

A PLEA FOR THE MODULOR
Skender Lurasi, Ph.D. Candidate, YSoA

What is the point of looking back at Le Corbusier's Modulor in this digital day and age? Let me start with what appears as an antithesis. In *Le Modulor* Le Corbusier proposes a universal apparatus that provides what today we would call *topological continuity*:

My dream is to set up, on the building sites which will spring up all over our country one day, a "grid of proportions", drawn on the wall or made of strip iron, which will serve as a rule for the whole project, a *norm offering an endless series of different combinations and proportions*; the mason, the carpenter, the joiner will consult it whenever they have to choose the measures for their work; and all the things they make, different and varied as they are, will be united in *harmony*. That is my dream (my italics).¹

"Only ten days or so after distributing Modulor tape measures to his assistants, Le Corbusier forbade their use."² It is also well known that in at least one occasion Le Corbusier stated:

Le Modulor, je m'en fiche (I don't give a damn about the Modulor).³

What appears as an antithesis, ambivalence, or opposition between two terms, is a highly reticulated field of *different stylistic* procedures and operations, technical objects and instruments or as I call them, *model-spaces*. The two parts of the antithesis—the Modulor and anti-Modulor, the geometrical and non-geometrical—are two different modalities, whose very existence as [their] *difference* is a function of technics and their relative speed. This difference is a function of the time it takes for the different model-spaces to take place, operate, and reticulate with one another. The slower the speed, more distinct, distant, and opposed these modalities appear in relation to one another; and conversely, the higher the speed, less distinct, distant and opposed they appear. I use the term *speed* (and *time*) in the literal sense of the time required to perform a certain task or series of tasks, as well as [and especially] in the sense of the degree according to which these different model-spaces are historically *more or less* unified and universalized through technology. Do traces of such ambivalence and what this ambivalence is an

effect of, that is, the reticulation of different model-spaces, still exist in contemporary architecture and architect's relationship to his instruments and technics? *Can and should* such ambivalence exist, today? If yes, *what form* should it take given today's historically unprecedented advances in computational speed?

Every universal needs a body, some body. In order to be constructed and transmitted from one subject to another subject, from one subject to an object, or from an object to another object, this universal, whether a golden section geometry or advanced algorithm, needs some kind of technics: pencil and paper, software and hardware, a geometrical, natural, or artificial language, some kind of memory machine that operates through letters, graphics, glyphs, traces or digital circuits. This process of encounter is conditioned by *technical finitude*; it happens with a certain amount of speed (however fast it may be) and it takes a certain amount of time and delay (however short it may be). This delay opens up the possibility of what Bernard Stiegler calls *individuation*, which is a process in and during which the universal [message] is *stylized and idiomatized*.⁴ Finding this delay is itself a stylistic process. *Style-as-individuation is [the] incalculable*.

Le Corbusier's Modulor is such an attempt at individuation. What ideologically, symbolically and technically stands for anthropometric proportions, golden section and neo-Pythagorean geometry undergoes stylization. This style-as-individuation is achieved through a reticulation of *different model-spaces*: grids of proportions, geometrical patterns, *objets ambigus* such as shell forms and industrial objects, sketches and drawings, photographs and paintings, visualization and calculation methods, tabulated values, historical examples and precedents, texts such as personal accounts and correspondences (in the form of what we today would call personal relations and social media), and concrete architectural examples, both modular-like looking buildings like the *Habitation de Marseille* and curvy-looking buildings like Ronchamp, the latter being a quintessential example of *non-modularity*. *These different model spaces perform as incomputable limits of one another*.

Is style still possible today, in the context of an ever increasing computational speed, that is, in a context where the *reader* and the *writer* tend to be unified, integrated, and universalized? The question is timely precisely today, when, because of the rapidly growing yet *deceptively* unlimited computational speed, the

monstrous and frightening dream of a universal and "hegemonic style"⁵—or what comes to the same thing, a universal computational and symbolic apparatus *without any lack*—might appear to come true.

Yet, there is no such thing as a universal and hegemonic epochal style. Style cannot quite become hegemonic. While style always emerges from an epochal already—there, say, a *large Style*, it is irreducible to that epochal already—there. Style-as-individuation is radically resistant to both hegemony and "apodicticity. It can never be apo-dictized. Like all idiom style is untranslatable."⁶ However well optimized and unified the relationship between *writer and reader* might be, the prehensive encounters between the two are open to singularity and individuation.

1. Le Corbusier, *The Modulor: A Harmonious Measure to the Human Scale Universally applicable to Architecture and Mechanics*, trans. Peter de Francia and Anna Bostock, (Cambridge: The MIT Press, 1968), 36-37.
2. Robin Evans, *The Projective Cast: The Architecture and its Three Geometries*, (Cambridge: MIT Press, 1995), 273.
3. This is what Rudolf Wittkower reports in the R.I.B.A. debate of 18 June, 1957. See: 'Report of a debate on the Motion 'that Systems of Proportion Make Good Design Easier and Bad Design More Difficult,' Held at the R.I.B.A., 18 June, 1957,' RIBA Journal 64, no. 11 (September 1957): 462.
4. The concept of individuation is an essential concept in Bernard Stiegler's three Volumes of *Technics and Time*.
5. Patrick Schumacher, "Advancing Social Functionality Via Agent-Based Parametric Semiology," *Architectural Design*, John Wiley & Sons, 2016, 109.
6. Bernard Stiegler, *Technics and Time 2*, Trans. Stephen Barker, (Stanford: Stanford University Press, 2009), 85.

