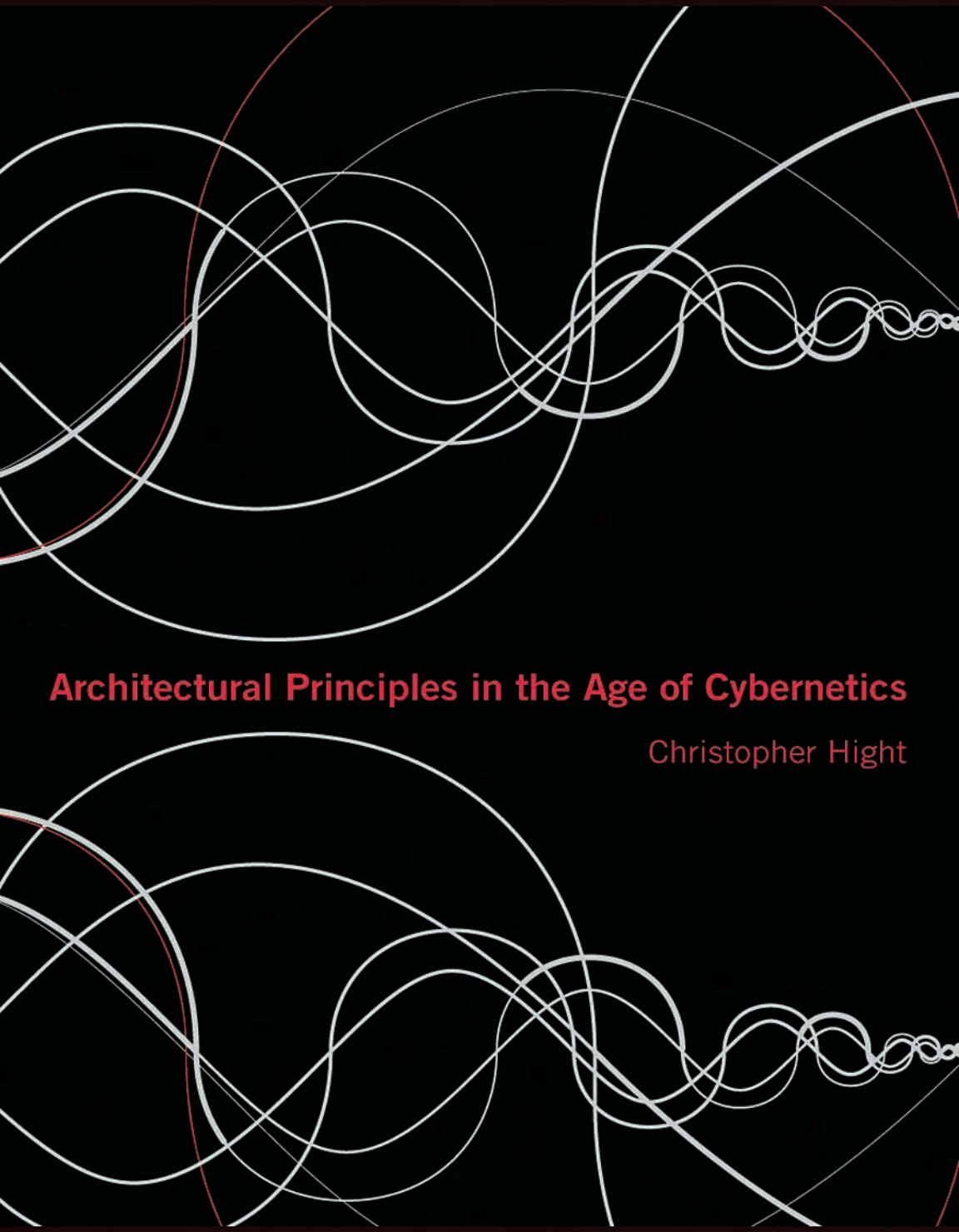

Architectural Principles in the Age of Cybernetics

Christopher Hight

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Architectural Principles in the Age of Cybernetics offers a theoretical account of the body, anthropomorphism and proportion in modern architecture, daringly bridging Renaissance and mid-twentieth century architecture with today's interest in post-humanism and digital design — in the process radically challenging conventional modern architectural history.

An innovative analysis of the mid-century interest in proportion by architects and writers such as Le Corbusier and Rudolf Wittkower reveals how these widespread but now mostly forgotten debates provided the intellectual terrain upon which recent and seemingly opposed work by architects and theorists ranging from Greg Lynn to Joseph Rykwert have been constructed. In doing so, the book transforms the understandings of contemporary architectural design and debate, raises new questions regarding modern architecture's relationship to the Renaissance and humanism, while relating modern architecture to its contemporary philosophical and technological context. This book argues that much of what we take to belong to a classical architectural tradition, such as the Vitruvian Figure, are far more recent constructions that helped formulate architecture's concepts and use of form, subjectivity and technology in the twentieth century. In turn, it suggests what might be at stake for architecture in today's post-cybernetic culture.

The book is written for an informed but non-specialized architectural audience and is designed to appeal to professional architects, academics and students, by serving as a general introduction to central issues of architectural history, theory and design over the past fifty years while suggesting new formulations of what that history constitutes.

Christopher Hight teaches graduate and undergraduate design and theory at Rice University School of Architecture. He previously taught at the Architectural Association in the Design Research Laboratory and has worked and published internationally.

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1.
INTRODUCTION

One is apt to think that a culture is more attached to its values than to its forms, that these can be easily modified, abandoned, taken up again; that only meaning is deeply rooted. This is to… ignore the fact that most people cling to ways of seeing, saying, doing and thinking more than to what is seen, to what is thought, said or done…

A whole history of the formal in the twentieth century remains to be done: attempting to measure it as a power of transformation, drawing it out as a force for innovation and locus of thought, beyond the images or the "formalism" behind which some people try to hide from it.

—Michel Foucault

1.1 Satellite photo of Manhattan, New York, September 12, 2001. NASA Goddard Space Flight Center.

PROLOGUE: INFERNAL RETURNS

On a late summer morning at the dawn of a new millennium, the identity between architecture and the body returned with a sound like thunder. And then it was doubled. The trauma of the September 11, 2001 attack on the World Trade Center was so effective in part because it evoked the relationship between architecture and our sense of embodiment. Just the day before, such an identity between buildings and bodies seemed a quaint myth in our age of transnational dot-com capital. Yet, between the impacts and the Towers' smoky absence, an intimate psychical identification seems to have been made across the buildings and those who watched from a safe distance or via telepresence. In the following days, the Towers' destruction was represented as a wound, a personal one for many, but also as a symbolic injury to the collective political body of the nation and even to the nebulous body of culture dubbed "civilization."

The World Trade Center was a complex object for such projections. On the one hand, the Towers were proportioned like colossal Doric columns, long celebrated as recalling the standing body. The points of impact appeared like gashes in the taut steel and glass skin; the doubling of the event stretched the instant of shock into a televised duration replayed repeatedly. On the other hand, the edifice was exactly the sort of modernist architecture often criticized as dehumanizing and scaleless. Indeed, before the attack, Minoru Yamasaki's towers served as icons not for the body but for modern architecture's inhuman abstraction. Their vast size and generic blankness seemed symbolic of globalization's incompatibility with humanism and humanistic environments. Upon the building's completion, Lewis Mumford criticized the complex as an example of technocratic megalomania. Not only did the design not reflect the human body, it embodied the forces of unchecked modernity that, Mumford decried, were "eviscerating the living tissue of every great city."[1] The Towers were, in short, seen themselves as weapons and invaders attacking the body of the city and the cosmopolitan body politic born from the womb of the metropolis.

Of course, such identifications only tentatively rely on the forms of the object. Indeed, the identification formed on September 11th seemed to have been not a symbolic identification with a thing so much a desire for such at the very moments of its impossibility. Slavoj Žižek has suggested that part of the shock of the event lay in familiar phantasmagoric Hollywood images of destruction being suddenly rendered *really* Real. The Towers, Žižek suggests, were peculiar symbols of the disembodied hyper reality of global finance.[2] Perhaps in a similar way, the physiognomy of the Towers foreshadowed the day's unrepresentable events. Their abstract physique did not signal simply a lack of a body-building identification but rather shrouded the void that underlay all such metaphorical constructions. In their twinned blankness, they stood like vast brackets in an urban field, at once holding

open and cloaking the dissolution of architecture's capacity to articulate subjects' relationship to a collective Reality.[3] This gap was revealed as the buildings' apparent monolithic stability was replaced by punctures that transformed the buildings' bulk into seemingly paper-thin lace curtains. Indeed, their steel lattice and truss structure, as it turns out, was integral to the way they withstood the initial impact and the dynamics of their collapse roughly an hour later. The void that was bracketed became apparent in those minutes. The symbolic relation of architecture to our body or sense of embodiment was not something remembered so much as experienced as already lost. No wonder images of the Towers in television shows and movies were digitally removed so quickly afterwards.

This is also evidenced by the popular reaction against the initial proposals for rebuilding the site as yet another generic global *simulacra*. There was a moment when architecture's role in articulating collective desire seemed to matter again. Donald Trump's counter-proposal to construct a precise imitation of the World Trade Center Towers—but fortified—was impossible for the same but inverted reason in that it would have created a double bracket, converting the events into simulations. Or, think of the popularity of Daniel Libeskind's "Memory Foundation" master plan. His original proposal for One World Trade Center consisted of a 1776-foot angular shard with an offset spire that aped the physiognomy of the Statue of Liberty. The other buildings were to have mirrored this first building as progressively smaller fragments. In this all-too-literal proposal, the two lost towers were to have been reconstituted as an echo of an architectural colossus, a body sown together out of pieces, a kitsch Frankenstein monster, not a monument for the victims so much as the simulacral monumentalization of America's bewilderment within the "desert of the Real" suddenly made apparent in lower Manhattan.

As I watched that day's events from London, a few lines from Jean-Paul Sartre's *Being and Nothingness* reverberated with the images on my television screen:

> *I live in my body in danger as regards [to] menacing machines as well as manageable instruments. My body is everywhere: the bomb which destroys my house also damages my body insofar as the house was already an indication of my body. This is why the body always extends across the tool which it utilizes… in the whole house for it is my adaptation to these tools.*[4]

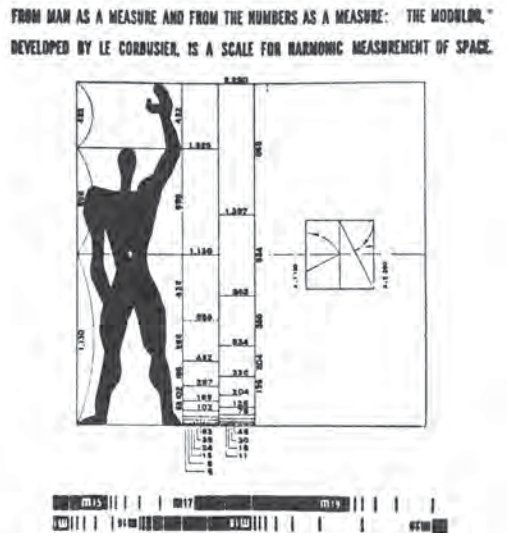
I had first encountered this passage through Anthony Vidler's book *The Architectural Uncanny*, and (on a day that had begun for me like any other around that time, with research for what would become this book) I could not help but feel an uneasy sense of repetition.[5] Sartre was speaking, of course, about World War II and the age of intercontinental nuclear warfare and not of the different geo-strategic space of the twenty-first century.

Nevertheless, once again, our "manageable instruments"—from the planes to the television media, to the cell phone that first brought the news to me within the British Library, to the internet and even information infrastructures used by the terrorists and global capital alike—were converted into weapons against the metaphorical body of the World Trade Center, which also served as a synecdoche for an entire nation and as a metonymy for global capital. Once again, architecture participated in disassembling symbolic structures.

Moreover, this dynamic of disassembly seems to have been mobilized in reverse in the subsequent "war on terror." The attacks on the crystalline geometries in New York (and revealingly, far less the lumpen Pentagon) are portrayed as attacks on the edifice of "western civilization." Meanwhile, the outsiders are presented as nomads hiding in the caves of Tora Bora or in holes under the Iraqi desert. Reversing Aristotle's claim that the construction of cities is a crucial demarcation of culture, this representation of a lack of architecture becomes one mechanism to convert their representation as human subjects into less-than-human "enemies," or even as, "collateral damage," that is roughly equivalent to buildings. Likewise, holding detainees in cages at Guantánamo Bay, a placeless spot removed from any nation's domestic space, is one small way of repeating the Bush administration's rhetoric that such "illegal combatants" are not members of any body politic and therefore not protected by either social contracts (constitutional protection and international treatise) or human rights. Bentham's Panopticon may have been architecture for disciplining the criminal subject (as Foucault argued) through an apparatus of vision, but the prisoners of Guantánamo are presented as undeserving of legal representation via architectural orthopedic correction. To echo Judith Butler's arguments in *Precarious Life*, withholding architecture from these other bodies helps to absolve our complicity with the violence done to these persons, guilty, innocent or in the wrong place at the wrong time.[6] This dynamic is also at work domestically since the attacks on the World Trade Center provided the mechanism for advancing what Giorgio Agamben has called a "state of exception" that suspends legal structures of the collective body politic in favor of control over the "bare life" of individual bodies.[7] What bodies are being adapted through these tools of power, what subjects are we fashioning through these "manageable instruments"?

THE BODY OF ARCHITECTURAL KNOWLEDGE

This book is not about those events, but its time frame is bracketed by the war chronicled by Sartre and the hyper-Orwellian "war on terror" inaugurated in 2001. This book is about the relationship between architectural form, the body, subjectivity and epistemology in the last half-century of architectural theory and design. Or rather, I examine the role of that which architects call "the body" in articulating the relationship between architectural form and



1.2 Le Corbusier, *The Modulor*, Figure 172, *Modulor 2*. Copyright, FLC/ADGAP, Paris and DACS London, 2006. This is the last image of the Modulor in the book. On the right of the figure are the two Fibonacci sequences, which Le Corbusier called "Red" and "Blue" scales of measure, with a stylized human figure inscribed within these measures. The square on the far right suggests a derivation from the Golden Section. Below the main drawing, the two scales are repeated as a ruler, which, as the caption suggests, became the basis for a version of the Modulor as a tape measure.

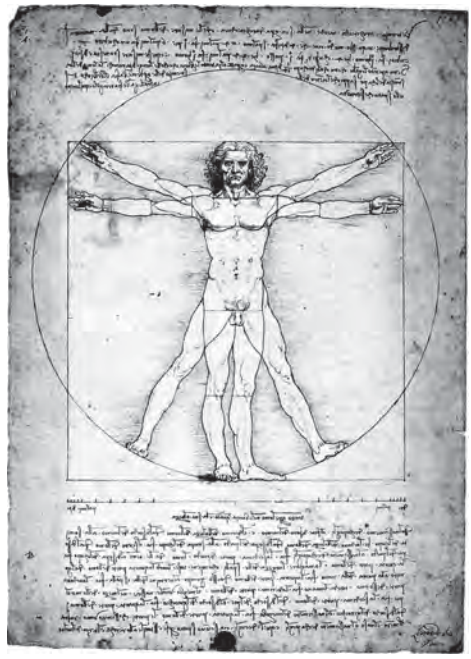
architectural ideas of subjectivity. I am, therefore, also concerned with the spaces and dynamics of projection through which objects of knowledge and concepts are formulated. I hope that this theoretical examination operates as a partial history of the present, a moment when the very concepts of the body, order and subjectivity all promise to be radically transformed by digital technology, new organizations of power, and when the traditional objects and ordering of architectural knowledge seem in crisis or even eclipsed.

My primary site of examination is the sudden, and heretofore unexplained, re-appearance of the human figure in mid-twentieth-century architecture and its relationship to recent interest in the body in reference to issues of post-humanism, digital technology, globalization and science. There are several reasons why I locate my inquiries around this apparent backwater of modern architectural history. First, histories of modern architecture have overlooked the discourse around the human figure prevalent between the late 1940s and the early 1960s in many parts of Europe and America. A few articles exist, but these are often very specific or idiosyncratic; still others, which often seek to continue this discourse, are theoretically regressive. Accounts in broader historical texts are absent or cursory. Even Le Corbusier's Modulor, the most famous representative of this discourse, has

received relatively little attention in accounts of his œuvre. Yet, even today, many books are published each year claiming some correspondence between design, the human body, natural forms and geometric proportioning system such as the Golden Section and Fibonacci series.[8] Secondly, there has been a renewed interest among progressive architects in early-twentieth-century arguments for the geometric ordering of natural bodies, such as found in D'Arcy Thomson's *On Growth and Form*. To understand what might be at stake in such arguments, it seems useful to examine a historical discourse that referred to similar or even the same referents as a way of ordering architecture. Fourth, architectural discussions of the body, humanism and post-humanism frequently refer to the mid-century discourses on proportion, but rarely in detail or as a straw-man. This book, in contrast, attempts to map a partial preconscious topology of contemporary architectural thought, seeing the modern discourses of proportion not as a backwater but as a hinge to current issues.

Lastly, while the mid-century interest in the body is usually presented as a return to Vitruvian humanism, I will argue that this was merely a superficial effect of a more complex attempt to formulate a theory of form for an entirely modern organization of knowledge and subjects. In fact, by crossbreeding history with design techniques, the texts that emerged with the late 1940s discourses of proportion by Rudolf Wittkower, Colin Rowe and less overtly, Le Corbusier, constructed a normative reading of the Vitruvian Figure and the relation between humanism, modernity and architectural form. Any attempt to track the history of the body in architecture must pass through this convention, at least implicitly.[9] This formation of thought, as Sylvia Lavin has put it, "haunts" contemporary architecture.[10] It is time to specify the terms in which these texts became such specters, to exorcise our demons.

Traditionally, of course, the relationship of the body to architecture was defined through Vitruvius's first-century BC treatise, *De Architectura*, which described how a human figure could be inscribed in a circle and a square and provided a set of ideal geometric principles to be copied into architectural form. Vitruvius's text has come to embody the tradition of humanism in architecture and has been interpreted so often that drawings of the so-called "Vitruvian Man" or "Vitruvian Figure" have become a cliché. This traditional relationship between the building and the body has been described through a variety of tropes: general analogies in which buildings are like bodies, and specific metaphors of the singular bodies of Kings and structures of power;[11] synecdoches wherein isolated buildings seem like entire worlds; metonymies where architectural details, like the column, are understood as whole bodies.[12] In return, traditional concepts of what constitutes a proper body—biological, political or technical—are notably architectural in their organic melding of parts into symmetrical and hierarchical wholes. Abraham Bosse's frontispiece to Thomas Hobbes's *Leviathan* is just one example of the use of image of the body as a proper



1.3 Leonardo da Vinci, Vitruvian Man, 1492. Pen, ink, watercolor and metal point on paper, 343 x 245 mm. Gallerie dell'Accademia, Venice.

"forme" (to employ part of Hobbes's subtitle) for the State that integrates its constituents into an organic whole greater than the sum of its parts. Much of architectural knowledge seems to dance around the understanding of what the traditional body metaphor is, the ordering it projects, how it was constituted, and how it inscribes subjectivity through geometry.

As both digital and biological technologies raise existential anxieties, the body has again become central in attempts to locate architecture's relationship to subjectivity and epistemology in our "post-human" condition. Virtual reality myths and networked information technology promise to drastically collapse bounded wholes and replace them with electronic flows. The presence and stability of the body as a model have been replaced by proliferating *simulacra*. Likewise, in recent decades theorists of technology, art, architecture and visuality have argued—not unlike Sigfried Giedion did *vis-à-vis* mechanization in the early twentieth century—that we are experiencing a quantum leap in the dislocation of the subject due to the internet, virtual realities and digital visualization. Former Dean of Architecture at MIT and leading theorist of digitalization in architecture, William J. Mitchell argued that unlike photography's indexical relation to vision as a prosthetic eye, digital visualization bears no necessary relationship to human embodiment and challenges our trust in empirical reality since programs such as

1.4 Abraham Bosse, frontispiece for Thomas Hobbs, *Leviathan*, 1651.

Adobe Photoshop™ allow alterations and fabrications without leaving any traces.[13] What you see is no longer what you get, or maybe, is all you can get. Jonathan Crary characterized the present as a "transformation in the nature of visuality probably more profound than the break which separates medieval imagery from Renaissance perspective."[14] What is occurring, he suggests, is the augmentation of singular experience with new mediated forms of telecommunication that challenge traditional notions of embodiment. According to Fredric Jameson, "our postmodern bodies are bereft of spatial coordinates."[15] Or, at least, space no longer seems usefully understood through the traditional coordinates of the architectonic body.

Simultaneously, biotechnological projects and evolutionary theory continue to diffuse the boundaries of the human and animal as well as nature and culture. By the middle of the twentieth century, the architectonic model of the organism had been replaced by an informational model of life, whether one is talking about the discovery of DNA, ergonomic integrations of human operators into electro-mechanical networks, or the advances of cognitive psychology. One of the founders of cybernetics, Norbert Wiener replaced the architectural body metaphor by describing human experience as a whirlpool, a pattern, a momentarily stable system within a vast flowing ocean of information. "Life," in this cybernetic framework, is an emergent

epiphenomena produced by feedback loops, codes, and informational errors (mutations); bodies became performative containers for the transmission and transformation of this semiotic code across generations.

And so, by 1969, none other than Martin Heidegger felt compelled to announce the "completion" of the age of humanist metaphysics by the "new and fundamental science called cybernetics."[16] He speculated on what remained for thought when the sciences of the human subject were governed by informational "function" rather than "ontological meaning." As then dominant strains of cognitive psychology must have seemed to demonstrate, philosophy had become information theory. Epistemology and ontology merged into information.[17]

Today's descendants of such post-war cybernetics continue to deterritorialize the body to fashion new assemblages of subjects and technologies. We can combine genetic material to create "transgenic" creatures even as we discover that most of the stem-cell lines available for use with the United States are already contaminated with mouse DNA. Scientists are developing at least two different techniques for growing "cow-free" steaks in laboratories while performance artist Stelarc and medical researchers attempt to grow living tissue in the shape of human ears. Artists like Eduardo Kac produce phosphorescent bunnies as transgenic bio-art. Structural engineers are seriously proposing that buildings should grow themselves, either formally via "genetic algorithm" software or even as actual construction. Nanotech may realize the promise of the Vitruvian body by annealing utility, commodity and delight on the fly.

At the same time, these body technologies have coupled with social and political frameworks to place representations of subjects via the body at the center of debate, whether as in the advancement of multi-culturalism, feminist cyborg theory, green politics or even by the Religious Right. Debates about genetically modified food, cloning, stem cell research, living wills, and electronic implants register concern over the development of what Michel Foucault, Gilles Deleuze, and recently Hardt and Negri (among others), have diagnosed as the biopolitics of a control society. Rather than operating through the Hobbsian ideas of a body politic, biopower operates directly upon a multitude of individual bodies through administrative functions and technologies, transforming concepts of public and private, interior and exterior, local and global. Society, it is said of our post-colonial, globalized condition, is no longer an organic and hierarchical unity of its parts but rather a network of radically different multitudes. Giorgio Agamben, echoing Heidegger, has recently argued that we are experiencing a shift wherein the intimacies of the body and its management have become the site where our hopes, desires, nightmares and power are negotiated and manifested as new forms of subjectivity and social order alike.[18] That is to say, our bodies are part of constructed assemblages, commingling objects with subjectivities

operating within vast networks of institutions, media, and technologies. The body and its figuration of the subject are no longer given by transcendent or even stable referents, but are immanently and intimately *designed*.

Every day, in ways mundane, fantastic and therapeutic, the categories of the natural born and the culturally constructed are traversed in favor of novel hybridizations. Donna Haraway and Bruno Latour have argued that every categorical distinction thought to make humans distinct has been revealed as science fiction in our cyborg age. This is true as well in our most compelling post-war myths of the body and technology. What is your body when surfing William Gibson's "cyberspace," in the hunt for *Bladerunner's* Replicates, or indeed in J. G. Ballard's *Crash*, other than an erotic interface for coupling with machinic assemblages and non-human intelligences? We are becoming cyborgs, or at least are on the road to being "post-human."[19]

And so, just when the tides of history seem poised to wash humanism away, when the body never seemed less certain as a model, architects stand at the shore of the future surrounded by a proliferating multitude of cyborg bodies, prosthetic bodies, animal bodies, blobby bodies, mutant bodies, steroid bodies, pornographic bodies, holocaust bodies and even ghostly disembodied bodies. An image that has surfaced in architecture as an icon of such hybridity is Daniel Lee's "Manimal," which Ben van Berkel and Caroline Bos claimed replaces the Vitruvian Figure's humanist integration of parts into a greater whole with a "seamless organization of disconnected parts."[20] The "Manimal" is a series of "portraits" based on the Chinese zodiac generated by using computer software to merge elements of human and animal bodies. In the computer, all images are made up of a rasterized matrix with every pixel independently addressable and interchangeable with any other point. As in Mitchell's arguments, we can no longer determine what belongs to its original source, or even locate the seams between parts; there is no part, no whole to be made. In so far as the portraits can be said to depict bodies, therefore, they are bodies given by the information-based genetic recombination allowed by statistical topologies, not the geometric organicism of Vitruvius. This body is not made by drawing the geometric contours of an ideal subject but is produced by recombining hue and tone values of simulacra, copies without models. In this way, the "Manimal" refers to a world in which ultimate distinctions between animal/human, machine/animal and the virtual/physical have all been superseded.[21]

Many of the technologies and knowledges that are transforming the actual body are also transforming the body of architectural knowledge and practice. A building designed using computational algorithms and constructed by mass-customized production seems a fundamentally different sort of object than that which is drawn by the hand and erected using the skilled labor of craftspeople or even mass-produced. The status of the architect as author is put into question. Conversely, just as architectural

1.5 Daniel Lee, "Manimal: Year of the Ox," 1993. Copyright and courtesy of Daniel Lee.

bodies have provided so many of the organizational metaphors and spatial typologies for political and social theory and practice, architects have asked what physiognomy mirrors our post-Fordist information economy. What are the architectural principles in this age, when the traditional body that we are told provided the model for architecture seems to have been replaced by cybernetic networks and similar comminglings of things with subjectivities and subjects with things?

STRUCTURE OF THE BOOK

This book attempts to partially map the conditions of this maelstrom. If we are experiencing a fundamental shift in our embodiment and of the built environment—or even if we wish to determine whether such a phenomenon is occurring and whether it marks a break with or is a further stage of modernity—we need to understand our relation to those who preceded us.[22] I begin with two chapters examining the understanding of the traditional Vitruvian model that informs contemporary architectural discourse and its concepts of humanism and modernity. Chapter 4 unfolds Le Corbusier's Modulor into this narrative as the heir of the Vitruvian tradition, but one that presents problems for the understanding of it. Having established the active operation of this apparently historical discourse within recent architectural thought, I turn in the rest of the book to the discourses of proportion in

the middle of the twentieth century. In Chapters 5 and 6, I recall the larger scope and nature of the debate and encounter Rudolf Wittkower's construction of a Renaissance for modern problems of knowledge, re-examining the role of Neo-Kantian thought in modern architectural history. Chapter 7 brings these threads together by tracking the legacy of the decade-long interest in proportion through Sigfried Giedion's use of Ernst Cassirer's theories of humanity and animalism to develop a quasi-anthropological theory of architectural form. In Chapter 8, the discourses of proportion in modernity are related to the rise of statistics and the construction of the subject given by the social sciences. Chapter 9 then applies these discoveries to provide a different account of the Modulor as a visual anthropogenic machine. The final chapter concludes by drawing together the implications of the arguments of the book, distinguishing the problems of modern anthropomorphism from those of anthropocentrism.

In these analyses, I concentrate upon the problems of architectural design and its bodily models in modernity, but approach these issues from a vantage point outside their normative disciplinary context. I adopt a strategy of critique, attempting to describe the objects, practices and statements of architecture in a way that raises different sets of questions than those which govern conventional historical accounts, though I do employ historical material and work through concepts of historicity to formulate theoretical propositions. For example, rather than focusing on the meaning of the human figure's re-emergence after World War II, I explore the conditions and forms of its re-emergence. Similarly, rather than assume it simply marks a return to a traditional Vitruvian humanism, I ask on what terms such a comparison becomes possible.

In this process, I hope to chart how constructions of architecture's past operate as a complex site of introjection within contemporary architectural thought. Such sites of introjection are crucial for problems that evade elaboration because they inform the discipline's conditions of possibility in the present. Made visible by proxy and transposition into a different field of knowledge or a different time, the problem becomes accessible and is then reincorporated into architecture. It now appears as an object that arose elsewhere, but that in fact became a carrier of a blind spot in the discourse because it is constitutive of its larger field of possibility rather than an isolated problem that can simply be resolved and moved beyond. Through this process, a preconscious condition of knowledge becomes a conscious statement within a discourse, opening a potential within it. Thus, such problems are not holes in knowledge for the historian to fill but events that ripple along our horizon, discontinuous folds along the topography of thought that can serve as measures of its transformations. If architects seem to eternally return to the body, they do so today because it offers an unfinished—incompletable—problem that is paradoxically a motor of both innovation and conservation.

2.
THE PHENOMENAL ORIGIN OF ARCHITECTURE

2.1 Claude Perrault, first plate, *Ordonnance des cinq espèces de colonnes selon la méthode des anciens*, 1683. Courtesy of The Getty Center of the History of Art and the Humanities.

The interest in the body-building analogy is not merely archaeological … The value of the antique example [of the body-building analogy] is… in the implication of what everyone, all of us, expect from building whether we know it or not: that… buildings will be the screen through which the body with which we are intimate will help us situate ourselves in the unfamiliar and often hostile outside world.[1]

Instead of railing against the possibility of body analogies in architecture let me suggest that what we used to call bodies have simply mutated and transformed into something else. The bodies themselves are probably the same as they always were but our concepts have changed… the combinatorial model of the body is founded on the changes in identity that take place with greater degrees of complexity and connection.[2]

We find here two statements made five years apart near the *fin-de-millennium*. Each was published in collections themed around the renewed interest in the body in architecture. Their authors speak from leading educational institutions, one a respected authority in the twilight of a scholarly career; the other emerging at the bleeding edge of architectural design. Both reclaim the potential of what they present as a neglected or disparaged "body analogy" as a site for contemporary architectural practice. The first, from a text called "Body and Building," seeks to recover an antique analogy in order to stabilize architecture within a chaotic and alienating present, while the second, "From Body to Blob," calls for new analogies better able to articulate the complex webs of identity in our wired world.

In short, these proclamations represent divergent positions that have both placed body metaphors at the center of architectural thought and innovation, the first drawing upon phenomenology and hermeneutics and the second circulating around post-structuralist theory. Moreover, both positions continually return to a normative model of the body, one that remains implicit in these two passages, but from which they are derived. This is, of course, the Vitruvian idea that a precise set of proportions and geometric relations can be derived from an ideal body, and that this should be the model for architecture. This has often been drawn as the so-called "Vitruvian Figure," perhaps the most famous, repeated and arguably important diagram of architectural order and its link to subjectivity, epistemology and even cosmology. The Vitruvian Figure is important to phenomenologists because they seek to recover that tradition. Meanwhile, because the post-structuralists seek a definitively non-humanist architecture, the Vitruvian Figure becomes an important register against which to project alternative futures. To understand their arguments it is useful to understand what is meant by this "Vitruvian Figure" and the tradition for which it stood and the role it plays within recent design discourses and their projected futures.

I examine these operations in this chapter by examining the "phenomenological" position and follow on in the next chapter with an analysis of "post-structuralist" arguments.

PRIMAL IDENTIFICATION

In the late 1970s, a critique of modernism began to emerge that attempted to produce a theory of architectural design based upon hermeneutics and phenomenology, especially the writings of Paul Ricoeur, Hans-Georg Gadamer, the later work of Maurice Merleau-Ponty and, of course, Martin Heidegger. While never formalized as a "school," the writings of Joseph Rykwert, Alberto Pérez-Gómez, Juhani Pallasmaa, David Leatherbarrow, and Dalibor Vesely, to name a few, have constructed a rather stable and coherent formation of thought within contemporary architecture. This architectural version of hermeneutic phenomenology emerged from institutions like Cranbrook, Cambridge University and the University of Pennsylvania, expanding with successive generations of graduates. Indeed, even while presenting itself as an alternative to normative practices of architecture as a service profession, it has become a prevalent pedagogy within the academy, strongly represented, for example, in the annual conferences of the American Collegiate Schools of Architecture. While each author has different emphases, the relationship between the body and architecture is a recurrent theme.

I want to examine this position through case studies of texts by two of its most important adherents, Joseph Rykwert and his former student Alberto Pérez-Gómez. First, I will examine Rykwert's career capstone, *The Dancing Column*, and his use of historical material to produce a theoretical claim that the metaphorical projection of the body is the origin of architecture, both historically and conceptually. I will then examine the implications of this claim for understandings of modernity, turning to Pérez-Gómez's analysis of the origin of modern architecture in his widely read *Architecture and the Crisis of Modern Science*. For both Rykwert and Pérez-Gómez, bodily metaphors serve as the foundation of architectural order. Ultimately, theirs is a polemical project that argues for how the body metaphor operated in the past in order to speculate upon how that relationship might be recovered in the present. I have selected these two texts as case studies not simply because they have been influential but also because they present the most sustained arguments in regards to the relationship of architectural history to concepts of the body and order. However, the sorts of statements and claims they present are repeated in many other texts, lectures, and course syllabi.

In his massive text, *The Dancing Column*, Joseph Rykwert presented a veritable edifice of archaeological and ethnological evidence of the role of the body in ancient Greek architecture, which he interprets via hermeneutic and phenomenological frameworks. Rykwert claimed that the basic post-and-lintel structural principle of the Greek temple allowed a "primal identification

of the standing human body with an upright post."[3] Primal is the keyword, for it invokes the body as the source of architectural order, the first architecture as it were. It also suggests a magical animation of inert stone with organic, living, and human, qualities. The divisions of architecture into top, middle and base, the organic integration of parts to whole, and the general proportions of these elements and wholes were all transposed from the body. In this, Rykwert locates a double origin of Architecture as a discipline: first, a cultural and historical origin in the ancient Mediterranean, crystallized in the Greek temple and its orders; second, a conceptual origin in the forms and measures provided by the body, inscribed into stone via metaphorical projection.

This formulation of the body in architecture, Rykwert argued, was effectively axiomized by Marcus Vitruvius Pollio in his *De Architectura libri decem (Ten Books on Architecture)*, written in the first century BC. His passages on the body as a model occur principally in the third book, where he makes explicit the relation to be drawn between the human body and architecture as an organic whole:

> *Symmetry is the proper agreement between the members of the work … in the human body there is a kind of symmetrical harmony between forearm, foot, palm, finger, and other small parts; so it is with perfect buildings.*
>
> *…*
>
> *In the members of a temple there ought to be the greatest harmony in the symmetrical relations of the different parts to the general magnitude of the whole. Then again, in the human body the central point is naturally the navel. For if a man be placed flat on his back, with his hands and feet extended, and a pair of compasses centered at his navel, the fingers and toes of his two hands and feet will touch the circumference of a circle described therefrom. And just as the human body yields a circular outline, so too a square figure may be found from it. For if we measure the distance from the soles of the feet to the top of the head, and then apply that measure to the outstretched arms, the breadth will be found to be the same as the height, as in the case of plane surfaces which are perfectly square.*[4]

Thus, the proportional relationships of this ideal human body served as the model for the arrangement of architecture into an organic whole, one greater than the sum of its organs. Nothing could be added or subtracted without disrupting this symmetry. Vitruvius provided no drawings, leaving the imaging of this ideal body inscribed into a filigree of geometric to architects and humanists of early fifteenth-century Italy, when Vitruvius's text was rediscovered and translated. Alberti, for example, made explicit connections between the centralized church and the Vitruvian body as "a visible echo of a celestial and universally valid harmony."[5] Architects and artists have since

made innumerable drawings interpreting this passage. Upon these few hundred words, an entire tradition seems to have unfolded.

At this level, therefore, Rykwert's argument makes no claims of novelty. His arguments, in fact, depend on their status as refrains within a long tradition. The nature of the relation between body and building may change, becoming more or less explicit, laying dormant or even falling into disrepute, but it is ever present in some way. Rykwert summarized architectural history as a dialectic of body models and metaphor:

> *On one side is a perpetually changing awareness of the body, the slower modifications of building methods, and the differing visions of the world order (or disorder); on the other is the sure expectation of the metaphoric commerce between them, against which all the changes may be rung.*[6]

That is, each new edifice that has deserved the name Architecture has been a recollection of its origin, its "primal identification." The apparent diversity in architectural objects, styles, periods and geographies are merely versions of a primal identification, calibrating the fundamental metaphor via what secondary, cultural or historical referents, such as gender (for example, he examines the ethnographic associations of Corinthian Order as female and the Doric as male).

THE HOME OF MAN

These themes are also present in Pérez-Gómez's writings. For example, *Architecture and the Crisis of Modern Science* depicts a pre-modern architecture structured according to the same body metaphor, repeating Rykwert's claim that, Vitruvius's *Ten Books* marked "the beginning of our tradition" of architecture, one that returned to ancient Greek architecture as a model.[7] He also invokes a similar reciprocation between architecture and the body, citing Merleau-Ponty's dictum that knowledge cannot exist outside the "*a priori* of the body's structure and its engagement with the world."[8] Accordingly, Pérez-Gómez pronounced that, "The creation of order in a mutable and finite world is the ultimate purpose of man's [and architects'] thought and actions."[9] Here, the projection of the body is not simply the *telos* of architecture, but also of humanity itself.

In such arguments the body metaphor in architecture is the foundation for humanity's poetic structuring of the world. Through the metaphorical projection of our body the world of things reflects our sense of embodiment. This is not so different from the cognitive theories of George Lakoff and Mark Johnson. In a series of collaborative and separate texts, Johnson (a philosopher) and Lakoff (a linguist) have placed the projection of bodily experience at the core of what it means to be human and of our understanding of the world created through such metaphoric operations. They also rely heavily upon the philosophies of Merleau-Ponty and mobilize anthropological and archeological evidence, though they combine this with modern linguis-

tic theory and cognitive psychology. They argue that our experience of our body provides the primary metaphors through which to organize our perception and sensation of the world into meaningful arrangements, which is then projected through our body and its extensions (tools, writing, and architecture) in order to fashion a commensurable life-world, or *Umwelt*. As the title of their first collaborative book suggests, we "live by" these metaphors in the sense that they govern our understanding of existence and through them humanity has developed a rich cognitive and social reality. Like Rykwert's metaphoric commerce, understandings of the body might change, but these are contingencies that only overlay the *a priori* experiential template the body provides.

Similarly, Rykwert concludes that body metaphors are at the origin not simply of architecture as a body of knowledge but also at the core of being human:

> *The condition for any person "finding himself" in the man-made world must therefore be that buildings should be like bodies in the first place, and in the second, like whole worlds…*
>
> *The condition, perhaps the only necessary condition under which architecture may be produced at all, has always depended on that double metaphor, since architecture is the essential* parlar figurato *(the speaking in figures) of building.*[10]

Here, the metaphorical projection of the body into architecture is a primal condition for constructing a meaningful world. The body metaphor does not simply allow a meaningful architecture; the identification between the body and the building is also the necessary condition of being human, for making a home for humanity in a hostile world.

Likewise, the anthropologist Mary Douglas placed architecture as the body's original symbolic surrogate:

> *The homely experience of going through a door is able to express so many kinds of entrance. So also are crossroads and arches… [However] the structure of living organisms is better able to reflect complex social forms than door-posts and lintels… Even more direct is the symbolism worked upon the human body. The body is a model which can stand for any bounded system.*[11]

In traditional cultures, she argued, the body has provided the model for all symbolic boundaries and architecture duplicated this symbolic schema. Concepts of the body and architecture inform the distinctions between order and disorder, the clean from the defiled, that which is ordered and proper from that which is "matter out of place" (Douglas's definition of dirt). To put this in Heideggerian terms, the Vitruvian tradition offered a poetics for the elaboration of *techne*—through which to dwell in the universe. Architectonics is not simply shelter, but an act of revealing the possibility of Being as dwelling.[12] The relationship between building and body provides the ground

(*topos*) that sets humanity apart, in an architectonically closed and symbolically ordered space distinct from the world of nature.

In these arguments, *anthropos* and *arche* are synonymous. Designate a pile of stone "architecture" and you extend the category of "human" or "culture" to its creators; withhold this name and you have animals or barbarians.[13] Myths of the origin of architecture are filled with references to a use of the body to measure out the dimensions of a fabled primitive hut. If Freud suggested that we are "prosthetic gods," born too early and unable to survive without supplement, then architecture serves as the original prosthetic. Aristotle argued that the mark of culture and humanity's transcendence over animals was the construction of cities. In all these examples, the "open" of sensations and instinct of animal intensity are transformed into a closed world of human representation through the extensive projection of the body.[14] In other words, the projection of the body in architecture symbolically circumscribes the "ascent" of the animal named *Homo sapiens* and bestows upon this creature a proper name, *Human*.

