_{ij} and B_i defining the function X_i are chosen only once. Periodically (though no precise time scale is provided here), the functions X_1, ..., X_q are reassigned to different groups of outputs. This reassignment is done randomly, through a process where essentially all groups of outputs are equally likely to be chosen. As Schöffer is vague about this part of the computation, it is difficult to describe it any further, and unfortunately, the simulation does not integrate this periodic change of assignment of the X_i functions. We can deduct from Schöffer's description that it might be a matter of minutes between the groups' re-assignments, but it is important to stress that we cannot be sure. However, one could imagine the following situation: for five minutes a group of mirrors is sensitive to the number of trains in Gare du Nord, and then for the next five minutes it is moderately sensitive to the visitors at the Louvre, while the red lights are then very sensitive to the number of trains in Gare du Nord, and so on.

It seems noteworthy that Schöffer also required a certain number of the X_i functions to permanently take the value 0; he did not however specify the exact proportion of the X_i functions that should do so. This suggests that he wants, at any given time, to leave a certain number of the outputs disabled. We can imagine that, according to the periodic reassignment of the X_i functions, the inactive outputs of the tower would change randomly, that is, move from one part of the tower to another, with all parts of the tower being equally likely to be chosen in each reassignment. For example, the mirrors could be inactive for five minutes, and then the red lights would be inactive for five minutes, then the blue lights, and so on. We could imagine a period of five minutes where the X_i functions have been assigned to the groups of outputs and stay the same. Starting at the beginning of the five-minute period, the values of the X_i functions are computed according to the inputs entering the programme at that time, as described in the formula (*) above. For a function X_i taking the value 1, a random time of activation Y_i is then computed, and a 'mode of operation' is chosen at random. Schöffer describes how a 'mode of operation', which is a sub-programme, made in advance and stored on the tower's computer, can be used to activate any group of outputs. For example, one mode of operation can activate the outputs of the group from left to right, or right to left, meaning that the lights, mirrors or propellers are activated from left to right on the tower's frame. Interestingly, Schöffer planned fifty such programmes to be written in advance, and did not leave this part of the programme open. The time Y_i is chosen within an unspecified time range, and according to a probability law (which is also not specified, and is to be made 'according to artistic criterions').[13] The group of outputs associated with X_i is then activated during the time Y_i. After that, the function X_{-i} is computed again with new inputs. For a function X_i taking the value 0, a random time of activation Y_i is computed and the corresponding group of outputs is left disabled. After that time has elapsed, the function X_i is computed again with a new set of inputs. To sum up, each function is sensitive to

different input; some are sensitive to trains, some to the stock market. Every five minutes the functions are assigned to different outputs, meaning that sometimes the number of trains light up red lights, while sometimes they turn on the propellers.

The Y_i functions in the programme are those that determine how many times during the activation period the tower receives and reacts to input.[14] This could happen as many times as computation time allows for during a period or only once.

We could imagine the following behaviour, supposing that the function X_i governing the red-light group is sensitive to the trains in Gare du Nord for five minutes. If there are a lot of trains in Gare du Nord, during the first minute, the red lights are activated. The time of activation and the mode of operation, chosen at random, are one minute and left-to-right behaviour, which means that the red lights behave in this way for one minute. If, at the start of the second minute, in the five-minute period, there are far fewer trains in Gare du Nord, the lights are not activated. The random time of activation is then two minutes, so the lights stay off for two minutes and so on for the remaining minutes. At the end of the five minute-period, the function X_i is assigned to another group of outputs (for instance, the mirrors), and the process is iterated.

We have remarked that except at the beginning of the programme, the functions X_i will in general not be calculated at the same time, which means that the effect of an important change in the inputs will not necessarily impact the entire tower at the same time, and that the delay during which it will do so relies heavily on the choice of range and probability distribution for the times of activation Y_i.

Closing the open system?

Upon reviewing the programme, several programmatic as well as conceptual problems become apparent, the main one being the programme's reliance on probability for perturbations to the system. Reading the programme suggests that the stagnation Schöffer imagined he could avoid by treating the input according to probability laws could in fact reinforce monotony. To see this, we have to turn to the laws of probability. A probability distribution is a representation of the probability of each event within a fixed number of possibilities. A probability is conventionally represented by a number between 0 (impossible event) and 1 (certain event), the sum of the probabilities for all possible events being 1.[15] In practice, probabilities are interpreted statistically: when we say, for example, that the probability of 'obtaining an even number when throwing a die' is 1/2, we mean that if we throw the die a large number of times (1000, for example) and repeat this process several times, we will obtain a proportion of 50 per cent of even numbers (or very close to it; the more attempts we make, the closer we get to this proportion). Thus, a series of events ruled by a probability distribution are almost impossible to predict 'locally' (the number that appears after throwing the die once) but easy to predict 'globally' (numbers that appear in 1000 throws of the die). This means that the tower would appear unpredictable and non-repetitive within a short time frame (such as five minutes), but within a longer time frame (an hour, a day, a week) it would be extremely similar to itself. The same phenomenon would occur spatially. Someone looking very closely at the tower (a person working in La Défense, or one of the tower's visitors) would not see any pattern (for example, colours changing constantly around him), but someone looking at it from far away would see some pattern (for example always around 60 per cent of the blue lights would be on). This phenomenon would even be independent of the precise probability distributions chosen. Of course, the tower would look different (both locally and globally) with a different choice of distributions, but it would always be globally similar to itself with respect to both space and time. In order to avoid this, Schöffer would have to make an even more sophisticated programme, for example by changing the probability laws over time, or by shaping the laws according to the inputs. Unfortunately, the perturbations, introduced

by Schöffer to avoid repetition and predictability, would have the opposite effect. Moreover, looking at the very large number of inputs, treated only as a *volume* of information (the nature of inputs is not taken into account), combined with its treatment via many probability distributions, one could even doubt that the tower would reflect the city in any way: it could simply result in a big 'blur'. Seen as an open system, the tower could finally behave as if it were not interacting with its environment. To avoid this, the artistic criteria mentioned by Schöffer in his description of the programme would have to be specified. By leaving these choices 'open' it seems Schöffer is instead slowly letting his system close in on itself.

Notes

1. Nicolas Schöffer, *La Tour Lumière Cybernétique* (Paris: Denoël/Gonthier, 1973), 74.
2. Nicolas Schöffer, *La Ville Cybernétique* (Paris: Tchou, 1969), 185; Translation by the authors.
3. Section 6, 'Introduction to the simulation' (Simulation du fonctionnement et visualisation de certains élément de la T.L.C.), Schöffer, *La Tour Lumière Cybernétique*, 112.
4. 'It will be necessary to install a disruption system that will intervene each time there is a tendency to repetition, saturation or stagnation of programmes (an abacus for example).' Schöffer, *La Tour Lumière Cybernétique*, 100; Translation by the authors.
5. Schöffer, *La Tour Lumière Cybernétique*, 6–7.
6. Ibid., 5.
7. Schöffer, *Le Nouvel Esprit Artistique* (Paris: Denoël/Gonthier, 2018 [1970]), 12; Translation by the authors.
8. Schöffer's humorous way of describing the often heated debates of the Assemblée Nationale, the French parliament.
9. Schöffer does not specify what these parameters would look like, but maintains them as artistic criteria to be determined.
10. Schöffer, *La Tour Lumière Cybernétique*, 120.
11. Ibid.
12. Ibid.
13. Ibid., 111.
14. In contrast with the X_{-i} functions, Schöffer does not provide a formula for the Y_{-i} functions.
15. For example, the probability distribution associated to the roll of a die is called 'the uniform distribution': each of six possible outcome 'rolling the die and getting the value n' , for n=1, 2, 3, 4, 5 or 6, has the same probability, 1/6. The sum of these six probabilities is 1, the certain event.