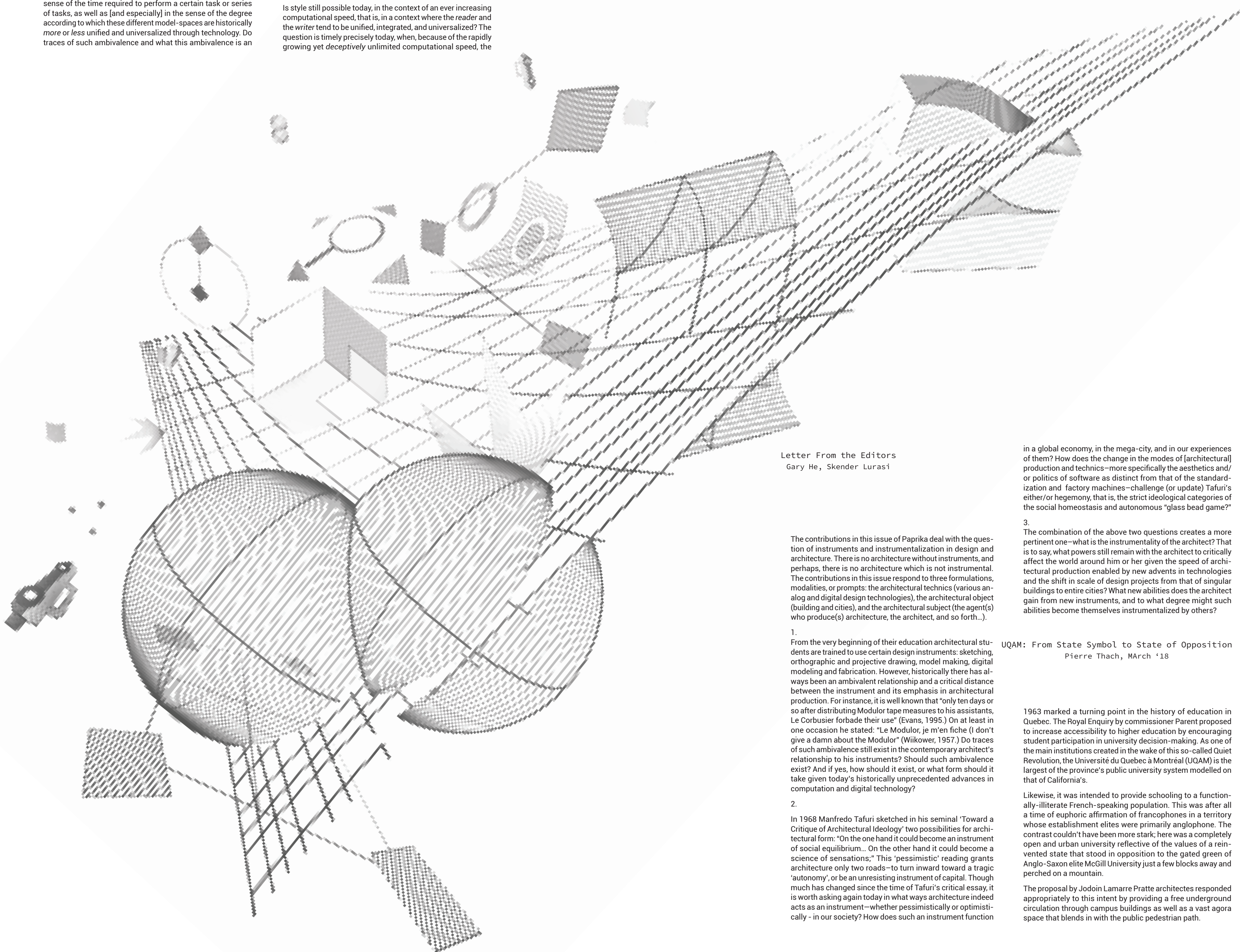
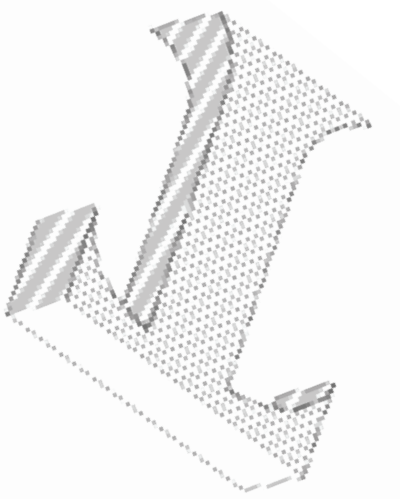
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Letter From the Editors
Gary He, Skender Lurasi

The contributions in this issue of Paprika deal with the question of instruments and instrumentalization in design and architecture. There is no architecture without instruments, and perhaps, there is no architecture which is not instrumental. The contributions in this issue respond to three formulations, modalities, or prompts: the architectural technics (various analog and digital design technologies), the architectural object (building and cities), and the architectural subject (the agent(s) who produce(s) architecture, the architect, and so forth...).

1. From the very beginning of their education architectural students are trained to use certain design instruments: sketching, orthographic and projective drawing, model making, digital modeling and fabrication. However, historically there has always been an ambivalent relationship and a critical distance between the instrument and its emphasis in architectural production. For instance, it is well known that "only ten days or so after distributing Modulor tape measures to his assistants, Le Corbusier forbade their use" (Evans, 1995). On at least in one occasion he stated: "Le Modulor, je m'en fiche (I don't give a damn about the Modulor" (Wilkower, 1957.) Do traces of such ambivalence still exist in the contemporary architect's relationship to his instruments? Should such ambivalence exist? And if yes, how should it exist, or what form should it take given today's historically unprecedented advances in computation and digital technology?
- 2.

In 1968 Manfredo Tafuri sketched in his seminal 'Toward a Critique of Architectural Ideology' two possibilities for architectural form: "On the one hand it could become an instrument of social equilibrium... On the other hand it could become a science of sensations;" This 'pessimistic' reading grants architecture only two roads—to turn inward toward a tragic 'autonomy', or be an unresisting instrument of capital. Though much has changed since the time of Tafuri's critical essay, it is worth asking again today in what ways architecture indeed acts as an instrument—whether pessimistically or optimistically - in our society? How does such an instrument function

in a global economy, in the mega-city, and in our experiences of them? How does the change in the modes of [architectural] production and technics—more specifically the aesthetics and/or politics of software as distinct from that of the standardization and factory machines—challenge (or update) Tafuri's either/or hegemony, that is, the strict ideological categories of the social homeostasis and autonomous "glass bead game?"