THE DECAY OF MODERN ARCHITECTURE

Ultimately, Rykwert's "necessary condition" defines a humanist architectural tradition irrespective of style or location, though inaugurated in ancient Greece and formalized by Vitruvius. While this canon is most apparent in the classical orders, it is not limited to a style, nor does the use of classical details ensure coherence within this humanist canon, as we shall see.

In fact, the claim that the body metaphor is the "necessary condition" of architecture and of being human has important implications for the phenomenologists' understanding of modernity and modernism. Because the metaphoric commerce is not limited to a classical style, Pérez-Gómez suggests that "the origins of modern architecture cannot simply be a matter of evaluating the extent to which the classical orders were used or rejected."[15] Instead, the origin of modern architecture is to be found in the erosion of the metaphoric relationship between the body and architecture and thus of architecture's "necessary condition" itself.

Pérez-Gómez located the beginning of this erosion in later seventeenth-century France and in Claude Perrault's controversial treatise, *Ordonnance des cinq espèces de colonnes selon la méthode de anciens* (1683). For Pérez-Gómez, this text marks "the 'beginning of the end' of traditional architecture," due to its displacement of body metaphors by "scientific" reason.[16] Because Perrault's *Ordonnance* figures so strongly in this argument, it is useful to examine his interpretation in detail.

Perrault, in Pérez-Gómez's recounting, never questioned the classical orders or the importance of proportions as such. Instead, he rejected the body's authority as a model for the classical orders. Perrault argued that rules of proportion created an "arbitrary beauty" based on "fancy"

and cultural "taste" given by custom rather than a transcendental value or timeless truth. Perrault did not blindly accept Vitruvius as authority and instead sought to confirm his arguments by measuring important ancient and Renaissance architectures (or at least drawings of them). The results revealed inconsistencies in the use of proportions and little regard for any correspondence to an ideal body model as prescribed by the so-called "Vitruvian Figure." No consistent canon of proportion seemed to govern widely admired buildings. Given this, Perrault decided that habit rather than the "imitation of nature" or the body determined proportional rules. The body metaphor was merely an illustrative myth, one that should be replaced by reasoned measure. Moreover, Perrault claimed one could improve upon ancient theories through rationalization, proposing a common module derived by averaging the measures he had taken of admired works of the past.[17] This new metric, he argued, was to govern all the orders. The most famous of Perrault's drawings placed columns from all the orders on a single grid for the first time; they are not distinct orders so much as statistical variation of an overall mathesis. In addition, Perrault rejected optical corrections (such as the *entasis* Rykwert suggested reflected a sense of corporeality) as "abuses" since they placed fallible perception above mathematical rigor.[18] For Perrault, authority derived from the mind, measure, calculation and consistent use, not ancient authority, natural law, or perception. In doing this, Pérez-Gómez argued, Perrault displaced the body as the central metaphor of architectural order.

Perrault's bravado was spectacular given that he had translated Vitruvius's *De Architectura* only a few years earlier. A neat symmetry exists between Perrault's translation and his subsequent rejection of Vitruvius and Pérez-Gómez's relationship to Perrault's treatise. A recent English translation of the *Ordonnance* was prepared in collaboration with Pérez-Gómez, who also wrote a lengthy introduction that repeats—and slightly revises—many of the themes, arguments and conclusions made in *Architecture and the Crisis of Modern Science*.[19] In both, Pérez-Gómez presented the *Ordonnance* as pivotal to architectural history, a monumentally tragic marker of when "architectural proportion lost, for the first time, in an explicit way, its character as a transcendental link between microcosm and macrocosm."[20] Pérez-Gómez interpreted Perrault's rejection of optical corrections as the dislocation of architecture from the embodied experience of the subject in favor of rationalism and ideal formalism. Deference to the senses of the subject became in Perrault's treatise an "abuse" rather than a source of meaningful order. In turn, Perrault's concern for the use of a consistent module over the metaphor of bodily proportion signals the reduction of the world to an instrumental plane of explanation dominated by science and positivism. Pérez-Gómez considered the break with the body as part of the disenchantment and alienation of architecture from the human subject.[21]

Pérez-Gómez claimed that this erosion has continued since the late seventeenth century. Ultimately, the *Ordonnance* is important, he argued, because its influence needs correction: "grasping Perrault's theoretical positions, its complexities and contradictions, allows us insight into the reason underlying the impoverishment of the world of architecture."[22] In this regard, Pérez-Gómez emphasized Perrault's text not as a model but as an intellectual and ontological "failure," one repeated for the next three hundred years.

Rykwert also traced the beginning of the "decay" (Rykwert's term) of the body-building metaphor to the seventeenth century.[23] Rather than focus on the rise of scientific reason, he argued Perrault's declaration that proportions were culturally determined instead of transcendental marked the moment when, "notions of harmony and composition were displaced by those of taste and character."[24] Henceforth, Rykwert argued, theorists shifted their attention from *poiesis*—that which is concerned with the acts of making and meaning or what Pérez-Gómez called architectural intentionality—to the *aesthetik* of posterior judgment.[25]

For both Pérez-Gómez and Rykwert, Jacques-Nicolas-Louis Durand completed the downfall that constitutes modernity. Perrault retained a residual symbolic meaning, but with Durand's functionalism and the pervasive influence of his teachings and theories architectural form was reduced to mere "signs of technological [use] value."[26] Indeed, Pérez-Gómez and Rykwert argue Durand's functionalist formalism and his influential teaching led directly to the "geometry of the Bauhaus, the International Style, and the Modern Movement, which was essentially the undifferentiated product of a technological world view."[27] At the same time, for Durand, "the objective of architecture… was to please the eye" rather than speak to an embodied poetics of being.[28] This condition continued, they argue, until our understanding of metaphorical poetics decayed entirely. Thus, for these phenomenologists, two seemingly opposed developments eroded the Vitruvian tradition of bodily metaphor: on the one hand, the rise of rationalism and, on the other, the rise of taste determined by subjective fancy.

These two streams converged in modern architecture's apparent rejection of decoration. For Rykwert, Durand's arguments that decoration was a "foolish expenditure"[29] led directly to the modern view of ornament as a crime.[30] Rykwert argued that what we now call decorative elements were central to the elaboration of the body metaphor. The modern rejection of decoration was not simply stylistic, but based on its equation with rhetorical ideas such as the body metaphor. Decoration might be pleasing to the eye, but like a politician's rhetoric, it came to stand for untrustworthiness. Rather than making the primal identification legible (as Rykwert argued it did in ancient Greek architecture), ornament now appeared as a sophistry that persuaded with rhetorical flourishes and concealed truth.[31] If ornament was seen as meaningless supplement, it became appropriated by the

most decadent formalisms of the Beaux-Arts. In response, early modernism rejected "form" and "style" in favor of what appeared to be more objective criteria. The literal construction, its function and its structure, were thought to lead to a more rational, objective ground free from subjective license. In this regard, Rykwert made special mention of Lewis Mumford and Nikolaus Pevsner. The latter, according to Rykwert, claimed that architecture is something added to raw building, a supplemental "aesthetic appeal," while the former believed that modernity required a "plain-speaking architecture" stripped of rhetorical flourishes.[32]

But if the modernists sought a literal language of architecture by referring to construction, Rykwert replied that all language—architectural or otherwise—is figurative and rhetorical. As we have seen, in his reading of post-and-lintel architecture of ancient Greece, structure itself, by expressing the metaphor of standing is metaphorical. In elevating such tropes, he again echoes Lakoff and Johnson that metaphor is not a supplement but the core of the possibility of language. This has an architectural consequence because if all language is produced by and through such tropes, then the modernist attempt to remove rhetorical flourish and uncover a pure structure of literal language is a red herring. The double metaphor of the body is not something that can be stripped to reveal a more pure form because it is the very essence of architecture.

Instead, what occurred was the displacement of the primal identification and metaphoric commerce of the body and building with other sets of metaphoric referents, typically technological, cultural and scientific in origin. However, Rykwert claimed the modernist tropes of technology and rationality alienate the embodied condition of humanity from the means of producing the artifact. This means that construction cannot be used to articulate the relationship between the embodied subject and the world and instead only monumentalizes the alienation of the subject.

This repeats a common lament heard from writers as diverse as Heidegger, Adorno and Jacques Ellul about technology as a force of alienation.[33] Gianni Vattimo has summarized this account of a machined modernity:

> *Technology appears as the cause of a general process of dehumanization that includes both the displacement of humanistic cultural ideas in favor of modeling the human subject based on the sciences and on rationally controlled productive capacities, and a process of accentuated rationalization at the level of social and political organization that reveals the features of the wholly administrated and regulated society.*[34]

Rykwert echoes this in a vaguely Marxist vein, emphasizing a modern architecture driven by developers and standardized manufacturing processes that displace both the architect and their clients from the *poesies* of making, and thereby, Being as dwelling. Rykwert also associated this with the reduction of meaning based practices, including architecture, into commodities.[35]

Architecture becomes simply a technologically enframing, as Heiddeger described it, in which humanity becomes "standing reserve," instrumentalized for autonomous processes in which meaning is replaced by the infinite exchange of empty signs. In conformity, Pérez-Gómez laments that "most contemporary architecture speaks only to a technological process, not to the world of man."[36] He further claims that:

> *Clearly today, in a world of complex technological systems, we control, individually, very little; yet our actions… have a phenomenal importance… This is why I would argue formalistic strategies in architecture, regardless of the legitimizing frame of reference (in Marxist theory, linguistics, physics, or evolutionary biology) may be dangerously irresponsible.*[37]

Moreover, if body metaphors were the core of architecture's metaphysical function, its decline would have disturbed the humanist perspective that "places man at the center of the universe and makes him master of Being."[38] The split between the world and the subject that he argues began in the late eighteenth century is literally concretized by architecture. In so far that modern architecture specifically intended to break with a figurative *poiesis* of the classical tradition, it is deliberately nihilistic—without and against meaning. Both speak of cold, "sterile" cities of dead, speechless architectures in which a lonely figure is doomed to walk sullen streets planned by technocrats for maximum circulation rather than for "dwelling."[39]

In a different way, we can see this phenomenological argument as part of a broader interpretation of modernity as incompatible with humanist embodiment. Iconic modernist images of the body are often said to index a profound break with humanistic embodiment offered by historical worldviews, even from a not explicitly phenomenological point of view. The dynamic bodies depicted in Duchamp's *Nude Descending a Staircase* or Boccioni's *Unique Forms of Continuity*, Sanford Kwinter has suggested, seem incompatible with the Vitruvian Figure's static geometry and organic wholes, which seem to speak to a "tradition whose time and space belong to late Greek and early Christian cosmology" rather than modern field and energy theories.[40] Likewise, the chrono-photography of Marey, Muybridge, and later, Edgerton, represented new geometries of the body in motion, dynamic orders made manifest only though mechanical means of recording and reproduction.[41] For Jonathan Crary, such techniques of machinic observation amounted to nothing less than the "uprooting of perception from any space-time co-ordinates" of the embodied subject.[42] Crary has argued these examples mark a fundamental rupture and displacement of the lived body in the late nineteenth century:

> *The breakthrough of Muybridge's work in 1878 was its deployment of machinic high speeds for the creation of perceptual units beyond the capacity of human vision, and their subsequent abstract arrangement outside the terms of any subjective experience.*[43]

2.2 Eadweard Muybridge, Descending Stairs and Turning Around, 1884–85

Other new ways of visualizing the body in medicine and science accentuated this sense of a technological world detached from the embodied human point of view. In 1895, Roentgen accidentally discovered x-rays and in the early twentieth century, taking x-ray photos became a popular leisure activity not unlike the cinema; by the mid-1930s radioscopy had become a standard medical tool. These new technologies for visualizing the depths of the body upon the surface of a film or cathode ray tube were linked to the development of film and the cinematographer's sensibility of space.[44] Invisible radiation allowed the visualization of what was once a hidden microcosm, effortlessly effusing the skin and rendering its boundary moot, diagnosing (and often causing) strange new illnesses.[45] Reality had become detached and abstract from embodiment; if there was a geometrical order to things, it was no longer one which belonged to the *Lebenswelt*, that is, to the world as lived, but to the inhuman domains of technological systems.[46]

Of course, this break is usually understood as part of a greater displacement of humanism. Nietzsche crossed out God and his first edition of *The Will to Power* defined that modernity was the experience in which "man rolls from the centre towards X," a destination unknown.[47] Humanity was decentered from itself, no longer at home. Freud argued that the existence of the unconscious displaced the subject from his rational Cartesian center. Marx had described the modern worker as alienated from the means of production, labor transformed into simply a resource, excessive exchange value unhinged from any substantive measure of use value. In modernity, "all that is solid melts into the air"[48] or as Walter Benjamin iterated, "the universe is a site of lingering catastrophes."[49] The stable and whole order to which classical architecture spoke was ruptured, replaced by a historical condition in which all was in flux.

It should not be surprising therefore, that phenomenologists typically oppose attempts to link processes of architectural form-making to metaphors drawn from media, science and architectural experiments relying upon digital tools. In addition, like Lakoff and Johnson, they disparage those thinkers who challenge a normative idea of the whole body as the willful imposition of all-too modern neuroses since to attempt to dissolve this metaphoric commerce is to attempt to dissolve the world of humanity *per se*. Pérez-Gómez, for example, has repeatedly and polemically rejected the use of science and scientific metaphor (such as complexity theory), as well as explicitly opposed the use of Derrida and Foucault; all these are for him, "instrumentalist." They criticize modernists, historical post-modernists and the so-called neo-avant-garde alike for accepting the modern supremacy of rationality, the denigration of ornamentation and elevation of formalism.

Finally, though they define modern architecture not as a style but as the lack of the body metaphor, they equate the formal in modern architecture with the alienation of humanity due to modern economies of production and rationality. Appeals to aesthetics and beauty only obscure the alienation of humanity by technology and science.[50] Because form became unhinged from meaning at the end of the eighteenth century, Pérez-Gómez finds the idea of architecture providing simply aesthetic pleasure dangerous.

Thus, for them, modern architecture emerged from a rupture with the "necessary condition" of architecture, when the space between the body and the building ceased to be a primal identification and became an abyss. The implications of this argument are sweeping. Indeed, if the body metaphor is the origin of architecture and the origin of modern architecture is the loss of that metaphor, then modern architecture is best understood as a different trope, the oxymoron.

If, as Rykwert claimed, architecture is the "speaking in figures of building"[51] and if the primal figure is the body, then there can have been no significant architecture without this "necessary condition."[52] Outside this relationship, there are just buildings, whether laden with decoration, stripped down to suit a minimalist taste, or expressively formalist. Now, Rykwert argued, while such structures might be aesthetically pleasurable, they cannot convey real meaning since they are (in his terms) metaphorically "mute" and thus cannot "speak" to man's existential condition.[53] As a result, Pérez-Gómez has claimed that we have been, "lacking a living tradition for architectural practice since the nineteenth century."[54] We may have many buildings, even some interesting ones, but no "Architectural" tradition in the real sense of the word. Nor do we have a viable discipline or discourse about architecture. Each new example of modern non-architecture is a return, not to the origin of architecture's beginning (the body as model), but rather to the origin of the end of architecture. For Rykwert and Pérez-Gómez, to experience modern and contemporary architecture is to continually relive the death of Architecture.[55]

Such tales of a primal condition and modern rupture allow no real novelty or even transformation. Each new edifice that has deserved the name of architecture has been a recollection of its corporeal origin, of architecture's profound anthropomorphism. The hermeneutic task, therefore, is to interpret whether an architecture is a proper resemblance to this original model. Some examples are judged accurate copies and therefore legitimate while others are merely *simulacra*, bad copies, because they distort the primal identity or ignore it altogether. The implication of Rykwert's arguments, for example, is that rather than improving on the past, the closer to the "primal condition" or origin, the more real architecture becomes. This account of architecture operates as a quasi-Platonic history of resemblances to an original model that provides normative criteria for all subsequent examples. Anything that does not conform to this original identity is simply rejected as error or noise and little else can be said about it. No actual difference or change can be described outside this model without withdrawing the designation "Architecture" altogether. What does this mean for other traditions of architecture, or other bodies, that are not traceable to the double Greek origin? Colonialism is inherent to their arguments, in which any divergences seen as, at best, only resemblances of a privileged Western tradition and its concepts of the body, cosmological order and subjectivity.

The same is true for the possibility of other formations of thought within the Western tradition. The idealist logic of resemblance manifests in the phenomenologists' tendency to present history as the balance of dialectically opposed forces—such as myth versus science, meaning versus sensation, subjective embodiment versus objectivist formalism, dwelling versus alienation. In each case, the identity of the second term, all traits of modernity, is determined by its status as the negative of the first term's relationship to an originary model. Again, difference is given only as degrees of resemblance. Pérez-Gómez presents these as essential dialectics. Before about 1800, he argues, the dichotomy between the phenomenal and the formal was balanced with extreme difficulty; it began to collapse into the formal pole with Perrault and fully eclipsed the phenomenological in Durand's texts.

Such formulations depend upon an unquestioned continuity. What Pérez-Gómez feels requires explanation is any break in continuity; the Greek body, the Roman Vitruvian body, the Renaissance Vitruvian body, are all treated as roughly a single continuous tradition. In fact, what requires explanation is this apparent continuity since the very forces Pérez-Gómez sees as unbalancing might be understood as producing the conditions for the dialectic itself. Second, even when phenomenologists claim that a great rupture has occurred, this is not a real transformation since all that has happened is the ascendancy of one of the two terms. The overall structure of thought, culture and architecture remains essentially the same. For

Pérez-Gómez, the life-world was once balanced and now it is out of control. However, he assumes that there was always something to balance, that knowledge operated through such opposed forces, and that this dialectic is real and eternal. Indeed, his objective ultimately must be to conserve this dichotomy because he cannot imagine an architecture that works outside this structure.

As a result, their accounts are suffused with what Gianni Vattimo has called a dangerous "pathos of authenticity," in which the loss of an authentic and authoritative origin is at once mourned and monumentalized.[56] This pathos is a sublime aesthetic of a fall from a mythic Eden of wholeness and harmony, before the world was split in two, when meaning was unified, when spirit was unified with form, and the spirit of man looked towards a higher purpose, when architecture was noble and asserted man's centered place, his authority over nature and technology. Architecture's future lies only in redeeming itself and being reborn into the metaphors of the lost, Vitruvian, tradition. To this end, Pérez-Gómez has argued that a "living tradition" of architecture can only be reconstructed by "visiting and interpreting the traces and documents of the past," re-founding a new tradition upon shattered fragments of the old.[57] This may seem well intended and comforting. Yet, if since the dawn of modernity Architecture has shared the crypt with Man and God, architectural theory becomes a mystical reanimation of a corpse.

Fortunately, we do not need to share in this eschatological dread because to differentiate the modern from an authentic tradition in this way is, of course, entirely modernist itself. In fact, it is exactly the same as the differentiation of the modern from the past that Perrault himself hoped to establish, though of course with the opposite intent of demonstrating the superiority of the scientific modernity of late seventeenth-century Paris to the ancient tradition.[58] Pérez-Gómez simply inverts the comparison, longing for the non-scientific stability of the past. Additionally, the phenomenologist attempts to resolve a perceived imbalance between dueling pairs—the formal and the perceptual, the subjective and the objective, the rational and the poetic. Such oppositions belong to distinctively modernist organizations of thought, traceable back to Kant and Hume. Phenomenology, however, elevates what at the dawn of modernity served as critical distinctions, for example, in Kant's grand philosophical project, into an ontology that takes these categories as eternal realities.[59] They introduce ideas such as intentionality and intertextuality as ways of spanning the supposed abyss but the very premise of such an abyss, and the need to span it and therefore reinforce its existence, is also characteristically modernist.[60]

Likewise, what they accomplish is not really a critique of technology and rationalization. Instead, they naturalize the modernist myth of autonomous technology and ever increasing instrumentalism and rationalism.[61]

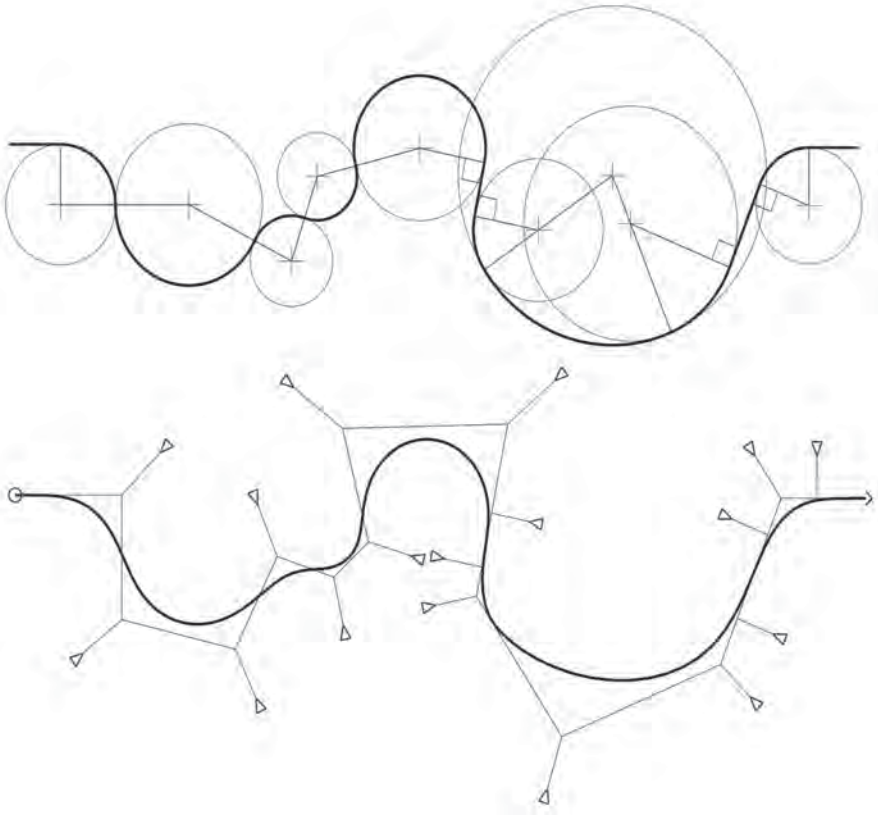
Upon any reflection, such a statement is bizarre since it requires endorsing technology as over-determining culture. Either this underestimates the complexity of our world and the nature of humanity, or else, as Langdon Winner quipped long ago, human nature is so weak that it was not really worth saving. More damagingly this sort of criticism anthropomorphizes technology even as they describe it as de-humanizing. The problem with technology is that it has come to be, or at least seen to be, far too alive, too like humans, not that it is dehumanizing.[62] This animism is coupled with dated concepts of technology and science studies that seem oblivious to at least fifty years and several academic fields of study on scientific knowledge and practice in relationship to culture and history that have rendered such arguments moot.

Finally, while they mourn the triumph of such instrumental realism over the poetics of Being, their account of the body and modernity simply inverts what they see as the modern value system, claiming that it is science that is false and what is real is the domain of subject. In short, they look forward to the ending of the modernist end of architecture, but their arguments are committed to an eternal circling around modern forms of knowledge they condemn. Even in style, their general portrayal of modern architecture and modernity are so extraordinarily reductionist and determinist, while their claims for the past are so grandly nostalgic and romantic, that their depictions have a distinctly heroic modernist flavor. And as a side-effect, logically Rykwert and Pérez-Gómez cannot offer, within their own definition, any theory or criticism of the vast majority of the built environment beyond a blanket dismissal. This means of course, that they find plenty of what apparently was lost when they turn their attention to more recent works. In turn, we must question not only the grounds upon which they define modernity as a break with the Western tradition of the body, but also the usefulness of this tradition itself and its historical armature. The crisis of modern science, its erosion of a meaningful figurative architecture, is a phantasmagoria for those who take pleasure living in the tomb of Architecture they construct.

3.
STRUCTURAL CONTINUITIES OF CLASSICISM

I should like to begin this essay of mine on man by some fables and plays, since man is himself a fable and a play.

—Juan Luis Vives,
Fabula de homine*, c. 1518*



3.1 Greg Lynn FORM, drawing comparing composite and spline curves, *Animate Form*, 1999. Copyright Greg Lynn FORM; courtesy Greg Lynn FORM.

At the same time as the phenomenological position was developed, post-structuralism, deconstruction, critical theory and psychoanalysis began to be mined by designers and theorists. These "post-structuralists" do not necessarily share a common "style" or define a school of thought, nor is it my intention to conflate divergent positions. However, since the late 1970s, their texts and projects have attempted to open the possibility of a post-humanist architecture. More specifically to this book, such a program often targets the relation between architecture and the body since anthropomorphism seems to epitomize architecture's entrenched humanism. As a result, their projects and texts are filled with references to alternative models of corporeality, such as blobs, rhizomes, cyborgs, mutants and prosthetic supplements.

Just as architectural phenomenology developed through specific networks of actors and institutions that mobilized both architectural and extra-disciplinary sources, the post-structuralist position precipitated around academic institutions (especially those of the American North-East) and sought to open architectural thought to new and more critical constellations of thought. English translations of French post-structuralism, for example, the writings of Jacques Derrida, Michel Foucault, and later, Gilles Deleuze and Félix Guattari, were (and often remain) important sources. These were often combined with references to scientific discourses, such as chaos theory, complexity theory, embryology, genetic engineering and most recently ecology and emergence, since these seem to offer alternative metaphysics and metaphors of the relationship between the culture, the subject, the body and nature. In addition to a series of influential exhibitions, such as the infamous 1988 *Deconstructivist Architecture* exhibit at New York's Museum of Modern Art (guest-curated by Philip Johnson with Mark Wigley), journals such as *AD*, *Assemblage* and *ANY* were vital platforms of dissemination for established figures, such as K. Michael Hays, Eisenman, and Diana Agrest. They also were important for the emerging careers of Rem Koolhaas, Zaha Hadid, R.E. Somol, UNStudio, Diller + Scofidio, Sanford Kwinter, Greg Lynn (who guest-edited the very influential issue of *AD*: *Folding in Architecture*), and many others. For example, the *ANY* project headed by Cynthia Davidson, consisted of a series of annual symposia, a thematically oriented journal, and related book projects, all of which helped to coalesce a network of architects, theorists, educators and by extension pedagogical programs. Many of these journals are now defunct—indeed *ANY* was conceived with a built-in expiry date. But through them, post-structuralist theory, new scientific paradigms and computer-aided design were annealed into a formation that continues to proliferate within schools and increasingly influences the design that emerge from professional practices.

Such "post-structuralists" are overtly antagonistic to the position represented by Pérez-Gómez and Rykwert and vice versa. As we will see, the post-structuralists understand ideas like Rykwert's "primal identification"

as a limiting ideology rather than an essential "necessary condition." In turn, the phenomenologists often ridicule the post-structuralists for their continuing reliance upon formalism, *Zeitgeists*, and instrumental references to science and technology. Yet, in spite of all these differences I will demonstrate how both operate within the same field of reference to the Vitruvian Figure and the tradition of architectural humanism for which it stands. To do so, I will track three rather different arguments presented by Diana Agrest in regards to gender and the architectural construction of the subject, Greg Lynn in relationship to form, and Peter Eisenman's important article, "The End of the Classical" with reference to historicity and humanism. Again, these examinations are not meant to be exhaustive or exclusive, but rather serve as case studies that evidence a pattern of argument repeated many times over in texts of other writers, in academic reviews, and between the lines.

CLASSICAL SYSTEMS OF KNOWLEDGE AND SUBJECTS

Diana Agrest's article, "Architecture from Without" is a clear example of how the Renaissance Vitruvian Figure is understood by the post-structuralists. Published by the journal *Assemblage* in 1989, just as historicist post-modernism was receding, Agrest's article was part of a broad attempt to reorient architecture around a critical discourse of semiotics, feminism and deconstruction.[1] Agrest defines architecture as a semiotic "system" of signs, signifiers and signifieds that circulate around a traditional relationship to the body. She states as a matter of fact that, "Architecture in the Renaissance established a system of rules that forms the basis of Western Architecture."[2] In that classical language, the body was not only central but also "generated the most extraordinary metaphors in the elaboration of architecture ideology."[3] Like Rykwert, she argues this system was based on a mimesis with nature and the divine, both of which authorize the body. She traces this authorization to Vitruvius, quoting his famous equation:

> *Nature has designed the human body so that its members are duly proportioned to the frame as a whole… we can have nothing but respect for those who, in constructing temples of the immortal gods, have so arranged the members of the works that both separate parts and the whole design may harmonize in their proportions and symmetry.*

Such statements imply an architectural order that is not invented by culture so much as it follows rules of "Nature." Therefore, the natural laws are transferred into architecture and appear as true and unquestionable.[4] She suggests that architecture further naturalized this relation by replicating the body's posture and relationship to gravity. The Vitruvian body was therefore circumscribed into *ideal* natural order and the hierarchies of architecture become authoritative. Moreover, "this anthropocentric discourse [functions] at the level of the unconscious," that is, as ideology.[5] Thus, the humanist system of architecture had its origin in metaphors of the body established through the

rediscovery of Vitruvius and subsequent architectural treatises for which Vitruvius's *De Architectura* served as the model. Agrest subsequently examines how a few of these "founding texts" structured a coherent tradition of architecture.

Greg Lynn offers a similar characterization by ascribing to the Vitruvian system a set of formal principles derived from an understanding of the body as whole, ideal, static and organic. These values, he argues, have governed architecture since the Renaissance. He also reasserts that Vitruvius defined a canonical body metaphor.[6] Lynn implies that architectures based on these ordering principles are essentially humanist, whether or not they manifest overt signs of classical architecture.

Despite their differences, both the phenomenologists and the post-structuralists accept that the Vitruvian body defined the classical tradition, which in turn determined subsequent architectures through certain geometries and organizational principles. They all claim that the interpretation of Vitruvius in the Renaissance originates a "system" in Agrest's terminology or a "canon" in Rykwert's. Like the phenomenologists, for Agrest and Lynn, this metaphor was the core of a classical architectural language—its grammar, as it were. Agrest shares with Rykwert an understanding of a "double analogy" between body and building as the origin of a coherent and stable (that is, systematic) architectural tradition.[7] For all, the metaphor formed a hermeneutic loop, a closed system of meaning: the body is the natural model for architecture, which became a model for nature, which was, in turn, a model for the body. Principles such as organic wholeness, harmony, proportion, verticality, symmetry and eurhythmy, structured this system. So again like Pérez-Gómez and Rykwert, the Vitruvian body appears in Agrest and Lynn as the core metaphor of humanist architectural thought.

Nevertheless, while both treat the Vitruvian system as the origin of an architectural tradition, divergences appear between the phenomenologists and the post-structuralists. Most obviously, their use of terms suggests different conceptions as to the status of this humanism. For Rykwert and Pérez-Gómez, the Vitruvian metaphor captured the "necessary condition" of what it means to be an embodied human subject. For them, the metaphorical presence of the body is something precious, to be preserved wherever possible and recovered when lost. By contrast, Agrest focuses on what and who is necessarily excluded from this Vitruvian system. She is centrally concerned with the representation, or rather the lack of representation, of women in this humanist system: "The Renaissance operations of the symbolization of the body are paradigmatic of the operations of repression and exclusion of women by means of the replacement of her body with that of the male Vitruvian body."[8] In contrast to the "primal identification" Rykwert locates in the post-and-lintel system, for Agrest, the body operates as a semiotic "shifter" that relocates the metaphor of the body from being a

cultural convention to a principle of natural order, transforming the body into a geometric set of "abstract" relationships that appear transcendent of both culture and physical form.[9] While Rykwert's *identity* suggests harmonic consonance, Agrest's deployment of Barthes's term, *shifter* implies that the Vitruvian system is neither natural nor *a priori*, but is a cultural, linguistic, construction. Moreover, rather than revealing a metaphysical truth, it serves to naturalize cultural and historical values as truthful and conceal violence done by them. Because for both Lynn and Agrest, the Vitruvian system and its anthropomorphism must be somehow displaced, "opened" (Agrest) or "involuted" (Lynn) to new possibilities, for them, the task of architectural theory is not to recover the body metaphor but to expose it as neither neutral, natural nor true, but as a construction of thought and culture.[10]

Yet, even here, at the very points where their narratives diverge, one can detect certain shared conditions upon which their disagreements depend. Agrest's term, "shifter," is itself simply another word for trope, meaning "turning." For Agrest, the metaphorical resemblance ascribed between a standing body and the post-and-lintel system would not be a "primal identification" or expression of the subject's embodied experience but an instance of ideological shifting, in which the subject is conditioned, or even constructed, through the experience of architecture. Nevertheless, it is governed by a conception of metaphorical signification and representation via formal systems of order in which the body, architecture and the subject constitute a closed loop of reference. Agrest concludes with a phrase, that maps Rykwert's "double-metaphor," but that draws attention to architecture's role in the construction of subjectivity, "I am spoken through the city and the city is read through me."[11]

GENDERED BODIES OF ARCHITECTURE

To better understand this statement, it is useful to examine Agrest's argument about the relationship between the Vitruvian body and issues of gender.[12] In fact, her text was part of a renewed interest in gender within critical architectural discourse. Agrest suggests that issues of sexuality and gender had been rather neglected in architecture.[13] Agrest begins by declaring, "logocentrism and anthropomorphism, in particular male anthropomorphism, have underlain the system of architecture ever since Vitruvius, [who was then] read and rewritten in the Renaissance and through the Modern Movement."[14] Her use of the word "underlain" suggests that the male body has been the foundation of architecture while also being unconscious. As a result, women and the female body have been "excluded," "outside," "repressed" in the dominant Vitruvian system.[15]

Agrest then describes a nuanced three-fold process of displacement of the female body and women in this system. The phallocentric Vitruvian system first of all projected a specifically male body as the model for architecture

and cities. Against this, the woman's body was "assigned the negative term" in a dialectic of gender in which the male stood for the correct ordering, and the female as error.[16] This was a formal and conceptual repression of the woman's body. Second, the male architect "usurped" the traditional role of woman as demiurgic creative force and giver of life. Referring to Filarete's treatise, Agrest details how the master architect likens his creative acts to childbirth, appropriating the woman's body and praxis for the male master architect.[17] Finally, the masculine assumes all the qualities associated with femininity, with the city as the womb of civilization. This third repression completes the displacement of the feminine with her erasure at the metaphysical or poetic level.

This three-fold repression, Agrest argues, appropriated the woman's body and "neutralized or erased" its tracks.[18] As a result, women stand (in a paradoxical turn of phrase) "in the outside" of architecture and its discourses.[19] She concludes this argument by restating her original thesis that it is, "through her body and through the symbolic order that women have been repressed in architecture."[20]

Likewise, in *Architecture and the Burdens of Linearity*, Catherine Ingraham argues that, "architecture has traditionally insisted on the neutrality of the category of space in order… to mute and neutralize the political and analogical power of… especially the sexual."[21] Naturalizing the male body as the model "neutralized" and inoculated architecture against the dangers of gender. Nevertheless, certain geometries and poses have been associated with certain genders. Ingraham notes how Le Corbusier (as many before and since) associated the "rational" rule of the straight line and right angle with masculine traits and "irrational" weaving path with woman.

In all these examples, first the feminine (sexuality), woman (sex), and female (gender) are repressed by a masculine model; then, because this phallocentric ideology is presented as neutral, matters of gender, sex and sexuality are marginalized as such. This, it is suggested, has been a continuous condition from Vitruvius through Modernism. These repressions have continued at a subconscious level, only uncovered by the critical theorist or historian through textual hermeneutics and deconstruction.[22] Gender might continue to find expression in the margins of architecture, but it could not have been an explicit object of architectural discourse in any but the most repressed of ways.[23]

Obviously, Agrest does not accept that the Vitruvian system refers to a universal body or human subject but rather that it participates in the construction of a specific body that relates to certain models of subjectivity. Indeed, the very idea that that there is a "neutral" model aids in the repression of gender. Likewise, the repetition of the Vitruvian system at "the level of the unconscious" excludes alternative bodies and subjects. Because architecture participates in the construction of subjectivity, power and gender,

the opening of architecture to these others is potentially liberating. Thus, Agrest suggests alternative architectural geometries, drawing upon different models of the body that might open architecture to other forms of subjectivity.

An example of a firm that has pursued such alternatives by making apparent the construction of the normative body has been Diller Scofidio + Renfro. They do not seek direct geometrical or organizational models, but cultural signification and subjective identification. In their work, the matter of the body, its *Flesh* as they entitled their 1994 monograph, has been a primary site of investigation of the relationship between a subject and the contemporary conditions of space. The gendered body and the critique of the phallocentric body as a model is central. For example, in *Bad Press: Dissident Housework Series* (1993–98), the relationship between architecture and the gendering of domesticity is foreground via a series of "mis-ironed" shirts. For Modernist architects such as Le Corbusier, the man's dress-shirt is an analogue to the body and its gendering.[24] The orthogonally ironed and starched shirt is a proxy for representations of masculinity, rationality and order. The mis-ironing of shirts thus calls into question this masculine body model and reveals the unconscious gendering of architecture. Alternative concepts are alluded to through the introduction of non-orthogonal folds, which through their complexity bring to the surface the labors of domesticity and its sublimated women subjects, who, as Diana Agrest argued, remain unspoken through architecture's positioning of the masculine model as neutral and objective.

In the 1989 *Para-site*, installation at the Museum of Modern Art, live-video feeds of other locations in the museum are displayed on a series of monitors, hung on architectural armatures that parasitically attach to the neutral white box of the gallery space. By re-orienting the monitors and locating them in relationship to indexes of the body—domestic furniture—the exhibit challenges the neutrality of the body, concepts of embodied orientation, as well as the relationship between telepresence and physical space. In both these projects, the "primal identification" of the standing body and architecture is put into question.

These themes of disorientation and electric augmentation come together in their 2002 project, *Blur Building*, in which corporeal bearings are literally lost in cloud of information (the internet is often referred to as a "cloud"). The primary material of this pavilion for the Swiss Expo is, according to the architects, water. A manufactured fog envelops a lightweight structural space-frame that provides platforms for occupation. The result is at once an intensification of embodiment and disorientation of geometric orientation, both for the architecture and of the experience of its occupant. The architects planned for a smart raincoat to be programmed according to a questionnaire; this prosthetic would compensate for the physical disorientation by augmenting the senses with informational indicators. The occupant

would become a cybertourist whose augmented body would glow and vibrate in correspondence to the answers stored in the raincoats of other visitors, extending the concepts of embodiment into a network of multiply affiliated subjects within an indeterminate space that refers to the navigation of the internet.

THE HIDDEN INTERIOR OF ARCHITECTURE

Like Agrest, Greg Lynn has declared that one of the most pertinent questions facing architecture is, "What is the nature of the interior of architecture? What lies hidden within this interior?"[25] By interior, Lynn does not refer to physical enclosure but to the idea of what "belongs" or as Catherine Ingraham has put it, what is "proper to" architecture as a discipline. It is worth examining this because it bears directly on how he and Agrest believe architecture signifies subjectivity and how one might propose different ideologies and power structures.

Lynn suggests that "we find the first clue" as to the nature of architecture's interior in Vitruvius's ideas of harmony, the whole, and proportion.[26] Like Agrest, Lynn characterizes architecture as:

> *[a] closed system in which all parts are regulated by the whole is organized from the top down. Proportional orders impose the global order of the whole on the particular parts. This* whole *architectural concept ignores the intricate local behaviors of matter and their contribution to the compositions of bodies.*[27]

Here Lynn equates the Vitruvian aesthetic of the body with an ethics of exclusion. Lynn related this concept to Panofsky's thesis in "The History of the Theory of the Proportions as a Reflection of the History of Styles," which argued that the "monstrous" quality of the so-called Berlin sphinx was due to the incommensurable proportioning systems of its lion, human, and the figure of a goddess carved into the sphinx's chest. Lynn contrasted this monstrous body to the Vitruvian body composed of "whole" units and a singular order.[28] The Vitruvian tradition, he argues, privileges the *eidetic*: that which can be exactly measurable by a whole metric and governed by resemblance to a model, such as the Vitruvian body.[29] Such a closed regime excludes non-whole organizations and geometric possibilities; other systems of order appear simply as disordered noise (chaos), or misshapen monsters. Following Bataille's definition of architecture, Lynn suggests this is allied to architecture's servicing of power. The body of architecture is that of the "King," a crypto-fascist identification of Sameness that is projected onto the multitude subjects, who have this likeness imposed upon them and, to return to Agrest's phrase, are spoken through it.[30] The violence of such an identification based on resemblance to a model is integral to the humanist architectural order.

