ARCHITECTURE RESEARCH / ARHITEKTURA, RAZISKAVE

CONFLUENCES / STEKANJA

2019

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/ KAZALO

"Edification has two principal meanings—to build and to be morally uplifting... That is, edification must be ethical, entailing communication of value choices. In the present situation... the only possibility of edifying in the sense of building is to edify in the sense of 'rendering ethical,' that is, to encourage an ethical life: to work with recollections of traditions, with traces of the past, with expectations of meaning for the future."

Gianni Vattimo[1]

1 Gianni Vattimo, quoted in Kenneth Frampton, *Studies in Tectonic Culture* (Cambridge, MA: MIT, 1995), 299.

EDITOR'S FOREWORD

Confluences form the context of experience. Confluence involves the inextricable intertwining of artifacts, concepts and perceptions, with temporally and physically distant and proximate origins, which are thereby made simultaneously present in experience. Confluences can occur in a way that seems entirely natural, as when the water of two rivers converges to form a new watercourse that seamlessly merges the two tributaries. Confluences can occur in a way that is entirely unexpected, as when two ideas previously assumed to be mutually exclusive are combined to form a new compound exhibiting the characteristics of neither of its constituent elements. As Vattimo suggests, confluences can interrupt the seemingly ceaseless flow of time by constructing an event in the present moment that edifies and combines "the recollections of traditions, the traces of the past and the expectations of meaning for the future."

Every construction—painting, building, city—is fundamentally a confluence (adding/grafting/combining/intervening/laminating/reconstituting/intertwining/interweaving/layering/integrating/translating/transforming) of new artifacts and pre-existing conceptual, spatial and material contexts. Confluence of the contemporary with the layers of the historical (one thinks of Carlo Scarpa's laminations of ancient and local with modern and universal in his constructions in Venice); confluence of concepts of space, order and perception flowing from art and architecture (one thinks of Alvar Aalto's engagements in his works of George Braque's idea of "tactile space"); confluence of the familiar and the unfamiliar (one thinks of Italo Calvino's translations of his city of Venice into all the cities of Kubla Khan's empire); confluence of intimate and immense, private and public, domestic and urban (one thinks of Bernhard Hoesli and Colin Rowe's employment of compositional strategies drawn from Cubist painting in urban design pedagogy); confluence of ancient and modern, time and place, near and far, abstract and concrete, timeless and of its time, personal insight and inspiration and shared inheritance and tradition—confluence as the *making* that allows all these streams to flow together, their intermingled interplay shaping our experience.

The poet and philosopher Paul Valéry defined all constructive work that involved *making* in the arts and architecture as being fundamentally

a matter of "finding the right combination" of things or thoughts that already existed, but which had never been joined together in precisely this way before. Each combination is made to craft the solution to a particular problem—how to articulate an idea, how to paint a formal structure, how to span a space—in a way that simultaneously construes and constructs. Valéry's concept was developed in writing his *Cahiers* (Notebooks), a record of what he called his "morning work," which involved him waking every morning at 3:00am and sitting at his desk, confronting a sheet of white paper, on which he would write a sentence, and then spend however long was necessary, from fifteen minutes to three hours, combining and constructing words until the sentence achieved perfection, and could not be further refined. Valéry's idea of combinatory construction is a way of making through confluence, through the bringing together of things not normally expected to be related.

The novelist Arthur Koestler, in his book, *The Act of Creation*, proposes a similar interpretation of construction, which argues that discoveries and inventions in art, humor and science all involve the bringing together of two ideas usually considered entirely unrelated and even mutually exclusive, and that the sudden revelation of their mutual implications results in an entirely new conception. Because we find it difficult if not impossible to consciously put two mutually exclusive propositions together, Koestler demonstrates how these breakthroughs almost always involve lateral or even distracted thinking. One of his many examples is the mathematician Henri Poincaré, who spent fifteen days seated at his desk struggling unsuccessfully to resolve the Fuchsian functions. When he was forced to interrupt his mathematical work to participate in a geological excursion, at the moment Poincaré put his foot on the step of the bus, all the equations suddenly came clear in his mind. This same concept of constructive inspiration led Jonas Salk to tell Louis Kahn that he wanted the Salk Institute to be a place where he "could invite Picasso to meet with my scientists," so that in their time away from the biological laboratories the Nobel-winning scientists would have to confront the entirely different world view of the artist.

But "confluence" should also be understood to have other, less optimistic and constructive implications. In this we think of Walter Benjamin's interpretation of the Paul Klee mono-print, *Angelus Novus*, which, "shows an angel looking as though he is about to move away from something he is fixedly contemplating. His eyes are staring, his mouth is open, his wings are spread. This is how one pictures the angel of history. His face is turned toward the past. Where we perceive a chain of events, he sees one single catastrophe which keeps piling wreckage upon wreckage and hurls it in front of his feet. The angel would like to stay, awaken the dead, and make whole what has been smashed. But a

2 Walter Benjamin, "Theses on the Philosophy of History," IX (1940, first published 1950), *Walter Benjamin: Illuminations*, Hannah Arendt, ed. (New York: Schocken, 1969), 257-258.

3 Bernard Knox, *Backing Into the Future: The Classic Tradition and its Renewal* (New York: Norten, 1994), 11-12.

storm is blowing from Paradise; it has got caught in his wings with such violence that the angel can no longer close them. This storm irresistibly propels him into the future to which his back is turned, while the pile of debris before him grows skyward. The storm is what we call progress."[2]

The confluence of forces forming the winds of history and progress, pushing the angel forward into the future, while he remains facing backward, into the past. There is a melancholy associated with the Benjamin essay that may be understood as a disturbing counterpoint to the optimism of high modernism and the production of architecture after both world wars. Architects have always been very optimistic about their work. While it requires optimism, and a good bit of luck, to get anything built at all—and therefore architects tend to inherently be optimistic in their approach to their discipline—can we not also detect a melancholy like Benjamin's, a sense of longing in the constructions of our era?

Regarding the implications of Benjamin's *Angelus Novus*, there is definitely something to be said for the cautionary, not to say pessimistic, but rather realistic interpretation of the forward-moving impetus implied by the term "confluence," in which one imagines being swept forward, but also backwards, sometimes—it is good to recall that tides go both in and out. The optimism necessary to be a maker of places and things, to get anything built in our contemporary world, should not be confused with an overly optimistic outlook as regards the context and culture in which one works.

On the other hand, there are architects practicing today who are optimistic not only about the potential for their buildings to make the world a better place, but even for the angels of our collective better natures to prevail in the larger world. Granted, it is hard to see this as being entirely realistic when, as Wilfried Wang recently wrote, we are without question living in "the age of climate change." But there is no question that if one is not optimistic, one can never get anything built. How to square this essential aspect of the practice of our disciplines with the need to be skeptical, and in some cases overtly pessimistic, about the motives and intentions of those who pay for our works?

Yet there is also a contrasting, constructive interpretation of Benjamin's apparent reversal of the normal interpretation of past and future orientation, which originated not in the turbulent times in which he lived, but, as Bernard Knox has pointed out, dates back at least to the ancient Greeks: "The early Greek imagination envisaged the past and present as in front of us—we can see them. The future, invisible, is behind us. Only [the blind prophets] can see what is behind them. The rest of us, though we have our eyes, are walking blind, backwards into the future."[3] This image of the architect, employing their disciplinary past, as it is embodied in the historical buildings and landforms inherited from previous generations, in order to construct the present that will

4 Kenneth Frampton, "Towards a Critical Regionalism," *The Anti-Aesthetic*, Hal Foster, ed. (Port Townsend, Washington: Bay Press, 1983), 20.

house its inhabitants as they move into the unforeseeable future, is the key to understanding the work of the best architects working today.

This literally retrospective point of view regarding the relation of present events and acts to the past, and its concomitant prospective blindness towards the future, has been construed in a constructive way by the architectural historian and critic Kenneth Frampton. Frampton has argued that, rather than continue the *avant-garde* posture, with the destruction of local culture through globalization that inevitably accompanies it, contemporary practitioners would better serve the discipline by assuming the position of an *arriere-garde*: the rear guard, who turn and face the past, and the disciplinary history and principles it embodies: "Architecture can only be sustained today as a critical practice if it assumes an arriere-garde position... only an arriere-garde has the capacity to cultivate a resistant, identity-giving culture while at the same time having discreet recourse to universal technique."[4] Thus it may be said that rear-guard architects, who turn and face the past, thereby protect and conserve both shared disciplinary principles and the particular qualities of their place in the world, acting in a way that is appropriate and careful—full of care.

The editors of *AR/Architecture Research* 2019 have sought writings that engage and examine the theme of confluences between, within and among the widely varying territories encompassed in and around the disciplines of architecture and art. Essays range from philosophical dialogues regarding the dual nature of being in the context of the synchronous communication network; to the intertwined definitions of reality in science and art; to the transformative and spontaneous nature of poetic experience; to the exploration of recent interpretations of metaphor and diagram employed to construe design and experience; to the confluence of structure and material in composite and synthetic constructions; to the relations between light and dark as constructed in the phenomenon of penumbra; to the pivotal nature of the concept of the threshold or in-between in reconceiving modern architecture; to the relations between appearance and phenomena in the representation of inhabited space; to the generative potential of concepts of collective form in the reinterpretation and transformation of cities; to the increasing importance of slowness in the gestation of constructions that last; and all of which engage the complementary interweaving of conceptions of art and architecture in the construing and constructing of the lifeworld. The binding concept for *AR* 2019 is the exploration of the multivalent meanings to be discovered in contemporary *confluences*.

Robert McCarter
Guest Editor

"Beseda *edifikacija* ima dva glavna pomena: 'gradnja' in 'moralno utrjevanje'. [...] Gradnja mora biti torej etična, kar pomeni, da mora sporočati vrednotne odločitve. V sedanjih razmerah [...] je edina možnost edifikacije v smislu 'gradnje' edifikacija v smislu 'etičnega utrjevanja', torej spodbujanja etičnega načina življenja; to je delo s spomini na tradicije, s sledmi preteklosti, s pričakovanji pomena za prihodnost."

Gianni Vattimo[5]

5 Navedeno v: Kenneth Frampton, *Studies in Tectonic Culture*, The MIT Press, Cambridge (Massachusetts), 1995, str. 299.

UVODNIK

Stekanja oblikujejo kontekst izkustva. Stekanje vključuje neločljivo prepletanje artefaktov, konceptov in zaznav, po svojem izvoru fizično in časovno oddaljenih in bližnjih, ki so tako v izkustvu prisotni sočasno. Stekanja se lahko pojavijo na način, ki se zdi povsem naraven, na primer ko se združita dve reki in ustvarita nov vodotok, v katerem se njune vode zlijejo v eno. Stekanja se lahko pojavijo na povsem nepričakovan način, na primer ko se ideji, za kateri je poprej veljalo, da se izključujeta, spojita v nov koncept z značilnostmi, ki jih sestavna elementa nista imela. Kot piše Vattimo, lahko stekanja prekinejo navidezno nenehni tok časa, tako da v sedanjem trenutku ustvarijo dogodek, ki edificira in združuje "spomine na tradicije, sledi preteklosti in pričakovanja pomena za prihodnost".

Vsaka konstrukcija – slika, stavba, mesto – je v osnovi stekanje (dodajanje/presajanje/kombiniranje/poseganje/laminiranje/rekonstruiranje/prepletanje/prepredanje/plastenje/vključevanje/pretvarjanje/preoblikovanje) novih artefaktov in že obstoječih konceptualnih, prostorskih in materialnih kontekstov. Stekanje sodobnega s plastmi zgodovinskega (na misel nam pride Carlo Scarpa in laminacije starodavnega in lokalnega s sodobnim in univerzalnim v njegovih stvaritvah v Benetkah); stekanje konceptov prostora, reda in zaznavanja, ki jih oddajata umetnost in arhitektura (tu pomislimo na dela Alvara Aaalta in njegovo uporabo ideje o *tipnem prostoru* Georgea Braquea); stekanje poznanega in nepoznanega (tu pomislimo na Itala Calvina in pretvarjanje njegovih Benetk v vsa mesta Kublaj Kanovega imperija); stekanje intimnega in brezmejnega, zasebnega in javnega, domačega in urbanega (na misel nam prideta Bernhard Hoesli in Colin Rowe ter njuna uporaba kompozicijskih strategij, ki jih je razvilo kubistično slikarstvo, pri poučevanju urbanističnega načrtovanja); stekanje starodavnega in sodobnega, časa in prostora, bližnjega in oddaljenega, abstraktnega in konkretnega, brezčasnega in sočasnega, osebnega uvida in navdiha ter kolektivne dediščine in tradicije – stekanje kot *ustvarjanje*, pri katerem se vsi ti tokovi združijo, njihovo prepleteno součinkovanje pa oblikuje naše izkustvo.

Pesnik in filozof Paul Valéry je vsako konstruktivno delo v umetnosti in arhitekturi, ki vključuje ustvarjanje, v osnovi definiral kot "iskanje

6 Walter Benjamin, "Theses on the Philosophy of History", IX, v: Hannah Arendt (ur.), *Walter Benjamin: Illuminations*, Schocken, New York, 1969, str. 257–258.

prave kombinacije" stvari ali zamisli, ki že obstajajo, vendar niso bile še nikoli združene na točno tak način. Smoter vsake kombinacije je izdelati rešitev za določen problem – kako izraziti določeno idejo, kako naslikati formalno strukturo, kako premostiti določen prostor –, in sicer na način, ki združuje interpretacijo in gradnjo. Valéry je ta koncept razvil pri pisanju svojih Cahiers (Beležnic), ki dokumentirajo njegovo "jutranje delo". Vsako jutro je vstal točno ob treh, sedel za mizo in se soočil s praznim listom papirja; nanj je napisal stavek in ga nato preoblikoval toliko časa, kot je bilo potrebno – od četrt ure do treh ur; kombiniral in tvoril je besede, dokler stavek ni bil do konca izpiljen, popoln. Valéryjeva gradnja s kombiniranjem je eden od načinov ustvarjanja s stekanjem, z združevanjem elementov, ki jih običajno ne dojemamo kot sorodne.

Romanopisec Arthur Koestler v svojem delu The Act of Creation poda podobno interpretacijo gradnje in trdi, da vsa odkritja in izumi na področjih umetnosti, humorja in znanosti temeljijo na združitvi dveh idej, ki navadno veljata za povsem nepovezani in celo izključujoči, ter da nenadno razkritje njunih skupnih implikacij rezultira v povsem novem pojmovanju. Ker se nam zdi zavestno spajanje dveh izključujočih se elementov težavno, če ne kar nemogoče, Koestler pokaže, da ti preboji skoraj vedno vključujejo lateralno ali celo raztreseno razmišljanje. Opiše veliko primerov, med njimi primer matematika Henrija Poincaréja, ki se je za svojo pisalno mizo petnajst dni mučil z razreševanjem Fuchsovih funkcij. Potem je moral delo prekiniti zaradi udeležbe na geološki ekskurziji in v trenutku, ko je stopil na stopnico avtobusa, so se vse enačbe v njegovi glavi naenkrat razrešile. V zasledovanju tega istega koncepta konstruktivnega navdiha je Jonas Salk Louisu Kahnu predstavil svojo vizijo Salkovega inštituta, ki si ga je zamišljal kot kraj, kamor bo "lahko na srečanje s svojimi znanstveniki povabil Picassa", da se bodo ti Nobelovi nagrajenci v času, ki ga ne bodo prebili v svojih bioloških laboratorijih, primorani soočiti z umetnikovim povsem drugačnim pogledom na svet.

Beseda *stekanje* pa ima tudi druge, manj optimistične in konstruktivne implikacije. Tu nam pride na misel interpretacija monotipije Paula Kleeja Angelus Novus, ki jo je podal Walter Benjamin. Podoba "prikazuje angela, za katerega se zdi, da se bo ravnokar odmaknil od nečesa, kar intenzivno motri in o čemer razmišlja. Njegove oči bolščijo, usta so odprta, krila razpeta. Tako si predstavljamo angela zgodovine. Z obrazom gleda v preteklost. Tam, kjer mi zaznavamo sosledje dogodkov, angel vidi eno samo katastrofo, ki predenj nenehno kopiči razbitine in ruševine. Rad bi ostal, obudil mrtve in razbite kose ponovno sestavil. A močan veter piha iz raja; uprl se je v angelove peruti s tako silo, da jih ta ne more več zapreti. Ta vihar ga nezadržno žene v prihodnost, kamor je obrnjen s hrbtom. Medtem kup ruševin pred angelom raste v nebo. Vihar je to, kar imenujemo napredek."[6]

Stekanje sil, ki tvorijo vetrove zgodovine in napredka ter angela

7 Bernard Knox, *Backing Into the Future: The Classic Tradition and its Renewal*, Norten, New York, 1994, str. 11–12.

potiskajo v prihodnost, medtem ko gleda v preteklost. Benjaminov esej preveva melanholija, ki jo lahko razumemo kot moreče nasprotje optimizma visokega modernizma in arhitekturne produkcije po obeh svetovnih vojnah. Arhitekti imajo že od nekdaj optimističen odnos do svojega dela. Čeprav sta za izgradnjo česarkoli potrebna optimizem in kar nekaj sreče (arhitekti zato k svojemu področju pristopajo z inherentnim optimizmom) – mar v zgradbah naše dobe ne zaznavamo tudi otožnosti, podobne Benjaminovi, nekakšnega hrepenenja?

V zvezi z implikacijami Benjaminovega Angelusa Novusa vsekakor marsikaj govori v prid svarilni, skoraj pesimistični, a dokaj realistični interpretaciji pogona naprej, ki ga nakazuje izraz *stekanje*; pod tem izrazom si predstavljamo tok, ki nas odnaša naprej, včasih pa tudi nazaj – ne gre namreč pozabiti, da plimi vedno sledi oseka. Optimizma, ki je potreben za ustvarjanje krajev in stvari, za izgradnjo česarkoli v našem sodobnem svetu, ne smemo zamenjevati s preveč optimističnim pogledom na kontekst in kulturo, v katerih delamo.

Po drugi strani danes delujejo arhitekti, ki optimistično verjamejo, da lahko njihove zgradbe naredijo svet boljši in celo da lahko v svetu prevlada, kar je v človeški naravi dobrega. Taka pričakovanja se nam spričo dejstva, da, kot je nedavno zapisal Wilfried Wang, nedvomno živimo v "obdobju podnebnih sprememb", ne morejo zdeti povsem realistična. Brez dvoma pa drži, da brez optimizma ne moremo zgraditi ničesar. Kako naj torej uskladimo ta bistveni vidik prakse na naših ustvarjalnih področjih s potrebo po skepsi in v nekaterih primerih kar pesimizmu do nagibov in namer tistih, ki plačujejo za naša dela?

Obstaja pa tudi nasprotno, konstruktivno razumevanje Benjaminovega navideznega obrata ustaljene interpretacije usmerjenosti med preteklostjo in prihodnostjo. To ne izvira iz nemirne Benjaminove dobe, pač pa se je, kot navaja Bernard Knox, pojavilo že v antični Grčiji ali celo prej. "Stari Grki so si predstavljali, da sta preteklost in sedanjost pred nami in ju zato lahko vidimo. Prihodnost naj bi bila za nami in zato nam nevidna. Samo [slepi preroki] vidijo to, kar je za njimi. Vsi ostali pa, čeprav videči, tavamo v prihodnost kot slepci, s hrbtom naprej."[7] Ta podoba arhitekta, ki na osnovi preteklosti svoje discipline, utelešene v zgodovinskih zgradbah in krajinah, podedovanih od prejšnjih rodov, gradi sedanjost, ki bo domovanje svojim prebivalcem, medtem ko stopajo v nepredvidljivo prihodnost, je ključna za razumevanje ustvarjanja najboljših sodobnih arhitektov.

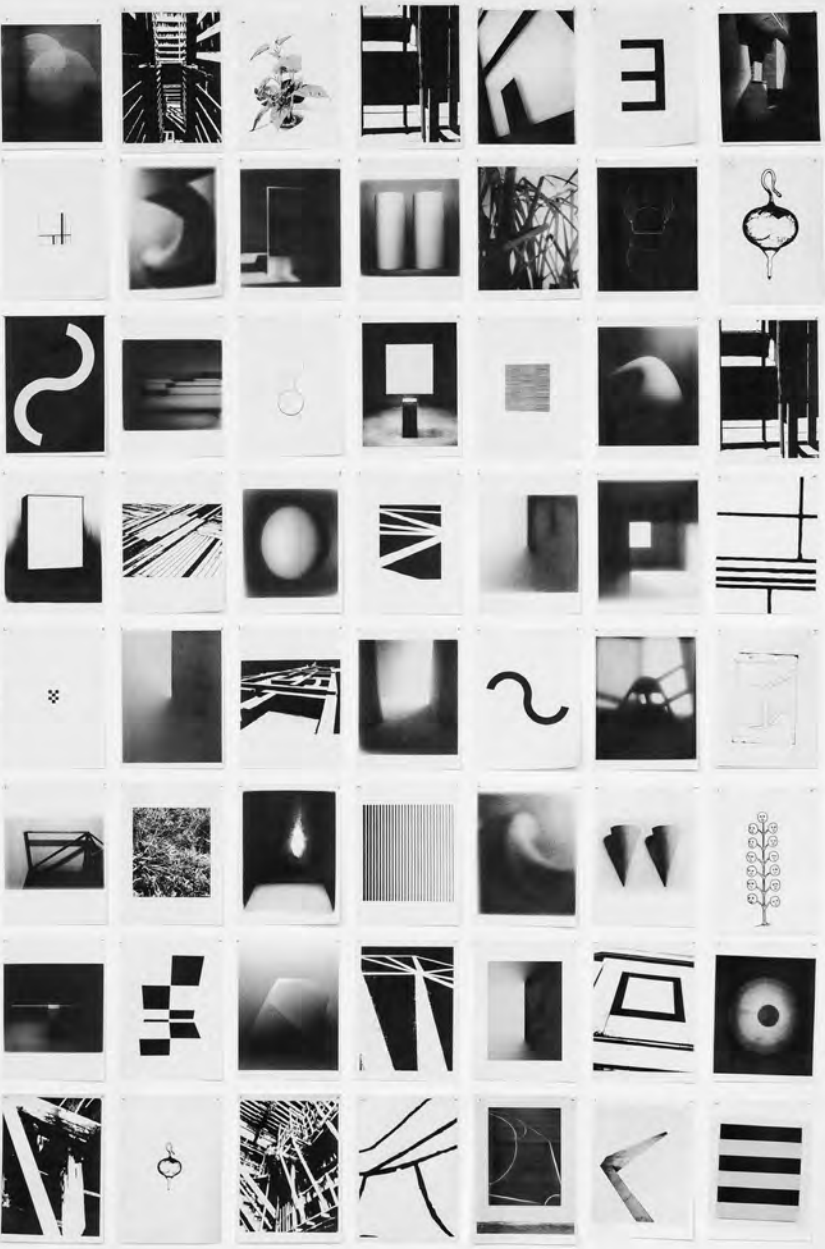
To dobesedno retrospektivno gledišče na razmerje sodobnih dogodkov in dejanj do preteklosti, ki ga določa tudi sočasna slepota za prihodnost, je na konstruktiven način interpretiral arhitekturni zgodovinar in kritik Kenneth Frampton. Njegova teza je, da bi bilo za arhitekturo kot disciplino bolje, če sodobni ustvarjalci ne bi vztrajali v drži *avant-garde*,

8 Kenneth Frampton, "Towards a Critical Regionalism", v: Hal Foster (ur.), *The Anti-Aesthetic*, Bay Press, Port Townsend (Washington), 1983, str. 20.

ki jo neizogibno spremlja uničenje lokalne kulture zaradi globalizacije, temveč bi zavzeli stališče *arrière-garde* – zadnje straže, ki je zazrta v preteklost ter v zgodovino in principe svojega ustvarjalnega področja, ki jih ta preteklost uteleša. Frampton nadalje trdi: "Arhitektura lahko danes kot kritična praksa preživi le, če zavzame pozicijo *arrière-garde*[.]" "[...] [S]amo *arrière-garda* je zmožna gojiti obstojno kulturo, ki daje identiteto, ter obenem diskretno uporabljati univerzalne postopke in metode."[8] Lahko torej rečemo, da *arrière-gardni* arhitekti, ki se obrnejo v preteklost, varujejo in ohranjajo tako splošna načela svoje stroke kot posebne značilnosti svojega mesta v svetu; delujejo ustrezno in skrbno.

V uredništvu pričujoče številke revije AR/Arhitektura, raziskave smo iskali besedila, ki se osredotočajo na temo stekanj med in znotraj izredno različnih polj, ki sestavljajo in obkrožajo področji arhitekture in umetnosti. Prispevki vključujejo filozofske dialoge o vprašanju dvojne narave eksistence v kontekstu sinhronega komunikacijskega omrežja; obravnavajo prepletene definicije resničnosti v znanosti in umetnosti; transformativno in spontano naravo poetičnega izkustva; raziskovanje novejših interpretacij uporabe metafore in diagrama pri razumevanju oblikovanja in izkustva; stekanje strukture in materiala v sestavljenih in sintetičnih konstrukcijah; razmerja med svetlobo in temo, kot so konstruirana v pojavu polsence; ključno vlogo koncepta praga oziroma vmesnega prostora pri ponovnem zamišljanju sodobne arhitekture; razmerja med videzom in pojavi pri upodabljanju naseljenega prostora; ustvarjalni potencial konceptov kolektivne oblike pri reinterpretaciji in preoblikovanju mest; naraščajoči pomen počasnosti pri snovanju trajnih objektov; vsi prispevki se ukvarjajo tudi s prepletanjem in medsebojnim dopolnjevanjem pojmovanj umetnosti in arhitekture pri razumevanju in gradnji okolja, v katerem bivamo. Vsem besedilom revije AR 2019 je skupno raziskovanje multivalentnih pomenov, ki jih najdemo v sodobnih stekanjih.

Robert McCarter
gostujoči urednik



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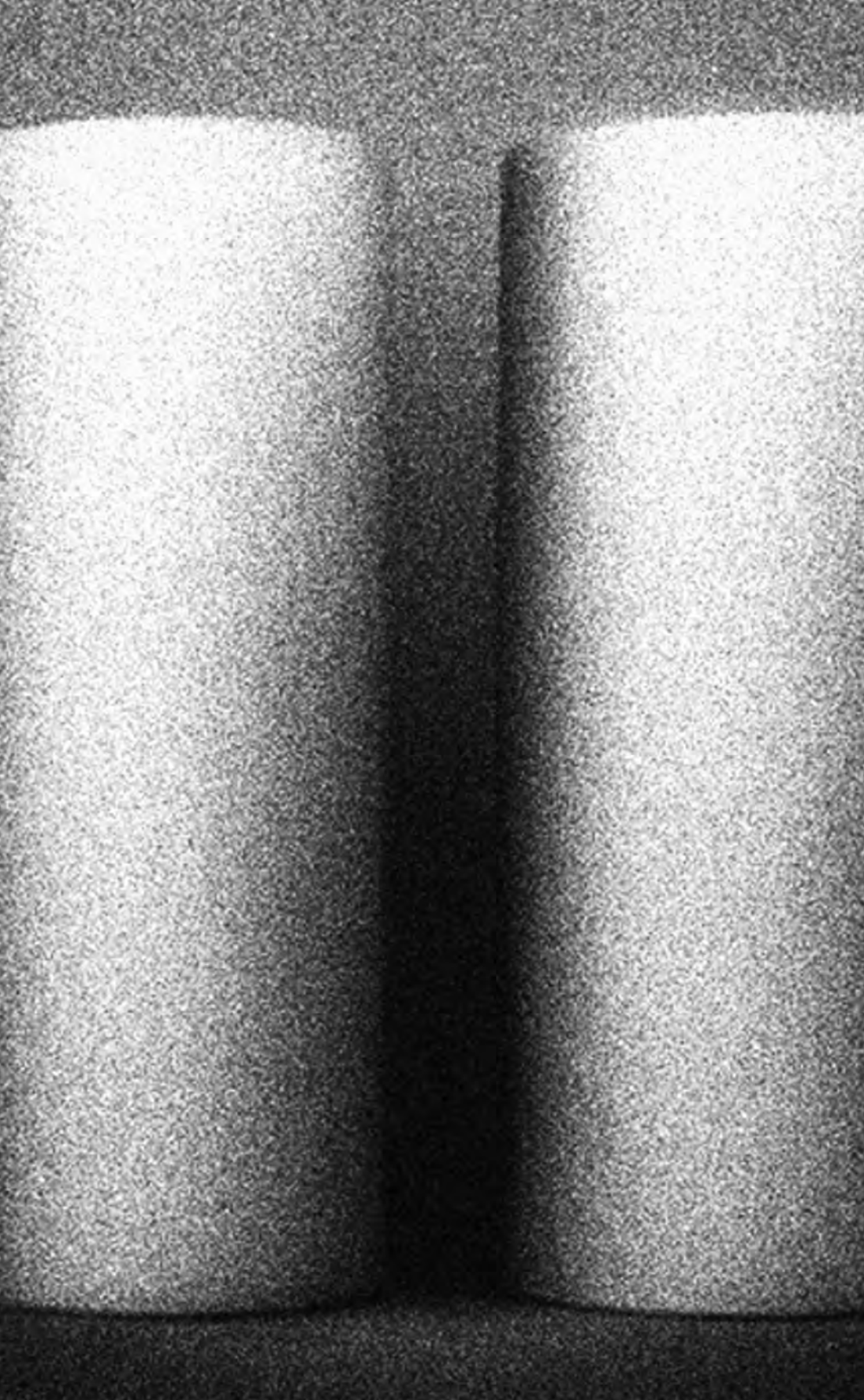


THE SIGN WORLD AND CHASM WORLD

Monde-Signe et Monde-Gouffre

François J. Bonnet

Contemporary modes of existence exacerbate a kind of constitutive duality in man. This duality is that which is articulated around what one might refer to as the finite being and the projected being. The finite being is the local being, physical and mortal, which is defined by its limits and its material contingencies. It is this being who suffers and who enjoys. It is the being which walks or runs at a limited speed, jumps to a limited height, and whose voice carries at a limited distance. It is the being which grows tired, gets sick and feels hot or cold. Upon this body-being, the being facing the infinity of the world is superimposed; the being who dreams of being potentially unlimited and eternal (as, supposedly, the world around him). This being has always expressed itself, for example in the social game, political positions, ideals, patriotism, feelings of belonging or beliefs. It is the part of each person that is precipitated into a space that transcends it: the space of sacrifice, of posterity, of community, that is to say the other space or the space of others; in short, the space of elsewhere.

Such articulation is obvious. It has been studied in a thousand ways. What is less so is that which it produces. The current era offers a new context to this duality and makes it toxic. This context, which is so specific, is split. It is illustrated, in the first place, by the advent of a technical era that will soon render possible the expression of a totally synchronous world; one in which each point of the globe will be connected and updatable in "real time" by its positioning in a network; and secondly by what Jean-François Lyotard called the end of the great narratives, typical of the postmodern era we live in, where the discursive meta-structure in which we can inscribe our history is failing. Today, the projected being no longer deploys itself through projects of society, ideals, religions or beliefs. One of the common functions between all these forms was, in fact, the ability to traditionally explain, extend and perpetuate existence beyond the finite being (with the concealed objective of being able to dispose of this same finite being and thus to submit it to its Law). The projected being now thrives less through these transcendent axes in such a way that it synchronizes with the Network to rejoin the stasis of

1 Jean-François Lyotard, Discours, Figure, Paris, Klincksieck, 1971, p. 155.

the hyper-present, and this, for the sole purpose of finding itself confirmed there at every moment. Let us remember, the projected being dreams of being eternal. Death is no longer a horizon for him. And that is the secret objective: to reassure oneself and hide the horizon of death.

One of the major symptoms of this contemporary toxicity which is instilled in the "finite being/projected being" articulation touches the sensory register, in the sense that it results in the asphyxiation of experiences which are immediate or made immediate, attaining the gradual but irresistible silencing of the finite being. One of the most striking examples, and which for the past decade has constituted a series of miscellaneous news items that have taken place mainly in Asia, is that of young people dying in cyber-cafes, after continuously playing online for days and nights. Their being is projected into the globalized and static synchronous world of the Network, while their forgotten body struggled in silence before finally collapsing due to immobility. Here is an extreme example of the projected being which knows how to silence the finite being until its destruction.

Now, without waiting for such fatal consequences, the same imbalance in the articulation is expressed today for everyone, at any moment. And this, through the overall modification of our relationship to the world and the possible sensory experiences that such a connection either allows or, on the contrary, neutralizes and conceals. Henceforth, what is "allowed" to be felt is that which can be uttered. According to Jean-François Lyotard, "for the animal that speaks, the most spontaneous treatment of perceptual space is writing, i.e. abstraction. Spontaneity leads to the construction of the field as a fragment of a system that 'speaks'"...[1] However, to utter the world is not exactly to describe it, and this is even more important nowadays.

Because if language can shape, deploy and even sublimate sensations and feelings, and thus intensify our relationship to the world by multiplying nuances, as literature shows, if it can even try to describe the indescribable by building bridges between two words to evoke an intermediate tonality, it also hides and obstructs any possible direct relationship to the world. This obstruction is more and more obvious as language loses its richness and the range of words making it possible to utter the world becomes scarcer. Let there be no misunderstanding: there is a strange relationship between the richness of the vocabulary and the ability to feel. There is, moreover, an affection, qualified as a personality trait and not as a pathology, called alexithymia, which denotes the difficulty of identifying and qualifying one's emotions. Alexithymia points to the complex relationship established between feeling and formalizing one's feelings, exposing the fact that not being able to express one's emotions is already not being able to feel them fully. It remains to be determined if alexithymia is not the preliminary step to generalized anesthesia of the synchronous world.

Because, in the Synchronous Network, it is less important to say than to signal. However, to signal is not to say, and even less to describe. It is not to perform a discourse, but to send a signal and signaling oneself. By producing or responding with standardized protocols and a grid of symbols and pictograms (a heart, a star, a thumbs-up, an emoticon), we share emotion but more important than that, we signal ourselves according to a standardized procedure.

In our reticular contemporary world, that is to say the world where the sense of performance has instilled itself in almost everything thanks to the World Human Network, there is now a trend: we systematically disqualify that which does not make a sign; more precisely, that which is not synchronized. In other words, that which does not make a sign according to a protocol that is simple enough to be used, transmitted and received (here, the technical constraints are not as important as the simplification and formatting of the message itself). Information saturation has led to a second age of the Network – the one where we clock in and out synchronously.

Projected space, the other space in which the being projects itself as infinite and unlimited, is precisely the space that summons the world beyond itself. This signifying outward motion, that goes beyond the local and mortal being, has long been associated with the worlds of the sacred, whose function was precisely to evoke the excess part of the being: the soul, life after or before death, ancestors and descendants, and sometimes the future of societies. However, the wave of modernity and its gradual recession, once the discourse of progress has been delivered, have left behind a foreshore deprived of almost everything that is sacred and mysterious. The territory of the sacred has been left fallow. It has been substituted by a glorification of the present moment through the Synchronous Network. The projected space of the utterable world has been almost entirely reduced to the signaling space, therefore to become ever-synchronous.

On the other hand, if the sensory is subject to the sign in the Synchronous Network, what could be the residual world of the failing sign, where nothing can be said, but everything can be felt, then? In the work of Belgian artist Francis Alÿs entitled The Nightwatch, a fox named Bandit is prompted to walk in the National Portrait Gallery at night in London. A parallel world opens up to us when we watch this work. A parallel world where there is no guided tour and where the paintings do not inspire enough interest to give us pause. The gallery sprawls and defines itself once more according to the way Bandit uses it and walks through it: In a certain way, it reveals the fox's own world.

One could simply consider this work as another reminder that every species evolves precisely in its own world, its environment, as Jakob von Uexküll showed more than a century ago. And it is indeed a reminder. Propelling Bandit into a space that can barely be reconfigured

2 Jakob von Uexküll Milieu animal et milieu humain, 1934, tr. fr., Paris, Rivages, 2010, p. 71

3 Peter Sloterdijk, Sphères 1 : Bulles, 1998, tr. fr., 2002, Paris, Fayard, « Pluriel », p. 522.

into an environment for a fox is an implicitly disturbing reminder of what Uexküll calls the "conventional fable of a universal space[2]. Man, like the animal, does not evolve into a homogeneous universal space but to quote James J. Gibson, into an "environment composed of substances with a greater or lesser substantiality, of a medium –the gaseous atmosphere – and of surfaces that separate the substances from the medium. "In this environment, the human being moves more precisely in his own world, defined by his faculties of perception and the possibilities of his actions and powers. However, one of the specificities of the human being is that he has managed to extend his powers and develop the environment beyond him. This is the meaning of the sentence by Peter Sloterdijk, who writes that "I am not [...], as the current systematists and bio-ideologists think I describe myself, a living creature in its environment; I am a soaring creature with which geniuses create spaces."[3]

The world in which Bandit is evolving is no longer completely ours. It is a world abandoned by man, a world without language, or more precisely, a world where our language is absent. And this world is hostile, in the sense that man has no place, because he has no more words. In any case, according to Hofmannsthal, "words are not of this world", that is to say, they never manage to give a true account of it, but always conceal and reveal it. This backward revelation resonates with the other side of that which is ineffable, which is no longer on the side of the animal, but of that of the contemporary man who has chased the geniuses away and moved them elsewhere to take refuge in the synchronous and eternal hyper-present, the time of the projected being.

In this economy of the hyper-present, there is a polarization of the sensory where language plays a strange game. On the one hand, there is the world of the expressible which is not quite the world of sharing but that of the exchange, or information about one another. It is the world of the community of the utterable, which has become, through accelerating, saturating and dismantling the language, the world of the synchronous dominant sign. On the other hand, there is the ineffable world of impressions, the infra-sensory, and emotions engulfed by the stream of consciousness. There is no opposition in principle between these two poles, which are only other representations of each other, but there is more to observe in the relations to the world, which based on one or the other of these poles and which work against those who pull from the opposite pole. The only possible distinction must be in terms of intensity of life, intensity of experiences, and use of the sensory.

The infra-lucid dynamics (in opposition to the extra-lucid that detects messages from sensory experiences), which explore and recognize the influence of a world that is ineffable (and yet produces affects, rather than signs), are

4 Ibid. p. 71.

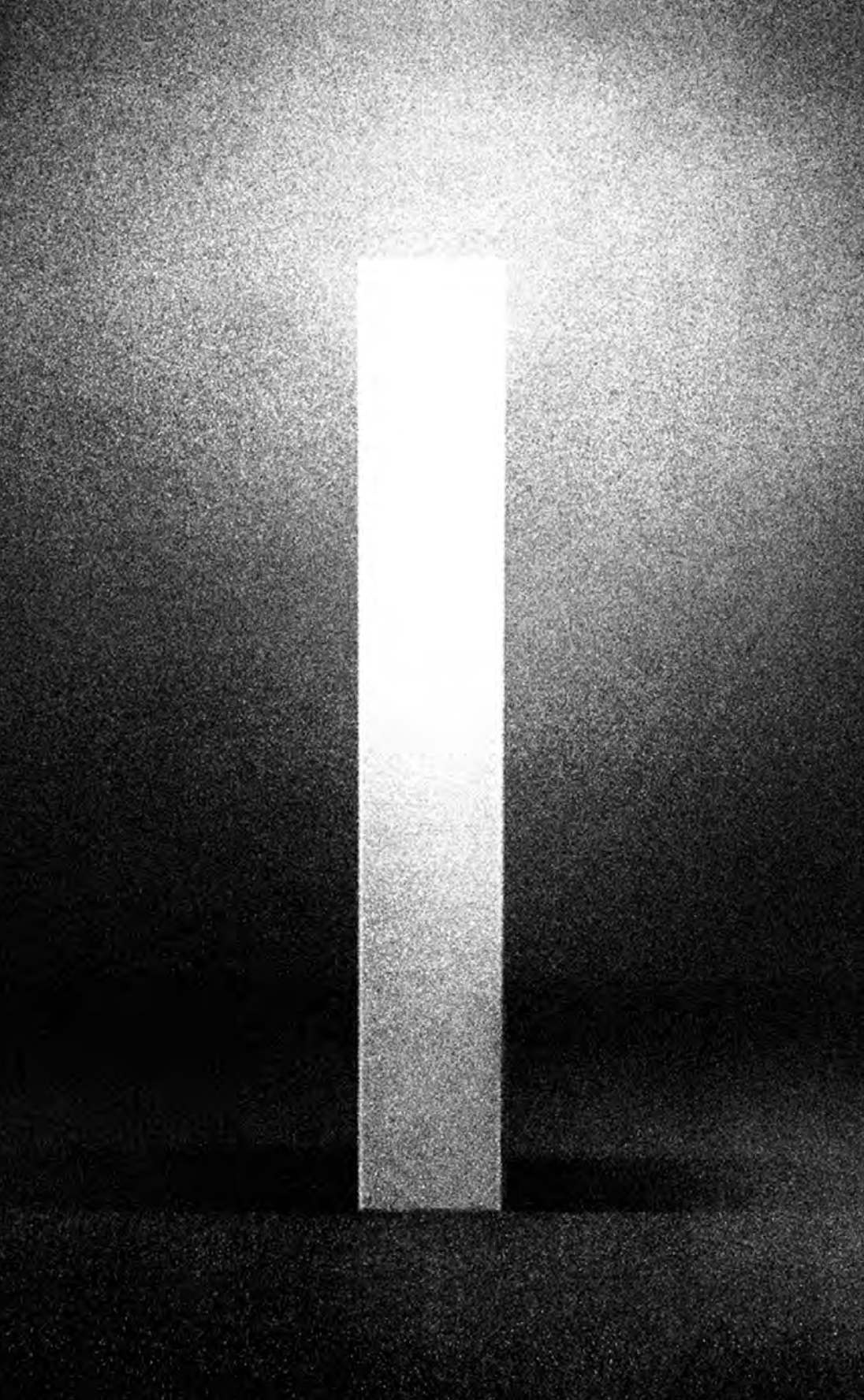
5 Paolo Virno, L'Usage de la vie, 2015, tr. fr. , Paris, L'Eclat, 2016, p. 11.

both revealing and inspirational. It is a question of delving into these other possible worlds as illustrated by the hybrid world in which Bandit evolves, in order to undermine the sensory and signifying structures which validate this "conventional fable of a universal space"[4] that is synchronous space. We then need to see "behind the fable", to use the expression of Michel Foucault, of this space, to delve into the chasm world. Let the silence fall. To reintensify one's relationship to the world as a finite being and to silence, to a certain extent, the projected being, the social being which constantly replicates experiences in order to live towards a synchronous matrix of narrative. It is no longer a question of reading or uttering the sensory through the Network, it is a question of using it.

For if, as Paolo Virno writes, using does not allow the isolation of the characteristic properties of a being, but identifies its "convenience, (or on the contrary, its resistance), to the current activity", and if "using is marked from one end to the other by the seal of interest, in the most literal sense of the term: inter-esse, inter-being",[5] it is through such use of the sensory that a relationship to the rebalanced world can expand.