3. The combination of the above two questions creates a more pertinent one—what is the instrumentality of the architect? That is to say, what powers still remain with the architect to critically affect the world around him or her given the speed of architectural production enabled by new adventures in technologies and the shift in scale of design projects from that of singular buildings to entire cities? What new abilities does the architect gain from new instruments, and to what degree might such abilities become themselves instrumentalized by others?

UQAM: From State Symbol to State of Opposition
Pierre Thach, MARCH '18

1963 marked a turning point in the history of education in Quebec. The Royal Enquiry by commissioner Parent proposed to increase accessibility to higher education by encouraging student participation in university decision-making. As one of the main institutions created in the wake of this so-called Quiet Revolution, the Université du Québec à Montréal (UQAM) is the largest of the province's public university system modelled on that of California's.

Likewise, it was intended to provide schooling to a functionally-illiterate French-speaking population. This was after all a time of euphoric affirmation of francophones in a territory whose establishment elites were primarily anglophone. The contrast couldn't have been more stark; here was a completely open and urban university reflective of the values of a reinvented state that stood in opposition to the gated green of Anglo-Saxon elite McGill University just a few blocks away and perched on a mountain.

The proposal by Jodoin Lamarre Pratte architectes responded appropriately to this intent by providing a free underground circulation through campus buildings as well as a vast agora space that blends in with the public pedestrian path.

At least, this was the plan on paper. But the story behind the creation of UQAM is not as straightforward as one may be led to believe. In fact, adoption of its founding charter was sped through the National Assembly as student protests of 68' intensified. The Quebec Liberal Party (QLP), which formed the majority in parliament, knowingly sought in the forthcoming establishment a quick fix to quell growing student dissatisfaction with the pace of language reforms in the province.¹

For a time, it was a politically-rewarding maneuver to prop up waning support for the government. But for all intents and purposes, the plan backfired. The university would become a fiery hotbed for student activism in opposition to the state in the decades to come. Of course, all kinds of other factors play into this change in paradigm, but the urban setting of the campus might offer somewhat of an explanation as well.

For anyone strolling through the arts district where UQAM is located, identifying its buildings would be no easy matter. And while this is welcomed by partisans of urban integration, blending can be just as synonymous with concealment. Such hyper-intensification of the freedom to discredit creates a seemingly innocent anonymity; the possibility of appearing and disappearing at the same time or to quote military language, to hit and run.

This anonymity would be brilliantly exploited by students during the province-wide protests in 2012 against tuition fee hikes. In many ways, its labyrinthine layout and underground pathways are a microcosm of the city's numerous small alleys and metro stations, which youth activists used to enter or exit protest sites swiftly and effectively. On the opposite end of the spectrum, the very image of the campus was cunningly instrumentalized by the government as a public relations tool to discredit students, by equating the unassuming nature of the design to the naivety and incoherence of students.

Although the Quebec Liberal Party government backtracked on its plan to increase tuition fees, the protest movement's victory couldn't have been more bittersweet. The QLP would eventually be defeated by a small margin in elections, but quickly bounced back in 2014. Additionally, the severity of student strikes polarized the debate and permanently scarred the university. UQAM, as a site of instrumentality, would see its reputation suffer in subsequent years, never to fully recover.

1. La Naissance de L'UQAM: Témoignages, Acteurs et Contextes. Denis Bertrand, Robert Comeau, Pierre-Yves Paradis. PUQ, Jan 1, 2009 - Education, Higher - 193 pages

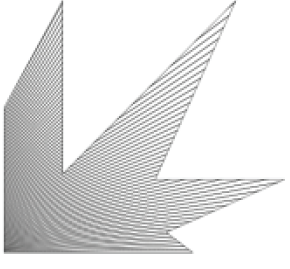
“Other” Activism
Jacqueline Hall, March & MEM '18

A brief moment of discomfort struck me during the panel discussion, “The Aesthetics of the Other: Alienation, Estrangement, and Unfamiliarity,” at the “Aesthetic Activism” symposium. Three artists, Gregory Creadson, Caroline Picard, and Pamela Rosenkranz spoke about their work. It felt strange to be sitting in Hastings Hall, listening to lecturers invoke questions of identity and divulge deeply personal stories as the origins or content of their work. The architects who typically speak in Hastings usually only use personal anecdotes insofar as they contribute to their disciplinary identity or mystique. Perhaps this is because architects have a sense of responsibility to resist subjectivity in their work so that potential users of their buildings, the subjects, can be succinctly categorized or generalized to fit into the logic of a project. Maybe it’s a defense mechanism against the unknowable to generalize social relations rather than seeking ideas in the messy, complicated, and contradictory specificity of people.

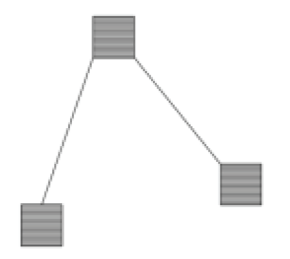
However, many architects are fascinated with the potentials of messy, complicated, and contradictory specificity in the process and morphology of design itself. I am reminded of Mary McLeod’s critique of architects’ co-optation of Foucault’s lecture on “heterotopias.” She critiques the abstract and homogenous interpretation of the architectural “others” that architects look to create within the bounds of the existing architectural institution. McLeod is deeply critical of this attitude which she believes to be politicized without social content or clarity of purpose. For Foucault’s part, he does not explicitly invoke architecture. Cultural constructions and social relations are more important in the logic of heterotopia. McLeod writes of the very formal architectural reinterpretation of this idea, that the “spoken and unspoken assumption is that ‘different’ is good, that ‘otherness’ is automatically an improvement on the status quo.” But, she asks, “to what extent is this preoccupation with ‘otherness’ a product of critics’ and practitioners’ own identity and status? Does it elucidate or support groups considered socially marginal or ‘other’? Are there positions in architecture outside these two tendencies that address concerns of ‘otherness’ relevant to ‘ordinary’ people—those for whom the avant-garde has little significance?”