3.2 Diller + Scofidio, Para-site, 1989. Installation for the Projects Room at the Museum of Modern Art, New York. Copyright, Diller Scofidio + Renfro; courtesy of Diller Scofidio + Renfro.

3.3 Diller Scofidio + Renfro, Blur Building, Yverdon-les-Bains, Switzerland, 2002. Copyright, Diller Scofidio + Renfro; courtesy of Diller Scofidio + Renfro.

Therefore, Lynn's immediate concern is to engender alternative systems of order based on inclusive difference rather than exclusive identity: "What is necessary for a rigorous theorization of diversity and difference within the discipline of architecture is precisely an alternative mathematics of form; a formalism that is not reducible to ideal villas or other fixed types."[31]

For him, biological sciences, evolutionary theory and topological mathematics, along with Deleuze and Guattari's concepts of the smooth and the "Body-without-Organs" offer such alternative orders, which he calls the "anexact," the "affiliative," the pliant, and so on.[32] Lynn is not interested in copying the body but in developing morphogenetic and embryological models of growth and development for architecture. Lynn's body referents refuse a transcendental canon of the human figure, and prefer the immanent resolution of forces within dynamic processes. Rather than perfect circles, he champions an "ethic" of animate form (or dynamical formation), suggesting that it depends upon an entirely different world of references, *a priori* assumptions, and principles of operation.[33]

Moreover, Lynn associates these concepts with computer technologies and digitally-based design processes that are presented as having fundamentally altered the relation between the subject, representation and the production of the architectural object. At the time of Lynn's early work, the personal computer had become powerful, affordable, and easier to use, allowing sophisticated modeling programs to be used by small firms and schools in an unprecedented way. Under the stewardship of Bernard Tschumi, Columbia University's School of Architecture spearheaded the "paperless studios" in which teachers such as Lynn appropriated animation software to explore dynamic and surface-based processes of architectural form-making. In some ways, this design research into what has become parodied as "blob architecture" extended formalist processes Peter Eisenman had developed in his series of house projects and later work throughout the 1970s and 1980s. In these projects, Eisenman argued he was exploring the relationship between post-structuralism and architecture. While Eisenman based his research on linguistic and textural references within post-structuralism, Lynn seized upon the scientific allusions and materialism within the writings of Deleuze and Guattari. Such digitally-based research has since proliferated across the globe and continues today within many schools as computationally-based design attempts to develop new processes of fabrication, genetic algorithms and design ecologies.

To explain the potential of such concepts and tools, Lynn illustrated his arguments with images of ideal bodies, on the one hand, and "monstrous" alternatives, on the other. The best example is his juxtaposition of two apparently similar lines (presented as the frontispiece to this chapter). While these two lines appear alike, their geometries refer to very different understandings of the relationship between form, matter and forces. The

first curve is based on a geometry that is assembled from circular arcs, his own version of the Vitruvian Figure's aesthetical ethic of the whole made up of discrete parts. If any part of the line is changed, all the others have to be recalculated and redrawn separately to be re-integrated into the line. The second curve is defined by a spline geometry based on the flow of forces through the curve; this force is regulated by the position of the triangular handles. Such topological geometries are integral to the animation and surface modeling software and any change along the curve is recalculated along the length of the curve as a renegotiation of forces. The former, Lynn argues, presents a hylemorphic and humanist world view that sees matter as at once objective and inherently static, and which must have ideal and subjective geometries (in the universal Kantian sense of subjective) imposed upon it to give it form. The second curve maps forces, forms and matter as an intrinsically dynamic and interrelated field, in which subjects and objects negotiate and unfold each other diagrammatically. Such geometries do not operate according to mimesis of a fixed model, but through animations and dynamic modeling based on differentiation, multiplicity, continuous variation and transformation. These geometries, Lynn argues, can contain and express difference in a way eidetic geometries cannot.

MODERNITY AS "THE END OF THE CLASSICAL"

As we have seen, both the phenomenologists and post-structuralists claim that the Vitruvian Figure embodies a continuous tradition of architectural humanism from the Renaissance to the advent of modernity. Moreover, both groups define modern architecture as a break with this Vitruvian body. However, neither associate this break with the advent of an overtly modernist style of architecture. As we saw in the last chapter, the phenomenologists located this break in the late eighteenth century; for the post-structuralists, this break has yet to occur.

In fact, they understand the modernist architectures of the late nineteenth and twentieth centuries as merely extensions of classical humanism. The apparent abstraction and functionalism of Modernism were merely new guises of the classical value system of architecture. In discussing gender, for example, Agrest argues that the Vitruvian tradition extends into modernity and continues to inscribe its phallocentrism into architectural geometry, form and space. While Agrest's Renaissance enjoyed a rich and continuous examination of sexuality and gender (albeit with the result of repressing the feminine), modern architectural discourse simply naturalized this classical repression and moreover repressed gender altogether with its references to seemingly "objective" and value-free criteria like function, science and construction. Thus modern architecture repressed not simply the woman's body but issues of gender and sexuality *per se*. In parallel, recently a growing body of critical historical research, such as Mark Wigley's *White Walls*

and Designer Dresses and Beatriz Colomina's research, has documented this repression of the body by uncovering these veiled metaphors.

Greg Lynn has echoed this idea that the Vitruvian system has governed all of architectural history, observing that, "Since the time of Vitruvius and throughout its history, the *whole* concept of architecture has been dependent on the model of a unified body."[34] The term "whole" here seems a *triple-entendre* referring both to a compositional ideal and to an ethical principle embedded in the Vitruvian Figure and also to a unity of historical development. To evidence this Lynn has mined Colin Rowe's article "Mathematics of the Ideal Villa," rehearsing Rowe's claim that the same classical proportions underlie Palladio's and Le Corbusier's architecture, a theme we will return to in later chapters.[35] Lynn recognizes that Rowe's project itself is dependent upon the eidetic conception of architectural order, in which it is the theorist-critic's job to reveal the whole hidden order of architecture that, as it were, lies beneath the decorative and contingent aspects of their forms. Lynn therefore suggests that the Vitruvian system has informed not simply the processes of design but also the methods and representations of history and theory, determining what "counts" as proper architecture and order well into modernity and its historical accounts of its past.

This premise that modern architecture continued the Vitruvian tradition is fully developed in Peter Eisenman's, "The End of the Classical."[36] In this important and often republished text from 1984, Eisenman claims to use Foucault's schema to re-read the history of architecture, which he suggests "has never been adequately articulated in relationship to architecture."[37] The most important of Foucault's concepts for Eisenman is that of the *episteme*. In *Les mots et les choses* (translated as *The Order of Things*), Foucault develops this concept as a finite configuration of representations, concepts, words and things that determine the conditions of any specific knowledge or practice of that time. Importantly, an *episteme* is defined as much by the differences that can occur within patterns of statements as any coherence and without reference to some external identity, model, essence or spirit. It is through the concept of the *episteme* that Foucault provided an alternative to the conventional history of ideas privileged by rationalization and progress.[38] Foucault mapped a succession of three *epistemes* since the fifteenth century, moving from what he calls the Renaissance, to the classical, to a modernity produced through what he calls the "human sciences."

Eisenman adopts aspects of Foucault's *episteme* as a way of describing the ordering of architectural history as a system of signs, though he contends that Foucault's sequence of *epistemes* is reversed in architecture such that what Foucault defines as a post-eighteenth-century relation between signs, signified and signifiers governed architecture beginning in the fifteenth century. Moreover, Eisenman argues that architecture has operated according to

a single system between the Renaissance and the twentieth century whereas Foucault maps three different organizations of knowledge during this same timeframe.[39] This single architectural *episteme* is defined by a set of relationships which Foucault named "modern" but Eisenman calls the "classical."

Eisenman then attempts to flesh out architecture's classical *episteme*, arguing that it is governed by three "fictions," or what in Foucaultian terms one might call three historical *a priori* conditions for architecture.[40] Each of these is necessary for the Western humanist system of architecture. The first is "representation," in which architecture is taken to stand for something beside itself. For him, the canonization of ancient classical architecture by Renaissance architects marks the arrival of this "fiction" by representing ancient Greek and Roman architecture and the values for which these old architectures seemed to stand. The second condition is that architecture represents "truth," a natural order or divine law. Eisenman, like Agrest and her critique of "ideology," but also equally like Pérez-Gómez and Rykwert, locates the origin of this "fiction" in the Renaissance use of the Vitruvian Figure, which he asserts without further elaboration, "is the most renowned example" of an architecture that related "anthropomorphic geometry" to natural and divine models of order.[41] The third condition is "history," or rather, the idea that architecture must represent timeless qualities, or be "classic." The Renaissance is said to have originated this timelessness by its reference to antique forms as models. Each condition reinforces the others and triangulates the "continuous mode of thought [that] can be referred to as the classical."[42] One can clearly see how Eisenman's assumptions are repeated in Greg Lynn's idea that the value of the whole has governed the whole of architectural history, and echo Agrest's Marxist-feminist critique of what she sees as the unbroken phallocentrism of the "Vitruvian system."

Thus far, Eisenman repeats certain claims of the phenomenologists. For example, he argues that the division between classical architecture and truly modern architecture cannot be defined stylistically but is to be located in the disruption of a deeper structure of signification. He also shares their understanding of Renaissance architecture as referring to religious value, while suggesting that Enlightenment architecture privileged rational and positivistic knowledge. If Renaissance architecture sought to represent cosmological, or divine truths, Eisenman argues that the "Enlightenment aspired to a rational process of design whose ends were a product of pure, secular reason."[43] Eisenman even parallels Pérez-Gómez's reading of Durand as the architect who overturned Renaissance architectural cosmology with a belief in reason. Again like Pérez-Gómez, Eisenman asserts that Durand's proto-functionalism led more or less directly to the International Style of the twentieth century.

However, Eisenman attempts to show that the shift towards rationalism between the seventeenth and nineteenth centuries was a superficial

adjustment rather than a real break with the "classical" Vitruvian system. He argues that Durand conserved the fiction that architecture represents and that what it represents is a truth that lies outside architecture.[44] And although Eisenman argues in parallel to Pérez-Gómez that modernist architecture cannot be regarded as "abstract" simply because it removed overt signs of classical figuration, for him, the removal of decoration allowed architecture to "represent reality itself."[45] Thus, the fictions of representation, truth and the timeless were maintained in this new guise. As a result, Eisenman concludes that, "modern architecture was not a rupture with history but simply a moment in the same continuum" of humanist architecture.[46]

To understand the implications of this statement, it is useful to extrapolate Eisenman's argument and compare it to Pérez-Gómez's critique of Perrault's *Ordonnance* (though Eisenman himself does not mention this text). As I have shown, the phenomenologists argue that the body metaphor defines architecture as such. In Eisenman's terms, the body metaphor is the means through which architecture represents timeless truth (the triple fiction). For Pérez-Gómez, Perrault's treatise dismisses this representation, which is perhaps why he cannily appropriated Eisenman's title when he called Perrault's architecture the "beginning of the end" of architecture.[47] Conversely, using Eisenman's reading, we could argue that Perrault's dismissal of direct body analogies did not break with these "fictions." In so far as Perrault sought a single module that coordinated all the orders as a whole number evenly divisible into all the parts, he displaced the concrete body metaphor only so that architecture better conforms to the "fictions" inscribed within the Vitruvian Figure. The metrification of the architecture was not a rationalization at the hands of a science divorced from the world of myth but rather a technique to produce an architecture that would even more truthfully represent the timeless as construed in seventeenth-century France. This Eisenmanian Perrault would not mark a break with the classical but merely the adoption of scientific rhetoric in order to conserve the classical system.

Indeed, Eisenman argues that modernist architecture was stripped of "anthropomorphic motifs" so it could offer a "simulation of efficiency based on scientific reason and technical positivism."[48] This was a superficial change because it maintained the fictions that architecture must *truthfully represent* the *timeless*. It is important to recall that the body was itself understood through functionalist frameworks as a machine; the house as a machine for living therefore was also like the body as machine. Le Corbusier's houses may refer to biplanes or steamships rather than human bodies but for Eisenman they continue to "exhibit the same referential attitude towards [the Classical fiction of] Representation" of Truth as did Renaissance buildings.[49] Indeed, Le Corbusier captioned his photographs of airplanes as plastic "organisms" that represent an eternal natural order which architecture should represent. For Eisenman, these fictions would have to be displaced

to locate a break with the classical system of architecture.[50] Thus, Eisenman concludes (as do Agrest and Lynn) that, "Essentially… nothing has changed since the Renaissance idea of origin" found in Vitruvius.[51] There has, in other words, never been a truly modern architecture; the style of modernist architecture was simply a continuation of the classical architectural *episteme* with merely different referents for its three governing fictions.

Yet, something did alter with modernity in that we became aware of the fictional status of these classical values as fictions. Modernism maintained the conditions of classical architecture but no longer enjoyed its authority. As the world of humanism and its God became a fable, its structures remained as empty husks. If so, modernist architecture not only continued the Vitruvian tradition, it continued it as a *simulation*. Referring to Baudrillard and to Derrida, Eisenman argues that under modernism the necessary conditions of classical architecture became not simply "fictions," but *simulacra* in the sense that they were revealed as fictions without authority yet were nevertheless maintained. This suggests not simply their obsolescence, but that, "these classical values were *always* simulations… that architecture sustained for five hundred years."[52] If the phenomenologists lament architecture's death in modernity and hope to reanimate its pre-modern corpse, Eisenman sees modern architecture as a vampire, leaching off the corpse of tradition.

THE PARADOXES OF NOT-MODERN ARCHITECTURE

An important contribution of post-structuralist thought to architecture has been its argument that the Vitruvian body is not neutral nor directly accessible but contains specific and defined concepts of what a proper body constitutes. From this point of view, the phenomenologists fail to interrogate how perception itself is shaped or how some perceptions become more important than others.[53] Post-structuralists, on the other hand, argue that any attempt to either maintain a modernist architecture (which is actually classical) or revert to classical values such as the Vitruvian body (which actually never departed) is misguided or in bad faith. Nevertheless, they never abandon the understanding of Vitruvius as the origin of a continuous tradition called the "classical," and see the present potential exclusively in relation to this origin.

Two paradoxical conditions arise in this network of arguments. First, it is possible to see in the post-structuralist version the potential for a "non-humanist" phenomenology of architecture. Second, it is also possible to understand Eisenman—and the post-structuralists' position in general—as remaining wholly within the classical system. The first is latent in Eisenman's closing call for a "not-classical architecture." From his post-structuralist position, Eisenman cannot claim to be able to simply overcome the classical fictions because that would base his discourse on

the Enlightenment version of that fiction of progress as truth.[54] Instead, Eisenman argues that we must acknowledge the present *absence* of the three *a priori* required for architecture's classical *presence*. Because no general alternative model of architecture can be posited directly without unwittingly maintaining the classical model, what is required is the deconstruction and trans-valuation of models themselves. This he calls a "not-classical" architecture posited on his now infamous phrase, "presence of absence and absence of the presence."[55]

Having argued for the understanding of humanism as a fiction, here Eisenman moves to mobilize other fictions as fictions. As the reductive nature of humanist metaphysics becomes apparent, it immediately begins to lose its authority, that is, the memory of its presence is experienced as absence (what is misconstrued as the experience of alienation).[56] This event is *not* apocalyptic, as Pérez-Gómez for example thinks, but rather an "unconcealment" of the human condition which is to be celebrated as the completion of Western metaphysics, in the sense of finishing its task rather than finishing it off. This arrival—which as we saw in the introduction Heidegger located with the rise of cybernetics—marks the threshold at which potentials of human existence beyond "humanism" and "metaphysics" become possible.[57] That is, the experience of absence becomes a potential of transformation. The ability to perceive humanism as limited suggests that its space no longer encloses knowledge.

Eisenman has drawn heavily upon both Derrida's deconstruction and Vattimo's project of "weak thought"—both of which are philosophical projects that can be understood as the pursuit of the more "radical" implications of Heidegger's work. As we saw in the last chapter, the phenomenologists' Heidegger is "the philosopher of the nostalgia of being"; Eisenman's implicit Heidegger, on the other hand, is the philosopher of the "forgetting of Being as foundation."[58] The latter opposes a pathos of authenticity in favor of fully accomplishing the suspension of now despotic value systems based on authenticity.

Eisenman himself implied such a phenomenology at work when discussing *House X*, his first fully "decompositional" project:

> *If the role of man in Western culture since the Renaissance*—vis-à-vis *his object world has been a positivistic one—a kind of conical unfolding from his anthropocentric man as creator—perhaps the new role can be seen as the inversion of this unfolding.*[59]

Eisenman's "not-classical" architecture is predicated upon this double movement—both revealing and completing (as ending) the metaphysics of Being found in Heideggerian thought. Indeed, Eisenman's *œuvre* could be understood as the attempt at just such an architectural "inversion" of anthropomorphic projection, folding "man" back into the tumultuous void from

which he was born. For writers who constantly bemoan alienation, the post-structuralist pursuit of accomplished nihilism may be their only hope.

In this regard, Eisenman's text offers at once a hand of friendship and of challenge towards phenomenology in the direction of the "accomplished nihilism" which Vattimo concludes is "our only hope" in the present age.[60] To shed the pathos that shackles the phenomenologists' project and re-fashion the body-building relationship, they need to embrace post-structuralist architectural thought as well as contemporary theories.[61]

The second paradox rests within this possibility of a post-structuralist phenomenology of the body in architecture. As we have seen, the *post*-structuralists cannot be post-modern since modern architecture curiously exists only in what Eisenman calls a "no longer future." The break with classicism has yet to be accomplished. Nor can the post-structuralists project a different architectural model or suggest that we progress beyond the classical without collapsing their discourse back into the fictions of the classical (in this case, that of progress). As a side-effect, their architecture must continually defer to modernist (that is, the not-yet-modern but really classical) architecture as *simulacra* that, paradoxically, operate as origins for their thought of a not-classical architecture. One sees this sensibility in Eisenman's continual reference to Terragni and to Le Corbusier. His 1963 doctoral thesis examined Le Corbusier and Terragni's architectures (among others), diagramming their designs to present an extended formal analysis of how these architectures could be understood without reference to anything outside their compositional effects and organizational rules. To do so, he attempted to draw out the organizing principles of their architecture in abstract diagrams related to the spatial and formal effects experienced by the subject of the architecture. Though he could not articulate it in such terms then, this quest for "The Formal Basis of Modern Architecture" (his title) can be understood as an attempt to mine the history of modern architecture in order to produce a theory of architectural affects for the subject.[62] Subsequently, he has repeatedly returned, in words and design, to modern "texts" to reveal their "fictions as fictions." His early nine-square grid permutations, his overlaid grids extracted from cartographic systems, his archaeology of lost structures and his penchant for incomplete formal tropes (such as the "el") and folding, are all agents of this critical transvaluation of value. Recently, Eisenman published a long promised book on Terragni, an event that bookends Eisenman's own body of work, one that began and ends with his *Transformations, Decompositions, Critique* of Giuseppe Terragni, since his work remains the point of origin of Eisenman's diagrams and design processes.[63] In these terms, the post-structuralists work is not "not-classical," but rather the playing through, or full revelation, of the classical project as a fiction.[64]

POST-STRUCTURAL PROBLEMS

The post-structuralist arguments we have examined in this chapter do present their own set of issues. For, while they criticize the values of the "timeless" and the "whole," they present a history entirely dependent on such notions. As I have shown, they argue architecture has been operating as a continuity of humanism since the fifteenth century. Yet, such a claim relies upon the anachronistic premises of a unity of a singular tradition, an antithetical modernity, and a constant invocation of the *Zeitgeist*.

Such tendencies are apparent in Eisenman's "The End of the Classical" exactly because he situates this text as a Foucauldian archaeology of architecture. Whatever its merits might be, the text fails to provide such an archaeology. Eisenman bases this argument on the apparent resemblance between Renaissance architecture and ancient architectures. This follows, of course, Wölfflin's methodology as adapted by Colin Rowe in "Mathematics of the Ideal Villa" which first attempts to find similarities in terms of appearance (which we will examine in the coming chapters). However, were one to really take on Foucault's archaeological "method" as a way of analyzing the history of architecture, such appearances would not be enough to justify a continuity since the manner in which representation operates in each might very well be incommensurable. The system of ancient classical architecture is not necessarily the same as for the Renaissance simply because they use similar words or forms; their meaning and function are subject to extreme difference. For example, a Doric column in the Greek temple is a fully formed object and a component of another volumetric whole; for the Renaissance it is a dependent component of a planar wall system. Though they might look the same, the identity of the "column" within a system of architecture is incommensurable if the two architectures depend upon different conditions of knowledge and signification.[65]

The second issue extends the continuity of objects to what we might call the continuity of practice. One should not assume that Renaissance architecture represented a past architecture simply because it redeployed its overt signs, but more to the point, such repetition is insignificant since signs are mobile and transformable rather than fixed marks of continuity. It is the construction of the classical architecture within and through the work and writings of Renaissance architects that remains to be described, not their repetition of a classical architecture as an already defined and fixed site of history. The re-appearance of Vitruvius would not be taken to mark a return or repetition of an "already valued architecture" as Eisenman argued it did. Rather, it would need to be determined how this recovery was a transformation within the discourses about building, design and its practices and knowledge (e.g., the radical difference of architectural authorship, drawing and its relationship to construction found from the northern "master builders" of the Gothic cathedrals and Florentine "man of letters"). Similarly,

one would not move so quickly to ascribe to all these *epistemes* a genre of ideas and practices called by the name "Architecture." What constitutes "Architecture" as a set of practices and knowledge, authors, legal structures and economies in the fifteenth century, or in the twentieth might be incommensurable from that of ancient Greece or Rome and thus be better represented as *different* rather than a continuous field of endeavor. One could not assume that there is a continuous discipline of architecture that coheres to an essential identity. Instead, one would map the transforming constellations of practices and formations of knowledge. Rather than privilege the apparent similarity of certain Renaissance forms to Roman or Greek orders, one would ask what it was that allowed these objects to reappear in the way that they did. Similarly, rather than detect in Modernist architecture a continuation of classical order and define truly modern architecture as a break with this order, one would begin to ask how this apparent continuity became possible and the role it played in constructing a modern discipline of architecture. The history of architecture would be a discontinuous charting of difference rather than a tracing of a continuity given by an original model of Vitruvius.[66]

Most suspect is Eisenman's implicit location of his own work and his own time as the moment of rupture, a frequent conceit of Hegelian histories of progress and transcendence which for 150 years has continually relocated the line of rupture from one present moment to the next. If Eisenman argues the modernists were "ideologically trapped in the illusion of the eternity of their own time,"[67] then he appears equally snared in the habits of his historical position at the supposed end of history. In so far as Eisenman accepts that the attempt to move beyond classicism is itself classical (in its modernist variant), he not only is bound to an indefinitely prolonged ending but, like so many of post-modernists, elevates this break to a new form of completion of a Vitruvian origin. He criticizes their metaphysics as dominant narratives but is happy to re-inscribe them as the origin of his historical significance. Thus, while on the surface of his rhetoric, Eisenman continues to operate within a Hegelian structure and conception of history.

Greg Lynn also perpetuated this covert total history. His argument that "wholeness" and organic proportion have determined the "whole history of architecture" is a nice play on words that obscures the very traditional notion of history upon which it depends. Is Lynn being ironic, drawing a parallel between the idea of a whole history and wholeness in form, implying that the two go hand in hand, that the prejudice for wholes also makes architectural history seem more unified than in fact it is? Even if this is the case, this is to conflate two different registers between appearances of truth and historical processes of formation. Surely, the history of the concept of the whole in architecture—especially if it is to destabilize architecture's predilections for the whole—cannot itself be characterized as a whole. While

Lynn points out the dangers of such an assumption of identity in terms of formal and geometric resemblances and suggests alternative models based on continuous differentiation (citing Bataille and Husserl), he never pursued the implications of his argument for the forms of historical description.

To be fair, in an incisive text describing the significance of Rowe's "Mathematics of the Ideal Villa", Lynn implied that in fact these constructions are far more recent. Moreover, he critiques the dependence of Rowe upon the presupposition of identity, to which any difference is seen as secondary to the unchanging, "natural" architectural order that Humanism proffers.[68] But Lynn comes close to mobilizing histories that follow just such a logic of resemblance. Similarly, Agrest's account of gender seems to accept many of the terms and identities given by the phallocentric system of architecture. She does not, however, seem to ponder the possibility of concepts of gender actually changing from the fifteenth century to now, let alone deal with the non-binary constructs of gender such as existed in ancient Athens.

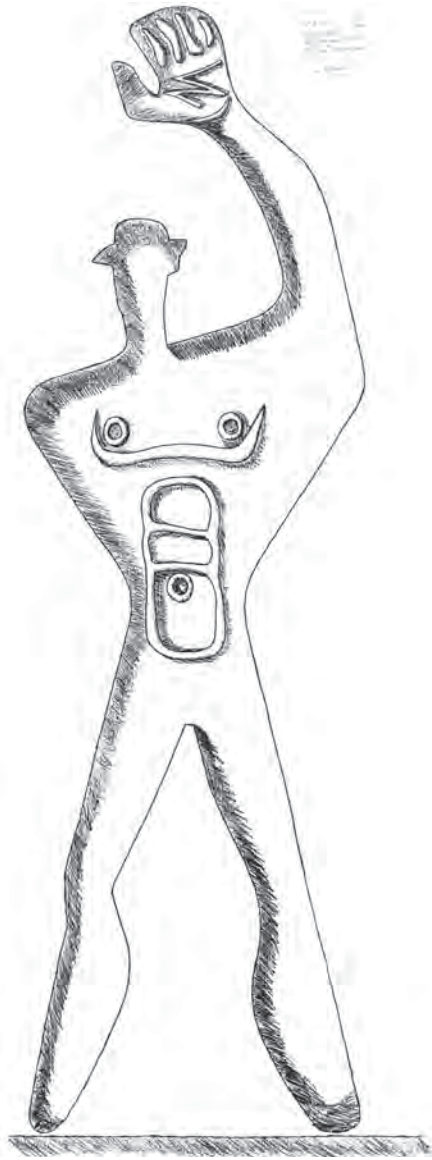
Ironically, by their own arguments, neither Agrest, Lynn nor Eisenman can occupy a neo-avant-garde position. They can only surf the wake of the classical, playing out the prolonged end game of its *unconcealment* as a fiction. A post-humanist architecture lay stranded in a near future perpetually delayed. If the phenomenologists ultimately offer moralism, the post-structuralists are bound to a negative theology.

Moreover, by rehearsing a dialectic of tradition and modernity, post-structuralists de-historicize the formation of this dialectic and the objects made available through its discourse. They wish, for example, to displace the values of the timeless and the whole, but their attempts to do so rely upon a historical narrative dependent upon exactly these values. It is bizarre to premise a shift towards a non-humanist architecture by maintaining—and reinforcing—a humanist historiography and the identities of architecture it has provided, both in terms of the nature of its objects of discourse and the discipline itself. This does not mean that architecture remains deeply humanist but that it may remain within the same space of knowledge that created this representation of its past and present. This suggests re-examining the discourses surrounding the body and ordering that existed within modern architecture as a post-humanist archeology of the present.

4.
MODULOR RESIDUES OF HISTORY

Modernity is often defined in terms of humanism, either as a way of saluting the birth of "man" or as a way of celebrating his death. But this habit is itself modern, because it remains asymmetrical. It overlooks the simultaneous birth of "nonhumanity"—things, or objects, or beasts and the equally strange beginnings of a crossed-out God.

—*Bruno Latour*, We Have Never Been Modern

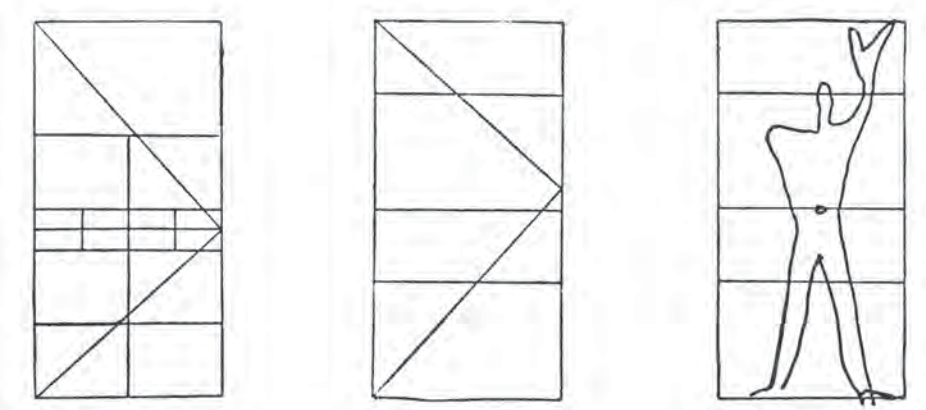


4.1 Le Corbusier, drawing of "man with arm upraised" or the "Modulor Man" to be cast into the concrete at the Unité de Habitation. Copyright, FLC/ADGAP, Paris and DACS London, 2006.

So far we have examined how the Vitruvian Figure operates within recent architectural discourse. This chapter turns towards another frequently referenced model of the relationship between the body and architecture—Le Corbusier's Modulor. I am not interested in serving as apologist or critic of Le Corbusier's apparent attempt to re-invent the Vitruvian Figure for a modern age. Instead, here I want to examine how it operates as a historical object through which current discourse is constructed. Knowing this allows a better understanding of what is at stake in the coming chapters' examination of the body in modern architectural history. What I will try to indicate is that, whatever else the Modulor may be or might have been, it has played an oddly useful role within recent discourses of the body in architecture. Even as architecture seeks to overcome humanism, the once rather forgotten Modulor returns as a specter of unfinished business. It is unfinished in two senses: first of all, in contemporary architecture's historical relationship to the Vitruvian tradition and its historicity and, second, in the relation between formalism and humanism. Like the phantom, the Modulor gains its power and importance not from an internal fortitude but as a shadow of the past.

RECALLING THE MODULOR

Le Corbusier began work on the Modulor in 1943, when commissions were scarce. He completed the book, *Le Modulor*, in 1948 and published it in 1950, followed by a sequel, *Modulor 2* in 1955.[1] A third book was planned but never completed. Through these texts Le Corbusier developed and disseminated his claim that the forms of the human body can be inscribed within the geometries given by the Golden Section ratio and Fibonacci series. Le Corbusier first used the average Frenchman's height of 1.60 meters as the basis for such a relation, later increasing this to accommodate the average all-American male as he attempted to market the Modulor in the United States. He then subdivided and multiplied this measure into a set of Golden Section rectangles to provide a system of proportions and from this initial geometry were derived two "rulers" (called the Red and Blue Series) that were graduated according to the Fibonacci number series and the Golden Section. He drew a human figure within these geometries, each part of the body governed by the ratios, and called it the "Modulor Man" in an obvious allusion to the Vitruvian Figure. The claim was that this constituted a proportioning system based on the human body. Moreover, he imagined that it should have been used in all manner of industrial production, colliding the then nascent field of ergonomics with the compositional "regulating lines" inherited from Wölfflin's analyses of paintings and adopted by Le Corbusier early in his career.[2] Doing so, Le Corbusier asserted, would restore a lost harmony between humans and their environment by regulating technological production through a measure derived from the body and its scale.



4.2 Le Corbusier, derivation of the Modulor as a measure related to the human figure and Golden Section, *Le Modulor*, Figure 9, 1948. Copyright, FLC/ADGAP, Paris and DACS London, 2006.

Beyond this simple account, any attempt to explain the Modulor is frustrated by the nature of the texts that described it. While the books were designed using the Modulor, and might be thought of as the first products of the system, the content shows little concern for systematic organization. Hastily edited, *Le Modulor* and *Modulor 2* were montages of tales of origin, and polemics about the future. Le Corbusier combined broad cosmological theories with anecdotes about the Modulor's implementation, travelogue, and correspondence. These disjointed narratives were accompanied by parallel streams of diagrams, sketches, captioned and uncaptioned photographs, found objects, mathematical formulae and tables of numbers. The tone ranges from megalomaniacal to false modesty. The texts resist rigorous interpretation or deconstruction because their arguments disintegrate before the reader. Because of this, they can be interpreted to support almost any reading that one cares to project.[3]

Of course, they were huge hits. The first edition sold out quickly and was translated into English in 1951, though by that time it was already widely discussed within Anglo-American architectural discourse. Soon, *Le Modulor* was translated into Spanish and was published in South America; shortly thereafter German and Japanese editions ensured it became a worldwide phenomenon. Its successes spawned symposia, numerous articles, lectures, imitators and competitors. The British Library contains dozens of similar measuring systems created in the 1950s, many citing the Modulor as their chief precedent. The second volume followed in 1955 (published in English in 1958), comprising a collection of correspondence from devotees of the Modulor around the world, accounts of its use within Le Corbusier's own architecture, as well as tales of his efforts to have it patented. In addition, Le Corbusier collected a considerable amount of material for a never published third volume (under the working title, *Modulor III*).[4] The Modulor was the

object of continuous effort on its author's part, and of considerable attention by others. Frequently reprinted, the texts continue to sell and be used. On its fiftieth anniversary, a newly boxed edition of both volumes was published at half-scale, accentuating the sense of the Modulor as a precious curio.

Such was its success, the Modulor and the Modulor Man became a logo for Le Corbusier. Both were cast into some of the buildings where he employed the Modulor measures, most famously in the Unité de Habitation.[5] In photographs, a cut-out of the Modulor Man would sometimes be posed next to his buildings, such as in the presentation of Maison de l'Homme (aka, the Swiss Pavilion) in the *Œuvres Complètes*. In *Modulor 2*, another apparently staged photograph depicted Le Corbusier at the site of what would become the city of Chandigarh, which he claimed was organized by the Modulor. In the photo, the architect examines his plans while a cut-out of the Modulor Man stands in the background as if it is an assistant surveying the land. This figure is positioned in the photo such that it appears to extend off the edge of the plan and into the landscape, literally mediating the border between the drawing and the constructed experience. In the accompanying text, Le Corbusier provides a mythic origin entitled "Birth of a Legend": at the sunset of his March 28th 1951 visit to the site, he lost his Modulor tape measure in the dust and imagined it as a seed planted in the barren ground, from which would "flower" a harmoniously planned habitat for humanity.[6]

Use of the Modulor figure was not restricted to Le Corbusier; for example, Paul Rudolph requested permission to cast the figure of the Modulor into the Yale Art and Architecture building, which Le Corbusier granted.[7] The Modulor also appeared in professional manuals of architecture, which increased or added introductory sections on human scale and anthropometrics in the 1950s.

Even at the end of the twentieth century, visitors to Villa La Roche—now a museum adjacent to the archive and administration center *Foundation Le Corbusier*—were still greeted by a Modulor Man printed on their entrance ticket, as if the Modulor was the currency used inside a parallel Corbusian universe. Once inside, architectural tourists can purchase a mass-produced replica of the Modulor tape measure modeled after one made for use in his atelier by his assistant, Soltan. If you can't take home an original bit of Le Corbusier's architecture, you can purchase its ordering device and reproduce its aura at home. Although Le Corbusier was never able to patent the Modulor as he attempted for years, it has posthumously become a proprietary and copyrighted trademark of his *œuvre*. Given this, the Modulor might be seen as the first concerted attempt at architectural "branding."

4.3 Photo showing cut-out of the Modulor Man at the "Maison de l'Homme", Zurich, 1963-67. Copyright, FLC/ADGAP, Paris and DACS London, 2006.

4.4 Photo of Le Corbusier and Modulor Man at Chandigarh, from *Modulor 2*. Copyright, FLC/ADGAP, Paris and DACS London, 2006.

THE RESIDUAL HISTORICITY OF THE MODULOR

Despite these reminders of the Modulor's popularity, by the mid-1960s it was often presented as a failure and as forgotten, though the few that continued to champion or criticize it ensured its status as a footnote. It is interesting to note the degree to which it was written out of theories and histories of modern architecture. For example, in 1980, Robert Slutzky's article, "Aqueous Humor," published in *Oppositions*, emphasized the anthropomorphism of Le Corbusier's architecture, its references to natural order and its hydraulic empathy with the embodied subject. Yet, throughout his many examples, Slutzky never mentioned Modulor, even in a footnote. Moreover, the article appeared in a special double issue of *Oppositions* devoted to Le Corbusier in which the Modulor was not mentioned.[8]

Similarly, in the early 1980s, the Modulor was not a reference for post-modernism. Michael Graves, for example, argued in his 1982 article, "A Case for Figurative Architecture," that architecture should be "rooted in a figurative, association, and anthropomorphic attitude."[9] The Modulor makes no appearance. Graves used *ad hoc* references to traditional building components—such as wainscot, soffit, and cornice—rather than an abstract ordering principle derived from the measures of the body. Composition and proportion were "timeless" not because they were thought to embody a systematic geometry as Le Corbusier thought, but because they replicated historical forms. Likewise, Peter Eisenman's "The End of the Classical" did not deal with the Modulor, even though it would seem clear evidence of modern architecture's continuity with the classical.

Even the monographs and historical surveys of Le Corbusier's *œuvre* written in between the mid-1960s and the late 1980s usually relegated the Modulor to a few passing paragraphs. It became a marginal object of architectural history in every sense: a minor work but also marking threshold of historical transformation. Robin Evans argued that for most critics and historians it "registers as a last, faltering attempt to discover a rational basis for architecture, an attempt that was superseded before it was complete."[10] As a result, Evans argues, the Modulor is a "residue that provides a historical link to the prewar Le Corbusier concerned with calculation and precision, but having no power to define or modify the strange architectural forms" of his later years.[11] It no longer appeared to inform architectural thought either as a model to follow, to reject, or even mention. It simply faded, having been effectively written out of the active corpus of architectural knowledge.

Only as the body and humanism became a topic of debate, spurred by the rise of phenomenological-hermeneutic theories, on the one hand, and French post-structuralism, on the other, did the Modulor reappear, now as a figure of modern architecture's relationship to a classical past and to modernity. Curiously, it reappeared most prominently in attempts to forge a "post-humanist" and "critical" architectural program. By the late 1990s,

4.5 Replica Modulor tape measure and film canister for sale at the Fondation Le Corbusier. Photo by Christopher Hight; product copyright, FLC/ADGAP, Paris and DACS London, 2006.

Eisenman—who had previously avoided it—reinstated the Modulor into the genealogy of crucial "diagrams" in modern architecture that also included the nine-square diagrams made so famous by Wittkower and Rowe.[12] In 1997, it playfully reappeared on the walls and annals of the Architectural Association in a student project that juxtaposed it with John Travolta's uncannily similar stance on the poster for the film "Saturday Night Fever." References in journals multiplied. Now it is difficult to mention anthropomorphism, architecture and modernism without citing the Modulor as a prime example. What is important is not the depth or breadth of writing about the Modulor—there remain only a few articles that treat it in a sustained fashion and no books. It continues to be seen as a historical footnote, but this position has become mobilized for a variety of purposes.

THE MODULOR AS "ONE EXAMPLE"

Because the phenomenologists seek to recover a meaningful relationship between the body and building, they present the Modulor as a path not taken. At the end of *The Dancing Column*, Rykwert argued for the need to reinstate a metaphorical relationship between the building, the body and the world:

> *One example of what can be done seems to be provided by Le Corbusier's Modulor. It was perhaps the most convincing attempt to set out a mimetic teaching and it is at least partially successful… [It] has so far been an isolated instance of a* techne *formulated for current conditions.*[13]

In this statement, Modulor re-emerges from the nihilist despair of modernity as the exemplar of how architecture and construction might be re-aligned with a "metaphorical commerce" between building and the body.[14] He presented the

Modulor as an attempt to work through the paradox of modernity: a system of rules that would have rationalized construction and design by appealing to our embodiment. Here a common interpretation of the Modulor as belonging to an early twentieth-century abstraction and systemization combines with an equally common reading that it was an irrational personal myth. By putting the Modulor into a relationship with Greek theories of *poesies* and *techné* rather than modern *aesthetics* and production, Rykwert situated it as a way to recover their lost unity of Being. In fact, he closed *Dancing Column* by suggesting that, while the Greek tradition "spoke to another time," the Modulor was one example of how to reinvent its tradition for our age.[15]

Alberto Pérez-Gómez presented a very similar reading of the Modulor. While acknowledging the Modulor's reductionism (as so much contemporary theory condemns it), he immediately moves to save it with a "more subtle interpretation" of the Modulor as an opening in modernity towards a symbolic architecture, "whose meaning would transcend the specificities of language and cultural difference."[16] If Pérez-Gómez argued that a constitutive meaning of architecture was lost at the end of the seventeenth century, he also suggested that the Modulor offered a glimpse into the possibility of recovering architecture's lost metaphysic adapted for modern conditions. This apology argues that the Modulor's reference to the body recaptured some eternal essence and universal meaning of architecture. Throwing off rationalism in favor of the primacy of perception, the Modulor attempted to tame modern technology for the embodied subject.