We are never totally in the world in which we are in. Nor are we in an established environment – neither a purely synchronous dialectic space. We are in a hybrid environment that is always a bit magical, to use von Uexküll's terminology one last time, that is to say a world where the invisible shows up and where the imagination tries to prevent it as much as it can. We live in a world intersected by lines of force that call and signal towards other worlds. The chasm world, the infra-world, is the one that flourishes between these lines of force. Facing this, the world stands disarmed, static and synchronous.

Two antagonistic poles fight over the sensory experience of the world. One of these poles is synonymous with the pan-signifying and synchronous determination of the world as a constructed world, while the second, on the contrary, signals the sensory concealed beneath the threshold, the infra-sensory. From one pole to the other, all the becomings of the sensory experience, from the terrorizing experience to the anaesthetized over-coded perception, are gradually sprawling. And from one to the other, the double impossibility of language set against the two irreconcilable worlds of signs and chasms dissolves.



THE WORLDS OF ART AND SCIENCE

Reality and Experience in Architecture and Art

Juhani Pallasmaa

1 Gaston Bachelard, *The Poetics of Space* (1958) (Boston: Beacon Press, 1969).

2 Gaston Bachelard, *The Philosophy of No: A Philosophy of the New Scientific Mind* (New York: The Orion Press, 1968).

Gaston Bachelard was a philosopher of science until his mid-life, when he came to the conclusion that science does not - and cannot - say anything meaningful about the reality of lived life, the human life world and its existential meanings. This is the realm of sensory encounters, lived experiences and emotions, and it can be articulated and mediated only through artistic and poetic imagery. After this dramatic shift in his interest from science to poetics, Bachelard wrote significant books on the poetic imageries of air, water, earth and fire, as well as on dreams and reveries, and the imagination of matter. His book *The Poetics of Space* (1958)[1] became one of the most influential books in the architectural discourse of the past half a century. The continued interest in Bachelard's philosophy of poetic imagery reflects a yearning for the mental dimensions of building, which the dominance of professionalist rationality in the practice of architecture tends to eliminate. The threatened dimension is the existential meaning, its mental content and the mediation between ourselves and the world.

Altogether, the quasi-rationality of our culture tends to wipe away mental meanings, not to speak of the spiritual dimensions. Human culture has deviced three parallel approaches for the aspiration of meaning in the world and our existence in it: religion (and myth), science and art. The first seeks meaning through faith and primordial experience, the second through rational knowledge, and the third through sensory and emotional encounter. These three realms are independent paths of search, which cannot be fused into each other, and I intend to focus on the boundary and interactions of the worlds of science and art in.

TWO DOMAINS AND OPPOSITE DIRECTIONS

In his intriguing book *The Philosophy of No: A Philosophy of the New Scientific Mind*[2], written in 1949 at the time when his interests were beginning to shift from science to art, Bachelard explains the development of scientific thought as a gradual transition from animism through realism, positivism,

3 Ibid., 15.

4 Ibid., 16.

5 Lecture of William Gass in the series of philosophical conversations of the Washinton University in St Louis at the Pulitzer Foundation Library in 2002. The author's personal note.

6 Colin St John Wilson, "Public Good and Private Necessity", *RIBA Journal*, March 1979.

7 Jean-Paul Sartre, "What is literature?", *Jean-Paul Sartre:Basic Writings*, ed. Stephen Priest (London and New York: Routledge, 2001), 272.

rationalism and complex rationalism to dialectical rationalism.[3] This is the closed orbit of scientific thought in Bachelard's view. "The philosophical evolution of a special piece of scientific knowledge is a movement through all these doctrines in the order indicated", the philosopher argues.[4]

William H Gass, the American logician-philosopher-writer (1924 -2017) once suggested interestingly that the arts develop along the same route as science, but in the opposite direction away from rational, analytic and conceptual knowledge back towards an animistic encounter, existential knowledge and an embodied identification with the world.[5] This image of science and art moving along the same path of human consciousness to opposite directions is thought-provoking and worth remembering when discussing the interchanges between neuroscience and architecture, for instance, a widening interest today. In our current culture, which is undeniably developing away from the natural, ecological and lived sense of reality towards an increasingly fabricated and manipulated experience, art desires to turn back towards life and the lived reality, its forces and processes, away from the world of excessive rationalisation and conceptualisation. Artistic imagery works its way from the cerebral and analytic understanding back towards a mythical, existential and animistic grasp of the world and an individual mental identification with it.

Science evolves and communicates through ideational concepts and rational argumentation, whereas art addresses our bodily and mental being directly with lived images without concepts, definitions and proofs. Colin St John Wilson, the architect of the British Library in London, describes this non-ideational and embodied language vividly: "It is as if I am being manipulated by some subliminal code, not to be translated into words, which acts directly on the nervous system and imagination, at the same time stirring intimations of meaning with spatial experiences as though they were one thing. It is my belief that the code acts so directly and vividly upon us because it is strangely familiar; it is in fact the first language we ever learned, long before words, and which is now recalled to us through art, which alone holds the key to revive it"[6]

Whereas scientific thought progresses and differentiates, artistic thought seeks to return back to an undifferentiated and experientially unified, oceanic understanding of the world. Artistic imagination seeks expressions that mediate the complexities of human experiential encounters with the world through lived poetic images. They mediate complete existential experiences. "If the painter presents us with a field or a vase of flowers, his paintings are windows, which are open on the whole world", Jean-Paul Sartre writes.[7] The paradoxical task of fusing singularities and universalities is achieved through embodied images that are experienced and lived rather than reasoned and understood. It is painful to look at Tizian's painting *Flaying of Marsyas*

8 Paul Valéry, *Dialogues*, (New York: Pantheon Books, 1956), 94.

9 Jorge Luis Borges, *This Craft of Verse* (Cambridge, Massachusetts: Harvard University Press, 2000), 115.

10 Vida Katarina Vidovic, "The Abstract World Urn for Giorgio Morandi", *Juhani Pallasmaa, One week workshop,* Ljubljana, May 2015, Workshop Report (Ljubljana: University of Ljubljana, 2015), 55.

11 J.G. Ballard, *Crash Kolari* (Helsinki: Loki-Kirjat, 1996), 8.

(1570), in which Marsyas the Satyr is skinned alive in Apollo's revenge. The viewer feels his own skin being pealed off; this is a forceful bodily identification characteristic to artistic experience. We do not just watch or listen to a piece of art, it becomes part of our very being. The fact that we are moved by the cave paintings nearly thirty thousand years after their conception, is a proof of the magic power, the perpetual nowness and persistence of art. "An artist is worth a thousand centuries", Paul Valéry, the poet, declares[8], and the oldest rock art in Africa and Australia is already approaching the half age of the poet's prediction. Jorge Luis Borges suggests an even longer time perspective for artistic quality: "Beauty connects us with the eternal"[9].

Our quasi-rational materialist and disenchanted culture prioritizes cerebral understanding and knowledge over intuition and feeling, and regards science as a mediator of unquestionable and verified facts and truths, whereas art is commonly understood to convey mere subjectivities, emotions and sensory pleasures. Consumer culture even tends to regard art as mere cultural entertainment and spectacle. This dichotomy disappears, however, when we realize and accept that science and art are engaged in different dimensions of reality. The first investigation takes place in the world outside of ourselves (even in the case of the sciences of the human mind and the neural realm, the phenomena are studied outside and separate from ourselves as unique, living individuals), the latter directly in our experiential, embodied and mental reality, as well as the realms of memory, imagination and empathy.

Reality is another complex and arguable notion. Giorgio Morandi, the painter of metaphysical still-lifes, suggests provokingly: "Nothing is more abstract than reality"[10]. Here the painter points at the complexity and fundamentally mysterious nature of the concept and experience of reality. The same can be said about the notion of time. The forceful development of consumerist culture is making the concept of reality ambiguous. J.G. Ballard, the writer of the best-selling novel *Crash*, makes an interesting comment on the altered reality of our time. He argues that the relation of fiction and reality is in the process of beeing up-ended. As we live increasingly in technologized, economic, social, and aesthetic fictions, the task of the writer is not any longer to invent fiction. Fictions are already here, Ballard suggests, and the writer's task is now to re-invent reality.[11] Even the physical settings of our technologized consumer culture are loosing their sense of the real as they turn increasingly fictitious, aestheticized, unreal and dreamlike; just think of the ghostlike structures in our cities wrapped in opaque coloured glass, and totally without any existential meaning. We are living in deliberately fabricated stage sets for consumerist life, devoid of meaning. The dimension of architecture, which is especially endangered today is its existential meaning, the mental content in its experience. The task of architecture has never before in history been reduced to utility

12 Rudolf Wittkower, *Architectural Principles in the Age of Humanism* (New York: Random House, 1965), 117.

13 Alberto Pérez-Gómez, *Architecture and the Crisis of Modern Science* (Cambridge, Massachusetts and London, England: The MIT Press (1983), 1990), 298.

14 Hannes Meyer, "Building" (1928), in Claude Schnaidt, *Hannes Meyer Buildings, Projects and Writings* (Teufen AR / Schweitz: A Niggli, 1965), 94.

and economy, as its primary task has always been to mediate the human relationship with the world, between the gods and the mortals. As a consequence of this development towards the unreal, the task of the architect in strengthening our sense of the real, is as crucial as that of the writer. Our duty is to invent – or re-invent - a humane, existentially meaningful and dignifying reality, that is capable of continueing the human saga.

RATIONALISING ARCHITECTURE

Ever since the Renaissance time, there have been repeated efforts to turn architecture from an artistic and cultural craft into a scientific practice and a fully rationalized operation, based on a theoretical ground, measurable facts, and rational methods. Renaissance theories believed that through giving architecture a mathematical ground by means of associating it with the Pythagorean theory of musical harmony, this goal could be achieved. Indeed, in the Renaissance era, architecture became recognized in the *quadrivium* of the "mathematical arts" along with arithmetic (the study of numbers), geometry (the study of spatial relationships), astronomy (the study of the motions of celestial bodies), and music (the study of the motions apprehended by the ear).[12]

At the time of the Enlightment systematic attempts to turn architecture into pure and predictable rationality emerged through the vocabulary and syntax of a pre-determined language of building types. This is exemplified by Jacques-Nicolas-Louis Durand's *System of Architectural Elements*. Alberto Pérez-Gómez describes Durand´s intention in *Précis des Leçons d´Architecture* (1819*)*: "Because architecture was the most expensive of all the arts, it should not be whimsical or guided by prejudice or routine. In order to avoid wasteful expense, architectural design had to follow closely totally rational and immutable rules".[13]

Today there is a persistent line of thinking that wants to reduce architecture into performance, economy and aestheticized image. This approach necessarily implies the loss of poetic and existential meaning, and the reduction of architectural practice into a mere service profession satisfying only the desires of clients and investors.

The early Functionalist theories of the 1920s and 30s also presented efforts of turning architecture into a rationalized practice. Hannes Meyer's ultra-materialist equation ARCHITECTURE = FUNCTION x ECONOMICS demonstrates the extreme reductivist view, which is increasingly seen as a target again today.[14] Yet, Meyer's own creative talent gave rise to such passionately charged architectural projects as the Peterschule of 1926 in Basel, suggesting that in his design work Meyer was himself guided by artistic desires and intuitions rather than his rationalist theories. The same has to be

15 Aino and Alvar Aalto, "Mairea", project description, *Arkkitehti*, No. 9, 1939.

16 Aalto held two lectures in 1930 with the title "Non-Synthetic Aspirations in Architecture"; the lectures do not exist.

17 Alvar Aalto, "Interview", *Nidaros*, Trondheim, Norway, 28 June , 1930 in *Alvar Aalto The Decisive Years*, Göran Schildt (New York: Rizzoli, 1986), 195-6.

said of the touchingly humane and optimistic buildings of early Functionalism, in general. Modern architecture was altogether inspired and guided by ideas of modern art just as much as by any operational theories or scientific views. "It all began in painting", Alvar Aalto confessed, and revealed that his legendary Villa Mairea (1938-39) was inspired by spatial and formal ideas in modern painting.[15] The separation of architecture from its connections with the realm of the arts and human mental parameters is exemplified by today's fascination with algorithmic, digitalized and evidence based design. At the same time that the analytic interest is welcome, it projects a distrust in man's intuitive, imaginative and empathic capacities, the ground of the arts…

As understood in phenomenological philosophy, the outer and the inner, the material and the mental, constitute a continuum, and architecture is unavoidably part of our mental reality. Built structures express our very humanity and its historicity. They should not be dealt with as external and neutral objects or utilitarian and instrumental issues outside of ourselves and the realities of life. Like life itself, architecture is a complex and "impure" mixture of incompatible worlds, such as technological rationality and artistic expression, knowledge and belief, conscious intentionality and unconscious projection, and consequently, its very essence cannot be inclusively theorized or predicted. Architecture is not a result of a fully rational operation, as it is always also an expression of intentions and desires, beliefs and dreams. It facilitates concrete requirements, but it is always also a confession. It is a confession, wish and vision, as much as it is a result of reasoning and deduction. It fuses reality and dream, knowledge and desire. It is not just a vehicle for specific utilitarian purposes, as it also unavoidably shapes ourselves, our self-understanding. In the Jonas Salk Institute by Louis Kahn, for instance, it is not the architect's performative skill that moves and dignifies us, it is the unexplainable authority of the building and the metaphysical void of the courtyard, a space opening to the horizon of the Pacific ocean, that connects us with cosmic dimensions and sends shivers through our nervous system.

ARCHITECTURE AS A SYNTHESIS

As a young man, Alvar Aalto believed in the possibility of a purely rational architecture, and in the early 1930s he was even working on a book on "non-synthetic architecture".[16] "I do not believe that it is sensible to concentrate on synthesis in tackling an architectural assignment […] the Functionalist architect is an entirely different professional type from the old-style architect. In fact he is not an architect at all; he is a social administrator", Aalto said in an interview.[17] Yet, ten years later he made an exactly opposite statement with equal assurance: "Architecture is a synthetic phenomenon covering practically all fields of human activity. An object in the architectural field

18 Alvar Aalto, "The Humanizing of Architecture", *Alvar Aalto in His Own Words*, ed. Göran Schildt (Helsinki: Otava Publishing Company Ltd., 1997), 102-3.

19 Alvar Aalto, "Rationalism and Man", *Alvar Aalto in His Own Words*, op.cit., 91.

20 Alvar Aalto, "The Trout and the Stream", *Alvar Aalto in His Own Words*, op.cit., 108.

21 Richard Neutra, *Survival Through Design* (Oxford: Oxford University Press, 1954), 7.

22 Alvar Aalto, "Art and Technology", *Alvar Aalto in His Own Words*, op.cit., 174.

may be functional from one point of view and unfunctional from another […] If there were a way to develop architecture step by step, beginning with the economic and technical aspects and later covering the other more complicated human functions, the purely technical functionalism would be acceptable; but no such possibility exists […] Technical functionalism is correct only if enlarged to cover even the psychophysical field. That is the only way to humanize architecture.[18] As a result of his newly reversed ideology, Aalto began to speak of architecture as a synthetic aspiration and to theorize ideas of "extended rationalism" and "flexible standardization".[19] Aalto also saw the biological and neurological dimensions of architecture: "I would like to add as my personal, emotional view that architecture and its details are in some way all part of biology".[20] Four years later Richard Neutra extended the biological view to the human "nervous make-up". "Today design may exert a far-reaching influence on the nervous make-up of generations", Neutra professed.[21] Today, sixty years later, neuroscientists are studying these influences and interactions with today's extraordinary laboratory instruments and focused scientific thinking. Due to the enticing power of new technologies in research, the philosophical understanding of the nature of architecture as a fundamentally mental endeavour, is crucial as a guide to research and, especially, for the interpretation of the scientific findings in neuro-science.

ART, ARCHITECTURE AND SCIENCE

In his inaugural lecture entitled "Art and Technology", as the newly appointed member of the Academy of Finland in 1955, Aalto made his confidence in the artistic approach in architecture clear: "Almost every formal assignment involves dozens, often hundreds, sometimes thousands of conflicting elements that can be forced into functional harmony only by an act of will. This harmony cannot be achieved by any other means than art. The final value of individual technical and mechanical elements can only be assessed afterwards. A harmonius result cannot be achieved with mathematics, statistics, or probability calculus".[22] Aalto made this statement on the primacy of art over science in the context of architecture knowing that some of the most authoritative representatives of scientific thinking in Finland were present at his lecture. I am not speaking here of a primacy of art over science, or vice versa, I am pointing out their constitutive difference.

The relationships and interactions of science and art are still an ongoing discussion today. In our utilitarian culture science is usually judged to have a higher truth value, but there are also voices that see the meaning of art beeing closer to the realities of life. Vittorio Gallese, one of the discoverers of the mirror neurons, which have opened promising views into our

23 Vittorio Gallese and C Di Dio, "Neuroesthetics: The Body in Esthetic Experience", *The Encyclopedia of Human Behaviour*, Vol. 2, ed. V.S. Ramachandran (Amsterdam: Elsevier, 2012), 693.

24 Semir Zeki, *Inner Vision: An Exploration of Art and the Brain* (Oxford: Oxford University Press, 1999), 2-3.

unconscious pre-reflective and affective interactions with the world, expresses an unexpected view of the relationship between science and art. "From a certain point of view, art is more powerful than science. With much less expensive tools and with greater power of synthesis, artistic intuitions show us who we are, probably in a more exhaustive way with respect to the objectifying approach of the natural sciences. Being human squares with the ability to ask ourselves who we are. Since the beginning of mankind, artistic creativity has expressed such ability in its purest and highest form."[23] This statement by a humanist scientist is surprisingly parallel with Alvar Aalto's intuitive view 60 years earlier. Semir Zeki, the British neurobiologist, extends the realm of the intuitive artistic grasp to human neural phenomena: "Most painters are also neurologists […] they are those who have experimented upon and, without even realizing it, understood something about the organization of the visual brain, though with the techniques that are unique to them".[24] I see no reason to limit this argument of the artist's intuitive grasp of neural realities to visual brain alone. The artist cannot, of course, be a neuroscientist in the disciplinary sense of the science, but she can intuite aspects of the functioning of her neural networks. As we know now, the senses interact and collaborate and cross-modal interactions are not limited to the special phenomenon of synesthesia. An artist may not know anything about neuroscience, yet she may be able to live and intuit neurological correlations through her sensitized sense of existential causalities. This sensitivity to its own functioning must be considered a unique quality of our neural constitution.

It is evident that there are numerous areas and sub-questions in architectural design—that can and should—be approached through scientific knowledge and methodologies. Architecture has a double essence, functional and technical rationality, on one hand, and the existential mediation between the mind and the world, on the other. Even functional design does not only respond to the brief, as it actively choreographs and initiates action, and even the technical aspects can mediate poetic intentions. I do not underestimate the cognitive and rational ground of building design, but I wish that the human capacities of feeling, atmosphere, intuition, memory, empathy, compassion and imagination are not underestimated. Questioning the significance of computers in the various phases of project development today would be thoughtless. My argument is that as a deeply grounded cultural, mental and artistic complexity, an architectural proposition cannot be fully theoretically formulated and mechanically or digitally conceived. Thus, architecture must be grounded on "impure" and partial theories, and "hybrid" methods combining knowledge and precision with imagination and intuition. As a consequence of its complexity, architecture is bound to arise from an iterative and fused embodied action rather than mere rationality. There can well be theories and science-based rational aspects in the design process, but in its entirety the process is

25 José Ortega y Gasset, *The Dehumanization of Art and OtherEssays on Art, Culture, and Literature* (Princeton University Press, Princeton, NJ, 2013).

26 I learned the quote of Alberto Giacometti from a student in my workshop in Ljubljana in 2015, see note 9. Original source unknown.

iteratively synthetic, which was Alvar Aalto's view above. The architectural design process is guided by a subjective "self-piloting" action and an immersive embodied identification with the concrete task, that fuses rationality and emotion, knowledge and intuition, reality and imagination, instead of being an application of cerebral, methodical and predictable procedures. The design is not a logical path, as it contains repeated deviations, dead-ends, new beginnings, hesitations, temporary certainties and a gradual emergence of an acceptable goal as the result of the process itself.

All artistic works are essentially forms of questioning. In fact, questions and answers arise simultaneously in the poetic realm. Metaphorically, creative work is closer to hunting or fishing than a scientific project; you never know what you are going to catch, if anything. Due to the essential existential content of architecture, its design cannot be a smooth logical problem-solving process. This call for a hybrid approach, that is intuitively balanced, is also the demanding task of architectural education, but rarely understood in its full essence. In fact, the architect needs to understand all the three realms of existential meaning – faith, knowledge and emotion - mentioned in the beginning of this essay.

ART AS REPRESENTATION AND REALITY

One of the central developments in the art of the past one hundred years has been its distancing from its mediating representational function to become an increasingly autonomous and independent reality of its own. In his book *The Dehumanization of Art* of 1925, José Ortega y Gasset presented a thoughtprovoking idea concerning the shifting subject matter of art. In his view, the subject matter was first "things" or events (as in the art of Caravaggio and Velasquez), then "sensations" (as in the works of Cézanne and Picasso), and finally, "ideas" (as in modern and contemporary art).[25] Ortega's view actually suggests that art has approached science in its new ideational quality. However, "The object of art is not to reproduce reality, but to create a reality of the same intensity", Alberto Giacometti reminds us.[26] The historical development of art encompasses the emergence of abstraction and autonomy, the pluralisation of conceptions of reality as well as the increasing prominence of multisensory practices moving away from pure retinality towards full embodiment. These orientations also include the questioning of the artist's unique creativity (Marcel Duchamp, automatism, conceptual art), disengagement of the work of art from its frame and base and its transformation into an environment or part thereof (landscape and land art) and, lastly, atmospheric works whose essence lies in their multisensory, physical and emotive presence, rather than in representation (Olafur Eliasson). At the same time, art has accepted the multi-sensory

27 Albert Einstein, quoted in Richard Dawkins, op.cit..

28 Erich Fromm, source unidentified, most likely *Escape from Freedom* (1941).

29 The notion "dirty proof" was used by several lecturers at the conference "Simplicity – Ideals in Practice in Mathematics & the Arts", City University of New York, Graduate Center, 3-5 April, 2013.

30 Paul Dirac, "The Evolution of the Physicist's Picture of Nature", *Scientific American*, 208, nro 5 (May 1963), 45-53.

nature of human perception. In his works Richard Serra has activated our sense of weight, gravity and muscular experience, James Turrell has articulated experiences of light and enabled us to see "tactile light" and "old light", cosmic light that has travelled thousands of light years through outer space before hitting our retina; this experience even permits us to touch time and sense infinity and eternity. We may well be looking at the light of a planet that does not exists any more. A number of artists have also approached their field by means of scientific theories and methods, such as the members of the Light and Space Movement (most notably Robert Irwin and James Turrell), that emerged in the 1960s, and more recently the Islandic-Danish artist Olafur Eliasson, a later member of this movement.

THE MAGIC OF BEAUTY

The basic structure of Olafur Eliasson's works recurs from one piece to the next: a technical construction based on rational knowledge and deduction—an "experimental setup", in his own words—elicits a personal experience in the spectator. The artistic or poetic experiential reality is suspended between the work and the viewer's self. Often the experience reveals an unexpected dimension in the perception of physical reality, awakening a sense of ultimately inexplicable, mystical or poetic nature of the lived reality. The very clarity of the effort calls forth the hidden mysteriousness of our experiences. Even Albert Einstein made the surprising confession: "The most beautiful thing we can experience is the mystical. It is the source of all true art and science."[27] Here lies also the power of Louis Kahn's cosmic void at the Salk Institute. It is the sense of the mystical that is in the danger of being annihilated in our culture of consumption and quasi-rationality, the superstitions of our time, masked as rationality and reason.

It is evident that beauty is an ideal and aim in science and mathematics as much as in the arts. It also seems that in both science and art beauty is connected with ethical judgement. "Beauty is not the opposite of the ugly, but of the false", the social psychiatrist Erich Fromm claims.[28] Today mathematicians use the notion of "dirty proof" for a mathematical proof that has been achieved by immense computing power, but which cannot be judged and grasped by human senses and intelligence.[29] A dirty proof does not conform with the ideal of mathematical beauty.

Like Einstein, many other great scientists have seen an aesthetic criterion in their work and choices. Paul Dirac, the British theoretical physicist, who discovered the laws governing the quantum behaviour of the electron, believed that theories of physics that are beautiful are probably also true.[30] Herman Weyl, who developed the quantum and relativity theories, made an even more frank confession: "My work always tried to unite truth with

31 "In meiner Arbeit habe ich immer versucht, das Wahre mit den Schönen zu vereinen; wenn ich mich über das Eine oder das Andere entscheiden musste, habe ich stets das Schöne gewält". The quotationappears above the bust of Weyl located in the Hermann Weyl Zimmer at the ETH Zurich.

32 Semir Zeki, op.cit., 1.

33 For a thoughtprovoking discussion on beauty and autonomous aesthetic choise among animals, especially birds, see: Richard O. Prum, The Evolution of Beauty: *How Darwin's Forgotten Theory of Mate Choise Shapes the Animal World – and Us* (New York: Anchor Books, 2018).

34 Paul Valéry, "Eupalinos or the Architect", *Dialogues* (New York: Pantheon Books, 1956), 107.

35 Gaston Bachelard, *The Poetics of Space*, op.cit., 6.

the beautiful, but when I had to choose one or the other, I usually chose the beautiful".[31] Today Frank Wilczek, the Nobel Laureate theoretical physicist and mathematician, is working on theories of symmetry as the fundamental source of order and beauty in the physical and natural worlds. On the other hand, Semir Zeki has suggested "a theory of aesthetics that is biologically based".[32] Research on the evolutionary ground of aesthetic choice among animals can be expected to valorize our own environmental preferences.[33] As mentioned earlier, the connection of architecture and biology was already intuited by Alvar Aalto. Today, we are entering an age of biology on all fronts.

THE SHARED MISSION OF ART AND SCIENCE

Profound architecture strengthens our sense of the real, the reality of our experience, instead of leading us to a world of fantasy. However, this strengthened sense of reality also enables us to dream. The courtyard space of the Salk Institute sets us in the reality of the landscape, the view of the ocean and the changing weather and illumination, as if we were on a stage, but the clarity of Kahn's vision leads us to metaphysical contemplation. Indeed, Paul Valéry asks: "Is there anything more mysterious than clarity?"[34]

As Bachelard noted, the task of architecture is to allow us to dream: "If I were asked to name the chief benefit of the house, I should say; the house allows one to dream in peace […] the house is one of the greatest powers of integration for the thoughts, memories and dreams of mankind".[35] Through their scientific or alchemical nature, Eliasson's works remind us of the common mythical and historical origins of art and science in wonder, and the fact that earlier in history artists practiced both endeavours simultaneously. In fact, as long as science studied the reality observable by the human senses, the great artists were among the most significant scientists of their times, whereas closer to our time, especially many biologists were remarkable draftsmen and watercolorists.

Eliasson's work reminds us of the explorers in history of the mysteries common to science and art. Both practices were inspired and guided by a sense of curiosity and wonder. We can think of Filippo Brunelleschi verifying his theory of perspective in front of the Baptisterio in Florence; Leonardo da Vinci performing his nocturnal anatomy studies in a secret Florentine cellar room; Albrecht Dührer constructing a perspective image of a woman lying on the table in front of him, with his framed drawing device; Johannes Vermeer examining his model through a *camera lucida* in front of the window, so familiar to us in his paintings, and; Paul Cézanne contemplating the discontinuous transitions of horisontal lines resulting from his incessant staring at the still life on the table. We might also think of David Hockney today stooped over optical devices in his attempt to prove that scientific

36 Quoted in Richard Dawkins, "Bar Codes in the Stars", op.cit., 13. This quote has also been attributed to another poet, William Buttler Yates.

37 Maurice Merleau-Ponty, *Signs* (Evanston, Ill.: Northwestern University Press, 1982), 56.

instruments were used as technical aids by artists hundred years earlier than so far assumed. In order to prove his assumption, he has returned back to the use of the historical technical devices to practice his own art as his predecessors did more than four centuries before him. With the help of his numerous specially skilled assistants, Olafur Eliasson is also studying the mysteries of physics, as well as human perception and understanding, in order to create experiences that express truth, beauty and magic, all at the same time.
Science and art can be seen as opposite, perhaps even mutually exclusive approaches to reality, as Bachelard did. Science has occasionally even been accused of robbing the world of its sense of magic and poetic wonder through offering explanations that only appeal to reason. In 1817 the poet John Keats blamed scientists like Isaac Newton for destroying the poetry of the rainbow.[36] However, we need not to be supporters of either science or art, as we can have confidence in both realms, each one with its own specific intentions and tasks. I do not believe that neuroscience could destroy the poetry of architecture. Do not science and art ultimately both approach the mysteries of the world, human consciousness and understanding, and the enigma of our existence in the world? "How would the painter or the poet express anything other than his encounter with the world", Maurice Merleau- Ponty argues, and this argument surely applies to the scientist and architect as well.[37]

An earlier, more brief, version of this essay was published in the first issue of the *Intertwining* Journal, Venice, 2018. A version of the essay was also given as a lecture in August 2018 entitled "Between Art and Science: reality and experience in architecture and art" at the New School of Architecture and Design in San Diego, California in the summer course on Architecture and Neuroscience.

APPEARANCES AND PHENOMENA

Michael McGarry

1 Ungers, O.M. 1982. Morphologie / City Metaphern. Köln: Walter König.

2 Auerbach, Erich and Edward W. Said. 2013. *Mimesis The Representation of Reality in Western Literature*. Princeton and Oxford: Princeton University Press.

3 Barthes, Roland. 1977. "The Death of the Author" in *Image Music Text*. London: Fontana Pess.

O.M. Ungers' wonderful atlas of phenomena *Morphologie / City Metaphors Morphologies*[1], communicates through paired images and nouns in English and German. Each two-page spread directly provokes six potential relationships between images and words; the wonder being the transferability across scale and medium, phenomena as universal metaphors represented through appearance and overlaid by the cultural specificity of language. The book is a pleasure of representations.

Auerbach and Said's seminal work on mimesis[2], positioned likeness as central to representation in western European culture. First photography and now virtual reality has disturbed the assumed value of likeness as the means of coming to terms with the world. The limitations of this are now apparent in the digital experience of the work relative to that imagined. The hand-drawn sketch has the attribute of possibilities, the computer drawing the certainty of but one. Ungers' atlas of representations directly evidences the potency of the gap between underlying thought and its particular manifestation.

Representation is a creative phenomenon of displacement, an imaginative space between two positions, provoking and allowing for engagement and advance. Artistic practice determines the relationship between the artist and her/his work, while hermeneutics (interpretation in the widest sense) determines the onlooker's engagement. These processes of engagement are (separately) relational and with significant elements of reciprocity - in other words we are affected by that which we perceive such that our perception is further altered; 'separately' as suggested by Barthes[3] in that the engagement of author and reader is through the work and not between author and reader.

The practitioner develops through action within her/his discipline, that very action informing future practice. For some, this action takes place at multiple remove from the ultimate incarnation. Architecture is an obvious example, architects speculate, posit, imagine remotely before persuading and informing others to build. The point applies to all artistic practice, we operate at some remove, and are influenced by our response to that which we confront. Our perception is predicated on the present representation of a

4 Schon, Donald A. 2011. *Displacement of Concepts*. London and New York: Routledge.

5 Schon 2011, 31-33

7 Van Schaik, Leon. 2015. *Practical Poetics in Architecture*. Chichester: Wiley

6 Lawson, Brian. 2006. *How Designers Think*. New York and London: Routledge

8 Mallgrave, Harry Francis. 2011. *The Architect's Brain Neuroscience, Creativity and Architecture*. Chichester: Wiley-Blackwell

9 Zeisel, John. 2006. Inquiry by Design. New York London: W.W.Norton & Company

10 Zeisel 2006, 30

11 Arendt, Hanna. 2019. xxii "Introduction Walter Benjamin: 1892-1940". In *Walter Benjamin, Illuminations*, translated by Harry Zohn. Boston and New York: Mariner Books.

future condition. In psychology, displacement is understood as the purposeful redirection of an emotion or impulse from its original object to another.

Gadamer's *horizons* and Bordieu's *habitus* provide parallels; both originate in Heidegger's spatial ontology, both understand experience and existence through spatial phenomena where further insight is acquired at the edges of that which is known. The underlying human impulse is to understand the world through what we know, we exist in a liminal condition, relieved only by the prospect of future speculation and knowledge. David Schon's[4] elegant explanation as to how new knowledge forms is useful. He gives two opening historical explanations, firstly that new concepts form by revelation (implicitly divine) or secondly that that which appears new is simply a rearrangement of the preexisting (as in reducivist). The former (divine) is of little use to most of us and the latter does not explain the very real evidence we have of advance in thought and knowledge.

Instead, and by way of elaboration, Schon posits the situation of entering into a metal room with a thin wall that reverberates whenever it is jarred[5]. The thought arises that the room is a kind of a drum but there is also the reciprocal process, that the original concept (the drum) is now reimagined by virtue of its momentary transference to the room. Design and artistic practice is typically non-linear, iterative, associative, suggestive, sometimes resonant and often metaphorical. This relatively recent understanding was founded on the empirical evidence from observed design processes rather than how it had been theorised or rationalised (Schon, Lawson[6], Van Schaik[7], and others), and has been relatively recently confirmed in advances in neuroscience (Mallgrave[8] and others) where the importance of non-linear neural linkages is now accepted. Simply put, the character of much of our brain activity is associative rather than causal, reciprocal rather than linear, nimble rather than consistent.

The intellectual lineage is clear, originating in Dewey's philosophical pragmatism and his learning by inquiry, followed by Schon specific identification of the generative metaphor and his theory of displacement of concepts, and Zeisel's[9] identification of the occurrence of conceptual gaps in creative practice. The last is important, the paradigm shift made possible through generative metaphor[10].

In the English language the correspondence between the adjectives figurative and metaphorical is significant. We speak metaphorically or figuratively referring to an understanding or experiencing of one kind of thing in terms of another. Hannah Arendt (referring to Walter Benjamin) wonderfully referred to metaphors as the means by which the oneness of the world is poetically brought about[11]. Figurative of course has a second meaning as representing forms that are recognisably derived from life, from the figure, and particularly from the human figure; the semantic implication being that

12 Pallasmaa, Juhani. 2012. *The Eyes of the Skin*. Chichester: Wiley

13 Panofsky, Erwin. 1991. *Perspective as Symbolic Form*. New York: Zone Books.

14 Panofsky 1991, 53-54

15 Panofsky 1991, 67-72

16 Greenberg, Clement. 1961. "Modernist Painting" in *Arts Yearbook Volume 4*. New York: Art Digest

17 Foucault, Michel. 2011. *The Object of Painting.* London: Tate Publishing

18 Foucault, Michel. 2001. "Chapter 1, Las Meninas" in *The Order of Things: Archaeology of the Human Sciences.* London and New York: Routledge.

figure is an essential metaphor rooted in our psyche as humans and at the root of our negotiation with the world. Pallasmaa writes "understanding architecture implies the unconscious measuring of an object or a building with one's body, and projecting one's bodily scheme on the space in question"[12].

This negotiation is played out through embodied experience, meaning both our presencing of where we are and our sensory capacities. In situations where we are at one remove, our experience is realised through the imagined presence and experience of others; the metric is the figure, our own, or vicariously through that of others, or indeed through objects.

Panofsky in *Perspective as Symbolic Form*[13] charted where early spatial representations were made possible by and between human figures and goes on to observe medieval attached sculpture (set within its own niche as a consequence of its carving), and the subsequent evolution into renaissance perspectival space with which we are now familiar. Panofsky linked representation with understanding and understanding with self-awareness through existential and cultural identity. His observation in respect of spaces formed in medieval relief work, was that this of course matched the contemporary conceptualisation of earthly space as being contained, defined and finite - hence the appropriateness of the trapped space and figure; unlimited space was a preserve reserved for the Almighty.[14]

Panofsky's slim tome identified that retrospective representations of self are predicated on both how and where we see ourselves; the *what* and *where* of human existence being inseparable. He also articulated the reciprocal, that our future negotiation with the world is indeed influenced by those very representations.[15]If existence is spatial then the representation of space is an acute concern.

Greenberg[16] made the neat observation that modern art was preoccupied with the very process of the depiction of space (depth) using two dimensions (the flat canvas). Greenberg interpreted this as an ethical imperative for the modernists, a coming to terms with reality, in opposition to the suspect illusionism of pictorial tradition of western Europe.

Manet's paintings sustain Greenberg's argument with space ruthlessly frustrated in its depth, subtended between figures, perspective distorted or avoided, an overall flatness prevailing. Yet earlier, Velazquez played equivalent games of depth of field where indeed the viewer is enveloped in the optical framework, destroying object/viewer polarities. Manet and Velazquez were preoccupied by the phenomenon of spatial depth as depicted in two dimensions and were therefore of sustained interest to Michel Foucault [17/18] for whom the representation of space was a critical epistemological pursuit, as with Panofsky.

Frank Stella the American painter lamented the absence of spatiality from twentieth century abstract art and struggled in his own

19 Stella, Frank. 1986. *Working Space*. Cambridge and London: Harvard University Press.

20 Carravagio's *Calling of St Matthew.* https://en.wikipedia.org/wiki/The_Calling_of_St_Matthew_%28Caravaggio%29#/media/File:The_Calling_of_Saint_Matthew-Caravaggo_(1599-1600).jpg

21 Stella 1986, 11-12 and 143-144

22 Scolari, Massimo. 2015. *The Jesuit Perspective in China*. Cambridge and London: MIT Press

work to find depth close to the surface of the canvas without recourse to the comfort of pictorial illusion. In *Working Space*[19] he recognises similar concerns in the work of Caravaggio[20], Carracci, and post-cubist Picasso; work where space is established between the painted figures yet compressed relative to the plane of the canvas[21].

While western Europe moved from murals to framed panel and canvas, from shallow to deep space and then resurfacing or (flattening) with late modernism, China continued a tradition of the painting as narrative or more accurately narratives, without either single viewpoint or vanishing point, without perspectival diminution, depiction not within a frame but on a continuous scroll. Manet's indebtedness to Japanese printmaking is evidenced in his spatial sensibility, his use of frontal flat colour, and the liberties taken with the conventions of optical perspective notwithstanding his eschewal of both narrative and larger landscapes.

The conflict between these traditions of east and west is highlighted in the account of the Jesuit's arrival in China in the Scolari's *Oblique Drawing*[22]; renderings that functioned to successfully persuade in Europe were considered as absurd distortions by the Chinese, again an affirmation of Foucault's position that in addition to cultural significance, the representation of space through figure was of epistemological significance. In larger landscapes and spaces beyond the dimension of conversation, human presence as metric adopts different guises. Narratives of sequence, time, and travel were used to map the incomprehensible by the pioneers, the European pilgrims, and the native Australians' walkabouts represented in their extraordinary planar images.

Systemic poverty limited cultural development in Ireland to talk, music, and ultimately text; language (particularly when borrowed from an overlord) became instrumental in a sophisticated survival made possible through guile, wit and irony. Irish aural and oral traditions are immensely strong with consequences for a particular spatiality, space delimited/understood by the topographical relationship between conversing characters, and secondly the prolific use of the descriptive narrative with place being defined through its occupation. The former echoes the concerns noted above (Panofsky, Manet, and Stella), the latter a nod to Gadamer. The reference to character rather than figure is important, character absorbs personality, a presence beyond objective material presence.

Before the arrival of cinema, Irish society's exposure to picture making was mainly through religious iconography. The Protestant scepticism for the visual left the imaginative field open to the Catholic churches each of which had its obligatory fourteen stations of the cross and (commonly) one or more stained glass panels, the extent of the latter being a measure of local wealth. The stations of cross are a spatial reconstruction of the path taken by

"Views of Westport House" by George Moore.
From left to right: West View and East View.

Both images courtesy of Siobhan Sexton Mayo County Council with the consent of Lady Sheelyn Browne.

23 Henry, Paul. 1920. *Errigal Donegal*. https://imma.ie/collection/errigal-co-donegal/

24 Keating, Sean. 1929. *Nights's Candles are Burnt Out.* https://artuk.org/discover/artworks/nights-candles-are-burnt-out-90693

25 Dillon, Gerard. 1946. *The Little Green Fields*. https://www.nationalgallery.ie/art-and-artists/exhibitions/shaping-ireland-landscapes-irish-art/education-programme-shaping-1#na

26 O'Brien, Flann. 2007. "The Third Policeman" in *The Complete Works*. New York London Toronto: Everyman's Library.

Jesus Christ on the day of his crucifixion and depict events and places within this defined narrative. The stations are distributed around each church, are experienced sequentially, viewed from below and at relatively close distance. The available techniques of marquetry, carved or painted wood, combined with the imperative of the narrative, produced distortions of perspective typically resulting in severely foreshortened and compressed space. As in Panofsky's observations, the spatiality is articulated through the device of the ensemble of figures. The second cultural exposure to compressed space (physical rather than depicted) was the confessional, a tiny dark cubicle of black darkness aiding anonymity, a space to seek relief from past misdemeanours and from which to escape absolved into the dim light of the church.

Picture making for the Irish land-owning class focused on portraiture with the spatial depictions favouring landscape rather than interiors. These paintings of landscape tended to be frontal, tonal, concerned with silhouette, a limited spatial depth achieved by layering. The beautiful twin *Views of Westport House* (1761) by George Moore are among the richest spatial descriptions, two planar views (more accurately *aspects*), recto and verso, the landscape predicated on the existence of House, depicted within a formal language of book and picture; the House as ersatz figure. The landscape idiom continued into the twentieth century with Paul Henry's wonderful silhouettes of the west of Ireland[23] where depth is subtlety suggested by colour tone. Seán Keating's publicly commissioned paintings for the new Irish state[24] reveal their cultural origin in Ireland's religious picture-making and particularly in the formal construction and depiction of depth in the ubiquitous stations of the cross. Gerard Dillon achieved something similar and tackled landscape using the most planar of viewpoints, eschewing perspective and imagined as seen from the air[25]. The relationship between figures as a device of spatial articulation and marking is as with Carravagio - expansive in the lateral and vertical axes but compressed in the third dimension at right angles to the canvas.

The Irish landscape is a narrative of places of habitation, event, and local feature, articulated through human presence, and understood through its representations (visual and aural) as much as through its direct experience. Myth is a particular representation of a narrative, an attempt to explain the inexplicable through the collapse of time and physics, phenomena revealed. Reciprocal translations also apply (as in Shon's example of metaphor), specifically the influence of a culture of visual representation on that of the written narrative.

Brian O'Nolan (1911-66) was an Irish author, surrealist in all but name working under multiple pseudonyms, a liver of two or more lives. As Flann O'Brien he penned *The Third Policeman*[26](1967), an epic romp through imagined spaces and occasions, a twisted commentary on Irish social life in the first half of the twentieth century. Obliquely, the book is concerned with the gap between the appearances of things and their meaning, appearances in his

27 O'Brien 2007, 265-266

case being those of phenomena. In the novel, the main protagonist murders, and then enters some circular sequence thereby returning to a police station that inhabits the thickness of a wall. The first appearance of the police station is as planar apparition in other words, frontal as if in a drawing.