In Foucault’s lecture, the presence of a subject who interprets the existence and meaning of the heterotopia is invoked with clear biases and assumptions. If we consider that these “other” spaces are indelibly marked, even formed by society and culture, who, exactly, are the subjects which determine or interpret the “otherness” of design and further, how do (or don’t) designers engage with the subjects who use their spaces or with their own subjectivity? Perhaps it is worth understanding what makes certain activities or identities socially “other” before designing for some unknown, and generalizing “other” and leaving the interpretation of those spaces to chance, or simply crossing our fingers that they will give way to alternative social politics.

Maybe a deeper interest in identity and subjectivity could help us analyze spaces that cause people to feel “othered” so as to de-stigmatize or make visible social conditions which are marginalized or not recognized and granted space. Perhaps a theory of an architectural “other” could be more akin to Lefebvre’s concept of “differential space” which accommodates difference rather than homogenizing relationships.



“Current Location”*
Nicholas de Monchaux **



Let’s consider two things.

The first: over the next forty years, we will build as much urban fabric as was built in all the previous ten thousand years of human history combined.¹ The second: every two days—and at a rapidly accelerating rate—we now collect and store more information than the total amount of information captured between the start of recorded history and the last decade. This information is increasingly spatial, and, more than ever, urban in its origins and character.²

But data is not knowledge. This enormous increase in urban fabric, and in information about it, is inseparable from an equally radical increase in uncertainty surrounding our cities’ future, which emerges primarily from the inherent unpredictability surrounding the inevitable effects of man-made climate change. As is already becoming apparent, the coming century will bring cycles of flood and drought, urban damage and civic recovery, that will drive dramatic mass population changes—with arriving refugees and departing exiles—as seen in no century before.

The ability of cities to survive and thrive in the face of this kind of predictable uncertainty has been widely termed *resilience*.³ Yet this word—from the Latin *resiliens*, describing a mechanical spring’s return to form—carries little clue about how such a quality can be achieved. So for all its currency, resilience also implies—through its spring-sprung origin—the impossible. That is, it indicates a near-perfect reprise of a previous state of being and (perhaps worse) a singular and linear means of attempting it.

For what we are beginning to know about how cities actually work tells us that they are not very much like springs. Instead, they resemble, well, us—the complex organisms that collect in and constitute them. Like us, cities are adaptive, self-sustaining systems with interconnected metabolisms. When in good health, they can recover from astonishing injuries. But cities can also—under other circumstances—prove remarkably fragile. And, unlike the lacework of human physiology, the webs of urban metabolisms are only partly physical. They are, most of all, economic and social, and so synthesized out of that most immaterial of substances, information. In this light especially, it is impossible to truly imagine physical resilience without social, cultural, and economic resilience as well.

Local Code is an attempt to address the question of how information, cities, and resilience can be considered together, and how many different kinds of resilience—all interconnected and each one essential—can be imagined and created in concert. In particular, it proposes an information-inspired, physical resilience that is designed, above all, to support its social, cultural, and economic counterparts. The tools for this proposal are the media of architecture and the city—some old, some new, and some crafted specifically in the course of the work. From the Latin “middle element” or *lens*, *media* has come to mean, handily, both tools and ways of seeing with them; the work here attempts to be both.

The drawings of *Local Code* speculate about possible futures for 3,659 abandoned and underutilized sites in three large, representative American cities: San Francisco, Los Angeles, and New York. And one small, special European one: Venice. The focus on these spaces arises from a unique yet confluent characteristic of these sites. The same spaces generally abandoned and avoided by normal urban mechanisms of occupation, exploitation, and use turn out to have several very essential qualities in common: from an ecological perspective, they tend to accumulate in parts of the city—downhill, downstream, down-at-heel—where ecological interventions are most transformative, and best buffer the city against physical threats, from floods to heat waves. From a social and economic perspective, such sites are positioned precisely in those communities traditionally denied access to parks and public space. And their remediation is, as a result, also likely to have a remarkable, and predictable, benefit to public health and social well-being.

Before the availability of digital mapping tools, finding and imagining futures for such sites was an exercise in herculean bookkeeping and singular imagination. Before widespread digital information about cities made analysis of their complex qualities possible, speculation on the complex, adaptive qualities of opportunistic urban networks took another, special kind of foresight. Inspired by such visions, this project is indebted to a second kind of media: that of previous ideas, speculation, and experiment.

As the last decades of evolutionary biology have taught us, adaptation and change does not take place through anything resembling optimization. Rather, they take place along what the biologist Stuart Kaufmann was the first to describe as a “landscape of adjacent possibility.” And if *Local Code* is an attempt to trace such a landscape in the fabric of abandoned space in the city, it is also an attempt, through a parallel project in the archive and in argument, to trace a similar, related set of transformations in the landscape of ideas that surround this work. For ideas, too, are adapted and transformed things. We forget this as often as we forget that every seemingly new piece of architecture is a re-making—of site, of material, of event—as well.

Local Code, and all its embedded and implicated propositions, draws from established, and important, precedents in neighborhood greening at the local scale—such as in Baltimore, Chicago, and Los Angeles—and is deeply indebted to them as well as to the landscape of ideas outlined above.⁴ These efforts have so far been justified on substantially social and political grounds; but a much more substantial argument is proposed here, which is that it is only through understanding and engaging the existing nature of our cities as complex, networked artifacts that we can design for, and imagine, a robust and resilient future for them. Such a future is considered here, socially, economically, ecologically, and, as an inevitable corollary, spatially, materially, and formally—built into and out of the city itself.

* Adapted from the Introduction to *Local Code: 3,659 Proposals about Data, Design, and the Nature of Cities*. (Princeton Architectural Press, 2016).

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1. United Nations, Department of Economic and Social Affairs, Population Division, *World Urbanization Prospects: The 2014 Revision, Highlights (57/ESA/SER/A/352)*. (New York: United Nations, 2014).

2. Martin Hilbert and Priscila López, “How to Measure the World’s Technological Capacity to Communicate, Store, and Compute Information,” *International Journal of Communication & Media Research* 6 (2012): 966–79.