These readings adhere to Le Corbusier's own narratives. After all, Le Corbusier juxtaposed the evolution of the Greek temple to models of the Citroën in *Vers une Architecture*, suggesting not only that an architecture could be derived from a machine aesthetic, but that mass production could be tuned to embody that eternal essence of architecture. Rykwert's idea that the Modulor attempted to heal technological alienation conforms to Le Corbusier's narrative, in which many passages seem to correspond with Merleau-Ponty's phenomenological subject. For example, at one point, Le Corbusier differentiates the Modulor from the Vitruvian Figure because his system organizes things in accordance with an embodied subjective perception.[17] Thus, the Modulor appears as a phenomenological version of the Vitruvian Figure that refers to the embodied senses of the subject. Le Corbusier sought to hear the speaking in figures of Greek architecture echoing across millennia and restate it within twentieth-century parlance.

Nonetheless, the Modulor is a problematic object within the phenomenologists' historical narrative of continuity and rupture. If, as they argue, modernity really sundered so completely the body-building metaphor that it killed the tradition of architecture, how does one explain the sudden appearance of the Modulor (let alone the widespread re-emergence of the human figure as a model of order in the 1950s)?

Essentially, they explain it by presenting the Modulor as anachronistic to modernity. First, they see the Modulor as a lonely voice in the silence of modern architectural prose, "an isolated instance" (as Rykwert puts it) of the attempt to recover the lost body metaphor of the Vitruvian tradition.[18] For Pérez-Gómez and Rykwert, the Modulor represents an idiosyncratic bridge within that massive abyss. Second, in so far as they define modernity as a break with the body metaphor, the Modulor must be non- or even anti-modern. The Modulor is anachronistic because in attempting to re-establish this relationship it contradicts the definition of modern architecture. Instead, they align the Modulor with a former historical organization of subjects and objects, knowledge and artifacts. In a profound sense, the Modulor never has its moment within history. Instead, it marks a double loss since its attempted recovery of the body metaphor remains tragically unfinished or failed. The presentation of the Modulor as anachronistic and idiosyncratic allows the phenomenologists to champion it and in doing so conserves and actually reinforces their homogenous portrayal of modernity. Had it been adopted, as Le Corbusier dreamt as a universal measure, or rather, if the possibility ever had existed that it could have somehow overturned the pervasive instrumental realism they claim permeate modern existence, the phenomenologist account of modernity would cease to be possible. Therefore, one has to question Rykwert's portrayal of the Modulor as one example of how to resurrect the lost metaphoric of architecture, since to do so would mean that we were never as "modern" in the terms that he and Pérez-Gómez claim. Perversely, they champion the Modulor but need it to exist only ever as a failure, for the heroic Modernist architect to stumble, and indeed require that his attempt be abject in order to maintain their account of architectural history.

THE MODULOR AS VITRUVIUS'S HEIR

One can readily understand why the Modulor would play a role in the phenomenologists' arguments, but surprisingly it has also been a frequent reference for post-structuralists. In fact, numerous attempts to reformulate the relation between the body and architecture in a supposedly non-Classical, non-anthropomorphic, non-humanist form dig up the Modulor from its historical grave and present it as the modern heir to Vitruvius.

One might compare Rykwert's argument for the Modulor as an isolated example with Anthony Vidler's characterization of the body's role in modern architecture:

> *With the isolated exception of Le Corbusier's vain attempt to establish the Modulor as the basis for measurement and proportions, the long tradition of bodily reference… seems to have been definitively abandoned with the rise of a modernist sensibility.*[19]

As with Rykwert, the Modulor appears in Vidler's narrative as an isolated "unabashed" attempt to "reinvent the Vitruvian man for the modern age."[20]

Similarly, when Kate Nesbit, the editor of an anthology of recent architectural theory, introduced "The Body" as one of the "themes" of the post-modern architectural theory, she summarized without evidence that, "Le Corbusier was almost alone in pursuing a human-based proportioning system, the Modulor. The relationship between the body and architecture was for the most part neglected."[21] This ostensibly modest statement contains a series of common but untested assumptions, for example, that the body did not play a significant role in the history of modernism. As before, the Modulor is difficult to account for within this history of classical continuity and modern rupture except as the exception to prove a historiographic presumption.

At the same time, the Modulor is often used as evidence of modern architecture's continuity with the humanist tradition. In her article "Architecture from Without," Diana Agrest reduces the Modulor to a footnote, but argues that it carries the same exclusively male reference of the Vitruvian Figure.[22] Here the Modulor is a literally marginal figure within the theory of architecture, yet one that evidences in its very marginality the phallocentric repression of issues of gender and sexuality within the history of modern architecture. Likewise, the symposium and book *Anybody* situated the body's condition within contemporary architecture by invoking the Modulor. Its editor, Cynthia Davidson introduced a set of papers entitled "The Idealized Body" with the following hypothesis:

> *Vitruvian Man, the Golden Section, and Modulor Man were formerly proposed as idealized icons of the anthropomorphic relationship of the body to architecture. It was on these figures of the human male body that proportions in architecture were based. But…*[23]

Inevitably, many "buts" qualify such citations (in this case a list ranging from psychoanalysis to genetic engineering), rendering the old figures outdated—or at least easy targets.[24] Its anachronism marks the estrangement of architecture's models from broader cultural development, leaving architecture outdated. Because they argue that modernist architecture continued the Vitruvian tradition, the Modulor has become the very icon of this continuity.

Meanwhile, for other theorists and architects who seek to redeploy the body in non-classical forms, the Modulor has re-emerged as the central target in their critique of modernist architecture's classicism. While Greg Lynn notes some superficial differences between the Modulor and the Vitruvian Figure, like Pérez-Gómez, he suggests these are far less important than their, "adherence to ideal proportional reference… [such as] harmony."[25] Moreover, for him, the Modulor is not marginal, but "has been the dominant figure in the definition of modernism" to the neglect of other possibilities often implicit in Le Corbusier's own work.[26] For Lynn, the Modulor no longer serves as an exception to the idea that modernism was divorced from the body but now operates an exceptionally clear example of the humanism entrenched within modernist architecture.

However, even as post-structuralists see the Modulor as an icon of modernism's classicism, it continues to appear as a strangely anachronistic figure, arriving in the waning days of high modernism as a reactionary gesture to buttress the edifice of architectural humanism that was already beginning to crumble. Lynn portrays the Modulor as a sign of decadence in an article concerning Charles Gwathmey's architecture, comparing the Modulor with another Le Corbusier drawing of the body, that of an aging boxer. Lynn argues that Gwathmey's architecture is like the latter, an over-exercised and worn-out body, an exaggeration of the classical body. Lynn's critique is double-edged. In an echo of Rowe's article on "Modernism and Mannerism," Lynn argues that Gwathmey's formalisms mark the decline of the classical system through exaggeration, "the deterioration of a seemingly whole structure… What appears in modernism as a well-maintained, stable purity, is now exercised excessively."[27] Lynn's reference to an aging body builder suggests the decrepitude of the classical modernism inherited by the so-called "New York Five."[28] Their architectures at once repeated and exaggerated the latent Vitruvian formalism of their Oedipal father, Le Corbusier. The forms of the "New York Five" are mannerist exhaustions of this modern classical system, final evidence that the humanist ideology has become bad faith, or to put this into Eisenman's terms, the anthropomorphism of the Modulor reveals modern architecture as merely a simulation of Vitruvian (classical) values.[29]

The Modulor figures in this genealogy as a belated revelation of modernism's humanism and Platonism, and as a Vitruvian body in crisis. The Modulor refers to a modernism that is not so modern, as a final attempt to shore up a decayed body of classical architectural knowledge. The Modulor has been very useful to post-structuralists yet it also is a source of embarrassment for it reveals their father figure's premature obsolescence, and modern architecture's failure. As such, it marks the beginning of the end of this continuity of an architectural humanism. The last in a historical succession, the Modulor takes its place at the end of a classical lineage, not simply as the heir of Vitruvius but as the last, decrepit descendant in its genealogy of humanism.

For this very reason the Modulor now appears in architectural discourse far more frequently than it has since the 1950s, especially in attempts to formulate a post-humanist architecture because it seems to reveal a modernism unable to break with a classical tradition. A marginal figure weirdly becomes central to how we understand modernism and its historicity, but at the same time undermines modernism's importance since the repetition of the human figure in the Modulor seems to index the repetition of the classical within modernity.

Nevertheless, as with the phenomenologists, the revision of the Modulor has a paradoxical effect. Because Lynn and Eisenman implicitly position their work as the first truly modern (not-classical) architecture,

they pluck the Modulor out of obscurity to emphasize the radicalism of their "deviant" fragmented, mutant and blob forms. Yet, this new dominance only reinforces the Modulor's—and thus, Vitruvius's—authority as the normative model. The whole, ideal, masculine, anthropomorphic, harmonic, symmetric, representational, static body of the Modulor-as-modernist-Vitruvian-Figure effectively defines the grounds upon which a different (supposedly truly modern) formulation of the body can occur through multiplicity, monstrosity, feminist iconology fragmentation, asymmetry and operativity. The latter terms all draw their meaning and power to shock from a direct and often explicit juxtaposition with the earlier qualities now ascribed to the Modulor/Vitruvian classicism. Now, the Modulor appears more significant and dominant than it should because it marks the boundary for an order that might replace it. If the phenomenologists need to maintain the Modulor's failure to maintain their definition of modernity as a break with a classical tradition, post-structuralists require it to emerge from the margins of history to evidence that modernism adhered to the Vitruvian system of architecture.

UNFINISHED BUSINESS

The very consistency of the interpretation of the Modulor as a modern version of the Vitruvian Figure might seem to suggest that this reading is correct. However, I wish to question the grounds upon which such a judgment becomes possible. This does not concern the Modulor itself but what its interpretation as a modern Vitruvian Figure reveals about the nature of the history in which this repetition can occur.

Crucially, the post-structuralists' understanding of the Modulor is complementary rather than contrary to the phenomenologists' view that it is isolated and anachronistic. As I argued in the last chapters, both define a break between traditional and modern architecture not in terms of style but according to the system of reference in which architecture participates. Like phenomenologists, post-structuralists treat classical humanist architecture as a linguistic system that operated through bodily tropes. They both think that the Modulor is isomorphic to that humanist language of signs and referents. They both accept that the Modulor is anthropomorphic and that this anthropomorphism represents an anthropocentrism derived from Renaissance or ancient cosmology.

In all these accounts, the Modulor appears as an anachronism. I mean anachronism in the fullest sense: as something displaced from its proper period in history into another, as something that promotes such displacement, and as something that is itself out of date. I also mean it in the most literal sense of the original Greek, as something that is against (*ana-*) time (*khronos*). The Modulor, as we have seen, does not fit easily into representations of modernity as a break with a classical humanist tradition or as its continuation.

Either it is an irruption of a dead tradition within the desert of modernity, or it reveals the deadening non-modernity of modern architecture.

Yet, this depiction is complicated by the fact that this particular residue, as such, also plays a constructive role in the discourses of recent architecture. Indeed, as we have seen, it was only with the dissemination of post-structuralism and phenomenology in architecture since the mid-1980s that the Modulor appeared as a notable—and problematic—object of discourse. The Modulor's appearance of anachronism is equally useful to those like Pérez-Gómez, who lament the tumult of change as it is to those, like Lynn and Eisenman, who wish to argue that modernist architecture remains essentially the same as in fifteenth-century Italy. All these projections of architecture's future pass through a consistent pattern of argument about the Vitruvian body and its Modulor heir apparent. Their understandings of the Vitruvian tradition and the Modulor as an anachronistic version of that tradition in modernity depend on this continuity and the role of the classical as a model. If an opposition to tradition defines modernity's historicity, then as with all dualisms, the first term, the classical tradition, operates as a model that defines the second, modernity, as its inverse. The latter is defined as a break, a simulation, a rupture or as alienation; in other words, a *lack* in regards to the continuation of the classical as model. Moreover, the normative model of the classical absorbs any transformation that might have occurred, as the classical is re-inscribed *in absentia* as the basis for modern architecture. Given this characterization, one sees how these theories exhibit an anxiety about the supposed failure of modernism; indeed, defined as a negation, modern architecture *necessarily* fails and can only be in perpetual crisis. However much post-structuralists believe it to have been rendered obsolete, they still locate their discourse *vis-à-vis* the Vitruvian-Modulor model.

Thus, in the paradoxes and ironies we have uncovered and the patterns we have mapped in the last three chapters, we can see that far from belonging to architecture's past, the Vitruvian body is integral to the debates and problems of contemporary architecture. In so far as contemporary architecture seeks to move beyond anthropomorphism and humanism, or as others seek to recover such concepts and schemas, these figures provide the yardstick—or the Modulor tape—by which we measure our distance from both tradition and modernity.

Perhaps it seems perverse to suggest that the Modulor—by usual accounts a relatively unimportant interval in the history of Modernism—is crucial to problems of post-modernity and to formulating a non-humanist architectural theory. In histories that privilege continuity and tradition, even if the tradition of the modern is defined as continual change, such an anachronistic object must be explained away, re-integrated into the narrative, or marginalized as an error. The phenomenologists and poststructuralists assume that an object of historical or theoretical inquiry enjoys a continuous

identity to its appearances in past (or future) inquiries. The writers we have examined dismiss any problems it presents not simply within the broad narratives of modernism but also within our understanding of categories of historical representation, such as the author, the *œuvre* and the period. These are all protected by rendering the Modulor as a bit of historiographic detritus, "matter out of place," an error.

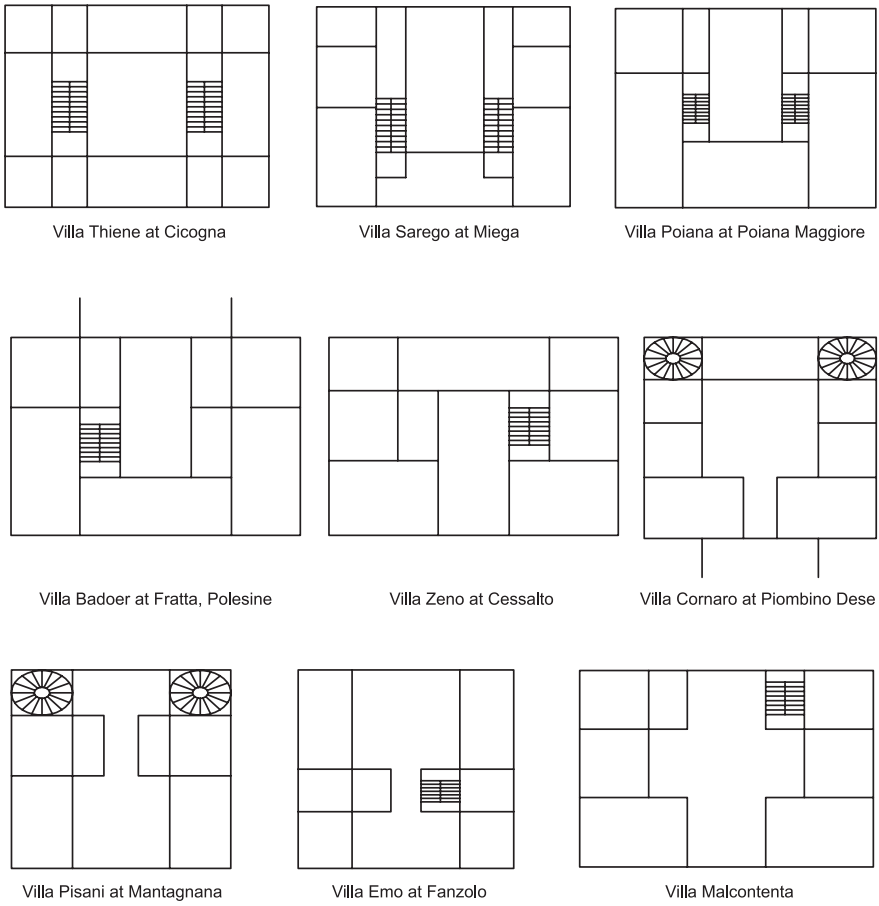
Taking its anachronism not as a given, but asking on what terms it appears as such, I propose to employ the Modulor as a crack in historical representations that privilege continuity and simultaneity at all costs. Is it not this narrative *about* the Vitruvian Figure's humanism that provides the conditions for contemporary and modern discourses of architecture? A productive anachronism like the Modulor cannot be understood as something intrinsic to an object which can be empirically located within a succession of pasts, presents and future objects but as a complex figure in the construction of that narrative. Accounting for its operations requires suspending many of the conventional assumptions that its presentation as an anachronism serves to conserve. Rather than interpret the Modulor as a modernist version of the Vitruvian Figure and an attempt to recover the values of a Renaissance or classical tradition, we should ask how such identifications were formed and what work they perform. Mapping the anachronistic time-frame within which the Modulor exists unfolds the possibility of reformulating the historicity of modern architecture as something besides a break. It suggests a rather different account of modernity and the so-called Vitruvian tradition is required, one that begins to question the conventional accounts based on a dialectic of a lost tradition and modern rupture (whether or not it has occurred already or awaits our discovery). Therefore, the following chapters will attempt to describe this identification as an object of modern architectural discourse that articulated an explicitly modern set of problems.

5.
A MID-CENTURY RENAISSANCE

What this generation sought was historical justifications for its own attitudes, and it sought them in two main areas of history—the traditions of Modern Architecture itself… and the longer traditions of classicism.

—Reyner Banham

Schematized Plans of Palladio's Villas



5.1 Diagrams drawn after Rudolf Wittkower "Schematized Plans of Eleven of Palladio's Villas," Figure 8, *Architectural Principles in the Age of Humanism.*

Shortly after Le Corbusier published *The Modulor*, the architectural historian Rudolf Wittkower published a short book, *Architectural Principles in the Age of Humanism*. Considering himself chiefly a scholar of the Baroque, Wittkower presented this text on Renaissance architecture as a diversion from his main body of work; the volume reworked three essays already published in the *The Journal of the Warburg and Courtauld Institutes* during the previous decade.[1] For architects, on the other hand, this thin book—often concerning projects that were never built—continues to eclipse Wittkower's thousands of pages on the Italian Baroque.[2] Moreover, in this text, Wittkower constructed the image of Renaissance architecture and its use of the Vitruvian Figure that continues to inform contemporary architecture. This understanding also helped to construct the Modulor as heir to this tradition. In this chapter, I examine Wittkower's arguments and their role within the larger discourses on proportion of which his book was an important catalyst. We also encounter Wittkower's student, Colin Rowe and how his work allowed his teacher's historical arguments to be transferred into post-war design processes that emphasize the "diagram" as the locus of innovation.

WITTKOWER'S RENAISSANCE

Wittkower's book did not offer a comprehensive overview of Italian architecture in the fifteenth and sixteenth centuries. Instead it constructed an over-arching theory and identity of "Renaissance architecture" through relatively limited case studies, including: Alberti's and Palladio's use of mathematical ratios; the significance of the Vitruvian Figure for the centralized church; and the relationship between architectural order and music theory. Each study turned on Wittkower's thesis that proportional systems were intimately connected to Neo-Platonic philosophy and theology that, he argued, dominated Renaissance architectural thought. Through this link, Wittkower sought to analyze architectural design both to embed it within its culture and as something that reveals this context.

To do so, Wittkower combined textual analysis from the writings of the architects with evidence of their drawings and photographs of the buildings, and most significantly, "schematized plans" that Wittkower produced by tracing over actual plans and reducing them to a series of simple geometric diagrams (a technique analyzed in depth in the next chapter). For example, he redrew 12 of Palladio's villas, abstracting the thickness of the walls and crenellations of detail into grids, that he argued, revealed how each example cohered to a single set of harmonic ratios also central to music theory and Neo-Platonic philosophy. Wittkower paid special attention to the preference given to developing schemes for centralized churches, which was at odds with the program of the Catholic liturgy (which required a large space for an audience all located behind a central altar and a secondary lectern, typically solved by the traditional basilica type). To explain the persistent

fascination for this form in spite of its impracticalities, Wittkower referred to the supposed dominance of Neo-Platonist cosmology in which the circle or sphere was thought the perfect form, followed by the cube or square and then the other Platonic solids. For example, Wittkower argued that Alberti claimed that: "no geometrical form is more apt to fulfill this demand than the circle and the forms deriving from it. In such centralized plans the geometrical pattern will appear absolute, immutable, static and entirely lucid."[3] Similarly, Wittkower cited Palladio's rephrasing of Plato's *Timaeus* where the geometry of the circle was said to be the "most perfect and uniform of all" geometric shapes and could therefore be used to repeat ideal reality as a shadow in human experience.[4]

The interest in these geometries was furthered, Wittkower argued, by the recently rediscovered books of Vitruvius, especially Cesariano's 1521 translation. The Vitruvian Figure was the link between Neo-Platonist cosmology and architectural forms. "This simple picture," Wittkower argued, "seemed to reveal a deep and fundamental truth about man… and its importance for Renaissance architects can hardly be overestimated."[5] Indeed, the Vitruvian Figure is first drawn as such during this period, and Wittkower juxtaposes illustrations of six examples from the early 1500s with nine plans of centralized churches from Serlio's fifth book on architecture (1547) and several sketches by Leonardo of centralized churches. Because the latter were purely notional projects, never intended to be realized, Wittkower declared, they should be understood not as architectural plans so much as "documents of Renaissance religion."[6] The use of the Vitruvian proportion, "that organic geometrical equilibrium where all the parts are harmonically related like members of the body" the divine order would reveal itself in the stony shadows of human experience.[7]

The importance Wittkower gives to Neo-Platonic religion for Renaissance architecture has some correspondence to Michel Foucault's controversial characterization of the same era. Foucault also saw Neo-Platonism as philosophically dominating what he called the Renaissance *episteme*, which he argued had no concept of the "sign" in the modern sense. Signs did not represent or symbolize in the sense of Husserlian signifier nor as metaphors; instead, all true resemblances were understood as real relations. There resemblances were made evident via signatures:

> *The system of signatures reverses the relation of the visible to the invisible. Resemblance was the invisible form of that which from the depths of the world made things visible; but in order that this form may be brought out into the light in its turn there must be a visible figure that will draw it out from its profound invisibility.*[8]

In mathematics, geometry did not prescribe an aesthetic idea of harmony or balance but rather the reverse: they were marks that corresponded and made

manifest the constitution of the world. Among the terms for such relations were *conjunctio, similitudo, concertus, amicita* and *proportio*.[9]

Regardless of the accuracy of Foucault's characterization of Renaissance thought, because both he and Wittkower emphasize Neo-Platonism as the dominant world-view, it can shed light on claims made in contemporary architectural discourse because Peter Eisenman's "End of the Classical", to name one example, combines Wittkower's understanding of Renaissance architecture with Foucault's analyses.[10] Indeed, Eisenman's entire argument depends on the commensurability of their understandings of the Renaissance. For Wittkower, the rediscovery of Vitruvius's text was caught within the web of Neo-Platonic *similitude*. In Foucault's Neo-Platonist classical *episteme*, humanity was at the pivot of the great fulcrum between shadowy nature and the ideal reality of God, "the centre upon which all relations are concerted and from which they are once again reflected."[11] Likewise, in Wittkower's Neo-Platonic Renaissance, the Vitruvian Figure revealed an "intellectual relationship between the soul and God" as a double signature.[12] First, it revealed the *similitude* of the human body with the divine geometry of the circle and square. Then it provided a signature, proportion, through which this could be replicated. For example, in *Divina proportione*, mathematician Luca Pacioli (whom Wittkower quoted), argued for the use of the Vitruvian body as a model for architectural order because, "from the human body derive all and every ratio and proportion by which God reveals the innermost secrets of nature."[13] Wittkower also quoted Alberti's edict to, "borrow all our rules for the harmonic relations (*finito*) from the musicians to whom this sort of number is extremely well known, and for those particular things when Nature shows herself most excellent and complete."[14] Similarly, for Palladio, churches should be built, "in such a manner and with such properties, that all the parts together may *convey* a sweet harmony (*une soave armour*) to the eyes of the beholders."[15] Wittkower interpreted this passage as meaning that, "the architect who relies on those harmonics is not translating musical ratios into architectures but makes use of a universal harmony apparent in music: *'certissimum est naturam in omnibus sui esse persimilen'*."[16] The translation Wittkower uses and his reproduction of the Latin are important; his translation inevitably suggests aesthetical pleasure in the modern sense, but the original retains a greater sense of Neo-Platonic *similitudo*. It is vital to note how different this is from the modern phenomenological explanation. The order was not to be perceived by an autonomous subject so much as it placed the subject within an order of divine resemblance that instantiated itself through signatures. It did not matter if such orders were perceptible to the occupant nor ultimately to produce pleasing results for the eye, though that might also be a result. Ultimately, the symbolic operation of Renaissance architecture is understood as an intellectual problem of the installation of divine order through its geometric signatures for the mind's eye.

A PARADIGM SHIFT?

Wittkower's title is thus ironic because he attempted to demonstrate the importance of religious thought in the architecture of the sixteenth century, albeit one that placed humanity at the hinge between the natural and divine worlds. This was no doubt intentional as his title name-checked Geoffrey Scott's, *The Architecture of Humanism* (1914), which had provided the dominant interpretation of late quattro and quintecento architecture for early twentieth-century Anglo-American architects. In Scott's rendering, the Renaissance was humanist in the modern sense of a secular discourse of taste and aesthetic pleasure. Wittkower explicitly rejects this "hedonist" reading, which he attributes to the influence of Ruskin, on his very first page. Accordingly, Wittkower added two words to his own title that radically altered Scott's intention: "Age" to signify the historical and cultural specificity of the architecture that he believed Scott, Ruskin and others had anachronistically elided with their own and which Wittkower sought to recontextualize; the addition of "Principles" suggests that these architectures spoke to a transcendental truth rather than subjective aesthetics. Thus, Wittkower's "sampling" of Scott's title reclaims the Renaissance in new terms. Indeed, it has often been said that *Architectural Principles* inaugurated a new "paradigm" about the Renaissance, its relationship to modernity, and in many ways the relation between architectural order and meaning. This term "paradigm" is problematic but also indicative of the sense that Wittkower created a stable and homogenous frame for architects' understandings of Renaissance architecture.

The first edition of *Architectural Principles* of six hundred copies was intended for Renaissance scholars, although Wittkower thought a few architects might also be interested.[17] It rapidly sold out, as did a second more affordable edition. Soon, Wittkower's book became a featured text in architectural schools and ateliers across Britain and America, devoured by an emerging generation and established professionals, who attempted to convert his analysis of Renaissance architecture into tools for rebuilding post-war cities.[18] It soon became a standard course reading for architectural students and remained so until the 1980s. Reyner Banham declared, "The general impact of Professor Wittkower's book on a whole generation of post-war architectural students… [was] one of the phenomena [of the time]."[19] In the early 1960s, Peter Smithson rebuked a critical review of *Architectural Principles* that had been published in the journal of the Royal Institute of British Architects by declaring Wittkower, "the only art-historian… capable of describing and analysing buildings in spatial and plastic terms," and dubbing *Architectural Principles* the single most important English text on architecture since the end of World War II.[20] A review by Kenneth Clark predicted Wittkower's "masterpiece of scholarship" would completely supplant then dominant accounts of Renaissance architecture.[21] Similar statements

were made by many other architects and art historians.[22] By the mid-1960s, in a Foreword to another, far larger, example of Wittkower's scholarship, *Art and Architecture in Italy, 1600–1700*, Nikolaus Pevsner wrote:

> *Scores have profited from, and been inspired by* Architectural Principles in the Age of Humanism *and its lesson of the importance of consistent modular relations. No other book on the subject of architectural history written by scholars of his generation had such a creative effect on men in practice.*[23]

This view remained the consensus—for architects at least. In the late 1980s, James Ackerman suggested *Architectural Principles'* legacy was as the most read scholarly work on architecture in a thousand years—implying a similar importance to Vitruvius's *De Architectura* written at the turn of that millennium.[24] More recently, in her analysis of the role of architectural history in post-war architecture, Alina Payne confirmed Clark's prediction that, "Wittkower's paradigm… relegated an old one [that of Scott and Ruskin] into obsolescence."[25] Payne attributes its influence to the way it allowed modern architects to understand historical material in a way that seemed familiar to their concerns and therefore made history useful for them.[26] For her, the book marks a "warp" in history between an early twentieth-century architecture that privileged regulating lines, systemization, essentialism and abstraction and an "emerging discourse" of post-modernism that would increasingly turn towards history.[27] In all these assessments, the importance of the book is attributed to its impact on architects. Not only did Wittkower's text replace one representation of architecture's history, it affected the historical unfolding of modern architecture.

THE ARCHITECTURAL PRINCIPLES OF THE MODULOR

In the processes of installing a new understanding of Renaissance architecture, Wittkower also assisted in establishing the conventional reading of the Modulor as the heir to the Vitruvian Figure. At the time of their publication, both *Architectural Principles* and *Le Modulor* were conjoined twins, one looking back, the other forward. For example, in a 1950 lecture at London's Institute for Contemporary Art, Siegfried Giedion reported that *Le Modulor* and *Architectural Principles* were the most widely read texts in the United States at MIT and at the ETH in Zurich.[28] In an article in the influential journal, *Architectural Design*, Ruth Olitsky and John Voelker expressed the consensus view of the time:

> *It is seldom that chance timing in the publication of two books has been so fortunate as in the case of Dr. Wittkower's* Architectural Principles in the Age of Humanism *and Le Corbusier's* Le Modulor. *Both books are concerned, broadly speaking, with interpretations of man's place in the universe. The first explicitly, through historical documentation, the second implicitly, through the development of mind and idea. Each book*

> *illuminates the other, and through them it becomes possible to see the origins of many issues that are very much alive amongst architects at the present time.*[29]

Likewise, Reyner Banham's manifesto for *New Brutalism* situated these two texts as central to the future of post-World War II architecture.[30] Combined, he argued, these books represented a truly awesome force for "evil as well as good" since they were as important for the revitalization of modern architecture (e.g., Smithson's architecture) as they were for a so-called modern Neo-Palladian revival.[31]

Moreover, Wittkower and Le Corbusier engaged each other's work directly. While the historian claimed discomfort with his new-found celebrity among the star architects of the day, he often emerged from the dim stacks of the Warburg Institute to share their spotlight. In his conclusion to *Architectural Principles*, Wittkower suggested there had been a mid-20th century renaissance in studies of proportion, and in a 1949 lecture at the Architectural Association he argued that the Modulor was the prime example of a "new and unexpected solution to this ancient problem."[32] Complimentarily, Le Corbusier quoted at length a letter from Wittkower stating that the Modulor provided a preliminary answer to the adaptation of Neo-Platonic proportion systems for modern scientific theories of "space-time."[33] In 1954, Wittkower made an even stronger assertion that the Modulor was the "first consistent synthesis since the breakdown of the older systems" that had occurred at the end of the Renaissance.[34] Another article of 1963 compared the ancient proportioning system to that of the Renaissance as an evolution "moving closer to the Modulor."[35] He followed with a final assessment that remains the common understanding of the Modulor:

> *Le Corbusier is thus in line of descent from Vitruvius and the Renaissance. When you look at his design of the "Stele of the Measure" built at the Unité d'Habitation at Marseille, you are right back at the anthropometric Renaissance exercises.*[36]

Thus, Wittkower installed and championed the now common understanding of the Modulor as a modern Vitruvian Figure. Even more, Wittkower argued the Modulor demonstrated the "coherence of our cultural tradition" with the Renaissance.[37] If Le Corbusier was the heir to Vitruvius, Wittkower was the lawyer who executed the estate.

This dialogue between Le Corbusier and Wittkower continued throughout the 1950s and into the early 1960s through lectures, articles and revised editions of their respective texts. By the early 1960s this fortuitous alignment seemed to have shifted. Some have attributed this to the rise of historical post-modernism; others, such as Peter Smithson, argued that architects in the late 1940s were looking for something to believe in and having found it with the writings of Wittkower and Le Corbusier soon moved beyond their mid-century crisis of faith.[38]

For exactly these reasons, the legacy of these texts looks very different. In contrast to *Architectural Principles'* enduring influence, as we saw in Chapter 4, the Modulor seems a failure, something long since superseded and inherently anachronistic. Subsequent scholarship of both texts has been similarly sparse, at least in the terms of scholarship that affected design discourse. *Le Modulor* escapes because it is seen as an unimportant error about which there is little that needs to be said; *Architectural Principles* because it has remained too definitive for architects, its arguments so accepted, repeated and naturalized that its arguments have become part of the tacit knowledge of architectural practice, its claims taken for truths. If the Modulor has become a lacuna because of its apparent anachronism and failure, *Architectural Principles* has become another blind spot because of its overwhelming success. Howard Hibbard's obituary of Wittkower called *Architectural Principles*, "his most original single work… too well-known and too influential to need comment."[39] Payne suggests the book has become "submerged and unnoticeable" because it is identical with the contemporary field. The roles that Wittkower's arguments continue to play within today's architectural debates are "invisible" because they underlie so many basic assumptions.[40]

POINTS OF EMERGENCE

This condition has also obscured our recollection of the far broader and intense interest in proportions and the human body that occurred in the middle of the last century. This is even evidenced by the discourses of proportion within art and architectural historical scholarship of the time. For example, in a 1921 article, "History of the Theory of Proportions as a Reflection of the History of Styles", Wittkower's mentor Erwin Panofsky felt the need to preface his arguments by begging his reader's indulgence: "Studies on the problem of proportion are generally received with skepticism or, at most, with little interest. Neither attitude is surprising. Nevertheless it is not unrewarding for the art historian."[41]

It sounds rather like my apology in the introduction to this book. By contrast, Wittkower's Appendix to the third edition of *Architectural Principles* records that "In the years after the Second World War publications of the problem of proportions have increased to such an extent that it has become virtually impossible to keep a check on them."[42]

The perception of different audiences is illuminating since both Panofsky and Wittkower share much in their understanding of proportion's significance. Panofsky speaks of proportion as interesting only to historians because such systems had themselves become historical objects. He begs indulgence, promising that patience will be rewarded with a profound, but expert insight for the specialist, the connoisseur, or the dilettante. He could not see proportion as anything other than a sub-field of his specialty,

iconology—"not unrewarding" but not broadly fascinating for all that.[43] By contrast, Wittkower's statement described proportion as a suddenly irresistible attraction, situating his work as part of a vast contemporary literature on the subject. Of course, Wittkower had added this observation after the phenomenal early success of *Architectural Principles*. In the 28 years between Panofsky's essay and Wittkower's book, the status of proportion had changed. By 1949, proportion was no longer an esoteric subject and *Architectural Principles* was key in this restoration.[44]

But this statement also indicates that however important his own work might have been and may remain in certain ways, it emerged within a context that was ready for its arguments. The interest in proportion was particularly intense in Britain, where it was linked to the rebuilding of cities. Here proportion became a tool for mass-produced and prefabricated social housing under an expanded welfare state.[45] A review of the British Library catalogue confirms that, beginning around 1946, there was an impressive upsurge in the number of articles and books published on the topic. Many are architectural or artistic in orientation while others have a more technical or ergonomic direction, or, indeed, seek to merge the two exactly in the manner Le Corbusier's Modulor attempted to do. Typically, debates on proportion in America were less aligned with social objectives and took a more "aesthetic," or formalist, turn.

On the European continent, intense interest in an exhibit on proportion at the Ninth Milan Trienniale led to the organization of a special three-day symposium in late September 1951 upon that topic. Many established figures in architecture, mathematics and science, as well as many younger voices, attended this "Primo Convegno Internazionale sulle Proporzioni nelle Arti." James Ackerman, then a young historian, reported that he was overawed by the roster of names that included many superstars: Max Bill, Funck-Hellet, Siegfried Giedion, Le Corbusier, Matila Ghyka, Ernesto Rogers, Rudolf Wittkower, Pier Luigi Nervi, Lucio Fontana, and Bruno Zevi. Wittkower was elected "president" of the conference at the end of the first day, and a telegram from Philip Johnson expressed his regrets at not being able to attend.[46] Many of the papers attempted to link architectural proportion with concepts of relative space and time, or other scientific and philosophical theories; others attempted to relate current issues to historical architectures (please refer to Appendix 2 for a program of this symposia). At the end of the long weekend, a standing committee was established with Le Corbusier elected as its president. This cumbersomely named "Comité International pour l'étude et l'application des proportions dans les arts et l'industrie contemporaine," included many of the conference participants and enjoyed a formal association with UNESCO's art and architecture department.[47] Johnson and Jose Luis Sert were invited to join, the former doing so in November of 1951 while suggesting that George Howe, then head of Yale's Department of Architecture

also be made a member.[48] While unsuccessful in organizing a second conference at New York's Modern Museum of Art, Johnson and Sert did arrange a symposium, "De Divina Proportione," on 11 March 1952, at Columbia University with many of the same participants.[49] Another follow-up occurred at the World Congress at Sienna in September 1952, at which Bill, Rogers, Le Corbusier and Speiser presented papers and discussed the topic of symmetry and "Harmony of the Modern Age." This title would be taken as the provisional title for the Comité's unpublished book, *Symmetry: Harmony of the Machine Age*, to have been supervised by Wittkower and to contain sections on history, contemporary issues, architecture and art.[50] While the Committee never seems to have been formally disbanded, it ceased to be active after 1954, at which time correspondence between Le Corbusier and the other participants shifts perceptibly towards his large building works then under construction.

Meanwhile, in the autumn of 1957, the Royal Institute of British Architects sponsored a debate, "On the Motion 'That Systems of Proportion Make Good Design Easier and Bad Design More Difficult'."[51] Nikolaus Pevsner, Maxwell Fry, Peter Smithson, Wittkower and John Summerson (among others) participated, with the motion defeated by 5 percent. Some have seen this marginal result as the demise of the fascination in proportion.[52] Yet, interest had not entirely waned; in the spring and summer of 1965, the recently opened and Le Corbusier-designed Carpenter Center for the Visual Arts at Harvard (1963) hosted a large exhibit called *Proportion, a Measure of Order*.[53]

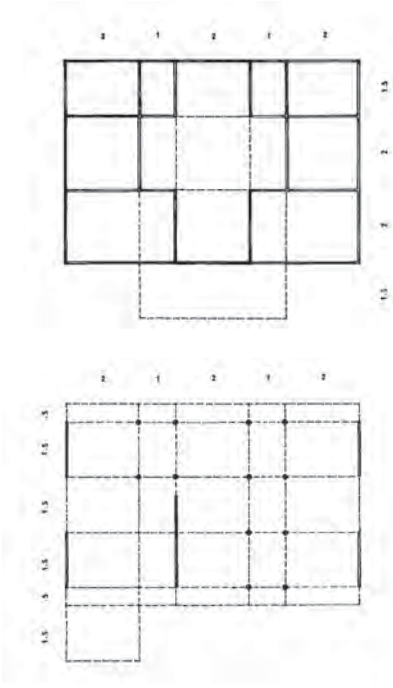
It is also during this period that manuals of practice, such as the *AIA Architectural Graphic Standards*, *Time-Saver Standards* and *Neufert's Architect's Data* all began to include or radically expand existing sections on human measurement and anthropometry. Usually, these were the first chapters and Neufert's was subtitled, "Man: The Universal Standard." These new inclusions indicate the extent that issues of proportion, human scale, and a quasi-ergonomic concern were explicitly installed into normative architectural practice. These manuals of practice continue to put human proportions front and center. Similarly, much introductory instruction in architectural design continues to repeat lessons on proportioning related to the Golden Section and the body.