Biography

Nina Stener Jørgensen is a PhD student at the Estonian Academy of Arts, Faculty of Architecture. Studying architectural models of participation from the 1960s in light of today's so-called smart city, her PhD research focuses on producing a genealogy of what could be referred to as a post-participatory condition in architecture.

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Review Article

Architect of Nothingness: Frank van Klingeren's Open Architecture

Ecem Saricayir

Among Frank van Klingeren's surprisingly diverse production, from newspaper and TV interviews, essays, and collages, to architectural design projects and even a movie script, his poem '*De sleutels van mijn tante'* (My Aunt's Keys) stands out for its creative and idiosyncratic criticism of the omnipresent (re)construction projects in the Netherlands which gave an all-important role of the architect while ignoring the needs of many participants of Dutch society:

> daarop past na veel beven
> de plaats is niet zo goed
> en in het tegenlicht
> de laatste van de sleutels
> als tante werkelijk weet
> dat dit háár bus is
> en niet die van drie hoog
> …
> maar hoe is het met de huur
> kan ze die wel betalen?
> hij was wel niet zo duur
> zo omstreeks zestig ballen
> maar dat kan nu niet meer
> met al die vele deuren
> moest daar iets aan gebeuren
> er gaan twee honderd bij
> voor het huisje aan het IJ

(after lots of trembling fits/ the space is not that great/ and with sunlight in her face/ the last of the keys/ when auntie is certain/ that this is her postbox/ and not the one for three floors up/ …/ but how about her rent/ can she still afford it?/ it wasn't that much/ about sixty guilders/ but that's no longer possible/ with those many doors/ something needs to change/ two hundred is added/ for the little house along the IJ).[1] This excerpt from the poem describes his elderly aunt facing the changes in her apartment complex after its renovation. Van Klingeren emphasises the uncomfortable reorganisation of the building as well as the subsequent increase of his aunt's rent. His critique is that such renovation projects are often initiated and designed without considering the varying needs and acknowledging the skills of different residents. His consideration of their agency places different users, their capacities, and their interaction at the forefront of architectural design.

Van Klingeren's concerns resonate with other architectural experiments of the time which have attracted scholarly attention in recent years and have been specifically theorised by architectural historian Esra Akcan in *Open Architecture: Migration, Citizenship, and the Urban Renewal of Berlin-Kreuzberg by IBA 1984/87*.[2] Akcan critically investigates architectural practices of equality and democracy in the course of modernism by extending the Enlightenment notion of the invitation to include migrants and not-yet citizens in architectural processes. She identifies 'open architecture' as an architecture informed by ideals of 'flexibility and adaptability of form, collectivity and collaboration, multiplicity of meaning, democracy and plurality, open-source design, the expansion of human rights and social citizenship, and transnational

solidarity'.[3] According to Akcan, open architecture aims to achieve 'the translation of a new ethics of hospitality into architecture,' which requires going beyond a Kantian ethics of hospitality dependant on an invitation from the host and the hierarchically lower and passive position of the invitee. Rather, open architecture 'is predicated on the welcoming of a distinctly other mind or group of minds into the process of architectural design'.[4]

Akcan's welcoming of distinctly other minds suggests recognising the agency of the resident, including immigrants, 'guest workers', stateless people and asylum seekers, among others. For instance, she discusses the critical renovation or reconstruction projects as part of IBA 1984/87 in Berlin, which included the inhabitants in the design process through consistent communication. Importantly, some of these residents were guest worker Turkish families who did not have German citizenship and were faced with housing regulations that actively limited possible living locations and their access to housing. In this context, Akcan understands open architecture to expand human rights by going beyond the limits of citizenship and by practicing transnational solidarity premised on social citizenship and equal rights. [5]

A couple of years before these experiments by IBA, Van Klingeren also reconsidered the relationship between the architectural project and its residents or possible future users. While not fully embodying the transnational values essential to Akcan's open architecture, Van Klingeren's architectural practice can nevertheless be understood as aiming 'towards open architecture' in line with that of Akcan. It renegotiates the roles of the architect and the resident, not only to overcome the gap between the design and the various changing needs of its users, but also by placing his architecture in the service of building social relations and strong communities. For Van Klingeren, this required that others be welcomed in the development of a building throughout its life cycle, from its design and construction stage to its possible reconstruction.

To do so, Van Klingeren used his expert position as an architect to turn architecture and urban development into a public discussion. Apart from participating in a public awareness campaign around plans to drastically restructure Amsterdam's central Leidseplein area, Van Klingeren also aimed to involve a wider public in the discussion through numerous interviews and opinion pieces in national media, with guest appearances on TV shows, and by producing a movie script, poems, and protest collages. He further argued that the architect is part of a necessarily collaborative field of design. In the journal *Architecture, Formes + Fonctions*, Van Klingeren explains this idea as follows: 'It is quite obvious that the architect is the end of a string of scientists: futurologist, psychologist, medicine-man, planner, anthropologist, society-philosopher, and this calls for a multidiscipline [sic] approach of [sic] problems as well as architectural education.'[6] According to Van Klingeren the architect needs to be in conversation with, among others, the sociologist, the psychologist, the futurologist and the urban planner.[7] [Fig. 1]

The involvement of the public and other experts in Van Klingeren's architectural practice does not mean that every detail of his buildings was fully designed. Quite the opposite: Van Klingeren aimed for his buildings to remain 'unfinished', to leave space for people to adjust the building as they make use of it. This feature of Van Klingeren's practice is most fully developed in his two large-scale community centres. Commissioned by the municipality, Van Klingeren built the community centre De Meerpaal in Dronten during 1965–67. It was the first large-scale community centre designed by Van Klingeren and is representative of an era of experimental architectural design in the Netherlands made possible by the welfare state. In the architect's imagination, De Meerpaal was to function as an agora and, accordingly, was thought of as part of the plaza on which it was erected. To stress this connection between the enclosed and open spaces of the project, the shell of De Meerpaal was a steel and glass construction

Fig. 1: The exterior view of De Meerpaal. Undated photo by Jaap Doeser. Copyright Roel Dijkstra Fotografie.

while its interior consisted of a large open space with unpolished surfaces which lent itself to be (re-) configured in different ways by its users. [Fig. 2]

According to various commentators, the large open space and the unpolished character of the building made De Meerpaal a popular meeting place. In an article published in 1969, Corin Hughes-Stanton wrote: 'this summer thousands of people watched an attention-gripping series of inter-country European competitions on television – not in their homes but in the Agora, spreading down and across from the cafe.' Noting the effects of the unfixed interior of the building, Hughes-Stanton also states that a

> wide range of activities, both organised and unorganised, can take place in the Agora. … There are no barriers between different areas: although the fixtures are as simple as possible, more equipment can be added, or taken away again, at a later date.[8]

Another commentary, also from 1969, was by the architectural theorist and critic Martin Pawley who wrote about De Meerpaal in the journal *Architectural Design*:

> In fact checking off aspects of the Agora's supreme modernism I came up with the following list:
> It is in a new town on reclaimed land
> A fresh start without cultural hangups
> It is 'functional'
> It is 'honest'
> Its planning is 'flexible'
> It is not only 'honest' but free from monumentality
> It is 'Democratic'
> It belongs to 'the people'
> It is 'user oriented'
> It is not 'fascist'
> It is designed for mixed media shows
> It is avant-garde
> It is built for 2000 AD
> It is OK[9]

Both commentaries point towards the user's centrality in Van Klingeren's design of De Meerpaal, celebrating the building's malleability and the active role of its users in determining the interior design. Hughes-Stanton comments on how people were able to configure the building with their own materials: 'It is a remarkable experience to see up to 3 000 people – farmers, shop assistants, and factory workers – bringing their own camp stools and sitting in the Agora outside the packed-out theatre to listen to a concert.'[10]

While these commentaries refer to De Meerpaal's flexible design, it would be a mistake to interpret the building only through the lens of the modern concept of flexibility. As Akcan points out, open architecture values, among other ideals, 'flexibility and adaptability of form, collectivity and collaboration.'[11] Using various historical examples, Akcan shows that in some cases these concepts are intimately connected, with the former two referring to the quality of form and the latter two to the quality of the design practice. For instance, due to its open plan, Mies van der Rohe's Neue Nationalgalerie can be (re)organised, but this flexibility remains within the architect's authority. In a contrasting example, the adaptable interior arrangement of the Rietveld-Schröder House was a result of the collaboration between Gerrit Rietveld and Truus Schröder-Schräder – the architect's authority was shared with the client from the initial phases of the design onwards.[12] However, both buildings already provide all elements with which their interior arrangements can be reorganised by its users or residents. Van Klingeren's use of flexibility and adaptability in De Meerpaal differs from these examples as he does not provide its users with a fully equipped building later to be reorganised. Instead, the architect chooses to design less.

This ideal of minimal design is developed in Van Klingeren's approach to unfinished architecture. Van Klingeren repeatedly emphasised the importance of an unfinished design to fully include people in the design and construction processes.

Fig. 2: The interior of De Meerpaal. Undated photo by Jan Versnel. 2.24.10.02/ 119-1353. Fotocollectie Rijksvoorlichtingsdienst Eigen, Nationaal Archief Nederlands, copyright Maria Austria Instituut.

For instance, he urged architects to adopt imperfection, to welcome residents to co-determine the end product: 'You must dare to embrace imperfection, perfection is unaffordable… A kitchen is never good enough. Give people an unfinished house… You have to appeal to the skill and resourcefulness of the residents.'[13] By designing an unfinished building, Van Klingeren hoped to include different types of public not only in the initial design or construction processes but also throughout the building's lifecycle.

Van Klingeren's approach of unfinished architecture was taken even further in his second large community centre, Het Karregat, which opened in 1973 in the Herzenbroeken neighbourhood in Eindhoven. Like De Meerpaal, Het Karregat was designed as a multifunctional centre to provide various services to the newly built district. This time, Van Klingeren designed a building that combined many different functions under one roof carried by repeated umbrella-shaped steel columns: schools for younger children, a library, an open area for gatherings, a paediatrician's office, a snack bar, a pub, an exhibition area and a shopping market. What made Het Karregat particularly experimental was Van Klingeren's decision to design the building without any interior walls. Van Klingeren had already experimented with such a wall-less design in De Meerpaal, where the theatre space was not completely shut off from the building's open interior space. This meant that other activities in De Meerpaal, which accommodated up to seven hundred people, would be audible and interfere with performances taking place in the theatre space. People inside and outside of the theatre had to respect each other and negotiate to attain the desired silence. [Fig. 3, 4] In Het Karregat, this idea of wall-less interior was developed further. Van Klingeren thoroughly embraced the idea of a fully open plan and the friction that follows from it in his design of Het Karregat. As a journalist noted in 1981, the building's wall-less interior design resulted in the interaction between all its different functions:

> the baker gives a lecture about bread in the classroom, the library's story reading session takes place in the kindergarten, the cafe functions as a detention space and waiting room for the doctor's office, biology classes take place amidst the patches of green in the neighbourhood.[14]

In addition to the exchanges and collaboration among different users of the building, Van Klingeren imagined that the absence of interior walls would create a visual and auditory nuisance for its users. Interestingly, and diverging from his colleagues at the time, Van Klingeren did not wish for the unattainable total elimination of nuisance, nor did he hold the naïve belief that encounters would always be voluntary or easy. [Fig. 5] Instead, Van Klingeren believed that his building

> must function in such a way that everybody can enter and it must bring people in contact with each other. The 'un-compartmentalised-ness' (onafgeslotenheid) of all activities is a part of that. In particular, by deliberately allowing people to disturb each other a little, you give them a sense of belonging together.[15]

Van Klingeren envisioned that this friction created by the building's wall-less design would have a productive and socialising effect, something he theorised as de-clotting (*ontklontering*). He thus saw an important role for architecture in its capacity to 'de-clot' society and create a more interwoven community than one which still carried traces of the pillarisation (*verzuiling*) system. Pillarisation divided Dutch society into groups or 'pillars' (*zuilen*) based on religious and ideological affinities from the mid-nineteenth century until the 1960s. The main pillars in the Netherlands were the Protestant, the Catholic, the socialist, and the liberal pillars, each of which had access to their own schools, radio and TV stations, newspapers, unions, sport clubs, and even grocery stores. Under this system, people of different pillars could exist side by side without much encounter. A product of these years, Van Klingeren