> As I came round the bend of the road an extraordinary spectacle was presented to me. About a hundred yards away on the left-hand side was a house which astonished me. It looked as if it were painted like an advertisement on a board on the roadside and indeed very poorly painted. It looked completely false and unconvincing. It did not seem to have any depth or breadth and looked as if it would not deceive a child.
>
> That was not in itself sufficient to surprise me because I had seen pictures and notices by the roadside before. What bewildered me was the sure knowledge deeply-rooted in my mind, that this was the house I was searching for and that there were people inside it. I had no doubt at all that it was the barracks of the policemen. I had never seen with my eyes ever in my life before anything so unnatural and appalling and my gaze faltered about the thing uncomprehendingly as if at least one of the customary dimensions was missing, leaving no meaning in the remainder…
>
> I kept on walking, but walked more slowly. As I approached, the house seemed to change its appearance. At first, it did nothing to reconcile itself with the shape of an ordinary house but it became uncertain in outline like a thing glimpsed under ruffled water. Then it became clear again and I saw that it began to have some back to it, some small space for rooms behind the frontage. I gathered this from the fact that I seemed to see the front and the back of the 'building' simultaneously from my position approaching what should have been the side. As there was no side that I could see I thought the house must be triangular with its apex pointing towards me but when I was only fifteen yards away I saw a small window apparently facing me and I knew from that that there must be some side to it. Then I found myself almost in the shadow of the structure, dry-throated and timorous from wonder and anxiety.[27]

28 O'Brien 2007, 387-388

Access is achieved by the device of a window sash, swung effortlessly and without resistance (physical or intellectual) into a third dimension, confounding the flatness of the apparition:

> He then turned sharply in towards the house and made for a small window which looked to me unusually low and near the ground. He flashed a torch on it, showing me as I peered from behind his black obstruction four panes of dirty glass set in two sashes. As he put his hand out to it I thought he was going to lift the lower sash up but instead of that he swung the whole window outwards on hidden hinges as if it were a door. Then he stooped his head, put out the light and began putting his immense body in through the tiny opening. I do not know how he accomplished what did not look possible at all. But he accomplished it quickly, giving no sound except a louder blowing from his nose and the groaning for a moment of a boot which had become wedged in some angle. Then he sent the torchlight back at me to show the way, revealing nothing of himself except his feet and the knees of his blue official trousers. When I was in, he leaned back an arm and pulled the window shut and then led the way ahead with his torch…
>
> The dimensions of the place in which I found myself were most unusual. The ceiling seemed extraordinarily high while the floor was so narrow that it would not have been possible for me to pass the policeman ahead if I had desired to do so. He opened a tall door and, walking most awkwardly half-sideways, led the way along a passage still narrower. After passing through another tall door we began to mount an unbelievable square stairs. Each step seemed about a foot in depth, a foot in height and a foot wide. The policeman was walking up them fully sideways like a crab with his face turned still ahead towards the guidance of his torch. We went through another door at the top of the stairs and I found myself in a very surprising apartment. It was slightly wider than the other places and down the middle of it was a table about a foot in width, two yards in length and attached permanently to the floor by two metal legs.[28]

Unlike the devices of spatial release in the work of C.L. Lewis or J.K. Rowling, O'Brien's revealed spaces remain compressed, indeed squeezed, and occupied. The unfolding of the police station is through its occupation by figure(s), the presence and movement of the two corporeal entities, the narrator and the

29 O'Brien 2007, 380

enormous Sergeant Pluck (the policeman's bulk magnifying the tightness of the occupied space).

In the book the bicycle takes on the attributes (and indeed gender) of its previous owner and is the device of spatial engagement with landscape, collapsing distance and time, reducing all to its own metric. The displacement of personality from person to bicycle provides the means of spatial discovery:

> I led the bicycle to the middle of the road, turned her wheel resolutely to the right and swung myself into the centre of her saddle as she moved away eagerly under me in her own time.
>
> How can I convey the perfection of my comfort on the bicycle, the completeness of my union with her, the sweet responses she gave me at every particle of her frame? I felt that I had known her for many years and that she had known me and that we understood each other utterly. She moved beneath me with agile sympathy in a swift, airy stride, finding smooth ways among the stony tracks, swaying and bending skilfully to match my changing attitudes, even accommodating her left pedal patiently to the awkward working of my wooden leg. I sighed and settled forward on her handlebars, counting with a happy heart the trees which stood remotely on the dark roadside, each telling me that I was further and further from the Sergeant.[29]

Space has two manifestations within O'Brien's *The Third Policeman*, the first is material, substantive, activated by figurative presence, enclosed, its phenomenological genesis being the occupied cave; the second is ephemeral, temporal, thin, restless, momentary, layered, frontal, activated by movement, its genesis being the journey. Both manifestations operate through corporeal agency, one directly, the other vicariously in the form of the bicycle.

Our presence is central even in our absence.

THE DIAGRAM AS AN ABSTRACT MAP

Georges Teyssot

1 *The Diagrams of Architecture: AD reader*, Mark Garcia, ed., (Chichester: Wiley, 2010).

2 Georges Teyssot, with Samuel Bernier-Lavigne, « Forme et information. Chronique de l'architecture numérique, » in : *Action Architecture*, (dir.) Alain Guiheux, (Paris, Éditions de la Villette, 2011), 49-87.

3 Manuel De Landa, "Deleuze and the Use the Genetic Algorithm in Architecture," *Architectural Design*, 2002 Jan., vol.72, no.1, 9-12; reprint: Id., in *Contemporary Techniques in Architecture*, Ali Rahim, ed., (London / New York: Wiley-Academy, 2002), 9-12; reprint: Id., *Rethinking Technology. A Reader in Architectural Theory*, William W. Braham, Jonathan A. Hale, eds., (London & New York: Routledge, 2007), 407-412.

5 Gilles Deleuze, *Difference and Repetition*, trans. Paul Patton (New York: Columbia University Press, 1994), 36.

4 Topology, a branch of mathematics, studies the property of objects that are preserved through continuous deformation, such as bending, twisting or stretching. It can be used to study the inherent connectivity of objects in any dimensional space, while ignoring their detailed form or shape. Topology studies the characteristics of figures, or topological surfaces, such as the Klein bottle, the Möbius strip, or the torus.

Whether graph or chart, the architectural diagram is today an ubiquitous presence. As graphic inscription of abstraction in space, since the 1990s, the notion of diagram has been so much extended that now it nearly encompasses every aspect of design. To think of the diagram as an architecture of ideas, (or, more classically, the idea of architecture), means to be still ensconced in some sort of platonic conceptions.[1] To avoid this trap, a first step would be to turn to Gilles Deleuze's notion of the diagram as an abstract map, and to show how the model acquires its meaning, specifically when confronted with biological paradigms. Such understanding may lead to a better comprehension of the present algorithmic nature of diagrams. These scripted procedures refer to form, or, more precisely, to processes of morphogenesis. Their aim is to enhance a modulation between natural components, physical elements, and architectural design. A range of practices (or protocols), based on adaptable (customable) software, capable of producing changing modalities of a structural topology driven by performance, are currently available.[2] For instance, addressing the issue of the use of genetic algorithm in design, Manuel De Landa, inspired by Deleuze's work, has proposed to introduce three theoretical levels of complexity: to think in terms of population (not the individual); to think in terms of differences of intensity (thermodynamic and entropic); lastly, to think in terms of topology.[3] The question addressed here will be therefore to know if (and how) the diagram is able to topologise the various fields of design.[4]

MORPHOGENESIS

As Deleuze writes in *Difference and Repetition* (1968), we live in a world dominated, by "a completely other distribution which must be called nomadic, a nomad *nomos*, without property, enclosure or measure."[5] The problem today is no longer the distribution of things and division of persons in sedentary spaces, "but rather a division among those who distribute *themselves* in an open space – a space which is unlimited, or at least without

6 Deleuze, *Difference and Repetition*, 36.

7 Ibidem, 37.

8 Ibidem, 225.

9 Ibidem, 224.

10 Ibidem, 225 and 229. Georges Teyssot, "Gilbert Simondon's Key Points", foreword, viii-xxii, in *Instabilities and Potentialities, Notes on the Nature of Knowledge in Digital Architecture,* Chandler Ahrens, Aaron Sprecher, eds., (New York and London, Routledge, 2019).

11 Anne Sauvagnargues, *Deleuze et l'art*, (Paris : Presses universitaires de France, 2006), 88-89.

12 Gilles Deleuze, "On Gilbert Simondon," in: Id., *Desert Islands and Other Texts, 1953–1974* (New York: Semiotext(e), 2004), 86-9.

13 Deleuze, *Difference and Repetition*, 208-209.

14 Sauvagnargues, *Deleuze et l'art*, cit., 90.

15 Deleuze, *Difference and Repetition*, 214.

16 Ibidem, 216.

17 Ibidem, 214.

precise limits. … To fill a space, to be distributed within it, is very different from distributing the space."[6] The leap from sedentary structures of representation to nomadic distribution, brings unsettling difficulties, transcending all limits, and deploying "an errant and even 'delirious' distribution".[7] Sedentary distributions, good sense, and common sense, are all based upon a synthesis of time, which has been determined as that of habit.[8] On the other hand, nomadic structures lead to "mad repartitions …, mad distribution – instantaneous, nomadic distribution, crowned anarchy or difference."[9] Such is the state that physics described in thermodynamics, from Sadi Carnot to Rudolf Clausius and Ludwig Boltzmann (whose equation described the diffusion of gas particles on a statistical method): that is, entropy.[10]

For Deleuze, it is necessary to recognize the primacy of multiple forces upon the form. In *Difference and Repetition*, he identifies this link between forces and forms as the two vectors of difference, using Henri Bergson and Gilbert Simondon as sources.[11] For Simondon, the individuation of the crystal is the physical formation obtained by a difference in potential. This difference is the entropic arrow between tension and matter (as in a crystal).[12] Deleuze translates this differentiation in terms of oscillation, a simultaneous vibration between the actual and the virtual, which are coexistent. Overcoming Bergson's opposition between matter and duration, he transposes the arrow of intensity into a model of the coexistence of the virtual and the actual.[13] Both states are real, but the actual characterizes the completed individual, such as the materialized crystal, while the virtual refers to the problematic field of the pre-individual, when the intensive differentiation is not yet actualized. To illustrate this, Deleuze, following Simondon, uses the model of an egg, the paradigm of an intensive body, literally a body without organs, because it is a body going through phases of differentiation.[14]

Actualization occurs in things through a process of differentiation. Embryology shows that the division of an egg into parts is secondary in relation to more significant morphogenetic movements. Deleuze describes the kinematics of an egg, going through its various processes.[15] The differentiation of species and parts presupposes a whole set of spatio-temporal dynamics: "The entire world is an egg."[16] However, if the world is an egg, then the egg itself is a theater: a stage with actors, spaces, and ideas, and where a spatial drama is played. To substantiate this conclusion, Deleuze employs multiple sources, including Étienne Geoffroy Saint-Hilaire's thesis on the kinetics of the fold; and Karl von Baër's hypothesis on morphogenetic movements, including the stretching of cellular layers, invagination by folding, and the orientation and axis of movement, all to be found in the kinematics of the egg.[17] In addition, Deleuze mentions Charles Manning Child's gradient theory, which offered a framework for thinking about formal arrangement, and Paul Weiss's paradigm of amphibian

18 Ibidem, 250.

19 Jakob von Uexküll, *A Foray into the Worlds of Animals and Humans: with a Theory of Meaning*, trans. Joseph D. O'Neill, [*Streifzüge durch die Umwelten von Tieren und Menschen*. 1921. English], (Minneapolis: University of Minnesota Press, 2010).

20 Raymond Ruyer, *La Genèse des formes vivantes*, (Paris : Flammarion, 1958), 140; Sauvagnargues, *Deleuze et l'art*, cit., 173, 185.

21 Translation: Raymond Ruyer and the Genesis of Living Forms; in: http://fractalontology.wordpress.com/2007/09/22/raymond-ruyer-and-the-genesis-of-living-forms-knowledge-and-structure/#comments

22 Deleuze, *Difference and Repetition*, 216, 330; see Fabrice Colonna, *Ruyer*, Paris, Les Belles Lettres, 2007.

23 Deleuze, Ibidem, 222-223, 228-229, 240-241; Sauvagnargues, *Deleuze et l'art*, cit., 90.

24 Deleuze, Ibidem, 250-251.

25 Albert Dalcq, *L'œuf et son dynamisme organisateur* (Paris: Albin Michel, 1941).

26 D'Arcy Wentworth Thompson (1860-1948), *On growth and form*, [1917], (Cambridge: University Press; New York: Macmillan, 1942); Id., *On growth and form*, new edition, (Cambridge, UK, The University Press, 1944); id., *On growth and form*, (Cambridge : Cambridge University Press, 1966).

27 Albert Dalcq, "Form and Modern Embryology," in Lancelot Law Whyte, *Aspects of Form: a Symposium on Form in Nature and Art* (London: Lund Humphries, 1951); published in collaboration with the Institute of Contemporary Arts (ICA) to coincide with the exhibition "Growth and Form," London, Summer 1951, the title of which was inspired by the new edition of D'Arcy Wentworth Thompson, *On Growth and Form* [1917] (Cambridge, UK: The University Press, 1944).

gastrulation, presented in his 1939 book *Principles of Development*, which elucidates how morphogenetic processes were capable of shaping form.[18]

In philosophy, the main source was the work of Raymond Ruyer, who, inspired by Jakob von Uexküll's etiology,[19] had elaborated a philosophy of differentiation already in 1939. For Ruyer, in every domain, form is endowed with a proper rhythm.[20] In his 1958 book, *The Genesis of Living Forms*, Ruyer discusses the spatio-temporal dynamism in cellular migration and makes a distinction between morphology and morphogenesis: "Morphology, the study of forms and their arrangements, … does not present any fundamental difficulty", because it relies on vision and description, while morphogenesis, "presents … the maximum of difficulty and mystery."[21] If Deleuze acquired ideas about spatial dramatization and the mystery of differentiation from Ruyer's opus, it is not clear whether the two philosophers agreed that the virtual did not disappear once individuation (and differentiation) were completed.[22] For Deleuze, form is not what remains of a physical action, nor is it the result of a depleted force: it is the outcome of a provisional state of equilibrium between forces.[23]

As previously indicated, in *Difference and Repetition*, Deleuze attempted therefore to draw a theory of difference, in part based on biological differentiation, giving a new meaning to the ancient mythologies of the world egg, beginning with Anaximander's cosmic egg, while he also provided a renewed interpretation of William Harvey's 1651 biological dictum *ex ovo omnia* ("everything comes from the egg"): "In order to plumb the intensive depths or the *spatium* of an egg, … the potentials and potentialities must be multiplied. The world is an egg. … We think that difference of intensity, as this is implicated in the egg, expresses first the differential relations or virtual matter to be organized."[24] Moreover, spanning a bridge between their theories, Deleuze relied also on Belgian biologist Albert Dalcq's morphogenetic embryology,[25] in addition to Simondon's theory of individuation. Dalcq's epigenesis offered a model for the differentiation *modus operandi*, which was at the heart of Deleuze's thesis. The popularity of Dalcq's work, in the 1950s among artists and architects, was equal to that of D'Arcy W. Thompson's *On Growth and Form* (1917). More a treaty on morphology than a morphogenetic theory, D'Arcy Thompson's volume argued that evolution had been overemphasized as the fundamental determinant of the forms of living beings, and proposed mechanical processes of transformation as equally important in the shaping of life.[26]

It is noteworthy that Albert Dalcq's book on embryology was the primary source on epigenesis, as much for the designers behind the exhibition, "On Growth and Form," held at the Institute of Contemporary Arts in London in 1951, the title of which was inspired by the new edition of D'Arcy Thompson, *On Growth and Form* (1944), as for Gilles Deleuze.[27]

28 Alberto Gualandi, « La renaissance des philosophies de la nature et la question de l'humain », in: *Le moment philosophique des années 1960 en France*, Patrice Maniglier, ed., (Paris : Presses universitaires de France, 2011), 59-72.

29 Gilles Deleuze, *Francis Bacon: the Logic of Sensation*, trans. Daniel W. Smith, (London / New York: Continuum, 2003), 41.

30 Gilles Deleuze, *The Logic of Sense*, trans. Mark Lester, (New York: Columbia University Press, 1990), 88, 342.

31 Sauvagnargues, *Deleuze et l'art*, cit., 87-88.

32 Sauvagnargues, *Deleuze et l'art*, cit., 90.

33 Gilbert Simondon, *L'individu et sa genèse physico-biologique*, (Paris: PUF, 1964), 41-42; quoted in Deleuze, *Francis Bacon…*, op. cit., 108.

34 Simondon, *L'individu…*, op. cit, 41-42; quoted in Deleuze, *Francis Bacon …*, op. cit., 165.

Read through the glasses of the philosophies of Spinoza, Leibniz and Bergson, Simondon's theory of individuation helped to identify the egg as a vast metaphor of the world. If Deleuze's philosophy of nature could anticipate the science of his time, it is because he succeeded in identifying the contemporary metaphors that buttressed his conceptualizations, the paradigmatic shifts that were enacted, together with the significant epistemic breakthroughs. Positioned (as he was) in opposition to the overcoded trends of Structuralism, and, at the same time, implicitly contrasting hard-nosed geneticists that read only in codes, Deleuze introduced the egg's metaphor that helped rearticulate the connection between the symbolical and the vital. Without entering the contemporary debate on biology and genetics, it seems that Deleuze theory was not far from the position sustained by the American Stephen Jay Gould's 1977 *Ontogeny and Phylogeny*.[28]

Deleuze will often use the embryo's model to expose the inorganic vitality of tissues, not yet stabilized in the shape of an organ, capable of multiple transformations: "… the body without organs does not lack of organs, it simply lacks the organism, that is, the particular organization of organs. The body without organs is thus defined by an *indeterminate organ*, whereas the organism is defined by determinate organs."[29] In Deleuze's *The Logic of Sense* (1969), everything will collapse around the paradigm of Antonin Artaud, whose poetical, schizoid delirium called for a body beyond its organic determination.[30] For Artaud, the completed organism felt like a form that imprisons the body.[31] During the 1970s, Deleuze and Guattari will never ask anybody to deprive himself of its organs, but to replace the notion of a full-grown organ by the metamorphic and polymorphic conception of an immature organ while it differentiates. Deleuze's bio-philosophy illustrates the virtuality of intensive forces, while they operate before the organic form is achieved and constituted. What Deleuze and Guattari proposed was to consider the virtual axes of informal forces.[32]

Resisting the Neo-Platonism of types and models, Deleuze believed that what exists in the world's immanence is not the copy of a model that would constitute the ideal mold of real individuals; that what is real is not the one and unique, or transcendental, but the singularities and the differences. The ideal mold is similar to the ideal type in art history, art, or design. Simondon elaborated a precise criticism of the idea of a mold by introducing the concept of modulation. In modulation, Simondon writes "there is never time to turn something out, to remove it from the mold."[33] To proceed to such a demolding (Fr., *démoulage*) is unnecessary, "because the circulation of the support of energy is equivalent to a permanent turning out; a modulator is a continuous, temporal mold."[34] While molding leads to a permanent state of things, modulation introduces the factor of time: "To mold is to modulate in a definitive manner, to modulate is to mold in a continuous and perpetually

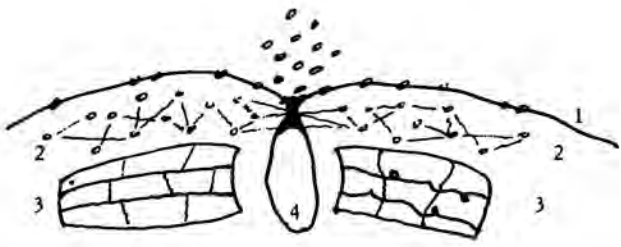
35 Simondon, *L'individu...*, ibidem; quoted in Deleuze, ibidem.

36 Gilles Deleuze, *Two regimes of Madness: Texts and Interviews 1975-1995*, trans. Ames Hodges, Mike Taormina, (Los Angeles, CA: Semiotext(e), 2006), 159.

37 Gilles Deleuze, *Two regimes of Madness*, *cit.*, 160.

38 See Alain Prochiantz, *Géométries du vivant*, (Paris : Fayard, 2008).

39 Gualandi, op. cit, 64-65.



1. Line of the outside
2. Strategic zone
3. Strata
4. Fold (zone of subjectivation)

"Michel Foucault's Diagram and the Topology of the Fold", in Gilles Deleuze, *Foucault*, trans. Seán Hand, (Minneapolis: University of Minnesota Press, 1988), 120.

40 Gilles Deleuze, *Foucault*, trans. Seán Hand, (Minneapolis: University of Minnesota Press, 1988), 34.

41 Deleuze, *Foucault*, cit., 35.

42 Anne Sauvagnargues, *Deleuze. L'empirisme transcendantal*, (Paris : Presses Universitaires de France, 2009), 422.

43 Deleuze, *Foucault*, cit., 85.

44 Ibidem, 35, not "evolution", but *devenir*, "becoming", in the original text.

variable manner."[35] Throughout his work, Deleuze also recommends altering the idea of molding by introducing that of modulation. In 1978, for example, he affirmed: "Every direction leads us, I believe, to stop thinking in terms of substance-form."[36] Taking up Simondon's criticism of hylemorphism, opposing inert matter to active form, he proposed to substitute it with a process of modulation, in which the form-giving operation would be conceived as the coupling of forces and materials. While this theory helped Deleuze to escape from resemblance, opposing the idea that a model needs to be copied, he reached a new definition of artistic activities, as the capture of intensive forces by new materials: "The material-force couple replaces the matter-form couple."[37] Contemporary science shows that genotype is not a mold that determines the individual in a univocal mode. Between the genotype and the phenotype, a process of development inserts itself, where the temporal variable plays a role as important as the spatial and topological variables.[38] The structure actualizes itself through a process of development, introducing factors of stochastic and temporal variability that singularize the individual prototype. As should be clear, Deleuze's thinking was not based on vague metaphors or rhetorical tropes.[39] If one can speak of metaphors, it is in the noblest sense, since they were able to grasp theoretical issues even in domains that had not yet been clearly perceived by science itself.

INTENSIVE DIAGRAM

The body without organs conveys the notion of matter in a not-yet-formed state, of a body not-yet-represented, or an unrepresentable body in its schizophrenic version. Overcoming organized form, one is introduced to matter as a receptacle of forces. Beyond the matter-form opposition, beyond organized form, there is matter as a non-formal mix of forces and materials. More than a metaphor, the body without organs refers to the notion of machine and of diagram, developed, in parallel, in the work of Michel Foucault, of which Deleuze is a keen interpreter. The diagram is a map, which is coexistent with the whole society, and forms an "abstract machine."[40] Dealing with fluxes, fluids, functions, it churns up matter, form, energy, networks. Every diagram is a "different machine."[41] Such a machine is concerned with the representation of relation of forces, belonging to a stratified formation, and it doubles the stratification (for examples, the strata of history and of society). This intensive diagram should not be conceived as a permanent structure, nor thought as a pre-existing form, but rather as a virtual problem -- that is, a complex of forces.[42] One could define a Pastoral diagram, a Greek one, a Roman one, or a Feudal one.[43] Or even a Baroque diagram. The diagram, however, is not historical, but belongs to a phenomenon of becoming: "it doubles history with a sense of continual becoming (*devenir*)."[44]

45 Ibidem, 86, translation edited by us.

46 Sauvagnargues, *Deleuze. L'empirisme transcendantal*, op. cit., 423.

47 Daniel Defert, "'Hétérotopie': tribulations d'un concept entre Venise, Berlin et Los Angeles", in: Michel Foucault, *Le corps utopique*; suivi de *Les Hétérotopies*, postface by Daniel Defert, (Paris: Lignes, 2009), 36-61.

48 Deleuze, *Foucault*, cit., 120.

49 Ibidem, 118.

50 Ibid.

51 Ibidem, 119.

52 Ibid.

As Deleuze remarks in nearly all of his books: "There is … a becoming of forces which remains distinct from the history of forms … It is an outside which is farther away than any external world and even any form of exteriority."[45] Indissociable from its actualization, the diagram is used to inject some becoming in every point of the stratified reality.[46] The concept of the diagram as an abstract machine helps us to understand the biological and machine-like reality of so many strata, such as institutions, technologies, and apparatuses; including heterotopias.[47] Moreover, it can help characterize works of art, including Proust's *In Search of Lost Time*, Artaud's schizo-poetics, or Francis Bacon's exhibition of the flesh. The diagram offers the tools to map art's phyla and genus, its phylogenesis as much as its heterogenesis.

Subsequently, one reaches what Deleuze defined as "Foucault's Diagram", a sort of diagram of a diagram, if not a master diagram, divided by a line between an outside and an inside, the latter being made of strategic zones and constructed of layers or strata, in which texts and images from the past are archived. In the scheme drawn by Deleuze, there is a gigantic fold, which indicates the position of oneself in relation to the task of producing new modes of subjectification. This way, three agencies (or instances) are being held together by a fold, which acts as topological operator.[48] Outside and inside are inverted. Far and near converge. According to Deleuze, for Foucault, Descartes's, "I think, therefore I am," should be replaced by the renewed formulation, I think, therefore I fold: "The general topology of thought … ends up in the folding of the outside into the inside."[49] The urgent prerequisite is to construct an inside-space that is completely co-present with the outside-space, "on the line of the fold."[50] Independent of distance and within the limits of any vital, lived space, "Every inside-space is topologically in contact with the outside-space . . . and this carnal or vital topology, far from showing up in space, frees a sense of time that fits the past into the inside, brings about the future in the outside, and brings the two into confrontation at the limit of the living present."[51] As Deleuze states, this is how Foucault grasps the doubling, or the fold: "If the inside is constituted by the folding of the outside, between them there is a topological relation: the relation to oneself is homologous to the relation with the outside and the two are in contact, through the intermediary of the strata which are relatively external environments (and therefore relatively internal)."[52]

It is possible to immerse oneself in an archive made of visible forms and articulate bodies; to cross surfaces, graphs, charts, and curves; and to follow fissures in order to reach an interior of the world. But at the same time it is also necessary to climb above the strata in order to reach an outside, an atmospheric element: "The informal outside is a battle, a turbulent, stormy zone where particular points and the relations of forces between these points are tossed about. Strata merely collected and

53 Ibidem, 121.

54 Ibid.

55 Ibid.; and not "micro-politics", as translated.

56 Gilles Deleuze & Félix Guattari, *What is philosophy?*, transl. Hugh Tomlinson and Graham Burchell, (New York: Columbia University Press, 1994), 164.

57 Deleuze & Guattari, *What is philosophy?*, op. cit., 165.

58 *Freiheit der Linie : von Obrist und dem Jugendstil zu Marc, Klee und Kirchner*, Erich Franz, et al., eds., (Bönen : Kettler, 2007).

59 Reyner Banham, "The New Brutalism", *The Architectural Review*, 118, December 1955, 354-61, quote 361. Reprinted in *A Critic Writes: Essays by Reyner Banham*, (Berkeley: University of California Press, 1996), ed. Mary Banham et al, 7-15, 14.

60 Gilles Deleuze, Félix Guattari, *A Thousand Plateaus: Capitalism and Schizophrenia*, transl. Brian Massumi, (Minneapolis: University of Minnesota Press, 1987), 263.

61 Gilles Deleuze, Félix Guattari, *Nomadology: The War Machine*, trans. Brian Massumi, [*Traité de nomadologie*. English], (New York, NY: Semiotext(e), 1986), 53-54; *Nomadology* forms chapter 12 of : Gilles Deleuze, Félix Guattari, *A Thousand Plateaus: Capitalism and Schizophrenia*, transl. Brian Massumi, (Minneapolis: University of Minnesota Press, 1987), 382 [trans. slightly different].

solidified the visual dust and the sonic echo of the battle raging above them."[53] Nevertheless, for Deleuze, "up above, the particular features have no form and are neither bodies nor speaking persons."[54] For both Foucault and Deleuze, the diagram is a "micro-physics."[55] However, read by Deleuze, Foucault's diagram lives a new life. Rising above the static opposition between form and matter, situating oneself in an energetic dimension, it becomes possible to think materiality in terms of movement and forces, and introduce a potential of deformation active in the material.

As Deleuze wrote, to have something stand up "does not mean having a top and a bottom or being upright".[56] One can draw "a monument, but one that may be contained in a few marks or a few lines, like a poem by Emily Dickinson".[57] Following this remark, it would be possible to attempt to write a brief history of the line, say, from William Hogarth's "line of beauty" (1753) to Henry van de Velde's line as a force, to Paul Klee's inflected lines,[58] and up to the topology of splines used in 2-D/3-D modeling. Already in the 1950s, while opposing the Platonism of Colin Rowe, Reyner Banham advocated a topological architecture.[59] Suddenly, what formed the basis of the traditional categories of space sees its meaning transformed, by transmutation, into a topological contact surface.

FLUID SPACES

Today, a question remains: how have topological concepts been introduced in architecture? Perhaps, a particularly refined topology is needed to describe the formation of spirals and vortices, or nomadic, smooth spaces, which are formed by haptic relations. As Deleuze and Guattari put forward, haecceities are to be found along intersecting lines: "Climate, wind, season, hour … Haecceity, fog, glare. A haecceity has neither beginning nor end, origin nor destination; it is always in the middle; it is not made of points, only lines. It is a rhizome."[60] From there, the well-known distinction between a nomad, "smooth" space, as opposed to a sedentary, "striated" condition will be developed by Deleuze and Guattari: "… There is an extraordinary fine topology that relies not on points or objects, but on hacceities, on sets of relations (winds, undulations of snow or sand, the song of the sand or the creaking of ice, the tactile qualities of both); it is a tactile space, or rather 'haptic', a sonorous much more than a visual space. … The variability, the polyvocality of directions, is an essential feature of smooth spaces of the rhizome type … The nomad, nomad space, is localized and not delimited. What is both limited and limiting is striated space."[61] Deleuze, inspired as always by Simondon, revived the concept of haecceity developed in Duns Scott's scholastic philosophy. Haecceity stems from the Latin *haecceitas*, meaning "this-ness", from *Haec*, "this thing."

62 See the new edition of the main doctoral thesis (1957): Gilbert Simondon, *L'Individuation à la lumière des notions de forme et d'information*, (Grenoble: Millon, 2005), 225. This edition combines *L'Individu et sa genèse physico-biologique* (Paris: Presses universitaires de France, 1964), that Deleuze read, and *L'Individuation psychique et collective*, published in 1989.

63 Gilbert Simondon, "The Genesis of the Individual," in: Jonathan Crary & Sanford Kwinter (eds.), *Incorporations* (New York: Zone Books, 1992), 297–319. See *Gilbert Simondon: Being and Technology*, Arne De Boever, Alex Murray, Jon Roffe, Ashley Woodward, eds., (Edinburgh: Edinburgh University Press, 2012).

64 Deleuze, Guattari, *Nomadology*, cit., 18 and 125; the authors cite: *Boulez on Music Today*, trans. Susan Bradshaw and Richard Rodney Bennett, (Cambridge, Mass.: Harvard University Press, 1971), 85.

65 Deleuze, Guattari, *Nomadology*, cit., 67.

66 Sauvagnargues, *Deleuze et l'art*, cit., 232-234.

67 Wilhelm Worringer, *Abstraction and empathy; a contribution to the psychology of style* [*Abstraktion und Einfühlung; ein Beitrag zur Stilpsychologie*. English. 1907], trans. Michael Bullock, (New York: International Universities Press, 1963).

68 *A Thousand Plateaus*, op. cit., 496.

69 Wilhelm Worringer, *Form in Gothic*, [*Formprobleme der Gotik*. English.1911], trans. Herbert Read, (London: Putnam, 1927), pref. to the 1st edition: "In its basic views the present psychological investigation of style is a sequel to my earlier book, *Abstraction and empathy*."

70 Wilhelm Worringer, *L'Art gothique*, trans. from the German D. Decourdemanche, (Paris: Gallimard, 1941); new ed., Id., same title, (Paris: Gallimard, 1967), see in general, 61-115; and in particular, 83, 86-87.

As it were, haecceity, or individuation, helped to explain the existence of particular individuals. With Scott, such a conception opposed to the Aristotelian theory of *hylemorphism*, which held that any individual being was the creation of dynamic form applied on indistinct matter, as if nature's creations were the outcome of a sculptor molding clay. Derived from the Greek, hylemorphism (or hylomorphism) referred to the imposition of an active form (*morphe*) onto passive matter (*hyle*). Scott refuted this theory, rejecting the suggestion that determinate, individual beings could be the output of indeterminate matter. As previously mentioned, Simondon will criticize hylemorphism for its universalistic, static, and frozen approach, and instead define individuation as an ongoing process that consists precisely of a modulation between form and information.[62] For both Simondon and Deleuze, one should consider carefully the specific processes of becoming-individual, encompassing the singularity in each being.[63]

For Deleuze, haecceity is not limited to any question of scale (small or large), but has a peculiar consistency which connects it physically to phenomenon, such as vapor, haze, mist or cloud situations that blur any defined limit or border. Haecceity constellates, forming groups, clusters and flocks. Inspired by Pierre Boulez's theory of music, Deleuze and Guattari write: "the model is a vortical one; it operates in an open space throughout which things-flows are distributed, rather than plotting out closed space for linear and solid things. It is the difference between a *smooth* (vectorial, projective or topological) space and a *striated* (metric) space."[64] In the first case, space is occupied without being measured, while in the second space is measured in order to be occupied, a distinction taken from Boulez. Like a flock, smooth, "nomad" art circulates in an open and connected space, as opposed to a striated, geometrical art, centered and self-contained. It is actually two different usages of measure: smooth space relies on a "numbering number [which] is rhythmic, not harmonic. It is not related to cadence or [an external] measure,"[65] while striated space is based on a homogeneous measure, marking out the surface in squares and rearranging everything in order. This observation helps tell apart an abstract line, unfolding its smooth space from a set of twists and torsions -- that is, from a striated space subject to norms and orthogonally squared by rules.[66]

Deleuze had read Wilhelm Worringer's *Abstraction and Empathy* (1907).[67] He was convinced that Worringer had given fundamental prominence to the abstract or primitivistic line "seeing it as the very beginning of art or the first expression of artistic will. Art as abstract machine."[68] Pursuing the investigation, Worringer published *Form in Gothic* (1911),[69] a psychological investigation of style, presented by him as a sequel to *Abstraction and Empathy*. Deleuze read also *Form in Gothic* and repeatedly quoted it from the French translations:[70] "From the depths of time there comes to us what Worringer called the abstract and infinite northern line,

71 Wilhelm Worringer, *Form in Gothic*, op. cit., 41-42; quoted in: Deleuze & Guattari, *What is philosophy?*, op. cit., 182.

72 Deleuze, *Francis Bacon …*, op. cit., 40-41.

73 Sauvagnargues, *Deleuze et l'art*, cit., 234.

74 Gilles Deleuze, *The Fold: Leibniz and the Baroque*, trans. Tom Conley, (Minneapolis: University of Minnesota Press, 1993), 14.

the line of the universe that forms ribbons, strips, wheels, and turbines, an entire 'vitalized geometry,' *rising to the intuition of mechanical forces*, constituting a powerful nonorganic life."[71] What differentiates the nomadic line from classical ornamentation are the paradigms of speed, of proliferation, and of accelerated transformation, which all are characteristics of smooth space. In such a space, the line is free from representational purposes, as well as untied from the laws of metrics; as such, it is liberated from classical symmetry, from the repetition of the motif, and from the striations of rational coordinates. All these characteristics belong to Renaissance architecture, which make it a stable, classical and "organic" art.

Following Worringer, Deleuze reveals definitively an anticlassical bend, and shows a preference for the northern line that swells by indefinite iteration. Moved by a principle of internal proliferation, the line follows the model of fluids, not solids: "The pictorial line in Gothic painting is completely different, as is its geometry and figure. First of all, this line is decorative; it lies at the surface, but it is a material decoration that does not outline a form. It is a geometry … in the service of 'problems' or 'accidents,' ablation, adjunction, projection, intersection. It is thus a line that never ceases to change direction, that is broken, split, diverted, turned in on itself, coiled up, or even extended beyond its natural limits, dying away in a 'disordered convulsion'"[72] Potently "inorganic", the line is set in motion by a mechanical mobility, whose redundancy and potent vitality is to be found in barbaric arts up to the Gothic. Worringer's book described so accurately the Gothic line of non-organic life that the infinite melody of the northern line offered a precise basis for Deleuze's kinetic line.[73] From *A Thousand Plateaus* and *The Logic of Sensation,* to *What is philosophy?*, the boreal-northern line will be used by Deleuze (and Guattari) to frame problems, for example, the organic and the non-organic, and also to map theoretical issues such as the smooth and the striated spaces, the nomad and the sedentary, and so forth. In Deleuze's *The Fold*, mutating itself into a baroque feature, the nomadic line will be defined as the becoming-line of the point, which unfolds in a trajectory.[74] As an outcome, nomadic lines take on great vortical organizations, prop up smooth topological spaces, and allow for a speed of proliferation that expands beyond the frame. The aim of art is to divert force into matter. What sets apart the nomadic line, whether from the northern-gothic variety or from the baroque type, is that it embodies speed and fluidity, while it captures intense forces in new materials.

What are the consequences for today's architecture? At present, through customized informational engines, it seems imperative to incorporate intensive elements into the virtual building. Such an experimental approach

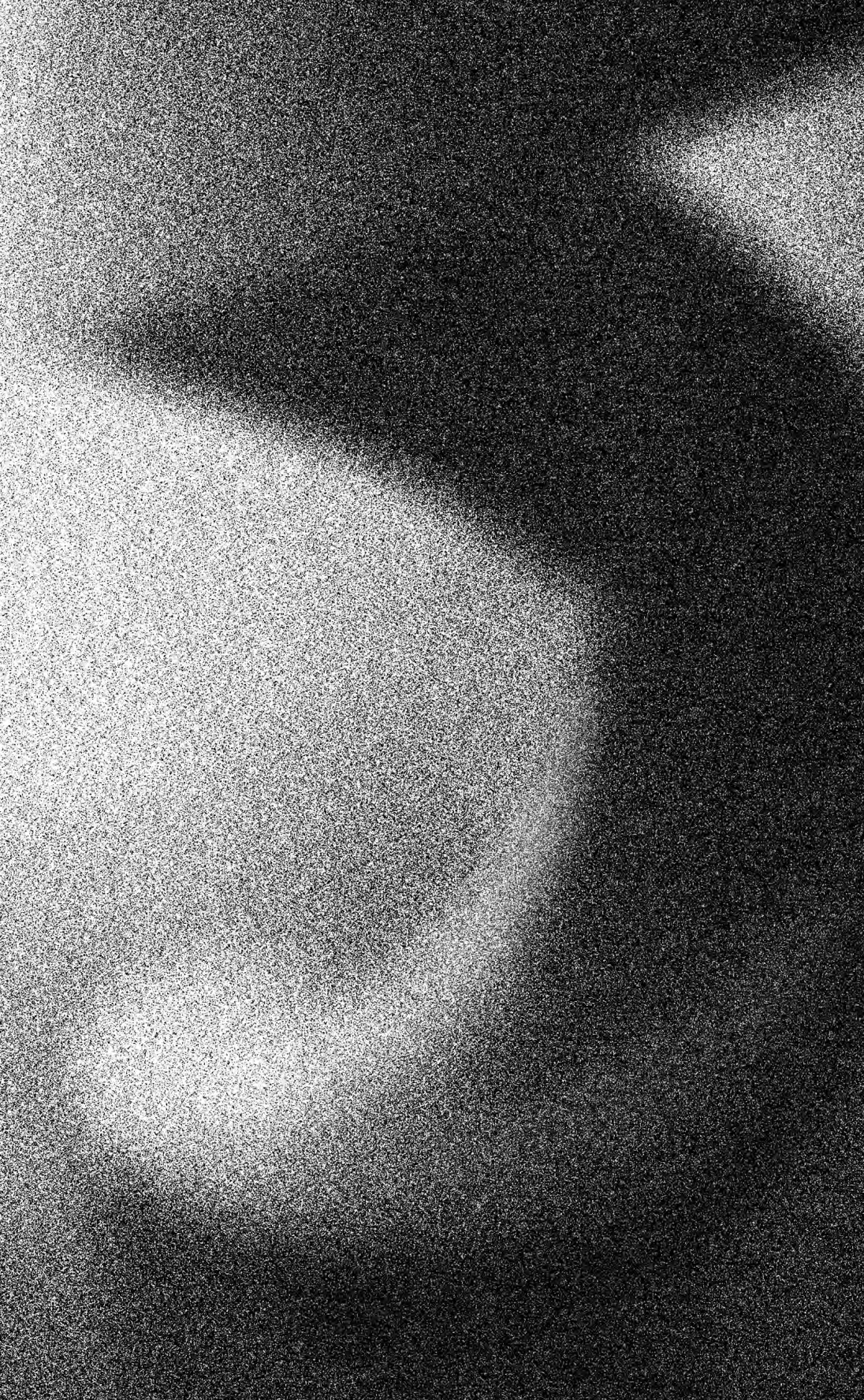
75 Panagiotis Michalatos and Sawako Kaijima, "Intuitive Material Distribution", in *Mathematics of Space. AD Architectural Design*, George L Legendre, ed., Volume 81, Number 4, Wiley, 2011, p.69.

76 Kristina Shea, "Directed Randomness", in *Digital Tectonics*, Neil Leech, David Turnbull, Chris Williams, eds., (Chichester, U.K.; Hoboken, N.J., Wiley-Academy, 2004), 89-101; Judith Leuppi and Kristina Shea, "The Hylomorphic Project", in *The ARUP Journal*, January issue, London, 2008, pp. 28-30.

77 Samuel Bernier-Lavigne, "Modulation de l'objet. Corrélation numérique entre force, forme et matière", in SCAN'16 *Toulouse, Séminaire de conception architecturale numérique : Mètre et paramètre, mesure et démesure du projet*, s.l.d. Jean-Pierre Goulette et Bernard Ferries, PUN – Éditions Universitaires de Lorraine, Toulouse, 2016, pp.249-263.

78 Georges Teyssot, *Une topologie du quotidien*, (Lausanne, CH: PPUR, Presses polytechniques et universitaires romandes, 2016), pp. 53-69.

aims at defining design solutions in response to a wide range of structural and environmental parameters. During the process, elements of structural engineering, such as distribution of stresses and the entire load bearing data, are taken into account, according to fitness criteria, prior to being selected by the designer in terms of their aesthetic aptness. Current specific digital technologies, such as topological optimization software, are based on weight and material efficiency model, generated through an iterative process.[75] Once a base condition is established, the software runs multiple iterations and then analyzes them to determine a best solution. The initial design is based on given parameters, and then is computed by the application, allowing an optimized solution to be determined.[76] Such a mode offers the possibility to integrate the expertise of designers and engineers on a unique computational platform. Information, which determines the formal concretization of architecture, is scripted to negotiate between form and matter, or, more precisely, between forces and materials. Such scripted procedures are akin to Simondon's "modulation"*.[77] If evolved architectural structures are to enjoy the same degree of combinatorial productivity as biological ones, they must be initialized by an adequate diagram, as an "abstract" or virtual building*.[78] At this point, the design departs from the conventional practices, engaging a complex of forces of which one must trace the diagrams, whether energetic, systemic, or topological.