THE ROWE EFFECT

Colin Rowe, a student of Wittkower during the period when *Architectural Principles* was being formulated, translated his teacher's historicism into modern design practice and theory. In his influential article published two years before Wittkower's book, "The Mathematics of the Ideal Villa," Rowe adopted many of Wittkower's techniques to famously reveal through a set of plan diagrams that the same proportional grid governed Palladio's Villa

Malcontenta (1550–60) and Le Corbusier's Villa Stein at Garches (1927). Wittkower was usually careful to foreground the historical nature of his analyses and their specificity to a certain time, place and culture. Often in the 1950s, Wittkower would reiterate that the Neo-Platonism of his Renaissance had little to directly offer twentieth-century architects. Any system of formal order would need to be "reinvented" to articulate architecture's relationship to modern cosmology and epistemology in the way Alberti had for Neo-Platonic world of the Renaissance.[54] This is exactly what he claimed the Modulor did. Rowe, however, extracted these systems from Wittkower's historical specificity, deploying the same techniques to suggest that modern and Renaissance architectures followed similar principles of organization and, by implication, represented similar classical values.[55] Ultimately Rowe decided that Le Corbusier seized "whatever might seem to represent the present and the usable past; all those items, while transformed by their new context, retain their original implications which signify maybe Platonic ideality."[56] For some, this allowed modern architecture and historical architectures to integrate into an idea of trans-historical and trans-cultural grammar of order.[57] For others, like Peter Eisenman, Rowe's analysis would become the basis for claims that modernity was continuous with classical humanism. For such writers, Rowe seems to have revealed the "persistence of a humanism within the heart of modernism."[58]

However, something very different had changed. Rather than reveal an essential continuity that lay behind their forms, what one sees in the article is the creation of an object of architectural knowledge, available to certain types of analysis and representations and dependent upon certain precepts. Between Wittkower and Rowe, the techniques of the historian and historical analysis were transposed into the architect's techniques of composition, rendering a design practice that appeared to be entirely transparent to *post-facto* analysis by a critic. This has implications for the objects Rowe analyzed, that is, the buildings of Le Corbusier and Palladio. The idea that Palladio and Le Corbusier's architecture are essentially similar in their fundamental order is basically confused with the conditions under which their architectures could be represented as such. Rowe himself pointed to this difficulty in his 1973 addenda to "Mathematics," where he suggested that his roughly "Wölflinian" techniques of analysis, "which begins with approximate configurations and which then proceeds to identity differences, which seeks to establish the same general motif" had obvious limitations.[59] The latter would be that any differences become adherent rather than constitutive of the work, subsuming the specific artifacts into top-down structures of analysis. However, the inadequacies Rowe lists are largely technical problems, compensated by his method's emphasis upon "primarily what is visible."[60] He makes this apology in spite of the fact that he had just argued that the

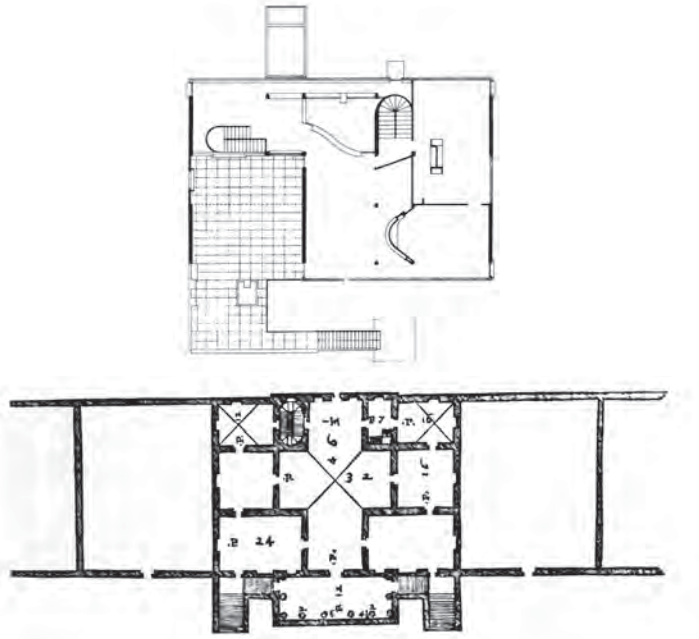


5.2 Colin Rowe, "Malcontenta and Garches. Analytical diagrams" from "Mathematics of the Ideal Villa," 1947. Courtesy of and copyright by MIT Press. These are the principal diagrams through which Rowe argues that Palladio's Villa Malcontenta, c. 1550-60 (top) and Le Corbusier's Villa Stein at Garches, 1927 (below), cohere to a "common standard, a mathematical one" [Rowe, "Mathematics", 9]

similarity of Le Corbusier and Palladio is all but impossible to see in experience and becomes apparent only in the abstract diagrams he drew.

This leads to a problematic presumption that the elements Rowe took to be already "visible"—or, we should say, are made visible through diagramming—are necessarily commensurable. For him, a grid is a grid is a grid, whenever and wherever it may have appeared. The result is that while Rowe might usefully have suggested that the relationship between modernism and classicism is more complicated than the Modernists would have us believe, he, like those we examined in the first chapters, prematurely foreclosed the conditions of differentiation, employing the Classical as the model of resemblance against which deviation is measured.

Nevertheless, this confusion was productive for designers in that it emphasized the diagram as a mobile generator of architecture in a way that was unprecedented even in the École des Beaux-Arts or early modernism. In detaching a system of relationships from their cultural and historical specificity, Rowe converted them, at least partially, from representations of meanings that lay outside architecture to an autonomous language of architectural order. And because these diagrams had supposedly revealed



5.3 Le Corbusier, Plan, Villa Stein at Garches (top) and Palladio, Plan, Villa Malcontenta (below), as reproduced in Colin Rowe, "Mathematics of the Ideal Villa," 1947. Source: Courtesy of MIT Press; plan of Villa Stein at Garches; copyright, FLC/ADGAP, Paris, and DACS, London, 2006.

the uniformity underlying the apparent stylistic dissimilarity of Palladio's classical decoration and Le Corbusier's modernist functionalism, this syntax was invested as the essence of both. For some, therefore, Rowe's ahistorical analyses suggested that there was a deep structure, or timeless principles, that all architecture adhered to as a semiotic system. For others, this syntax of lines, grids and points and grammatical rules of combination now were abstract and relative, and thus became mobile and productive of other architectures. This use of diagrams suggested the generation of an architecture isomorphic to its analytical tools, suggesting *new processes* of design and pedagogy that allowed the architect to consciously access and manipulate in new architecture the same level of abstract order such diagrams were said to reveal in historical architecture. The diagram could become the locus of architectural order, even more real, or at least pure, than a built artifact and its inevitable contingencies and compromises. Methods of analysis used by the texts of the critic, historian and theorist had become generative of new objects produced by the designer.

Rowe's article became a fundamental text for design education, even fostering a general pedagogical program and standard introductory

problems that redeployed the nine-square grid diagrams Rowe revealed in Le Corbusier and Palladio as a generative device for architectural composition. The point of such exercises was to instill in the student an understanding of the autonomous syntax of architectural order, rules which were tacitly or explicitly presented not only as fundamental but also timeless (that is, classic in the sense of unchanging).

Recent interest in the diagram is part of this genealogy, continuing to locate the diagram as the origin of architectural order, an instrument through which the architect can engage the level of the discipline itself, to operate upon the shared, conventional, and historically accrued language, to chart its rules and limits, and to produce novel results. For example, Eisenman's claims for how to produce a "not-classical" architecture begin by operating exactly on the grids Rowe argued were the syntax of classical architecture. Eisenman's doctoral thesis at Cambridge, where he spent considerable time with Rowe (to the extent that Rowe once quipped that he got less work done than he might have otherwise), combined aspects of Empathy theory (which I examine in coming chapters) with a diagrammatic analysis of the architecture of Le Corbusier, Terragni, Mies van der Rohe and Wright. The work of each architect was subject to analysis that privileged the diagrammatic representation of plans as a system or order, possible recombinations and, importantly, their effects for the subject of the architecture. The hope was to uncover the principles that governed all architecture. In the House series that followed, Eisenman mobilized such analytical devices as design tools. Repeating the Rowe and Wittkower three-by-three-by-three grid as the underlying schema, Eisenman subjected the grid to a series of permutations. In the early projects, this rule-based design process was intended to operate, in reference to Chomsky's ideas of deep structure, at the most abstract and basic level of the language of architecture. Beginning in House IX and by the writing of the book on House X, however, Eisenman had begun to use similar techniques to question the limits of this language and its underlying assumptions and ideality. This series would set the stage for his so-called "deconstructive" architecture and houses, such as House El-Even Odd and the Wexner Center, which sought to undermine the humanist basis of architecture, and for which his text "The End of the Classical" served as a polemic.

Similarly, Greg Lynn has examined Wittkower's and Rowe's arguments and their legacy to situate the historical and conceptual importance of his use of animate geometry. He notes that Rowe "cross-bred" Palladio and Le Corbusier only to reveal their essential similarity, and that in Wittkower's geometric analysis of Palladio any apparent differences are "canceled out" so that each building becomes evidence of the existence of a single type, or model.[61] This reveals, he argues, their adherence to a Vitruvian "eidetic" geometry and ethic of ideal wholes, and that their use of harmonic proportions was a mechanism to produce a universal and whole body as defined by Vitruvius.

In this Platonism, this ideal body is taken as the "real" of which specific architectures are mere copies. In contrast, Lynn refers to monstrous bodies and evolutionary theory as a counter-ethics based on continuous differentiation rather than resemblances to universal model and the ideal static geometries.

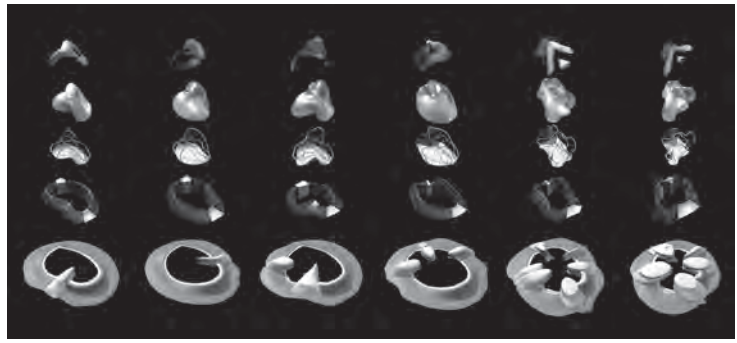
These concepts inform his *Embryological House* as an anti-Ideal Villa. This project was for a series of houses, not only designed through dynamical systems modeling with animation software but to be fabricated via mass-customization technologies (CNC milling). Rather than each house being a copy or version of an ideal type, as he argued Wittkower and Rowe did, using such techniques would allow each house to be part of a potentially infinite—and infinitely mutating—series. The consistency within this series is given not by a static set of proportions but by a set of diagrammatically inscribed relationships that can be altered according to program, site, or pure variation. For Lynn, the potential of this variable multiplicity links architectural geometry to globalization and post-Fordism:

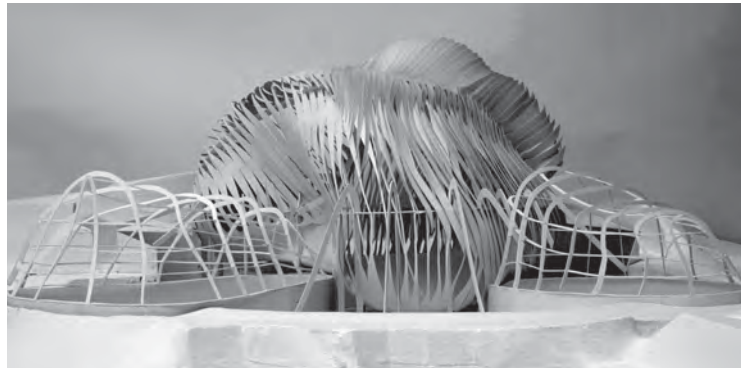
> *There is no ideal or original Embryological House as every instance is perfect in its mutations… This marks a shift from a Modernist mechanical kit-of-parts design and construction technique to a more vital, evolving, biological model of embryological design and construction.*[62]

Each instance of the House is identifiable as parts of a generic series, but no two are ever exactly the same. Rather than all the instances of the house relating to a transcendent and ideal type in which differences are insignificant, they are produced by differences immanent to processes of forming and manufacturing. The Vitruvian body as model has been replaced by *simulacra*, copies without models.

In these examples, we see the construction of an architectural body, but also an attempt to transform the body of architectural knowledge through the deployment of diagrams as analytical and generative devices. This diagram might be traced in the built architecture and indeed is described by the architects as the central mechanism of ordering and design, but it is not coincident with constructed forms. In other words, all the components of Wittkower's and Rowe's analytical techniques have been redeployed as a way of producing an innovative and meaningful architecture, including the use of point of alternative geometries. Of course, the architects do not always explicitly link their projects to the historians' diagrams and might argue for their difference.

More counter-intuitively, given their legacy as design tools, one can begin to see the constructive nature of Rowe's and Wittkower's supposedly analytical techniques. Rather than revealing the repetition of the classical in the modern, Rowe's techniques were integral to the conditions of generation, innovation and conservation of architectural design in the post-war era and, with Wittkower, the understanding of the classical relationship to





5.4 (top) Greg Lynn FORM, EMBRYOLOGICAL HOUSE ©™ Exploded axonometric of six variations and its primary components, 1998–99. 5.5 (middle) Greg Lynn FORM, EMBRYOLOGICAL HOUSE ©™ Polystyrene Study Model, 1998–99. 5.6 (bottom) Greg Lynn FORM, EMBRYOLOGICAL HOUSE ©™, one-third scale model, 7th Venice Architectural Biennale, Italian Pavilions, June–October, 2000. 5.4, 5.5, 5.6 Copyright Greg Lynn FORM; courtesy Greg Lynn FORM.

modern architecture's historicity. Indeed, they re-constructed artifacts from architecture's past and reconstituted them as modern objects of knowledge.

DIAGRAMS OF DISCOURSIVITY

By linking the architectural problems of Alberti and Palladio to the broader cultural and philosophical ideas of their time, *Architectural Principles* and "Mathematics of the Ideal Villa" installed a stable formation of concepts about something called "Renaissance Architecture," its use of the Vitruvian Figure: its humanism, its treatment of bodily metaphors, and its arguments concerning the metaphysical import of proportion and form. Wittkower and Rowe were also largely responsible for the reading of Le Corbusier's Modulor and architecture as the heir to this tradition, and as an example of how to recover this tradition. This reading is replayed by the phenomenologists' proposal to do just this as well as laying the groundwork for post-structuralists' claim for the lingering classicism of modernism. Even the apparent anachronism of the Modulor results in part because Wittkower's text continues to dominate the architect's understanding of the relation between geometry and humanism, providing the conventional shared narrative around which all current debate seems to orbit. Indeed, the entire idea that Renaissance architecture signified cultural values of humanism in the way we think it did depends upon Wittkower's description of the Renaissance. When Agrest refers to Renaissance architecture as an ideologically determined "system" and when Rykwert defines Vitruvius as providing a metaphorical canon, they relate to—wittingly or not—Wittkower's claims at least as much as their overt references to structuralism or hermeneutics. Perhaps more importantly, the techniques used to make these arguments were transferred as tools for design, and thus their understandings of how architecture operated in the past were projected into concepts for the production of new architecture in the present.

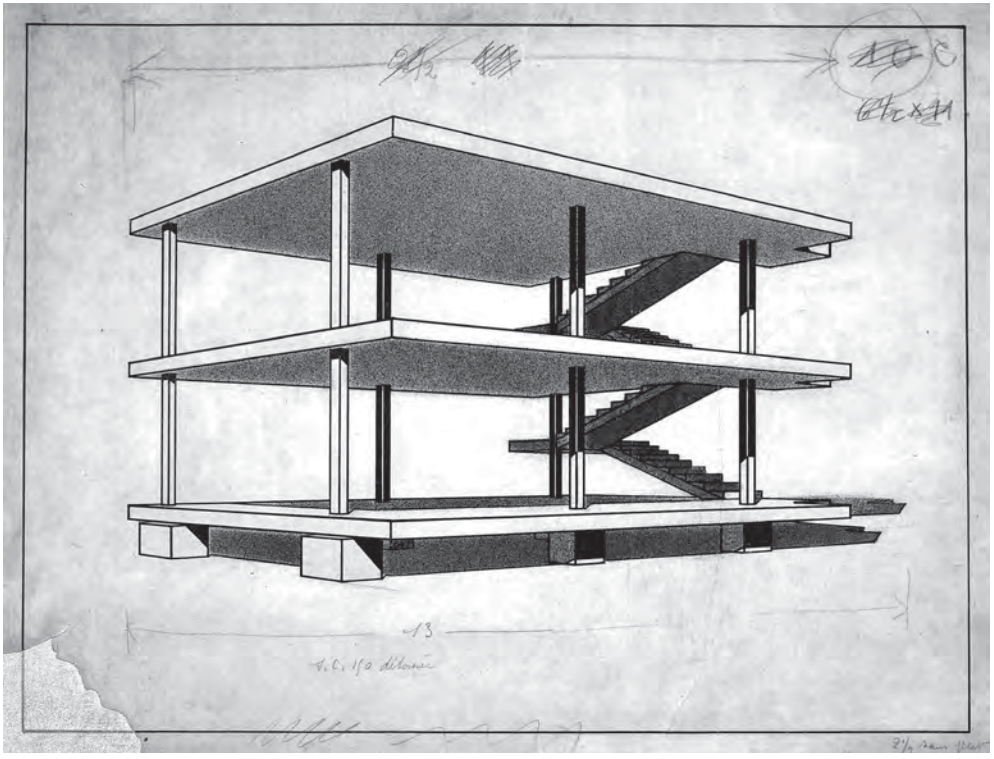
These examples suggest that Wittkower's and Rowe's texts, Le Corbusier's Modulor and the post-war discourse on proportion function as something like what Foucault called "founders of discoursivity." Around them precipitated not only direct extensions of their work but also "the possibilities and rules for the formation of other texts" and other practices.[63] Foucault's term is perhaps too Vitruvian and architectural, as if such authors are the most stable parts of an edifice, foundational corner-stones that underlie all subsequent work, the construction of which moves forward in time the way one might move from a basement to roof, and that these remain relatively unchanged but hidden as subsequent layers on top. As I have begun to describe here and will continue to do so in the following chapters, Wittkower and Rowe are not the stable underpinnings that Foucault's "founder" suggests. Nor, as the often used terms "paradigm" or *Weltanschauung* imply, did they

establish a homogenous representation of the past and over-determine the present as if a frame overlaying a coherent picture.

Instead, as I have described, they operate as central hubs within a larger and heterogeneous network. This network of actors, institutions, texts, tools and media created a complex field of relationships. These relationships inform the surfaces of emergences of new concepts that extend from the middle of the twentieth century until the present day. This network grows not from the bottom-up but by multiplying links and the production of new nodes relative to each other; these can be added, changed, thickened, or attenuated in a non-linear fashion such that the "past" can be mobilized in the present, reshaping the terrain of present potentials. Indeed, this is exactly what Wittkower and Rowe accomplished with their presentation of the "Renaissance"—the irruption of an apparently historical architecture within the field of modernity. Because of their prominence but also because of the dense triangulation made between the objects, tools and modalities of the critic Rowe, the historian Wittkower and the architect Le Corbusier, an incredibly persistent cycle of references emerged. This loop allowed their objects and arguments appear transparent and matters of facts upon which subsequent arguments could build. Even after these linkages fade in prominence relative to others, their triangulation remains relatively stable and informs the patterns mapped through them. Thus, it is not Vitruvius who provided the model and origin for an ancient architectural tradition, it is not that Le Corbusier recreated this model, but the mid-twentieth-century discourses of proportion that partially configured the often preconscious terrain of contemporary thought.

6.
THE SCHEMA AND THE DIAGRAM

We must analyze symbolic space. In approaching this issue we are on the borderline between the human and animal worlds.
—*Cassirer,* Essay on Man



6.1 Le Corbusier, Maison Domino diagram, 1914. Copyright, FLC/ADGAP, Paris, and DACS, London, 2006. After arguing for the geometric similarities between Corbusian and Palladian architectures, Rowe then distinguishes the frame construction of the Maison Domino prototype and its result "plan libre" from the load-bearing masonry constructions of Palladio.

The previous chapters' examination of the network of arguments, actors and concepts through which the midcentury interest in proportion was developed can now be explored in relationship to the broader issues of humanism and architectural problems they attempted to address. Rudolf Wittkower presented his arguments in a beguiling expositional style, as if they were simple empirical descriptions rather than the strong theoretical assertions that they are. Indeed, part of the text's effect on subsequent discourse derives from its dry style of presentation, which present speculations as matters of fact. Nonetheless, while Wittkower ostensibly offered a "history" of the theory of proportion in "Renaissance" architecture, he really mobilized historical material in order to elaborate a theory about the relationship of form to broader cultural patterns as had been developed by Ernst Cassirer in his multi-volume *magnum opus*, *The Philosophy of Symbolic Forms*. In this relationship between Cassirer's and Wittkower's texts, we can begin to understand what was really at stake in the mid-century discourses of proportion: the attempt to formulate a theory of architecture for the subject of modernity.

THE MODERN PROBLEM OF KNOWLEDGE

Because they seem obscure today, we first need to recall Cassirer's arguments. He claimed that in the late eighteenth century the work of Kant in philosophy, Goethe in biology and Herder in history triangulated a broad and "peculiar reversal," in the nature of knowledge that amounted to a second Copernican Revolution. For example, while in the Enlightenment history was concerned with "practical" and causal relations, after Herder's work in the last quarter of the eighteenth century, "events were significant only in so far as they were revelations and disclosures of human nature."[1] Knowledge was turned inside out as the subject became the condition for knowledge about the world.

In this regard, the title of his four-volume *Das Erkenntnisproblem* ("The Problem of Knowledge") is a double-entendre. On the one hand, he presented a history of how systems of knowing had evolved in different cultures and was brought to bear upon a panoply of different issues. Yet the history he unfolded was one where the condition of knowing and of the objects of knowledge themselves become increasingly problematic. Indeed, the implication of the revolution was that *knowledge* as such became a problem. All of a sudden there arose two distinct worlds of the human and "inhuman," including Nature, the latter available only through the mediation of the subject's concepts and forms of knowledge.[2]

Here we should pause as we did in the last chapter and note that while Cassirer's Neo-Kantianism and Foucault's late-structuralism would seem rather incompatible, Foucault's *Order of Things (Les mots et les choses)*, used different texts to described this same reorganization of knowledge beginning in the late eighteenth century. Not only did the "focal point"[3] of

knowledge shift to the inner life of humanity, a new type of figure, which Foucault called "Man," emerged that was at once the autonomous locus of thought and also the object of those kinds of knowledge. For this reason Foucault called this subject a "transcendental-empirical doublet."[4] It is transcendental in that it was the *a priori* of knowledge, empirical because its knowledge is only made available through the senses (formalized in the methods of the new human sciences).[5] This doubled condition, Foucault argued, must be distinguished from the "humanism" of the fifteenth and sixteenth centuries, and indeed, Enlightenment thought of the seventeenth and early eighteenth.[6] Out of it, he argued, arose new problems of knowledge and with those new fields that he called the "human sciences" of psychology, sociology, history, as well as the rise of inhuman forms of existence, including biological "life" and "natural history" as an autonomous force. In this, we can see that Foucault relied on the idea of a so-called Kantian revolution far more than he overtly acknowledged and perhaps this subterfuge made it possible for architects like Peter Eisenman to smoothly conflate Wittkower's Cassirerian history with Foucault's *episteme*.

Though Cassirer could never have pursued the implications as far as Foucault, he did argue that knowledge became different problems in modernity than they had been in the past. For Cassirer, the "*distance* [of objects] from immediate reality and immediate experience is the condition of their being perceived" by the subject.[7] In turn, the relation between humanity *as such* and the non-human was constituted through this gap. That is to say, the space of modern thought spans an abyss between what *appears* as a transcendental subject and the world of things, a reality only empirically accessible by that subject.

Because the subject was the condition of knowledge, the knowledge of the subject necessarily became the central problem, as seen in the proliferation of fields that studied human nature and subjectivity, such as psychology, sociology, anthropology, and of course, history. Yet, because for these fields the subject was at once the empirical object and subject of study, Cassirer found a paradox:

> *No former age was ever in such a favorable position with regard to the sources of our knowledge of human nature. Psychology, ethnology, anthropology, and history have amassed an astoundingly rich and constantly increasing body of facts… We appear, nevertheless, not to have found a method for the mastery and organization of this material… we shall remain lost in a mass of disconnected and disintegrated data which seem to lack all conceptual unity.*[8]

Two possible ways of organizing this formless matter of knowledge had been tried. The first, bottom-up, approach favored the specificity of objects and discrete fields, and cultures. Cassirer argued this course tended to reduce the philosophy of knowledge and culture to a relativistic history of

its various forms, curtailing any transcendental philosophical understanding. "Human nature" would simply be a story about what different peoples and times understood it to have been. The other route lay in the potential to develop a philosophical anthropology of cultural forms. However, this depended on finding general principles and structures without reducing the specificity of disciplines, practices and history to top-down "abstract universals," or to "dogmatic metaphysics."[9]

Wittkower detected a similar problem for architectural history as Cassirer had for studies of human nature. While scholarly methods and archeological research since the nineteenth century had unearthed an unprecedented vast archive of material, these materials lacked a synthetic, non-reductive way of understanding these historical objects. At the same time, Wittkower strenuously rebutted what he saw as attempts to impose a modern superstructure of categories upon architecture's past—be that Geoffrey Scott's use of empathy theory or Sedlmayr's deployment of Gestalt Theory to explain the forms and spaces of the Renaissance.[10]

For Cassirer, this dilemma reached a crux with Hegel's *Phenomenology of Mind*.[11] To solve the predicament, Hegel effectively liquidated any specific problem of a discipline such as architecture by rendering its history as an index of the dialectical realization of an obscure—and to Cassirer wholly magical—force called the Spirit. This was problematic for Cassirer, because any specific bit of empirical knowledge or artifact becomes a cipher for something outside it that tautologically enforces prepositions of a superstructure while doing little to illuminate the specificity of that artifact, knowledge or its cultural practice. Cassirer claimed that Hegel merely asserted a "uniform law"—that of dialectical method—that refers to abstract essences impossible to define with any rigor, such as the *Zeitgeist*, or Spirit of the Age.[12] One might replace *Zeitgeist* with Humanism and the dialectic of reason and emotion and get a similar circularity. Exactly at the moment when cultural practices seem to be dealt with at their most concrete, therefore, Cassirer argued that Hegel reverts to a form of metaphysics in which specificity of empirical practices and knowledge is lost since they are simply signs or markers of the development of something that lay outside them.[13]

For any architectural historian who sought to gauge architecture's relationship to other practices there was the additional problem that under Hegel's system, architecture's historical moment was long past. In his *Lectures on Fine Art*, Hegel located architecture at the "beginning of art… grounded in the essential nature of art itself." One should not confuse this with the claim that architecture is the highest or most foundational art form. For Hegel, architecture's primal role meant that its active participation in the dialectic of the Spirit was more or less finished even before its "Classical" formulation and was thus "inherently" incapable of becoming a mature "reflection of the spirit" after that time.[14] That destiny belonged to other

forms of art, such as painting. If architecture was no longer very active in the historical unfolding of the Spirit, architectural history would have ended millennia before there were architectural historians. Wittkower, for one, thought this argument too destructive both to design practice and architectural history.[15]

THE SCHEMA AND THE POST-KANTIAN SUBJECT

Cassirer's *Philosophy of Symbolic Forms* attempted to alleviate these problems by creating a "phenomenology of knowledge," drawing out what he saw as the important insights of Hegel and reintegrating them into a Kantian critique. Kant's doctrine of the schema was central to this endeavor. As we have seen, under his system, forms and concepts belonged to the domain of a universal subject, while matter and other objects resided in nature. Knowledge of those things was made possible only by the projection of concepts of the subject onto the world of matter. The "thing in itself" or *noumenon* was unknowable; instead only *phenomena* was available to knowledge via the senses and cognition of the subject. For these to cohere, Kant declared that:

> *[T]here must be something that is third [a "third thing"]… homogenous with the category, on the one hand, and with the appearance, on the other hand, and that thus makes possible the application of the category to the appearance. This mediating presentation must be pure (i.e. without anything empirical), and yet must be both* intellectual *on the one hand, and* sensible*, on the other hand. Such a presentation is the* transcendental schema.[16]

Space and time were offered as examples of schema; later embodiment would also be seen to provide a schematic organization. The schema mediates between the manifold of matter and the forms and categories that organize the subject's experience. But the schema does not simply translate between two domains of the subject and the world. Instead, it is "the true and sole conditions for providing these concepts with a reference to objects and hence with *signification*."[17] That is, the schema is the condition for any knowledge of the object made available to the categories of thought inherent to the subject. Knowledge is knowledge about empirical representations ordered via schema. As Cassirer baldly stated, "the only objectification of which [science] is capable is, and must remain, mediation."[18]

For Cassirer the legacy of post-Kantian thought was the working through of the implications of the schema. For Kant, the schema were *a priori*; by Cassirer's time, they seemed at least affected by cultural and historical conditions. His philosophy of "symbolic form" examined specific practices and products of cultures and their transformations as evidence of that culture's ordering of their world into meaningful relationships and mediations. By finding ways to track these cultural and historical schema,

Cassirer hoped to reveal what remained altered and what remained consistent and thus derive a concrete understanding of "human nature."

Cassirer thought artistic production provided an ideal "symbolic form" through which to map schema because he argued that the doctrine of the schema presented in the first critique was given flesh in Kant's *Critique of Judgment*. For Cassirer, the third critique was neither a less-sure supplement to the first two volumes nor merely a formal necessity given by Kant's obsession for architectonic system as it is often portrayed. Instead, Kant's aesthetics provided the details for that mediating schema around which the previous *Critiques* circulated and in doing so demonstrated how Kant's edifice was far more open and complex than often believed. The schema was always an aesthetic problem in the sense that it organized matter into meaningful constellations of sensation. If the matter at hand was artistic and sensational, these effects concerned beauty and the sublime; but in the second half, the "Critique of Teleological Judgment," Kant argued similar dynamics were at work in biological life (as Goethe also argued in different ways), in that life was a series of "judgments" about stimuli organized into a meaningful world via the schema of the organism. Once supplemented with evolution and genetics, this proposition would be a powerful framework, used, for example, in cybernetics, evolutionary theory and complexity sciences.[19] In any case, Cassirer thought art could allow access into the underlying schema of a culture by providing concrete examples of how it organized a world of sense into meaningful, or symbolic, relationships. Thus, rather than see art as the sign of an abstract Spirit, Cassirer utilized art, anthropological and archeological evidence to empirically discern and describe abstract mediations of culture and the world.

NEO-KANTIAN NETWORKS, AKA, ARCHITECTURAL HISTORY AS ANTHROPOLOGICAL EPISTEMOLOGY

This privileged status of artistic production was key to Erwin Panofsky, who acted as mediator between Cassirer's *Symbolic Forms* and Wittkower's *Architectural Principles*.[20] Panofsky was also Wittkower's mentor and colleague. By engaging Cassirer's philosophy, Panofsky inscribed art and architectural history into a history of ideas (and vice versa). Accordingly, he made epistemological claims for aesthetic practices by attempting to understand art as a symbolic form, claims Wittkower took up in his historical method.[21] Wittkower and Panofsky shared Cassirer's desire to find a "kind of grammar of the symbolic function as such," a "symbolic and semiotics" of cultural form.[22] They also shared a perception of the problems that confronted aesthetic practice after the dramatic transformation of knowledge in the late eighteenth century.

Despite differences in their specific training, Wittkower, Panofsky and Cassirer emerged from a single milieu of German philosophy, art history and

aesthetics, caught between Neo-Kantian philosophy and post-Hegelianism. They drew upon a common grouping of texts, authors and institutions. Many of their affiliations orbited around Aby Warburg's unparalleled library on ancient and classical artifacts. Cassirer once remarked that he found Warburg's archive so rich that he had to avoid entering it lest he be lost in its vast but unorthodox arrangement of materials.[23] In his later years, Cassirer succumbed to temptation, frequenting Warburg's library in its transfigured state as the Warburg Institute in London, where Wittkower and Panofsky were ensconced before emigrating to the United States.[24] Wittkower wrote *Architectural Principles* and its constitutive articles while based at the Warburg. During this time, he also taught Colin Rowe. Through these affiliations, Wittkower also participated in the later stages of Cassirer's *Erkenntnisproblem* (to which Panofsky had contributed in the early part of the century).[25] Therefore, Panofsky and Wittkower translated a particular formation of twentieth-century German historical practice and its discourses into post-war Anglo-American milieus.[26]

In the last chapter we brushed against the link between Wittkower's *Architectural Principles* and Erwin Panofsky's earlier article, "History of the Theory of Proportions as a Reflection of the History of Styles" in terms of their perceived audiences. Now I turn to their conceptual affiliations. Panofsky's article on proportion made a similar claim for proportional systems as he had for systems of perspective in his famous essay, "Perspective as Symbolic Form."[27] That article was an explicit attempt to apply Cassirer's philosophical anthropology to develop a cultural history of art, even referring in his title to Cassirer's *The Philosophy of Symbolic Forms*.[28] To summarize, Panofsky argued that perspective is not a technical solution to a problem of naturalistic representation, but rather the history of different systems of perspective index the divergent symbolic schema that organize a culture's understanding of the world. The way objects were arranged in the virtual space of perspectival painting revealed a culture's symbolic ordering of knowledge and concepts of natural and subjective order. Changing systems of perspective, likewise, did not track progress in recreating an objective reality but were schema through which a society ordered its understanding of reality. Likewise, he argued that, "theory of proportions expresses the frequently perplexing concept of the *Kunstwollen* in clearer or, at least, more definable fashion than art itself."[29] Panofsky's analysis required turning the brush-work, the color, and the content of painting into an overlaid geometry of vanishing points and cones of vision in the case of perspective, or measurable ratios in the case of proportion. In a Kantian fashion, the essence of the work of art lay in design of forms and contour rather than color, ornamentation or media and material.[30]

The technique of overlaying geometric lines upon a drawing or other representation of a work of art or architecture was invented by August

Thiersch in 1883 and adopted by Henrich Wölfflin as a tool of historical analysis in 1889 to "reveal" an underlying proportional system of order, often corresponding to the Golden Section or Fibonacci series. Of course, the use of "regulating lines" to reveal an underlying order beneath the overt appearance of an architecture also appeared in Le Corbusier's *Vers une Architecture*, where he suggested their usefulness as a generative as well as analytical tool. Similarly, the Modulor is often interpreted as an extension of this use of regulating lines.

Wittkower's "schematized plans," a term that we can now see is more than incidental, are also products of this approach. For Wittkower, these diagrams were "charged with a particular meaning which the pure forms [of the architecture as built] as such do not contain."[31] The symbolic domain of art and architecture exceed the limits of the picture's surface or the forms of its stones, its meaning lay as a ghosted armature for the construction of the illusion of depth or as a compositional tool left on the drawing board of the architect. For Wittkower, therefore, architectural meaning was twice displaced from the building—once to the plan and twice to the diagram that explicitly or tacitly organizes the plan.[32] While Wölfflin's techniques had employed not dissimilar techniques of formal analysis, in *Architectural Principles* they were presented as revealing the intent of architects and of architecture's meaning in cultural terms since it is through these that Wittkower argues for the relationship between architecture and Neo-Platonic cosmology and of shared ratios between architectural and musical composition. These diagrams were aptly called "schematic" for they were to have revealed the schema that could be actualized as individual buildings and which revealed their relation to their culture's symbolic ordering of the world.

However, while Panofsky was always explicit in his theoretical references and intent, Wittkower left the theoretical suppositions and implications of *Architectural Principles* implicit. He only casually referred to Cassirer or used indicative terms without explanation.[33] In addition to his rather unspecified use of "schematic plans" (which if unaware of the link to Cassirer, one might think simply means "simplified"), Wittkower's opening lines seem to present a rather straightforward desire to correct the then dominant interpretation of Renaissance architecture with a modest hypothesis: "Renaissance architecture is nowadays usually interpreted in terms which stress its worldliness… We maintain… that the forms of the Renaissance church have symbolical value."[34] The casual manner in which the last words—"symbolical value"—were dropped in scarcely suggests the theoretical conditions upon which this statement and its subsequent analyses hinge. Yet, this reference to the symbolic is more than a casual allusion and must be understood in Cassirer's sense, because it is to Cassirer and Panofsky that Wittkower owed his use of this term. Moreover, Cassirer's

analyses of the "Renaissance" provided much of the philosophical description that Wittkower mobilized in relationship to architecture.

Wittkower's Cassirerian point of view is also suggested by his comments in lectures and debates following *Architectural Principles*. During a debate about proportion at the RIBA, he argued, "There never were any universal systems of proportion in the past. It was only that the people who practiced those systems believed that their own systems were universal systems."[35] However, this does not suggest that proportions were relative. Actually, he was making the Kantian point that universality was a function of the subject's knowledge and not a transparently accessible quality of the object.[36] A few years later, he clearly argued that proportional systems were not wholly arbitrary and indeed were not only "intellectual" but "biologically conditioned sublimations… embedded in human nature."[37] Like Cassirer, Wittkower suggested a necessary correlation between a cultural-subjective intellectual system of proportion and the phenomena of experience. Proportional systems thus operated as a *schema* that mediated between the sensuous and the intellectual, impulses of nature and cultural value. Likewise, the term "architectural principles" was an analogue to Cassirer's "symbolic forms." Wittkower's principles were not objective laws derived from nature-in-itself, but rules of universal assent within the subject or culture. Principles and their systems of order were functions of a culture's symbolic order, not divine or natural rules. But they were not simply about taste, as he said Scott and Ruskin had argued.

PROPORTION AS A MODERN PROBLEM

Wittkower also shared Cassirer's diagnosis of the problem of modern knowledge as having unprecedented access to raw material due to the very reasons that made it difficult to assemble it into a coherent whole. Similarly, Wittkower suggested that modern architects were in a "particularly bad position" in regards to understanding proportion because for two hundred years, the legitimacy of such systems had been challenged.

Wittkower located the moment of decline in rules of proportion with the advent of the Kantian revolution, especially the rise of aesthetic theory in the eighteenth century.[38] Curiously, and perhaps because Neo-Kantian concepts are immanent to his arguments, the role of Kantian aesthetics in this transformation escaped Wittkower's analysis of this crisis. Instead, he referred to other philosophers and architectural critics, arguing, for example, that Hume's (1757) essay, *Of the Standard of Taste*, "turned objective aesthetic into subjective sensibility."[39] Hume argued that beauty was not intrinsic to objects but existed only to the "mind which contemplates them; and each mind perceives a different beauty."[40] The beautiful was conventional rather than *a priori*, achieved by consensus rather than demonstrated with objective truth via geometry.[41] As Wittkower noted, that was the same year

Edmund Burke published his *Enquiry into the Origin of our Ideas of the Sublime and the Beautiful*. Refuting the Vitruvian Figure, Burke argued that the analogy between the body and architecture was at best "forced," contorting a human statue into unnatural positions. "It appears very clearly to me," Burke wrote, "that the human figure never supplied the architect with any of his ideas." In any case, "no two things can have less resemblance or analogy, than a man, and a house or temple."[42] Hume and Burke were representative of a broader transformation; many other texts, such as those of Geoffrey Scott and Ruskin, Wittkower argued, replaced objective order with subjective taste. Ever since, Wittkower suggested, canons of proportions have been viewed with great skepticism and, as a result, modernity "lost the faculty of understanding even the most general principles of the classical conception."[43] Here, in his concluding remarks, Wittkower's arguments come full circle, returning to his introduction's dismissal of the then dominant reading of Renaissance architecture as a "hedonist" architecture of taste. Specifically, he implies that Scott and Ruskin could not conceive of how proportion once operated because they were mired in a post-Kantian universe. Indeed, Wittkower suggested, they anachronistically projected their modern viewpoint, which privileged subjective aesthetics onto their representations of the past.

In contrast, Wittkower—through the translation of aspects of Cassirer's theory of symbolic forms into architectural history—did not attempt to describe the architectural principles of humanism so much as argue that architectural design manifests and allows understanding into the *Kunstwollen* and the constitution of Renaissance humanism itself.[44] This was to have been a model for how to alleviate the fragmentation of his field of study into discourses of taste, relativism and historicism in much the same way that Cassirer attempted to synthesize new insights on human nature in his domain of philosophy. Thus, for Wittkower, the study of proportion contributed to what Cassirer had sought with *Symbolic Forms*—"A phenomenology of human culture."[45]

As we saw with Cassirer's "problem of knowledge," a sense of crisis motivated this attempt. Under Cassirer's framework, architecture (and art) were vital because they made orchestrating schema apparent and therefore played a central role in mediating between culture and nature. As Kant himself put it, "schematas… are the true and sole conditions that make possible any relationship of concepts to objects and consequently the conditions of their having any meaning."[46] The break-up in the belief in proportional systems thus radically dislocated architecture from its mediating role, which produced problems not only for the discipline but also for the broader culture.

One effect of the rise of discourses of taste was the corollary distrust in form in general as the basis of architecture order, which Wittkower's conclusion located as the principal problem of the then current architecture.[47]

Today, this wariness persists; to call someone a formalist is usually an insult. It means either that the architect or theorist is mired in abstraction, interested in hermetic permutations of composition detached not only from meaning but also from factors such as construction, site, client.[48]

In comparing Cassirer and Wittkower's frameworks, we can now see how for the latter the break-up of canons of proportion was merely a detail in the broader transformation that as we have seen was epitomized by Kant's *Critiques* in which knowledge was conditioned by the subject rather than the revelation of the thing-in-itself. For Wittkower's task, one of the most crucial effects of this transformation was that *form* itself could no longer be understood by reference to objective rules or authorities like nature or God, but only as constituted through and by the judgment of the subject.[49] Now groundless, concepts of form and its organization became suspect. The rise of Romanticism in the late eighteenth century refuted any attempt to tie the subject to a system of rule and by stressing the subjective nature of aesthetic judgment, it brought the derivation of proportional systems into question.

