*Noam Andrews*

# Climate of Oppression

Architects have often said that if they were to lay claim to any form of expertise, it would be an expertise in the design and manipulation of space. Although defensible as an abstract principle, nearly 40 years of ideological crises of confidence since the day "Modern Architecture died" have taken their toll.[1] The fundamentality of spatial expertise has been abandoned as architectural discourse has turned its attention inward in order to grapple with the implications of a new technological reassessment of traditional modes of production, fabrication, and representation. In the meantime, space has become an essential mechanism for explaining social and political processes for nonarchitectural disciplines, evidenced in the broadly influential work of urban social theorists like Henri Lefebvre, Manuel Castells, David Harvey, and Edward Soja. Within the institution of contemporary architecture, however, one cannot help but notice a marked disdain for space. Despite Bernard Tschumi's best intentions, the "spatial turn" – which has had a transformational effect on social and political theory since the 1970s – has gone unheeded in architecture, the discipline traditionally saddled with the "problem" of designing space.

The popularity of parametric design and the years of skill-building necessary in order to harness its potential have greatly contributed to the absence of a mature discourse about space in contemporary architecture. As one of the preeminent formal and conceptual paradigms driving current architectural theory, the marked disinterest in all things spatial (in favor of refining computational techniques and their link with manufacturing) has impacted a generation of architects unable to engage effectively in spatial terms. While the ongoing computational research had always been seen to justify the intellectual fallout, it has become increasingly apparent to everyone involved that parametric design is unable to produce spaces that stand as convincing architectural products without the support of the rhetorical structures erected to defend them. The evidence has been striking. Undulating surfaces abound in parametric architectures. Located in inhospitable climates and optimized to respond to environmental data, such projects are intended for refugees,

1. Charles Jencks famously declared the 1972 demolition of the Pruitt-Igoe housing complex in St. Louis, Missouri, to signify the end of the modernist era in architecture. See Charles Jencks, *The Language of Post-Modern Architecture* (New York: Rizzoli, 1984), 9.

migrants, and other third world populations in dire need of "help." Distinguished by architectural programming chosen to be noncommittal or vague, and lacking in cohesion and spatial comprehensibility, the result has been a motley collection of generic responses incapable of sustaining meaningful inhabitation.

## *Space Reader* and the Construction of Parametric Space

The absence of space in parametric architecture is addressed head-on in a new and significant publication by three of the discipline's most prolific and well-respected practitioners. *Space Reader: Heterogeneous Space in Architecture* (2009), edited by Michael Hensel, Achim Menges, and Christopher Hight, attempts to address spatiality in parametric architecture by proposing a "new" concept of space borrowed from poststructuralist theory. Far from being self-critical, *Space Reader* is a theoretical riposte that repackages parametric design in spatial terms. A collection of essays from within architectural theory intended to give credence to the concept of what it dubs "heterogeneous space," *Space Reader* represents a critical shift in parametric theory and a new strategy for claiming cultural legitimacy. *Space Reader* acknowledges the general parametric tendency toward *a-spatiality* and chooses to address the lack of space through a reinvention of current practice in overtly spatial terms.

The parametric paradigm has ushered in a host of rhetorical conventions along with its standard design products, and as a form of intellectual justification for the "ecological" paradigm that continues to dominate contemporary parametric discourse, certain "productive improprieties"[2] have been established to enable parametric architecture to claim the ability to *actualize* the ecological metaphors of poststructuralism.[3] Here the associative *meaning* of a word or text connects a philosophically inflected metaphor to a physical object rather than to an innate connection based upon *content*.[4] *Space Reader* takes these equivalencies between parametricist technical facility and poststructuralist theory to a new level by offering a design vocabulary as a spatial handbook for the parametric set. On the one hand, the "scientificity" of parametric work is wielded to defend projects against criticism on the basis of quantifiable, testable results. On the other, the "bottom-up" approach to parametric design (working from object relations back to the object) requires an open-ended attitude that encourages the "emergence" of spatial processes rather than the proscription of planimetrically defined spaces. Here parametric architecture

2. The term relates to forms of architectural assimilation that hark back to the 1960s debates between modernists and literalists. See Mark Linder, *Nothing Less than Literal: Architecture after Minimalism* (Cambridge: MIT Press, 2004), 7.

3. The word *ecology* in the work of ecological poststructuralists, most notably in Félix Guattari's *The Three Ecologies* and the writings of Michel Serres, is used to describe collections of interrelated, yet differentiated and heterogeneous, spatial entities. Building upon Claude Lévi-Strauss's structuralist antihumanism and its relation to the ethical duties of human beings toward the environment, ecological poststructuralism asserts a *structural* similarity between humans and all of creation, both organic and inorganic. Humans are defined only through their embeddedness in an ecological system and cannot separate their state of "being" from a general state of "information." Guattari develops these politics of ecological poststructuralism into an ethics of "eco-subjectivity." Within the poststructuralist ethos of environmental action, Guattari claims that dynamic ecological processes should be harnessed according to a relational sensibility that ought not aim to control or close space, but rather to steer dynamic socio-spatial processes. See Félix Guattari, *The Three Ecologies*, trans. Ian Pindar and Paul Sutton (London: Athlone Press, 2000); Verena A. Conley, *Ecopolitics: The Environment in Poststructuralist Thought* (London: Routledge, 1997), 61 and 64; and Jonathan Murdoch, *Post-Structuralist Geography* (London: Sage Publications, 2006), 189.