PROBABLE ARCHITECTURES OF IMPROBABLE REASON

Confluence in the Work of Eladio Dieste:
A Belated Book Review

Nader Tehrani

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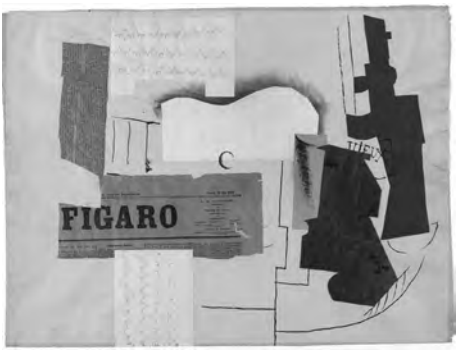

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1 "The Collective Invention", 1934, Rene Magritte

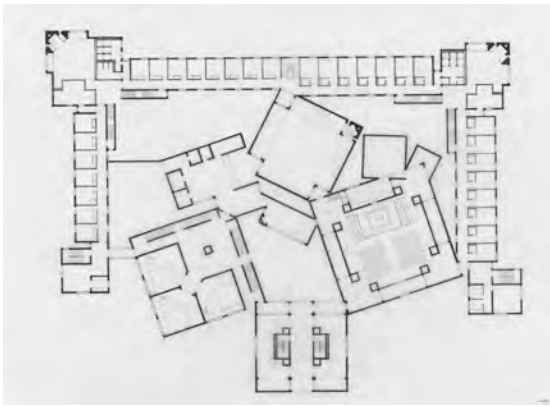
2 "Bottle of Vieux Marc, Glass, Guitar and Newspaper", 1913, Pablo Picasso

3 From left to right: "Cadavre Exquis" (Exquisite Corpse), 1938, André Breton, Jacqueline Lamba, Yves Tanguy and "Photomontage", George Grosz

1 *The Collective Invention* by René Magritte and Exquisite Corpse with André Breton by Steve Wolfe, Ashley Bickerton and Jan Hashey.

CONFLUENCE: FROM THE SEAMLESS TO THE EXQUISITE CORPSE

Confluence, from the Latin "confluere," signifies the idea of "flowing together," a concept that is central to how artistic production is often conceived: as fragments of ideas, artifacts and narratives woven together to create another reality. At the same time, what is interesting about the idea of confluence is that beyond the recognition that two (or more) elements are brought together, it connotes that they somehow 'flow' together without indication of conflict, predicament or friction. Thus, while many historical passages of art have had to contend with the challenge of composing varied pieces together, not all find meaningful ways to bring out the conceptual difficulties in the act of reconciling differences. In the 20th century, Cubism, Collage, Montage and Surrealism were just four movements that dealt with the question of difference in significantly varied ways, and each played out those theoretical positions in accordance with the medium at work. Whether in painting, sculpture or photography, the medium was often instrumental to the possibility of eventual interpretations. As such, the dispersed nature of the 'objet trouvé' in the Cubist collage contributes to an aesthetic of fragmentation that is central to the expression of collage as medium. The identification of irreconcilable realities in one image, the concurrence of multiple perspectives in one view and the simultaneity of front and back views of the same artifact are just some of the tropes that characterize the ways in which these aesthetic practices were composed of multiple realities, but deliberately denied of the possibility of fusion, natural flow or normative reconciliation. Alternatively, in the montage of photographs, this idea takes on a significantly different dimension, as we witness the medium address heterogenous realities that are blended, grafted or fused together seamlessly to create images that, while semantically divergent, were nonetheless formally confluent. The same could be said of the paintings of René Magritte, whose depictions—in contrast to the techniques of the exquisite corpse—are formed as singular, whole and seamless realities even when their semantic aim is to disrupt, de-stabilize and challenge the very canons of classical realist representation.[1] **[1-3]**



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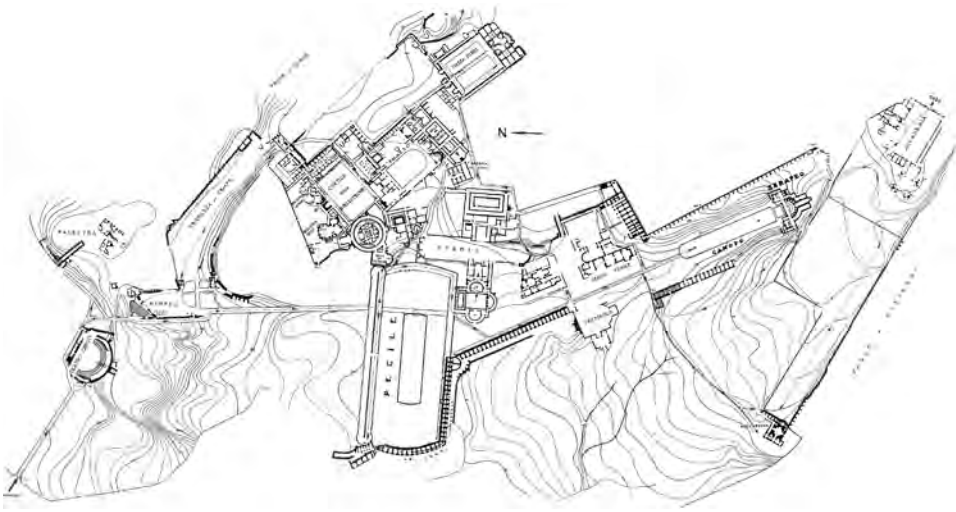

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4 The Dominican Motherhouse, 1965 - 68, Louis I. Kahn, Plan. Image courtesy of Robert McCarter, Louis I. Kahn, Phaidon Press, 2005, 294.

5 Hadrian's Villa, Rome, Plan

ARCHITECTURE: BETWEEN CONSTRUCTION, REPRESENTATION, AND PERCEPTION

In the context of architecture, the question of compositional difference has historically played itself out through a range of scales, techniques and aligned debates. Among them, the challenge of synthesizing multiple typologies (from configurations in Hadrian's Villa to organizations in Louis I. Kahn's Dominican Motherhouse), the difficulty of reconciling dissonant geometries (the circle, the square and the structural invention of pendentives and squinches) or the difficulties of developing a communicable language out of dissonant grammatical fragments (from Nicholas Hawksmoor's stacked totems to Robert Venturi's complex and contradictory iconographic assemblages) are three different modalities of engaging difference, composition and reconciliation. A discussion on typology invariably deals with the morphologies of organizational systems, the perpetuation of certain patterns of configuration over a long period of time and the persistence of formal tropes over material, functional and urbanistic differences. **[4-8]**

The latter two categories, however seemingly unrelated, gain an uncanny connection to each other because of the distinct way in which the idea of tectonics is construed within architectural discourse, between the actuality of construction and the expression of a building. Commonly construed as the confluence between the arts and sciences, the nature of construction is such that it is characterized by a combination of two fundamentally distinct imperatives: the actual technical resolution of material and geometric parts on the one hand, and on the other the expression of that reconciliation: something that is arguably rooted in the invention of an architectural language in combination with what I will call the "optics of perception." These optics invariably deal with a mix of illusion, scenography and trickery, and are not reducible to the actualities of construction. It is this rift between the dual-function of tectonics that problematizes the way in which architecture operates as a discipline: effectively what makes the building stand up is necessarily not the same as what makes it seem to stand up and, as such, architectural debates have internalized the relevance of each category in completely different ways, and in accordance to the relative techniques deployed.

A classic example of tectonics is rooted in the idea of the 'entasis' of a column, whereby the perception of weight is produced in the creation of a 'bulge' in the Doric column: a feature cast in stone, as if it were a function of the flesh. In other words, tectonics deals with the slippery relationship between fact and fiction, where the cold calculation of technical solutions (stereotomic stone carving) comes into conversation with the artful crafting of perception (the effect of gravity). Part of the curious sophistication of

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6 Hagia Sophia Pendentive, Photo by Steven Zucker

7 Isfahan Squinch

2 Eladio Dieste was not a registered architect, so my argument does not dwell on his professional status, but rather on his disciplinary insight, which most often outmerits the greatest of architects.

tectonics deals with the intelligent moral standards it has to negotiate as it weighs questions of truth versus narrative. As such, the entasis of the column effectively absolves us, as architects, from the guilt of believing in the fiction of its construction; the narrative of 'weight' that bulges through the stone has its own veracity, notwithstanding the actual material performance of masonry and, thus, architecture's moral compass internalizes this fiction as a central part of its value system. This interpretation of tectonics also casts a more challenging light on the theme of confluence, disallowing, us to naturalize the pairing of heterogeneous sensibilities, materials and organizational systems together uncritically: whether in service of an organic whole, or the revelation of discrete parts, the technical protocols of construction and their effects remain two parallel constructs, in both dialogue and friction. **[9]**

ELADIO DIESTE: FROM STRUCTURAL DETERMINISM TO IMPROBABLE ARCHITECTURES

The purpose of this essay, then—by way of detour to Uruguay—will be to re-examine the question of confluence in the work of 'designer' Eladio Dieste on the occasion of the twentieth anniversary of his passing. Belatedly, it will also offer an occasion to revisit Stanford Anderson's book *Eladio Dieste, Innovation in Structural Art*, which still serves as the critical benchmark on the work of a great, yet lesser known, 20th century thinker who operated outside of the modernist canons. In revisiting the past, this is also an occasion to construct a historical perspective around the work, and even interpret it through a different lens. Identifying Dieste as a designer does not do justice to his protean abilities, but here it serves provisionally to problematize the various characterizations that have been cast onto him in prior texts. As a professional 'engineer,' Dieste worked an entire lifetime, addressing challenges of structural design in an Uruguay of restricted means, putting his knowledge and speculative spirit towards the combination of material exploration, calculations, graphic statics and the construction of prototypes to advance the proposition of some of the most extraordinary structures built to date. However, his status as an architect is almost always left open-ended, in part, because of the ingenuity of his structural insight, such that all arguments are led to the inevitable positivist slant proffered by structural determinism thus leaving some of the complexities of his architectural decisions unaddressed.[2]

There is little scholarship that misses the target in identifying the engineering ingenuity of each of Dieste's structures, and without exception Anderson, Allen, Ochsendorf, Pedreschi, Larrambebere and Caceres all capture the detailed relationship between structural analysis, material speculation

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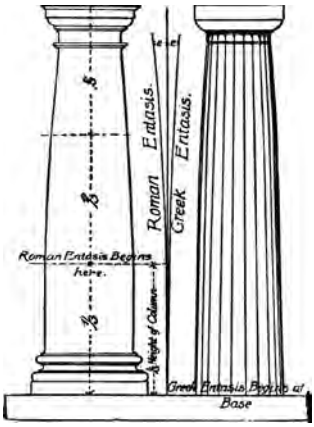

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8 St. Mary Woolnoth, Nicholas Hawksmoor

9 Column Entasis

and formal invention; but few focus on the architectural in any detail. They identify, with clarity, the disciplined and methodical way in which Dieste worked, and the many structural typologies he tested through multiple iterations, composed of four categories: Gaussian Vaults, Self-supporting Shells, Folded Structures and Ruled Surfaces. While each author is distinct in their approach, working in depth through varied areas of scholarship, what is consistent about the five essays is the way in which art and science are brought into confluence, revealing with great analytical precision how Dieste worked with the science of engineering to achieve geometric and structural feats that are deemed great works of 'art.' There is also an ideological dimension to these essays because their point of departure is characterized by a pre-ordained and loving acceptance of the 'affect' of these projects: insofar as the projects genuinely transcend the terms of everyday buildings, the devices behind these transformations are also left to some degree of wonder. They are always treated with scientific fidelity, but alternatively, they are also left in the ineffable fog of artistic value as an aftermath. Somewhere in between, the nature of the architectural discourse and rhetorical intentionality of the language Dieste produced is left open, and this is an opportunity to engage that liminal intellectual space.

THE PRESENCE OF THE STRUCTURAL FIGURE: BETWEEN PERFORMANCE AND SIGNIFICATION

Anderson appeals to Dieste's own metaphor of a "dance without effort" as the basis for the juggling act between the efficiencies of engineering and the kinetic qualities attributable to his structural shapes. The figurative nature of the metaphors are a central part of that identification, like the "Sea Gull" canopy in Salto, whose form appears as two half-arches, but upon examination, is revealed to work as a singular beam, operating in a perpendicular axis to the arch because of its pre-tensioned members. Imbedded behind the idea of the figure is an artistic notion that is somewhat of a self-fulfilling prophesy: on the one hand, the positivist idea that these figures are the result of structural determinism, and on the other, that they achieve a certain symbolic potency because of their projected alliance with nature—whether as 'sea gull,' 'wave' or 'gill'—all allusive figures that are encrypted within his various projects. Here, nature and technology are brought together in an ideological entwinement, each legitimizing the other in what I have characterized prior as the confluent: that which appears to naturally flow from one state to another. I will try to argue that the efforts of Dieste were far from natural, nor confluent in the ideological sense of the term: instead, he introduced devices and architectural instruments into these projects that were deliberate not only in their artifice, but also in producing effects that

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10 Door of Wisdom ("The Gull"), Salto, Uruguay

11 Church of Christ the Worker, 1958 - 60, Atlántida, Uruguay, Eladio Dieste. Photo by Ing. Gonzalo Larrambebere, Courtesy of Dieste Y Montañez S.A.

12 Gymnasium, Durazno, Uruguay, Eladio Dieste. Photo by Nader Tehrani

brought the actual and the perceived into a more complex and contradictory set of results. I borrow Venturi's theoretical apparatus here with the idea of extending the richness of Dieste's architectural operations beyond the deterministic and, in turn, to underline Venturi's own intellectual latitude beyond the semantic. Though left unwritten, one can imagine how the forces of structure could work into the complex and contradictory, to reveal the power of improbable reason, and the possible architectures it could produce—especially under the auspices of Dieste. **[10-12]**

INVERTING THE HOST AND PARASITE: THE SEMANTIC ALLURE OF COMPOSITE SYSTEMS

Ed Allen's contribution to the book identifies the important connection between graphic statics and the development of masonry vaults, linking the layered ceramic work of Guastavino—who radicalized the efficiencies of material usage—to Dieste, whose further work on numerical theory in the context of mathematics established morphologies that were completely impossible in the times of Guastavino. What is important is how Allen speaks to the confluence of the intellectual and the practical to reveal how key moments in history are able to catalyze radically new inventions and the production of new forms of knowledge; he effectively links Dieste's depth of knowledge in mathematics to the history of construction from the point of view of labor. It is no secret that Dieste's agency in advancing his research was primarily through 'practice,' and that the profession was somehow a vehicle to deliver on a social contract that overcomes the rarefied nature of the actual research itself. Dieste's work was deeply imbedded in the idea of labor, the communities it upheld and the technologies that were available to them. Thus, his focus on masonry was central to his social engagement, drawing the raw matter from the very earth of Uruguay, and placing it in the hands of the many local craftsmen to serve as basis for the extraordinary structures he conceived.

With impeccable detail, Allen captures the importance of the vicissitudes of masonry vaulting, but here it would be important to point out a detail that is somehow missed, even if well-articulated in the work of Dieste himself. It is a commonly held notion that Dieste was a master of masonry, and that he certainly was. At the same time, it was the strategic way in which he brought the confluence of mathematics, geometric thinking, the protocols of construction, material innovation and historical knowledge into dialogue that made possible the types of inventions he unleashed. Of the many things he enabled, arguably the most powerful—and timely—of them was the strategic use of steel, not masonry. Given the cost of steel being relatively high in comparison to masonry, it is poignant how Dieste adopted

a limited, but strategic use of steel—whether through rebar or pre-tensioning cables—to support his structures. With labor being affordable, he was able to absorb the costs in a way that yielded maximum benefit to the very structures he sought to optimize. And though our eyes only see masonry on the surface of Dieste's work, his actual contribution lies underneath it, in the difficult insertion of steel pre-tension members that work in dialogue with ceramic units. In this sense, Dieste's main contribution to structures resides in the medium of 'composites' in the first instance (much like Candela's concrete shell structures), and his use of masonry is arguably secondary to it. The masonry was a 'given:' it came from the earth, it could be handled within an affordable labor economy, and each unit was easy to carry, thus requiring minimal cranes. The steel, instead, enabled the masonry to fly. From a historical perspective, it is interesting to imagine Dieste's thought process in establishing his curious inventions. If his education had predisposed him towards the calculation of steel and concrete construction, then the idea of composites was actually germane to his ongoing thinking; thus, the steel reinforcement was a given, and the masonry a deviation from the very concrete that the academy would have presented to him as a foundation. Alternatively, if his historical knowledge of masonry, as load-bearing structures, was the launching pad of his thinking, then the steel would be seen as a radical agent in enabling a form of performance that is entirely alien to the conventional masonry structure. No matter the perspective, the presence of the masonry grain, in contrast to smooth concrete, offers a stark tectonic contrast, and one that is familiar and strange at the same time: familiar because masonry is commonly used in the region and part of a known vocabulary, strange because the new configurations of masonry layout produces a behavior that radically belies its conventional image.

The power of composites, as history has demonstrated, lies in their versatility of formal and dynamic performance. For this reason, we witness the use of fiberglass and carbon fiber composites in the construction of airplanes, cars and boats, understanding the strength of both compressive and lateral forces on these vehicles. Within the sectional profile of the composite panel, the honeycomb shell offers simultaneous depth and lightness as well as a medium through which compressive and tensile forces are balanced, while the carbon fiber skin offers a counter-bracing to the prevailing forces on the core, whether in tension or compression; the sum total of the composite panel gives an efficiency like no other. Dieste's roofs were composites first, masonry second, and here it is important to identify the layers at work in his various vaults. While they are all a combination of masonry as a lower layer, steel rods laid in between or on top of masonry units, with a pour of concrete to cap it off, the actual sectional composition of the vaults varied from structure to structure. If the Church of Christ the

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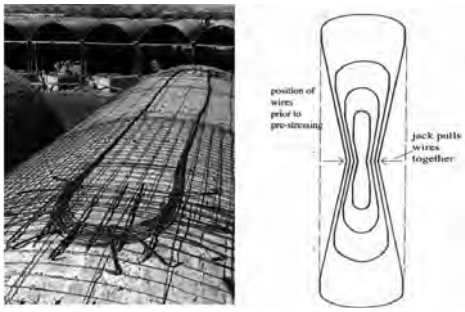

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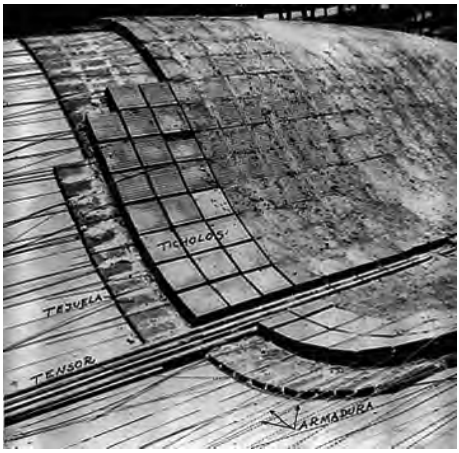

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13 Julio Herrera y Obes Warehouse, 1979, Montevideo, Uruguay, Eladio Dieste. Photo by Ing. Gonzalo Larrambebere, Courtesy of Dieste Y Montañez S.A.

14 Julio Herrera y Obes Warehouse, Montevideo. Photo by Ing. Gonzalo Larrambebere, Courtesy of Dieste Y Montañez S.A.

3 John A. Ochsendorf, *Eladio Dieste as Structural Artist*, Princeton Architectural Press, 94-105.

Worker in Atlantida was composed of solid masonry as a substrate, the Gaussian Vaults of the Julio Herrera y Obes Warehouse are composed of voided blocks, making the connection to honeycomb panels much more legible. Accordingly, since the vaults in Atlantida work as beams, the steel tension rods that are inserted within the valleys of the cross section help to cancel its horizontal thrust, and the Gaussian vaults of the Julio Herrera y Obes Warehouse contain steel primarily for the lateral and eccentric forces to address the tension on the surface. If the steel in Atlantida is concealed, it highlights the sacred aspirations of the space –to magically float, whereas in the Warehouse, the unpretentious revelation of the steel tension rods displays the utilitarian quality of a workspace without rhetoric or spectacle. In both cases, we may be led to change the narrative that guides our understanding of Dieste's conceptual terms, inverting the role of the host and parasite: Dieste, the great engineer of steel construction, who used geometry as structure, masonry as skin and concrete as glue. The confluence of these elements is also a necessary mechanism for the success of his compound structures, as the size of the brick allowed for 'pixels' small enough to build up surfaces that could curve in two directions, using the elasticity of mortar to flex the geometry where the brick unit cannot. **[13-14]**

BEYOND CONVENTIONAL OPTIMIZATION: THE ARCHITECT OF THE HORIZONTAL BEAM

John Ochsendorf refers to Dieste as a "structural artist," in effect, pairing up the two disciplines, with engineering giving reason to art, and art embodying the tenets of engineering. As such, aesthetic deliberations on beauty and elegance tend to affirm that which is bound to reciprocal notions of the fidelity between material usage and performance, with the idea that structural engineers pursue "works of art through their pursuit of efficiency, economy, and elegance in construction."[3] If Anderson appeals to the organizational principles behind typology to explicate Dieste's compositional decisions, he also attempts to historicize it in the context of other modernist precedents such as Le Corbusier's Maison Jaoul, a building that in appearance resembles Dieste's own house, though rooted in fundamentally different structural premises. Ochsendorf, on the other hand, helps to place Dieste within a lineage of great engineering masters, all of whom were committed to researching the relationship between form and structural behavior; from his own research on Gusatavino to the extended works of Eiffel, Torroja, Freyssinet, Maillart and Isler, he appeals to the incremental advancement of material sciences and structural innovations as the basis of what makes Dieste so unique. In the thinking of Ochsendorf, the exemplary elegance of Dieste's work emerges as a result of the expression of thinness of its masonry shell,

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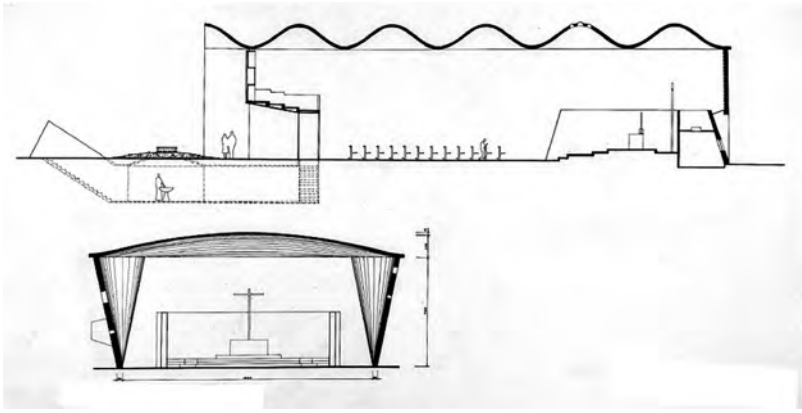

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4 Agustin Dieste explains the structural logic of this beam with conceptual ease, binding its form to its performance

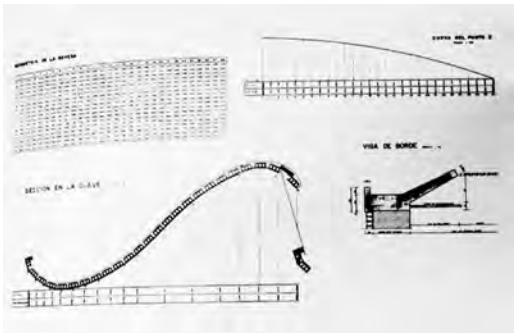
15 Church of Christ the Worker, Atlántida, Cornice detail. Photo by Ing. Gonzalo Larrambebere, Courtesy of Dieste Y Montañez S.A.

16 Church of Christ the Worker, Atlántida, Sections. Image courtesy of Dieste Y Montañez S.A.

for instance, as witnessed on the edges of the Atlantida church. A common trope also in the concrete shells of Maillart, Candela and Isler, the thinness of concrete is the result of an innate 'plastic' medium, with the liquid state of concrete being the matter from which forms and geometries may be molded.

In contrast, and by choice, Dieste was regulated by the cadence of the masonry unit, and he understood that he was a servant not only to its physics, but also its unitized means and methods of construction. If the finished state of concrete conceals the presence of steel by necessity (protecting the steel from the elements), it also tends to naturalize the pristine crust of concrete that is characteristic of classic modern structures. In contrast, Dieste's disciplinary—and stubborn—use of exposed brick produces an edge condition of aggregated masonry that floats perilously—and mysteriously—off the edge of the Atlantida Church, without evident recourse to reason.

Here, the contradiction between performative and optic evidence is poignant: if conceived as a masonry structure, the edges of the Atlantida Church would simply crumble under both compressive and lateral forces. However, since we know that the instrumental protagonist in these structures is steel, we also know that the brick edges are not slabs in the traditional sense, nor a mere extension of the roof vaults. This is where Dieste's deliberate role as 'architect' becomes evident: as required, he decides to establish a perimeter beam around the church, such that it takes the necessary compressive and lateral forces. Yet, contrary to the expected orientation of a beam, normatively optimized on a vertical axis, he shrewdly rotates the beam into a horizontal format. Seemingly irrational, this results in the now-famously thin masonry edges of the Atlantida Church. We also know that the masonry edge is held in tension by the very steel reinforcements within the vaults that require the beams on the perimeter of the church: a symbiotic set of structural forces acting upon each other, akin to isometric body training where the symmetrical forces of the body are pitted against each other. If, in general, the mathematical formula dictates that the height of a beam is elevated to the power of three for the moment of inertia, opposing the deflecting action of a force, in this vault, the horizontal thrust of the whole roof is proportionally higher than any vertical load that the ridge beam carries, resulting in the inevitable horizontalization of the perimeter beam.[4] Thus, the curiosity of the building's edges becomes understood as part of the tectonic grain of the building. The brick bonding of the crust slaloms back and forth, establishing an exact reciprocity between the figure of the building and the configuration of its construction. And yet, these very edges appear implausible, the result of a contradictory rationality, a feature that adopts the steel reinforcement to contain the building's edges in order to support the vaults. **[15-16]**



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17 Port Warehouse, Montevideo, Uruguay, Eladio Dieste, Gaussian Vault Secton. Image courtesy of Dieste Y Montañez S.A.

18 Gymnasium (Estadio Ernesto de Leon), Durazno, Uruguay, Eladio Dieste. Photo by Nader Tehrani

THE CONSTRUCTIVE INTUITION: THE RULED SURFACE AND THE SADDLED BEAM

Pedreschi and Larrambebere's essay on technology and innovation helps to further elaborate some of the central themes of Dieste's work, again couched in the ethics of truth, honesty and service to humanity to which masonry innovations are commonly attributed. With rigorous detail both address Dieste's development of a constructive intuition, creating an alliance between his design sensibilities in relation to his persistent engagement with construction as a central feature of his intellectual evolution. Among other elements, this essay deals with the ingenious invention of the Gaussian Vaults, the evolution of which can be tracked through numerous projects over the years of Dieste's panoramic career. With the ability to withstand forces beyond what a typical vault can achieve, the Gaussian Vault is defined by a single surface double curvature whose spring-point edges are flat, while the vault saddles both up and down as it spans vast dimensions.

Beyond Pedreschi and Larrambebere's argument, what is remarkable in this structural trope is its architectural ability to discover reason amidst a host of varied yet confluent alibis. Evacuated entirely of any structural beams in the conventional sense, the thin compound surface is called on to span extraordinary lengths, purely through its own figural distortion. The asymmetrical deformation of the vault is defined by the added value of the introduction of natural light into a large open space. The asymmetry of the skylight introduces a slope in the roof that invariably forces drainage to one side. Hence, the moment of ingenuity: the introduction of a saddle—in the form of a counter-curve in the vault—is such that in one formal swoop, the vault reorients itself vertically to connect with the plane of the clerestory window while also producing a constructed swale that redirects the water away from the glazing, while providing added structural strength at the bottom of the vault. In this sense, both saddles serve as flanges for the vault, reinforcing it through a surface figure while allowing the reinforced steel to add composite strength. The multiple narratives that are woven into this single surface describe the kind of phenomena that I like to call architectural confluence: the form is not determined by a single alibi, nor a linear form of reasoning, evading simplistic determinisms, whether structural, functional or semantic. Instead, the technique involves something deeply rooted in the architectural discipline: beyond the obligation to solve problems, the elaboration of a tectonic language, the integration of multiple contingencies, and the invariable synthesis of heterogeneous parts. What is extraordinary is that Dieste's functional fragments cannot be seen: the beam, the drainage and the skylight are all absorbed into one formal, spatial and material system, suppressing their contradictory functions towards a singular figure. **[17-18]**

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19 Church of Christ the Worker, Atlántida,
Exterior View. Photo by Nader Tehrani

By extension, what is particular to Dieste is a single-minded quality we see in few other architects: the penchant to work in a single medium as a means to radicalize the performance of material and programmatic behavior. Insofar as traditional tectonics is defined by logical differences in materials in accordance with conventional functions, it is also a deep-seated and historically grounded attitude that is imparted as part of the academy. Gottfried Semper's *The Four Elements of Architecture* comes from one such ideological foundation. For this reason the obstinate adherence to a medium—to make materials go beyond what they are meant to do—is also a significantly defiant intellectual act. Since nothing can work in accordance with normative adaptations, it forces the architect to transcend the terms of both material and social conventions to produce new forms, whose use will, in turn, challenge everyday rituals and practices. We witness something similar in the St. Petri Church of Lewerentz, where floors, walls and roof are all cast in brick, forcing each to display the predicament of difference through the elaboration of brick bonding, in both structural and iconographic terms.

THE CATALYTIC DETAIL: THE STEPPED TOWER OF ALTANTIDA

What none of the writers addresses directly, but which they insinuate throughout, is the degree to which the structures of Dieste are bound to particular material rules. His direct reliance on, and engagement with, the construction site is central to his research. Yet, none of the historians speak directly to the part-to-whole relationships created by the masonry logics he deploys. In part, Dieste's initial adoption of brick is rooted in the principle that links it to the cost of labor: first, the idea that labor was relatively economical, second that the brick, as a unit of construction, is designed around the dimension of a hand, and third that an edifice of sizable dimensions can effectively be built by an individual if a self-sustaining part-to-whole constructive principle is at work.

The most direct and fascinating architectural display of a catalytic material detail can be seen in the tower of Atlantida. From the outside, the tower is composed of monolithic vertical brick piers that are incrementally interrupted by what seems to be a vertical running bond pattern, albeit at a monumental scale. On closer inspection, and as is revealed by a view into its interior, we discover that the horizontal brick bands that make the so-called running bond pattern are merely the extruded brick treads of a spiral staircase that navigates all the way up the tower. The logic of the spiral stair, the bonding of the brick wall and the scale of the tower are all interwoven, but the seed for its inception lies in a small detail of a stair

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20 Church of Christ the Worker, Atlántida, Interior View of the Tower. Photo by Nader Tehrani

21 Church of Christ the Worker, Atlántida, View Up the Tower. Photo by Nader Tehrani

5 It is important to distinguish Dieste's tell-tale detail from that of Carlo Scarpa, as articulated by Marco Frascari. Scarpa's details do indeed tell a story, but each an essay onto their own, drawing in his arcane use of materials, crafts and singular moments, the sum of which rarely tells the story of the building at large. In contrast, Dieste's details operated as the genetic code of a construct, without which the building is not possible as an organic whole. For Scarpa, the detail was the exceptional moment of artistry, for Dieste it was the rule-set and inventive code.

6 It should be mentioned that over his career, Dieste enjoyed a long and fruitful relationship with artist Joaquin Torres Garcia, whose work spoke to some of the same preoccupations of "aggregation" and "assemblage" that is evident in Dieste's own work, especially in his more abstract paintings where latent readings of masonry impress themselves onto the surface of the canvas.

7 Agustin Dieste notes that a similar staggering of the horizontal links between vertical sections is seen in the Maldonado TV Tower. Here the scale is much larger, and thus not determined by the dimension of steps. Instead, they serve the purpose of supporting working platforms, as it was built without scaffolding, while shortening the continuous span of the vertical wall/column elements, to avoid buckling.

8 Julian Palacio notes that the plan layout of Atlantida redefined the liturgical protocols at a time ahead of the changes introduced by the Vatican Council II, making the community participant in the mass celebration.

tread and riser, whose engagement with the wall defines the logic of an edifice far greater. From a discursive perspective, the architectural allure of this strategy speaks as much to the logic of Trajan's Column in Rome as it does to the horse ramps at the Chateau de Chambord, both in their own ways weaving the configuration of the stair into the figure of a tower. In the case of Dieste, with an austerity of religious restraint, his buildings thrive on the richness of abstraction, and the refusal to ornament outside of the tell-tale detail[5]: his catalytic details are both structure, ornament and the genetic code that releases the logic of how these curious buildings work.[6]

Given his protean abilities, the details do not necessarily repeat themselves, but remain a critical part of the logic of each structure.[7] For instance, if the Atlantida Tower establishes a tight reciprocity between tectonics and the function of the stair, in the Gaussian vaults, Dieste develops a loose fit between the grid of tiles and the geometry of the vault. The loose fit allows him to contain the same number of tiles in each row, while using the mortar as the elastic dimension that permits the geometry of the vault to expand and contract—in effect, an embodiment of a wire mesh model. In contrast, Dieste's self-supporting shells are commonly cut at the end of their extrusions, slicing against the grain of the grid, if only to underline the cantilevered logic of the arches. They are not arches as such, but cantilevered beams. **[19-21]**

THE TYPOLOGICAL FIGURE: A BASILICA IN ABSTRACTION

It is commonly held that the San Pedro Church in Durazno is Dieste's most accomplished architectural work, but also somehow an outlier in relation to the others. A mere visit to the space is enough to silence both the architect and the believer; I can attest to that myself, having just returned from a pilgrimage. Set behind an old neo-Romanesque façade, the remains of a fire that gave rise to this commission, the new space of the basilica is concealed behind this historic relic, and yet locked into it as both structures reinforce each other on the longitudinal axis.

In contrast to the church in Atlantida, the figure of this church gains traction from a deep-seated fidelity to the church as an architectural type. The plan of Atlantida, architecturally ingenious as it is, draws from the sensibilities of the free-plan, and yet each and every figurative element, whether wall or roof, has a structural purpose, and there is no identifiable reference to cultural conventions beyond that—it's almost an entire invention.[8] Upon entry into San Pedro, the basilical 'impression' of the church as a culturally encoded space is immediate and identifiable, though at the same time allusive, abstract and disciplined. The extruded sectional profile of the basilica is unmistakable, yet all the elements that support its systems of structure,

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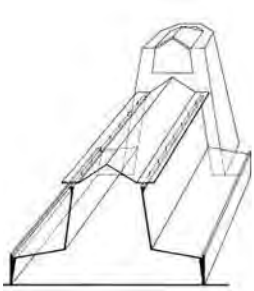

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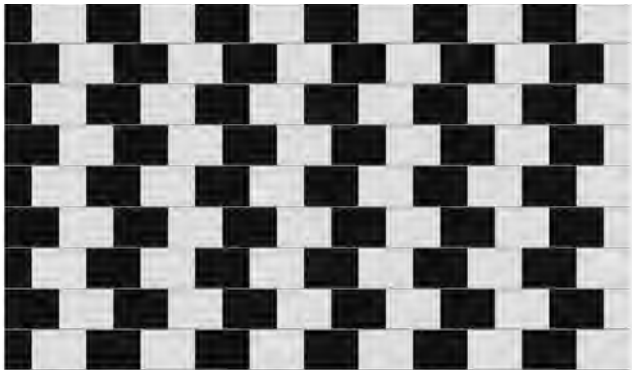
22 Church of San Pedro, Durazno, Uruguay, Eladio Dieste, 1967-71. Photo by Nader Tehrani

23 Church of San Pedro, Durazno, Axonometric Section from *Eladio Dieste: Innovation in Structural Art* (2004), Stanford Anderson

illumination and spatial organization are somehow missing...entirely evacuated actually. Effectively framed within a monolithically stacked-bond masonry organization, the figure of a column-less basilica is suspended in space; the bonding system amplifies its structural ambiguity. The effect of suspension is heightened by the fact that the roof over the nave mysteriously floats about two feet above the very walls that would conventionally support it. The longitudinal walls of the nave are canted out ever so slightly, angling towards the tilted roof of the side-aisles, whose compressed wings spatially buttress the nave. What is heretical about this space, in part, is its consciousness of the historical role that structure has played in the conception of a basilica, whereby the side-aisles of its antecedents were not only support spaces for the nave, they were also the space of structure, lodged in alignment with the flying buttresses, set within the same zone. Dieste replicates the spatial layout of this religious type but evacuates all finer grain elements: the structural piers, the bay organization, the clerestory windows, side chapels, among other things. Abandoning the part-to-whole relationship of the elements within the type, he reveals something irreducible about the spatial gestalt of the profile of a basilica, and in doing so, is able to dispense with any architectural surplus in service of a structural strategy that absorbs the structure and skin into one extend folded system, enveloping the entirety of the interior.

Indeed, the framing walls around the nave are not merely walls; instead, they are deep beams, running the length of the church—from the main façade all the way to the supporting wall of the apse—with a depth of about 20 feet. The brick of the interior captures the stark light that comes through the reveals of the roof, heightening the effect of weight, and depth. At the same time, the levity of its composition beguiles, because one is unable to understand how the figure of the church can be supported in a structure-less enclosure.

The effect of this space is resonant with a sense of absence: all the architectural elements, iconography and elaborations of the basilica are missing, and yet what resonates about the basilica as type, remains profoundly discernable. In linguistic terms, we might analogize the operations on this space to that of an ellipsis: the rhetorical device that communicates through omission. And herein lies the core of my argument: that while Dieste's profound knowledge of structure was undeniable, his contributions were in service of an even more sophisticated understanding of tectonics, whose premise was to reconcile the relationship between structure and its expression. Given his sometimes-mannered sense of rationality—and here, I would not want a confusion with the mannerisms of architecture—his self-conscious visual tropes establish a difficult and sometimes illusory relationship with the reality of the building, even when he is operating with absolute faithfulness to its structure. Often cited in the context of the baroque and



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24 Worker's Kindergarden Illusion

25 Church of Christ the Worker, Atlántida,
Entrance Wall. Photo by Nader Tehrani

mannerism, Dieste is anything but; the linguistics of his masonry work are not of a language of scenography, but rather meticulously tied to a construction system to which they were married—and revealed to be as such. **[22-23]**

THE OPTICS OF TECTONICS: A WORKER'S KINDERGARTEN ILLUSION

Lucio Caceres, a former student of Dieste, caps the book with a final essay as a tribute to his mentor. Its message is a generous one, reflecting on Dieste as a man, an engineer and creator. It speaks of the harmonious relationship between architecture and engineering in the vast body of work that Dieste leaves behind. Much is to be appreciated in this appraisal, and yet the insinuated harmony helps to camouflage some of the more heretical delights that I argue are the central pleasures of this work.

In one of Dieste's most articulate architectural feats, he separates the front façade of the Atlantida Church from its sidewalls, such that one can witness their structural independence through a reveal that allows a stream of light to enter from the north. As such, he identifies how the undulations of the sidewalls connect to the roof as a pinned frame, a pure manifestation of a moment diagram. The front façade then, is conceived as a deep monumental portal that is spanned by a masonry screen wall composed of an aggregation of smaller stacked diagonal walls. The diagonals disallow views into the church while ensuring the passage of light. In turn, the diagonals produce depth, as each layer stacks in the opposite direction of the layer above and below it, producing a coffering that functions virtually like a truss. From a visual point of view, this screen wall appears to undulate, created by an optical effect that is commonly known as a "kindergarten illusion"—also known as a café wall or chessboard illusion—the offset patterning of an optical illusion cited first in 1898 as a graphic device. Here, this graphic device takes on a charged role, as the two media come into direct confrontation: a structure embodying stability is faced with its own image as something kinetic, vulnerable and unstable. From the inside, the beauty of this wall can only be described in optical terms, as the pattern of light obfuscates the figure-ground relationship between solids and voids. Since the eye is not permitted to see the actual windows, one can only intuit the depth of the wall through the cadence of light, a stark reminder that the certainty of structural reason is in the service of a transcendent quality of illumination and illusion, and one that underlines the crafty way in which tectonics creates an alliance with optics over actuality. With this, the laws of physics and optics come into and improbable alliance—not natural, nor harmonious or obvious—but a masterful aplomb of artifice to witness. **[24-26]**

9 Stanford Anderson, *Eladio Dieste: Innovation in Structural Art*, op.cit., 32.

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26 Church of Christ the Worker, Atlántida, Interior View Towards Entrance Wall. Photo by Nader Tehrani

"I too obey the laws of physics."[9] Stanford Anderson quotes Dieste, who towards the end of his life was suffering from illness and had reckoned with the imminence of his passing. That he did; he forecasted structures through an impeccable understanding of physics as much as his body would succumb to a degenerative disease that he, himself understood to be his yield point. But beyond that, he disobeyed a myriad of other laws requiring a sophistication of mind to bridge the art of rhetoric, optics and perception to overcome the very laws of physics at work, drawing out the architecture contained within the structure.

Acknowledgements

I would like to thank Fernando Amen and Marcelo Payss. for my invitation to Uruguay, planning every moment of the visit with itineraries revolving around Dieste, and a lecture at the Facultad de Arquitectura, Diseno y Urbanismo; in turn, I would also like to thank Lucia Caldeiro for her meticulous translation of the lecture. Behind all this, it was my friend and colleague Julian Palacio, whose own research on Dieste and trips to Uruguay helped to launch this trip. I would like to thank Steven Hillyer not only for the meticulous editing of this text, but a disciplined commitment for over four years of collaboration, between writing, exhibitions and lectures; his efforts have far exceeded his title as the Director of the Archives at the Cooper Union, in service of an intimate reading of my many texts, none of which would have been possible without his close inspection. I would like to offer a special thanks for Esteban Dieste for the generosity of his time and intellect, as well as his patience as he mentored me through various buildings. Equally importantly, I would like to acknowledge Agustin Dieste, whose direct critique and conversation around this article gave it new perspectives at every turn. Last, but not least, I would like to acknowledge the late Stanford Anderson, whose book on Eladio Dieste serves as the roadmap for this reflection, not to mention his many years of intellectual leadership at MIT, where under his tutelage, I was able to flourish as faculty member.

FORMS OF PENUMBRA

The Codependent Existence of Light and Darkness

Paulo Barbaresi

1 Tom Heneghan quoting Koji Taki in Ando, Tadao; Pare, Richard; Heneghan, Tom (1996). *Tadao Ando architecture: the colours of light*. London: Phaidon, 2000, p. 19.

2 Baxandall, Michael (1997). *Shadows and Enlightenment*. London: Yale University Press, p. 3-4

In reviewing the vast bibliography concerning the topic of light and shadow one notices how differing layers of knowledge have built up one atop another. Thus, one may also take for granted that light is omnipresent, and that darkness is almost inexistent, where shadows are collaterally local manifestations experienced as a relative deficiency of light itself.

Throughout history western cultures have used light as a medium to convey clarity and to emphasize importance. Light has been associated with the value of life, the after-death and philosophical constructs regarding truth. Darkness has been associated with the occult, the hidden, to negativity and surreptitiousness. Conversely, most eastern cultures have shown a predisposition for shadows, where shadows are linked to the soul and inherent aspects of one's personality. Regarding space, the nuance shadows have defined platforms for spatial comprehension. In their spatial conception *"meaning is produced not through abrupt changes but through subtle variations,"*[1] suggesting patterns of shadows as a vehicle for manipulating space. Besides the cultural differences one can agree that the nuances of shadows imply differing nuances of light.