This suggests how form itself became a different sort of problem for the modern architecture than it had been previously. Wittkower recognized that proportion could only become a problem—let alone a specific topic of debate as it did at the RIBA—*after* the break-up of the belief in universal systems. During his presentation at the RIBA, he insisted upon the historicity of the problem of proportion: "Two hundred years ago this discussion [on proportion] would have been impossible. The discussion is only possible because we had the 19th century."[50] That is, proportion could only become a problem for architectural knowledge after it was severed from a discourse of the divine and the objective, and became an issue of the relationship between the subject's aesthetic judgment and an external natural order. In the Renaissance, as Wittkower describes, proportioning measures were simply presented as rules through which to repeat a transcendental order of which the world and humans are both a part. In modernity, it becomes a way to mediate humanity's condition apart from the world. The problem of proportion, like Cassirer's "problem of knowledge," is a double-entendre in that while an architectural historian can chart the history of different proportioning systems, proportion can itself only become a constitutive problem in modernity because only then does its mediating role become a conscious issue rather than an unconscious schema.

Architectural proportion was a useful and powerful object of study for Wittkower for three reasons. First, it presented a clear model of how to understand cultural products as symbolic forms in relationship culture's schematic ordering of its world (in his case architecture and Renaissance Neoplatonism). Second, proportion presented itself as a special problem after the 18th century involution of knowledge onto the subject. It was a problem not in the sense of a difficulty to be overcome with a local solution; instead,

the lack of a coherent theory of proportion defined architecture as a field of knowledge in modernity and its precise relationship to a post-Kantian universe and epistemology. Third, his study offered itself as a model for how to proceed and synthesize an approach to architectural history within the modern space of knowledge and its subject. Through his use of proportioning diagrams as Cassirerian schema, Wittkower actively constructed an identity around "Renaissance architecture" that exceeded an account of compositional techniques used by architects in the fifteenth and sixteenth centuries and instead served to problematize the modern understanding of architectural design as subjective as well as its analyses of historical materials.

THE SUBJECT OF ARCHITECTURE

Thus, the seemingly "sudden" interest in proportion in the middle of the twentieth century emerged from the intersection of two trajectories available for the theorization of architecture after the reconfiguration of knowledge and the human subject that began in the late eighteenth century. The first trajectory turned towards the subject itself. This manifested in the nineteenth century as *Einfuhlung* theory, later as psychology of art, Gestalt and later still, information theory.[51] Geoffrey Scott's theory of Renaissance architecture—which Wittkower attacked—lay on this path, attempting to explain forms through the operations and projections of the subject's spatial experience of his body. In fact, Scott's book, *The Architecture of Humanism*, is concerned not with Renaissance architecture but with attacking the attempts to explain architecture that try to appeal to some transcendental quality or do not place the subject's apperception of space at the core of its theory. Wittkower misrepresents Scott's arguments as claiming that proportions and architectural order were matters of capricious taste. While Scott does argue that architecture should be understood solely in terms of "taste," he does not mean an individualistic or even conventional whim. Indeed, he describes "taste" in terms more akin to Kant than Hume. This should not be surprising in that Scott explicitly derived his theory of proportions from post-Kantian *Einfuhlung* theory (or empathy theory), from which he appropriated the theory of introjection. First, he argued, the subject's experience of embodiment determines the perception of architecture. Then the subject represents this experience by transcribing "architecture in terms of ourselves."[52] For Scott, as for other adherents to empathy theory, the body is important not because it marks any intellectual relationship between philosophy and architecture, nor even because it opposes an intellectualization of form, but because of "the anthropomorphic way which humanizes the world and interprets by analogy with our own bodies… is the aesthetic way; it is the basis of poetry and it is the foundation of architecture."[53] The metonymy of the body is central because with the decline of external authority of God or nature, it is the only schematic model that "presupposes a true and reliable experience"

of the subject.[54] Moreover, for him, the classical body of the Vitruvian Figure offered the best model of this corporeal experience as it "conveys at every point a sense of equipoise" to the subject of architecture.[55]

The other trajectory opened was towards science, mathematics and other "inhuman" factors. The valorization of construction and function in early twentieth-century modernism also related to the attempt to reground form on such naturalistic criteria. Form had been so tainted by the beaux-arts and the expansion of bourgeois arguments of taste that it could offer no conceptual or political ground for a new architectural agenda. For example, Mies issued his famous censure: "We refuse to recognize the problems of form but only of building."[56] If form belonged to the subjective domain, construction and structure promised an order based on the order of Nature. Or, as Le Corbusier argued in *Vers une Architecture*, following the economy of mass-production and construction as a technological nature would result in an architecture analogous to the same principles of formation that govern biological entities. In these examples, the rise of functionalism and decoration derived from construction was therefore not a move towards "abstraction," instrumentalism or rationalization but symptomatic of a lack of a theory of form for modern architecture and an attempt to ground it to stable schema.[57]

Modern attempts to develop proportioning systems or to parse through proportion as a problem of architectural order attempt to mediate these two trajectories. Indeed, Colin Rowe's "Mathematics of the Ideal Villa" should itself be understood as attempting to create such a solution. This quality is foregrounded in the second half of Rowe's article, which is often overlooked.[58] Here Rowe complicated the reading he had just produced that Le Corbusier's Villa Stein repeated the ordering found in Palladio's Villa Malcontenta. While, he argued, schematic plans reveal the same proportions govern both, their section and construction present radically divergent orders for the subject of those architectures. In Villa Malcontenta, these lines were actualized through load-bearing masonry walls, while at Garches they became the concrete and steel frame of the Maison Domino prototype and its "plan libre." Palladio's load-bearing construction seamlessly integrated planimetric and volumetric spatial conditions. In other words, if you see one side of the building, you know roughly what the opposite looks like; if you are in a room in one corner, you can predict what lies beyond its walls in the far end of the structure and know that this would be repeated on every other floor. The subject could always reconstruct the whole body of the architecture out of a fragmentary experience, and thus occupy its conceptual center from any physical location. Form and structure produced a Gestalt whole, and operated centripetally to reinforce an anthropocentric condition. One might even infer a reciprocity between the subject's experience of embodiment. The subject of Palladio's architecture was enclosed within an organic unity present to him from any vantage point.

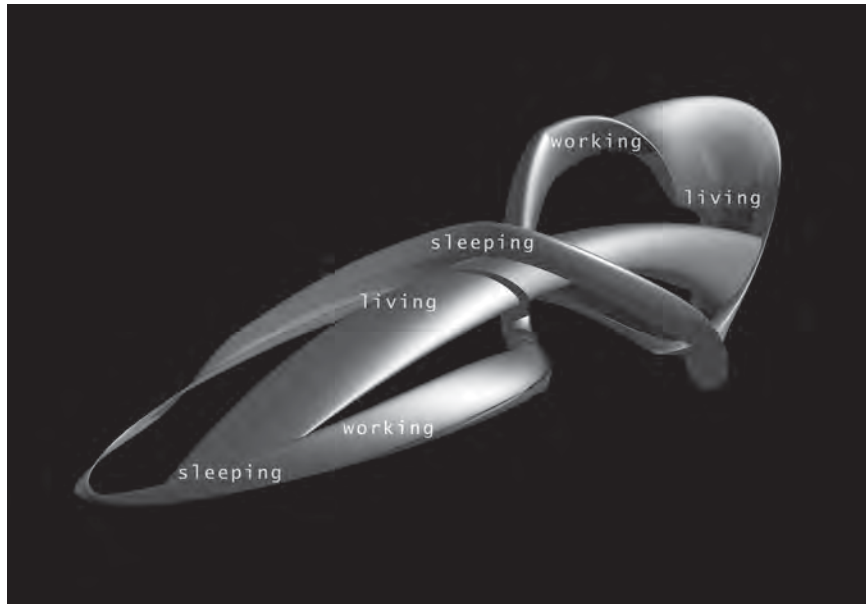
In contrast, Rowe argues, in Le Corbusier's Maison Domino and its "plan libre": "concentration at any one point is disintegrated, and the dismembered fragments of the center become a peripheral dispersion of incident."[59] One of the features of the Maison Domino diagram with its flat slabs and columns is that internal partitions need have no relation to structure, which meant that each floor could have radically different configurations of walls, windows and rooms. Moreover, unlike load-bearing walls, each floor itself could be highly differentiated, with radically different spaces and partitions and access from one floor to the next could be different on every floor. One cannot complete a mental image of the architecture from any point. In fact, the very idea of a static center was confounded by the privilege accorded to the experience of multiple circulation paths that flow across the spaces irregardless of the proportions that might have been revealed by Rowe's grids. As a result, Rowe concluded, the classicism within Le Corbusier's architecture was at most, "dissipated and inferential."[60] The only vantage point at which this order was legible is from a position outside its space, that of the diagram, or the God's eye view of the architect himself. Once inside the field, any relationships appear as incidental. The subject of this architecture is dispersed, or "dissipated" centrifugally within this variegated field. Put another way, the "classical" body of the Palladian villa was shattered in cubist fashion across a spatial matrix made up of points and planes rather than volumes and masses. The geometry might be the same, but its materialization creates two incompatible worlds for the inhabitants of these "ideal villas." Later, in works such as *Collage City*, Rowe redeployed this fragmentation of the subject's visual field as a formal strategy to create an urbanism for the modern subject, for whom order exists only in fragmentary glimpses of past wholes. Here, a complete and systematic urban physiology was replaced by multiple local fragments that contained a Gestalt image of a lost whole, an image the subject could mentally complete at any given moment in the city. The contemporary city was thus a collage of partial orders, assembled for the experience of its subjects as a palimpsest of historical artifacts and past social orders.

This second part of Rowe's article reveals what was ultimately at stake in his and Wittkower's study of the Renaissance: an attempt to develop a theory of form for the modern subject. Rowe's de-historicization of the syntax Wittkower had uncovered in the Renaissance ultimately compares Le Corbusier's and Palladio's architecture not to argue they are the same, but rather to draw out the instability inherent in the post-Kantian era that arises from the understanding that any system of order is available only to the subject. Indeed, his reading of the inferential space of Le Corbusier bears a striking correspondence to Cassirer's description of the inferential understanding of reality available to the post-Kantian subject. Palladio's geometries are embodied to produce an anthropocentric architecture while

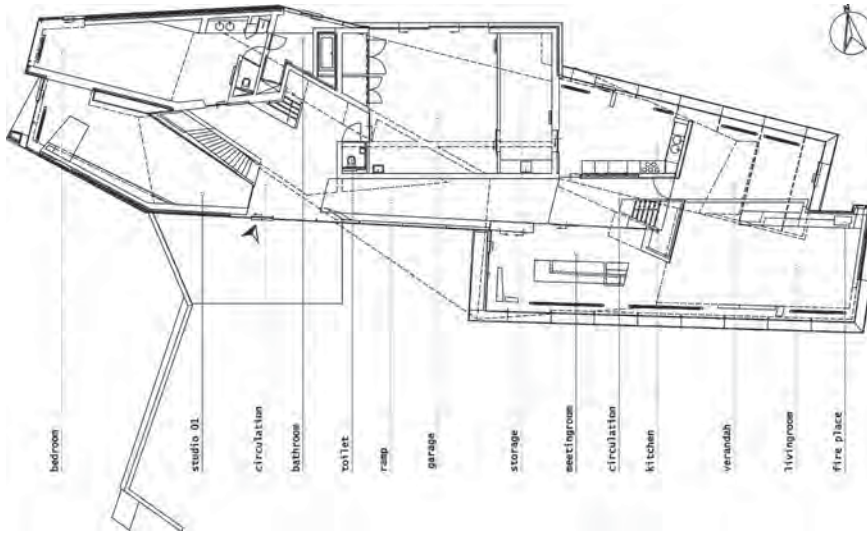
Corbusier's tectonic innovations disperse the subject into fields of relative relations and frames. Proportion here is not ideal in the Platonic or Pythagorean sense. Instead it operates a "mediating presentation" between the organization of matter and the forms of the subject, one that is both intellectual and sensible and whose deployment across different material organizations of Renaissance and modern construction, or natures, reveals the historical and ethnological unfoldings of the human life-world.

There are other less famous examples. A year after Rowe's article, Eliel Saarinen attempted to rescue form from "formalism" by stripping out "superficially decorative form" (not dissimilar from what Kant called "adherent beauty") accreted by custom and argued instead to "search for form" (the phrase itself is instructive) in logic and natural processes of growth, such as those found in plants and crystals.[61] Again, proportion was foregrounded as a schema that mediates between the processes of nature and the order apparent to the subject. The Modulor seems to have been viewed by Wittkower as an attempt to reformulate a *schema* for modernity by privileging the conditions of subjective apperception in the age of Einstein's Relativity and modern physics.[62] Le Corbusier's frequent invocation of mathematics and science in the Modulor also refer to this, as we will see in a later chapter.

Even today, the tension between diagrams and their actualization as material systems often play a mediating function in articulating issues of subjectivity *vis-à-vis* mathematical or natural ordering. A recent example that can be usefully compared to Rowe's twinned villas is the Möbius House by UN Studio. Founding principals Ben van Berkel and Caroline Bos have been key participants in post-humanists' use of the diagram in architectural design, editing an issue of the journal *ANY* on the topic and repeatedly arguing for their work based on its diagrammatic innovations. In the Möbius House, they appropriated a mathematical object, the Möbius loop, as a diagram, or schema, of architectural organization. An approximation of a Möbius loop is easily made by half-twisting a strip of paper, joining the ends and imagining there is no seam. If one begins tracing a line on what appears to be one of its sides, this line will meet. Thus, the Möbius loop is a surface that has only one side through its length, though at any given moment, one could draw or place something on what seems to be either side of the paper. For UN Studio, this suggested a way of orchestrating the particular programmatic and spatial needs of the clients, who each required distinct spaces to work during most of the day but who also wished to share certain moments and spaces of domesticity at certain intervals. They translated the Möbius diagram and its permutation as a temporal pattern of occupation and program distribution, and then used this diagram as a way of organizing form (Figures 6.2 and 6.3). To actualize this as a construction, they employed neither the concrete frame of Le Corbusier nor the load-bearing wall of Palladio but used folded and ramped concrete surfaces to distribute the program. These surfaces transfer



6.2 UN Studio, generative diagram, Möbius House, 't Gooi, The Netherlands, 1993–98. Copyright, UN Studio; courtesy of UN Studio. This diagram results from the translation of topological object, the Möbius loop, as abstract method for organizing the activities of its inhabitants, who each have different programmatic and spatial needs during most of the day, but wish to share certain moments. The diagram suggests an architecture that maps these two bodies movement in space and time, eschewing the humanist idea of architecture as containing a static and singular body. Project Credits: Design UN Studio: Ben van Berkel with Aad Krom, Jen Alkema, and Matthias Blass, Remco Bruggink, Marc Dijkman, Casper le Fevre, Rob Hootsmans, Tycho Soffree, Giovanni Tedesco, Harm Wassink.



6.3 UN Studio, plan, Möbius House, 't Gooi, The Netherlands, 1993–98. Copyright, UN Studio; courtesy of UN Studio.

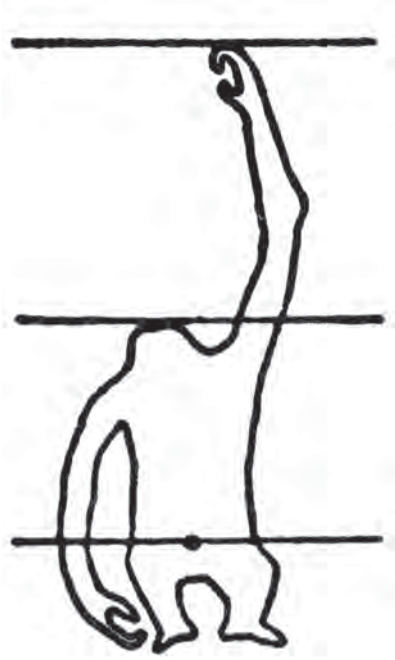
loads along their convoluted planes and therefore challenge the orientation of space provided by typologically distinct walls and floors. Providing neither a static matrix of rooms nor a free plan of floating partitions, the concrete walls wrap programmatic spaces that sometimes remain discrete while at other times opening or overlapping into multiple other spaces and flows of circulation. The most complex overlays occur where the diagram indicates a crossing of paths (Figure 6.4). Here, the spaces of the house are doubled, with interpenetrating but distinct zones. One is always located along a path, but can peer into or scrape against an adjacent space accessible indirectly through a circuitous route, effectively folding the physiognomy of the house through apparently floating concrete volumes and slices of space. In these affective moments, it becomes difficult to determine what is on the inside and exterior, both in relation of room to room but also in relation to the woods outside the structure. Without looking like a literal Möbius strip, the results are an architectural physiognomy that is doubled on itself but also strangely one-sided; the purposeful confusion of interiority and exteriority means the whole house seems to cling along the concrete surfaces. At the notional "center" of the onion-like structure, its enclosure seems at once to fold and dissipate, problematizing the experience of domesticity and public subjectivity. This villa eschews the Palladian idea of architecture as containing a static and singular body but also a modernist sense of a fragmented whole. Instead, it seems to manifest the post-colonial experience of hybridity, characterized, the architects claim, by the seamless integration of otherwise unrelated parts or individuals into a irreducible multiplicity. Rather than the whole and proportioned body of Vitruvius, for them, Daniel Lee's *Manimal* (Figure 1.5) provides an image of such a world, for which they fashioned an architectural equivalent.[63] In this way, recent discourses of the diagram play a similar role that proportional grids did for Wittkower and Rowe: they provide provisional schema through which to negotiate the lack of an objective ordering for architecture and serve as mediators between the organization of the world and the subject conjured through its architecture.

6.4 UN Studio, interior, Möbius House, 't Gooi, The Netherlands, 1993–98. Photo by Christian Richters; courtesy of UN Studio. This photo demonstrates the actualization of the Möbius diagram into a de-centered interpenetration of space and a multiplicity of experience through concrete and glass surfaces. Note as well the intentional blurring of interior and exterior, suggesting an architectural "body" that is no longer singular nor finite.

7.
THE SYMBOLIC STRIKES BACK

I am surprised that [Protagoras] did not begin his Truth with the words, "The measure of all things is the pig, or the baboon, or some other sentient creature still more uncouth."

—*Plato,* Theaetetus



7.1 "Modulor Monkey" by the Association of Architectural Students of Great Britain, *Modulor 2*, Figure 3.1.
Copyright, FLC/ADGAP, Paris, and DACS, London, 2006.

Plato's criticism of the famous Protagorian theorem that "man is the measure of all things" rests on his rejection of anthropomorphism. For Plato, as the famous parable goes, the world of sensation was, at best, a shadow of ideal forms and models, projected onto the cave of material experience. Any measure of order must therefore refer to the transcendental realm of ideal models and forms, which alone were true and real. Man was not the measure of all things but rather a copy of the ideal, albeit one with special access to the ideal through reason. Protagoras, however, located truth into the empirical domain, making "man" the model, or measure, of order. For Plato, such measures could only be simulacra, poor copies of ideal models, wavering projections of shadows upon shadows. Rather than transcendental truths, Protagoras's anthropomorphism meant that we would no longer have access to a stable ideal reality and would be left only with uncertain and flickering projections of our own experience. For Plato, therefore, the problem with claiming that "man is the measure of all things" was not its humanism but that it undermined humanity's unique access (through the mind) to the realm of ideal reality. Anthropomorphism is not a synonym for anthropocentrism, but in fact is opposed to it, turning the human-centered account of Nature inside out by turning a copy into a false-model, that is, a *simulacrum*. Moreover, because Protagoras confused the model and the copy, any "uncouth" but "sentient" animal could serve equally as well as the model. Simulacra like pigs or baboons could usurp our rightful place and overturn the true order of things with monstrous distortions of reality. Anthropomorphism is the first step, therefore, onto the slippery slope of dismantling human reason and becoming animal.

The same complex relationship between anthropocentrism and anthropomorphism, man and animal, model and *simulacra*, governs architectural debates about measure and proportion in the middle of the twentieth century. In this chapter, I will examine one of the vectors that extend from this discourse by turning to Sigfried Giedion's engagement with the work of Ernst Cassirer. The philosopher's importance to architectural discourses on proportion was not limited to Wittkower's construction of modern architecture's past. Giedion deployed Cassirer's concepts in the 1950s in an attempt to shift the conceptualization of modern architecture. Not unlike Wittkower, although less rigorously, Giedion understood proportion as one of Cassirer's *symbolic forms*. Moreover, he promoted the confusedly related idea of "human scale" as the essential schema for constructing our understanding of the world. Unlike Wittkower's covert deployment of *Symbolic Forms* upon specific historical material, Giedion treated Cassirer's *Essay On Man* as a tool-kit with which he overtly attempted to fashion a general theory of architecture. Cassirer's work brought Giedion into contact with ideas from biological to social sciences, through which Giedion extended the conclusions of his *Mechanization Takes Command*. In Cassirer's writings, Giedion found a cross-disciplinary matrix

of ideas with which to determine a "functional definition" (Cassirer's term) of the human subject for architecture. As I have previously suggested, the idea that adherence to the "human scale" was a principle of "good" urban and architectural design became a mantra of text books on design and professional manuals during this time in a way that it was not before 1950. To this day, professionally oriented architectural pedagogy stresses an ethic of human scale. By continually teaching about human scale and relating this topic to archeological materials, Giedion's work in the 1950s, though mostly unpublished and now neglected, helped institutionalize proportion and human scale as timeless principles of architecture rather than topics with altogether more recent histories.

In exploring aspects of Giedion's work between the completion of *Mechanization Takes Command* (1947) and *The Eternal Present* (1962), I do not wish to present a survey of all his activities, but instead examine one theoretical trajectory through mostly unpublished letters, lectures, articles, courses and manuscripts. First, I will foreground certain themes developed in *Mechanization Takes Command* that informed Giedion's subsequent research into proportion, human scale, biology, information science and the idea of symbolic form. Second, I will map the relationship of this latter work to Cassirer, who played a central role in Giedion's formulations.[1] The works I will discuss were often preparatory sketches for *The Eternal Present*, an analysis of which is beyond my present scope; yet, what is more important is how these essays, papers and courses delineate an unstable territory of humanism and inherent limits to the humanist subject that were becoming apparent in mid-twentieth-century architecture.

THE MECHANIZATION OF LIFE AND DEATH

Throughout the 1950s, Giedion lectured and taught extensively on the issues of human scale and proportion. He presented this new area of research as an extrapolation of his recent book, *Mechanization Takes Command*. Because it played an important role in framing Giedion's work on proportion, it is worth recalling the relevant aspects of that text. *Mechanization Takes Command* was a massive and often delirious account of the infiltration of technology into the workplace, arts, and domestic spheres of life. Giedion unfolded his arguments through dozens of case studies of "mechanization:" from locksmithing, to the production of grain and meat, to bathroom and kitchen design. In a non-linear approach, each of these studies built upon a theme of a section, but they also could reappear in other sections to address a different problem or relate to different themes. As a result, the text was extraordinarily broad in its scope while often detailed in its case studies.

Giedion's subtitle "a contribution to anonymous history" suggests the nature of his inquiry. Rather than present history as driven by geniuses, ideologies or dialectics, he attempted to present history as a process "closer

to biological phenomena."[2] Indeed, he described mechanization as an autonomous life force, in which each technology or event is a "particle" in a Heraclitian flow of matter. The dynamic of change he offered is a punctuated equilibrium of relatively stable states in which slow change would "accumulate into an explosive force" to alter civilization catastrophically.[3] As Langdon Winner has noted, such materialism is entirely commensurable with technological determinism since it gives technology, or any other topic of inquiry, a "living" force independent of human action or influence. Giedion presented an account which at least partially displaced human subjects as the prime agents of historical change, reciprocating his general thesis that humanity itself had been displaced by vast, uncontrollable, and often insidious, technological systems.

Mechanization was written largely in the United States between the winters of 1941 and 1945, that is, during World War II. The Holocaust, the atomic bomb, rockets and aerial bombardment of civilian populations had a great impact on Giedion. The scale of both precise and indiscriminate violence was only possible through the mechanization of warfare and its command and communication infrastructures. As Mark Wigley has suggested, Giedion's "anonymous history" of technology was entwined with the disempowerment of its anonymous victims. In fact, the book was not a history of mechanization so much as an extended exegesis on the degradation of human life via what he called "mechanistic thinking."

Of all *Mechanization*'s themes, "Death" and "Meat" are the most recurrent. As Mark Wigley has detailed, the mechanization of animal husbandry, slaughtering techniques and food preparation presents the carcasses of pigs, cows and chickens as not so subtle proxies for the victims of the holocaust.[4] To this end, the text frequently employed horror as a rhetorical device. The book's original cover featured a gory Technicolor close-up of a side of bloody meat photographed in such a way to invoke the same ambiguous horror of a Francis Bacon painting.[5] The text's first half climaxes in a section entitled, "Mechanization and Death: Meat," which linked the city to death via Haussmann's championing of the industrial abattoirs at La Villette. For Giedion, the modernization of Paris, indeed the development of the nineteenth-century metropolis in general, was inexorably linked both pragmatically and conceptually to the "engineering and organization" brought to bear upon the industrialization of agriculture and meat-packing.[6] The statistical and normative techniques necessary to administer the expansion of the metropolis also drove the systemization of meat production. Earlier in the book, he sketched a sequence of technological developments, moving from the abattoir to the assembly line and from Gilbreth and Taylor's "Scientific Management" techniques of photographic bodies to Paul Klee's "Pedagogical Sketchbooks." He concluded his first chapter with Etienne-Jules Marey's invention of a photographic gun aimed at flying birds to take photos subsequently

reassembled into his famous chrono-photographs and sculptures. One hundred pages later, the bird reappeared, not only shot but also plucked, in a large photo of a poultry production line, chicken carcasses hanging from mechanical rails like suits at the dry cleaners. In juxtaposing the aesthetics of movement found in Duchamp, Balla, and Marey, with similar work of Gilbreth and Taylor in work studies, to the abattoir techniques of the animal body, it is as if Giedion was documenting Paul Virilio's later observation that in the twentieth century the ability to see would increasingly become the ability to kill.[7]

This chapter concluded with monumental close-ups of robots used in car assembly plants, thereby linking the rationalization of human movement in work-studies to the problem of mechanically skinning an animal carcass. By implication, this extended to the metaphorical death of the skilled human worker. Giedion emphasized the robot's autonomy and vitalism, using zoomorphic tropes to describe their forms and actions.[8] One hundred pages after this passage, in the "Meat" chapter, he presented a two-page spread: on the left is an image of a bird's neck being sliced open, on the right, the famous eye-slicing sequence from Brunel's *Le Chien Andalou*.[9] The latter serves as a diagram for the book's montage of images and text as a surrealist meditation on death, attempting to link techniques of visualization to the violence of technology.[10]

Throughout *Mechanization*, bodies are sites of violence and are controlled by the agencies of technology, which Giedion argued were transforming, even destroying, the nature of humanity. As Mark Wigley argued, bodies of animals function in the text as metaphors of the human, their form a double for the human subject. Their bodies are continually degraded by technology until they become formless base matter, that is, "meat."[11] The dissection of the various animal bodies, from slaughtering processes to Marey's desegregations of the body's movement represented the destruction of an organic synthesis in which the body stood for the organization of nature, culture and the arts. For Giedion, the traditional nature of "man" as a formal category was as ruptured as a calf's spleen left on the concrete of the abattoir. If Wittkower presented the centralized church as the crucible of Renaissance subjectivity, Giedion treated the Parisian slaughterhouse as an antithetical typology for humanism's metaphysical disassembly. The conclusion to *Mechanization* claimed a general loss of faith in technological progress and the need to "canalize" mechanization to human needs and desires.[12] A new subject, a "man in equipoise" was required to "bridge the abyss between inner and outer reality by reestablishing the dynamic equilibrium that governs their relationship."[13]

RESEARCHING THE NEW HUMAN: GIEDION'S ACTIVITIES IN THE 1950s

In lectures in the United States and Europe three years after the completion of *Mechanization*, Giedion announced that this new man in equipoise was to be developed through a "return to the human scale and the assertion of the rights of the individual over the tyranny of mechanical tools."[14] His diagnoses of forces out of balance and his remedy of equipoise and dynamic equilibrium in *Mechanization* had already fused a homeostatic model of the organism with aesthetic postures of the human figure. It is, therefore, unsurprising that Giedion seized upon the re-emergence of proportion as a means to develop the architectural and urban cure for the condition he had diagnosed. In a 1951 lecture at Harvard, Giedion recalled *Mechanization* as an investigation into "what happened when mechanization met life and when it met death; in what happened whenever organic substance[s]… have been tackled mechanically."[15] He then repeated his conclusion: technology was not simply out of control, but was so because man had lost his equilibrium between the micro and macrocosm. The rapid expansion and acceleration of machinery had upset the balance between culture and biological nature, man and machine, life and death, and so on. He repeated this statement in various forms throughout his lectures and articles for the next 12 years. If the body was the site of violence by the hands of technology, reasserting human proportion and scale were to have been devices through which to contain the human subject and guide the growth of technology according to human needs.

This project took different forms, from courses and lectures to articles and books. In the spring of 1957, he taught a "Harvard Urban Design Seminar on the Human Scale."[16] The reading list was a who's who in the 1950s discourse on proportion.[17] He followed his Harvard seminar by a 1959 master class at several universities including Columbia, MIT and the ETH, Zurich. His seminar series included a lecture on the Modulor and the Golden Section. His notes record enthusiastic student presentations and include his own sketched attempts to draw a modern Vitruvian Figure (he calls them "Harvard Skeletons") in which a figure was placed into a variety of geometric shapes.[18] He had already taught a similar course at Zurich for several years and had lectured on similar topics since the early 1950s. In all these activities, he cautioned about the "dangers" of lapsing into "mystic fogginess," on the one hand, and "a preconceived negative attitude on the other," calling instead for a critical and methodical approach to proportion.[19] He turned to archeological evidence and "primitive" drawings, sculptures and architectures to support his theories that there were universally shared proportions and scalar relations.

Given these activities, it is hardly surprising that Giedion reported to Peter Smithson that *The Modulor* and *Architectural Principles* were the most widely read books at MIT and Zurich during 1951.[20] After all, Giedion had just lectured on the topic at both institutions at length.[21] Not unlike

Colin Rowe's pedagogy at Texas, Cambridge and Cornell, Giedion's teaching and lecturing at the most important schools in America and Europe helped install the topics of scale and proportion as fundamentals of professional training in the post-war era.

His courses at Harvard and Zurich were testing grounds for a steady stream of lectures and lecture series. The archive shows that he lectured constantly on the topic throughout Continental Europe, London and the United States. Their earliest full public presentation occurred at a lecture series given in 1950 at Yale, Harvard, the University of Chicago and Berkeley. These lectures were frequently adapted for articles; an abridged version of his "Art as Fundamental Experience" was published in 1956[22] and his (rather different) article "Symbolic Expression in Prehistory and the First High Civilizations" in Gyorgy Kepes's *Sign, Image and Symbol* in 1966.[23] At the 1951 Milan Trienniale that focused on proportion and scale, he co-chaired the first session with Wittkower on "Proportion in history of art and history of thought." Wittkower's convocational lecture was on proportion in the Middle Ages and Renaissance; Giedion's closing lecture theorized implications for the future. Thus, to the triangulated relationship of Wittkower, Rowe and Le Corbusier, we need to attach Giedion's blossoming writings on proportion. If Wittkower constructed a past for the present, Giedion projected a future program of architecture through the fragments of the past.

Giedion's research on the topic effectively concluded in the 1957 A. W. Mellon Lectures at the National Gallery of Art, in Washington, DC. Revised versions of these seven lectures became *The Eternal Present*, which placed far less emphasis on proportion and scale than primitivism and symbolism.[24] What is important about this sequence of activities, besides the ideas they put forth, is how they show Giedion arriving rather quickly at his proposition about human-based proportion and its uses, spending the next decade or so incorporating non-architectural arguments until proportion was subsumed into a rather conservative revision of architectural modernity presented in *The Eternal Present*, which tied any future to a recovery of the primal conditions of architecture in the prehistoric dawn of humanity. This work attempted to define the path post-war architecture would take much in the way *Space, Time and Architecture* had for the first half of the twentieth century.

DISPUTED BOUNDARIES OF MAN AND ANIMAL

Having recounted the scope and context of Giedion's activities, I want to examine his specific arguments, as well as their relationship to Cassirer and other fields. As suggested, the central theme of Giedion's work in the 1950s was the need to maintain humanity's boundaries, both formally and metaphysically through "the man in equipoise." This new subject was to maintain

the "dynamic equilibrium," or "homeostasis" between "inner and outer worlds," a dialectic that configured Giedion's thought on the relationship between the body and its environment, culture and nature, and society and technology. Giedion thought the general mode of "mechanization" confused these boundaries. In order to realize a new subject in equipoise, it was necessary to discover new ways of conserving the *forms* of humanity as a biological organism and as a subject. To do so, he needed to differentiate the human world from technology, and culture from nature. In *Mechanization*, this new subject remained empty and the question remained as to how this new creature could maintain its dynamic equilibrium. There was a clue at the end of *Mechanization*, when Giedion declared that the age of realist, mechanistic thinking was (necessarily) drawing to a close. By 1950, this evening had transformed into a new dawn, as he claimed to have detected a "reawakening of symbolic expression."[25]

Giedion sought evidence for such a renaissance primarily through Cassirer's recently published, *An Essay on Man*. The *Essay* provided Giedion with a rich, and for ten years seemingly endless, source of ideas, materials and references. It also brought Cassirer's ideas of *Symbolic Forms* to bear upon Giedion's areas of study: art, science and history. Giedion did not employ Cassirer simply as an authority; his dependence upon the *Essay* was far more pervasive although it is clear that Giedion thought that he could bring something to the Neo-Kantian tableau by developing Cassirer's still rather cursory explorations of art and architecture.[26] He frequently referenced this text, which seems to have provided many of Giedion's other sources and suggested directions for further exploration. His longer lecture series in the early 1950s were even structured according to the chapters and topics of Cassirer's *Essay*, moving from a definition of humanity, through its various forms and stages of symbolic expressions, and finally to an assessment of art. Giedion often did not acknowledge his source, yet even when he did not refer to Cassirer's arguments explicitly, his work on proportion and the symbolic certainly relied upon Cassirer's conceptual framework. Immediately after Wittkower's *Architectural Principles* reinstated the importance of proportion in architectural history via Cassirer, Giedion embarked on an attempt to develop proportion as a universal symbolic form for architecture's future.[27]

Giedion's choice of *An Essay on Man* as his primary source rather than the *Philosophy of Symbolic Forms* is revealing. Cassirer had presented his 1944 *An Essay on Man* as a more accessible version of his philosophy, written in English for a general Anglo-American academic audience.[28] By that time, Cassirer was ensconced within the academic milieu of the United States (having emigrated with the rise of National Socialism in 1941).[29] While there was increasing interest in the *Symbolic Forms* in America, the intricacies of post-Hegelian and Neo-Kantian German philosophical discourse (that *Symbolic Forms* leave rather implicit) would have been impenetrable

to all but specialist readers. Moreover, by that time, different philosophical problems seemed pressing and the human sciences upon which Cassirer had drawn had significantly changed in the quarter century since he wrote the first volume of *Symbolic Forms*. Cassirer sought to incorporate the latest research and problems while addressing multidisciplinary issues. Thus, rather than a simplification, the *Essay* attempted to translate the concepts and frameworks of *Symbolic Forms* from the highly specific post-Kantian German philosophical discourse of the early twentieth century to the nascent post-war North American arenas of anthropology and cultural study.

Foremost among Giedion's and Cassirer's consonances were their shared anxieties about the cohesion of the humanist subject within modernity. The first chapter of Cassirer's *Essay* traced the themes he had developed much earlier in the *Erkenntnisproblem* (*The Problem of Knowledge*) series, repeating his claim that in the late eighteenth century, humanity's knowledge had become ungrounded from traditional authorities and fragmented into numerous incommensurable fields, until by the middle of the twentieth century no single discipline could provide an overall representation of life and knowledge in the way theology, metaphysics and the natural sciences once had.[30] Knowledge had become a "labyrinth… of disconnected and disintegrated data which seem[ed] to lack all conceptual unity."[31] Giedion, meanwhile, repeated the idea that a corollary split in the eighteenth century between "thought" and "feeling" (his words) had prevented a similar unity in art and architecture.

Giedion seemed to have found in Cassirer's thought a sympathetic and authoritative philosophical account of the narrative he wished to present for architecture. To Giedion, it must have seemed that Cassirer shared his sense that the world had become unbalanced. He adopted Cassirer's historiography of modernity wholesale and referred to a shared group of modern authors, such as Herder, Freud and Marx, as diagnosticians of this condition. In *Mechanization*, Giedion had been concerned with the measurement of the body in Taylorist works studies and art. Cassirer focused on the study of the human subject by social sciences such as economics, psychology/psychoanalysis, economics and anthropology. For Cassirer, "our modern theory of man [had] lost its individual centre."[32] For Giedion, man had "lost the power to integrate."[33] Both entwined humanity's displacement of self-knowledge, physically and metaphysically, with the threat to human existence. The solution, according to Cassirer, was to renovate philosophical tools via archeology and ethnology, specifying that which was constant and changing, in order to construct a "phenomenology of culture" and knowledge. This was exactly the project Giedion embarked upon within architecture beginning in 1950 and which found its final expression in *The Eternal Present*, where he emphasized a quasi-anthropological origin of art and architecture as expressing the transformation from animal nature to human culture. In

each case, Giedion introjected an architectural question through the apparatus of Cassirer's *Essay* and returned it to architecture.

"MAN" AS "ANIMAL SYMBOLICUM"

The most important reflection Giedion saw in Cassirer was in the latter's proposal that a "symbolic dimension" distinguished humanity from the rest of Nature.[34] Throughout the 1950s, Giedion's lectures and courses often began with a formulation lifted from Cassirer's *Essay* (and often unacknowledged) that claimed every distinction between man and animal has fallen, one by one, over the past hundred years. Cassirer argued a new terrain of inquiry into the human condition opened in the nineteenth century, one as rich as it is problematic.

Cassirer—and Giedion after him—argued the distinction of the human as a rational animal (*animal rationale*) had "lost its force."[35] It failed to account for the vast amount of important human activities not considered "rational" in the philosophical or scientific sense, such as religion, myth, certain types of language, and art. Cassirer ridiculed the Cartesian "I think therefore I am" for reducing life to a moral imperative that equated the true with the logical.[36] For him, Descartes's subject depended on a *mathesis universalis*, not the capricious and complex subject revealed by anthropology, psychology and the other social sciences. Descartes's distinction of man as rational no longer provided an adequate explanation since modern sciences had demonstrated that much of human existence consisted of irrational drives.[37] One might reverse Cassirer's argument to suggest that it was largely the advent of the empirical social sciences in the nineteenth century—themselves made possible by the Kantian revolution (as Cassirer argued in Volume 1 of *Symbolic Forms*)—which made this *animal rationale* an inadequate definition and created the need to define a new subjectivity. Moreover, a different problem stemmed directly from opening these "irrational" aspects of human culture. Anthropology and developmental psychology, he stated, found not only regularities across human cultures, but also that many of the supposed marks of rationality, such as language, seem not so rational in their origin. As if this were not enough, he declared, these sciences had found that many of the marks of human intelligence were not uniquely human. Theological doctrines of the soul were obsolete for similar reasons. However, it was not simply evolution and Freud that were to have called the special place of humanity into question.

Cassirer also criticized Bergson's definition of humanity as *homo faber*. Bergson had argued that what defined humanity was neither intelligence nor rationality but what humans did with these traits. For him, knowledge did not simply understand the world so much as create a new one by fabricating artificial objects, tools (especially tools which make other tools—or, less benignly, weapons). This applied not only to prehistoric

anthropology, but also to contemporary philosophy.[38] Cassirer was generally sympathetic to Bergson's arguments. However, Bergson's *homo faber* implied an extreme separation of Being from life, which meant that the latter remained inaccessible to rational analysis and therefore could never be more than speculative and intuitional. This was no way, Cassirer thought, to produce a modern systematic phenomenology of culture. Moreover, Bergson argued, that this leap could only have been achieved by an act of will, a hypothesis that Cassirer claimed reduced the complexity of humanity, this time too far in the direction of the irrational. In any case, given Cassirer's Neo-Kantian position, it was not the making of actual tools that was most remarkable but the creation of the category of tools. For Cassirer, "tools can arise only where the mind has become capable of conceiving of a 'possible' object instead of giving itself over to a real one and losing itself in it."[39] That is, tools could have become a possible object of human action only under a schema between the toolmaker and the world upon which the tool would act.[40] There must have been something that made this possible. Furthermore, as with the critique of rationality, modern sciences such as primatology had shown that other animals employed tools.