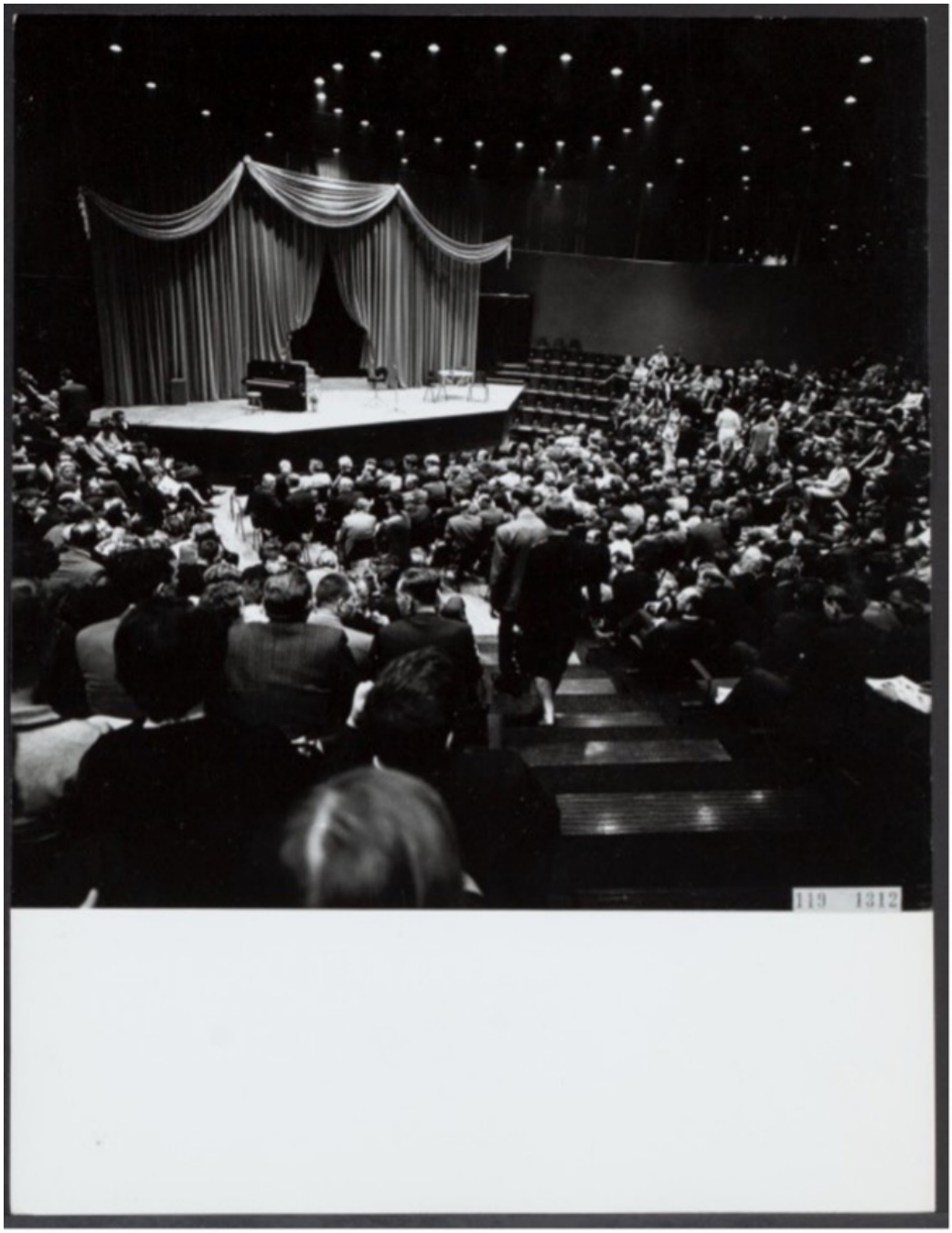


Fig. 3: An interior view of the theatre in De Meerpaal. Undated photo by Jan Versnel. 2.24.10.2/119-1312. Source: Fotocollectie Rijksvoorlichtingsdienst Eigen, Nationaal Archief Nederlands, copyright Maria Austria Instituut.

Fig. 4: An exterior view of the theatre in De Meerpaal. Undated photo by Jan Versnel. 2.24.10.2/119-1321. Source: Fotocollectie Rijksvoorlichtingsdienst Eigen, Nationaal Archief Nederlands, copyright Maria Austria Instituut.

Fig. 5: An early model of De Meerpaal. Undated photo by Jan Versnel. MAI30789507987. Copyright Maria Austria Instituut.

aimed to open up Dutch society by ridding it of the remnants of pillarisation. Writing in the architectural journal *Bouw* in 1973, Van Klingeren discusses the idea of de-clotting in relation to Het Karregat:

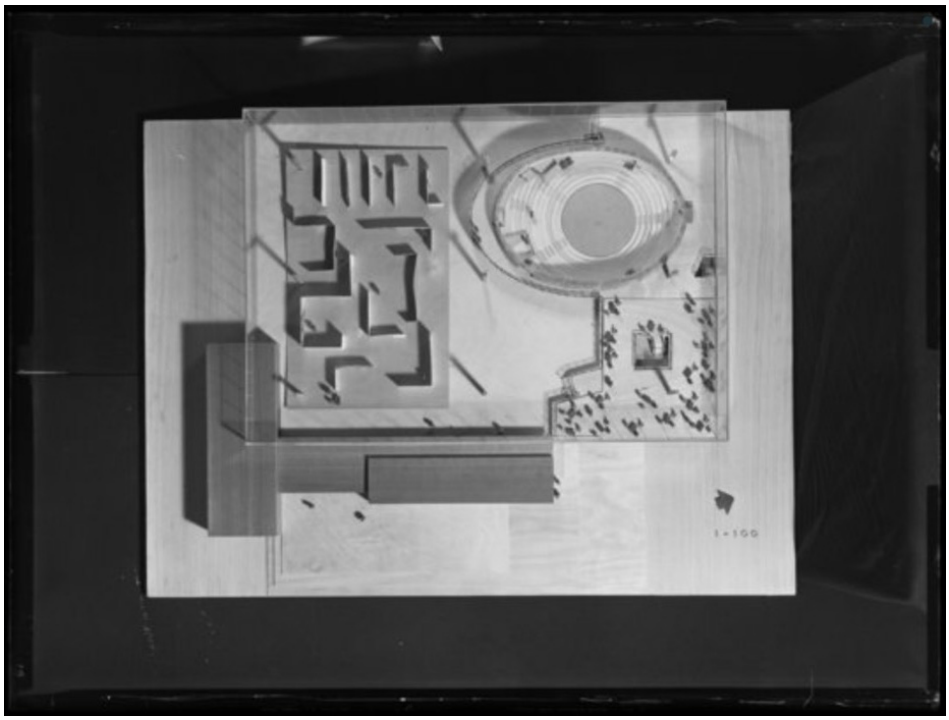
> We wanted to centre the social. Sometimes I call this 'de-clotting'. It refers to the struggle against the privatised, the preconditioned, and the asylum-like. In this case I would like to add: de-schooling. All of this is only possible through the empowerment and participation of the people. Participation requires that people can and want to speak up.…One should not forget that most of us – more correctly: all of us – grow up weighed down by the established order, even aside from the fact that this established order is at the same time the law.[16]

Although stemming from a critique of the pillarisation system, de-clotting carries much wider implications for the architect, as it touches upon issues of sociality, experimental pedagogies, and privatisation. For Van Klingeren, his open architecture was thus a means to shake up the established order and generate new forms of sociality.

Van Klingeren's open architecture is characterised by producing open and unfinished structures: from a simple structure with unpolished surfaces in De Meerpaal to the total absence of interior walls in Het Karregat. Through these spatial approaches, he aimed at generating another kind of sociality and welcoming other people – both experts and the general public – into the various design phases of a building's life. However, his architecture also garnered complaints and critique. For instance, the celebrated Dutch poet and critic Gerrit Komrij ridiculed Van Klingeren's commitment to building less, especially in Het Karregat. In his collected essays, Komrij – calling Van Klingeren a 'builder of nothing' – turns the previously discussed commentaries by Hughes-Stanton and Peters upside down, writing that

> the toddlers stole the buns from the baker's pastry case, the doctor noted down the thumping of carnival music as his patients' heartbeat, in the evenings the bar clientele would urinate between the school desks, the students were anxious and the teachers were burnt out.[17]

Indeed, there were concerns over the lack of suitable pedagogical material for the radically open schools and complaints from users of the building over the noise in Het Karregat. Moreover, the journalist Martin Ruyter called it 'a dangerous building', citing the communal life in Het Karregat as hazardous to family life in the district.[18] Eventually these criticisms led to various rounds of renovations, triumphantly commented upon by Ruyter. These renovation plans were bitterly criticised by Van Klingeren, who considered them fundamental alterations of the building's open design and accused his client of conservatism and cowardice: 'in the end, we still had to decide on too many details … because our client could not fully embrace the philosophy they initially accepted.'[19]