4. It is well known that language forms an integral and long-established tool for the production of architecture. Adrian Forty discusses the effectiveness of the *architectus verborum* – the architect of words, skilled in the craft of language – to literally construct architecture out of words and structure its form and semblance in the imaginations of an audience. See Adrian Forty, *Words and Buildings: A Vocabulary of Modern Architecture* (London: Thames & Hudson, 2000), 11.

evidences accountability only to its *own* internal logic, against which a design is tested, to the exclusion of other criteria deemed inessential.

Menges and Hensel's claim to heterogeneous space is representative of a widespread belief that parametric software is able to actualize the provocative abstractions of ecological poststructuralism. Differentiated and dynamic socio-spatial practices "arise" from environmental strategies in seemingly perfect fulfilment of Félix Guattari's "relational sensibility." The parametric discourse markets these environmental mediation strategies as the *fait accompli* of poststructuralist interpretation. The poststructuralist state of "ecological embedded-ness" is interpreted and "optimized" through the relationship of the subject to parametric systems of environmental mediation. The aim is to calculatedly reinvigorate the "heterogeneous space" of contemporary parametric practice as the architectural heir to the poststructuralist legacy of "heterogeneous space."

## Heterogeneous Space

Heterogeneous space describes both the explicit "project" of *Space Reader* and the type of space intended to be folded into the existing parametric discourse. According to the editors, heterogeneous space is defined as "the immanent field of relations between differentials"; the outcome of a *process* that describes space rather than a *form* that describes space. While the definition of heterogeneous space remains essentially abstract, *Space Reader* repeatedly stresses the fundamental condition of heterogeneous space to be the presence of *material* conditions that enable the emergence of differentiated *spatial* practices.[5]

As such, *Space Reader* stakes out an inclusive territory of heterogeneous "space-making" intended to be applicable to all parametric designers. For the authors, the ability to produce heterogeneous space is predicated neither upon awareness nor conscious intent, but upon the use of parametric software. Using examples from their own work in the concluding essay, Hensel and Menges demonstrate how heterogeneous space is intrinsically the product of parametric design. Consequent sensual effects are generated through the design of surfaces capable of expressively mediating the climate, interpreted as a tameable entity of predictable data, which is then experienced *in* space and *as* space by an imagined subject. Hensel and Menges describe this feedback loop between materiality, spatial effects, and spatial practices as an "ecological relationship" indicative of a preexisting con-

5. Michael Hensel et al., "En Route: Towards a Discourse on Heterogeneous Space beyond Modernist Space-Time and Post-Modernist Social Geography," in *Space Reader: Heterogeneous Space in Architecture*, ed. Michael Hensel, Christopher Hight, and Achim Menges (Chichester: Wiley, 2009), 16.

tract between objects and subjects and their environment.[6]

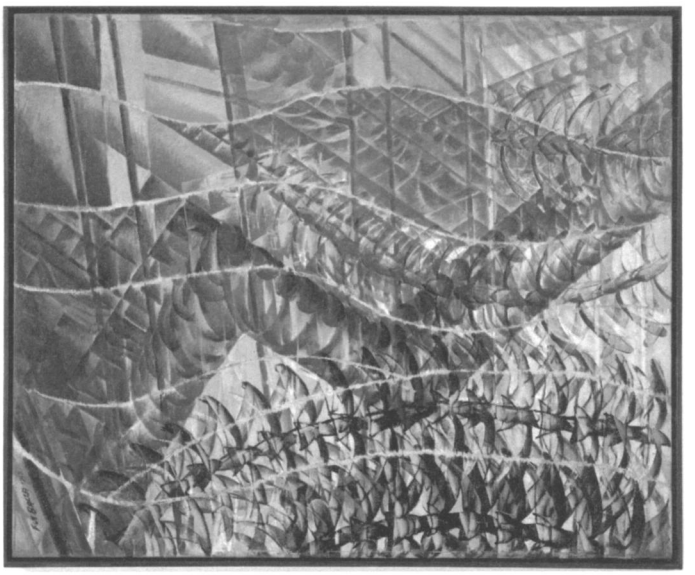
Heterogeneity functions here both as a type of formal logic for systems of parts, called *components*, and as the supposed natural condition of parametric space. Insofar as it is conceived as the collective practices and sensual impressions of a group of possible subjects, space is produced backwards through surface conditions beholden only to climactic phenomena reconstituted as "objective" data. The heterogeneous space that parametric design claims to produce is heterogeneous both because of its responsiveness to variable environmental conditions and because of the variety of possible spatial practices set into motion as a result of these climatic conditions.