3. See for example, “Resilience,” The Rockefeller Foundation, accessed May 25, 2015, <http://www.rockefellerfoundation.org/our-work/current-work/resilience>. Permalink at <https://web.archive.org/web/20150407031111/http://www.rockefellerfoundation.org/our-work/current-work/resilience>.

4. See Stuart Kaufmann, *At Home in the Universe: The Search for Laws of Self-Organization and Complexity*. (New York: Oxford University Press, 1995).

5. See Haan-Fawn Chau, *Green Infrastructure for Los Angeles: Addressing Urban Runoff and Water Supply through Low Impact Development*. (Los Angeles: City of Los Angeles Department of City Planning and UCLA Department of Urban Planning, 2007). 6. Gregory McPherson, David J. Nowak, and Rowan A. Rowntree, *Chicago’s Urban Forest Ecosystem: Results of the Chicago Urban Forest Climate Project*, General Technical Report NE-186. (Radnor, PA: U.S. Department of Agriculture, Forest Service, Northeastern Forest Experiment Station, 1994); and Gary Moll, *Urban Ecosystem Analysis for the Washington DC Metropolitan Area*. (Washington, D.C.: American Forests, 2002). http://www.americanforests.org/downloads/rea/AF_washingtonDC.pdf.

Instrument/ality: Instrumentality
Peggy Deamer

It seems clear to me, and I believe to the editors of this Paprika, that the “Advantages” or “Disadvantages” of instrumentality in architecture depend, first and foremost, on whether you are indeed speaking about instruments aiding architectural production (parallel rule, software, conventions of representation, contracts, etc.) or architecture as an instrument of capitalism (instrumentality). The first set is something we inherit and possibly take advantage of; the second aims to take advantage of us. One can say categorically, that the first is not a “disadvantage”—it’s just a fact—and the other is—it’s effects are repressive. I want to defend this blunt assessment but only after recognizing that these distinctions and qualifiers (instrument = not a disadvantage; instrumentality = disadvantage) are not so simple and not god-given.

BIM, for example, a supposed (mere) instrument, can be understood as a product serving not our work or creativity but the huge software corporations which demand our participation. Architects also pay for the software that, organizing more proficient procurement, financially only benefits the owner. BIM’s library can confine architecture to an institutional status quo.

Likewise, the “sharing” technologies are often instruments that, under the guise of self-empowerment, allow IT start-ups to cash in on our production of their information. They seduce us, often, into the supposed ideals of the gig economy and the precarity to which it condemns us. Intellectual property laws that are implicated in the sharing economy serve, in the end, lawyers and financiers.

Likewise, the “sharing” technologies are often instruments that, under the guise of self-empowerment, allow IT start-ups to cash in on our production of their information. They seduce us, often, into the supposed ideals of the gig economy and the precarity to which it condemns us. Intellectual property laws that are implicated in the sharing economy serve, in the end, lawyers and financiers.

Yes, the tools of architecture always confine the discipline. Perspectives condemn us to a hegemonic, anthropocentric, subjective points of view; axonometrics condemn us to a false, Euclidean and Platonic objectification; software demands that designs conform to certain scripted parameters. But these known constraints are neither harmful nor avoidable, and if we eventually rebel against a hegemonic tool, it does not

make it bad. All forms of knowledge, like language itself, are nothing other than the structure (regimented by tools) making visible conditions otherwise unimpressable. Assuming an instrument-free world depends on a belief in an ideal world that is not defined by them and there IS no such ideal world.

Capitalism, guiding architectural instrumentality, also yearns to sweep everything into its machinery, and like tools, appears to be inevitable. But this “inevitability” depends on our naïveté and the “disadvantage” rests on our willful ignorance of our instrumental role. Despite Tafuri’s incisive portrayal of how we architects dupe ourselves into believing we have a positive effect on society, we need not believe his teleology. If one gives up on the idea of the revolution—the other side of which was Tafuri’s sine qua non—then one thinks differently about our architectural agency. If making capitalism uncomfortable, or, as Keller Easterling suggests, complicit in its own illogic, we thwart instrumentality wherever it appears. The disadvantage is only the effort it takes to look beyond status quo of architectural acts.

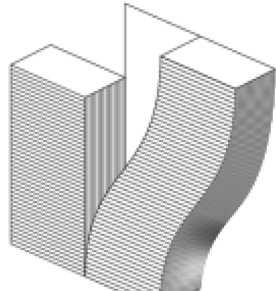
Architects DO have choices: the projects we agree to work on, the firms we are willing to work for, the programs we might question, the institutions we participate in, the colleagues we surround ourselves with, the expertise we seek out, the structures our work supports, the labor practices we participate in. Architecture is not a transcendent entity: it is made up of architects who can combat the disadvantages of our biopolitics.

Because we are now on the other side of the election and we have a deeply pro-development, anti-labor, and anti-intellectual president, architects need to, more than ever, analyze how our choices support an economy that we do not admire or a profession, in the form of the AIA, willing to side, along with our president-elect, against democratic citizenship or basic human rights.

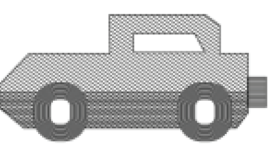
Rethinking the Synthesis of Form
as an Objectively Subjective Design Process
Christopher Leung, March '17

The design problems that architects face are never easy. They are interconnected, fast-paced and often far too complex for the individual designer’s mental capacity. Given these realities, the architect often resorts to either an oversimplification of the problem or an over-reliance on design intuition. The architecture becomes arbitrary, and the design problem remains inadequately resolved. With the development of digital architectural practice, it is pertinent for us to rethink the design process in order to manage design complexities and create meaningful architectural form.

Christopher Alexander’s binary system is an analytical tool that helps abstract the context and information within complex design problems. By eliminating “mismatches” between context and form, the architect can quantify variables and magnify their ability to make informed design decisions (Alexander 11). Complex design problems are broken down into smaller problems that can be more easily analyzed. This abstraction of context is necessary to generate a *right* design program that can be synthesized—through a progressive network of diagrams—into architectural form (Alexander 84). The objective codification of the subjective design *impulse* enables architects to more fairly evaluate context and generate comprehensible solutions for the design problems at hand.