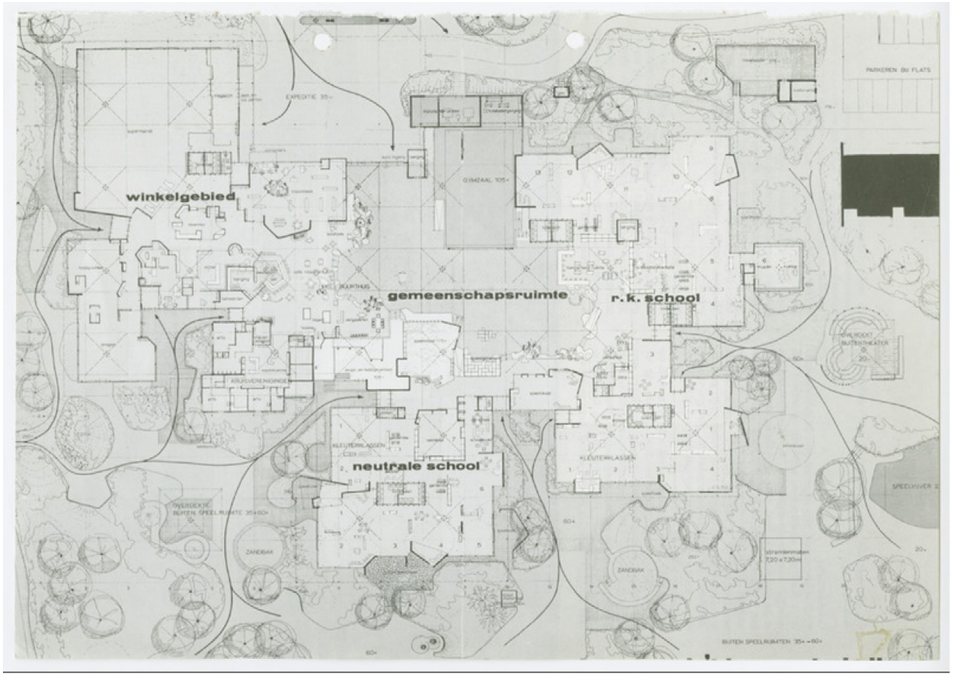


Fig. 6: An early model of De Meerpaal. Undated photo by Jan Versnel. MAI30789507987. Copyright Maria Austria Instituut.

Fig. 7: The plan of Het Karregat. Het Nieuwe Instituut, Rotterdam, Frank van Klingeren, KLIN.110510480, KLIN d12-2.

Notes

1. Frank van Klingeren, 'De sleutels van mijn tante', *Bouw* 37 (1982): 13; all of the translations from Dutch sources are my own.
2. IBA is the abbreviation of *Internationale Bauausstellung Berlin* or The International Building Exhibition in Berlin. Esra Akcan, *Open Architecture: Migration, Citizenship, and the Urban Renewal of Berlin-Kreuzberg by IBA 1984/87* (Basel: Birkhauser, 2018).
3. Ibid., 10.
4. Ibid.
5. Ibid.
6. 'Frank van Klingeren', *Architecture, Formes + Fonctions* 16 (1971).
7. Marina van den Bergen and Piet Vollaard, *Hinder en Ontklontering*: *Architectuur en Maatschappij in het Werk van Frank van Klingeren* (Rotterdam: Uitgeverij 010, 2003), 9.
8. Corin Hughes-Stanton, 'Closed Environment for Living Space', *Design* 241 (1969): 44.
9. Martin Pawley, 'Agora', *Architectural Design* 6, no. 39 (1969): 360.
10. Hughes-Stanton, 44.
11. Akcan, *Open Architecture*, 10.
12. Ibid.
13. Quoted in Marina van den Bergen and Piet Vollaard, *Hinder en Ontklontering*, 119.
14. Edie Peters, 'Karregat-proef Teruggedraaid', *De Volkskrant*, 14 April 1981.
15. Piet van den Ende, 'De Magische Doos van Van Klingeren', *Het Parool*, 7 November 1967.
16. 'En Hoe Nu Verder? Een Interview met Frank van Klingeren', *Bouw* 52 (1973).
17. Gerrit Komrij, *Het Boze Oog* (Singel Uitgeverij, 1991), 146–47.
18. Martin Ruyter, 'Het Karregat is een Gevaarlijk Gebouw', *De Volkskrant*, 9 March 1974.
19. Martin Ruyter, 'Een Gebouw dat Uitnodigt tot Onrust', *De Volkskrant*, 15 January 1977; 'En Hoe Nu Verder? Een Interview met Frank van Klingeren', *Bouw* 52 (1973).

Biography

Ecem Sarıçayır is a PhD candidate in History of Architecture and Urban Development at Cornell University. Her dissertation analyses the history of art, architecture, and urbanism in the South Caucasus, focusing on the Russian colonial development and the various subsequent nation-state modernisation projects in the region. In parallel, she studies late modern and politically progressive Dutch architecture. Currently, she is a visiting doctoral fellow at the Freie Universität Berlin.

Review Article

Contextualising *Liberté d'Usage*

Alberto Geuna and Claudia Mainardi

> It seemed as if we only needed a big blue sky, a kind of transposition into another world, a dream.
> Lacaton & Vassal, *Café Una*.[1]

Liberté d'usage

One of the most characteristic elements in the practice of Lacaton & Vassal is the way they develop the architectural project through empathy with those who will live in the designed space.[2] The design is thus generated from the inside, narratively, prefiguring living practices. The architectural project is understood as a sequence of actions based on a careful reading of the various design requirements and proceeds through a series of gestures aimed at generating a type of comfort not determined a priori by standard performances, but which depends directly on how a space can be used, on its *liberté d'usage*.

One of the most controversial methodological positions proposed by the duo is the desire to build volumes that encourage an optimum *liberté d'usage*. To achieve this it is necessary to exploit the potential of economical building systems, carefully weighing the spatial qualities inherent in each and cross-referencing them with costs, speed of construction, and environmental advantages. This method allows for the generation of large buildings with tight budgets, allowing for redundant space that, according to the couple, has the capacity to unlock *liberté d'usage* if adequately designed. From this reasoning, a precise positioning concerning the discipline of architectural composition emerges. For Lacaton & Vassal, architecture plays a particular role among other disciplines involved in construction. Architects must recognise this role and limit themselves to working in their sphere with dedication and humility, allowing other figures to express themselves too. In essence, the architectural project is seen as a series of design moves based on evaluating technical and economic aspects, the ultimate goal of which is to determine a built form in which the inhabitant can enjoy *liberté d'usage*.

This attitude, as well as the interest in standardised, industrial building technologies, is essentially modern; not so much in terms of praising technological advancement (Lacaton & Vassal's work is anything but high-tech), but in the belief that the appropriate use of technology can improve the living conditions of the inhabitants and lead to a higher degree of freedom and enjoyment. Similarly, this approach allows those who design to keep control of the budget during the project itself.

Most of the qualities proposed by the couple derive from their childhood and youth spent in large Mediterranean houses equipped with large terraces overlooking the sea. In Lacaton & Vassal's view, however, one cannot exclude the possibility of a space enriched with other meanings, as lived through the imagination of the occupants. For this reason, it is necessary to guarantee *liberté d'usage,* to leave the inhabitants free to express themselves in the places they inhabit. In this sense, the rationality and economy of the architectural proposal come together with a crucial imaginative component, focused on the possibility for the occupant to inhabit space freely.