### The Biological/Ecological Paradigms

To a greater or lesser extent, parametric architecture defines itself as "ecological" according to an implicit equivalence with *environmental responsiveness*. Ecology is here understood to entail a belief in the power of architecturally mediated weather to engender specific responses in the subject. The result has been a proliferation of architectural projects that perform by modulating the effects of the sun, wind, and rain not over time but more or less immediately. Above all else the issue is comfort, and it is from within this narrow range that parametric strategies for environmental mediation operate. Social bodies cohere around climactic sensitivities that cut across cultural boundaries to form new groups of similarly impacted subjects. More singularly, the designs ask to be regarded in terms of their *phenomenological* effects on inhabitation. The role of architecture is simplified to encompass a diffused boundary condition between interior and exterior environments consisting of a distributed set of thermal and visual conditions. The areas adjacent to or underneath edge conditions are animated by the interplay of light cascading off algorithmically defined, self-shading components, dazzling layers of material calculated to reveal various degrees of visual transparency, and differentiated thermal zones and currents. As Hensel and Menges write, "We looked for paradigms . . . in the disciplines of biology and more specifically ecology . . . as well as climatology. . . . What is at stake is a *biological* and, moreover, *ecological* paradigm for an architectural understanding and instrumentalization of space."[7]

Parametric design purports to "go beyond using biology as merely a source of convenient metaphors or a superficial formal repertoire"[8] in its exploitation of the powers of 21st-century machine production to actualize biological processes

6. Michael Hensel and Achim Menges, "The Heterogeneous Space of Morpho-Ecologies," in *Space Reader*, 196.
7. Hensel and Menges, *Space Reader*, 196.
8. Michael Hensel and Achim Menges, "Morpho-Ecologies – Towards an Inclusive Discourse on Heterogeneous Architecture," in *Morpho-Ecologies*, ed. Michael Hensel and Achim Menges (London: AA Publications, 2006), 16.



Giacomo Balla, *Swifts: Paths of Movement + Dynamic Sequences*, 1913. Oil on canvas, 96.8 x 120 cm. Digital image © MoMA. Image courtesy SCALA / Arts Resource, New York.

in architecture. Here the "biological paradigm" is declared as a general concern with "issues of higher-level functionality," a concept further refined in scope through its reference to an "ecological" understanding of architecture as the mediator between human beings and their environment. Although visually similar to the painted research into movement of the early 20th-century Futurists, exemplified by Giacomo Balla's 1913 painting *Swifts: Paths of Movement + Dynamic Sequences*, the processes underscoring the production of parametric projects are claimed to be fundamentally different. Research agendas into processes of "self-organization" and "other natural formation processes" have become popular ways of positing a biomimetic relationship to the integration of natural form, growth, and behavior. For parametric design, the strength of the biological paradigm lies in its ability to be truer and more expressive of ecologically inflected biological processes than all previous architectures.

As shown by the new "functional" interpretation of biology, the self-professed biological paradigm claims little relation to the established historical poles of the biological metaphor in architecture. Bruno Zevi's abstract concepts of a humanist and social organicism[9] are of as little direct relevance as the architectural exemplars: Eugène Viollet-le-Duc's use of nature as formal inspiration, Owen Jones's horticulturally inspired *Grammar of Ornament* (1856), and Bruno Taut's 1914 Glass Pavilion for the Deutsche Werkbund Exhibition. Closest, perhaps, in spirit are Frank Lloyd Wright's contentions, in service of his own brand of design, that "nature provides lessons about form and func-

9. "Architecture is organic when the spatial arrangement of the room, house, city is planned for human happiness, material, psychological, spiritual." See Bruno Zevi, *Towards an Organic Architecture* (London: Faber & Faber, 1950), 76.

tion" and, furthermore, that "organic architecture does not contradict machine production."[10] The contention that biological *processes* rather than biological *forms* interpreted at the level of architectural systems of construction and manufacturing contribute interesting design products is undoubtedly an accurate one. However, the issue here is not whether parametric design is "true" to its biological inspiration, but whether the entire paradigm of environmental mediation is built upon the construction of a highly problematic notion of subjectivity.

## Parametric Subjectivity

Forgoing all contemporary research in the scientific fields related to perception, and even a qualifying theoretical framework, Hensel, Menges, and Hight make use of the obscure biologist Jakob von Uexküll and his 1930s use of the term *Umwelt*[11] in their defense of the "parametric subject." The subject postulated (one might even say reinvented) by parametric architecture is a strange and dated one. In prefacing their republication of "An Introduction to Umwelt" (1936), the editors revisit the definition of *Umwelt* postulated by Uexküll as "an island of the senses, that wraps every man like a garment."[12] As a defense of the new parametric definition of heterogeneous space, the editors propose that *Umwelt* may be used to understand the reflexive mechanisms by which subjective experience is constructed. Uexküll's *Umwelt* provides a decontextualized[13] reference from science, used in *Space Reader* as a form of intellectual legitimization, to conclusively state that space is formed directly through the subjective impressions delivered through the human senses.