Alexander’s program is not a generative force behind specific variations of formal composition, however, and there remains a substantial separation between context and the resulting form—a distinction that suggests increased opportunity for human arbitrariness during the design process. Is Alexander’s constructive diagram itself a flawed conceptual simplification? Or is there a more effective translation between context and form that can be allowed through advanced computation?



One possible reason for Alexander’s disconnect is the technological shortcomings of the architectural instruments of that era. The development of parametric models represents an advancement that can eliminate such disassociation, providing the potential for a design process in which computation leads directly to form.

Patrik Schumacher’s *Autopoiesis of Architecture* is a contemporary example of providing a system that tackles the overlaps and differences in information to assist the design process. Schumacher analyzes architecture as an autopoietic cyclical organization that reproduces all its specific components out of its own life-process (Schumacher 17). Parametricism becomes the instrument that allows for a more integrated design process between form and contextual information.

With such reversibility and freedom offered by parametrics, the architectural possibilities offered by this system are twofold. The architect is given the choice to either use the system to extract information and generate better design solutions, or contrastingly, eliminate the meaningful evaluative processes all together. The risk lies in using autopoiesis to satisfy individual biases towards a predetermined image rather than using it to create a malleable system to question context with form. Parametric programs offer the architect additional capability to manipulate a diverse range of formal solutions. Without logical abstraction or evaluative measures, however, the misuse of this instrument can also lead to a rapid generation of arbitrary form.

The significance of both Alexander’s program and Schumacher’s autopoiesis thus lies on an *objectively subjective* design process that—along with the development of architectural instruments—can reduce uncertainty whilst allowing for a wide range of formal opportunities. The combination of *both* systems together increases the architect’s capacity to make informed design decisions, restoring the architect’s responsibility to rethink the design process, and acknowledge the complexities of context—to abstract and subsequently devise design solutions through the available instruments. The computational nature of the system compels the architect to consider the design problem in palpable terms, prevent personal bias and reduce arbitrariness from preceding the evaluative stages of the design process. The synthesis of meaningful form, however, still relies on the architect’s own *subjective* sensitivity towards a more *objective* grasp of the context.

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On Technology as Revealing of Truth
Martin Man, March '19

In his 1977 essay ‘The Question Concerning Technology’, German philosopher Martin Heidegger addresses modern technology and its essence as an instrumental way of revealing the world. That is to say, we conceive of modern technology as means to achieve ends. As instrumental, the essence of technology concerns causality.

Heidegger recalls that the Greeks had four conceptions of causality, or occasioning something, of bringing something forth. He associates modern technology with the *causa efficiens*, or efficient cause, and identifies that it has taken precedence over the other three causes, *causa materialis*, *causa formalis*, and *causa finalis*.

By bringing-forth Heidegger refers to what he calls ‘presencing’ [Anwesen]. ‘Bringing-forth brings himst out of concealment forth into unconcealment...This coming rests and moves freely within what we call revealing [das Entbergen]’. Heidegger tells us that the Greeks have the word *aletheia* for ‘revealing’, which is ‘truth’, or *veritas*, for the Romans. By these associations, he shows that the essence of technology is revealing, is bringing forth truth, not merely a means to an end—that is, not merely instrumental.

However, Heidegger also identifies that revealing in modern technology follows from ‘modern physics’, exact science, and its technical apparatuses. He explains: ‘The revealing that rules in modern technology is a challenging [Herausfordern], which puts to nature the unreasonable demand that it supply energy that can be extracted and stored as such’. This challenging approaches nature as something from which energy can be unlocked, so that more things can be done. This in turn leads to further transformation of the energy of nature, which is stored, and which is mobilised to further unlock. Heidegger identifies this cycle still as a way of revealing, but one that treats nature as a stock of resources to be drawn upon—as a ‘standing-reserve’.

To treat nature as a standing-reserve under the regime of modern technology, man must order it within a certain frame. This movement Heidegger terms ‘Ge-stell’, or, ‘enframing’. Importantly, by enframing nature as standing-reserve, man removes itself from nature: ‘Thus when man, investigating, observing, ensnares nature as an area of his own conceiving, he has already been claimed by a way of revealing that challenges him to approach nature as an object of research’. In objectifying nature as an object of research, science treats it as calculable, as order-able. Heidegger identifies technological revealing of the world as a projecting its own end before it begins to reveal. It investigates nature by calculating and experimenting according to the lines of ordering pre-established by nature’s enframing: ‘Hence physics...will never be able to renounce this one thing: that nature reports itself in some way or other that is identifiable through calculation and that it remains orderable as a system of information.’

Enframing, then, impedes other ways of revealing by consuming everything within its ordering, and presenting all as standing-reserve. Treating technology as an instrument prevents us from pressing past the essence of technology (enframing) and arriving at the truth that comes to presence through unconcealing. For Heidegger, the realm in which revealing can bring forth truth is in art, especially poetry. ‘Once there was a time when the bringing-forth of the true into the beautiful was called *techne*. And the *poiesis* of the fine arts also was called *techne*.’ The essence of technology is in the end not technological, and the realm in which we should confront its revealing is, ultimately, art.

1. Martin Heidegger, ‘The Question Concerning Technology’, in *The Question Concerning Technology and Other Essays*, (New York: Garland Publishing, 1977), 11.
2. Ibid., 14.
3. Ibid., 19.
4. Ibid., 23.
5. Ibid., 34.

Instruments, Efficacy, Value
Philp Bernstein

Rudolph Hall is chock-a-block with digital toys, and Yale has Rudolph Hall is chock-a-block with digital toys, and Yale has always been in some vanguard of the digital turn in architecture. Our graduates often emerge surprised that the real world of practice is far less electronically enthusiastic, the toy box considerably shrunken in the office and the jobsite. Yet even the recalcitrant building industry is now rapidly modernizing as ubiquitous, cloud-enabled tools finally bring computation to the challenges of design and construction. What’s coming will be much more about data, analytics and prediction than form-making and material shaping. Architects will need to stride atop new data-driven design process (that includes their collaborating designers and builders) to achieve desired ends whatever they may be. Will the means change those ends?