Scholars have recently proffered the notion that the mystery of light in space does not gravitate towards its presence—as an independent isolated matter—but rather towards its absence. Based on this thesis, one can momentarily detach the cultural implications of shadows and observe that the absence of light—as a modal procedure—has been consistently present within the realm of artistic and spatial poetics of western culture.

Leonardo Da Vinci attempted to understand the phenomena of light linked to the studies and theories of perspective evolving during the renaissance through observational drawings. He categorized three types of light deficiencies: cast shadows, attached shadows and shading[2]. Despite discrepancies in how these terms are contemporaneously understood, the nature of Leonardo's observational sketches condense the phenomenal complexities of light through graphic codes: light represented through projections and shadow as surfaces.

1

3 McCurdy, Edward (1871). *The notebooks of Leonardo da Vinci.* Old Saybrook, CT: Konecky & Konecky, p. 124.

4 Ibid., p 122.

5 Ibid., p 122.

6 Ibid., p 121.

1 "The Fall of Light on a Face", 1480, Leonardo Da Vinci. The study of the effect of light rays on a face is a part of Leonardo's scientific interest in painting and natural phenomena. The study concludes with a series of classifications of shadows according to how they fall and how they are produced. Royal Collection Trust © Her Majesty Queen Elizabeth II 2019

The falling of Light on a face (1480) maps an event **[1]** using syntactical trajectories of light to inform the relationship among the source (point a), the medium (face) and the receiver (skin). This analytical demonstration detaches the spatial characteristics of light and darkness by reducing the phenomena to simple representational/observational facts.

This reduction of content inherent in the analysis of complex events reshapes our mental constructs about these phenomena, preventing the awareness of other fundamental aspects of light and darkness: those critical elements related to space. This fact drives observers to associate light with "what is visible" and shadows with a collateral projected surface. A more experienced observer might semantically associate light with a presence – with addition, and shadows with absence – with subtraction.

If a representation implies—by default—a reduction of content, is there a possibility that we are losing inherent aspects of the phenomena that may reshape our conception of light and darkness? Can shadow—as a degree of darkness—be associated with a presence and light with absence? Is the analytical procedure conveying the idea that light and shadow are two separate conditions preventing the observer from seeing and experiencing them as one?

The perceptual understanding of the phenomena requires the inclusive analysis of both analytical and artistic representation. Leonardo Da Vinci himself wrote in his notes: "*Darkness is the absence of light. Shadow is the diminution of light*."[3] He further asserts: "*The beginnings and ends of shadow lie between the light and darkness and may be infinitely diminished and infinitely increased. Shadow is the means by which bodies display their form. The forms of bodies could not be understood in detail but for shadow.*" [4]

Da Vinci's notes suggest that a shadow is an interstitial condition between bodies...between light and darkness: "*Shadow is the diminution alike of light and of darkness, and stands between darkness and light*" [5]. It is important to understand that the term shadow was used differently by Leonardo, often as "*the counterpart of the luminous rays, which are cut off by an opaque body*" [6], in other words as an absence, and as a degree of darkness, which he called *simple shadow* or *compound shadow*. To avoid misunderstanding, this interstitial condition can be identified with the term *penumbra*. Penumbra (from Latin *paene*, "almost" and *umbra*, "shadow") is understood and revealed to us as the space of shadow between light and total darkness. It is an area where it is difficult to define the ending of one presence and the beginning of another. *Penumbra* is used here broadly and is not limited to the physical—fading light/darkness—but includes physiological and perceptual features that its presence generates in space. It frames the feeling of ambiguity inherent in the "liminal" condition, between two apparent, consolidated stages.

2

7 Primordial is undestood as an aspect constituing at the beginning, with the potential of giving originh to something derived from it.

2 "The Calling of Saint Matthew", 1601, Michelangelo Merisi da Caravaggio. The juxtaposition of two forces is solved with the technique of chiaroscuro, using shadows to convey meaning. © Scala / Art Resource. Public domain. Image displayed under Fair Use policy.

Da Vinci explored the interstitial nature of *penumbra* in *Madonna Litta (1490-91)* and *The Last Supper (1498),* among other works. Tiziano Vecellio, in his painting *The Agony in the Garden (1558 – 62),* furthered the idea which in turn influenced his pupil Michelangelo Merisi da Caravaggio. *The Calling of Saint Matthew (1601)* is well-known for exploring the coalition of the two forces: the power of faith represented by Jesus's illuminated face—bringing the omnipresent light with him—and the mundane world of tax collectors **[2]**. The painting representationally illustrates oppositions and inversions. The use of *chiaroscuro* on the right side is extreme, and illustrates the bodies of light and darkness—almost touching—with a clear horizontal dissection: the good from the bad, clarity from darkness. Jesus is positioned within the darkness.

The liminal condition between bodies—light and darkness—is expanded towards the left side of the painting. A wider body of penumbra corresponds to a wider range of personalities within the mundane world and the diffuse boundary between potential and helplessness. Penumbra embraces the tax collectors but also Matthew, defining a body where transformations happen: the call, the moment of conversion from one condition to another. Thus, the composition inverts the idea of shadows as a representation of absence and presents it as a fundamental, spiritual presence. Penumbra becomes a body capable of generating space and containing critical events via different illuminations. Light is associated with absence, or, with and external presence dominating the scene.

Caravaggio's penumbra contributed to making this biblical event a contemporaneously immediate, even pedestrian, event: the result of a modality that conveys meaning and exposes content by "solidifying" the relation between light and darkness. As timeless as they are in themselves, they also make the relation between space and tension timeless, regardless of the specificity of content. Certain forms of penumbra are—in themselves—a vehicle.

Caravaggio's alchemistical approach using doses of penumbra and dramatic chiaroscuro have become fundamental for generating tension and conveying meaning. His work gave birth to the *tenebrism* for the pronounced use of light and darkness, especially when darkness projects *primordial* characteristics.[7] The profound potential of the technique inspired coetaneous painters—the *Caravaggisti*—to work inside a field with generous darkness, a field induced by tension; they successfully conveyed meaning by regulating interstitial accents and densities of penumbra.

In reviewing their work, one cannot dismiss that the dark compositional aura touches upon the transcendental edge of the sublime. There is a spatial richness "inbuilt" through the accented use of chiaroscuro, a force that expresses the capacity of emergence. Is there a potential form of space "locked" within this tension? Does this tension temporarily remain in time or does it vary with it? To which point is the medium—the form, which constructs accented

3

8 Goldwater R., Treves M. (1980) *Artists on Art: From 14th to 20th Century.* London: John Murray, 1990, p. 440

3 "Mystery and Melancholy of a Street", 1914, Giorgio de Chirico. Penumbra is used in combination with optical tools to construct narrative content by observation. © Private collection. Image displayed under Fair Use policy

penumbra—responsible for holding this tension? Is it possible that a conceived form constructs such a tension that it transcends time?

Holding this condition in time has been the interest of many artists, in some cases taking the topic to levels that exceeds existence and posits a reality outside human perception. Giorgio Di Chirico confronted this uncertainty with a set of pictures known as *piazze metafisiche,* metaphysical explorations that began after a personal experience in Piazza Santa Croce, Florence Italy. The *piazze* are preludes to a deeper study of parallel experiences: "*Everything has two aspects: the current aspect, which we see nearly always and which ordinary men see, and the ghostly and metaphysical aspect, which only rare individuals may see in moments of clairvoyance and metaphysical abstraction.*" [8]

Mystery and Melancholy of a Street (1914) surrealistically maps an event. Penumbra is all there: it is a suggestion—the message to convey—it is a fading resonance embodied with latent content. The penumbra evokes the will to reveal what has not been revealed yet—the anticipatory threshold of the unknown **[3]**.

An eclipse-like orange light slices the canvas with an incisive trace, a demarcation of the duality required to define form. The metaphysical event allows free projections, distorted vanishing points and suggests a juxtaposition of spaces as the measure for the composition. Degrees of darkness contribute to a modality that seems to dissociate space from time, the preface for a *time-lapse* experience.

The dark base of the picture, as in *The Calling of Saint Matthew,* and the skies in accented darkness are framing the observer to stand in a point in which light is faded. Darkness, as point of view, is the counterpoint of the incisive light at the center of the picture. It emphasizes the enigma of the central shadow and the girl's silhouette. Chiaroscuro is used in perspective, through the depth of the picture, following a trace from the observer to the vanish points. These resources are framing a space dislocated from the point of action. The girl's black silhouette forces us to focus on *what her shadow is saying*: to run to the shadows of a possible statue. The message is clear: the shadows come first—the will, the action; after comes the possible result—arriving to the statue.

There is a narrative path, a line we follow which raises tension. The unfolded enigma allows the observer to fill in the gaps of the unknown, becoming perceptually involved and eventually creating his/her narrative with potential spaces. The right-hand building in the penumbra offers the question of what may be inside the building itself, at the arcade and especially what is behind it: a square where action happens. As with Caravaggio, light is void.

The non-alignment of vanishing points contribute to the overlapping of spaces framing the time-lapse. The left-side projections and vanishing points define the armature for configuring a "hidden space", a place where the action *may* happen. The right-side projections and vanishing

9 Campo Baeza, Alberto et al (2018). *El bisturí en la línea: razón, precisión y mesura en el dibujo y el pensamiento arquitectónicos de Alberto Campo Baeza*. Alicante: Universidad de Alicante

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4 "El Guernica", 1937, Pablo Picasso. Shadows emphasizing the act of stillness versus light expressing movement. © Sucesión Pablo Picasso. VEGAP, Madrid, 2019. Image displayed under Fair Use policy.

points lead to the narrative action itself, a point where two shadows/silhouettes will meet. The non-alignment of forces challenges the idea of space and action as juxtaposed, synchronized entities and proposes that they are not oppositional within one's perceptual—observational—field.

The incisive line dividing both bodies acts as a scalpel, a tool used to slice form and space. As the architect Alberto Campo Baeza has suggested, line is used as a medium for understanding space by dissecting what is darkness and what is light[9], what is form and what is space. The tension held between both is the field of maneuver for De Chirico to convey a message, a mode with potentiality for architects to influence architecture.

Furthermore, complex uses of shadows can be observed in certain works of cubism, the first artistic vanguard to challenge the strict idea of perspective as a form of narrative representation – a restructuring of formal representational tools and systems used to express all parts of an object—or scene—in the same picture plane, thus achieving a "holistic vision" of space. A divorce from a perspective is a divorce from a unique point of view. Multiple faces of an event are synthesized and collated into one piece as one expression.

The act of fragmenting form and space is not innocent. It distances itself from assumed factual representations. Pictorial representations focus on perceptual experience, expanding the time-lapse of events through multifarious points of view. In *El Guernica (1937),* Pablo Picasso explores the horrific drama of the bombing of Guernica. The whole scene is narrated by connecting individual events, which are semantically three-dimensional, bi-dimensionally stripped and exposed. A collection of elements is revealed one to another, expressing how they are related to each other inside the drama. Mapping these relations becomes a priority defining a palimpsestic reading, decomposing and fragmenting form and condensing information as needed to unfold the mayhem. Penumbra is fundamental. The body of shadows becomes independent. It becomes a separate identity capable of being "detached" from the form and performs a deeper role: to hold/connect the events that are vigorously, and anarchically, fragmented **[4]**.

The body of shadows works as an armature in the composition, giving stability to fragments and pieces. The bull and horse positioned in dark shadow seem to represent the act of staying, a prelude for the drama. The nuances of the penumbra support static events: the ones happening an instant before the bombing—the living—and after it...the dead. The contours of the projected shadows escape the rational logic of light projections. They tend to connect to one another giving a sense of measurement between the elements in the picture. Light can be associated with suffering, screaming, running and escaping. Light is the movement that tends to escape from the armature of penumbra.

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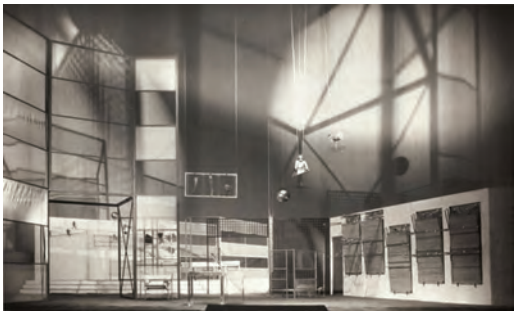

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10 Rawsthorn, Alice (2009). A Life of Light and Shadow. The New York Times. [Online] Available from: https://www.nytimes.com/2009/10/19/arts/design/19iht-design19.html

11 Moholy-Nagy László, Theobald Paul (1947). *Vision in Motion*. Chicago, p. 12

5 Photogram "Self-Portrait of the Inventor of the Photogram", 1926, László Moholy-Nagy. One-off picture as the end result of condensing light passing through several media. © The Moholy-Nagy Foundation

6 From left to right: "Scenography of Hoffmann's Erzählungen", 1929 and "Light Space Modulator" (© VG Bild-Kunst / © Lucia Moholy), 1930, László Moholy-Nagy. These images show Moholy-Nagy's intention to generate tools for *projecting* forms to create new manifestations of space. © The Moholy-Nagy Foundation

There is another form of penumbra that is not fully appreciated because it is not used as a medium for relating objects in the scene, but is rather a matter contained in the process of making. In 1922 László Moholy-Nagy began to map ideas of transparency using a source, a medium and a receiver. He produced silhouettes in a negative form by exposing objects on light-sensitive paper in a photographic process without the use of a camera. He called these one-off pictures 'photograms'. *Photogram Self-Portrait of the Inventor of the Photogram (1926),* as he called it, features a kind of penumbra that cannot be separated from the photogram itself. The image condenses the depth of matter produced by light passing through the objects and spaces between them. The whole journey of light is compressed in the receiver (the medium), in this case, photographic paper, around Moholy-Nagy's face **[5]**.

Moholy-Nagy was one of the pioneers in the use of Light as a decision–making element. Through an experimental machine known as *Light Space Modulator (1930),* ideas about transparencies emerged as form of projected patterns of penumbra. The machine for *"creat[ing] pools of light and shadow"* [10] would exemplify his principle of *"vision in motion"*[11] based on understanding and extracting aesthetic forms from a living body to create new expressions of space **[6]**.

Many instances in his career make his fascination with mapping transparency evident. The series of *Gelatin silver photograms* and *Gelatin silver prints* from 1939 to 1943, including experiences using color (1939), are patterns of penumbra as aesthetic forms. Moholy-Nagy saw space in these patterns, especially in the beauty of the movement as a prelude for spatial form. Projected registrations of penumbra were compressed in a surface medium—a photogram—resulting in a choreography of spatial associations. One can assume that Moholy-Nagy was not looking for transparency, but for forms of *translucence*: quasi-transparent forms that allow materially regulated transmissions of light, establishing an "aesthetic dialogue". The result did not seek to evoke a reality but rather an exploration of the act of mapping itself. The relation between the elements along a trajectory of light became primordial. The source, the mediums and the receiver were everything needed for configuring the spatial manifestations to artifacts and artifacts to space.

The action of compacting space into a planar form reveals that penumbra can be "contained" in certain representational mediums. In 2014 Steven Holl visited Caja of Granada, considered one of the best works of Campo Baeza. According to Holl the visit was a celebration of the existence of architecture "regardless of its function". He expressed the magnificence of this space as an "impluvium of light", a vessel for light and a medium that stipulates the seasoning of the building. The spatial "richness" of this work would not be possible without the use of a key transmutational medium: thin pieces of alabaster.

7

7 Caja de Granada, 2001, Alberto Campo Baeza. Screenshot from Steven Holl at Caja de Granada (video). Alabaster skin utilizing external light to reveal internal forms of penumbra, its structure and its essence. © Alberto Campo Baeza. Courtesy of Estudio Arquitectura Campo Baeza

The inner shell is constructed using plates of alabaster, a material that does not reject/reflect light but rather absorbs it. One can say the penumbra governs the interior of this stone: it only needs light to reveal what is hidden within. Alabaster, as a medium, allows light to escape or reenter the void. The same relationship is present here: the source, the medium and the receiver. Penumbra can be associated with density; matter condenses forms of penumbra **[7]**.

Forms of penumbra are present in acts of representation and making. It is a medium in both. Penumbra contained in representations is connected more to the idea of conveying meaning, while penumbra as a result of making is related more to the idea of mass and form. Both can be seen as separate or joint experiences; as a continuum and a consequential process, from a bi-dimensional to three-dimensional manifestation, and vice versa. The first implies a process of creating space, adding content to a planar manifestation in order to spatialize it. The second involves a process of condensing, reducing and extracting content to eventually finish with a distilled armature.

The forms of penumbra considered above are deployed as *vehicles* operating within the design process. Specifically, Caravaggio's work features a penumbra that is often bi-dimensional: a juxtaposed planar field, extremely dark, that achieves three-dimensionality by being interrupted abruptly where critical content needs to be anchored, by becoming diffused where meaning needs to be constructed, by intensifying color-contrast where narrative links need to be heightened and by allowing transparency where metaphysical presences need to be evoked. The accuracy in the details and the manner in which penumbra colors the event make the "instant of the calling" a point in time palimpsestically embedded with meaning.

De Chirico's penumbra fundamentally embodies space, which is inherently latent in his metaphysical motives. Although there is a bi-dimensional medium, the spatial narrative is completed by the observer when filling in the gaps the artwork ambiguously conveys. The work has the potential to perceptually trigger a three-dimensional world.

Picasso structured Guernica with patterns of shadows and connected them with aspects of "time". Shadows associatively connect scenes as intentional armatures conveying content before and after the bombarding. Light is the action and the movement, which is framed between these two moments in time. Spatiality is also challenged semantically when multiple points of view reinforce the message.

Maholy-Nagy reshapes penumbra as technique—and tool—and situates it as an inherent, and transmutable, spatial condition. Through his photograms and ideas of transferring movement—or three-dimensional manifestations—to bi-dimensional mediums and vice versa he achieves the idea of synthetically condensing space versus expanding and creating space—adding content.

12 McCurdy, Edward (1871). *The notebooks of Leonardo da Vinci.* Old Saybrook, CT: Konecky & Konecky, p. 119.

Observations about Campo Baeza's building reinforces tangential ideas in Moholy-Nagy work, which implies that penumbra is not only an external manifestation of form but it is also an inherent interstitial manifestation of matter. Light is needed to reveal the hidden penumbra within the mass itself.

These ideas reinforce the potentially embedded in the use of penumbra within the design process. Leonardo Da Vinci has an intuition:

> "Light [on an object] is of the nature of a luminous body; one conceals and the other reveals. They are always associated and inseparable from all objects. But shadow is a more powerful agent than light, for it can impede and entirely deprive bodies of their light, while light can never entirely expel shadow from a body, that is from an opaque body." [12]

Penumbra has a strong relation to accuracy, latent content, armature, expanded and condensed space and matter. Therefore, it has the potential to enrich design processes when it is understood as a *medium,* not just as an armature for conceiving design, but rather an *element of transition* to new creations, enhancing continuity in the design process.

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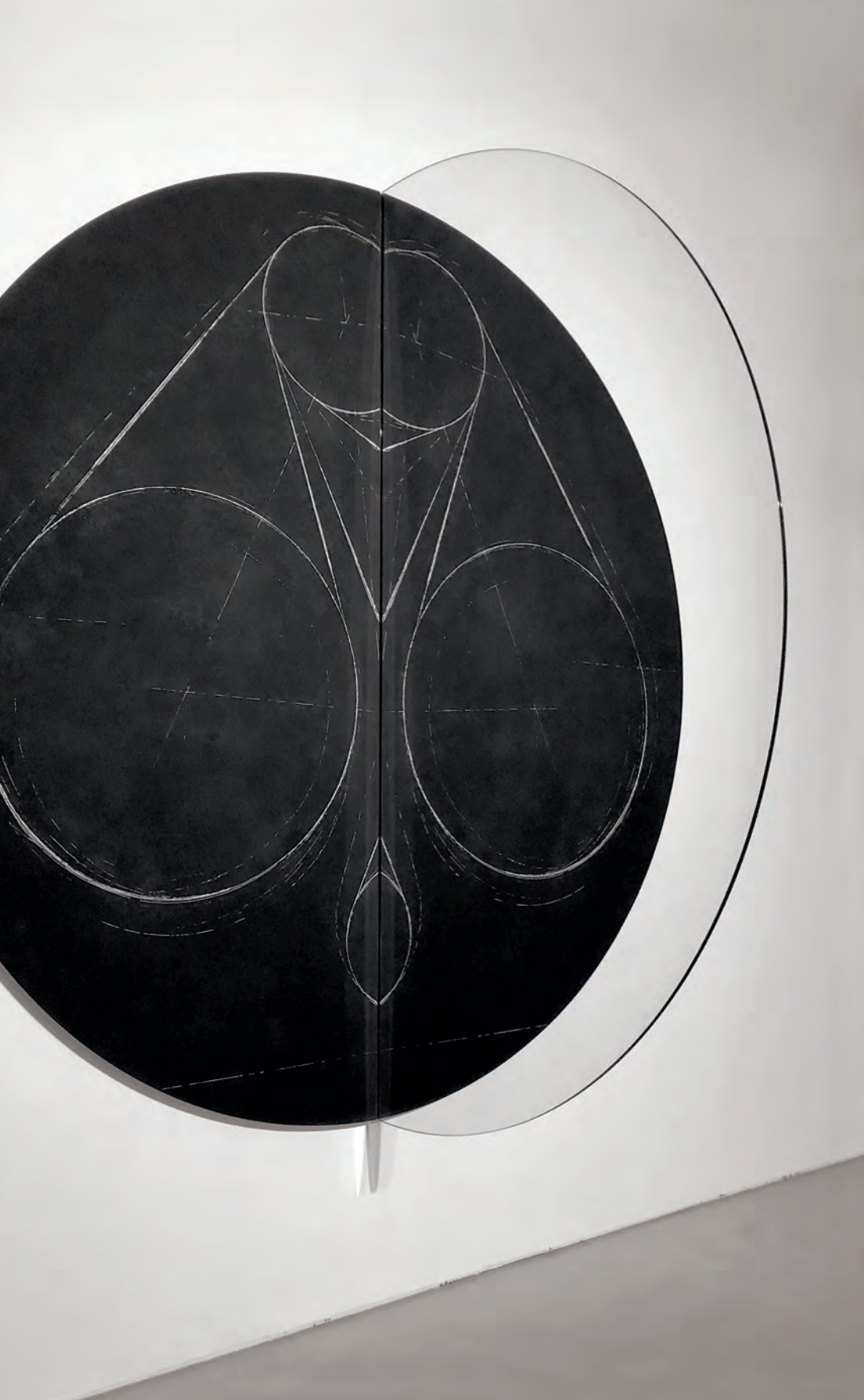
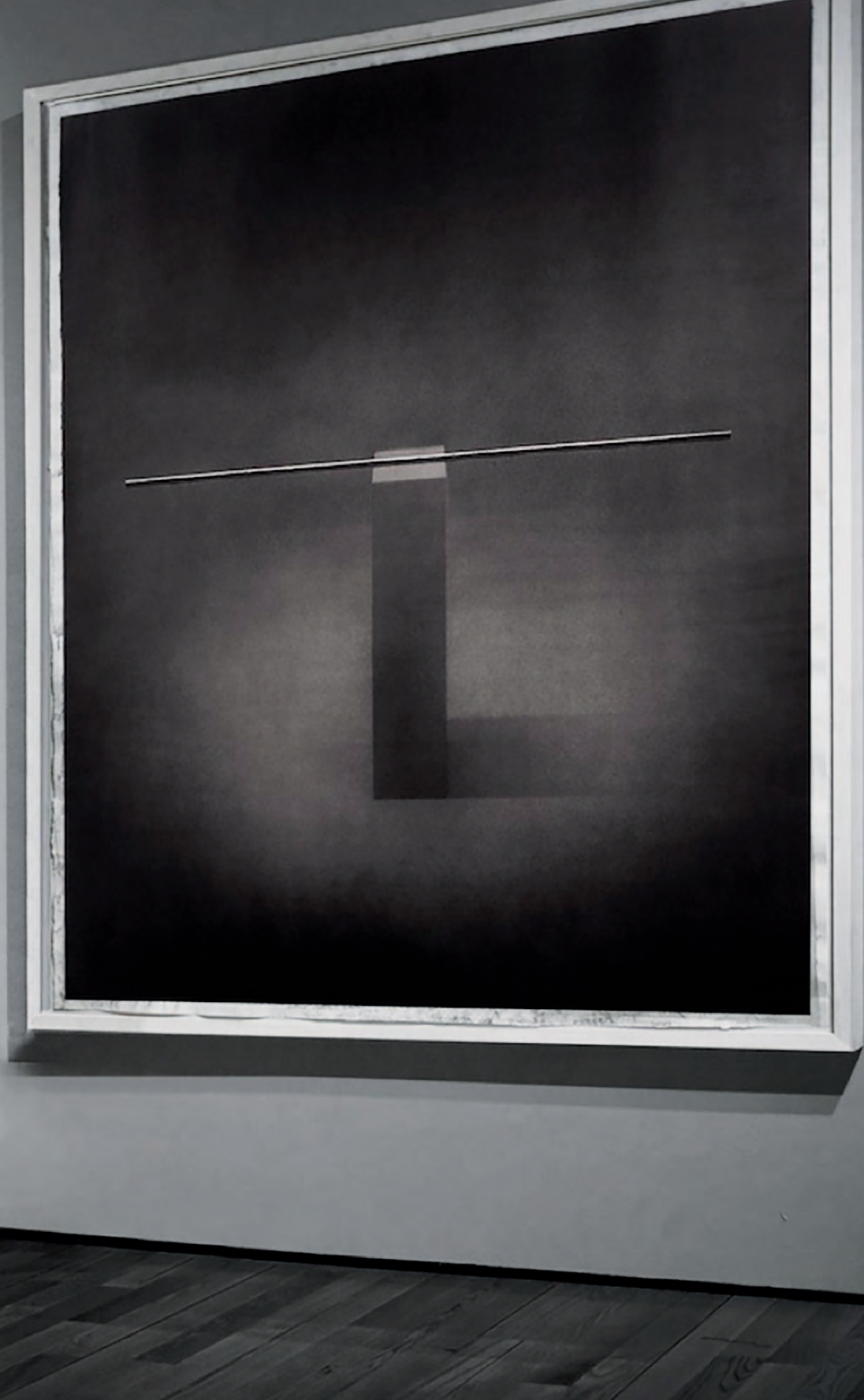
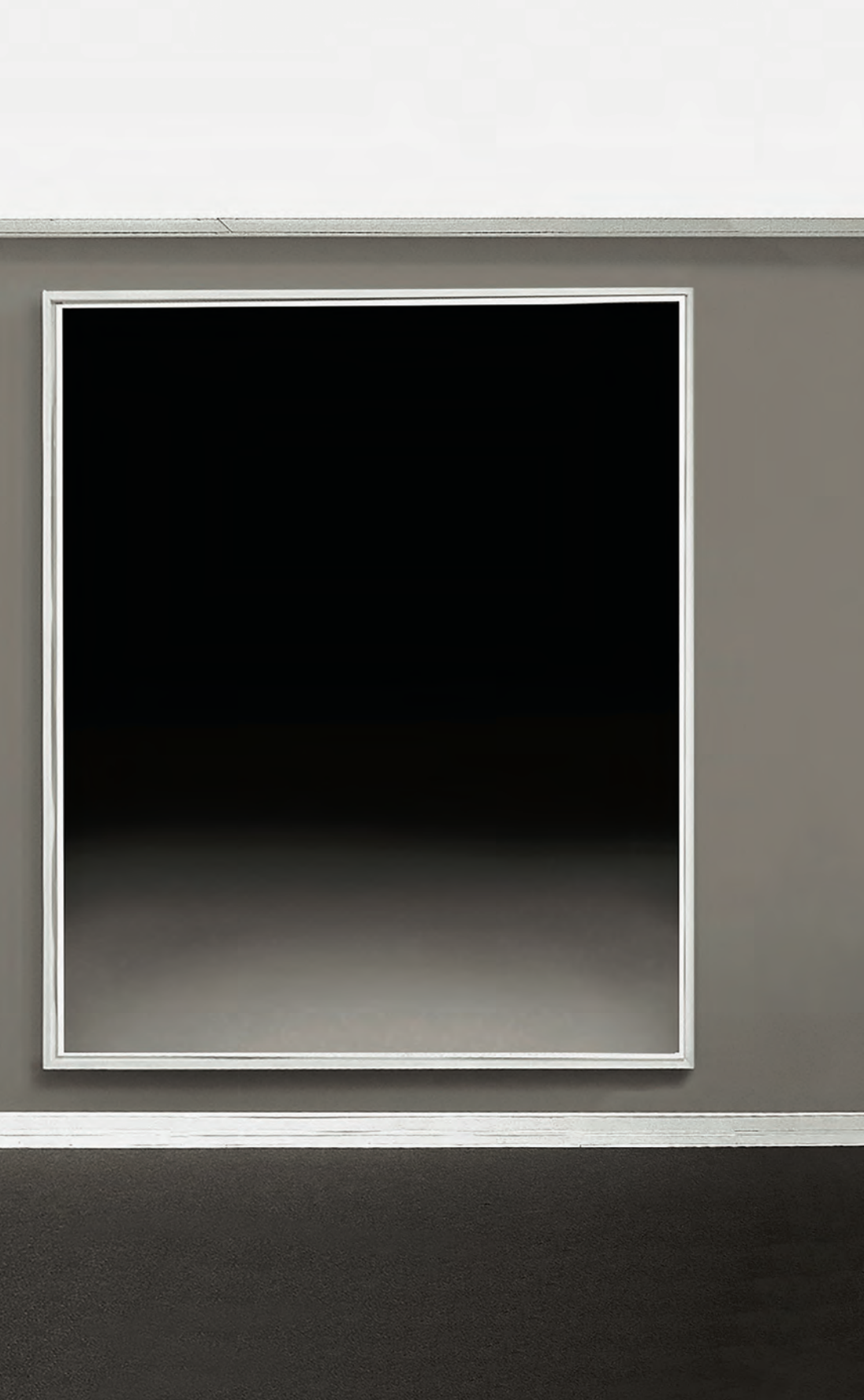
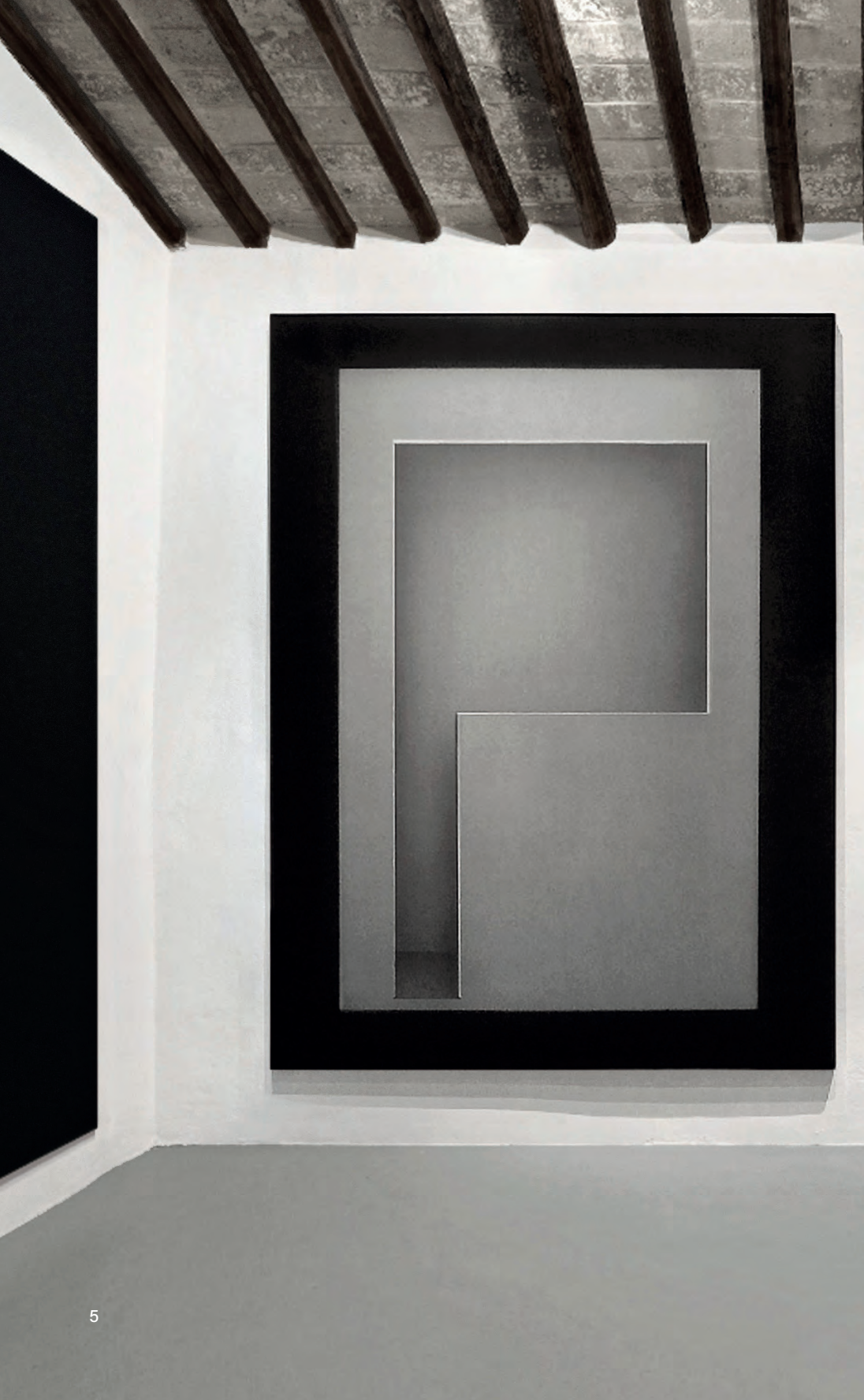
MARCO TIRELLI

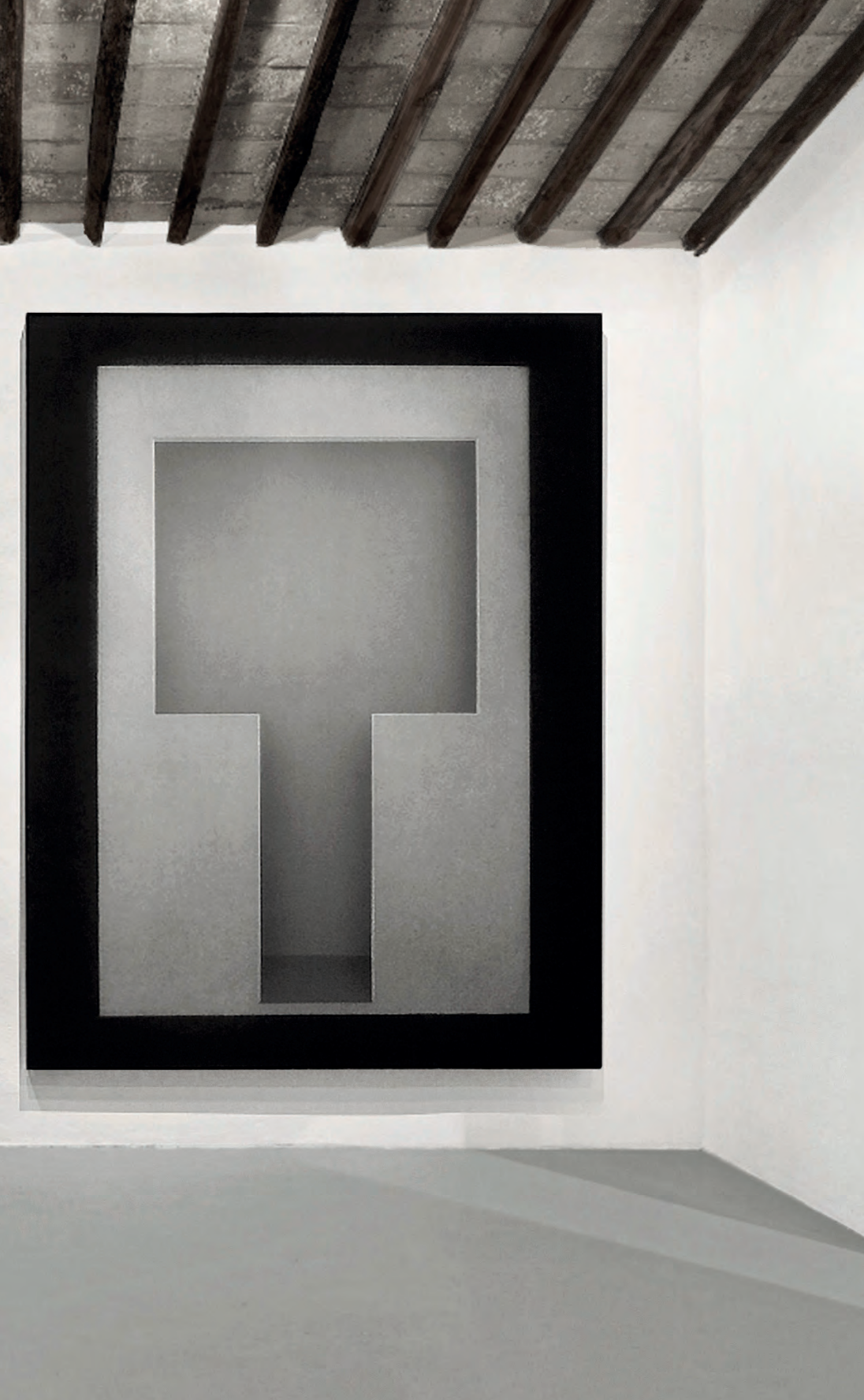
selected works

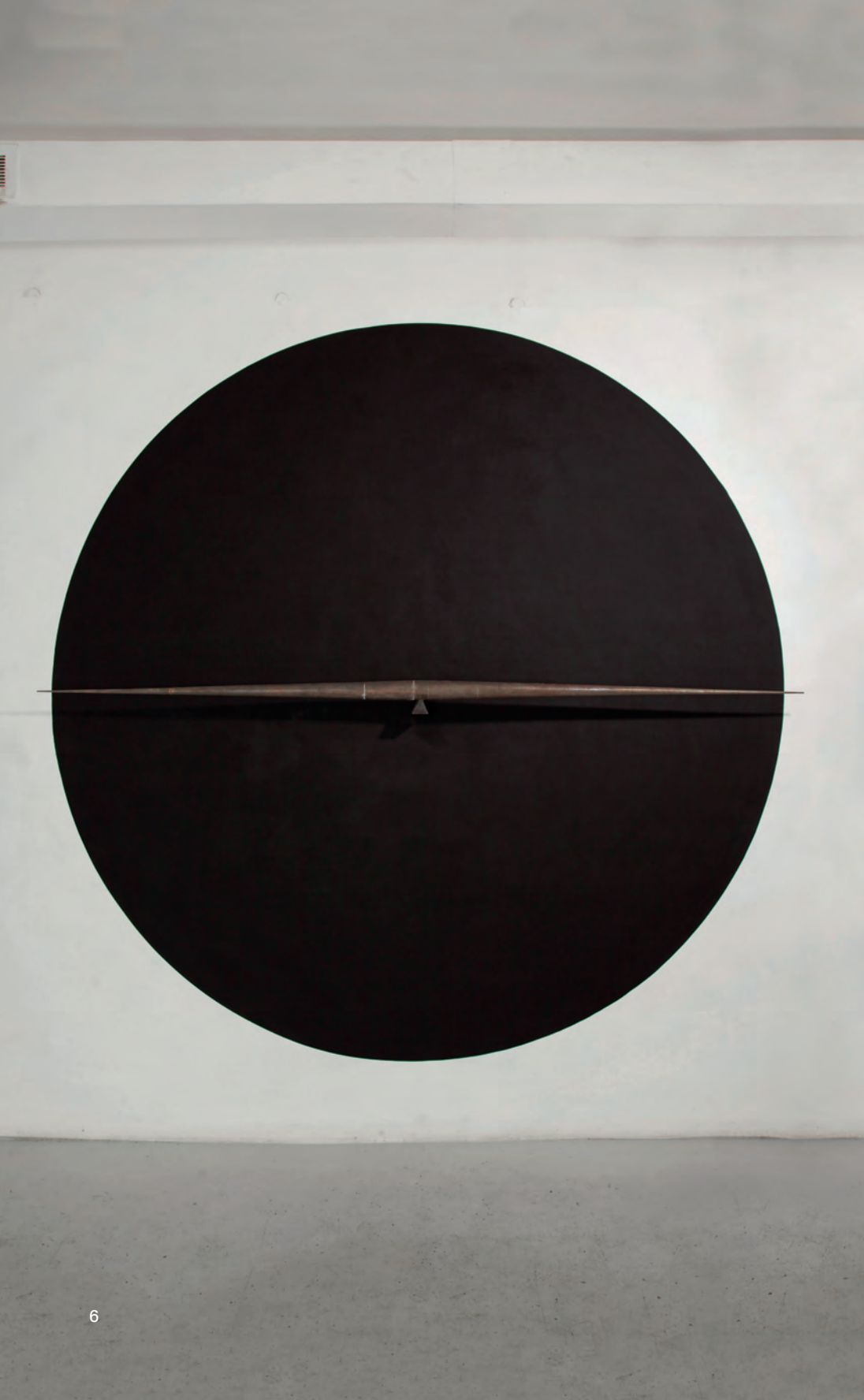


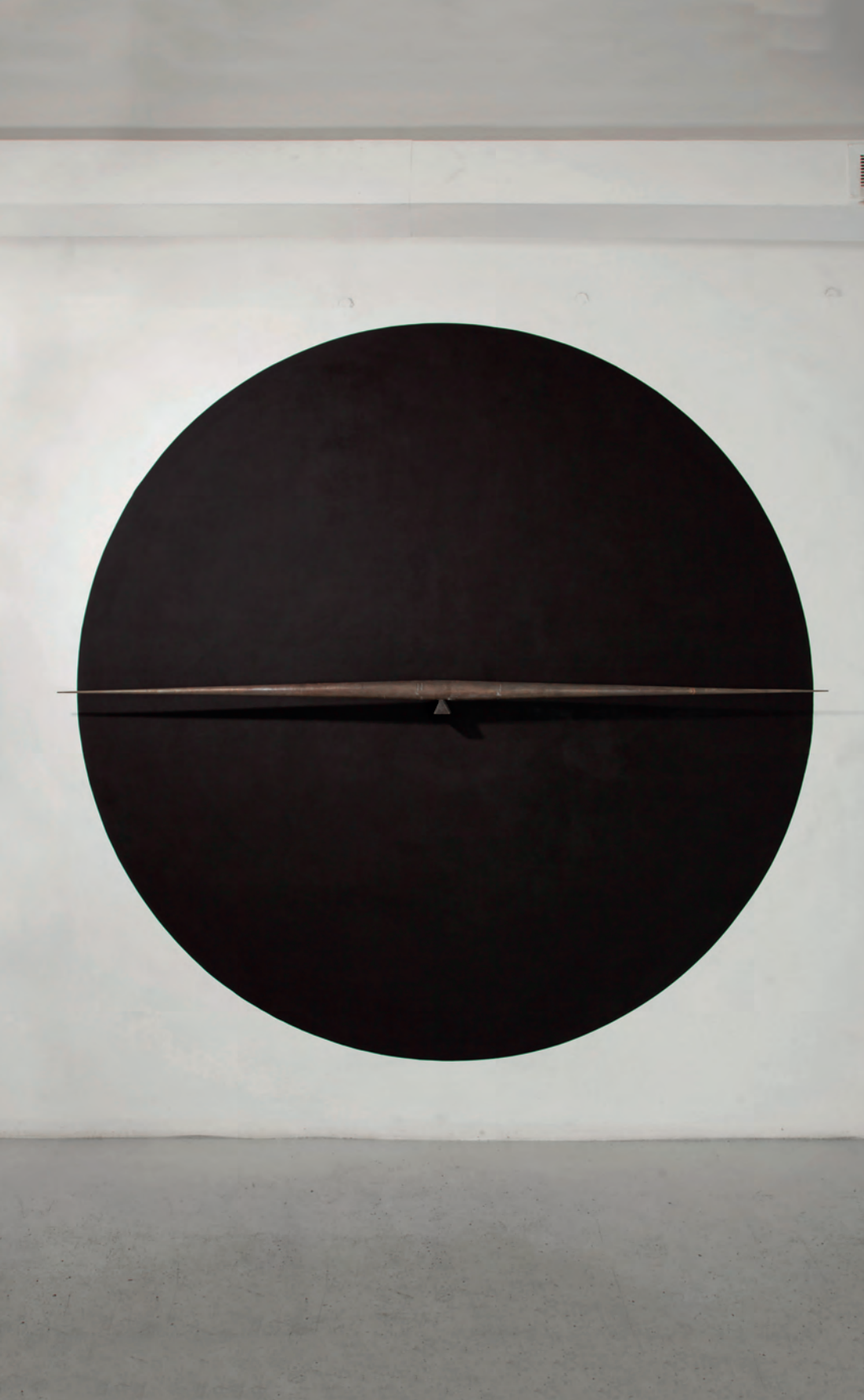












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The images used for for each title page were taken from:

Atlante, 2018
tempera on canvas,
cm 306 x 245
found on page 24-25

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Proteo, 2018
chalk and acrylic tempera
on table with mirror
diameter cm 300, radius cm 150
Collection MAXXI Arte

L	Untiled, 2012 mixed media on paper cm 180 h x 130	R	Untiled, 2012 mixed media on paper, cm 180 h x 130
L	Untiled, 2012 mixed media on canvas cm 300 h x 272	R	Untiled, 2012 mixed media on canvas cm 300 h x 272
L	Untitled, 2018 mixed media on canvas cm 250 h x 208	R	Untitled, 2018 mixed media on canvas cm 250 h x 208
L	Untitled, 2008 tempera on canvas cm 150 x 120	R	Untitled, 2008 tempera on canvas cm 150 x 120
L	Untitled, 2014 tempera on wall diameter cm 175 x 190	R	Untitled, 2014 tempera on wall diameter cm 175 x 190

Untitled, 2012
mixed media on canvas, triptych,
cm 300 x 216 (x 3 panels)

IMAGINING THE SPACE-IN-BETWEEN

The Elaboration of a Method

Marina Lathouri

“A dictionary begins when it no longer gives the meaning of words, but their tasks.”