The parametric *Umwelt* is a conscious form of subjectivity that, like heterogeneous space itself, works backward from an already existent architecture. Attracted by visual stimuli, repelled by inhospitable climates, delighted by the interplay of light and material above all else, and predisposed to "flowing" movement, the ideal subject of the parametric paradigm is as much a construction as the architecture itself.[14] "An interplay of concave and convex networks . . . creates deflections and diversions of pedestrians and light, weaving together street life and river activities."[15] The conceptualized behavior of this subject, a subject guided by the contemporary parametric reliance upon sensual and sensorial perception and read solely through the terms dictated by architecture, produces a form of subjectivity indispensible to the performative success of these architectures.[16]

Parametric subjectivity suffers from a self-imposed nos-

10. Kenneth Frampton, *The Evolution of 20th Century Architecture: A Synoptic Account* (New York: Springer, 2007), 52.
11. *Umwelt* merely means "environment" or, more literally, "surrounding world" in German.
12. Jakob von Uexküll, "An Introduction to Umwelt," in *Space Reader* (Chichester: Wiley, 2009), 145.
13. Perhaps a broader understanding of *Umwelt* can be found in Agamben's reference to Uexküll in *The Open: Man and Animal*. Here Agamben discusses *Umwelt* as an environment-world consisting only of elements carrying immediate significance illustrated through Uexküll's description of the behavior of a tick. See Giorgio Agamben, *The Open: Man and Animal*, trans. Kevin Attell (Stanford: Stanford University Press, 2004), 46.
14. *Space Reader*'s use of Uexküll in order to support the contention that climatic shifts may overtly determine the behavior of individuals has its roots in the Enlightenment discourse on automata and its relationship to a modern subjectivity. In his radical treatise *L'Homme machine* (1748), Julien Offray de La Mettrie refuted Descartes' proof in *Discourse on Method* (1637) that the dictates of rational thought processes require the presence of an individualized soul, thus distinguishing between humans as rational beings and the irrational *bête machine* of soulless, mechanical creatures. Based upon his observation of significant biological continuity and function among all living things, La Mettrie relegated humans to the status of being advanced machine-animals, probabilistic automata with mental traits such as perceiving, believing, and using language functioning as an added by-product of an organizational and structural complexity able to be accounted for in automaton-theoretic terms. Foucault has instructively referred to these Enlightenment conceptions of automata as "small-scale models of power," docile bodies that were considered completely open to manipulation, subjectivization, and use. Similarly, parametric subjectivity persists in reading the subject only through the terms dictated by architecture. See Christoph Asendorf, *Batteries of Life: On the History of Things and Their Perception in Modernity* (Berkeley: University of California Press, 1993), 7; R. J. Nelson, "Mechanism, Functionalism, and the Identity Theory," *The Journal of Philosophy* 73 (1976): 365; Michel Foucault, *Discipline and Punish: The Birth of the Prison*, trans. Alan Sheridan (London: Penguin Books, 1991), 136.

talgia of essentialist human experience rather than the contemplation of how bodies are (and could be) interacting with technology and their environment at the present moment and beyond. The parametric body is not only simplified, it is regressed to a primordial state even as technology (architecture) is allowed to grow monstrously precise. To a large extent, this is the self-perpetuating dilemma of an architectural discourse that has invented a subject in order to suit an existing repertoire of form. *Umwelt* is an arbitrary term chosen to support the expedient aim of justifying contemporary parametric practice. The parametric subject simply does not exist.

## Power and Subjectivity

Whether or not one believes the parametric subject to be a convenient fiction, the implicit subjectivity remains highly problematic and undeclared behind an architecture explicitly concerned with "the political and social implications of design"[17] generated by climatic data deemed "objective." The desire for heterogeneous spatial practices to emerge from climatic modulation depends solely upon this concept of an environmentally determinate subjectivity. Consequentially, the subjectivity postulated by the climatic politics of parametric design has remained a form of hegemonic power relations uninterrogated by current architectural discourse.[18] In the extreme, there have been other architectures that have attempted to manipulate and predict the behavior of a group of subjects based solely upon the choreography of environmental factors. While Giorgio Agamben and others have written on the concentration camp as a paradigm of biopolitical space, it is the "gas vans" of the same era that may help to exteriorize the implications, taken to the nth degree, of a quantifiable, and performative, climatic subjectivity. In an internal memo from 1942 entitled *Geheime Reichssache* (Secret Reich Business), several considerations regarding repairs to the vans are discussed and evaluated.[19] The vans, which filled with carbon monoxide gas in order to asphyxiate their passengers, were the subject of a bureaucratic debate over how to optimize the procedure.