In the first chapter of their seminal book *PLUS*, Frederic Druot, Anne Lacaton and Jean Philippe Vassal include a text by their mentor Jacques Hondelatte entitled 'Apartments? Areas to Make Use Of'.[3] The document, originally published in the journal *L'Architecture d'Aujourd'hui* in June 1985, is a declaration on the architect's particular position on a specific aspect of the open project: *liberté d'usage*.

> I would like to live in the Taj Mahal, the Tower of Pisa, the Statue of Liberty, the gardens of Granada, Jean Nouvel's project in La Défense, the caves of Altamira, San Marco in Venice, and the arena in Seville: do we maybe inhabit better what is not made to be inhabited?[4]

In fact, it is to Hondelatte – mostly ignored since his death in 2002 – that Anne Lacaton and Jean Philippe Vassal largely owe their stance regarding openness and *liberté d'usage*. Hondelatte's position in time (graduating in 1969 and initiating his professional work in the aftermath of May '68), in space (he was almost morbidly attached to his native Bordeaux), and regarding his influences (from the drawn architecture of Peter Cook to Hassan Fathy's vernacular and the countercultural experimentations from the Third Bay Tradition) renders him a figure of particular interest to us today.[5] Operating, as he did, from Bordeaux rather than from Paris and given the unusual collection of influences that fuelled his work, Hondelatte was able to shape French architectural discourse not from the centre but from geographical and disciplinary peripheries.

The original French title of the aforementioned article is 'Exorcisme: pour la liberté d'usage,' and it proposes a way of designing domestic space inspired by the lofts of Manhattan. Exorcism here consists of removing a priori definitions of a space:

> No rooms, no living rooms, no bathrooms, no predetermination of work spaces, sleeping spaces, eating spaces. Rather a catalogue of spaces of complementary and contrasting qualities. The small dark room, cool by the basin, the quilted floor, the large sunny spaces of the swimming pool and the alcoves.[6]

Not by coincidence, one of Lacaton & Vassal's first projects was a collaboration with Hondelatte to renovate an apartment for the Cotlenko family, situated in a historic row house in the centre of Bordeaux. Architectural critic Didier Arnaudet describes it as a collage that preserves the heterogeneity of confrontations, tensions, and interrogations;[7] a succession of styles dictated by the desire to preserve and to add, refusing any recuperation, any logical progression, and drawing a variety of colourful and visionary spaces, bringing together the traditional and the contemporary, the artificial and the natural, playing with its constraints and oppositions.

> The quality of this apartment does not lie in functional efficiency but dimensional, visual, and emotional fluidity. It is an indefinite space dedicated to the enigma, imposing its obviousness, its poetry, without metaphorical recourse. ... A strange feeling of movement and light, of amazement too. The body gets lost in it. It is a space of breathing, intimate exercise of endless becoming, living on a gentle slope, or dreaming in vain.[8]

To describe such qualities in his projects, Hondelatte coined the term *mythogenèse*, meaning the capacity of objects to not define themselves only by their function but also by their plastic properties; by their amazing propensity to come and live in our dreams, and their ability to generate myths. In Druot's terms, 'even through insignificant details, Jacques Hondelattes invites the "marvellous" to become part of everyday life and arouse the inhabitants' imagination.'[9]

A dreamy, imaginative, atmospheric dimension of the project; an intimate and intense understanding of space which is almost spiritual: in these qualities lies the concept of openness and freedom of use that Hondelatte handed down to Lacaton & Vassal.

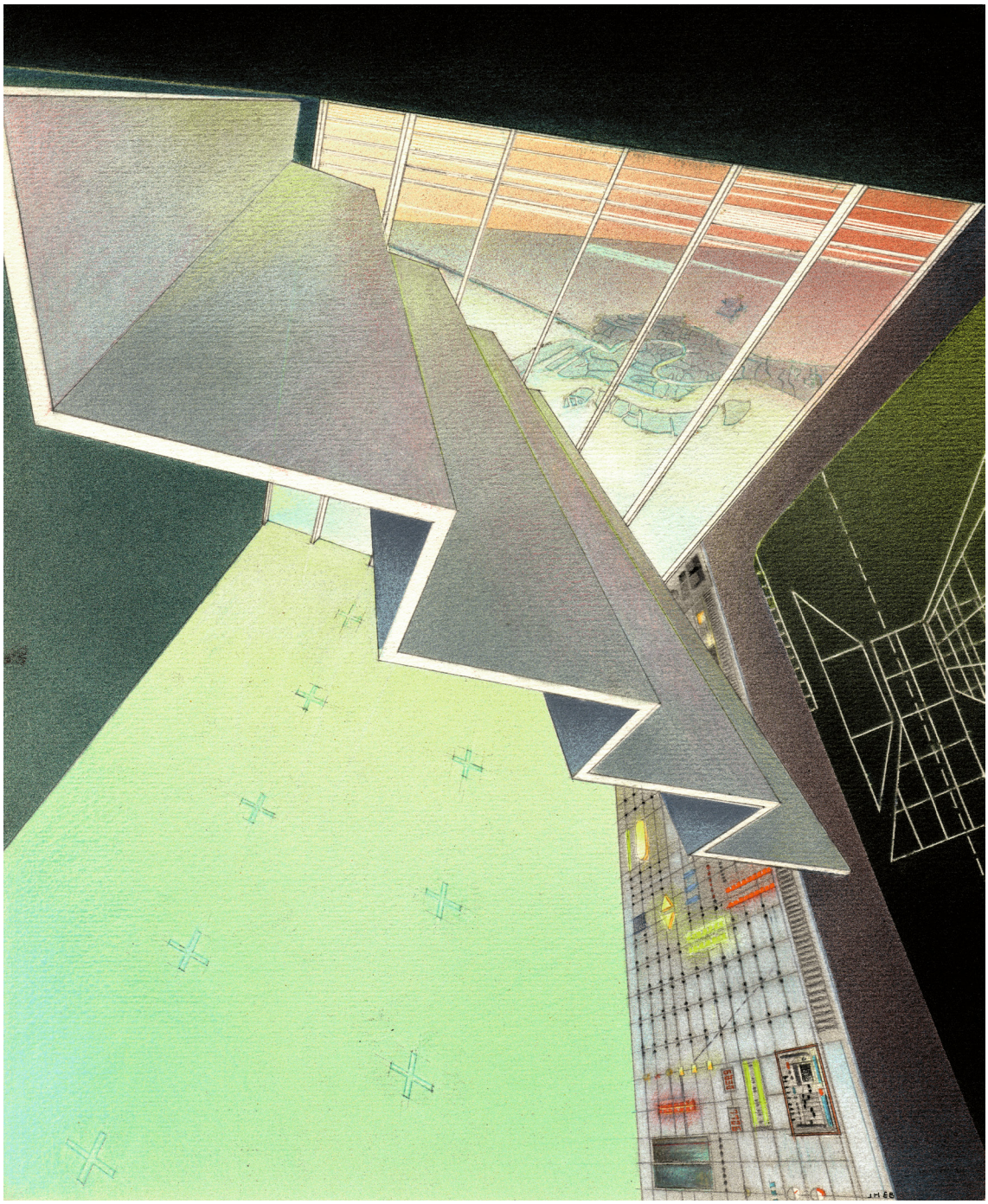


Fig. 1: Jacques Hondelatte / Epinard Bleu, *Réminiscences - Le mur des facilités: 'Venise ville contre nature', Chateaubriand*, 1985, airbrush painting and pencil on paper, 25.7 x 21.2 cm. Courtesy the Estate of the Artist and Betts Project.