Cassirer argued that one could apply the same critique to every type of substantive definition of man, from Bergson's *homo faber* to Huizinga's latter *homo ludens*. In short, Cassirer challenged any attempt to delineate the boundaries of the human through an essential identity. He proposed instead a purely *functional* difference, a formulation not derived from humanity's unique essence but its special form of purposiveness (derived from Kant's "Critique of Teleological Judgment"). Rather than ask "What is the essence of mankind?" and answer with an already given object such as "tools," "language," "rationality," and so on, this functional differential asks what was necessary for humans to develop categories such as tools and rationality?[41] When did sensation become cognizable as such via representations and instruments of representation? Cassirer distinguished "Man" from other animals on the possibility of conceiving of a world of tools, objects—and subjects—as such. There could be no "forms," no "objects," cognizable outside the subject's construction of these categories; these were produced purely by the subject's schemata, the comprehension of apprehension. In other words, the *functional difference* lay in the fact that while animals experience sensations, humans abstract these into a symbolic schema of signs and categorization. We are not an *animal rationale* but an *animal symbolicum*. Because schemas coordinate objects, matter, senses and impulses into cognizable categories and forms, Cassirer suggested an even more precise definition of humanity in the scholastic term *Capaso formae*—he who is "capable of form."[42]

Closely paraphrasing Cassirer in a 1950 lecture, Giedion proposed that the boundary between man and animal and between culture and nature

existed only in the capacity for "symbolic processes."[43] Giedion argued that both "man and animal are capable of expressing… but the insurmountable difference between man and the animal world… is to be found in animals' lack of symbolic imagination."[44] In a very Kantian turn, Giedion suggested, "for the animal, words are sounds, always connected to distinct objects. Never do they become, as in the human world, symbolic abstractions which are integrated into a new artifact called a sentence."[45] That is, the symbolic was to have been the capacity to give names and associate them with a concept to construct a distinctly human world of representation and meaning. For Giedion, giving measure to things was to have played the same role of giving recognizable form to otherwise indeterminate sensation and matter. Cassirer clearly extended the shift to symbolic language to every other human activity, from the language of painting and architecture to the language of science. This multi-faceted symbolic dimension also had a history, moving from local analogies towards abstraction and formalization, i.e., purely symbolic form.

While Giedion deployed Cassirer's basic argument verbatim, it is unclear the extent to which he grasped the intricacies and complications of Cassirer's argument. In the early 1950s, he seemed to adhere to it very closely, paraphrasing Cassirer's text. By the late 1950s, as in the 1957 Mellon Lectures and *The Eternal Present*, he presented far more banal and essentialist formulations. Indeed, in the later text, he completely ignored Cassirer's use of the term symbolic and lapsed into the most banal and problematic use of the symbol as a mere sign or icon.[46]

In any case, a peculiar side effect of Cassirer's argument became rather more important in Giedion's transposition into art and architecture. Based on the definition of humanity as he who gives form to otherwise amorphous matter, Cassirer had argued that to understand culture, "we must analyze *symbolic space*" and moreover that, "[i]n approaching this issue we are on the borderline between the human and animal worlds."[47] Here Kantian aesthetics played a central role. In fact, Cassirer extrapolated from Schiller's *On the Aesthetic Education of Man*, which contrasted the basic "physical state" of *Homo sapiens* as a biological entity from an "aesthetic state of reception" found only in "Man" as subject.[48] Only the latter momentarily stabilizes the rush of stimuli and "background of transience" into a "form." Cassirer then reincorporated Bergson, arguing that the formalization of stimuli into objects, categories and names transforms "things" into tools, literal or conceptual devices with which to refashion the world into an organized composition. Only humans removed themselves from the chaotic flux of stimulation and response to conceptualize response as a pattern of behavior and as representation. Indeed, Cassirer argued at the end of the *Essay*, drawing on Worringer's "Empathy and Abstraction" (an article Giedion would increasingly rely upon as well) that the job of art theory was

to determine the "proportion of deviation" between the forms we give in our art and the forms we give to nature. In other words, theories of art were to examine the products of culture, deducing from the life of forms and progress of art how we represent the world to ourselves and construct its meaning. Art does not represent a given reality (the object in itself) so much as evidence the schematic organization of the sensoria.[49] Cassirer suggested that this anti-realist mimesis was applicable not only to art but to all domains. As a result, for him human existence is fundamentally aesthetic in so far that life consists of judgments that confer experiences to symbolic schemas of order. For him, abstraction and formalization were not reductions of lived experience, but the root of the possibility of *being* human. Representation is not something that hinders our knowledge of the world so much as makes it possible. The space of man is that of representation.[50]

Giedion replicated Cassirer's stated boundary between the animal and the human: "For the animal, words are sounds, always connected to distinct objects. Never do they become, as in the human world, symbolic abstractions which are integrated into a new artifact: called a sentence!"[51] However, the symbolic functioned in Giedion's texts not simply as a necessary condition of humanity but also as a prosthesis that supplements a certain lack. Giedion argued that while "every animal is perfectly adapted to its own environment and is able to restore equilibrium, between inner and outer world," man as such no longer enjoys a commensurability with natural dynamics.[52] He declared that when Protagoras proclaimed "man as the measure of all things," humanity was precipitated into an alienation from the world of nature. In an inversion of Plato's argument we encountered at the beginning of this chapter, for Giedion, this marked the moment that "the organic universe broke into pieces and the position of the animal world became debased or devaluated forever."[53] The opening of symbolic dimensions of life at once elevated human existence from the instinctual responses of the animal world, and removed humanity from the ordering of nature. The condition of human subjectivity *per se* is far from equilibrium. This is not simply a problem but also the pressure that drove the evolution of *Homo sapiens*' social and cultural endeavors as ways of bridging this gap. Because, "the human being has to re-establish equilibrium in another manner… man's symbolic approach to the world that appears in every field."[54] He drew this formulation directly from Cassirer's *Essay*. However, while Cassirer simply stated that humanity exists in a different relationship to his environment due to his occupation of a symbolic space, Giedion both exaggerated and inverted its implications. For him, humanity was exiled from an Eden of natural order, and rather than understanding the symbolic dimension as the conditions of possibility for the human *Geist*, it is suddenly converted into a way to recover a lost organic unity of Being.

In Giedion's work, "Man" as *Capaso formae* was interjected through Cassirer and back into architecture as a way to resolve the problematic status of form for the subject of architecture. In *Mechanization*, this problem presented itself as a crisis in humanity's relationship to technology, but now one can see how this was merely a superficial problem stemming from the de-authorization of forms and categories of subjectivity that had occurred since the late eighteenth century. Giedion presented symbolic form as a way to recover a lost unity with man's nature but this dichotomy itself was merely an effect of a reorganization of the conditions of knowledge in the post-Kantian age. The "meat" that supposedly stood for the imminent death of man actually demonstrated how the "human subject" as a category of thought was no longer capable of an essentialist definition but was only given to knowledge through the constructions of forms of recognition. To that end, Giedion employed proportion as a way to make the figure of "man" under modernity cognizable and architecture once again capable of judgment. Yet, at the same time—and in an antithetical way to Cassirer—Giedion sought to use proportion's symbolic "form giving" as a way to recover a lost organic "unity" or "synthesis," first, of Man with nature and, second, of technology to Man's recovered natural equilibrium.

THE *NETZ*-WORKED BODY

Cassirer's *Essay* also introduced Giedion to a scientist whose work had tremendous impact on his thought, Jakob Johann von Uexküll, an ethnologist and biologist of the early twentieth century whose ideas often laid the groundwork for systems theory and many of the principles of cybernetics. Giedion was fascinated with Uexküll's argument (as he paraphrased Cassirer) against the premise that there, "exists an absolute reality of things which is the same for all living creatures."[55] Instead, Uexküll's research revealed that the physiology of the organism determined the reality that exists for it: "Reality is not a unique and homogenous thing; it is immensely diversified, having as many different schemes and patterns as there are different organisms."[56] Uexküll argued that comparative anatomy alone could provide evidence of what reality exists for each species. However, as Cassirer emphasized, Uexküll was not interested in traditional classificatory methods based on morphology, but in the physiology of the sense and perceptual apparatus defined as systems:

> *A careful study of the structure of the animal body, of the number, the quality and the distribution of the various sense organs, and the conditions of the nervous system, gives a perfect image of the inner and outer world of the organism.*[57]

Uexküll presented a post-Kantian biology, in which the corporeal organization of a being determined its reality, the *schema* that registered the "inner and outer" world as the measure of all things. This schema allowed

the representation of stimuli and events to a subject, effectively creating its reality. Moreover, this organizational schema was not understood in terms of an organic body, isolated organs or sensation but as two systems: a receptor system (*Merknetz*) and an effector system (*Wirknetz*). Combined, they created the reality of the organism, or what Uexküll called the "life-world" (*Umwelt*).[58] The organism, in turn, was not defined by the physical boundaries of the body or hierarchies of organs and part to wholes, nor even defined by a dialectic between microcosm and environment but as the configuration and interaction between its two systems as a coherent *Merknetzen*.[59]

Uexküll explicitly situated his biology in reference to Kant's "Critique of Teleological Judgment."[60] Indeed, if the life-world of each organism derived from the exchange of impulses between two informational networks, and the subsequent cognition of this input/output information was a schematic representation, as Uexküll claimed, then life was nothing other than a multitude of judgments about patterns and their differentiation. The organism's "body" did not define nor was distinct from subjectivity; embodiment and the senses were the expression of the networks of effector and receptor systems.[61] Life was nothing other than the exchange of information between the *Netz* that define the organism as such, and the error rates within this system propelled the evolution of species and the history of individual beings within it.[62]

Cassirer sought to extend Uexküll's explicitly Kantian framework to the "human world."[63] If different configurations of *Merknetzen* distinguished animals and their multiple realities, Cassirer suggested a more radical differentiation of the human. He argued that humanity's *Umwelt* was not simply quantitatively different in that it had denser receptor and effector networks but it marked a "qualitative change." If humanity could be differentiated from other animals as the *animal symbolicum*, Cassirer argued this resulted in a *third* network, which he named the "symbolic system." This was a second-order *Netz*, immanent to the physiology of the *Homo sapiens* but which physiology alone could not sufficiently explain. If the *Merknetz* and *Wirknetz* created the "reality" for the organism and allowed its interface with the biological "life-world," the symbolic system fabricated another life world of "culture" and allowed humanity to traverse the realms of natural phenomena and cultural practice. Humans alone, in other words, transformed *information* into symbols, impulses into language, that is, life into knowledge. The extraction of humanity from the balance of nature into the distinctly human domain of symbolic representation is a void now spanned by the development of a prosthetic symbolic *Netz* which reintegrates man's body into natural stimulus.

Giedion drew from this informatic definition of life as a balance of networks, often paraphrasing Cassirer's summation that, "Without the corporation and *equilibrium* of these two systems [*Merknetz* and *Wirknetz*] the

organism could not survive" (emphasis added).[64] Already in *Mechanization*, Giedion had formulated a similar conclusion: "The Human organism requires equipoise between its organic environment and its artificial surroundings. Separated from earth and growth, it will never attain the equilibrium necessary for life."[65] Giedion also mobilized another of Uexküll's central theses that the animal was captured in the network of *Netz* through which its reality is constituted.[66] This implied a recursive loop between an organism, other entities and the environment in which all map each other, coevolving and adapting to their different life-worlds. As previously mentioned, Giedion argued the precipitation of *Homo sapiens* into the symbolic world of Man simultaneously removed humanity from its natural equilibrium with the environment. For him, the third network (symbolic system) was a prosthetic required to engineer a new equilibrium between Man and his environment, one that could rein in technology. Giedion, after Cassirer, declared this emergent "symbolic dimension" unique to human existence and it took its place at the apex of his previously privileged objective schematic dimensions of "space and time," giving these latter two meaningful order.

In the theme of homeostasis and feedback between inner and outer worlds, Giedion echoed the contemporary work of Norbert Wiener, the founder of cybernetics. Giedion did not adopt or borrow cybernetic frameworks explicitly, but Reinhold Martin has noted an uncanny repetition of themes in *Mechanization Takes Command* and Wiener's *Cybernetics* published the same year.[67] They were drawing on a shared archive of research, disciplines and concepts long before they actually met at a conference in 1950.[68] The term cybernetics derived from the Greek *kybernetes*, or steersman.[69] This is also the root for the term "governor" (a device installed in various electromechanical devices to regulate their output). The thermostat is the archetypal example of a very simple governing feedback mechanism: whenever the temperature deviates, this "information" triggers the thermostat, activating an air conditioner to correct the imbalance. The field of cybernetics developed related ideas of reflexivity as a radical model for the organism and the environment as a single and interlocking reflexive informational loop rather than autonomous entities.[70]

In fact, throughout *Mechanization*, Giedion had drawn upon various physiological and biological models of homeostasis (mammalian temperature regulation, population growth) in which two opposing forces are balanced. These forces traverse some sort of threshold, either the boundary between the interior of the organism and its environment, between the organic and the artificial, the individual and the collective.[71] Such a dialectic of natural systems, Giedion argued, was necessary to find a balance between the relatively stable human needs and the rapidly changing conditions of our environment. Giedion claimed life had become too accelerated and unbalanced by rapid and uncontrolled mechanization.[72] Each chapter of *Mechanization* therefore

operated as a case history of a set of equilibriums unbalanced by technology. Moreover, as we have seen, he argued no balance existed because the cultural domain had grown out of control into an autonomous force he described as a technological system. However, he also continually examined how technology provided the "regeneration [of] bodily equilibrium."[73] Examples in that text included hydrotherapy of the nineteenth century, some of the work study techniques developed by Gilbreth, Taylor and Marey, innovations in chair design in the later nineteenth century in relationship to posture, and the mechanization of the kitchen. Now proportion in architecture would take its place as such a technological realignment of the human world, natural laws, and technological production.

We can now see why Giedion thought proportion and scale might offer the symbolic clay out of which to fashion the "man in equipoise" as the third, symbolic dimension or network of organization. Throughout the early 1950s, Cassirer's functional definition allowed Giedion to argue not only for a renewal of symbolic concerns in architecture, but to use the formalization of the body schema itself as an ontological aesthetics. If, as Giedion argued, man's tripartite *Merknetzen* had become distorted by mechanization, the use of scalar proportions to constrain technological production would realign them to the human life-world. As we will see in Chapter 9 with Le Corbusier's Modulor, proportional systems were seen as an orthopedics of the flow of information across the networks of human subjectivity, technical processes and natural growth.

SIMIAN ARCHITECTURE

Given their definition, for both Giedion and Cassirer, primatology played a particularly important role in drawing the symbolic boundary between the animal and human. This interest is not idiosyncratic to Giedion and Cassirer. In fact, Donna Haraway has documented that between the end of the nineteenth century and World War II, "primatology served as a mediator between life and human sciences in a critical period of reformulation of doctrines of nature and culture."[74]

While both writers focused upon two primatologists, Robert Yerkes and Wolfgang Koehler, Giedion also emphasized their work with linguists who drew from that field such as Henri Delacroix and the American philologist Samuel Ichiye Hayakawa (also a famous opponent of the student protest movements in the late 1960s as president of San Francisco State College as well as co-founder of the conservative politics through language group, US English). This international and multidisciplinary roster of authorities spoke to Giedion's broadly ranging, quasi-anthropological approach and typified the heady intermixing of linguistics, social, psychological, physical and biological sciences of that time. Giedion would recount Hayakawa's research at

length as the clearest evidence of the difference between what Cassirer calls animal reaction and human response:

> *A chimpanzee can be taught to drive a car… but its relations are such that if a red light shows when it is halfway across a street, it will stop in the middle of the crossing, while if a green light shows while another car is stalled in its path it will go ahead regardless of the consequences. In other words, so far as a chimpanzee is concerned, that red light can hardly be said to* stand *for stop; it* is *stop.*
>
> *[In contrast] whenever human beings can communicate with each other, they can, by agreement, make anything stand for anything.*[75]

It should be mentioned that Hayakawa's depiction of the chimpanzee's understanding of the stop sign is rather similar to Wittkower (and Foucault's) depiction of the Renaissance Neo-Platonism; the red light is stop, the circle is divine. This might suggest an analogous role between the chimp as locating an originary boundary of the human and the Renaissance as the origin of humanist architecture. Here, empirical science seemed to confirm the functional definition of humanity as a symbolic animal by tracing the limits of that potential from its exterior, using the chimpanzee as humanity's double.

To further understand this use of primatology, one can examine Giedion's reference to Robert Yerkes's work as he was the most significant actor in his and Cassirer's narratives. From 1924 to 1942, Robert Yerkes founded and administered a "laboratory colony" of chimpanzees at Yale University that set the standard for all such centers thereafter.[76] Funded by the university's Institute of Psychology and later renamed the Yale Laboratories of Primate Biology under the auspices of Yale's medical school, his work traversed the social and natural sciences not simply conceptually but institutionally. Yerkes himself chaired the Division of Psychology and Anthropology in the United States National Research Council, supported by the philanthropic Engineering Foundation and Rockefeller grants.[77] Indeed, Yerkes named his method "psychobiology," a mix of experimental psychology, embryology and personality studies.[78] As Donna Haraway has detailed, his "laboratory" coupled domains of inquiry of nature and culture to those of engineering. For Yerkes, the laboratory animal was neither wild nor domesticated.[79] They were essentially "designed and standardized" as experimental apparatus, shaped "intelligently to specification" by the scientists for the needs of their research.[80] Because they could be trained to perform complex tasks, chimpanzees were highly pliant hybrids between Nature and Culture that could be engineered up (or down) the Great Chain of Being, "becoming" more like human or more bestial according to the nature of the experiment.

This hybridity indicates why primatology played such an important role for Cassirer and Giedion, although in different ways. For Cassirer, not only did the symbolic define humanity, he thought of the human as a "difficult text which had to be deciphered."[81] Myriad cultural layers, philosophical and

scientific over-determination, traditions and historical contingencies obscured the fundamental condition of humanity. In addition, the "human" was itself a difficult object of scientific or empirical knowledge since it was also the subject of this knowledge. He suggested that some of these difficulties could be offset by examining the "pre-historical" man or "primitive" societies, since they were understood as somehow closer to a natural state, less obscured by the apparatus of culture.[82] Indeed, it is clear from his writing that Cassirer looked to the origins of civilization, art and language because he thought the development of these marked the transition from animals to human subjects. For Cassirer, Yerkes's primatology was essential because the apes were not full subjects but rather "were natural objects redesigned [by science] to produce useful knowledge."[83] Yerkes's "engineering" of the chimp also offered insight into how humanity once fashioned itself into a different, symbolic, dimension of existence. If the history of humanity was a shrouded and murky pool, a lens dark, the primatologists' chimps appeared to offer "unobscured mirrors" of man.[84]

Giedion replicated these arguments, applying them to the study of art and architecture. For him, primatology offered an empirical study of an organism just on the other side of the boundary that separated man from the rest of nature. Cassirer treated the studies of chimpanzee culture, language and abilities as an analogue of anthropology; comparing the two, he thought, demonstrated the qualitative gap that lay between them. Similarly, in Giedion's lectures and writings of the 1950s, the simian provided a biological equivalent for his quasi-ethnographic accounts of "primitive" art he would use later in *The Eternal Present* and *The Origins of Architecture*. By examining the primate's use of signs, Giedion thought one could peer back into time, stripping away the accreted layers of culture until one gazed at the dawn of Man as the origin of art. The chimpanzee's relationship to symbolic language thus served in an originary discourse of the cultural practices of humanity.

Moreover, for Giedion, the attraction of primatology stemmed from its use of engineering to create pliant "quasi-subjects." The idea that chimpanzees could be "re-engineered," reshaped and then studied in order to mark the exterior boundary of the human suggested that primatology offered insight into how science and technology were capable of engendering new human subjectivities. Yerkes had clearly stated this larger hope:

> *We have believed it important to convert the animal into nearly as ideal a subject for biological research as is practicable. And with this intent has been associated the hope that eventual success might serve as an effective demonstration of the possibility of re-creating man himself… and active acceptance of the principles of modifiability, controllability, and consequently improvability, of human nature.*[85]

Haraway has described how Yerkes's work was instrumental to the "human engineering" Giedion had studied in *Mechanization*. In the 1920s, Yerkes

presented his endeavors as, "disinterested research" into how to guide technological society.[86] Central to this study was the question of how to scientifically "manage" the differences of race and gender. While working at the Boston Psychiatric Hospital between 1913 and 1917, he developed the famous "Point Scale Test" for mental functioning that would be employed in the assignment of duty in the military, and as Chief of the Division of Psychology in the Office of the Surgeon General, Yerkes oversaw all psychological examination in the US Army, which first developed rigorous intelligence testing. In this way, primatology was an integral part of the narratives of statistical normalization and population control examined in the previous chapter with the example of Galton and work studies.[87] Moreover because chimps performed as cognitive and anatomical analogues for humans, they provided perfect "test subjects" for ergonomic testing, interface design, G-force and pressure experiments, crash testing and hostile environment simulations all employed chimpanzees as quasi-subjects and stand-ins for human bodies. For example, the chimpanzee "Ham" was the first American astronaut launched into orbit. All these applications suggest how the biological and social sciences were coupled to medical research and ergonomics in an effort to produce a "new synthetic humanism."[88]

It was exactly such a re-engineered subject that Giedion declared necessary at the end of *Mechanization* and primatology served as a mediator in his subsequet attempt to understand how scale and proportion might re-shape both machines and human subjectivity.

A MANIFESTO FOR EQUIPOISE

In the 1950s, Giedion's interest in proportion was related to a re-conceptualization of the organism and its embodiment away from architectonic or mechanistic frameworks towards an informatic explanation of the organism as a set of homeostatic feedback loops and the body as the schematic organization of these loops into a networked environment. Proportion offered a means through which part of the organism's equilibrium could be maintained. By the end of the 1950s, Giedion was increasingly turning towards prehistoric, "primitive," origins of art and architecture. In *The Eternal Present* and its companion volume, *The Origins of Architecture*, the symbolic and its associated matters of scale and proportion offered the site of origin for "Man" as a subject elevated above his base status as animal. It was at this moment of the original separation of the human from animal nature, at this founding event of the third symbolic network that defines humanity as such that one could look to find ordering systems that could restore the long-lost balance.

In her *Cyborg Manifesto*, Donna Haraway described three boundary conditions of the human and animal. The first is that between the human and the animal, the second between the animal/human and machine, and

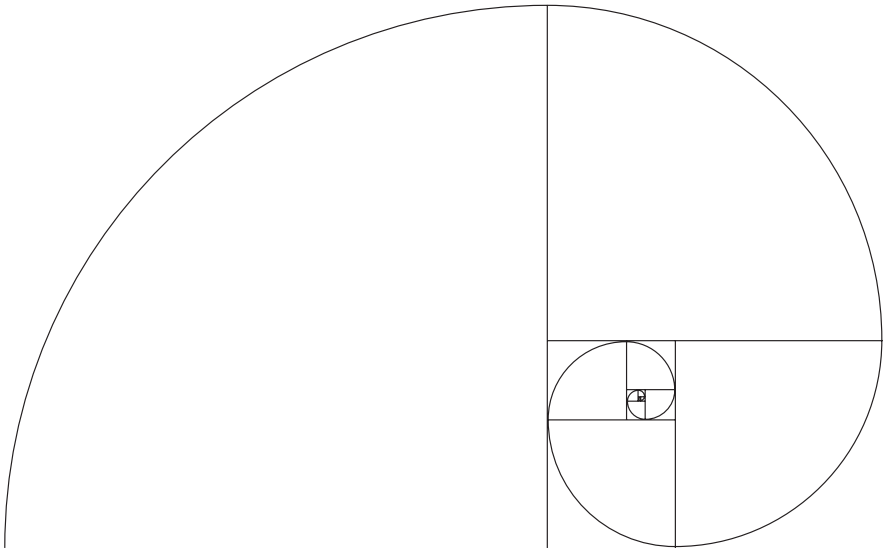
the third is the polarity that exists within the Kantian manifold between form and matter, subject and object, culture and nature. As I have argued, for Cassirer and Giedion, the first of these boundaries was effectively breached since no *essential* distinction could be made between humans and animals.[89] Both sought to conserve the category of Man, however, through the functional addition of a symbolic dimension, or a symbolic net which at once elevated the human organism above its animal nature, distanced "Man" from nature, and provided the means to engineer a new equilibrium. Yet the category of the symbolic, by displacing essential criteria and mechanistic models of life with informational loops and networks, effectively rendered the second and third conditions moot.

The instability in the definition of the human was also a feature of Le Corbusier's Modulor. Le Corbusier was happy to repeat the most playful associations between the chimpanzee and the Modulor, reproducing British students' inverted Modulor scale with a figure of the Modulor chimp. Le Corbusier gleefully calls this a "topsy turvy Modulor Man which is not without savour."[90] *Modulor 2* was a montage of reportage and correspondence, and Le Corbusier positioned this drawing directly after his correspondence with the biologist Pierre Girard (director of the prestigious Institute of Physico-Chemical Biology). In an echo of Cassirer's thesis of *animal symbolicum*, Girard endorses the Modulor as expressing "the very essence which constitutes us."[91] This statement's juxtaposition with the Modulor Monkey is provocative, for if Le Corbusier believed the Modulor's order permeated nature and culture alike, it obviously traversed species barriers (and in the case of mollusk shells and phyllotaxis in plants, phyla and kingdom). Indeed, the students drew the Modulor Monkey simply by turning the proportional scale Le Corbusier used to draw the Modulor Man upside down.[92] This reveals how the worry about proportion in the middle of the twentieth century has little to do with Renaissance humanism other than seeing it as a stable referent against the post-Kantian modernity where the boundary between the human and inhuman was a blurred domain constantly needing focus. The Modulor Monkey is a literal mirror image of humanity, a reflection of the human life-world, an anthropomorphic reality created by our networked sensory organs and their technological extensions. These reflections, projections and introjections are architectural manifestations of the unstable condition of the human in modernity: lacking a theory of form for the modern subject, architecture constructs a hall of mirrors between humanity, nature and technology. These Protagorian simulacra are not shadows of an ideal world drawn onto a dark cave, but produced by the techniques and sciences that seek to illuminate the modern problem of "human nature," whose figures shimmer like mirages in the desert of reality.

8.
MEASURED RESPONSE

In the presence of the beautiful I am like a measuring line without marks.

—*Plato,* Charmides



8.1 Example of a logarithmic spiral using the Fibonacci series of numbers. Note that while this looks like the spirals that can be produced using the Golden Section, it is not an exact match and that the two are different figures.

> *I met recently a well-known French architect who seemed much concerned with the use of that old superstition, the Golden Cut; he told me that it should be applied to even the smallest details of construction. It was refreshing therefore to hear Aalto's far more logical approach… no code of regulation for the production of good buildings will be ever finally laid down.*[1]

This is an opening salvo in the fierce debates about proportion that began in the mid to late 1940s. Like the name of a God that cannot be spoken, the "well-known French architect" was, of course, Le Corbusier, who was undoubtedly expounding the virtues of the Golden Cut—now more usually known as the Golden Section—in a pre-launch publicity campaign for *The Modulor*. These comments were made in passing as part of a long review of an early autumn lecture by Alvar Aalto given at the Architectural Association in London in 1946, yet they catalyzed a sequence of heated letters that ran for an entire year in the school's journal.[2]

Why did a passing comment elicit such a response? What sort of exchange is this? What did it concern? Who participated in this debate? The letters were by turns painfully academic and emotionally charged. Some protagonists repeatedly corresponded; others wrote only once. Interest and disciplinary affiliation provided qualifications; students, journeyman practitioners, heroic architects and academics alike joined the fray. The debate consisted of disjointed threads of argument, unfolding in non-linear stages and, most importantly, through non-propositional statements that often veered towards gossip.

In other words, the nature of the exchange would be uncannily familiar to anyone who has read a blog debating Mac versus Windows, or indeed, the exchanges between students and architects on discussion websites such as Archinect.org. It is the same construction of a discourse, albeit unfolding in a slow motion and with formal salutations rather than hip avatars. The debate raged like a "flame war" with each side having its devotees. "What ignorance!" one professional correspondent retorted to a letter that had dismissed the Golden Section as nonsense, while a third-year student demurred, "I find the current quibble over proportion rather depressing." Letters repeatedly declared the debate on proportion was uninteresting and hardly worth the effort, yet the energy spent in both support and denouncement was disproportionately fierce. As happens today, just as someone begs the discussion thread be closed, another letter initiates another tangent.

Like a webmaster, the editor of the journal allowed this debate to proliferate, suggesting that he saw merit in its minutiae. Why, for the protagonists and for the editor, was this debate worth sustaining? What does the energy expended on the topic as abstruse as the Golden Section indicate when post-war British architecture was facing seemingly more pressing issues?

These questions are pertinent not simply to this debate, but to understand the historical moment in which this debate was mounted.

The letter quoted above, for example, appealed to a "far more logical approach" of Aalto over Le Corbusier's superstitious Golden Section mojo, but then immediately claimed that this logic rested in acknowledging the "impossibility" of an objectified "code" for the production of good (in other words, beautiful) buildings. In fact, the logic ascribed to Aalto's approach apparently lay in his claim that the subjective and cultural domains should remain distinct from the rational rules and techniques used to understand nature.

Within this dichotomy between Natural law and Cultural practice, the Golden Section operated through three further oppositions. First, there was an epistemological opposition. Some present the Golden Section as a useful guide to artistic creation that can be scientifically demonstrated. In the letters exchanged through the *AA Journal* one architect proposed to scientifically investigate the usefulness of the Golden Section: "To test this hypothesis, I have designed a special apparatus whereby turning certain dials various combinations of elementary shapes on a luminous screen can be made to vary and the positions of preference accurately recorded."[3] Others who opposed the Golden Section argued that judgment is not uniform and that this disparity can be scientifically demonstrated. As another correspondent reasons: "Proportions in architecture expressed mathematically cannot be granted a firmer status than is accorded to scientific hypotheses. The latter rely upon verification by experiment."[4] Here the Golden Section is related to the problem of measurement for the subject, both of the Golden Section as an aesthetic measure of beauty and of the ways to measure its effect upon the subject.

Second, there has been a symbolic opposition, in which the Golden Section is said not only to be useful, but meaningful as a poetics that repeats in architecture a ratio found in nature by science. Thus, a letter writer wonders: "It is surprising how often it is unconsciously used… there must be something more fundamental in it than mere superstition."[5] Against this claim, the Golden Section is presented as mystical, irrational, un-modern.

Third, there has been a regulative argument in which proponents claim the Golden Section is useful, but only because of its consistency. Architects, so this line of argument goes, require rules of proportion although any system would provide the same benefits: "A simple proportion, repeated through a building will, generally speaking, help to give a harmonious effect. But it is surely wrong to suppose that one ratio is more beautiful than another."[6] Here the Golden Section operates in the problematic relationship between the subjective creation and perception. To this is opposed the claim that architecture is creative and free and cannot be fettered by rules of composition: "Great architecture is beautifully proportioned by the feeling of the artist."[7] The Golden Section is disparaged as an irrational mysticism that,

paradoxically, attempted to rationalize a law for that which must remain subjective and which escaped reason.

All these statements replay features of the basic opposition and any single letter could contain one or all three attributes, and even mix the oppositions. For example, one letter denies the scientific link between the artist's use of the Golden Section and its occurrences in Nature, while invoking its power on the subject: "[there is no] correspondence between architectural proportions and biological forms… but that does not detract from the emotional significance of such things."[8]

This pattern of argument in the letters to the *AA Journal* was replicated across the journals and institutions of British architecture in the late 1940s and 1950s. A 1948 article in the *Journal of the Royal Institute of British Architects* by Manning Robertson, "The Golden Section or Golden Cut: the Mystery of Proportion in Design," provoked vitriolic condemnations and defenses which raged across the "Letters" section for the next few months.[9] These exchanges even crossed from one journal to the next. For example, Leonard Roberts published a response to Robertson in *Architectural Design*. This exchange prompted the head of the Royal Institute of British Architects' Board of Science to attempt to prove the Golden Section's objective truth while others dismissed Robertson's belief in the Golden Section as itself childish and irrational.[10] The editors noted that "few subjects arouse more ferocious arguments among architects."[11]

Similar patterns again re-appeared in a public debate held in September 1957 at the Royal Institute of British Architects. Maxwell Fry pleaded for the need for the Golden Section as moderating a dialectic of human nature between the rational and a "much more primitive side of feeling and emotion."[12] Tatton Brown criticized an earlier proposition by Misha Black that such systems curtail artistic genius, arguing instead for a more "biological approach to architecture."[13] Peter Smithson's presentation during the debate neatly summarized all of the possible oppositions, perhaps purposely obscuring his ambiguity on the issue. So the debate flowed across journals, symposia, books and classrooms.

Such debates support Wittkower's observation that proportion was "on the minds" of a broad cross-section of architects.[14] What is more interesting is how these arguments replayed the tension Wittkower portrayed in his book between Renaissance proportion linked to cosmological order and the late eighteenth-century eclipse of proportion by aesthetics and taste. In his accounting, recent scientists, architects and theorists offered the Golden Section as a means to link architecture to natural order while others resisted this attempt by referring to Romantic notions of creative genius unfettered by rules or by arguing that the Golden Section was bad science corrupted by superstition.[15] Wittkower himself moved across these poles. At the end of *Architectural Principles* and in lectures throughout the 1950s, he argued that

proportion was a matter of aesthetics and thereby belonged to the domain of the subject but at the same moment, as a symbolic form, such proportions allowed this subject access to natural order.

Because proponents detect the Golden Section within natural forms and human artifacts, architects and scientists have invoked each other when making their arguments, describing the Golden Section and its related figures as an order that spans nature and culture. The influential D'Arcy Thompson, the more obscure Thomas Cook and the altogether more fanciful Matila Ghyka argued that such geometries were a mathematical substructure of nature. Ghyka was a mathematician and mystic whom Le Corbusier claimed as an important conspirator in the effort to make the Modulor a universal measure. As Ghyka wrote in his 1946 book—the same year as the exchange in the *AA Journal*—the Golden Section was at once eternal and ancient, a mathematical rule embodied in the forms of life and art, from botanical morphology to depictions of the human face.[16] Ghyka and other proponents suggested that as the Golden Section is an object of mathematical and scientific inquiry, it lay beyond the cultural vicissitudes of taste and historical change. Yet at the same time, the Golden Section was to have been a universal attribute of culture, found in all art and architecture from various "civilizations" across all times.[17] Le Corbusier repeated this tension once again in his Modulor narratives; it is entirely unclear in his books if the authority sought for the Modulor derived its correspondence from embodied experience or from its apparent ubiquity as a natural law or from both. Le Corbusier measured works of art and architecture from the past to find in them a trace of the Modulor; he also measured technological products and natural forms; he claimed the Modulor corresponded to an average height and ideal body proportions, and with the way we see. These writers searched for its presence in seashells, pine cones, paintings and buildings as evidence of its universality across Nature and Culture. The Golden Section was a truth whispered to our nihilistic modernity from the ruins of past civilizations and carried on the winds and tides.

More recently, it has reappeared as a featured character within Cecil Balmond's book, *Number 9*, a sort of *Da Vinci Code* for designers. In the book, the Golden Section again appears as some quasi-mystical secret code embedded in natural forms and growth and which also seems an ideal proportion within art.[18] Here, possibly the world's most influential engineer for seemingly non-humanist architects ranging from Daniel Libeskind to Rem Koolhaas, represents the same tale of the Golden Section as at once transcendent and immanent, as autonomous and as a mark of the interdependence between Nature and Art.

Therefore, the letters in the journals of the late 1940s exhibit a pattern that has occurred roughly for the past hundred years: advocates of the Golden Section claim that it can be proved by scientific method while its

opponents emphasize its mysticism and idealism. Some see in it the possibility to find standards of judgment while others dismiss this attempt to find subjective rules. The Golden Section is considered an antique mathematical figure or an enduring sign of natural order. For some it seems an anachronistic residue from past and often exotic cultures; for others, because it derives from mathematics and geometry, it is understood as timeless. Some claim the Golden Section as a natural law, others as a universal but subjective principle, while for others it is metaphysical nonsense.

In this chapter, I examine the problem of the Golden Section in modernity, interweaving the history of architecture with that of psychology, aesthetics, statistics and biology. This analysis will foreground the status of the Golden Section amidst the rise of normative statistical-probabilistic frameworks—the same frameworks that provided armatures for the social sciences and modern aesthetics. The Golden Section is a measure that was to give stability but which served itself as mediator around which a set of complex problems has repeatedly refracted, focused and then diffused.

PREHISTORY OF THE GOLDEN SECTION

Tracing the history of the Golden Section from its origin in Euclid's *Elements*, through the intense interest in it in the thirteenth century and later by Alberti, Paccioli and Kepler is well beyond the scope of the present work.[19] Fortunately, this is not required since the role it plays as a mediator between Nature and Culture is neither ancient nor timeless. Thus, rather than trace its origin, I will suggest why the traditional histories that see it as a continuous line of development are mistaken.[20]

According to the modern formalization first provided by Adolf Zeising in 1854, the Golden Section derives from the division of a line into two unequal parts in a way that the proportion of the larger segment to the original line is equal to that of the smaller to the larger segment.[21] The ratio between the two lines is approximately 1.6180339887. The Golden Rectangle is simply constructed using these two segments. This process can be repeated *ad infinitum* in either direction, larger or smaller, always yielding the same ratio.

Accounts of the Golden Section often conflate it with the Fibonacci Series, a sequence of numbers that Le Corbusier and many others have invoked in the course of debates about proportion and the human body in modernity. In fact, Le Corbusier premised the Modulor upon this confusion. Vaguely employed by Pythagorean and other Greek mathematicians, the Fibonacci series was formalized by Leonardo de Pisa, aka Fibonacci, in his *Liber abbaci* as a sequence of numbers around 1200 AD. Pisa presented the series as a model for the hypothetical growth of populations, in his case, of rabbits. For mathematicians of the Middle Ages, this irrational Golden Number had almost magical properties. At the turn of the sixteenth century,

Luca Pacioli reworked this series in his book, *De divina proportione* and this title has been repeated ever since, suggesting how it appeared to be transcendental. It also made appearances in Kepler's astronomy and in Piero della Francesco's treatises on painting.

The reason the Golden Section's history is confused with this series is because the ratio between any two successive Fibonacci numbers approaches the ratio between the two segments of a Golden Section Rectangle.[22] However, it is a mistake to equate the Fibonacci series with the Golden Number and both with what the nineteenth century comes to call the "Golden Section," for three reasons. First, the limit of the Fibonacci number series is not mathematically identical to the Golden Section. For example, spirals drawn by each do not align exactly. While Le Corbusier thought of this gap as a magical and elusive mystery, and however attractive it might be in our *Da Vinci Code*-obsessed culture to find that both are *approximately* the same and seem to have a relation, there are no grounds to assume a natural—or supernatural—conspiracy of number.

Second, there is little evidence that the Greeks, Fibonacci or his successors thought the Golden Ratio a sign of a mathematical natural order in the way we would mean it. Pacioli, for one, made no *causal* link between the function of the Golden Number in mathematics and aesthetics or natural forms.[23] Fibonacci's model for population growth of rabbits was a thought exercise and in no way did he ascribe to his series of numbers an autonomous and causal rule. Kepler wrote of the divine proportion as just that, "The divine proportion served as idea to the Creator when He introduced the creation of likeness, which also continues indefinitely."[24] Kepler's presentation of the "divine proportion" repeats the Neo-Platonic cosmology in which *proportio* is just one of many signatures of the Divine. Things like the Golden Ratio were understood as signatures of a divine order that operated in an infinite chain of resemblance or similitude (*A* was a signature of *B*, *B* a signature of *C*, and so on). For Kepler, "in terms borrowed from Nicholas of Cusa… the universe is *complicatio* to which geometry offers the *explicatio*."[25] In fact, Kepler remarked on how he sees this "likeness" of the Fibonacci series and Golden number in "the image of man and woman," in "all blossoms that lead the way for a fruit" and that "the propagation of plants and the progenitive act of animals are in the same ratio."[26] In Kepler's description, the "divine proportion" is a signature of Neo-Platonic *resemblances* in which the infinite repetition of this proportion replicates the infinite string of signatures of the Divine. Here we see exactly how within Renaissance Neo-Platonism, the so-called Golden Ratio did not possess explanatory power as a natural law, but operated as a signature which makes the buried resemblances of things apparent, a "visible figure that will draw [these resemblances] out from its profound invisibility."[27]

Third, the term Golden Section was coined only in the nineteenth century and emerged as a constant of nature within the same re-organization of knowledge that also saw the rise of aesthetics and our concepts of measure and normativity.[28] Therefore, the Golden Section cannot have been obscured by the rise of modern aesthetics and rationalism and thus could not have been rediscovered by Le Corbusier. In fact, the Golden Section emerged as a problem of measure between the nineteenth-century rise of statistical-probabilistic frameworks of explanation, German aesthetical theory, and the emergence of experimental psychology.