*The manufacturers told us during a discussion that reducing the size of the van's rear would throw it badly off balance. The front axle, they claim, would be overloaded. In fact, the balance is automatically restored, because the merchandise aboard displays during the operation a natural tendency to rush to the rear doors, and is mainly found lying there at the end of the operation. So the front axle is not overloaded.*

15. Julia Ka Yee Li, "Ornamental Dérives," in *Articulated Grounds: Mediating Environment and Culture*, ed. Anne Save de Beaurecueil and Franklin Lee (London: AA Publications, 2009), 130.
16. This is in direct contrast to contemporary research into modeling the subject and subjectivity in various nonarchitectural fields and discourses. Neurodynamics, quantitative social modeling, and even the practice of contemporary art have all abandoned mechanistic, linear, predictable, and deterministic models in order to incorporate self-consciousness and self-awareness.
17. Hensel, Hight, and Menges, eds., *Space Reader*, 35.
18. Purely from a subjective, yet informed, point of view, parametric design does indeed seem to have benefited, like earlier "forward-gazing" architectural movements before it, from the "power of the new" manifested as a general lack of criticality from nonparametric practitioners or theorists and the recycling of exuberant architectural fantasies of fluidity and smoothness which have been around in similar form since Le Corbusier. There are surely many reasons for this critical blind spot, first and foremost including, but not limited to, architecture's prevailing progress-driven ideology and age-old infatuation with the application of new technologies. See particularly Mark Cousins, video transcript of the symposium "The Critique of the New: Questioning the Legitimization of Newness through Technology," held at the Architectural Association, London, May 2008 (London: Architectural Association Lecture Archive).
19. The original document can be found in the transcript to Claude Lanzmann's documentary film *Shoah* (1985).

*Lights could be eliminated, since they apparently are never used. However, it has been observed that when the doors are shut, the load always presses hard against them as soon as darkness sets in. This is because the load naturally rushes towards the light . . . which makes closing the doors difficult. Also, because of the alarming nature of darkness, screaming always occurs when the doors are closed. It would therefore be useful to light the lamp before and during the first moments of the operation.*[20]

Without belaboring the relationship, parametric architecture is predicated upon the manipulation of states of thermal comfort in order to determine behavior. The "aptitudes directly inherent in the body" of the parametric subject (that is, the innate human sensitivities to the presence/lack of light and heat) are manipulated to "bring into play relations between individuals,"[21] or to put it in the language of *Space Reader*, to enable the emergence of coherent socio-spatial practices. But the only agenda for the parametric subject is to maximize comfort. Although the threshold is much lower, the use of environmental stimuli is essentially a question of the absence of pain and the degree to which painfulness/comfortableness is capable of producing similar reactions in subject groups. Choice of movement is predetermined by a biopolitical sensitivity that, to quote Agamben, wholly subscribes to "the growing inclusion of man's natural life in the mechanisms and calculations of power."[22]

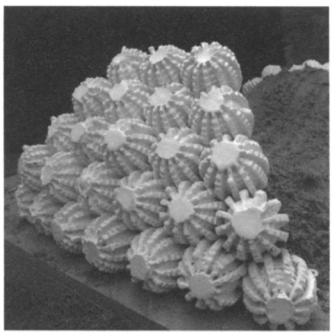
20. Claude Lanzmann, *Shoah: the Complete Text of the Acclaimed Holocaust Film* (New York: Da Capo Press, 1995), 93.
21. Michel Foucault, "The Subject and Power," in *Power*, ed. James D. Faubion, trans. Robert Hurley, et al. (London: Penguin Books, 2002), 337.
22. Giorgio Agamben, *Homo Sacer: Sovereign Power and Bare Life*, trans. Daniel Heller-Roazen (Stanford: Stanford University Press, 1998), 119.
23. Foucault, *Power*, 341.
24. Steve Hardy, "Environmental Tectonics: A Call For Projects Competition," in *Environmental Tectonics: Forming Climate Change*, ed. Steve Hardy (London: AA Publications, 2008), 11.

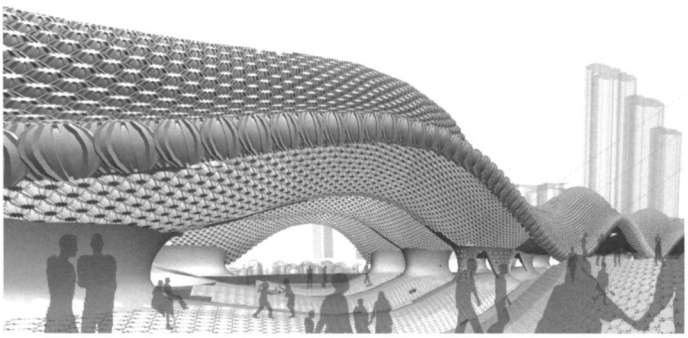
## Storm Watershed

*[Power] operates on the field of possibilities in which the behaviour of active subjects is able to inscribe itself. . . . It is always a way of acting upon one or more acting subjects by virtue of their acting or being capable of action.*[23]