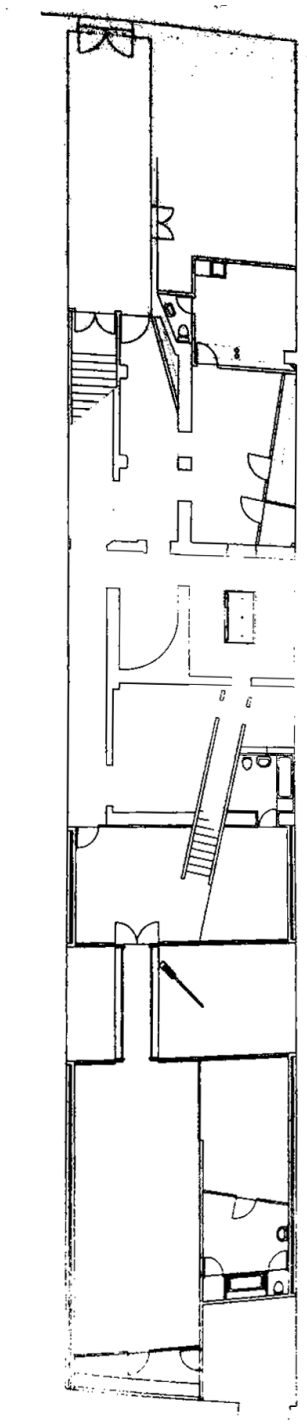


Fig. 2: Ground floor plan of the Cotlenko Apartment. Courtesy the Estate of the Artist and Betts Project.

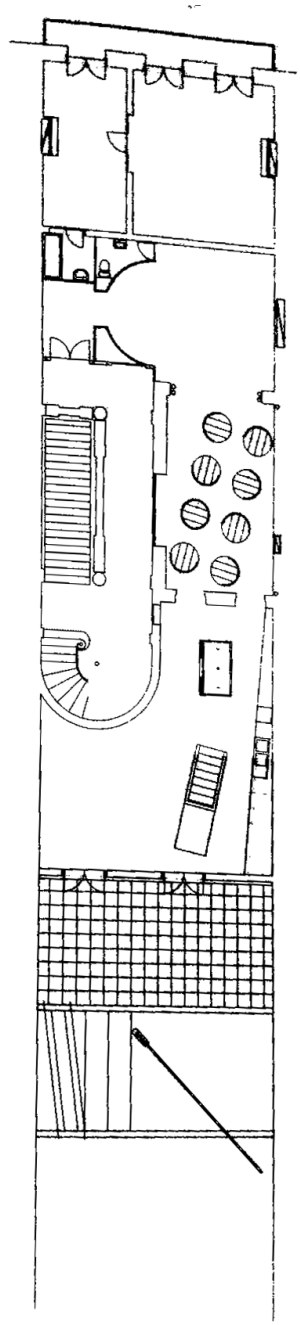


Fig. 3: First floor plan of the Cotlenko apartment in Bordeaux. Courtesy the Estate of the Artist and Betts Project.

Fig. 4: Entrance of the Cotlenko apartment in Bordeaux. Photo: Philippe Ruault. Courtesy the Estate of the Artist and Betts Project.

Fig. 5: Ground floor patio of the Cotlenko apartment in Bordeaux. Photo: Philippe Ruault. Courtesy the Estate of the Artist and Betts Project.

Liberté d'usage is not a mere form of functionalism based on the flexible construction of space. Instead, it consists of the profound understanding of a place's imaginative and atmospheric possibilities, as well as its inherent and dormant qualities. *Liberté d'usage* offers the possibility to subvert the domestic environments' rules and norms by adding a skylight, enlarging a balcony, tearing down a wall, planting an orange tree; leading to spaces 'soaked in fantasy and permeable to adventure', as Arnaudet puts it.[10]

Forms of freedom

In modern architecture, the use of 'freedom of use' as a distinct notion can be traced back to Le Corbusier's *plan libre* and his quest to liberate architecture from the rigid constraints of nineteenth-century construction via reinforced concrete. But freedom in the *plan libre* was more an aesthetic emancipation of the architect from the physical constraints imposed on him by masonry than an opportunity to enhance the freedom of the user:

> Generated by the independent framework, the plan is free on each floor, independent from above and below. The reinforced concrete posts support the floors and allow distribution as needed. The framework itself can take on an aesthetic function. It is highlighted inside by the fillings covered with plaster which leave the structure legible.[11]

Le Corbusier's *liberté* is thus freedom of design, not freedom of use. The free plan is drafted and tightly controlled by the architect, who for all intents and purposes neglects inhabitants' role in shaping architectural space.[12] Although more inhabitant-minded understandings of freedom in architecture were introduced by critics of Le Corbusier after the 1960s, the idea of attributing responsibility to users to make architectural space their own remained a source of deep anxiety for architects throughout the twentieth century. Rather, architects tend to allow for freedom of appropriation within specific fixed schemes characterised by conservative views regarding social space, particularly when dealing with domestic space.

Rem Koolhaas is about ten years older than Anne Lacaton and Jean-Philippe Vassal, and has long been identified with the attempt to break with architectural ideologies embodied in spatial programmes. He has also been lauded for his programmatic innovations, such as the production of fields of social encounter and new functional juxtapositions, but his idea of freedom in architecture does not question the order of social space. For Jeffrey Kipnis, for example, Koolhaas's version of freedom is not an overt resistance to authority but rather a form of programmatic sabotage in which the aim is to 'liquefy rigid programming into non-specific flows and events ... to weave together exterior, interior, vestigial and primary spaces into a frank differential matrix that rids the building of the hackneyed bourgeois niceties of cosmetic hierarchies.'[13] According to Kipnis, Koolhaas wants to defy the 'social logic of space' in order to free up the programmatic imperatives that lock architecture into the service of a highly choreographed and ritualistic reproduction of social life.[14]

For Koolhaas, freedom – particularly in the domestic realm – is not about subverting social space but rather about demolishing and reconstructing it. An example is the *Maison Floirac* in Bordeaux, which can be seen as 'a reconstruction of the bourgeois house with its servant quarters and cellar dug into the hillside', as Kim Dovey and Scott Dickinson describe it.[15] Despite being considered a radically innovative and imaginative piece of architecture, both formally and spatially, the house embodies forms of social control and gender divisions that 'are enhanced rather than challenged. In general, despite a brilliant programmatic innovation, Koolhaas misses an understanding of freedom as a form of practice: something people do rather than consume.'[16]

Herein lies the main difference between Hondelatte's *liberté d'usage* and other notions of

Fig. 6: First floor of the Cotlenko apartment in Bordeaux. Photo: Philippe Ruault. Courtesy the Estate of the Artist and Betts Project.

freedom in architecture. *Liberté d'usage* is a practice, it requires cooperation between inhabitant and architect. The empathy that underpins Lacaton & Vassal's projects (as it does Hondelatte's) aims to synthesise architect and client, and strives to cross cultural barriers between the two. This way it solves many of the contradictions that defined the architectural debates of the twentieth century.