Georges Bataille, *L’Informe* (1929)

1

2

1 Entrance of a House in Djenne, photo taken by Aldo van Eyck, 1960 (first published in Forum 1959-63)

2 Orphanage Amsterdam, Aldo van Eyck, 1955-60

1 “Major political, territorial and economical upheavals as well as scientific advances at the time laid stress on a greater interdependence of the parts. The problem of co-operation and co-operative action “as a basis for effective international organisation and world peace” underlined the problems of the relation of every part of the world to every other. In August 1945, the text of a draft constitution for a “United Nations Educational Scientific and Cultural Organisation” was published. The purpose of this organisation was defined in Article I as follows: 1. To develop and maintain mutual understanding and appreciation of the life and culture, the arts, the humanities, and the sciences of the peoples of the world, as a basis for effective international organisation and world peace. 2. To co-operate in extending and making available to all peoples for the service of common human needs the world’s full body of knowledge and culture, and in assuring its contribution to the economic stability, political security, and general well being of the peoples of the world.” In: T. S. Eliot, *Notes towards the Definition of Culture* (New York: Harcourt, Brace, and Company, 1949), p. 12.

The space-in-between, or the "greater reality of the doorstep [i.e., threshold]," as the Dutch architect Aldo van Eyck put it, captures to a great extent the mutations of the architectural debates, which took place after World War II and through the 1950s. In a period of destruction, uncertainty, but also vast number of changes,[1] the imagery and spatiality of the threshold furnished architects with a scale and certain coordinates to interrogate and re-negotiate relationships fundamental to the modern project: between the dwelling unit and the city, the individual and the collective, the formal and the informal, the new and the historical. Transferred from ethnographic studies of forms of living in traditional and small-scale settlements to the core of the architectural debates on the modern city, the realm of the threshold proposed a paradigm. It presented itself as alternative, if not correction, to the rationalistic views and scientific techniques apprehended as characteristic of architectural functionalism. Located within the sphere of the intimate, it expressed the urge to reconsider and stress human agency in the meaningful construction of the world as we see and live and act within it. Passing through a door, how irrelevantly banal came to stand as a condensed expression of human life itself. On a different scale, the one of the city and the region, of geography and history, the macro became nothing but an extension of the micro. **[1-2]**

Limen (or *limes*), meaning in Latin threshold, doorway or limit, has always been a site for the construction of alternative social and discursive patterns. The term, used to characterise multiple areas and forms of experience, has a long history indeed. While the concept of liminality becomes much celebrated in social and cultural theories, in particular over the second half of the twentieth-century, it does acquire a more profound presence in architecture, since the latter presents itself through the economy and apparatus

2 Colin Rowe and Fred Koetter, *Collage City* (Cambridge Mass.: The MIT Press, 1978)

of the boundary. Does not the labyrinth, in its archetypal status, betoken the condition of the liminal signifying at once the marking of an enclosure and the description of a route? Between the myth-grounded archetype and the critical construct, the concept of liminality, as Zygmunt Bauman said, is deeply ambivalent. Yet the ways, in which various understandings of it are expressed and materialised, pose questions, which are simultaneously spatial, political, juridical, personal and historical. In the physical world, architecture defines spatial limits, creates material enclosures. It is impossible to design anything without thinking the boundary itself first. But in so doing, conceptual enclosures become manifest as well. What is the space of home, the city, the common, the national, the local, if not attempts to identify and circumscribe areas of interiority and proximity? There is no interiority, however, without the marking of a certain limit, trace of the relationship between here and there, the familiar and the unfamiliar, the inside and the outside, the intimate and the shared. The ways, in which, these instances are marked is necessarily a political question, an interrogation of the politics of inhabitation. This is not to imply a certain political way of appropriating and inhabiting spaces or describing that inhabitation, but an attempt to examine and understand the complex of effects written into the experience of spaces that seem at first isolated from these effects. Nonetheless, to cover all speculations on the significance and multiple functions of the liminal would be beyond the scope of this text. Instead, the enquiry here centres into the ways in which expressions of the liminal re-engaged in the architectural and urban debates of the 1950s, steering and pushing ideas and design practices in new directions, and in fact anticipating recent arguments and emerging issues.

But where is the 'space-in-between' to be located? Can it be delineated and described? What are the material and functional aspects of such space? Does it demarcate an interruption, a transition, meeting of opposite categories or a confluence of material elements, scales, perceptions and experiences? The various readings and uses can hardly be reduced to a single systematic statement. Nonetheless, what pertains in the various interpretive and design strategies is the importance of the principle of relations and a mode of operating from within; hardly a new question, but one that has become central to debates of recent decades.

The term liminal appears in Colin Rowe's and Fred Koetter's *Collage City* problematising the conception of space as undifferentiated plane, upon which, spatial, visual and programmatic elements are laid out.[2] Though published in 1978, the authors refer to Victor Turner, the British anthropologist who re-discovered the concept of liminality in 1963 and extended it to the roots of human experience. The condition of liminality, in Turner's writings and the anthropological notions of the rites of passage, marks out "actions and reactions between the profane and the sacred," the crossing by the subject (the "passenger") of ordinary customs and daily ritual to open to

3 "The attributes of liminality or of liminal personae ("threshold people") are necessarily ambiguous, since this condition and these persons elude or slip through the network of classifications that normally locate states and positions in cultural space. Liminal entities are neither here nor there; they are betwixt and between the positions assigned and arrayed by law, custom, convention, and ceremonial." Victor W. Turner, *The Ritual Process, Structure and Anti-structure* (London: Routledge and Kegan Paul, 1969), p. 95. See also Arnold van Gennep, *Les Rites du passage* (Paris: Nourry, 1909). Van Gennep shows that all rites of passage or "transition" are marked by three phases: separation, margin (or *limen*, signifying "threshold" in Latin), and aggregation.

4 Turner uses the Latin term 'communitas' and not 'community' to distinguish "this modality of social relationship from an 'area of common living'," and denote "a communion of equal individuals who submit together to the general authority of the ritual elders." (Ibid. p. 103)

5 "What the present essay is all about. A proposal for constructive dis-illusion, it is simultaneously an appeal for order and disorder, for the simple and the complex, for the joint existence of permanent reference and random happening, of the private and the public, of innovation and tradition, of both the retrospective and the prophetic gesture. To us the occasional virtues of the modern city seem to be patent and the problem remains how, while allowing for the need of a 'modern' declamation, to render these virtues responsive to circumstance." Colin Rowe and Fred Koetter, *Collage City* (Cambridge Mass.: The MIT Press, 1978), p. 8.

6 Ibid. p. 49.

7 Robert Motherwell, prefatory note to Max Ernst, *Beyond Painting* (New York: Wittenborn Schultz, 1948), p. VI.

8 Rowe and Koetter, *Collage City*, pp. 62-63.

9 As Rowe stated much later, "there can never be a centre until there is enough pressure on it by the surroundings to make it central." Colin Rowe, *As I Was Saying – Volume 3: Urbanistics* (Cambridge, Mass.: The MIT Press, 1995), p. 320. This process, however, to define a formal logic able to give rise to "fluctuations of significance," was initially sketched out in the essay that Colin Rowe and Robert Slutzky had at first conceived in the mid1950s and published in 1964 under the title "*Transparency: Literal and Phenomenal*." The concept of transparency was employed as a technique to open possible readings of material reality. It is worth noting that in 1923 the Gestalt psychologist Wilhelm Fuchs published a paper entitled *On Transparency* (published in English in 1938). In this text, the author discusses the possibility of the simultaneous perception of two objects that are located the one behind the other. Fuchs draws the distinction between the "real" space and a "phenomenal visual space" and indicates the overlapping space, the one shared by both objects as the "critical area," which allows the reconstruction of the visual and spatial field. Wilhelm Fuchs, "On Transparency". In: *A Source Book of Gestalt Psychology*, William D. Ellis, ed. (London: Kegan Paul, Trench, Trubner & Co., Ltd., 1938), p. 89.

10 Max Ernst, *Beyond Painting* (New York: Wittenborn Schultz, 1948), p. 21.

the unaccustomed.[3] Most interestingly, Turner connects the state of being-on-the-threshold with the notion of communitas.[4] "We are presented," he writes, "in such rites, with a 'moment in and out of time,' and in and out of secular social structure, which reveals, however fleetingly, some recognition (in symbol if not always in language) of a generalized social bond." In fact, it is within the 'betwixt and between' that "the generic authority of tradition" is effectuated, and it is precisely this temporal dimension, which Rowe and Koetter invested the term liminal with. Critical of modern architecture's "failure to recognize the complementary relationship," they used the term to depict the city in terms of a fluctuating ground "for the joint existence of permanent reference and random happening, of the private and the public, of innovation and tradition, of both the retrospective and the prophetic gesture."[5] Every building is for the authors at once a project of "prophecy" while bringing together "the known, perhaps mundane and, necessarily, memory-laden context from which it emerges."[6] Rowe and Koetter imbedded the anthropological approach in the attempt to rethink the city in terms of a "solid and continuous matrix or texture," within which the building functions at once as distinct object, a 'figure' carrying the Geist of its time, and part of the 'ground', that continuum of spatial, visual and historical relationships, which is ceaselessly activated and transformed by "generations of connotations, associations, sense experiences."[7] The city/ground is thus being analysed as a "legible structure" (the "generalised social bond"), which gives "energy to its reciprocal condition, the specific space."[8] The multiple interfaces, deliberately unspecific, take centre stage for the user to imagine, negotiate and occupy.[9] This also explains the use of the term 'collage', especially as defined by Max Ernst in his book *Beyond Painting*; a "mechanism" for "the exploitation of the chance meeting of two distant realities on an unfamiliar plane."[10]

The understanding of the city, or indeed any spatial organisation, as layering of formal and material configurations and human associations had been expressed in earlier architectural arguments, merely from a social point of view. Catalysed by the extreme material and human destruction of the Second World War, the urgency of reconstruction in parallel to the on-going process of modernisation, architects in the 1950s turned their attention to the space of human encounter, which, in various expressions, captured the core in the process of reassessing the role of architecture. The shift of perspective transformed previous conceptual assumptions and methods of design on multiple fronts. One of the most critical was that the sense of building embodied in its three-dimensional geometry was gradually combined with the idea of a structure that responds to and extends social and environmental needs. For example, human habitat, the theme of the 1953 CIAM meeting (Congres Internationaux d' Architecture Moderne), beyond providing a critique of the standardised

11 *Team 10 Meetings*, edited by Alison Smithson (New York: Rizzoli International Publications, inc., 1991), p. 8.

12 A. & P. Smithson, *Urban Structuring: Projects of Alison & Peter Smithson* (London: Studio Vista, 1967), p. 29.

13 Not a coincidence, the French geographer Max Sorre had published his three-volume *Fondements de la Géographie Humaine* between 1940 and 1952. Max Sorre, *Les Fondements de la Géographie Humaine*. Vol. 1 *Fondements Biologiques de la Géographie Humaine* (1940), Vol. 2 *Les Fondements Techniques* (in two parts 1948 and 1950), Vol. 3 *L'Habitat*, (1952) (Paris: Colin editions). In the 1952 issue of the journal *Urbanisme*, the commentator Gilbert Cautier saw the invaluable of the work in the study of the human condition in its totality, "departing from elementary biological conditions to arrive to the most complex social phenomena." Gilbert Gautier, "Les Fondements de la Géographie Humaine de Max Sorre", *Urbanisme*, No 5-6 (1952).

14 An example, the panels presented by the ATBAT-Afrique team (Georges Candilis, Shadrach Woods, Vladimir Bodiansky, Henri Piot) at Aix, titled "Housing for the greatest number" (*Habitat pour le plus grand nombre*). Settlements in Southern Morocco, the bidonvilles in the outskirts of urban centres are documented and compared with new developments such as the Carrières Centrales implemented by the team in the new districts in Casablanca. The caption of the "La cité verticale" reads: "The casbahs of the Sahara, the ksours, fortified villages in the Atlas mountains, and the collective granaries-citadels all reflect this tendency, according to which the persons live close to one another, respecting the privacy of the families but nevertheless always managing affairs of collective interest by common consent." The documentation of the exhibition has been photographed and the negatives are stored as part of Jacqueline Tyrwitt's archives, gta/ ETH. Mentioned in Jean-Louis Cohen, The Moroccan Group and the Theme of Habitat. In: *The Last CIAMs*, Rassegna 52 (December 1992), pp. 63-64.

15 A. & P. Smithson, *Urban Structuring: Projects of Alison & Peter Smithson*, p. 29.

and mass-produced dwelling unit, framed the question of dwelling as "a scale," which, in the words of Team X, "would be really effective in terms of the modes of life and the structure of a community."[11] **[3]**

Migrated across disciplines such as ecology and social geography, at that time young sciences, the term habitat was used to signify the whole of human relations, and delineated dwelling primarily as place (rather than function) of living embedded in a broader geographical and cultural system. The whole here is not to be understood as an aggregate of distinct objects, fixed identities or forms but an entanglement of operations, forces or events. In these terms, any intervention, from the scale of material detail to the scale of landscape, becomes the locus of certain responsiveness to the existing and the emphasis in the design is placed upon the study of relations between projected forms of living and the conditions – topographical, cultural, social, in which they unfold. As the British architects Alison and Peter Smithson put it, what is important is "the way, in which the new part is organized plastically to give it meaning within the whole complex. As the complex changes with the addition of new parts, the scale of the parts must change so that they and the whole remain a dynamic response to each other."[12] The aesthetic and social dimension, which is suggested here, is of a very different order restating the part within the whole and the individual within the community.[13] Paradoxically the striking photographic material of traditional settlements and close-up views of human activities, juxtaposed with diagrams outlining urban growth, project an ethics of seeing, in which the intermingling of the natural, the human and the social, the past and the future are portrayed as aspects of the same project of modernisation and urban evolution.[14] **[4]**

A similar play with great contrasts in scale is also in place when photographs of children playing in the street are set off against a diagram suggesting expandable infrastructure systems. While these visual and graphic fragments seek to provide an incisive recoding of the quotidian dimensions of space, the emphasis is on a more global and of greater complexity scale of operations yielding interpretations of modernity. For instance, Alison and Peter Smithson, for whom "a town is by definition a specific pattern of association, a pattern unique for each people, in each location, at each time," introduced the term cluster (CIAM 10 in Dubrovnik, 1956) to signify any grouping together with no indication of scale and hence replace such group concepts as house, street, district and city. The groupings described in terms of "a close knit, complicated, often moving aggregation, but an aggregation with a distinct structure", were according to the architects "as close as one can get to a description of the new ideal in architecture and town planning."[15] Drawing inspiration from sciences as well as an emerging culture of mass communications, mobility and dynamic processes, the idea and imagery of cluster not only turn the discourse toward infrastructure

3 CIAM Algers Group, Grid panel for CIAM IX meeting at Aix-en-Provence, July 1953. 'La Charte de l' Habitat', was the theme of the meeting, and the rhetoric and iconography are indicative of the desire to reframe the question of dwelling in new terms and produce a corollary to 'La Charte d' Athenes' (1943).

(Re-published in Eric Mumford, The CIAM Discourse on Urbanism 1928-1960, The MIT Press, 2000, p.230, and Jean Louis Cohen, Alger: Paysage Urbain et Architectures, 1800-2000, Editions de l'Imprimeur, 2003, p.201)


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BIDONVILLE MAHIEDDINE.
Alger. Algiers. N.-Africo.
Groupe CIAM-ALGER.
préparation des repas
preparation of meals

4

16 "An urban agglomeration composed of separate and differentiated but closely related entities plus a proportionate network of services and appropriate points of crystallization or cores: the whole forming an urban constellation. This does not imply a *predetermined* radial or other pattern, but would develop following the lines of a basic diagram conditioned by broad topographic and economic factors. The physical expression will be that of a free expanding pattern." (Illustrations – solar system including Milky Way) From CIAM X, Lapad, 11 August 1956, Third Report of Commissions A.1. *Formulation of the Charte de l'Habitat*. Bakema Archive, Folder a12.

17 Aldo van Eyck, referring to his plan for the Orphanage in Amsterdam, describes the building as "the common ground where conflicting polarities can again become dual phenomena." He concludes: "The time has come to conceive of architecture urbanistically and of urbanism architecturally, i.e. to arrive at the singular through plurality, and vice versa." Aldo van Eyck, "The Medicine of Reciprocity Tentatively Illustrated", *Forum*, v.15, nr 6-7 (April-May 1961).

18 Van Eyck's consideration of the in-between as that, which removes 'the duality of interior and exterior space', the duality of past and future into an expanded 'now' owes a great deal to the philosophical debates of the time. The reference to Sartre's post-war writings and the impact of Henri Lefebvre's book *Critique de la vie quotidienne* (*Critique of the everyday life*), first published in 1947 have been already commented upon in studies of the architect's work. So have they been discussed his immersion in the artistic deliberations of the previous generation such as Kurt Schwitters's collages and interiors of buildings and even James Joyce's writings in which objects and/or words are engaged as in a particular, unique situation. See Francis Strauven, *Aldo van Eyck, The Shape of Relativity* (Amsterdam: Architectura & Natura, 1998). Also Liane Lefaivre and Alexander Tzonis, *Aldo van Eyck Humanist Rebel* (Rotterdam: 010 Publishers, 1999).

19 In Hannah Arendt's terms, the movement between the realms of the private and the public constitutes the social existence of an individual. In fact, the public realm, according to her, is bound to the place where distance is maintained so that form and structure (relation) may appear. In other words, an aspect of the public can emerge within the distance that enables the articulation of differences.

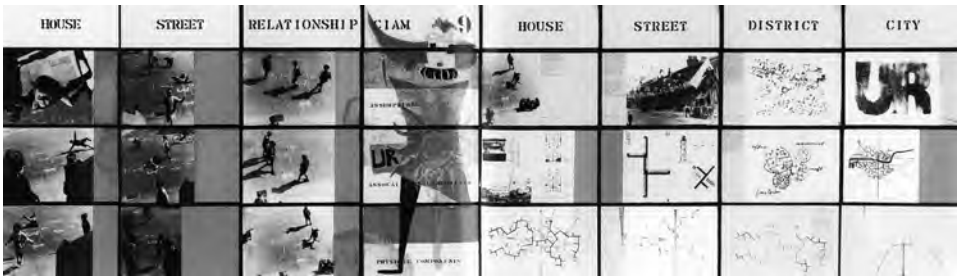
4 L'Habitat pour le plus grand nombre', Supplement to l'Architecture d'Aujourd'hui, 1953, Georges Candilis, Shadrach Woods and Victor Bodiansky (et al.)

20 Anthropology has often served to sustain various incompatible views of the 'human' or of 'human nature', often seen as a shortcut to establishing the universal rules.

systems and a new visual order; they suggest the architectural project primarily as a process toward the elaboration of a method, which, resolved on to "*plans (structures)*" can "apprehend and extend existing patterns," but also enables the "possibility of mutation in scale and intention."[16] **[5]**

Contemporaneous with the Smithsons, the Dutch architect Aldo van Eyck was more concerned with elementary relations. In his view, the building is primarily "a configuration of intermediary places" to receive "the shifting centre of human reality." This way of thinking brings the threshold and the most evident aspects of "the greater reality of the doorstep" linked to human experience at the core of the architectural project.[17] Doors, windows, recesses, passages, steps function as markers of the continuity of experience across a zone of transition rather than boundary. It is this instance, expressed in a series of architectural figures that becomes the most active element of the composition, a gestalt that appears to be both inside the building holding it together, and manifestly, outside.[18] These intermediary places not only articulate spatial and visual transition but also receive human transaction. The scale of human gesture and chance encounter, and the scale of the landscape are brought together to configure the built environment as a continuous fabric. It is indicative that in one of his initial drawings for the Orphanage (Amsterdam, 1960), van Eyck begins by sketching out areas of movement and activity. The sketch is not a gesture that encompasses the unity of intention but seems to want to capture a fragment of inhabitable ground, as a means to develop a method of design. That which appears as expression of the spontaneous, and perhaps intentionally imprecise, is but one stage in the process of the development of an architectural and formal system. These intimate topographies become "a statement about territory and occupancy," while projecting ways of thinking and engaging with the urban, an approach, which, far from assuming a form *a priori*, entails continuous exploration of possible relationships and functional associations rather than adjacent boundaries. **[6]**

The discourse of the modern transforms to accommodate, or better, to claim the common and the banal, to celebrate the ordinary and spontaneous gestures. This amounts to nothing less than liminality erupting from within the core of primary sociability.[19] Yet, while paying the utmost attention to every instance and encounter, there is a moving back and forth between microscopic details (textures, colours, shapes) and the larger picture (social structures, universal patterns), a form of belonging and a form of global citizenship. Anthropological insights in the theorization of the architectural project, coming from an encounter with a non-Western cultural context become the platform from which to develop a critique of functionalism and instead establish a new universality, the universal rules of the 'human condition'.[20] The question is whether



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21 John Voelcker, "CIAM Team X Report", in: *Carré Bleu*. In this report, Voelcker discusses the idea of an open aesthetic in relation to the work of Hansen and Jersy Soltan in Poland.

22 Ernesto Nathan Rogers, *The sense of history* (*Il senso della storia*) (Milan: Edizioni Unicopli, 1999), p. 62. This text is the opening lecture that Rogers gave for the course of History of Modern Architecture at the Polytechnic School in Milan in 1964/65.

23 Ernesto Rogers was the editor of *Domus* from 1946 to 1947 while Giuseppe Pagano and Edoardo Persico edited Casabella. During this period of time, Rogers constantly sought to link the actuality of history and architecture to more complex themes of culture in general. See Tafuri, Manfredo, *History of Italian Architecture, 1945-1985*, (Cambridge, Mass.: The MIT Press, 1989), pp. 9, 206.

24 Newman, Oscar, *CIAM '59 in Otterlo*, (Stuttgart: K. Kramer, 1961).

25 Focillon, Henri, *The Life of Forms in Art*. (Zone Books, The MIT Press, 1989), pp. 1,6. The original *Vie des Formes* was originally published in Paris in 1934. The first translation into English by Charles Beecher Hogan and George Kubler appeared in 1942

5 Alison and Peter Smithson, "Urban Redentification" grid, presented at CIAM 9, 1953 (Architectural Design, 1955)

the latter reflects a universal and transhistorical paradigm or it constitutes a disguise for a temporal, political, and culturally specific program. In many ways, architectural narratives seeking to assimilate their techniques to the reevaluation of the human and the local, often fell within the larger discourse on colonial and indigenous forms of modernity.

While the Smithsons and van Eyck resolved their investigations in what they described as "open aesthetic," in which "form is a master key […] capable of reciprocating the constant change of life,"[21] the intuition that the architectural project needs to take into account the historical perspective opened up a slightly different framework in postwar Italy. A "sense of history" was fully propounded in the pages of the magazine Casabella. In a series of editorials between 1954 and 1955 ("Responsibility to Tradition," "Pre-existence of the Environment and Practical Themes," "The Tradition of Italian Modern Architecture"), Ernesto Rogers (director of the journal between 1953 and 1965) returned frequently to tradition as integral to the now and indeed to modernity itself. According to Rogers, "there is a present that comes from the past and a past still linked to the present."[22] The terms *continuità* (continuity), which Rogers added to the title of the magazine (Casabella-Continuità), and *preesistenze ambientali* were set forth as a connecting element between history, existing factors and modern movement.[23] In his view the city is a historical phenomenon (rather than history as element of the city), and any intervention is but an open-ended search, a method of entering into this experience of culture, to ensure the continuity through establishing a discourse on the city as historical phenomenon. As Giancarlo de Carlo pointed out during the last CIAM meeting in Otterloo (1959), history is "the acquisition of an exact knowledge of the problems."[24] It is precisely here that Rogers identifies the validity of the architectural project, which, in his words, consists in a "methodological process" (*processo metodologico*) which aim is to look at the development of the "most salient qualities" (*emergenza più saliente*) of the existing and better capture its "specific essence" (*essenza specifica*).

These ruminations may bring to mind Henri Focillon in his earlier study on the history of art and question of style, and in particular, his idea of art as system in perpetual development of coherent forms as well as the idea of history as a superimposition of geological strata that permit us to read each fraction of time as if it was at once past, present and future. A work of art, according to Focillon, is "an attempt to express something that is unique, it is an affirmation of something that is whole, complete, absolute." Yet, "it is likewise an integral part of a system of highly complex relationships."[25] Therefore forms (alike buildings in Rogers' discourse) acquire in their stratified evolution a life, which follows its own trajectory and can be generalised only on the level of method.

26 Vittorio Gregotti's writings in the late 1960s on the "territory of architecture" *(Il territorio dell'architettura)* extended the above problematic to the scale of geography. For Gregotti, environment is historically transformed and the main function of the production of the territory of architecture is not to establish a synthetic unity but to structure the differences instead. The placing of a story in a certain setting, like the building of a house, a wall, or a road, makes a place habitable, but the place gives solidity, continuity, and perdurability to the life that is lived within it, as well as to the records of that life and ascribes some collective value to this or that spot.

27 "Sculpture in the Expanded Field", in: Krauss, Rosalind, *The Originality of the Avant-Garde and Other Modernist Myths* (The MIT Press, 1986), p. 277.

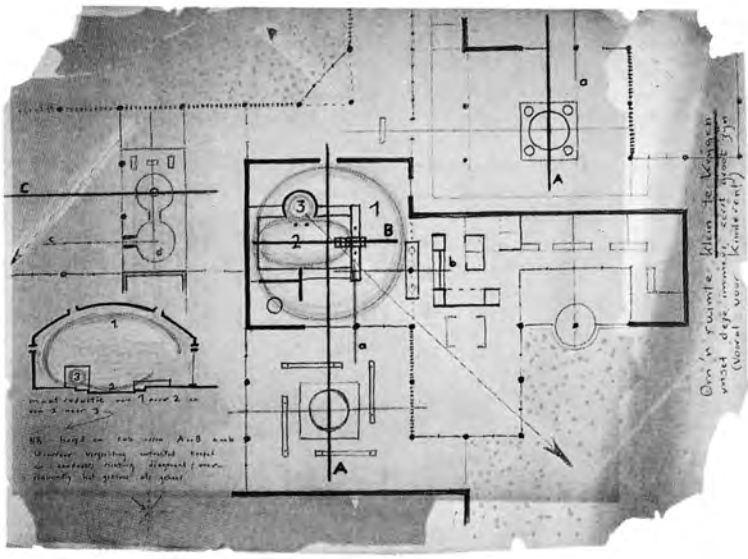
28 Bruno Latour, *Facing Gaia: Eight Lectures on the New Climatic Regime*, trans. Catherine Porter (Cambridge, MA: Harvard University Press, 2017 [2015]).

How the above ideas can expand to the discourses and practises of today is rather beyond the limitations of this text. The particular arguments discussed, while moving within different registers and referential frameworks, put forward an understanding of the building and the city less in terms of an autonomous form than in terms of a manifold system of relations – perceptual, social, material and cultural, something which seems relevant for today too. It is of course a historical fact that at the heart of these debates there was a desire for the possibility of architecture to negotiate the realm of the human scale set against planning policies, massive implementations of functional premises and the conceptual poverty of architecture in the 1950s. They sought for a method of design capable of forming an expandable spatial and social continuum whilst maintaining a coherent relationship with existing structures and dwelling patterns.[26]

These questions have been fragmentary and took on various formulations, yet they are indicative of a stance and a method. The concern with how things relate, how they work together shifts the emphasis from the object and the design of the building as a self-contained unit to the consideration of built space as part of a larger territorial, social, visual environment. Expressed in multiple ways – geographic or cultural milieu, pre-existing conditions, historical situation, region, habitat - the category of environment seems to provide a theme that weaves together most of the threads of association suggested. Rosalind Krauss's argument in the essay "Sculpture in the Expanded Field" (1979) seeks to resume some of these threads.[27] For Krauss, sculpture is a "category that resulted from the addition of the not-landscape to the not-architecture." And this happened because these terms ('not-landscape' and 'not-architecture') were to "express a strict opposition between the built and the not-built, the cultural and the natural, between which the production of sculptural art appeared to be suspended." Krauss then argues for an "expanded field" where "there is no reason not to imagine an opposite term – one that would be both landscape and architecture," which she called "the complex." It is precisely the idea of the 'complex' that may throw a different light into the theoretical, design and formal challenges, which many architects in the 1950s encountered in their attempt to graft their strategy onto the existing (no matter how 'the existing' was to be understood and considered), a challenge that remains as great as ever.

What does it mean to rediscover an inhabitable ground in a world order, marked by what Bruno Latour describes as the "New Climate Regime" thinking "'climate' in the broad sense of the relations between human beings and the material conditions of their lives"?[28] Proposing the term 'terrestrial' to draw together the human and the natural, the local and the global, Latour writes: "each of the beings that participate in the composition of a dwelling place has *its own way* of identifying what is local

29 Ibid. p. 93.



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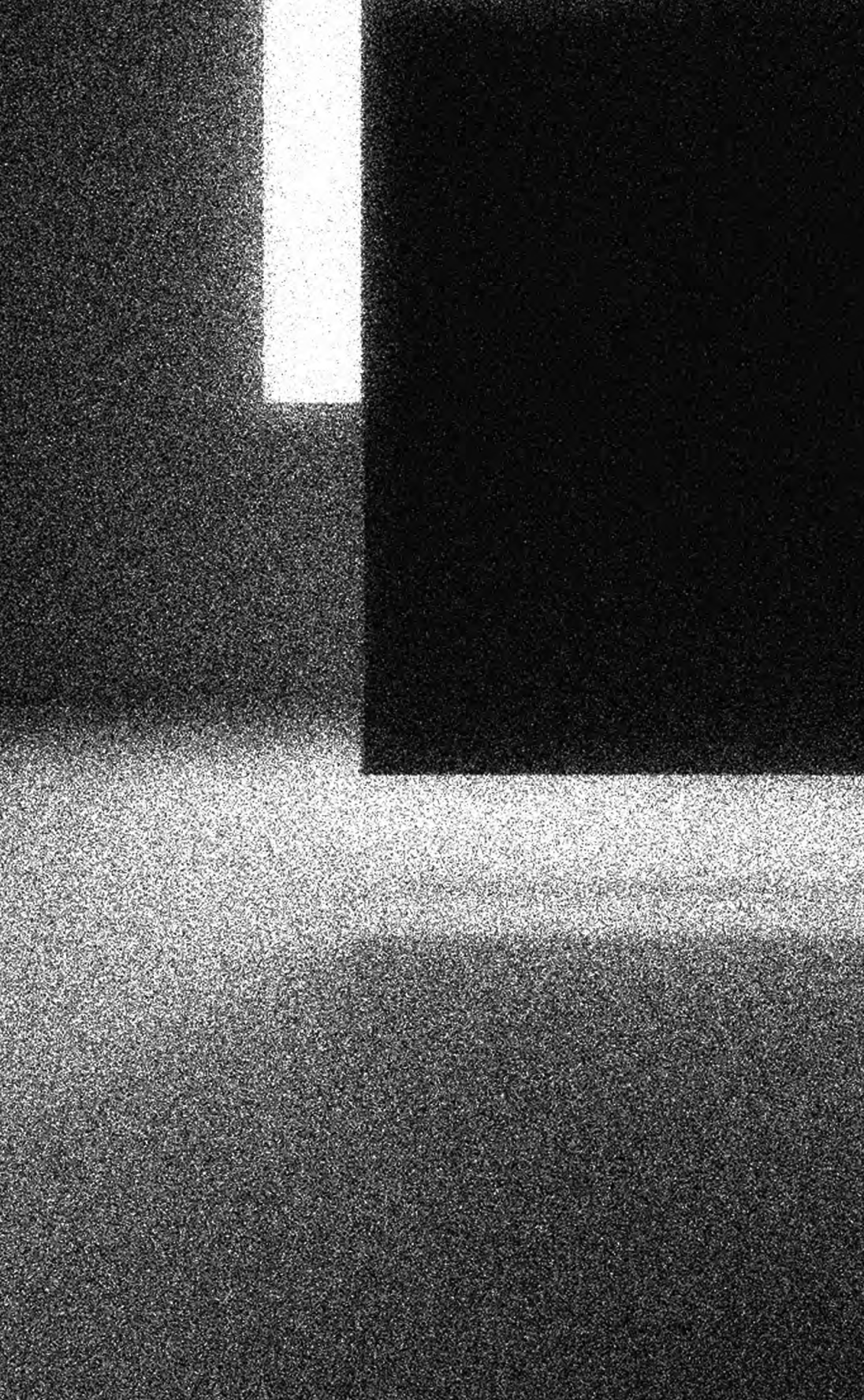
6 Orphanage, 1960, Amsterdam, Aldo van Eyck.
Plan-diagram of the central domed space.

and what is global, and of defining its entanglements with the others."[29] If the description of the current scale of being in the world and operating is accurate, the "terrestrial," or, the "planetary" scale obliges us to reopen inhabitation as a social question while intensifying it through new forms of appropriation of resources and politics of land which do not confuse the latter with what the local is often inflicted upon - identity, patrimony, ethnic homogeneity, national and personal immunity, which allow the erection of all kinds of borders whose mere existence is to exclude. In this context, one of the urgent questions which should be asked is the following: Who and how will define thresholds which might open up the possibility of a different aesthetics, a different politics of inhabiting the Earth.



POETIC SPONTANEITY BEYOND CONTEXT OF MEANING

Levent Kara

“Just what the ‘truest philosophy’ is, is a matter of some dispute. But critics of this school do not lack definite, not to say dogmatic, convictions on this point. [...] they are ready to pronounce *ex cathedra* judgments, because they are committed to some conception of the relation of man to the universe that flourished in some past epoch. They regard its restoration as essential to the redemption of society from its present evil state. Fundamentally, their criticisms are moral recipes.”

John Dewey (1934, 319)

Dewey's reply to T.S. Elliot's "the truest philosophy is the best material for the greatest poet" surgically exposes an ethical claim on the work of art. There is every sense in making the ethical claim that the work is genuine, a *true* work of art, to the degree that it is *about* life. Advanced as a critique to modern experiment in making, this *aboutness* became the underlying core of the arguments for understanding making in terms of poiesis [techne as phronesis]. Heidegger in "The Origin of the Work of Art", in confronting the Hegelian prophecy about the end of art, asks similarly whether modern art represents truth or not; "truth that is decisive for our historical existence." (1971, 700)

Genuine work, the work of art, is always in touch with things. However embedded in the world in an order of things, it still moves beyond this order in the way it orders its own elements, in the way it constructs itself. In its self-referential autonomy, a kind of projective singularity, the genuine work radically ripples the webs of possible meanings, the order of things upon which it builds its own world in its own thingness here and now. Genuine work is about life, however to bind that life before the work to some existential conditions, to reduce life to significances from some contingent historical practice, before work's own attempt to constructive dialogue in making our reality, terminates the value of making itself as a mediating capacity. Life in this instance before the work cancels out the work.

Grassi's understanding of the notion of 'work', as it articulates on the agency of human creativity and the possibility of communication beyond known significances in the making of a common world, has an ontological value: "Inventive and metaphorical activity lies at the basis of work, be it material or intellectual effort through which we strengthen our existence." (1980, 99) Not so far removed from Kant's synthetic apriori judgments (1781), Grassi underlines "the concepts through which we come to understand and 'grasp' each situation come from our ingenious, metaphorical, fantastic capacities that convey meanings in the concrete situation with which we are confronted." (1980, 100) We live in the spontaneity of

concrete situations and there are always new constellations of phenomena *to be in touch with*. The immediacy of here and now, in an openness to the thing in front of us, requires new syntheses of imagination. Synthetic, because a newness emerges, and *almost* apriori, because we apprehend it in its systemic unity, its self-referential autonomy only through which the newness emerges in all its otherness, the spontaneous act of imagination cannot be explained on the basis of some general acquired through traditions and language. Our web of meanings is always under construction in a self-reflexive response to new events, things that happen to us if we are attentive, in an openness to the world; it is always in the making through our acts of making sense, sometimes even blindly.

The view that our *true* knowledge of the world and ourselves is in constant change and formation, always in the making, in the living body of language is also Gadamer's main thesis in *Truth and Method* (1960). Beyond the metaphorical flexibility of language, there is an original act of seeing in particular situations which initiates expressions into the familiarity of language that also transforms the general of the language by the addition of a new particular. Meaning changes through original acts of seeing. Reminiscent of Heidegger's aletheia, in an instance of phronesis, something shows itself in its somethingness.

However, because these acts of new seeing require established contexts of meaning [the moment of 'prejudice', 'fore-judgment' in Gadamer], his notion of concept formation in moments of genuine understanding of a particular cannot explain the spontaneity of the work: because, genuine work is disruptive: it does away with contexts of meaning; it rewrites them in its own language. Encountered with prejudice, the work is mute. It only comes to speak when prejudice is suspended, when any context of possible meaning to initiate the hermeneutic circle is dropped away from the fragile formulations of perception.

This is the moment of poetry in genuine work. Above and beyond the general metaphoricity of language, the poetic utterance cannot be subsumed under a general significance: it is not within an established context of meaning, thus the formulations of perception are fragile. To *understand* the poetic utterance, you need to recite it endlessly. Transcending the contexts of meaning, the poetic utterance stays with its intentional object. *What is said*, is only possible within the poetic utterance as a singular projection of reverberations (reverberations of contexts of meaning) in and of itself. The genuine work is its own context of meaning.

If the poetic act is getting hold of a particular meaning within its own rule, then its conception depends again on an original seeing, but this time, because it is spontaneous, it is without a context of meaning prior to its own utterance. Even if the general metaphoricity of

language and poetry issue from the same ground of participation beyond language – that of a layer of experience prior to language, the possibility of poetry shows that our imaginative capacities to see and apprehend things are beyond the significances of language or the contexts of meaning that are constantly formed in effective traditions.

If the general metaphoricity of language can be explained by judgments of phronesis, as done by Gadamer, as fusion of a new particular and an old conception, 'the fusion of horizons' as he calls it, the moment of poetry can only be explained by judgments of taste which are more like Gestalt switches in our experience. Our perception shifts in a sudden moment of illumination of a wholeness that emerges in the work, a spontaneous unity binds imagination. And it is important to see the continuity between these two senses of judgment of a particular. The meaningfulness of life in concrete situations depends upon our ability to make sense of new particulars. If meaningfulness of life lies in genuine acts of encounter with what is seen, perceived, experienced, in an openness to the world in its otherness, each such moment of being in touch with things is an act of phronesis, and each involves a certain imaginative ordering of phenomena beyond known generals. Utterance of a new sentence, and its possibility of being understood by others, is dependent upon seeing the new occasion in its otherness, which, even if within the possibilities of the language, is still a new phenomenon that is ordered into a new significance. The difference between the new phenomenon and old meaning is bridged by a synthetic act of imagination.

But we also know that in the experience of poetry, there is no such old conception that the poetic utterance transforms. Poetic utterance says what it says beyond any such context of meaning, and it still *makes sense to us*, as we see its intention in the reverberations of its images, even if we cannot *know* it beyond the moment of its utterance in poetry. The poetic act liquefies the contexts of meaning in the language and brings forth a new spontaneity, emerging meaning, even through bizarre operations on the known phenomena. It is this spontaneous emergence of new meaning in poetic utterance that shows us the layer of first-person phenomenal experience on which we can pass judgments beyond acts of phronesis, beyond contexts of meaning. Such judgments, through which poetry makes sense, relate to lived experience directly beyond the known significances and are products of imagination - spontaneity of mind that enable new seeings, new relations. These judgments are sharable in principle to the degree that we share our experiences in common language.

This level of lived experience is what Dewey sees as the ground of aesthetic experience; and far from being a private act of pleasure as it is mostly deemed by its critics, aesthetic experience emerges from a common ground of relating to the world beyond reified significances

1 "Kant rightly characterizes such taste as *sensus communis* or common sense. Taste is communicative; it represents something that we all possess to a greater or lesser degree. It is clearly meaningless to talk about a purely individual and subjective taste in the field of aesthetics. To this extent it is to Kant that we owe our initial understanding of the validity of aesthetic claims, even though nothing is subsumed under the concept of a purpose." (Gadamer 1986, 19)

and contexts of meanings in effective traditions. This level of lived experience is also the ground of genuine work that is a participatory act of an agent, as the unity of subject and object beyond what is already done, said, and experienced in the making of culture.