– Michel Foucault

*Environmental Tectonics: Forming Climate Change* (2008) is the selective result of an international call by the Architectural Association for projects to "discuss the challenges of climate change and seek transformational responses from the design profession."[24] In the place of a productively critical response to current practice similarly absent in *Space Reader*, and typified by the example of the "prototypical family home" exposed to rising water levels due to global warming, the editor of *Environmental Tectonics*, Steve Hardy, spells out a near-apocalyptic future in which parametric projects are necessary to mediate possible catastrophic climatic shifts. Here the imminent threat of annihilation justifies an "ecological" set of performatively optimized "relations of pro-





Dan Marks, Storm Watershed, Mumbai, 2007. Detail of modular water storage and structural unit. Right: vaulted structure parametrically optimized for water capture. Images courtesy the author.

duction and signification," the unapologetic envisaging of a subjugated and dystopian form of subjectivity. As the emblematic project in *Environmental Tectonics*, Storm Watershed, by Dan Marks, illustrates, we are intended to view populations living in harsh and unremitting climates as opportunities for the deployment of parametric architecture.

Storm Watershed shared second prize in *Environmental Tectonics*' 2007 competition,[25] and therefore must be said to represent an exemplary contemporary environmental mediation strategy and spatial resolution. The site is Sri Vinayak Nagar, a slum neighborhood in Central Mumbai, located along an open storm-drainage channel susceptible to flooding during the monsoon season. The context, like the site, is defined in terms of an environmental resource (water), an issue (the lack of freshwater provision to the slums), and a potential solution (Mumbai actually gets a lot of rainfall during the summer that could be captured and delivered to the slums). The project, which consists of sets of distributed flood-mitigation and water-storage facilities, is essentially a vaulting structure made from clay excavated from the nearby floodplain and parametrically optimized for capturing and storing water in structural supports doubling as reservoirs. The top surface is inhabitable and we are informed that crops may be grown there, while the spaces below may accommodate a market in the dry season.[26]

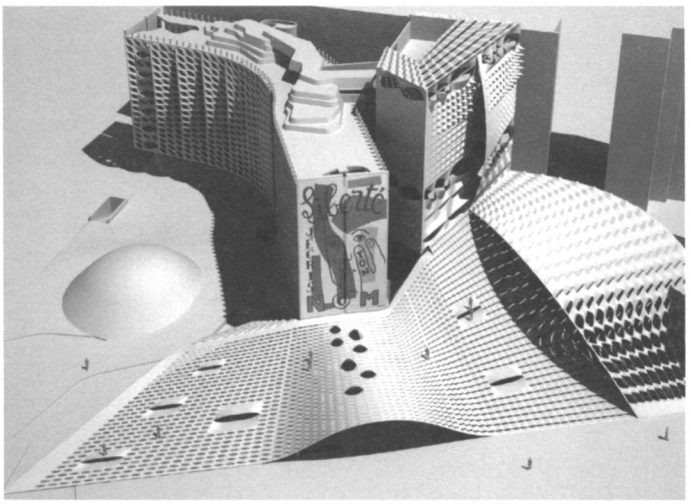
It is naive to believe that Marks could defend a proposal intending to solve the myriad health-related issues faced by Sri Vinayak Nagar simply through the provision of water. And as we are neither informed about the amount of water to be provided by the watershed nor whether any consideration has been given to its integration with the social practices involved in maintaining and distributing the water supply, it is fair to assume that Sri Vinayak Nagar has been chosen as a prototypical site on which to deploy the prevailing "environmental tectonic" sensibility. Storm Watershed is at its most effective when developing elegant cactuslike structural

25. The first prize that year was awarded to Brett Jacobsen for his Marine Cultivation Park. I have chosen not to discuss this project because it is primarily concerned with the design of a sustainable fish farm populated mostly by nonhuman inhabitants (fish).
26. Dan Marks, Storm Watershed, in *Environmental Tectonics*, 60.

components capable of being assembled by an unskilled local workforce. But while Marks's ultimate goal may not have been to engage with the complexities of life in Sri Vinayak Nagar, the spatial implications for the users of Storm Watershed are drastically cynical. The spaces produced are wet and cavelike with indeterminate programs visualized in a set of virtual tabula rasa images with no appreciable sign of the existing Sri Vinayak Nagar. The extent to which the project imagines a dystopic future populated by workers as unskilled as they are now, continuing to live as quasi-refugees underneath a giant clay surface, testifies to the lack of attention provided to any larger socioeconomic concerns.

Storm Watershed articulates a self-perpetuating state of control that is inherent to all parametric projects based upon performative environmental quantifiers. According to these parameters, Storm Watershed "works" (it could be great for catching water) but the narrowness of its scope results in an oppressive formulation of the subject. It fits in with *Space Reader*'s concepts of heterogeneous space – spatial practices reflexively produced by environmental mediation – by utilizing "low-tech" construction methods relying on "modes of production that are highly labour intensive and dependent on low-skilled manual workers."[27] Marks develops a structural component that is easy to assemble and could "articulate a complex vaulting structure but still be assembled by a local workforce," taking into account that "it is relatively easy for an unskilled workforce to erect simple compressive structures consisting of a limited set of components."[28] In contrast to the technological and material innovation of other parametric projects or the expensive sun-shading components in the following Parisian example, the low-tech "realities associated with construction in India" are embedded in the standardization of the component. In this way, the signification of Storm Watershed, a "whole" made up of *identical* components in a discourse that prides itself on differentiation, articulates a sluggish spatial heterogeneity that, in practice, approximates a hegemonic homogeneity. Heterogeneous space, "stabilized" into homogeneous space through the capacities of "low-skilled manual workers," reflects the architect's assessment of Sri Vinayak Nagar's basic economic resources. Here we see that while there is no "possibility for escape" or meaningful political action in Storm Watershed, the very use of the environmental data, at the exclusion of any other data, is itself an inherently political action.