We’ve always appropriated, adapted and sometimes even created the instruments of architecture. Medieval masons included Euclid as one of their own, absorbing principles of geometry into those of design (or at least layout). Most digital tools today were built for other disciplines and purposes (making engineering drawings, managing geometry, creating game characters). Even though today’s BIM tools were built specifically for architects, the ambivalence of a designer using a BIM tool for the first time (“who the hell created this and have they even designed a building before?”) is a signal of a larger challenge of instrumentality: as our tools move from implements to algorithms the hand of the instrument-maker is ever more present. Software today is more than an implement, it’s an epistemological system with all the attendant mis-alignments of world view between UX designer, software developer and end-user. And as digital practice moves from the use of mass-produced tools (think Revit) to bespoke algorithms and data structures (say, Grasshopper in the limited realm of geometry) the hand of the designer herself will also appear in the instrumentality of her tools. I’ve often wondered if I could drive through an American city and identify less-distinguished buildings by the version of AutoCAD or Revit used to create them. A critical awareness of the unseen instrument maker is one important way architects can control, rather than be controlled by, the expanding array of digital tools.

In the construction economies where our graduates operate, architecture is an instrument of capital. Most of the biggest decisions about—or at minimum the critical constraints on—the design of a building project is largely made before a client hires the architect. Why a building needs to be is determined

far earlier than what it needs to be. But there’s an opportunity in emerging digital tools that give the architect an opportunity to close two gaps to her advantage: between speculation and outcome, and between labor and production. In the former, data-driven analysis and simulation gives architects the power to preformulate and predict what her design might do as well as what it might be. That new-found power gives us the chance to extend the architect’s role far earlier in the formulation of a project, whether a single building or a city. In the latter, design decisions in a world of digital fabrication increasing determine the means of production, providing a symmetrical opportunity in the realization of building. Digital instruments thus potentially increase the architect’s span of control over both the formulation and creation of the physical environment. This may be our best chance to act as agents of Tafuri’s “social equilibrium” and stretches the span of the architect’s control. It remains to be seen to what ends.

As the saying goes “past performance is not a guarantee of future results” and let’s hope that the same is true for architects’ ability to leverage the advantages of technology effectively, as it is easily argued that after almost three decades architects have failed to convert the possibilities of digital instrumentality to their own real benefit. The technical gains of the digital turns have largely been applied to either document production (AutoCAD, Revit) or formal exuberance (Rhino, digital fabrication). The efficiency of the architect is no doubt improved, but what about our efficacy? Are we playing a larger role? Getting paid higher fees? Seen as more important contributors to the environment? Delivering higher value to clients, users, the public? As we transit through the age of BIM into that of big data, analytics and ubiquitous connectivity the question should not be “can we do the old stuff faster and better”—because surely we can—but rather “what’s the new stuff that makes architects and architecture more important?”

135 Years of Nanomaterials
Peter Yeardon, Yeardon Space Agency

For those of us who tend to think of architecture as something that is made, there is nothing more instrumental to the field than matter, in the form of materials that react to gravity, heat, light, pressure, electromagnetism, and our imagination. And, without a doubt, the two materials that have had the greatest impact on the making of architecture in recent decades have been liquid crystals and silicon. In the estimation of many, these two substances have made us much more productive, and so it is highly probable that you spent the better part of today grazing at liquid crystals manipulated by some form of silicon.

And it may be that these two materials will continue to have the greatest impact on the field in the near future, as VR increasingly changes the way we produce architecture and AR eventually changes the way we experience it. But if we consider the long view of what today’s material discoveries portend for architecture, in terms of what it will be made of and how it will be experienced, then we are clearly entering an age that is dominated by nanomaterials. You might not see it, but history shows us that it’s happening.

Because of architecture’s extraordinary aversion to taking on risk, new materials innovations first emerge in other fields. The splendid Elytra pavilion that was recently installed at the V&A, is a terrific example of this. Made of glass and carbon fiber composites, the structure is intended to test a possible future for architecture. Its construction made use of automated winding processes that are new to architecture, but that are already well understood in the manufacture of ATL/AFP composites. We can thank aerospace and marine manufacturers, athletes, and others for that; but perhaps no one more than Edison, who first created carbon filaments 135 years ago.

The Elytra pavilion illustrates a traditional, low-risk approach to materials-based innovation in architecture: we copy from others. New materials might eventually arrive in architecture, but only after they are already established in sectors that have made use of these innovations for decades, or even centuries. Elytra shows us that we’re now, finally, finding architectural applications for fiber-reinforced polymers in a substantial way. It took millennia for cast iron to have a significant impact on architecture, after finding its way into common products, tools, warfare, and transportation. Reinforced concrete’s adoption was much quicker, but began with boats and planters. Irrespective of the material, materials-based innovation in architecture has shared a common trajectory, and it’s slow because others do the R&D for us.

And nanomaterials in architecture? Their trajectory is no different. They emerged in cosmetics and apparel some time ago, and are now found in numerous manufactured products. So, even though their adoption in architecture might be slow, nanomaterials are already well on the path to changing architecture over the next 135 years. It will happen. They’re in manufacturing streams already, and architecture is overly dependent upon a profusion of manufactured products that have been created by others, so the impact of nanomaterials should be significant.

Like electricity, nanomaterials will become a vital aspect of architecture. They will enable us to do things, to make things that were not possible before. And because many nanomaterials are being developed as molecular machines—that is to say, materials that perform as autonomous devices—they will bestow new behaviors on architecture. For example, nanomaterials should enable us to fully experience an architecture of effects, where spaces perform acts that engage our senses directly, without the need for AR augmentation.

There is already evidence for this in an assortment of nanomaterials that could one day serve as instruments for achieving a responsive architecture of effects, where architectural character once again matters. If the behavior of architecture is to exhibit a change in shape, or a change in color, or to emit light, or self-seal, or self-assemble and self-destruct, there will be nanostructured materials for achieving that. Their predecessors already exist in the form of: Azobenzene, Spiropyrans, Quantum Dots, Disulfides, Rotaxanes, Catenanes, etc. We’re ready, manufacturers. Bring it.