If phronesis is an imaginative judgment, it is also always within a given context of meaning with its own articulated forms. Judgment of taste, as understood both by Kant (1790) and Gadamer (1986), is phronesis without an established context of meaning, [1] where a particular spatio-temporal unity can be judged on its own terms as bearing its own rule in itself. Such a particular condition becomes its own context of meaning in its uniqueness beyond established contexts of significances. If everyday life is a context of phronesis in the making of the work, the making itself, as construction of formal structures, in the object that is experienced, involves judgments of taste as we do not have a context of generals for spatio-temporal forms as would be the case in a dictionary of forms, a vocabulary of elements, a stylistic system, an iconographical system, a language of types, etc. both in the sense of vernacular and classical. A kind of memory, of course, is involved in construction of formal structures, but judgment of taste in the aesthetic experience already contains that moment of memory as one of its conditions. The ground of memory in aesthetic experience is not the retrospection of known significances in certain contexts of meaning but a more liquefied field of experiences – not all of which are explicitly available in the consciousness as articulate significances. It is not about the order of things but about the way we order things in space and time, in our first-person phenomenal experience.

Thus, to conceive making of the work on the model of phronesis without establishing the double aspect of its simultaneous thinking of life in the making of the object would be establishing unified contexts of meaning prior to work: *what is proper to do in the moment of the object*, the properness of life in one of its representations. Genuine work demands its place in the dialogue of culture by negating the givenness of contexts of meaning from above. It disrupts prior perceptions. The moment of properness in the work is not the properness of life before the object but the properness of life as it emerges in the actual experience of the object. One has to see the work's claim on its own. Whether this experience is going to hold in one's self as to the unity of her/his overall web of meanings or not is a different kind of judgment that falls into the moral-practical realm and cannot account for the meaningfulness of the object as it is in front of us.

Understanding the genuine work, the work of art, as a cultural agent beyond a model of language as representation (also beyond any non-linguistic system as all forms of signification, representation, suppose a structural field of signification on the model of language,

2 "When egotism is not made the measure of reality and value, we are citizens of this vast world beyond ourselves, and any intense realization of its presence with and in us brings a peculiarly satisfying sense of unity in itself and with ourselves" (Dewey 1934, 195).

which is a web of generals) requires understanding the moment of judgment of taste in its construction. The thinking of life in the making of the object requires precise calibrations of spatio-temporal intentions that are only accessible to judgments of taste. The unity of the object as we hold it as an aesthetic nuance [fragile formations of perception] in its experience is the product of judgment of taste. What it says emerges because of this aesthetic nuance, as this aesthetic nuance.

Any thinking of the work on the model of language has to accept something like a dictionary of elements - forms, types - where the work becomes a cryptic entity (try to *see* a word and imagine the possibilities of understanding its meaning by just looking at it) that can only refer to other works. Our relation to work as a constructed form is not like words that would be the case if we knew them on the basis of other forms (dictionary). The genuine work, in the way it orders its own elements, in the way it constructs itself, does not *represent* meaning, it *performs* meaning spatio-temporally by organizing first-person experience. And our first-person experience is not an effective tradition that can be reduced to the model of hermeneutic commerce on the model of language where all seeing is reduced to seeing particulars under known significances.

Re: *There is every sense in making the ethical claim that the work is genuine, a true work of art, to the degree that it is about life.* And every genuine work is about life, but just what that life prior to work is cannot be the moment of the work in the making of our reality. Reducing that life to some existential conditions, to some set of significances from some historical practice, cancels out the agency of the work as a constructive instance in the dialogue of culture. Binding the work's claim to meaning to a condition of life prior to itself also forgets a larger sense of participation in the human dialogue beyond the moral-practical exigencies sedimented in life forms through languages and traditions. Reified forms of consciousness as such, in contrast to their enabling role in the hermeneutic circle, may cancel out the work before it makes its claim, thus missing the real ethical dimension of aesthetic experience as openness to the other. [2] Beyond the narrow definition of the fusion of horizons in the hermeneutic moment in effective traditions, the very possibility of disruptive Gestalt switches in the experience of genuine work, the work of art, indicates a broader horizon of 'I and Thou' freed from the existential hinge of shared worlds.

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REINVENTING THE COLLECTIVE FOR ETHICAL DESIGN

The Theoretical Confluences of Fumihiko Maki's "Collective Form" and Thom Mayne's "Combinatory Urbanism"

Colleen Chiu-Shee

The 1950s and 1960s were a transitional era when the architecture field saw the ideological shift from principles of High Modernism to human-oriented concerns. The shift gained momentum in concomitance with the rise of urban design as a new academic discipline. This era also encompassed the formative years of Fumihiko Maki, a globally renowned Japanese architect and the 1993 Pritzker Prize winner, who went to the United States to study architecture after witnessing the post-World War II transformations in Japan. Maki reflected on his life experiences and world travels during his formative years and consolidated his thoughts in the book *Investigations in Collective Form* (1964). Maki's notion of Collective Form is not only a manifestation of his cross-cultural education and practice in architecture and urban design, it also includes design philosophies that have lasting impact in the fields that concern the built environment. Maki's theories were influential on Thom Mayne, another globally renowned architect based in the United States and the 2005 Pritzker Prize winner. Mayne also developed his architectural education and practice during a transitional era with changing ideologies in architecture and politics. Mayne expands on Maki's notion of Collective Form and illustrates his design philosophies in the book *Combinatory Urbanism: A Realignment of Complex Behavior and Collective Form* (2011).

Maki and Mayne express parallel understandings of the built environment and underlying human systems that transcend disciplinary, cultural, geographic, and time limitations. Their discourses about the "collective" involve confluences in multiple dimensions: the confluence of design-related fields with increasing elusive boundaries of academic disciplines, the confluence of Eastern and Western ideologies, and the confluence of traditional and modern concerns and design methods. This essay contextualizes Maki's and Mayne's design philosophies in their formative years and discusses important ideas at the confluences of their theories. These ideas point to an ambiguous, yet adaptive quality essential in their ideologies. Revisiting their notions of the "collective" unearths their shared sociopolitical values, centered on adaptability, sustainability and equity in solutions to complex societal problems. Design principles

1 Fumihiko Maki, "Exploration of Urban Design Language," *Fumihiko Maki,* Phaidon, 2009, 16;

and practices aiming at collective good emphasize the potential for design to engender social-political changes, evoke the rethinking of architectural practice and education, and provide enduring lessons about design ethics for today's diversifying fields of environmental design.

MAKI'S UNIQUE EXPERIENCE DURING HIS FORMATIVE YEARS

Maki is one of the few Japanese architects of his generation to receive deep influences from international cultures. From 1952 to 1965, Maki studied, taught and practiced architecture in America and traveled around the world, before returning to Japan and starting his own practice. Maki regards this period as his "formative years" and considers living in America as his "journey to the west." Trained mainly as a modern architect, Maki also studied urban design at Harvard University and taught at Washington University in St. Louis (WUSTL) during the early 1960s. The fusion of East-West and local-global influences undergirds his forward-looking ideologies. His architecture integrates local cultures and traditions with contemporary materials and technologies.

Maki's academic mentors—Kenzō Tange and Josep Lluís Sert—strongly influenced his views on architecture and the city. At Tange Lab in the University of Tokyo, Maki learned about Walter Gropius's work at Harvard Graduate School of Design (GSD) through reading *L'Architecture d'Aujourd'hui* and adopted a very rational approach to problem solving and form-making. In the early 1950s, Tokyo was still recovering from the devastation of WWII while America was rising as one of the epicenters for architecture. In particular, Harvard and MIT had become the birthplace of innovation through the fusion of various ideas transplanted from elsewhere, especially Europe. Later, when Maki attended the GSD, the school was shifting from the Bauhaus ethos under Gropius's deanship to an emphasis on urbanism advocated by Sert. Maki's studies at these two institutions are fundamental to his formation, during which he developed growing interests in "the issue of identity in a mass society and the search for ways in which cities might accommodate distinctive places."[1] The postwar social-cultural conditions inspired his explorations of the relationship between architecture and the city and between parts and the whole in urban complexes.

Maki grounds his concerns about architecture and the city in humanistic philosophies, yet his approach to addressing socio-cultural problems hinges on formal explorations. This approach resonates with the ethos of the first American school that Maki attended—the Cranbrook Academy of Art. Eliel Saarinen, who insists that searching for form is a fundamental approach to artful creations, designed the Cranbrook campus and

2 Fumihiko Maki, Nurturing Dreams: Collected Essays On Architecture And The City, The MIT Press, 2008, 11;

largely shaped its ethos. Maki was impressed by the campus and read about Saarinen's notion. Saarinen might have indirectly stimulated Maki's curiosity in understanding and inventing the form of urban complexes. After decades of practice, Maki highlights his persisting interest in creating a humanistic environment through shaping spatial experiences of the users. This interest is central to his design philosophy of modern architecture and contemporary cities, which is reflected in his notion of Collective Form.

Maki's lifelong interest lies in the confluence of place-making and building-making. On one hand, Maki was strongly interested in investigating the qualities of the built environment and the intertwined linkages between architecture, groups of buildings and the city at interrelated scales. On the other, he was enthusiastic about exploring new technologies, materials and morphologies to shape high-quality architecture that performs not only aesthetically but also socio-psychologically. In this way, his practice is both retrospective and forward-looking and allows considerations at building and urban scales to inform each other. Maki grounds his concerns in a fundamental curiosity about how architecture can shape sociocultural characteristics of the broader human society and expresses his visions through inventing buildings as a formal expression and spatial intervention. Maki believes that his urbanistic approach greatly contributes to more diverse, holistic considerations about the collective than a classic modernistic design.

THE POST-WAR INNOVATIVE MODERNISTS

World War II destroyed many cities and triggered a series of rapid, far-reaching social impacts. A generation of innovative, young modernists emerged after the war, who sought to rebuild and modernize their cities after witnessing the destruction. Maki is one of the progressive architects who were greatly influenced by the Modern Movement and its post-war transformations. Maki was born in the Yamanote district of Tokyo in 1928. In the 1930s, the Bauhaus movement entered Japan and modernistic buildings represented excellence in design.[2] By the 1950s, architects who challenged the validity of modernism, especially modernist approaches to designing cities, have begun their explorations of new languages and innovative methods.

After WWII, there was an ongoing trend towards an urban focus in architectural discourses. The 1950s saw an increasing dissatisfaction towards compositional design approaches that emphasized rigid alignment of functional zones. Architects, especially the younger generation of modernists, problematized the simplicity of geometric rationality and shifted their attention to regional, contextual, and anthropological concerns. From then on, numerous urbanistic explorations emerged internationally to expand the design philosophies and methodologies for designing architecture and urban complexes.

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3 Harry Francis Mallgrave, Modern Architectural Theory: A Historical Survey, 1673-1968; Cambridge University Press; 2005; chapter 14.

4 Klaus Herdeg, *The Decorated Diagram: Harvard Architecture and the Failure of the Bauhaus Legacy,* The MIT Press, 1985, 102;

5 Harry Francis Mallgrave, Modern Architectural Theory: A Historical Survey, 1673-1968; Cambridge University Press; 2005; chapter 14.

1 Ville radieuse (The Radiant City), 1930, Charles-Édouard Jeanneret (Le Corbusier)

2 The Monumental Axis in Brasília

From CIAM to Team 10

Inspired by dramatic technological and social changes, the architecture field underwent ideological transformations during the early twentieth century. In 1928, a group of avant-garde architects founded the International Congresses of Modern Architecture (CIAM), led by Le Corbusier and Giedion until the 1940s. CIAM members were strongly influenced by Le Corbusier's designs and theories, seeking comprehensive, urbanistic approaches to human environment. They gradually directed town planning efforts to a rigid alignment of functional zones, separating dwelling, work, recreation, and circulation. This movement gained momentum after the fourth CIAM meeting on "the Functional City" in 1933 when Le Corbusier's Ville Radieuse (*Radiant City*, 1935 **[1]**) rose to be an international paradigm, documented in *The Athens Charter*.[3] After WWII, the *Athens Charter* gradually became an influential guideline for city design internationally. In American architecture schools, architects adopted CIAM's mechanical principles that emphasized functional zoning and two-dimensional layout in studio teaching, including Walter Gropius's and Marcel Breuer's studios at the GSD and Ludwig Hilberseimer's studios at Illinois Institute of Technology.[4] One manifestation of the Functional City is the Plan for Brasília designed by Lucio Costa and Oscar Niemeyer in 1956. **[2]** The plan exemplified a method of imposing order, progress and stability on Brazil's new capital, aiming to establish a city based upon equality and justice.

During the 1950s, dissatisfaction with CIAM's design principles increased. At the 1949 CIAM congress, Bruno Zevi criticized the dominant rationalist attitudes, led by Le Corbusier, Gropius, and Giedion, for excluding alternative views on modern design. At the same meeting, Sert initiated discussions about the heart of the city. Young CIAM members became increasingly concerned about "neighborhood," "cluster" and "association" and demanded a more organic, regional and contextual approach to imagining the city. At the 1953 CIAM congress, Alison and Peter Smithson advocated that a "hierarchy of human associations" (house, street, district, city) should replace principles of functional separation.[5] The Smithson couple and Aldo van Eyck officially formed Team 10 in 1954 and challenged CIAM's modernist approach at the 1956 congress. The rise of Team 10 ultimately led to the reorganization of CIAM in 1959. Team 10 members aimed at "a new beginning" departing from what they had inherited from modernism and began searching for new design approaches for the "society's realization-of-itself" through various explorations on urban theories and new formal languages, which were illustrated in *Team 10 Primer* (1962). They emphasized the importance of human scales, anthropological associations, and the social complexity of a community. Many members visited, and taught in, American schools, such as WUSTL,

6 Fumihiko Maki, Nurturing Dreams: Collected Essays On Architecture And The City, The MIT Press, 2008, 13.

7 Lin, Zhongjie (2010). Kenzō Tange and the Metabolist Movement. Routledge, 22.

University of Pennsylvania, Columbia University and Harvard, transforming architectural education. Maki became colleagues with Jacob Bakema (1959-61) and Aldo van Eyck (1961-62) at WUSTL, developed friendship with Team 10 members and participated in Team 10's meeting in 1960. Maki's view toward modern architecture largely paralleled the group's aspirations, suggesting influences from the post-CIAM humanistic turn.

Tange and Metabolism

Maki's worldview always had a strong tie to his inherent Japanese background. During his formative years he maintained close contacts with Kenzō Tange and the Metabolists.

In Maki's impression, Tange was eager to experiment with new ideas. Tange's lab featured a distinctive international approach to design and presented dual characters—an atmosphere for both art creation and scientific research. The atmosphere at Tange's lab inspired Maki to favor a dynamic process of collective decision-making. Maki recalls:

> The issue is always how to proceed from a blank sheet of paper to realization – that is, how to direct and influence group behavior in a concentrated and unique way toward a certain objective. I hold as my ideal an organizational structure in which the group, while centered around one person and one theme, is in a state of flux, pushed this way and that way by internal contradictions and conflicts of imagination. Decisions are gradually made on the basis of objective reasoning, as is necessary for the creation of something as concrete as architecture.[6]

During the 1950s, Japan underwent rapid postwar construction. A group of young Japanese architects, centered on Junzō Sakakura and Kenzō Tange, began to explore new languages, concepts and approaches for building cities. The group, formed in 1958, named themselves *shinchintaisha,* namely, *metabolism*. In a biological sense, metabolism is the essential exchange of materials and energy between organisms and the exterior world. It also means to replace the old with the new. The group adopted the word to express their ambitions to actively, metabolically develop a city through continuous growth and renewal.[7] They sought to solve urban problems caused by Japan's explosive growth on scarce land through building "artificial ground" in the "absence of *tabula rasa*." In 1960, the group initiated the World Design Conference (WoDeCo) in Tokyo, aiming to introduce their forward-looking, urban approaches to politicians, businessmen, journalists and academics both within and beyond Japan. As a mentor to the Metabolists, Tange emphasized

8 Rem Koolhaas, Hans Ulrich Obrist; editors, Kayoko Ota with James Westcott; Project Japan : metabolism talks; Köln: Taschen, 2011, 186-197.

9 Rem Koolhaas, Hans Ulrich Obrist; editors, Kayoko Ota with James Westcott; Project Japan : metabolism talks; Köln: Taschen, 2011, 295.

his interests in the future city at the WoDeCo and presented his Plan for Tokyo, which featured utopian megastructures and influenced many metabolists' approaches to urban design. He lectured about "*Technology and Man,*" arguing that we would consider our cities "in the same way as life, as organic beings composed of changeable elements, as the cell, continually renewing its metabolism and still retaining as a whole a stable form."[8]

In 1958, when Maki returned to Japan temporarily as a fellow of the Graham Foundation, he met the Metabolists and assisted the WoDeCo organizers. He proposed the Shinjuku Plan together with Masato Ōtaka, who presented their ideas of Group Form at the WoDeCo. In the presentation titled "*Cooperation of Designers,*" Ōtaka stated:

> … The city is composed of countless persons, countless individuals; ...wealth becomes more and more concentrated, developed, and transformed. With regard to this dynamic modern city I would like to propose a method of Group Form… dividing the city space into two sections: the machine-like sections and the human sections; and also of dividing it into two spaces: the space for speed and the space for people to walk.

After the WoDeCo, Maki distanced himself from other Metabolists, favoring "organic urban growth and linkage" over "master planning" and being concerned about the world rather than just Japan.[9]

The Decline of the American City and the Rise of Urban Design

Maki's memoirs often speak about the influences from his involvement in Team 10 and Metabolism, both of which inspired him to search for innovative design principles in the 1950s. The Metabolists in Japan put faith in technology and proposed gigantic utopian architectural structures. Team 10 members invited Maki to attend their Bagnols-sur-Ceze conference in southern France in 1960. They expressed concerns about how to effectively house large numbers of population, yet rejected Metabolists' ideas of megastructures due to considerations of humanity and regionalism. The exposure to reflective, forward-looking debates at the encounter of the Metabolists and Team 10 members greatly shaped Maki's design thinking at the intersections of technology and humanity, of architecture and the city, of reflections on history and visions of the future, and of Eastern and Western ideologies.

Nevertheless, Maki has developed his own approaches to design amid the then ongoing worldwide transformations of modern architecture. His inspirations also included some precursors' ideas centered on form

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10 Mumford, Eric Paul, Defining urban design: CIAM architects and the formation of a discipline, 1937-69; New Haven : Yale University Press, c2009,

11 Eliel Saarinen; The City: Its Growth, Its Decay, Its Future,1943;

3 Wendell O. Pruitt Homes and William Igoe Apartments aka Pruitt-Igoe Housing, 1954, St. Louis, Missouri

4 Pruitt–Igoe Housing

and derived from the changing conditions in postwar American cities. During the 1940s, American cities were fraught with urban illnesses such as industrial decline, auto-dependency, urban sprawl and racial-economic divisions. The white flight had left aging urban centers congested with nonwhite populations prevented from moving to suburbs.[10] Supported by President Truman, the Congress passed the 1949 Housing Act which made federal funds available for cities to clear large areas in city centers and build massive public housing. Redevelopments in the following years typically presented a CIAM approach or a Corbusian appearance, with multiple high-rise towers organized repetitively in rows, occupying giant super blocks merged from many existing city parcels. The Pruitt–Igoe Housing, designed by Minoru Yamasaki in 1950, best exemplified the modernist urban renewal projects. **[3-4]** The challenges of maintenance, crime and social conflict in the complex drew increasing criticism. Architectural design was blamed as a major cause. Despite the failures of such early urban renewal efforts, it was during the years of Pruitt–Igoe's rise that Sert had become the distinguished precursor who greatly promoted urban design at the GSD. Since the early 1950s, Sert led discussions and design studios on the future of the city centers as opposed to continued suburban sprawl. Shortly after completing his study at the GSD, Maki went to WUSTL in 1956 and co-taught architecture studios with Roger Montgomery, experimenting with designs for urban renewal. Sert's, Maki's and Montgomery's optimism towards revitalizing American cities led to the two earliest Urban Design degrees in American schools: Sert founded the Master of Urban Design degree at Harvard GSD in 1960; Maki and Montgomery established the Master of Architecture and Urban Design program at WUSTL School of Architecture in 1961. The initial focuses in these studios were to explore city design and test solutions for realistic urban renewal projects.

Maki's intense exposure to Western influence largely contributed to what distinguishes Maki from his Japanese architect peers. Under Sert's deanship at the GSD, Maki witnessed the ascent of urban design in the architectural academic world. He was influenced by discourses from precursors who rethought urban form and order in American cities. For example, in 1943, Eliel Saarinen proposed his vision of "organic order" and "organic decentralization" as the "surgical repair of deteriorated or blighted areas of failing cities." He emphasized that "the fundamental reason for success or failure in all town-building depends on whether or not town formation is based on the architectural principle of organic order."[11] Maki's notion of Group Form shares Saarinen's emphasis on organic order. György Kepes wrote in *Language of Vision* (1944) that the vision is a "device of orientation" and "a means to measure and organize spatial events" in both physical and human spheres and that the vision must evolve into a language of space that

12 Mumford, Eric Paul, Defining urban design: CIAM architects and the formation of a discipline, 1937-69; New Haven : Yale University Press, c2009, 101.

13 Mallgrave and Christina Contandriopoulos; Architectural theory, Volumn II: An Anthology from 1871 - 2005; Malden, MA : Blackwell Pub., 2006-2008; 291.

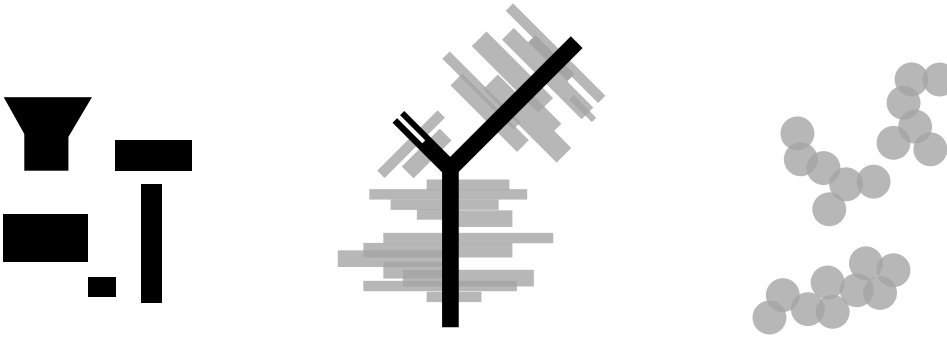
14 Fumihiko Maki, Nurturing Dreams: Collected Essays On Architecture And The City, The MIT Press, 2008, 26.

can enable humans' sensibility to perceive space-time relationships. Maki's premise for investigating Collective Form resonates with Kepes's advocacy for renewed visual representation of dynamic organizations in contemporary cities. Maki encountered Kepes at the first Harvard Urban Design Conference (HUDC), when Kepes presented his research on the "Perceptual Form of the City," conducted with Kevin Lynch at MIT and later published as Lynch's *The Image of the City*. The focus of the study was on human's perceptions of their relationships to the physical world. At the second HUDC, Kepes and Lynch together suggested that a good urban environment should be coherent, connected and growth-facilitating.[12] This idea is a critical reference for Maki's notion of Collective Form. In 1960, Louis I. Kahn lectured about "Order and Form" at the WoDeCo to the Metabolists including Maki. Kahn suggested that "design is form-making in order" which could emerge out of growth and support diversity and integration.[13] Kahn's philosophy connects physical form with social order and favors organic growth and social inclusivity. Maki's writings cite Kahn's work, echoing his beliefs.

Reviewing Maki's formative years, his academic experience, international travels and his interactions with his international peer architects have played fundamental roles in shaping his distinctive characteristics as an architect. Maki developed unique design thinking during a crucial, transitioning period in modern architecture. His writings on Collective Form capture major debates during the ideological shift in the mid-twentieth century. His theories exemplify the post-CIAM ideological breakthroughs in architectural thinking toward humanism and urbanism.

INVESTIGATIONS IN COLLECTIVE FORM (1964)

Maki's book *Investigations in Collective Form* (1964) consolidates his philosophies of architecture and urban design as an emerging practitioner and educator. One of the most memorable periods in Maki's life was from 1958 to 1960, when he traveled on the Graham Fellowship and retraced philosopher Tetsurō Watsuji's footprints recorded in his book *Fudō* (1928). Traveling from Japan to Europe, Watsuji observed the monsoon region in Asia, the deserts in the Middle East and the meadowlands in Europe, comparing the three regions' civilizations.[14] Maki studied the formation of vernacular settlements in various climates and cultures in Southeast Asia, India, the Middle East and Europe. He also visited new modern cities, such as Chandigarh (Maki met Le Corbusier at Chandigarh). The forms and organizations of traditional settlements inspired Maki to propose the concept of Group Form. When Maki finished his trip in 1960, he returned to WUSTL and wrote an essay on three paradigms of Collective Form based on his travel notes, which was eventually developed into the book *Investigations in Collective Form*, published by WUSTL in 1964 and reissued in 2004.



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5 Compositional Form, Megaform and Group Form. Redrawn by author based on the original diagram in Fumihiko Maki's Investigations in Collective Form, 1964.

In the book, Maki reflects on diverse Eastern and Western ideas and paradigms of architecture and urban design, contemplates the desired qualities of contemporary cities and illustrates how to operationalize corresponding design principles. The book consists of two chapters: the first, written by Maki and Ōtaka, elaborates on the formal characteristics and spatial rationales in three typologies of Collective Form—Compositional Form, Megaform and Group Form **[5]**; the second, written by Maki and Jerry Goldberg, investigates linkages among components of Collective Form. Compositional Form refers to the predominant Corbusian design in early CIAM projects. Megaform includes Metabolists' schemes featuring "superstructures". Maki critiques the formal rigidity and spatial limitation of these two paradigms and advocates Group Form. He suggests that vernacular settlements have evolved incrementally and organically at a human scale, responding to local settings. Maki argues that these three models capture basic relationships between individual elements and the whole in an urban complex; they are not mutually exclusive and can coexist in one configuration. Maki's notion of Collective Form was well-received in the field, praised by renowned architects such as Walter Gropius, Kevin Lynch, Aldo van Eyck, and Jacob Bakema. Maki's philosophies underlying the advocacy of Group Form parallel the concerns about contexts, urbanism and humanism expressed by Team 10 and Lynch.

Maki posits at the beginning of his book that urban societies are "a dynamic field of interrelated forces" in "a state of dynamic equilibrium," whose character changes over time. This understanding of the dynamic nature of cities fundamentally differs from the modernist view which views urban dynamics as disorder and backwardness. Maki regards urban designers as the most concerned observers of a society and its physical, technological and social changes. Poised to tackle and influence urban dynamics, Maki points to the then inadequacy of spatial languages for creating coherent urban spaces amid socio-technological dynamism. He initiates the search for adaptable forms of the collective—especially a collection of buildings—as important segments of the city.

Maki emphasizes the distinction between form and design. Referring to Kahn's presentation at the WoDeCo on "Form and Design," Maki considers form as an outcome of the built environment that is observable and belongs to the viewer, whereas he views design as designers' inference about form based on site condition, budget limitation and client's ideas. Form is shaped by collective acts and belongs to the society, whereas design is an individual activity and is personal to designers. Form appears and changes according to the coordination of plural designs. Based on his understandings of form and design, Maki analyzes the design rationales underlying the three conceptual typologies of Collective Form.

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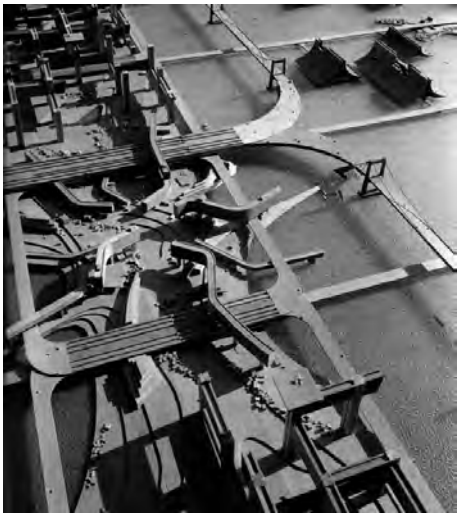

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6 Plan for Tokyo Bay, 1960, Kenzō Tange

7 Plan for Tokyo Bay

8 Japanese Metabolism: The Nakagin Capsule Tower, 1972, Tokyo, Japan, Kisho Kurokawa

Three Types of Collective Form

Maki considers Compositional Form as the then most accepted outcome of modern design in the 1950s. The elements of Compositional Form are individual buildings conceived separately based on considerations of functionality, visuality and spatial relationships on a two-dimensional plane. Designers prioritize geometric, proportional rationality in their designs. Maki views the making of Compositional Form as a natural extension of conventional architecture. The masterplans of Brasília and Chandigarh, complying with principles in CIAM's *Athens Charter*, exemplify Compositional Form. In these newly planned capital cities, each building stands freely as a sculpture independent from other buildings and the field, presenting an iconic, monumental image. Maki acknowledges the merit of this approach, especially in particular historical contexts, yet suggests that designs following compositional principles tend to neglect the space between solitary, autonomous buildings and lack inter-building linkages and collective coherence. The compositional approach to design views urban development as a static, completable process and therefore fails in adapting to urban changes. Its prescriptive, formally deterministic rationality is inherently rigid and constrains future alterations and evolution.

Maki coined the term "Megaform" in this book, defining it as "a large frame" accommodating all urban functions, which would be realizable with technological innovation. A Megaform shares features of order and rationality with a Compositional Form, yet grows with increasing demand. Tange's Plan for Tokyo Bay **[6-7]**, his studio at MIT themed "A Community for 25,000," and the Metabolists' schemes **[8]** best exemplify Megaform. These proposals concern the relationship between the collective and individuals. They share the aspiration to generate metabolic cycles of urban development in organically growing infrastructures which would accommodate continuous growth. The Metabolists' ideal city consists of elements with various metabolic cycles. Elements with long lifecycles include large-scale infrastructures for transportation and defense, such as highways, rails, harbors, dams and enormous "artificial grounds" spanning over ground-level infrastructures. These long-term, massive infrastructures serve as spines and platforms for the growth of small-scale elements with short lifecycles, including residential, commercial, business and recreational clusters. The Metabolists believe that the combination of megastructures and numerous individual cells would allow for continuous growth and simultaneous renewal.

The concept of Megaform derived from the demand for massive expansion in modern cities and presents a Utopian nature. It continues being imagined and experimented with practice. Reyner Banham's book *Megastructure: Urban Futures of the Recent Past* (1976) presents hundreds of built

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15 Zhongjie Lin, Kenzō Tange And The Metabolist Movement: Urban Utopias of Modern Japan, 2010, 11.

16 Fumihiko Maki, Investigations in Collective Form, 1964,11.

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9 Hydra, Greece

10 Hydra, Greece

11 Japanese Agrarian Village—Shirakawago Village with its main axis running North-South

and unbuilt projects featuring Megaform. Maki views Megaform as a promising approach to generating multi-functional urban complexes incorporating environmental engineering and modern infrastructures. However, he points out that although a megastructure enables changeable infills, it can become obsolete itself and lead to systematic failures. This innate deficiency in megastructures shares the rigidity and monumentality of Compositional Form.

Maki's distance from the other Metabolists is evident in the essay "Towards Group Form," co-authored with Ōtaka and published in the Metabolists' founding manifesto, *Metabolism: The Proposals for New Urbanism (1960)*. Questioning a static, rigid physical structure, Maki calls for "a more subtle internal order that underlies the natural evolution of cities."[15] He insisted that "a real urban order should accommodate certain degrees of disorder and encourage spontaneity, providing an alternative interpretation of 'city as process' to the megastructural approach." This ideal form is "a kind of master form which can move into ever new states of equilibrium and yet maintain visual consistency and a sense of containing order in the long run."[16] Against the invention of geometries and the static nature of compositional and mega form, Maki advocates for Group Form which is an organic pattern derived from environmental needs.

The concept of Group Form emerged during Maki's two-year travels. Starting in 1958, Maki headed west from Japan to Chandigarh, India; Isfahan, Iran; Damascus, Syria; Beirut, Lebanon; Cairo, Egypt; and Istanbul, Turkey. He then visited Greece and the rest of Europe. Maki observed numerous self-constructed houses scattered along the Mediterranean coast. He was impressed by the repetitive patterns and the intricate order in these vernacular communities. He perceived qualities of dynamism, coherence, flexibility, internal linkages, and open-endedness in these organically grown, self-governed communities. Maki began to use the term "Group Form" to describe the form of traditional settlements, exemplified by Hydra Town in Greece **[9-10]**, European medieval cities, North African villages, Japanese villages **[11]**, and sixteenth-century Dutch towns.

Maki perceived an organic whole in vernacular settlements such as Hydra. The form of the town emerged with the aggregation and repetition of its typical housing units and the streets, paths and public spaces connecting housing clusters. The internal order evolved incrementally overtime and was well understood by its residents. Each resident was a builder who would intuitively fit into the community and carry on its traditions. The entire town was composed of generic, simple spatial elements, which collectively presented regional culture and identity. Maki found it fascinating that these communities survived for hundreds of years and maintained their order and overall image, being coherent both socially and physically. From housing units, to housing clusters and to the entire town,

17 Fumihiko Maki, “Exploration of Urban Design Language,” Fumihiko Maki, Phaidon, 2009,17.

18 Fumihiko Maki, “The Future of Urban Environment,” Progressive Architecture 45, Oct, 1964, 178.

the overall community was spatially rich and vibrant. To Maki, Hydra's unique and intricate relationships between parts and the whole were loose without a rigid hierarchy, which essentially brought an enduring quality to the town. Even when individual houses were destroyed or replaced by similar houses, the town's overall form would remain consistent.

Maki's emphasis on the autonomy and influence of each element (as opposed to a dominant overall structure) and his advocacy of a dynamic, coherent Group Form (as opposed to two-dimensional compositions of solitaries or a centralized, powerful relationship between parts and the whole) reflects that he values collective culture, democratic organization and incremental progress in an urban society. Group Form represents a society with collective orders and connections that allow for inherent dynamics. Maki favors a dynamic, reciprocal relationship—both in form and in operation—between individuals and the whole in a Group Form. Each individual units is a prototype, which determines the character of the ensemble at large. Once the link between the elements and the whole is established, each unit can evolve freely and autonomously while the characteristics of the whole remain consistent. Group Form grows cumulatively in a non-hierarchical process. Maki insists that "in an organic form such as a city, an urban order can only be maintained if the autonomy of individual buildings and districts is assured."[17] Group Form derives from concerns about local societies, cultures, and their development. It represents an urban environment with a flexible, democratic order, which accommodates long-term spatial and social dynamisms while ensuring individuals' autonomy.

To further distinguish Group Form from other rigid typologies, Maki highlights its temporal dynamics. He suggests that Group Form "can move into ever-new states of equilibrium and yet maintain visual consistency and a sense of continuing order in the long run," because its image "derives from a dynamic equilibrium of generative elements, not a composition of stylized and finished object."[18] The overall Group Form is an open-ended process with continuous evolution. This notion embraces Group Form's incomplete, unpredictable and transient characteristics, reflecting the urban conditions then. Group Form is essentially sustainable, allowing for flexible social structures that can adapt to unpredictable, rapid unban changes.

Maki's democratic notions regarding humanistic concerns likely have derived from his experience in American academia between 1953 and 1965. Living in Boston, St. Louis and New York, Maki witnessed the rise of community movements against modernist urban renewal projects. Maki also read the work from influential urban theorists and educators, including Jane Jacobs, Kevin Lynch, and Aldo van Eyck, whose ideas resonated in criticizing the modernist approach towards city planning from a humanistic, populist perspective. Maki's emphasis on the overall, sustainable image

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19 Vincent Ligtelijn and Francis Strauven; Aldo van Eyck: writings; The child, the City and the Artist: An essay on architecture, The in-between realm; written in 1962; Amsterdam, Netherlands: SUN, 2008, 218.

20 Fumihiko Maki, Fumihiko Maki, Phaidon, 2009, 6.

12 Fumihiko Maki,
Hillside Terrace Housing in 2010

of Group Form parallels Kepes and Lynch's study at MIT on perceptual form of the city (1954-1959), published as *The Image of the City* (1960).

Both Maki and Team 10 members proposed ideal urban form following their humanist and social aspirations. Group Form also parallels the structuralist approach of adding dynamic individual elements to create a cluster, in which individual elements can change without altering the overall urban image. Aldo van Eyck (a Dutch Structuralist) identifies architectural reciprocity in part-whole, small-large and house-city relationships and sought to create corresponding diversity-unity and individual-collective reciprocity in human societies.[19] To reconcile the dual phenomena, he emphasizes the transitional, in-between places, resonating with Maki's emphasis on inter-element linkage in Group Form. They advocate that architects should create organic linkages between individual elements and the whole and between old and new elements. Accordingly, the designs of new architectural projects must respect existing urban contexts and fit into the rest of the city. Such propositions suggest a humble, yet socially responsible, role of architects in a society. Contrasting modernist design, which generates self-interested icons with a dominating image overwriting existing orders in the city, approaches exemplified by Maki and Team 10 are democratic and pluralistic. Architects become mediators among individuals, among individuals, collectives and the society, and among the past, the present and the future.

Maki has greatly enriched his notion of Collective Form through intensive practice. His basic approach to design remains "starting with individual elements to arrive at a whole."[20] Maki emphasizes after years of practice that space is an important medium and that the coherence of Collective Form depends on the cumulative effect of the designs of both exterior spaces and architectural forms. The underlying aspirations in his investigations in Collective Form have been central to the designs of his representative projects, including Hillside Terrace **[12]**, Tokyo Metropolitan Gymnasium, Keio University Shōnan-Fujisawa campus, and Republic Polytechnic campus in Singapore.

THE CONFLUENCE OF COLLECTIVE FORM AND COMBINATORY URBANISM

Maki has been a keen learner of local cultures across the globe and an active participant in forward-looking dialogues about people and the society. Maki's cross-cultural understanding of the urban is rooted in his inherited background and international influence. His contextualized explorations of adaptive, sustainable and democratic environment and social systems are highly relevant to today's urban practice and education. His spatial-social concerns and ethical stance on design principles have enduring impact on architectural and urban thinking in an era challenged by

globalization and increasingly volatile social-political dynamisms. Since the mid-twentieth century, fields related to architecture and urban planning have greatly diversified and become increasingly interdisciplinary. Architectural and urban practitioners face more complex urban problems intertwined on physical, social and environmental dimensions. Agencies shaping the built environment often hold diverse, conflicting interests. Capitalist ideologies largely drive state and market forces. Attempts to innovate traditional approaches to city making ought to continue.

Thom Mayne, another reflective architect and pioneering thinker, has expressed similar aspirations as Maki and published *Combinatory Urbanism: A Realignment of Complex Behavior and Collective Form (2011)* as a manifesto of his design philosophies. Mayne argues that the idea of using urban planning as a means to control urban growth based on the prediction of future development has become obsolete. He also refutes the idea that architecture is about inserting single objects into a comprehensively planned urban matrix. The conventional prescriptive approach to urban design and development is increasingly ineffective in meeting human and societal needs, since urban future cannot be accurately predicted, especially in increasingly mobile and rapidly changing societies. Mayne insists that architects and planners need to create new design concepts and methods that address the complex interplay of human and natural forces that shape cities and influence the future. Accordingly, architecture must responds to urban forces active in its contexts which transcend property boundaries; urban planning must create flexible, adaptive spatial structures that can accommodate rapid, unpredictable social-spatial changes. Architecture and planning practices must overlap and converge both in scale and in their spatial-social concerns.

Like Maki, Mayne experienced socio-cultural changes during his formative years which shaped his view toward architecture and the city. Mayne studied in architecture schools during the 1960s, which was a turmoil, transitional period in America. Mayne recalls experiencing the early phase of the exhaustion of modern projects and an antagonist attitude toward the past when schools paid little attention to urban history education. It was also a fraught time in American history amid the Civil Rights movement and Vietnam War. Against the backdrop of dramatic cultural-political changes, Mayne witnessed the discourse about architecture toward considerations of urban and natural forces. During Mayne's early practices in the 1970s, he realized that the ongoing social changes driven by various powers within broader business and political communities were out of sync with architects' aspirations. It was also a time of worldwide neoliberal turn in economic policies. American ideologies were divided by two prevalent understandings of the government's role: one notion favored unfettered freedom in a *laisser-faire* environment and rejected collective act, whereas

the other highly, almost religiously, appreciated the importance of the communal. Such dilemma in reality made architects' dialogues about the ideal form of architecture and the city seem lofty and Utopian. By the 1980s, the world had moved toward a more singular capitalist model. Urban design as a profession and dialogues about design ethics were disappearing.

To Mayne, there has been an unresolvable cultural divide in America rooted in conflicting values, which makes it difficult to negotiate and find the middle ground. Mayne believes that collective goals still are important for the overall wellbeing of a society and that equitable distribution of resources is crucial to a healthy economy. Capital should not be owned only by a small group of people. Therefore, the discourses about what development objectives matter to the society as a whole should shape architectural thinking. Architecture becomes the reflection of the world, consolidating conflicting values and social relations in its physical configuration. Those who shape the built environment—be it architects, urban designers or planners—must become thought leaders who bear the responsibility to respond to current socio-cultural conditions and to stimulate progressive cultural transformations.

Both Maki and Mayne traveled around the world, observed different places through an anthropological lens and absorbed ideas from various cultures. They share a sense of social responsibility. Both are interested in the fluidity, adaptability and complexity of architecture and the city. There are three parallel ideas at the confluence of their ideologies. First, they both view architecture and the city as open-ended, dynamic fields of interrelated forces. These interrelated forces shape Group Form in Maki's view and are "combinatory" in Mayne's term. In their views, architecture and urban complexes play infrastructural roles in constantly changing societies. They refuse to view architecture as isolated, static objects; rather, they emphasize the organizational and infrastructural roles of architecture in networked conditions and highlight the societal importance of tangible and intangible interconnections among urban elements. Mayne expands on this notion and views the built environment as information landscapes, which include elements with autonomous characteristics. Building interconnections and forming networks within the information landscapes become the method for coherently organizing plural elements and mediating between complicated problems.

Second, both Maki and Mayne consider the transformation and impact of urban complexes over time. A sense of space influences human experiences and memories; therefore, architecture and the city have lasting socio-cultural impacts. Maki and Mayne aim to create adaptive urban complexes that can accommodate future changes. To do so, they favor flexible configurations that respond to both site conditions and larger contexts. Mayne argues that architectural and urban design depends on iterative processes of feedback and adaptation. Both architects have been highly reflective in their practices

during which they continuously critique and challenge their own thinking and proposals with urbanistic, landscape, tectonic, functional considerations. They regard design practice as a reflective, cumulative process that builds on critical assessment of, and adaptive adjustment to, plural problems simultaneously.