27. Ibid., 60.
28. Ibid.



Arthur Mamou-Mani, Communist Party HQ, 2008. Exterior rendering. Image courtesy the author.

## Communist Party HQ

Arthur Mamou-Mani's project Communist Party HQ (2008), published in *Articulated Grounds: Mediating Environment and Culture* (2009), addresses the poignant, yet misguided parametric desire for environmental mediation to attain an intended political dimension. Here the parametric project stands as the embodiment of a "democratic" political sensibility for an economically evolved capitalist society. While the editors and architects Anne Save de Beaurecueil and Franklin Lee do not overtly reference space as the medium in which aesthetic questions connect with social experience, their reliance upon "environmental ornamentation" to choreograph "environmental and cultural forces" is similar in aspiration to the performance theorized for the projects in *Space Reader* and *Environmental Tectonics*. As such, the dialogue between the parametric discourse and projects in *Articulated Grounds* is, more so than in *Environmental Tectonics*, on the cusp of a meaningful engagement with space, which has developed naturally from the desire to positively impact social processes through the parametric design of environmentally modulating surfaces.

Mamou-Mani's Communist Party HQ is envisioned as an intervention in Oscar Niemeyer's French Communist Party Headquarters, designed by the architect while in exile in 1970. Mamou-Mani's project responds to a 2007–2008 Architectural Association Unit 2 prospectus brief, which called for a transformation of "monolithic organizations by introducing new iterative components for structure, fabrication, and environmental articulation."[29] More so than many of the other projects in *Articulated Grounds*, the subject of Communist Party HQ is an overtly political one: the creation

29. Anne Save de Beaurecueil and Franklin Lee, "The Smooth and the Articulated," in *Articulated Grounds*, 36.

of public space. Mamou-Mani frames his proposal as a response to Niemeyer's original intention for the building to be a "democratic ground," now standing stagnant as a "monolithic bunker" surrounded by security fences and "isolated from its neighbours in the poor, multi-cultural *arrondissement*." The project introduces an "architecture of accessibility" conceived of as an extension and modification to the existing building through a public plaza, the ubiquitous marketplace, and an overall system of environmental modulation. "Rather than the top-down tyrannical image that both the communist party and its headquarters suffer from, this new building and its inhabitable ground complex would embody a fluid, decentralized design that rigorously calibrates and diffuses the flows of capital and climate."[30] Communism is defined by its "top-down tyrannical image" as embodied in the very design of its headquarters; a building insensitive to climate and inaccessible to its surroundings. Thus for Mamou-Mani, tyranny is made synonymous with the implicitly political act of constructing an autonomous object as the physical space for a political body and is held in negative opposition to the expression of democracy, interpreted via Mamou-Mani's design of the "democratic ground." The ground condition here is also a roof condition, an undulating surface consisting of a component system scripted to parametrically follow solar angles and allow diffused light into the new interior market space that weaves its way around the existing buildings. One can infer from the drawings that the "rigorous calibration" of "the flows of capital and climate" must relate to the ability of the components to alter the amount of light allowed into the market, ostensibly the site of the "flows of capital."

30. Arthur Mamou-Mani, "Communist Party HQ," in *Articulated Grounds*, 88.

Communist Party HQ represents a sea change for parametric design because of the way in which it attempts to deliver its political ambition of a space for democracy using environmental data-driven components as the architectural vehicle. Here the climatic performance of an architectural surface/building is meant to directly enable the formation of a so-called site of contrary political action. The conceptual difficulty here, which is clarified by the abstract rhetoric of *Space Reader*, is the doubling of the meaning of political intervention as both an imaginary, and aggressive, surface landscape installed on a real site, and the *idea* of climatically generated socio-spatial practices existing within the realm of the modern city. The first issue is local to the project, but the second has become the "holy grail" for contemporary parametric design; the activist legacy of poststructuralism imbu-

ing architecture with a new belief in itself and the possibility to be explicitly and authoritatively political *without* being prescriptive about the politics proposed. As interpreted by Mamou-Mani, the unit's intention to "transform monolithic organizations" through "new iterative components" forces an explicit equivalence between monoliths as tyrannical objects and environmentally articulated components as anti-tyrannical objects. This is expressively illustrated by Communist Party HQ in the form of a direct, architectural response to the provocation of the brief. But the claim to actualize democracy is also wholly unsubstantiated both in the general parametric discourse and in Communist Party HQ, partially because the terms have been left undefined – accessibility, politics, democratic ground – partially because we are limited to talking about material systems and their effects, and partially because democracy, in any of its forms, rarely has anything to do with how much light is allowed into a marketplace. This disjunction between the description of a desire for current parametric practice to address political questions (in space) and the realities of what the project would conceivably accomplish is characteristic of the bodies of work contained within all three books – *Morpho-Ecologies*, *Environmental Tectonics*, and *Articulated Grounds*.