Contextualising *libertè d'usage* today

So seen, *liberté d'usage* is essentially an ethical principle that regulates the relationship between architects, clients, and society. When compared to notions of freedom in the work of Rem Koolhaas, a contradiction emerges, which is rooted in different political stances regarding the counterculture.[17] For all his radical thinking, Koolhaas's houses betray a conventional view of domestic space and familial hierarchy. This view is challenged by Lacaton & Vassal's approach to design, which can be linked to the May '68 slogan *imagination au pouvoir* (the imagination in control). While for Koolhaas the technocratic manipulation and recomposition of space are means towards architectural innovation, Lacaton & Vassal have a qualitative view of domesticity in which attention is directed towards the atmospheric qualities of specific spaces, and to the meaning those qualities might have for their inhabitants. Rather than complex three-dimensional models or abstract formal compositions, their designs are developed from the interior, through narrative iterations meant to prefigure the future living practices that will come to be after construction.

Each project by Lacaton & Vassal constitutes a series of gestures aimed at generating a distinct type of comfort not determined a priori by performance standards, but which depends directly on the relation between a space's form and its use. In this sense, comfort is approached qualitatively, as opposed to what is required by European building regulations. In essence, an operational aspect of the discipline of architecture is claimed, which is generally subservient to the satisfaction of numerical and quantitative standards. According to Hondelatte, the transmission of an atmospheric sense of well-being and luxury is preferable to numerical standards. This atmosphere is not based on a wealth of materials or particular attention to finishing. Instead, it depends on access to light, air, and an articulate relationship between the interior and exterior.

In an article published in 2009, Frederic Druot – himself a student of Hondelatte's – notes how

> functionality compromises the freedom of the way we use things ... Refusing de facto to recognise that the morphology and functionality of modern housing has evolved over the years is tantamount to refusing, at the same time, that the concept of the family has also changed.[18]

This is precisely one of the reasons why *liberté d'usage* as conceived by Hondelatte and as used by Lacaton & Vassal is relevant to the contemporary architectural debate. The different crises generated by the current COVID-19 pandemic has shown us that many homes are inadequate today, when the boundaries between work and private life are merging and family structures are being reshaped by new forms of living and demographic change.[19] The study and understanding of *liberté d'usage*, seen as the design of adaptable spaces with a fluid identity, gives access to a valuable tool to deal with cultural and natural change. Most importantly, practising *liberté d'usage* allows architects to recognise the human beings who inhabit the buildings they produce in all their complexity and their idiosyncratic needs; not numbers in a programme, not digital bodies in a 3D model, but people inhabiting a place.

Fig. 7: Wintergarden in the Cotlenko apartment in Bordeaux. Photo: Philippe Ruault. Courtesy the Estate of the Artist and Betts Project.

Notes

1. Extract from the description of Café Una renovation project at the Vienna Museumquartier; 'Café Una', Lacaton & Vassal Architectes, accessed September 6, 2021, https://www.lacatonvassal.com/index.php?idp=13#.
2. This position has been repeated by the architects on numerous occasions. As an example we include the following statement, regarding a project for a luxury hotel in Lugano, Switzerland: 'What is the best room? The one with the best views, so we reversed the usual proportions between meters of facade and depth'. Anne Lacaton interviewed by Patrice Goulet, Patrice Goulet, 'Conversación con Lacaton & Vassal', *2G*, 21 (2002): 124. Unless otherwise indicated, all translations from French and Spanish are our own.
3. Anne Lacaton, Jean-Philippe Vassal and Frédéric Druot, 'Luxury and Ease', in Anne Lacaton, Jean-Philippe Vassal, Frédéric Druot, *Plus: Large Scale Housing Developments – An Exceptional Case*, (Barcelona: Editorial Gustavo Gili, 2007).
4. Ibid., 35.
5. The Third Bay Tradition (also Third Bay Area Tradition) is an architectural movement from the period of 1945 through the 1980s that was rooted in the greater San Francisco Bay Area, with its best known example being Sea Ranch. The tradition was codified by the design works of Donlyn Lyndon, Charles Moore, and William Turnbull.
6. Jacques Hondelatte, 'Exorcisme: pour la liberté d'usage', in *L'Architecture d'Aujourd'hui*, 239 (1985), 5; our translation.
7. Didier Arnaudet, 'Appartement Cotlenko', in *Jacques Hondelatte: Des gratte-ciel dans la tête*, edited by P. Goulet (Paris: Édition Norma, 2002).
8. Ibid., 99; translation by the authors.
9. Frédéric Druot, 'Not Tearing Down is a Strategy: Not to protect, freeze, mummify, but rather, so that life can continue, and because it forces us to be intelligent and prevents harmful generalizations', in *L'Architecture d'Aujourd'hui*, 374 (2009), 73.
10. Arnaudet, Appartement Cotlenko, 99.
11. Eduard Sekler, *Le Corbusier at Work*, (Cambridge: Harvard University Press,1978), 2.
12. This omission would be documented by numerous posthumous publications. Particularly, the role of Le Corbusier's clients in the design has been explored extensively in the journal *Rassegna* in its issue no. 8 (1980), titled *I Clienti di Le Corbusier* (Le Corbusier's clients).
13. Jeffrey Kipnis, 'Recent Koolhaas', in *El Croquis*, 79 (1998): 27.
14. Ibid., 30.
15. Kim Dovey and Scott Dickson. 'Architecture and Freedom? Programmatic Innovation in the Work of Koolhaas/OMA', in *Journal of Architectural Education*, 56 (2002): 10.
16. Ibid., 13.
17. Both Koolhaas and Jacques Hondelatte lived through the 1968 uprising in their youth. As mentioned in numerous interviews, Rem Koolhaas was stationed as a journalist in Paris during the events of May.
18. Druot, 'Not Tearing Down', 67. Druot is the author of *PLUS* with Anne Lacaton and Jean-Philippe Vassal, and was a member of Épinard Bleu, a collective of young architects formed by Hondelatte's students.
19. 'What, If Not the Family? Guests from Multidisciplinary Perspectives Discuss the Spatial Implications of Ongoing Shifts in Ideas of the Family', *CCA*. March, 2021. https://www.cca.qc.ca/en/articles/issues/29/a-social-reset/79885/what-if-not-the-family.

Biography

Alberto Geuna is a PhD student in Architectural, Urban, and Interior Design at Politecnico di Milano. He holds a master's degree cum laude in architecture from Politecnico di Torino, and a post-master degree cum laude in architecture and urban design from the Berlage, TU Delft. He has worked in various architecture offices throughout Europe, including Sauerbruch Hutton, Lacaton & Vassal, BDR Bureau and Carlo Ratti Associati. His work with design-build collective Atelier Mobile was exhibited at the Triennale di Milano in 2018. His writings are featured in international conference proceedings and disciplinary journals like *Domus* and *San Rocco*.

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Footprint is grateful to our peer reviewers, who generously offered their time and expertise. In this issue, the following papers were peer-reviewed: 'Writing Open Architecture as a Book on Human Rights (and Against Nation-States)', 'Ventotene and Gorizia: Opening the Panopticon', 'Spolia and the Open Work', 'The Unbearable Lightness of an Open System: The Packaged House 1941–47', 'Free Plan versus Free Rooms: Two Conceptions of Open Architecture', 'The Open Map: A Granular Structure for Performative Readings', 'On the Open Style of Architectural Reasoning'.

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