Third, both Maki and Mayne embrace ambiguity in urban complexes, where multiple layers of constituent elements and inter-element linkages co-exist. They are interested in linkages, in-between spaces and interval behaviors. Mayne particularly rejects binary worldviews and advocates for the negotiation among plural, more nuanced understandings of issues at hand. Mayne holds architects accountable in making decisions that result from the negotiation of conflicting values in the complexities and dynamisms of contemporary societies.

Overall, both Maki and Mayne advocate for the creation of urban systems that both solve current, contextualized problems and facilitate enduring socio-cultural progresses in a broader society. They imbue socio-political aspirations in their practices and seek to intervene in intricate, interrelated urban spaces and political systems, aiming to generate enduring impact through the creation of adaptive urban complexes. They also both advocate for expanding and reshaping architecture and planning education to prepare practitioners for tackling broader societal challenges that matter for collective, sustainable wellbeing.

Conclusion

Fifty years after Maki proposed the notion of Collective Form, Mayne finds it thought provocative and useful for today's discourse about architecture and cities. Dialogues about the "collective" in architecture, urban design and planning stimulate new conversations and arguments about ongoing societal struggles in contemporary cities. The notion of Combinatory Urbanism not only echoes Maki's propositions of Collective Form, it also continues the socio-cultural debates about ethical principles for architectural practices originated during a transitional period in the fields of architecture and urbanism. This stream of discourse links many seminal ideas, including those from CIAM, Team 10, Tange, Sert and Lynch. It traces the historical evolution of architectural and urbanistic ideologies and connects Eastern and Western innovative thoughts. The fields of architecture and urbanism have always projected the ideal city. At the confluence of all the progressive attempts lies debates about design ethics for practitioners who shape urban systems. Maki's and Mayne's notions about architecture and the city are open-ended, ambiguous at the conceptual level, allowing for interpretation and improvement. They inspire productive, normative debates aiming at societal significance and hence produce enduring

impact on fields concerning the human environment and urban societies.

With technological innovation and massive adoption of digital tools, human connections increasingly become more abstract and intangible. Discourse about Collective Form brings back the disappearing discussion about the urban realm in a world with fragmented interests and even more rapid changes. Would collective aspirations disappear? What should be collective form for today's cities? How to build infrastructures and public realm that support collective goals of cultural and societal progresses? These questions remain relevant to the current society and worth continued discussion. Solving urban problems requires collective wisdoms synthesizing considerations on plural dimensions, including economic, tectonic, urbanistic and environmental factors. These dimensions are structural to a society. Tremendous efforts must be invested in balancing all these dimensions to generate a better collective outcome.

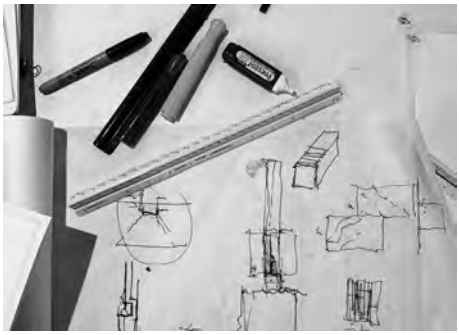
Urban study is located within the reality of its context. Historical evolution of ideologies in response to urban changes provides lessons for addressing contemporary issues and preparing for future changes. Today's flows of capital, knowledge and information are increasingly connected at a global scale. Yet, new forms of social and cultural divide increase with capitalist urban production. The urban realm is not limited to man-made cities, but applies to a multi-faceted realm interweaving natural, artificial and virtual elements. This opens the possibility of architecture to contribute profoundly toward the formation of more diverse and fertile urban environments. Mayne suggests that the current business and political environment fails to facilitate structural change in contemporary cities. Therefore, architects, urban designers and planners ought to be the imagineers who reshape the societal infrastructures to enable socio-political changes. They ought to be optimistic and take the initiative.

Acknowledgements

This essay derives from my master's studies at Washington University in St. Louis. I am grateful and deeply indebted to all those who supported me along the way. Special thanks go to my thesis committee Robert McCarter (chair), Eric Mumford and Seng Kuan. I also thank all my interviewees, including Fumihiko Maki, Thom Mayne, Cynthia Weese, Benjamin Weese, Robert Vickery, Jr., Peter MacKeith, Robert Dannenbrink, Jr., Donald Brandenburger, Eric Pettersson, and Ralph Insinger for their warm and insightful responses.

ON SLOWNESS, REVISITED

Tod Williams and Billie Tsien



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1 Tod's desk, September 2019, Courtesy of Tod Williams Billie Tsien Architects | Partners

2 Competition Sketch, Andlinger Center for Energy & the Environment, Princeton University, 2008, Courtesy of Tod Williams Billie Tsien Architects | Partners

3 Sunken Garden, Andlinger Center for Energy & the Environment, Princeton University, 2015, ©Michael Moran

The work of our studio has always been generated through an ongoing conversation, reflecting on our collective experiences and listening to the many voices of people we meet throughout work and life. At peaks and valleys of this conversation, we have tried to formalize our thoughts, evident in the essays that follow. Over time, these texts become voices from the past with whom we can re-engage. We can see how we've evolved, what we've learned, and what remains true. Twenty years ago we wrote one such essay that began as lamentation for the loss of the drawing tools of architecture but was really a call for "slowness".

It was meant as a quiet and personal observation in the Spanish journal 2G. What has surprised us is that teachers still assign this essay and students respond to it perhaps now more than when it came out.

For an architecture student today, reading over the description of lost and disappearing tools must feel as if they were hearing stories of quill pens and vellum. But certainly the idea of "slowness" is ever more fragile and evermore precious. Its pursuit is either a way to save ourselves or a path to obsolescence. But we are optimists and we believe it is the only way in which one makes things that last. Unlike the speed and ubiquity of social media though, architecture still remains essentially slow and is based in one place. It is a discipline of physicality, of realness, and materiality. There is and never can be a digital equivalent.

So what has changed in the way that we work in the studio? We now use the tools that are the universal tools of architecture- the computer and the evolving programs that are its language. We use Revit and Rhino and SketchUp but for us these are a language for transmitting information but not for developing ideas. Ideas still begin and are developed with the hand. **[1-2]**

A sketch becomes a digital drawing. The drawings are a compilation of the basic knowns - bleached and bare. The nuance, the shades and shadows, the idiosyncrasies are developed slowly in the layers of drawings that are drawn over the prints. So those tools of direct translation- the pencil, the pen are replaced by tools of editing and shaping - colored markers,

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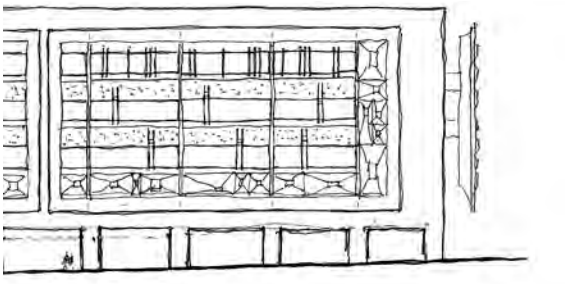

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4 Rendering, U.S. Embassy Mexico City, Rendering by MARCH

5 Mock-up sunscreen section during design phase, Courtesy of Tod Williams Billie Tsien Architects | Partners

6 Sunscreen sketch, U.S. Embassy, Mexico City, Courtesy of Tod Williams Billie Tsien Architects | Partners

thick sharpies and boxes and boxes of whiteout. In fact whiteout is the power tool of choice because it is about bringing back uncertainty to what appear to be the facts. And we continue to make real physical models often using unfolded rhino models as a quick base. **[3]**

Indeed as the world has become more digitally based we rely more and more on the physical. We now will not build a project unless we are able to have several mock ups made. It is part of our contract. We visit all the quarries that are being considered. **[4-6]**

We go to the stone finishing yards to understand not only the techniques we know but sometimes to discover new ones. We go to the factories where furniture is made, where the rugs are woven, to the yards where the bricks are produced, to the shops where the metalwork and the windows are fabricated. **[7-8]**

Each time we learn so much and as importantly we make a personal connection with the people who are supplying and making our work. We see and we get to know each other. There is a greater sense of trust and also a sense of shared mission. The physical connections apply not only to the material but to the relationship. **[9-10]**

With time and perhaps with greater maturity as well we have become more and more clear that we are here to be of service. That relieves us from the "burden" of trying to be "creative."

We do not have to generate an imaginary problem. One of the greatest aspects of an architectural practice is that we are asked to solve someone's problem within the constraints of a site, time and budget. We have parameters, and within those parameters we can go very very deep.

So to be of service is very different than being servile. To be servile is paying lip service to the problem and constraints. It is to stay shallow. To be of service is to so deeply commit to the problem that you discover answers that neither the client nor you would have ever imagined.

For us and our studio that is where the present and the future lays. **[11]**

ON SLOWNESS, TOD WILLIAMS & BILLIE TSIEN, 2G, 1999

In an earlier edition of *2G* devoted to Arne Jacobsen, Knud Aerbo, one of his former associates, spoke of Jacobsen's office:

> "What we had when we worked with Arne Jacobsen: A drawing table—a 90 x 160 cm uneven table top—a side chair with a straw bottom. Our own T-square and a pencil which had to be sharpened with a knife… Drawing pins to hold the paper; tape was not invented yet... If you look at it today, you will have to say: it could not be done. But luckily we did not know then."

1 clutch pencil, lead, and lead pointer*
bunny bag*
pounce*
erasing shield*
lettering template*
(*soon to disappear)

"There is a secret bond between slowness and memory, between speed and forgetting. Consider this utterly commonplace situation: A man is walking down the street. At a certain moment, he tries to recall something, but the recollection escapes him. Automatically, he slows down. Meanwhile, a person who wants to forget a disagreeable incident he has just lived through starts unconsciously to speed up his pace, as if he were trying to distance himself from a thing still too close to him in time.

In existential mathematics, that experience takes the form of two basic equations: the degree of slowness is directly proportional to the intensity of memory; the degree of speed is directly proportional to the intensity of forgetting."

Milan Kundera, Slowness

Recently, one of the architects in our studio put down the telephone and said incredulously, "No more leads!" Calling to place an order for new "F" leads, he was told that Faber-Castell was no longer making them. People apparently do not draw enough anymore to make it worth their while. This is just the latest disappearance. And it seems to be happening more and more often to more and more tools that we use. Lettering and shape templates are disappearing. In 1993 we were told that there were only 144 more Dietzgen lettering templates in all the warehouses in the United States. So, we bought twenty. The "S"s and "4"s on these templates are wearing out, breaking, and there are no more templates to be had. Because we hear that they too are being phased out, we are hoarding ink pens. It is isolating and disorienting; a very strange feeling, rather like waking up to find that that the tide has come in, and familiar landmarks are submerged. Slowly, the tools of the hand disappear.

In the United States, the practice of architecture has come to rely on the computer. In offices the word "efficiency" is always mentioned, and in design schools the capability to create and rotate complex forms in space is lauded. So, with surprising speed, the tools of the hand are becoming extinct.[1]

This is a lamentation for lost tools and a quiet manifesto describing our desire for slowness. We write not in opposition to computers—in fact we are in the midst of bringing them into our studio—but rather it is a discussion about the importance of slowness. We write in support of slowness. **[12]**

Slowness of Method

Our desire to continue to use the tools of the hand, even as we may begin to use the computer, has to do with their connection to our bodies. Buildings are still constructed with hands, and it seems that the hand still knows best what the hand is capable of doing. As our hands move, we have the time to think and to observe our actions. We draw using pencil and ink, on mylar and on vellum. When we make changes, they occur with effort and a fair amount of tedious scrubbing with erasers, erasing shields, and spit. We have to sift back through previous drawings and bring them to agreement. So, decisions are made slowly, after thoughtful investigation, because they are a commitment that has consequence. It is better to be slow.

We like to keep the stack of finished and unfinished drawings nearby so that the whole project can be reviewed easily. Their physical presence is evidence of work done, and a reminder of what there is to do. The grime that builds up from being worked over is poignant and satisfying. We see the history of the presence of our hand. To have the actual drawings in reach allows us to understand the project in a more complete and comprehensive way. In the buildings we design, we struggle to achieve a unity and sense of

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7 Stone quarry, Madurai, India, Courtesy of Tod Williams Billie Tsien Architects | Partners

8 Mock-up, TATA Consultancy Services, Banyan Park, Courtesy of Tod Williams Billie Tsien Architects | Partners

wholeness that can come from a balance of individual gestures within a larger and more singular container. The focus of a computer screen feels too compartmentalized and tight to see and understand the whole. And if every time a change is made, a new printout is made, there is the problem that the printouts are too clean. They don't show the scrubbed and messy sections of erasure, so there is no evidence to indicate the history of the development of an idea. Crucial to creating wholeness is the understanding of the development of the idea.

We work together, twelve people in one room without divisions. Much like a family, we expect that others will help whenever we need them, and however we need them. So there is no division of labor into design, production, model-making, or interiors. Each architect is involved in the making of contracts, billing, and writing of letters. Since we have no secretary, the phone is answered by whomever has the least patience with the ringing. Because each person must be a generalist, a certain amount of efficiency is lost, as each person must learn all the tasks of the office. We ask that people constantly shift their attention between their particular task and one which helps the office as a whole. What this rather casual approach to office management accomplishes is that everyone knows what is going on around them. If there is a problem, it is shared, and of course we try to share the joys as well. The sense of well-being in the studio must be supported and nurtured by each member.

So our way of working allows us to have the experience of slowness. Tools are connected to the slower capacity of the hand; the presence of hand-drawn pages documents both the path of thought and the destination. The generalization of tasks means our office works not as an efficient machine, but as a loose and independent and somewhat inefficient family. The slowness of method allows us breath and breadth.

We have written a Mission Statement for the office: Whatever we design must be of use, but at the same time transcend its use. It must be rooted in time and site and client needs, but it must transcend time and site and client needs. We do not want to develop a style or specialize in any project type. It is our hope to continue to work on only a few projects at a time, with intense personal involvement in all parts of its design and construction. We want the studio to be a good place to work, learn, and grow, both for the people who work in the office and for ourselves. The metaphor for the office is a family. Each person must take responsibility for their own work, but as well must be responsible for the good of the whole. We do not believe in the separation or specialization of skills. Each architect in the office will work through all aspects of a project. We would like to be financially stable, but this will not outweigh artistic or ethical beliefs, which will always come first. The work should reflect optimism and love. The spiritual aspect of the work will emerge if the work is done well.

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9 Stone panels cut with CNC machines and finished with hand carving for Jali screens, Courtesy of Tod Williams Billie Tsien Architects | Partners

10 Completed Jali Screen, TATA Consultancy Services, Banyan Park, Mumbai, 2014, ©Michael Moran

11 Sketch, Hands, Tod Williams & Billie Tsien. "Our work is not just made from our hands as designers, but the many hands that bring a project to life."

Slowness of Design

In a public forum we were asked, "What is your design strategy?" We were at a loss for words. There is no strategy for either an ascendant career, or more importantly, the way that we design. It is so easy to use the cushion of past thoughts to soften the terrifying free fall of starting a new project. It is inevitable that, as we accumulate a longer design history, we repeat things unconsciously. Still, perhaps naively, but in earnest, we try to start each project with a blank slate. The design is incremental—small steps that are made in response to the site, the client, the builder, and our own intuition. We try to fight through what we have learned, toward the freedom found in innocence. The design is a slow and often uneven accumulation of stitches, that are often ripped out part way through while we struggle to make clear, or to understand, what the pattern and organization might be, even as we avoid as much as possible knowing what the final image might be.

So, the first intuitive drawings are usually very rough plan forms which might demonstrate the gesture of the body's movement and how that is expressed by a mass in relationship to the land. We always show these drawings to the client because we want them to understand the intuition or gesture that is the genesis of the design. It is also a way of saying, "I don't know what I am doing yet, but I do have a feeling about it."

Often, as the plans are worked through, an idea about a section or a detail or a piece of cabinet work will come to mind. And for a while the plans are put aside and the stray thought is pursued. Progress is a stutter step, not a forward march: three steps forward, two to the side, and one step back. It is a choreography that somehow pulls itself together. With each project, it feels as though we are infants learning how to walk. We pull ourselves up, wobble, take a few steps, and fall down.

This way of developing the design mirrors the working method of the office: moving back and forth between advancing the particular task and attending to the myriad details that are the sidetrack. One generally thinks that to be "sidetracked" is a bad condition, but we think that it is enriching. The sidetrack is simply a parallel route. It has been said that architecture is the mother of all the arts; meaning, one supposes, that it is the generative root. We prefer to think that architecture is like a mother caring for a toddler: she must keep hold of the larger vision of the adult whom the child will become, while stopping to clean up fingerprints and wipe noses.

For us, elevations are always the last part of a building to be developed. Often we are at the end of design development before we even begin to rough out the elevations. This is because elevation drawings close down the process of questioning by making the image of the building too clear, too "graspable," and therefore too final. Clients, magazines—in fact, we as architects

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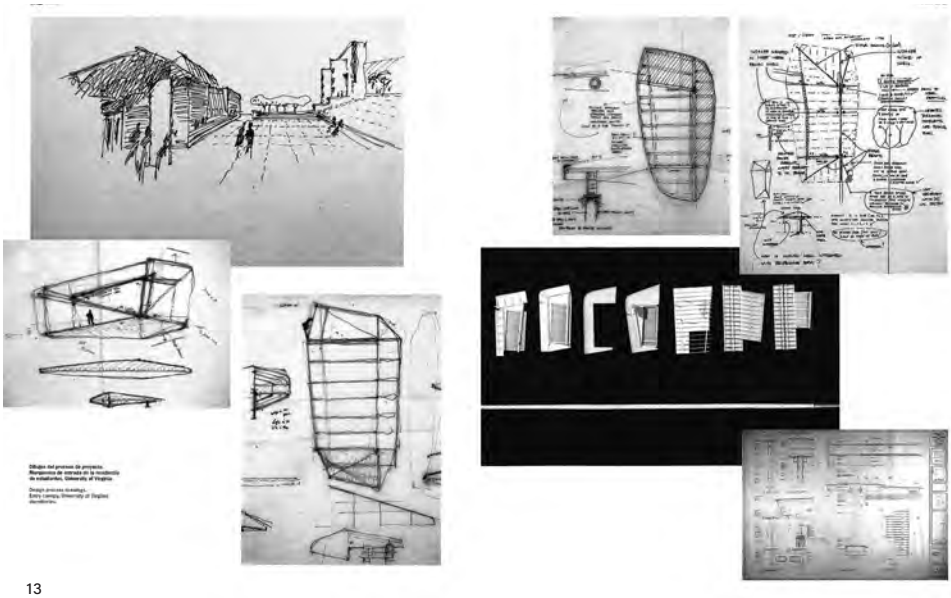

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12 Photo by Peter Arnold, 1998

13 Scan of excerpt from 2G

and human beings—all want an easy and clear answer. But it is better not to provide one before the interior habitation and the structure of the building has been given enough time to develop as the logic for the facade.

In our current practice, the construction drawings are produced on 30" x 42" mylar sheets using pencil and ink. Notes are typed up on the computer and Xeroxed onto what we call "stickyback," which is an acetate with an adhesive surface. This is glued to each page. The working drawings consist of the typical site plan, plans, reflected ceiling plans, wall sections, and general details. At the same time, and continuing through almost the entire construction process, is a sketchbook. The page size is 11"x17," which is the largest sheet size that our Xerox machine can duplicate. Divided into sections of cabinetwork, miscellaneous metals, window details, roofing details, and miscellaneous building details, the sketchbook can often run up to two hundred pages. Based on previous experience we try to have the contractor set an allowance for certain trades like cabinetwork or metal fabrication. There are several reasons why the sketchbook is useful. It allows several people to work on parts of a specific section at the same time. It means that questions can be answered quickly by issuing a sketch sheet rather than by going back to the large drawing set. Most importantly though, it means that we don't have to stop designing at the issuance of construction documents. It allows us to continue to develop drawings and details even as the project is being built and constructed.

Finally, during the construction period, the project architect—who has been involved since the beginning intuitive drawings—supervises the construction. Often on larger projects, the project architect has moved to the site for as long as a year and half. In this way as questions come up during the course of the project, the choices that are made are made with a sense of the history of the idea and they are true design decisions that accrue to wholeness. They are not simply the result of expediency in the field. This position of "not knowing a priori" is antithetical to the general model of the architect as hero. This is a damaging model because it discourages the slowness of process that comes from the patient search. Certainty is a prison. **[13]**

Slowness of Perception

As our work matures, the perception of it is less and less understandable through photographs. One can only understand it by being there and moving and staying still. One reason is that we have been trying to integrate our buildings into the landscape. Thus, often the most important space is the empty space that is contained by the built forms. This empty space is the heart of the project at the Neurosciences Institute in La Jolla. It is the invisible magnet that holds together the separate buildings, and provides the coherence that makes the project feel whole. So

what is not there is equally important, perhaps more important, than what is there. How does one photograph nothing? One experiences it.

And because we develop our facades as late as we can, we are not relying on a flat plane to carry the strength of the building or to transmit a sense of the place. So it is difficult to shoot the facade of a building because it is only seen by itself, and not, as your eyes see it, in relation to the buildings next to it, in relation to the empty space next to it.

So there is no quick take on our work; no singular powerful image that is able to sum it all up. We are not sure how to present our work. We know that the answer is not a computer-generated "fly-through," or even a video of the real thing. The pacing and the viewpoint of these methods are still too consistent. They are cold, machine-like lenses that follow a too-logical sequence of movement. A human eye scans panoramically, and then suddenly focuses down on a tiny point. You see the ocean, and then you see a grain of oddly colored sand. The boundaries of what one chooses to perceive are constantly expanding and contracting.

And of course there are the myriad of stray thoughts, memories, and images that are called up by what you see in the color and shade of an actual space. There are the distractions (and perhaps one can also see them as positive additions) of sound, smell, shifting light, and the conversations of passers-by. This can only happen when you are there. So, we suppose we can only offer this monograph of our work as a suggestion of what we do, or perhaps even as a pack of lies, which must be proven or disproven by your own feet and eyes.

SLOWLY (IMPROVING) VISION, TOD WILLIAMS & BILLIE TSIEN, *2G*, 1999

We wrote this essay as a continuation to *Slowness* in 1999 for the publication *2G*.

During a recent telephone interview, a student asked me to describe "our architectural vision." The question, asked by a person still in high school was so naïve as to be easily dismissed, yet so profound that I realized it was deserved a thoughtful and considered response.

As architects committed to resolving problems of human habitation through built form, most of our thoughts of peering into the future are restricted to such questions as, "How will potential users need their space to function when they move in, or, several years hence, what issues of growth and change might there be? What kind of expansion and use might be expected? Will there be more children? Guests? How much storage in the future? What kind

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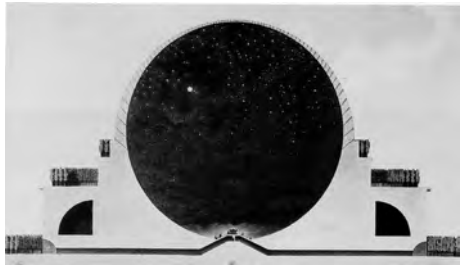

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14-15 "Carceri", 1761, Giovanni Battista Piranesi

16 "Cenotaph de Newton", 1784, Étienne-Louis Boullée,

of maintenance will be required? How long will the roof last?"

These concerns for a project's future are similar for practicing colleagues all over the world. They are issues that carry such important implications that they occupy much of our creative thought. We believe that creative resolutions to such questions are often precisely the ingredients of our creative search. The sporadic moments when the answers manage to transcend the questions are the foundation of what we imagine to be our vision. The constructed result of answering these questions is Architecture. **[14-15]**

But this answer, as understandable as it might be for most practicing professionals, provides little inspiration for a thoughtful and concerned high school student.

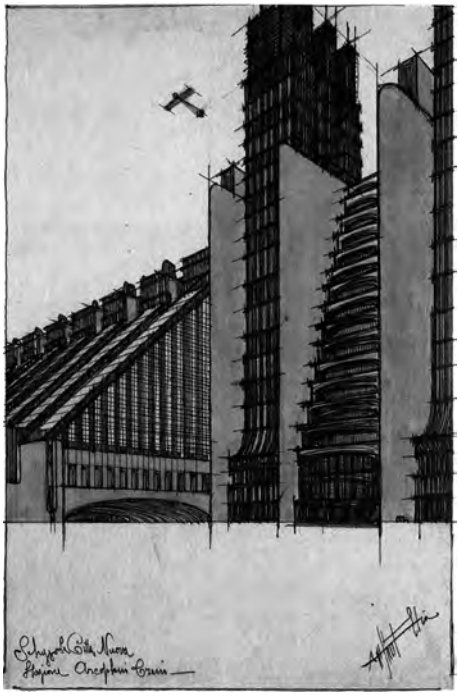
So I thought about the work of the visionary architects—Boullée, Ledoux, Sant'Elia—and came across *Twelve Lines*, a poem by Louis Kahn:

> Spirit in will to express
> can make the great sun seem small.
> The sun is
> Thus the Universe.
> Did we need Bach
> Bach is
> Thus Music is.
> Did we need Boullée
> Did we need Ledoux
> Boullée is
> Ledoux is
> Thus Architecture is.

The power of the drawn idea can be almost as irresistible as the sun, and as Bach. Piranesi's dark, layered, mysterious drawings, Sant'Elia's bold studies for the Citta Nuova, the Mile-High tower of Frank Lloyd Wright, have all reverberated in our collective architectural imaginations. Today, cyber-architecture occupies many students' imaginations. **[16]**

Visionary architecture achieves its greatest power as unbuilt work. What is lost in the actual realization of the work? Is the thought more powerful when it is expressed without dilution than the ambiguity that results from responding to a complex series of factors so common and necessary as client, cost, code, and use?

Antoni Gaudí is one architect whose work has retained its vision in built form. He is one of the most extraordinary, elusive, and intriguing of the visionary architects. Yet upon examining the Colònia Güell models, one is struck by the absolute logic that informed the fantastic. A series of strings with small, weighted sandbags were used to determine



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17 Citta Nuova, 1914, Antonio Sant'Elia

18 Maqueta de la Cripta Guell, 1898-1915, Antoni Gaudí

the curves created by gravity. Gaudí's work is so based on the physical observation that it seems very much in the spirit of observations made centuries earlier by Leonardo da Vinci. Da Vinci is a prime example of an artist, an architect, an inventor, whose visionary ideas may be best appreciated in hindsight. As much as he was appreciated during his lifetime, he was also very much criticized. Today, however, virtually all of his work is regarded as 'visionary,' even though it was originally generated by very practical applications, and was part of a larger society. It is the product of practicality and devotion to problem-solving. The techniques he and Gaudí used were very much a product of their time and place. Gaudí's work, principally executed in the '20s, when most of the great architectural minds were looking to the machine for inspiration, hardly foreshadowed the future. Rather, it was an observation and rumination on the present. He, as Leonardo, was trying to solve a problem set before him at that moment.

So how does one address the question of 'vision' in built work?

Perhaps we are looking for a clear vision rather than looking to be visionary.

Vision can be attained after a long period of building. To be visionary is exclusive of building.

We believe clear vision is slow in evolving, as is 'good work.'

We are not visionary architects, but we are beginning to see more clearly.

We have chosen to work in a particular way; it is a way at once ordinary and connected to the world around us. But it is precisely in the ways it is ordinary and connective that it produces extraordinary results. In this way, it may (eventually) be considered to have vision. **[17]**

Relationship to the Earth

Architecture is connected to the Earth. Too many buildings have an ambiguous relationship to the land. As long as we live on Earth, we will be dealing with principles of gravity, atmosphere, and the very richness of Earth's surface.

Virtually all adults, standing, are connected to the ground with their feet, their line of vision a mere four to six feet above it. This is the point of origin of our waking perception. Architecture must first be concerns with this zone: our feet in contact with the ground. The surface of the Earth is the canvas of the architect. The precise detail of this zone is ours to affect. If we give away responsibility for these crucial areas of concern (to the landscape architect, to the interior designer), we then reduce and weaken our ability to be effective within our most intimate environment. **[18]**

19

19 “Le notti di Cabiria”, 1957, Federico Fellini

Location on the Earth

We need shelter from the brilliant sun in a desert site in Phoenix, but within an infill house condition in New York, we need as much light as possible. The construction methodology in Phoenix will necessarily be different from that of New York, because of codes, labor, material availability, site accessibility, and a host of other reasons, all of which could be conquered, if one wished. And people do wish! Whether by purchasing a Big Mac or hiring an important 'signature' architect or artist, there are people who choose to ignore or erase the differences of locale. The exploration of ideas (which are universal) and locations (which are singular) should give rise to an unlimited series of connective responses. It is easy to step up and order the known; more difficult, risky and slower to search for the original. **[19]**

Care for Our Vision

As we become older, it is a little discouraging to discover our eyesight is less clear, particularly when near- and far-sightedness occur at the same time. Fortunately, this is a problem which is easily solved. A more difficult one is realizing that in this section of our lives we have more demands than ever, and with so much on our minds we find ourselves walking without seeing. But early this summer we attended a screening of Federico Fellini's film, "The Nights of Cabiria." Twenty-five years had passed since we had seen it first, and here we were astonished. A story was revealed to us in ways we never could have appreciated when we were young. Was it that the film's vintage had come into its own, or had our ability to see the work improved over the years? Our understanding and compassion for the human condition does improve with time. We have more to bring to our work as we grow older. Even as we may lose our ability to see distance, the accumulation of life as experience enables us to see depth. Over time our vision is (slowly) improving.

BIOGRAPHIES

Robert McCarter is a practicing architect, author, and, since 2007, Ruth and Norman Moore Professor of Architecture at Washington University in St. Louis; he has previously taught at the University of Florida (1991-2007), where he was also the founding Director of the School of Architecture; Columbia University (1986-1991); the Berlage Institute (Rotterdam); University of Louisville; and North Carolina State University, as well as being Visiting Scholar at the American Academy in Rome. Since 1982 he has had his own architectural practice in New York, Florida and St. Louis, with 25 realized buildings. He is the author of twenty-two books, including *Place Matters: The Architecture of WG Clark* (2019); *Grafton Architects* (2018); *Marcel Breuer* (2016); *The Space Within: Interior Experience as the Origin of Architecture* (2016); *Steven Holl* (2015); *Aldo van Eyck* (2015); *Alvar Aalto* (2014); *Carlo Scarpa* (2013); *Understanding Architecture: A Primer on Architecture as Experience* (2012, with Juhani Pallasmaa); *Louis I. Kahn* (2005), and *Frank Lloyd Wright* (1997). McCarter was one of 71 International Exhibitors for the 2018 Venice Biennale of Architecture, and he was named one of the "Ten Best Architecture Teachers in the US" by Architect magazine in December 2009.

François J. Bonnet is a Franco-Swiss composer, writer and theoretician based in Paris. He's been a member of INA GRM since 2007 and became its director in 2018. He has published several books (*The Order of Sounds, a sonorous Archipelago* and *The Infra-World* have been published in English by Urbanomic). His last work to date *Après la mort*, has been published in 2017 by éditions de l'Eclat. He's also editor of the SPECTRES book series (Shelter Press) and the Recollection GRM record series (Editions Mego) and produces radio show for national radio France Musique. His music has been played in renowned venues and festivals all over the world.

Juhani Pallasmaa (b. 1936), architect, designer, writer, professor emeritus. Practiced design in collaboration with other architects since 1962 and in 1983-2012 through his office in Helsinki. He has held positions, as Rector of the Institute of Industrial Design, Director of the Museum of Finnish Architecture, Professor and Dean of the School of Architecture, Helsinki University of Technology, and several visiting professorships in the USA. He has taught and lectured in numerous universities in Europe, North and South America, Africa, Asia and Australia. Member of the Pritzker Architecture Prize Jury 2008-2014.

He has published 60 books and over 400 essays, articles and prefaces, and his writings have been translated into 35 languages. His widely known books include: *The Embodied Image, The Thinking Hand, The Architecture of Image: existential space in cinema,* and *The Eyes of the Skin*.

He is Honorary member of SAFA, AIA and RIBA, Academician of the International Academy of Architecture, and has received numerous Finnish and international awards and five Honorary Doctorates.

Michael McGarry was born Dublin, educated at the School of Architecture UCD Dublin and UVa Virginia, worked in London for the Richard Rogers Partnership, and then in Germany and West Berlin as both architect and urban designer for Josef Paul Kleihues and International Building Exhibition Berlin. In practice in Ireland with Siobhán Ní Éanaigh as McGarry Ní Éanaigh Architects since 1984, he is a Fellow of the RIAI, a founder member Group 91 Architects, RTPI Gold Medal winner, RIAI Silver Medal for Housing winner, RIAI Annual Awards winner, AAI Annual Awards winner, CCCB European Prize for Urban Public Space winner, and the 2017 Union of International Architects Medal Winner for Inclusive Spaces. Published and exhibited internationally. Adjunct Professor of Architecture at RMIT Melbourne 2014/18. Professor of Architecture at Queen's University Belfast involved in design teaching and design practice research since 2009. External examiner and reviewer in various schools of architecture in the UK, Ireland, Australia, Belgium, Netherlands, and Japan.

Georges Teyssot is Professor at Laval University's School of Architecture, Quebec City (QC, CA). He was the curator with Diller + Scofidio of an exhibition on *The American Lawn* at the CCA in 1998. He is the author of many books, including *Die Krankheit des Domizils* (1989), *The History of Garden Design* (1991, 2000), and *The American Lawn* (1999). More recently, he has published a volume entitled *A Topology of Everyday Constellations*, in the "Writing Architecture Series", (Cambridge, MA: The MIT Press, 2013), of which he has edited the French version: *Une topologie du quotidien*, (Lausanne, CH: PPUR, Presses polytechniques et universitaires romandes, 2016).

Nader Tehrani is the Dean of the Irwin S. Chanin School of Architecture at the Cooper Union in New York. Tehrani is also Principal of NADAAA, a practice dedicated to the advancement of design innovation, interdisciplinary collaboration, and an intensive dialogue with the construction industry. He was previously a professor of architecture at MIT, where he served as Head of the Department from 2010-2014.

Tehrani's work has been recognized with notable awards, including the Cooper Hewitt National Design Award in Architecture, the United States Artists Fellowship in Architecture and Design, and the American Academy of Arts and Letters Award in Architecture. He has also received the Harleston Parker Award for the Northeastern University Multi-faith Spiritual Center and the Hobson Award for the Georgia Institute of Technology Hinman Research Building. Throughout his career, Tehrani has received eighteen Progressive Architecture Awards as well as numerous AIA, BSA and ID awards. He served as the Frank O. Gehry International Visiting Chair in Architectural Design at the University of Toronto and the inaugural Paul Helmle Fellow at California State Polytechnic University, Pomona. He also recently served as the William A. Bernoudy Architect in Residence at the American Academy in Rome. Over the past seven years, NADAAA has consistently ranked as a top design firm in Architect Magazine's Top 50 U.S. Firms List, ranking as First three of those years.

Paulo Barbaresi is a PhD candidate at the Faculty of Architecture, University of Ljubljana, Slovenia. He has a degree in architecture from the FAUDI, National University of Córdoba, Argentina and ETSAM, Madrid, Spain. He is a practicing architect since 2006. He is a qualified

architect at CAPC, Argentina and at ZAPS, Slovenia. He worked for Chapman Taylor Spain, Richards Partington Architects UK and Atelier Arhitekti, Slovenia and has collaborated with MetroStudio UK, Trije Arhitekti, Slovenia and Marcello Rodriguez Pons & Partners, Argentina. He runs his own practice since 2011. His work is emboldened by parallel research for the Secrtary of Science and Technology SECyT, National University of Cordoba, Argentina. As a continuum of his academic degree concerning *Light and Hybrid Cultures* (2005-2006), his is current body of research—which defines his PhD thesis—explores the *Generative role of Light in design processes.*

Marco Tirelli was born in 1956 in Rome, where he actually lives and works. He begins to exhibit already in the second half of the Seventies. His first participation at the Biennale di Venezia is in 1982, in the section Aperto 82 with a personal room. The collective exhibitions in Italy and abroad are numerous in the Eighties, among others: the PAC in Milan and the XI Quadrennial in Rome in 1986; *Dal ritorno all'ordine al richiamo alla pittura 1920-1987*, a traveling exhibition hosted by the Kunsternes Hus in Oslo, the Anteniim Taideemusee in Helsinki, the Matildenhöhe in Darmstadt and finally the Kunsthalle in Bielefeld in 1987; at the GAM Bologna in 1988; *Diptych, Aspects of Abstract and Figurative Art in Italy*, traveling exhibition between the Modern Art Gallery of Istanbul, the Museum of Contemporary Art in Ankara and the Museum of Modern Art in Tel Aviv in 1989. The Nineties open with the exhibition at the American Academy in Rome, which puts into dialogue a series of his drawings with some *Wall Drawings* by Sol LeWitt, followed by the participation in the XLIV Biennale di Venezia with a personal room. Among the art exhibitions of this decade, noteworthy it's the Sidney Biennial of 1990, the San Paolo Biennial of 1991, Prospect '93 at the Kunsthalle in Frankfurt in 1993, the XII Rome Quadrennial of 1996. In 2001 he presented a site specific installation at the Fondazione Volume! in Rome, in which he engages painting in an environmental dimension. In 2002 the Institut Mathildenhöhe in Darmstad dedicates an important anthological exhibition entitled *Das Universum der Geometrie*, showed the following year at the Modern Art Gallery (GAM) in Bologna. In 2004 he exhibited in a collective show at the National Gallery of Modern Art in Rome, in 2005 at MART in Rovereto and in 2006 in the group exhibition San Lorenzo in Villa Medici, home of the French Academy in Rome. Among the most recent exhibitions: Excelle. Around the silence, Gori Collection - Fattoria di Celle, Santomato (PT), 2009; Marco Tirelli, Museum of Palazzo Fortuny, Venice (2010); Marco Tirelli, MACRO, Rome (2012); a personal room in the exhibition *Vice Versa*, Italian Pavilion, LV International Art Exhibition of the Biennale di Venezia (2013); *Soltanto un quadro al massimo*, the German Academy of Villa Massimo, Rome, together with Bernd and Hilla Becher (2013); Marco Tirelli, Istituto Nazionale per la Grafica in Rome (2013); *Osservatorio*, Fondazione Pescheria - Centro Arti Visive, Pesaro (2014); *Proportio*, Palazzo Fortuny, Venice (2015). Between 2016 and 2017 he exhibited at the Fondazione Cerere in Rome, in France at the Musée d'art moderne et contemporain of Saint-Etienne Métropole and again in Italy in the Sala delle Pietre of the Palazzi Comunali of Todi. In 2018 it is often abroad, with solo exhibitions in

Switzerland, Hong Kong and Antwerp. He realized the work Proteo, commissioned by the MAXXI Museum of Rome and exhibited in its collection since 2019.

His works are part of the collections of some of the most important international museums among the others MAXXI Museo Nazionale delle arti del XXI secolo – Rome; La Galleria Nazionale – Rome; MACRO Museo d'Arte Contemporanea – Rome; Ministry of Foreign Affairs and International Cooperation. Farnesina Art Collection, Rome; European Parliament, Art Collection – Bruxelles; MART, Museo di arte moderna e contemporanea di Trento e Rovereto – Rovereto; Il Centro per l'Arte Contemporanea Luigi Pecci – Prato; Palazzo Fortuny – Venice; the Albertina Museum – Wien; Mumok, Museum Moderner Kunst Stiftung Ludwig - Wien; Kahosiung Museum of Fine Arts – Taiwan.

Marina Lathouri is the director of the Graduate Programme in History and Critical Thinking at the Architectural Association in London and visiting lecturer at the University of Cambridge. She has previously taught at the University of Pennsylvania and has been Visiting Professor at the Universidad de Navarra, Spain and the Universidad Catolica in Santiago, Chile. She studied architecture, philosophy of art and aesthetics. Her research, writings and teaching lie in the conjunction of history and politics of historiography, architecture and writing practices, the city and political philosophy. She co-authored *Intimate Metropolis: Urban Subjects in the Modern City* (Routledge 2008), directed the AA research project *City Cultures: Contemporary Positions on the City* (AA Publications 2010) and published numerous articles. In her teachings and writings, she aligns histories of the architectural and urban project with contemporary arguments as well as textual, visual and design practices.

Levent Kara is an Associate Professor at the University of South Florida and teaches design studios and theory courses. He is a registered architect in Turkey and has many awards for his design projects from the American Institute of Architects. Supporting his architectural practice and teaching, Kara's theoretical research concentrates on the epistemology of design thinking, from the fundamental modalities of architectural design in terms of the relation between thinking and making, to the more contemporary discussions on the conceptual and practical aspects of design processes. Kara's writings range from formal philosophical subjects in epistemology, aesthetics, and culture theory, to architectural design, theory and criticism, and architectural pedagogy.

Colleen Chiu-Shee is a Ph.D. candidate in the Department of Urban Studies and Planning at MIT. She has a professional background in architecture and urban design and has received scholarly training in architectural history and theory as well as social sciences. Her work and life experiences in Asia, North America, and Europe have inspired her curiosity about various people, places, cultures, political regimes, and their interactions. Colleen's expertise lies at the intersection of four interlocking fields of study—city design and development, urban governance, environmental studies and global studies. Building on the discourses in the four fields, she explores innovative interventions in the built environment and in societal systems that transcend preexisting paradigms to address human and environmental problems and that stimulate social progress on a transnational scale. She is appointed as the International Expert by CCICED (China Council for International Cooperation on Environment and Development) to support the "Green Urbanization" task force, initiative

by the Development Research Center of China's State Council. At DUSP, she co-instructs design studios and graduate courses on city design and development. She also co-organizes Urban China Workshop, sponsored by MIT China Future City Lab to enable research dialogues on China's urban issues.

Tod Williams and Billie Tsien have been working together since 1977 and founded their New York architecture practice in 1986. Their studio focuses on work for institutions such as schools, museums, and not-for-profits. Their buildings are carefully made from the inside out in ways that speak to both efficiency and the spirit. A sense of rootedness, light, texture, detail, and most of all, experience, are at the heart of what they design.

Over the past three decades, their dedication to this work has been recognized by numerous national and international citations including the National Medal of the Arts from President Obama and the Firm of the Year Award from the American Institute of Architects.

In parallel with their practice, Tod and Billie are devoted participants in the broader cultural community with longstanding associations with many arts organizations. They both maintain active academic careers and lecture worldwide. As educators and practitioners, they are deeply committed to creating a better world through architecture.

Izdala

Publisher
Univerza v Ljubljani, Fakulteta za arhitekturo
/ University of Ljubljana, Faculty of Architecture

Zoisova cesta 12, SI-1000 Ljubljana

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Graphic Design
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Layout
Ana Klofutar

Tisk

Printed by
Formatisk d.o.o.

Črkovna vrsta

Fonts
Minion Pro, Acumin pro

Prevodi v slovenščino

Slovene Translations
Boris Troha

Prevodi iz francoščine

Translations from French
Amidas d.o.o.

Podoba na naslovnici

Cover Art
Marco Tirelli

Tehnični urednik

Technical Editor
dr. Špela Verovšek

Naklada

Copies
500

Cena

Price
25 EUR

Arhitektura, raziskave 2019
/ **Architecture Research**

Univerza *v Ljubljani*
Fakulteta *za arhitekturo*

ISSN 1580-5573 **print**
ISSN 1581-6974 **www**