Mamou-Mani's description of a mechanical "component system diffus[ing] direct light and pedestrian movement to create a fused environmental and social strategy"[31] is wholly supported by the descriptions of heterogeneous space formulated by *Space Reader*. The self-shading components referenced in Communist Party HQ would similarly have been generated through the scripting of data from an analysis of the simulated impact of a solar path angle upon a digital model, and Mamou-Mani would certainly have chosen one of several iterative solutions, all of which could perfectly satisfy the prerequisite for self-shading. As the engineer Lawrence Friesen explains, "The data has been there for years. . . . What's different now is that we can also use this type of information to control a dynamic design process."[32] For Mamou-Mani, the design of a self-shading component, representative in this respect of all other environmentally responsive components, is understood to be an objective, apolitical act of manipulation rather than an ideologically loaded form of constructing subjectivity.

Communist Party HQ makes it abundantly clear that even in the rare occasion when the aim of parametric architecture is, in Foucault's terms, to facilitate a "relationship of confrontation," the existing parametric discourse is not a suffi-

31. Ibid.
32. Anne Save de Beaurecueil et al., "Responsive Structures," in *Articulated Grounds*, 42.

cient condition. The project relies upon an ideological substitution of the individuality of the differentiated parametric components and the multiple (individual) perceptions of heterogeneous space to deliver a "democratic ground." Yet the form of subjectivity conceived is fixed within a singular "climatic" position that in its fixity precludes a useful tension between the parametric discourse and alternate forms of subjectivity. Communist Party HQ is spectacularly misdirected in its confluence of sun-shading algorithms with democracy and its simultaneous ignorance of its role as a manipulative device that predetermines the conditions under which political action may occur in public space. Through environmental mediation "acting on the possibility of action," the "field of possibilities" is in actuality extremely limited. And any movement that might occur would only seek to reinforce the dominant parametric form of environmental subjectivity.

### Parametric Discourse

Typified in *Space Reader* but elaborated in kind by various other practitioners previously described, responsive strategies of environmental mediation have emerged as the dominant parametric discourse in architecture. As a result of this theoretical uniformity, parametric architecture, with minor variations, has held closely to sets of rules that approximate, in practice, those of an architectural typology. Environmentally mediating projects produce a consistent set of physical elements (undulating surfaces, components), programs left undefined (the shelter, the market), and a "sensing" subject beholden to changes in climate and light conditions in space. *Space Reader* has furthermore attempted to defend current practice against spatial criticism by defining this space – in essence, the space beneath parametric surfaces – as heterogeneous. To do this, metaphors have been borrowed from the work of several poststructuralists, most notably Deleuze and Guattari, which allude to the open processes underscoring parametric design. Heterogeneous space is thus interpreted and claimed by parametric designers as the consequence and natural by-product of a series of differentiated components, parametrically optimized to sets of environmental criteria, and organized through a declared ecological/biological paradigm. But while the jargon that parametric practitioners borrow from poststructuralism is full of emancipatory ambition, the common practice of using the climate as the key parameter input into parametric projects has created a legacy of self-obsessed spaces dangerously oblivious to the true nature of their politics.

The latent hegemonic subjectivity upon which parametrically optimized architecture stakes its claim to the intellectual legacy of ecological poststructuralism is constructed through an architecture that seeks to "biopolitically" manipulate its inhabitants. The subjectivity proscribed by heterogeneous space, described in *Space Reader* on behalf of all parametric projects and elaborated upon in Storm Watershed and Communist Party HQ, is very much the result of conceptual structures outside the conscious control or choice of the human captive subject. Simply put, the human subject is influenced and "attracted" by the absence/presence of environmental stimuli like light and heat. As such, this imposition exercises a form of "governmentality" understood according to Foucault's use of the term to describe the activity that consists of controlling human behavior. In its ignorance of its own political consequences and its complicity with regimes of control and exploitation, the spaces of parametric architectures do not uphold the intentions or progressiveness of poststructuralism as much as the abstract vocabulary of its apologists. Furthermore, the lack of attention to contemporary developments in the modelling of the relations between individuals and their environments attests to a parametric practice that has relied upon an aesthetic idiom rather than combining its computational rigor with a convincing study of human behavior or ethics. As it stands, contemporary parametric discourse, far from being at the vanguard of a new intellectual and material engagement with space, is in crisis. In place of offering the possibility for democratic political expression, the construction of a fictitious subject in a moral free zone known as the "biopolitical" has yielded a potentially totalitarian vision of space, which undermines the integrity of its performative aspirations.

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