Formless
Daniel Marty, March '17

Look at your big toe. Really look at it. When defining a dissident brand of surrealism, Georges Bataille used the big toe to illustrate that despite the obvious functional instrumentality of it (a balancing appendage), there are conveniently ignored

mundane and gritty qualities that operate abnormally to certain ideals.¹ We stand proudly erect on our feet, but we conveniently ignore that our feet are quite calloused, blistered, and dirty. As defined in Bataille’s *Dictionaries Critique*, these qualities operate *formlessly*. These abnormalities attack the device that allows an object to conform to a certain ideal, serving to declassify them, disturbing the relationship between object and narrative, between instrument and function. In linguistic terms, it is a mistake to understand the *formless* as an adjective that describes a phenomena; it is a verb with a task. Yve-Alain Bois writes:

“Nothing in and of itself, the formless has only one operational existence: it is a performative, like obscene words, the violence of which derives less from semantics than from the very act of their delivery. The formless is an operation.”²

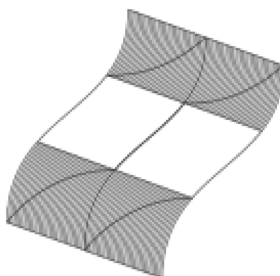
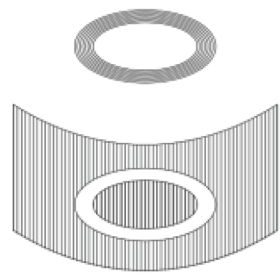
The formless is a powerful instrument that operates in opposition to instrumentality, reminding us of the qualities that are undermined by functional characterizations. It is an operation that is forced upon a space, serving to disrupt, to create something *other* from convention.

The 1996 exhibition “L’Informe: Mode d’emploi,” curated by Rosalind Krauss and Yve-Alain Bois, organized the ways in which the *formless* structurally performs into four categories: horizontality, base materialism, pulse, and entropy. The performative nature of the formless is clearest in the “horizontality” category, and is the most obvious entry into the discipline of architecture because it enacts a spatial device: the horizontal. However this does not necessarily mean that the *formless* is explicitly horizontal, but that it operates horizontally, it is an attack upon the fixation of the image and the object, and how each presents itself to the world. The spatial field of the Cordoba Mosque illustrates an aspect of this. It is not important that the field is made up of columns and that these columns support a roof. Instead the *formless* operation at play here is the field’s ability to challenge the autonomy of the singular column. In this act, an ambiguity is created within the object-as-field, where both humans and columns can participate in field-making. The *formless* squashes subjects and objects into things, regarding them on the same horizontal level of matter within the world.

The search for the *formless* in architecture is rooted in operations that bring an idea down to the same horizontal plane as matter, and stems from a Constructivist pursuit. Aleksandr Rodchenko asserts, “our things in our hands must be equals, comrades.” The *formless* is a re-reading, a reconstitution of the cult of the object, and a violent grounding of space in the reality of matter and things.

1. Bataille, Georges. *Visions of Excess Selected Writings, 1927-1939*, trans. Alan Stoekl (1985), 20.
2. Bois, Yve-Alain. “The Use Value of the ‘Formless.’” *Formless—A User’s Guide* (1997), 18.

The *Parallèle* and The *Parliament*
Nicolas Kemper, March '16



XML’s new book, *Parliament*, is a substantial contribution to Leroy’s canon: the plenary halls of all 193 members of the United Nations are represented diagrammatically both in detailed plans at 1:400 and situated within their building at 1:5000. If the French went to measure the Greek ruins, XML often denied original documentation, recreated many of the plans from photographs.

Parliament beats the French academicians at their own game. Thumbnails of the plans are organized not just alphabetically and by building year, but by five invented typologies, number of seats, population to seat index (the United States comes in second to last, at 740,264 citizens per seat, just ahead of India), and the Economist Intelligence Unit’s Democracy Index. For good measure, they include a map, too.

The 400 clutter-free pages of plans produce a gorgeous book, and also a useful tool. Like dictionaries and periodic tables, *Parallèles* have agendas, and exist to be used. One of Leroy’s students, Jean-Nicolas-Louis Durand, perfected the *Parallèle* in his 1801 book for a very specific purpose: war. Head of the newly founded *École Polytechnique*, it fell on him to educate engineers to build forts, roads, and bridges for a nation pitched against the world, and he wanted students to be able to pick up architectural concepts and apply them, quickly.

By cross-indexing plans with a democracy index, XML offers potential formal answers to achieving something more seductive: democracy. They offer a partial answer to this question: of the five typologies, the most commonly authoritarian is the Classroom, the members in consecutive rows all pointed towards the speaker. But unlike the French, XML is not offering up the past as a fount of answers. Their oldest example, Grenada, dates from the 1650s, and 370 years later there has been little if any innovation. In the introduction, XML strikes at this stagnancy with three critiques: First, the real action in parliament today lies not in the plenary chamber, but in the nests of meeting rooms surrounding them. Second, media is today so quick, present, and technological that it, too, needs accommodation. Finally, there is something fundamentally neo-classical about plenary chambers—all those circles and axes—how can we make something a little more 21st century? Indeed, only six of their examples predate *École* educated Jule de Joly’s 1823 Assemblée Nationale. Yes, XML is offering up history not for its emulation, but to judge and then transfigure it.

Then again, there is nothing more neo-classical than a *Parallèle*. If XML really wish to escape the long shadow of the *École*, they will have to start by finding a different method of analyzing buildings. Until then, by the book. Certainly it is much more affordable than an original of Durand’s tome.

The views expressed in Paprika do not represent those of the Yale School of Architecture. Please send all comments and corrections to paprika.ysoa@gmail.com. To read Paprika online, please visit our website, yalepaprika.com. Paprika receives no funding from the School of Architecture. We thank GPSS and the Yale University art gallery for their support.