THE GOLDEN SECTION AS A NATURAL CONSTANT

The earliest uses of the term "Golden Section," or "Golden Cut," in the modern sense emerged sometime between the late-eighteenth century and the 1835 edition of Martin Ohm's *Die reine Elementar-Mathematik*.[29] However, it was not until 1854 and Adolf Zeising's formalization in his *New Theory of the Proportions of the Human Body* that the Golden Section was applied to human form in terms of natural law or "ground-principle of all formation… in the realizing of both nature and art."[30] Zeising's cross-disciplinary activities were representative of the development of natural constants and norms in the nineteenth century. Before he turned to aesthetics, he had researched botany (where he first developed the idea of the Golden Section) and mathematics. In parallel with these scientific pursuits, he published novels, plays and treatises on natural philosophy. His application of the Golden Section to forms was not limited to plants or humans; he attempted to detect its presence in crystals, light diffraction patterns, the impulses of nervous systems and the morphology of fossils. For him, a natural law like the Golden Section did not underlie nature nor speak to some cosmic similitude but "permeates… all structures, forms and proportions whether cosmic or individual, organic or inorganic, acoustic or optical."[31] Two presumptions are necessary for such a statement. First, it is premised on the separation of his series of paired terms into distinct domains of Nature and Culture, or objective and subjective. Second, there is the possibility and desire to find across these domains rules of ordering. Rather than transcendental, the Golden Section, as Zeising saw it, was a rule inherent to, and a product of, *life*. Nature, in his Kantian view, strives towards a purposeful end, out of which the Golden Section manifests; it emerged from processes that informed the production of cultural artifacts because it also governed human nature. Zeising's work deployed the Golden Section as a normative measure for the human figure for the first time in the sense of a natural constant.

To understand the conditions for this emergence one must understand that only in the nineteenth century did the idea of a "natural constant" and measurement become autonomous means of explaining phenomena.[32] Such laws and principles (in their modern form) were unheard of prior to

1820. Previously, as Ian Hacking has argued, numerical regularities were not meaningful since there was no scientific concept of a physical constant or constant of nature.[33] Apparent regularities—and one could include the Fibonacci series or the Golden Number—might be useful, but were not explanatory or autonomous. This is how, for example, Dürer employed the proportional systems—as an aid for drawing. For example, while the idea that light traveled with constant velocity had been posited since the late eighteenth century, only in the late nineteenth century did the Michelson–Morley experiments attempt to determine the speed of light by empirical measure and it was not until Einstein's Special Theory of Relativity that this velocity attained the status of a broader natural constant that could not be exceeded and had implications for other phenomena of scientific inquiry.[34] The speed of light was a late entry in the rapid explosion of natural constants that had precipitated out of an "avalanche of numbers."[35]

By the end of the nineteenth century, science had not only discovered hundreds of such numerical constants; these new objects reshaped the nature of scientific practice, giving measure an unprecedented epistemological status. In 1831, the nascent British Association for the Advancement of Science published a book that employed the term "natural constant" for the first time in reference to empirically derived laws of nature.[36] By 1833, Charles Babbage was calling for a grand project entitled, "The Constants of Nature and of Art," a collaborative program of research to unearth numerical constants. Babbage wanted a cross-disciplinary approach to this endeavor, one that he considered "eminently necessary" and "of the greatest advantage to all classes of the scientific world."[37] Babbage has retrospectively been made into the father of the computer for his creation of the Difference Engine, a mechanical device designed to literally churn through calculations required for the exponential increase in quantitative data used by science and society in general. Handbooks for engineers and scientists filled with tables of such numbers proliferated soon thereafter. Ian Hacking has argued that the need to make so many calculations and to have tables of natural constants was only partly due to the rapidly expanding use of statistics and probability. These events also mark the emergence of natural constants as objects of knowledge. The emergence of the term and the specific understanding of the "Golden Section" signal its new status as just such a "natural constant."

The proliferation of "natural constants" is part of a broader development: the advent of normative frameworks as a means of understanding and even administering society and knowledge in the 1900s. Although the term "norm" appeared in Western culture as late as the mid-eighteenth century, its accompanying statistical and probabilistic frameworks have become so ubiquitous that they seem natural ways of organizing the world. The rise of norms took many forms, almost all of which were concerned with the administration and control of the recently developed concept of "populations."

Durkheim's famous work on suicide is the classic example. He argued that rather than fix an ideal suicide rate (presumably zero), one should measure statistical deviation from an average rate. These deviations, high or low, suggested a society out of equilibrium. Here the optimal state coincided with an average rather than an extreme (like zero). In fact, norms were a crucial tool in developing those categories of subjectivity studied by sociology and similar human sciences. For example, a metric system was proposed by the end of the eighteenth century (in France), but national committees for the administration of these standard measurements were established only around the turn of the twentieth century (e.g., the US Bureau of Standards was established in 1901). The development of such institutions was due partly to increased industrialization, in which the exchange not only between currencies but also within a single currency was an increasingly pressing concern. Yet, this was also part of the need to administer the rapid urbanization of Europe, as well as the vast military campaigns of Napoleon and other nationalist and colonial expansions.[38] By the end of the century, newly formed census bureaus tabulated vast quantities of numbers to regulate taxation and expenditure in the empire.[39] At the same time, statistics emerged as a discipline and probability turned into a tool of knowledge.

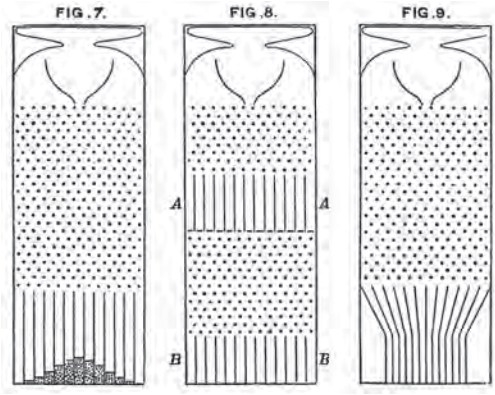
The statistical "norm," the sociological category of the "normal," and the biological processes of normativity, are often confused in casual use because they seem transparently accessible and are obscured by the reflexive normalization of this statistical way of organizing subjects and objects in the world.[40] The fulcrum on a scale indicating health and disease, the expected and the deviant, revolution and equilibrium, the norm operates across cultural and natural domains. Thus, though we have become accustomed to thinking of the normal as the correct, if unexceptional, it practically and conceptually replaced the role of the ideal.[41] In both colloquial parlance and scientific discourse, scales of "normal behavior" and "deviancy" displaced ontologies of human nature.[42]

Numeration and measurement were instruments of normalization and standardization required by new technologies, the exchange economies of industrialization, and the bureaucracies and institutions required by the unprecedented size and complexity of the populations in the nineteenth-century metropolis and maintenance of the nation-state and its armies. In so far as natural constants rely on statistical mathematics, these kinds of mathematics are notable for their use of measurement to explain what otherwise would seem disparate and incommensurable information and qualities. Thomas Kuhn and Ian Hacking have argued that measurement itself gained a new status during the nineteenth century, when the empirical edict that to know of and about something it must be measurable became a common feature of scientific discourse for the first time.[43] This should not be understood as a form of rationalization, abstraction, or quantification of

the world. Rather, measure is an analogy, bringing otherwise incommensurable things and phenomena into relation via an identity. Measurement in no way requires a number since it is merely the comparison of one variable term with another fixed one and is in this sense metaphorical. Numbers are highly useful for such comparisons but there are many measures which are not numerical. For a measure to be more than instrumental and to take on explanatory power as it did in the late 1800s, there must exist the idea that what is measurable is distinct but can be made exchangeable by the application of a third thing.[44] Zeising's work is, in fact, an example of how measurement could only attain its status as an explanation and revelation of natural laws and constants when Nature and Culture were defined as distinct domains and it becomes important for science and mathematics to be able to make claims that traverse these domains. It also means there must be some threshold across which exchange and measurement becomes a problem.

For example, Francis Galton was the first to convincingly argue that statistical regularities were autonomous and natural laws. To do so, he supplemented usual scientific method with dramatic demonstrations, the most famous of which was the Quincunx machine. Resembling a Victorian version of a Pachinko game, the Quincunx was a vertical board with a reservoir of ball bearings, which would bounce through a grid of regularly spaced pins before coming to rest within one of several channels. While the movement of each individual ball through the field of pins was stochastic and therefore its final resting place was unpredictable, the sum of many drops always produced a regular distribution of balls within the channels. Half of the balls would fall within the central channels, while the rest would fall on either side. Known as the bell curve because of its parabolic shape, this Gaussian distribution was dubbed the normal curve. Of course, this is the same figure that Galton found within any large population, whether of ball bearings or of people. The genius of the Quincunx as a demonstration was its use of basic and accepted Newtonian physics of gravity and collision as an analogy for social systems and distributions. Galton continued to produce machines that combined the physical with the social, and the aesthetic as one way to prove for the first time that statistical regularities should be considered "natural laws" that have the same status as laws of motion or thermodynamics.

Galton's work marks the moment when measure had become not simply a tool but an epistemological and ontological threshold across which the existence of things and concepts (for example, populations, the average, the norm) had become premised. Indeed, in the nineteenth century, measurement even became a form of intellectual entertainment, wherein members of the Royal Society would measure things for measurement's sake as a pastime in the same way one might enjoy cryptography in the form of Jumbles and crossword puzzles. Yet, at the same moment, the subject was also an object of measure, plunged into the field of natural phenomena and natural constants.



8.2 Francis Galton, Quincunx Diagram, 1889

Exactly because it had gained new power independent of the direct empirical observations of the observer, "the process of measuring is recognized more and more clearly as a *problem*, and a logical and epistemological one."[45] In other words, the commensurability of objects to subjects became an issue because knowledge became conditioned upon a subject that was at once the measurer and object of measure. For Kuhn, this constituted a second scientific revolution not about the mathematization of nature but about the possibility of comparing the subjective phenomena with natural ones. Zeising's characterization of the Golden Section as a "ground principle" that "permeates" every natural and cultural phenomena depended upon this new status of measure granted by the rise of natural constants and the normative framework of explanation.

A MEASURE OF EMPATHY

The Golden Section was then developed in the production of late nineteenth-century German aesthetic theory, psychology, and the foundations of architectural and art history. In 1873, Robert Vischer developed the central tenet of *Einfühlung*, or empathy, theory, a term he had coined in his doctorate on "emotional projection." As he put it, "I project my own life into the lifeless form… I am *mysteriously* transplanted and *magically* transformed into the Other" (my emphasis).[46] If this commensurability between the body and the object of projection were missing, the projection would be at best incomplete, or worse, traumatic. Therefore, Vischer required something that could translate between the "object and the subject in question."[47] Vischer understood the Golden Section to be a measure that could guarantee this commensurability, arguing that it was a "law of proportion" determined by "nothing other than the subjective laws of the normal human body."[48] This striking idea of a *subjective law* highlights the incommensurability between Vischer's Golden Section and older ideas of the "divine proportion" such as

found in Kepler. A Germanic cousin of Galton's statistical law, this *subjective law* indicates that aesthetic qualities (such as beauty) are *a priori* conditions of the subject and his judgment rather than innate qualities of an object. Referring to Zeising's work, Vischer suggested that the Golden Section was useful, if rudimentary, because it referred to the "physiognomic" forms of the body—a normal body, not an ideal one—which Zeising suggested provided the subject's schema, an "organic norm in viewing the world,"[49] according to which all judgments were made. If one used the Golden Section to compose space and form, one would transfer the bodily schema provided to the subject by his embodiment into the world. In turn, the perception of space and form was judged via the reciprocal return of empathic projection back onto the bodily schema:

> *In rooms with low ceilings our whole body feels the sensation of weight and pressure. Walls that have become crooked with age offend our basic sense of physical stability. The perception of exterior limits to a form can combine in some obscure way with my sensation of my own physical boundaries, which I feel on, or rather with my own skin.*[50]

While the subject may not be conscious of the relation between his body and a space, this correspondence was the condition for the formation of empathic introjection since it placed the object under the order of the subject. That is to say, the Golden Section offered a normative measure for empathic projection, through which the world of objects could be aligned with the subject, ensuring a commensurability between the subject's perception and the composition of objects, a precondition of the possibility of aesthetic judgment.

For Vischer, it was not necessary that the subject consciously perceive the proportions. The distortions of perspective are of little concern because the Golden Section was to have guaranteed not cognition but the commensurability between the subject's embodied sensation and the world.[51] Thus, for Vischer, the Golden Section was not an ideal order, but offered a Kantian schema that mediates between the world of matter and the forms for the subject. The Golden Section did not exist in Nature, but rather made the order of the world cognizable as such for the subject.

For Vischer, the mechanism and explanation for the Golden Section and its subjective projections remained "magical" much in the way the appearance of the bell curve in Galton's quincunx machine must have appeared to the untrained observer. While Vischer intuited the possibility of a subjective law, the nature of such a law remained in the "mysterious" realm of the psyche.

In 1876, Gustav Fechner sought to lift this veil. Like Zeising, Fechner's career moved across disciplines. After his 1822 doctorate in medicine and subsequent research in physics in the 1830s and 1840s, he founded the rather idiosyncratic field of psychophysics. Between 1865 and 1876, these interests informed his shift to research in aesthetics, work that would play an important role both in the discourses of psychology of art and German formalist

aesthetics. Fechner's work played an important role in the formation of the human sciences in the nineteenth century and for the constitution of the subject of these discourses. He was particularly important for the development of the psychology of art and visual theory as well as one of the founders of experimental psychology since his work seemed to demonstrate the possibility of measuring subjective response, something Kant himself had claimed was inherently impossible given that the subject was the measurer and that which was to be measured. For Kant, as for Vischer, such things needed to remain in the unfathomable, or "magical," realm of the transcendental *a priori*, of the genius, and of beauty.

Fechner was almost apologetic about this inability to measure sensation directly. Indeed, the impossibility of opening up the subjective domain to direct measurement, he implied, was the central challenge to developing a psychology of art as a science of aesthetics and sensation. However, Fechner did have at his disposal the new mathematics of statistics. Instead of measuring subjective response directly, he employed large numbers of test subjects who would state their reaction to various stimuli. By detecting general trends and repeated correlations, he argued he could prove the existence of causal laws. This required overturning existing approaches to aesthetics. In the opening pages of *Vorschule der Aesthetik*, he attacked virtually every explanation of aesthetics for depending upon abstract theoretical frameworks. Instead of moving from universals to specific instances (*von Oben*, or above, as he put it), Fechner proposed a theory derived from empirical evidence.[52] This approach of deriving principles from *von Unten* (below) was not simply inductive but carried with it the same commitment as Galton's idea that statistical regularities that can be measured are real and explanatory forces in themselves. In a series of groundbreaking studies, Fechner developed experimental techniques with which to test subjective preference and response to aesthetic qualities, such as color, weight, and so on. In this work, he sought to develop techniques for the measurement of subjective sensation and its rules. He did not feel the need to make his arguments through the analogies to the body as had Vischer, but instead employed statistical measure to find causal links between the subject's perception and response to objects. Indeed, the "body" becomes only another site of exchange within this statistical *topos*, not a model in itself. He argued that his statistical work made the subject as measurable and demonstrable as the telescope had for planetary motion. Fechner's treatment of statistics was as an *instrument* through which to peer into the miasma of the subject and clarify this hazy domain.

His 1872 *Elemente der Pyschophysik* systematized his general methods for employing statistical mathematics to derive correlations between stimulus of input and a subject's response. He was so successful in formalizing observations that he developed what came to be called Fechner's Law, which

states that the "magnitude of the sensation" is logarithmically proportional to the magnitude of the external stimulus.[53] This correlation was not simply useful but understood as an autonomous and general law. As Fechner put it:

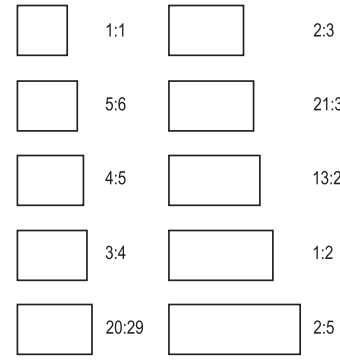
> *In the measurement formula one has a general dependent relation between the size of the fundamental stimulus and the size of corresponding sensation and not one which is valid only for the cases of equal sensations. This permits the amount of sensation to be calculated from the relative amounts of the fundamental stimulus and thus we have a measurement of sensation.*[54]

Fechner's experiments were some of the first successes in formulating a natural law, or constant ratio, that governs the human subject.[55]

Four years after his definitive formulation of the sensation–response law, Fechner employed the same concepts and techniques to explain the Golden Section.[56] His work on the Golden Section was an important step in the development of an autonomous theory of statistics and experimental psychology.[57] The central feature of Fechner's work on the Golden Section was his use of experimental methods (that would become standard in experimental psychology) to measure subjective preference for different proportions. He had three different experiments. First, he showed non-expert test subjects rectangles of various proportions. Second, he asked the 228 men and 119 women to measure various abstract shapes and everyday objects and state which they preferred. Third, he asked that they complete partially drawn figures in the way that they most preferred. In the first case, the rectangles that approached the Golden Section were chosen by the large majority; in the second, respondents seemed to prefer objects approximating this proportion; in the third test, subjects tended to complete rectangles proportioned according to the Golden Section.

For Fechner the results corresponded to his previous law, suggesting that the Golden Section was not some transcendental ideal, but like Durkheim's suicides, an average based on equilibrium of stimuli. He argued that, "People tolerate most often and for the longest time a certain medium degree of arousal, which makes them feel neither over-stimulated nor dissatisfied."[58] Fechner called this "tendency towards stability" the "principle of the aesthetic middle" to which a subject would naturally gravitate; Claude Bernard would define this as physiological homeostasis, Francis Galton as a sociological law of averages.[59] Indeed, in describing the distribution of preferences for the Golden Section, Fechner employed the Gaussian curve of distribution that, as we saw with Galton, was the prime example of the autonomy of statistical law. In Fechner's experiments, the Golden Section occupied the center of the curve as the *median* of subjective preference; he concluded that the Golden Section was preferable not because it spoke to divine order nor a universal *mathesis*, nor even because it was the most pleasurable or beautiful. Instead, he argued it caused the least excitation of the

senses for good or bad. A square was too static, an elongated rectangle too off balance; the Golden Section, often called the Golden Mean in the nineteenth century, was selected because it maintained the normative equilibrium of the subject's sensation. The Golden Mean was just that; not ideal, but average.



8.3 Rectangles used in Fechner's test of the Golden Section

Others duplicated and developed his experiments throughout the following decades.[60] As we saw in the letters to the *AA Journal* that began this chapter, one correspondent described an apparatus he had made to replicate Fechner's experiment, in which he would draw geometrical shapes upon a cathode ray tube. Even Freud, who did not often invoke experimental evidence in his formulations of psychoanalysis made special mention of Fechner's Law.[61]

Both proponents and detractors of the Golden Section often view this "statistical approach to the Golden Section"[62] as misguided. Some commentators have criticized Fechner's method, suggesting that because the Golden Section was roughly the mean in the range of rectangles used, the subject naturally gravitated towards this average and thus all he proved was a preference for an average.[63] However, such an argument misses the point. For Vischer and Fechner, the gravitation towards the average was exactly the grounds upon which the Golden Section was significant. Whatever proportions one included, the Golden Section rectangle would be in the middle of any evenly distributed range. In a different way, Rudolf Arnheim argued that Fechner's experiments could not adequately explain the phenomena since it reduced subjective and aesthetic experience to quantified measures.[64] Again, this misses how discourses on proportion in modernity were integral to the development of techniques to describe the modern subject given to the human sciences. In any case, quantification was only a technique for understanding the ordering of the subject's sensoria and formulation of subjective laws.

In fact, Fechner's experiments did not so much attempt to quantify perception as his work participated in the broader emergence of an entirely new object of knowledge. I have already argued that measurement had a new importance in science in the nineteenth century. If so, it was not limited simply to the "Baconian sciences." Entirely new disciplines, such as statistics, psychology and sociology, emerged directly because of the new role of measurement.[65] As we saw in the last chapter, the post-Kantian subject is a complex manifold, at once the authorizing subject of techniques of description and control and the object of their subjugation. These sciences are

inseparable from the establishment of the subject of those sciences. These two vectors intertwine continuously in the history of modernity because they effectively constitute the conditions of the field. Within the space of modern knowledge, as Jonathon Crary has argued, Fechner's work marked the emergence of a new type of subject (the "observer") that was at once the target of increasing regulation and standardization and a sovereign authority.[66] Crary also noted that Simmel's ground-breaking work on money flowed directly from Fechner's work on sensory experience. As with the spread of commerce and standardization of currency, statistical measure was a conduit by which previously incompatible objects and categories could enter into reciprocal exchanges and be directly compared. The expansion of capital depended upon the ability to bring incommensurable domains into a seamless exchange via measure, be that currencies of the realm or the realm of the subject. The significance of Fechner's work lay not in its abstraction of the subject nor in its rationalization but in its "delirious merging of the interiority of a perceiver into a single charged field" such that the domains of the subject and the object could be described in the same terms.[67] As part of the emerging human science of physiological aesthetics, Fechner's experiment with the Golden Section belongs within this topography of knowledge about the subject. If Kant's *Critique* was (for Cassirer) a second Copernican revolution in which the subject became the locus of knowledge rather than the world or God, Fechner operated as Galileo's equivalent in providing the experimental and empirical evidence.[68]

THE GOLDEN SECTION AS A MODERN QUASI-OBJECT

The Golden Section needs to be specified within the larger fields in which it operated. I have not made claims about its truth or usefulness; nor… have I made relativist claims that natural laws are purely cultural constructs. What I have argued is that objects of scientific, mathematical or aesthetic discourse are not given in the world, simply awaiting discovery by the light of reason; rather, they are made available through specific organizations of concepts and practices and institutions that inform their specificity as problems. Such problems and objects reconfigure according to changes in this field of knowledge and thus their point of origin cannot determine their condition at a given moment in history. Even if they retain the same name, it can signify a different problem.

Once one situates the Golden Section within these historical conditions of possibility—the rise of statistical frameworks of explanation and the psychological and social sciences—the common assumption that it refers to an ideal and ancient mythology reveals itself as an effect of the success of modern explanatory frameworks. By the late nineteenth century, the Golden Section had been transformed from a convenient ratio for the measure of the body to a statistical law that supposedly revealed the subjective ordering

of forms and bodies in the world. For Vischer, the Golden Section delineated the empathic space through which the subject projected his bodily schema and found its reflection in the world. For Fechner, the Golden Section was a mediator between the cognitive interior order of the subject and the external world of raw stimuli.

This should cause us to reassess its historical uses. Only in the late nineteenth century was the modern understanding of the Golden Section projected onto Renaissance and classical architecture.[69] This probably first occurred in 1883 with August Thiersch's *Handbuch der Architektur*, and was repeated in Jakob Burkhart's and Wölfflin's studies of the Renaissance.[70] Moreover, comparing Kepler's understanding of the divine proportion with Fechner's research on the Golden Section reveals that the Renaissance could not have understood the Golden Number as a "natural law" since it could have no such concept. Indeed, the idea that the Golden Section was a "principle" of Renaissance architecture only becomes possible after its invention as a natural constant and subjective law since "principles" as such refer to modern ideas of subjective but universal rules, modern statistical and empirical science of the subject and post-Kantian ethics. Late nineteenth-century observers might find this ratio in historical forms, but in the process construct a different object of historical representation than that which existed for the fifteenth-century Florentine. To assume otherwise is to impose our world-view onto the past and to ignore the historicity of knowledge. Although such an anachronistic projection is typical of both proponents and detractors of the Golden Section, it can only obscure its operations within the twentieth century.

Nor can we say that the rise of aesthetics replaced the belief in universal proportioning systems. The supposed turn away from such canons in the eighteenth century cannot be adequately understood simply as the rise of aesthetics and subjectivism, as Wittkower and after him, Rykwert and Eisenman, have argued. Nor were proportioning systems of the body displaced by rationalization as Pérez-Gómez claimed. Nor could the Modulor—however much Le Corbusier and his apologists might have wished—have healed some cosmic link between architecture and the body sundered by the rise of modernity. Instead, the rise of aesthetics and the development of empirical measures were irreducibly linked to the reorganization of knowledge that began in the late eighteenth century and that provided the space for the rise of the modern subject and its sciences.

Moreover, we can now see that in the roughly 100 years from the Golden Section's modern formulation to its contentious role in mid-twentieth-century architecture there is a consistent pattern of argument around ideas of the natural and objective at one pole, and culture and the subjective, at the other. It was discussed, rejected or championed according to a very modern relationship between the subjective sensation and the objective world of measure and the possibility of natural and subjective laws.

This corresponds to a modernity that Bruno Latour has argued operates according to a constitutive opposition of nature and culture. "Nature" appears objective, transcendent and exceeds human capacity. "Culture," meanwhile, is seen as constructed and immanent. Latour locates the birth of this polarity with Kant, and its dichotomy creates a set of paradoxes. While facts about Nature are available only through the cultural practices of science, these cultural practices appear as transcendent and independent (i.e., Natural). Moreover, the idea of Nature itself came to be seen as produced by social activities via modern anthropology and other social sciences, while Culture appears as a universal phenomenon (natural) of human populations. Against these paradoxes, Latour argued, modern thought has established three "guarantees:" first, that Nature appears as if we did not construct it as a category even if we did; second, Society (or the Subject) is as if it was constructed even if it appears not to have been; third, and most importantly, these two domains must remain distinct and their boundaries strictly regulated.[71] Nevertheless, exactly by creating these articles to guarantee the purity of Nature and Culture—that is, by making these domains so distinct—the Modern "constitution" of thought has allowed the proliferation of hybrids that freely traverse both domains. Indeed, while non-modern cultures have no conceptual difficulty with such mixtures of natural and cultural domains (e.g., astrology, witchcraft), the lack of distinction between the two limit their power to transform its society or its knowledge. Moderns, on the other hand, allow a new class of "quasi-objects" and "quasi-subjects" to arise at the same moment they created the human "subject."[72] The modern world of science, social science and the humanities are filled with such hybrids since they are conditions of knowledge of objects: such hybrids range from eighteenth-century vacuum pumps to mid-twentieth-century cybernetic man–machine assemblages, to recent arguments about global warming.

In the debate in the *AA Journal* and in today's discourses of form, those who claim that the Golden Section is folly because it attempts to objectify what is essentially subjective, those who claim it is a mystical miasma and those who see in it a higher, or underlying, order of nature, all circulate across this same dipole. It was never an accepted fact but was debated through a stable pattern of opposition between a Nature that is not constructed but contingent and a Culture that is constructed but transcendent. Those who favor and oppose the Golden Section policed the purity of these realms. The Golden Section is a controversial and paradoxical object that freely traverses these realms and which can operate at any point between them, performing as hybrid, a mediator, or a quasi-object: an irreducible mixture of the poles across which span the modern space of knowledge.

Architects continue to turn to Nature (and its objects) as a privileged source in their attempts to develop a theory of form for a modern subject (within Culture). Examine recent arguments about genetic algorithms,

morphogenesis, and emergence and one discovers the same pattern that operated in the debates of the Golden Section. Our mathematical figures have changed from the Golden Section to other, more "contemporary" referents. New actors play our favored mathematicians, scientists and engineers. Yet, the conditions of discourse and economy of discursive objects between these two poles remain relatively intact. Now as then, natural processes and phenomena or artificial natures simulated in the computer are used as the basis for architectural order. These quasi-natural processes serve as visual, formal and structural proportioning systems, though now topological rather than geometric, differential rather than static. Nevertheless, they provide a measurable ordering of architecture that must be legible on the surface of the architecture as an affect. That is, it is not that these architectures are based on the natural phenomena, but that "emergence" or "complexity" must be manifested as an ordering principle for the subject of these architectures in the same way that the Golden Section was to have produced the effect of equilibrium for the subject of its rule. This allows architecture to mediate the poles of modernity and open new terrains, typologies, or non-typologies, and hybrid blurrings.

Finally, this account of the Golden Section allows for a reassessment of how and why the Modulor and the general discourse about proportion appeared in the middle of the twentieth century. The letters to the *AA Journal* stopped just before Wittkower himself presented a lecture at the Architectural Association on the Modulor on 18 December 1947 (as part of that institution's centenary celebrations). His lecture marked the moment when the discourse shifted from murmurs in journals to statements by many of the most famous architects and writers of the day. The letters also evidence that Le Corbusier and Wittkower did not create a discourse from the top of the field down so much as operated within an already existing field of possibility. At the same time, this interest was not simply the result of proportion being "in the air" nor a crisis of faith in modernism as Reyner Banham once suggested, nor even the effect of some disembodied *Zeitgeist*.[73]

Instead, the discourses about the human figure and proportion continued a consistent formation that arose in the latter half of the nineteenth century that attempted to develop a theory of form for the modern subject. This problem still occupies architecture and operates through the modern constitutional guarantees Latour describes. The lack of a theory of form for the modern subject is not really something to be overcome because it is constitutive of the conditions of modern architectural knowledge. It is within this space of modern knowledge, its constitutive gap between the subject and the world, that hybrid mediators like the Golden Section and the Modulor proliferate.

9.
REFLECTIONS OF THE MODULOR

Homo sapiens, then, is neither a clearly defined species nor a substance, it is rather a machine or device for producing the recognition of the human… the anthropogenic machine is an optical one constructed of mirrors in which man, looking at himself sees his own image always already deformed.

—*Giorgio Agamben*, The Open

9.1 Photo taken to record the meeting of Le Corbusier and Albert Einstein at Princeton, 1946. Copyright, FLC/ADGAP, Paris, and DACS, London, 2006.

A photo from the archives documents a meeting between Le Corbusier and Albert Einstein. As recounted in *Le Modulor*, Le Corbusier had traveled to the New World, a place he previously had declared the "Land of the Timid" because of its refusal to subject its powerful modernism to ordering principles, a failure of which he thought the congested assortment of spires and historical styles in Manhattan was iconic. Now Le Corbusier had trekked to pastoral New Jersey seeking Einstein's endorsement of the Modulor. He had visited captains of industry, kings of commerce and leading academics, peddling his new measure and proselytizing its benefits. Here was a new rule, he proclaimed, derived from the correlation of the human figure with the Golden Section, that should replace the metric and imperial measures not only for the aesthetic composition of buildings or cities, but also for the fabrication of all of their components, tools and the rest of industrial production. If Le Corbusier's offer to completely re-plan the city from the top-down had been ignored before World War II, now in the dawn of a new age, he offered a device that would imbue order from the bottom up and across every scale, from screws to buildings to regions.

The architect often called his Modulor a discovery rather than an invention, implying that it was more a natural law than an aesthetic innovation. He prefaced *Le Modulor* with stories from his youth that present him as a naïve but eager student of nature.[1] To evidence the Modulor order's universality in time and space, he reproduced numerous diagrams of buildings, decorative patterns, paintings and sculptures from across the globe and history, measuring them to demonstrate their adherence to the Modulor, or at least to the Golden Section or Fibonacci series. He also reproduced images of natural objects, again detecting traces of the Modulor within their forms. The undulating curves of Modulor were presented as a geometric genetic code for the rhythm of life and growth. If the Modulor was associated with the sciences of nature, artifacts allied to its geometries would be human creations made according to the patterns of Nature.

Yet, he knew he was neither a scientist nor mathematician and so compensated by filling his texts with testimonials from scientists and mathematicians. The Modulor books contained numerous pages of their author's and these consultants' equations, calculations and tables of numbers, often with little or no explanation. Wherever possible, they were reproduced as hand-written notes, treating mathematical calculations as if they were equivalent to his architectural sketches—the signatures of intention and, perhaps, genius.

Einstein's judgment took special place. In *Le Modulor*, Le Corbusier portrayed their meeting with melodramatic—and false—modesty. He lamented that he had "explained the Modulor badly" and "stupidly" interrupted the scientist as he began making his own calculations. The loss of these scribbles must have been acutely felt as they emanated from the same hand

that once had written the most famous equation in history ($E = mc^2$) and his handwritten notes would have carried a special aura Le Corbusier could have reproduced in *Modulor 2*. Le Corbusier would recall that "the friend who brought me [to Einstein] was in the depths of despair." Nevertheless, the architect suggested the Modulor's merits showed through its interlocutor's faults and impressed the scientist. Le Corbusier interpolated the rest of the scientist's day by offering a tale wherein the Modulor occupies the thoughts of the scientist after the meeting and who, after turning over its mysteries in his mind, wrote a letter that evening declaring the Modulor, "a scale of proportions which makes the bad difficult and the good easy."[2] Le Corbusier frequently recited this as Einstein's judgment. In turn, Le Corbusier approved of Einstein's sanction as:

> *extraordinarily clear sighted … [a] gesture of friendship made by a great scientist towards us who are not scientists but soldiers on the field of battle. The scientist tells us: "This weapon shoots straight … It makes your task more certain."*[3]

Whether Einstein actually made this statement—and that is a matter of debate—does not matter; it is Le Corbusier's invocation of the scientist as a friend to architecture that is revealing.[4] Who better to authorize his new measure as a rule of artistic and industrial production than the physicist who had illuminated the most culturally influential natural constant in modernity, c, the speed of light? After all, Siegfried Giedion's *Space, Time and Architecture* had already presented Einstein's theories of relativity as analogous to Le Corbusier's Purist paintings (as Jeanneret), claiming Le Corbusier and Einstein shared a single research program into the "simultaneity of space and time."[5] It is no wonder then that the debate held at the RIBA on proportion in 1963 (which we encountered previously) quoted Einstein's judgment as the title of its motion. The resulting vote did not decide on whether proportion made the bad difficult and the good easy so much as ratified Le Corbusier's and Einstein's positions on the axis of modern knowledge, the latter seated upon the throne of Nature and the former at the altar of Culture.

Nevertheless, it is too simple to say that the architect ceded authority to science or even appropriated the scientist to justify his capricious adventures in form. We can take the photo of Einstein and Le Corbusier's meeting as a diagram of the relation between architecture and science that plays itself out in the Modulor and in modernity in general. The two figures are posed like mirror images of each other, with a line of symmetry bisecting the image as if an invisible mirror lay between the two figures. Like the motif of Narcissus in painting, where a figure peers at his reflection in a wavy pool, one figure gazes not at another, to whom he seeks approval, but upon a distorted reflection. The pressed and crisp body of the architect is reflected in the wrinkled and wavy reflection of the scientist. The architect is poised

at the left edge of the composition in such a way that he controls the entire frame: the eye moves from Le Corbusier, across a gap to the scientist, who becomes encompassed by the architect as the eye returns back to the architect. The scientist is caught by the architect's gaze, a reflection of his line of sight, a projection of his desire.

In *Le Modulor*, after all, it is the architect that finally declared Einstein's judgment as "extraordinarily clear-sighted."[6] This dynamic plays itself out in practice at Le Corbusier's Parisian atelier on Rue des Sèvres, where Le Corbusier reportedly banned the use of Modulor tape measures only days after distributing them to his assistants because they used it like a crutch and ceased to rely on their own intuition, with poor results.[7] The Modulor, apparently, made the bad all too easy. By withdrawing it from his underlings, the architect threw off his mantle of foot soldier and reasserted his authority as General-in-Chief. From this position, Le Corbusier refuted the scientist's judgment and refused his hand of friendship. The scientist, once courted by his architectural counterpart, in the end is portrayed as having only limited knowledge because his objects concern Nature alone. It is the architect's genius that spans Nature and Culture. Across the past and future of the moment documented by this photo, the dynamic of identification between architecture and its legitimating discourses seems complete. Le Corbusier does not seek authority outside architecture but instead acts as a thief of hearts in order to reclaim mastery, playing Einstein, the most famous intellect of the twentieth century, as the fool.

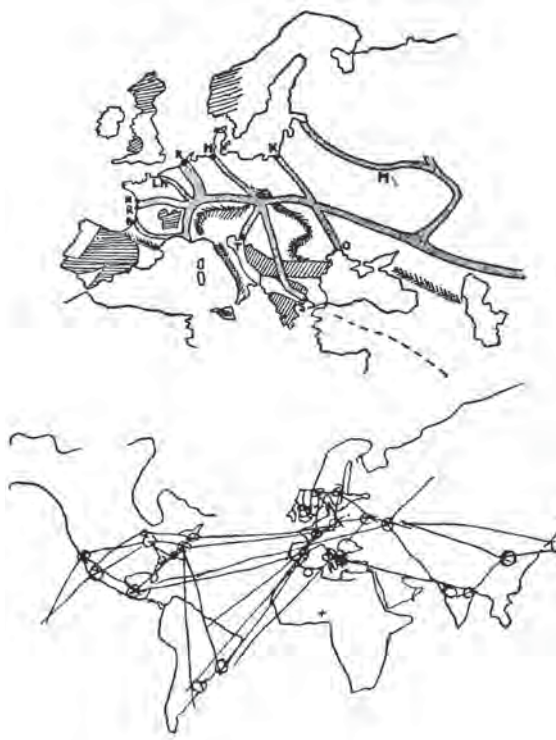
This encounter may be unique in the biographies of Le Corbusier and Einstein, but is merely one in an innumerable series within the history of architecture. The discipline continuously seems to look beyond itself—to science, to nature, to philosophy. Today this commonplace is diversely formulated: Architects are said to steal from other disciplines (like science), find inspiration in another domain (like nature), seek foundations in something thought to come before architecture (such as the body), or misappropriate some theoretical armature. Such accusations can be uttered in damnation, lament, apology or excuse. All suggest a promiscuity and insufficiency inherent to architectural thought. Architecture seduces and its web of come-ons and promises captures scientists, philosophers and others.[8] Seemingly, only by importing concepts from other fields can architectural knowledge renovate itself and keep pace with intellectual, social and technological developments. Nevertheless, this relationship flows in two directions since architecture is, as we are so often reminded, a metaphor of the systematic and rigorous for fields like mathematics, science, and philosophy. They seek to capture and tame architecture to buttress their own arguments.[9] And so, even as architecture is a model of rational discourse, architectural thought itself appears inadequately formed, incomplete, irrationally ungrounded.

Yet, this mirrored portrait of the Architect and Scientist suggests something else at work, a dynamic of introjection. From Vischer's Golden Section, to Giedion's fascination with primatology, to the function of Wittkower's Renaissance for modern architects, to Le Corbusier's courting of Einstein, such introjections characterize attempts to develop a theory of form for the modern subject. It is not that architects beg, borrow, or steal from science or look to Nature to justify forms. Instead, they project architectural problems into scientific or historical domains, which can then become materials for the advancement of architectural knowledge. What is often seen as a deficiency of architectural thought is actually its mechanism of its transformation. In this chapter, I will examine the Modulor through its operations of projection and reflection. I will also address Le Corbusier's peculiar attempt to merge proportional systems of order with issues of scale. While the latter is obviously a problem of the subject's perception and sense of embodiment, the former, as Viollet-le-Duc argued, is concerned strictly with the ordering of the object.[10] Rather than a continuation of the *trace-regulators*, as it is often said to be, the Modulor crystallizes a fundamental transformation in Le Corbusier's thought. The Modulor rests upon an intersection of the concepts normativity with bodies calibrated through these concepts via techniques of visualization. This happens in two ways: one concerns the proportioning of objects via the proliferation of Modulor grids; the second operates to position the subject in relationship to this field of Modulorized objects. But this was not a return to Vitruvian Humanism. The gap between the issues of scale and the problems of proportion in the object is the space through which the subject of the Modulor precipitated as an architectural response to transformations of social order after World War II, one that would attempt to reassert architecture's authority by recasting it as a mediated interface.

A WORLD OF FLOW

In *The Modulor*, Le Corbusier drew two mirrored maps of the world. The first depicts Europe, organized via hierarchal trade routes traversing defined territories. The second portrays the globe as a network of flows wherein economic movement and webs of communications and transportation nodes collapse geographic distances and political boundaries. These lines are constructed by "the telegraph, the radio, and the flying machine," through which "everything is exchanged, linked, interlinked *above nationalities*."[11] Le Corbusier described this as a qualitative transformation wrought by a quantitative increase in speed and what would come to be called bandwidth. This networked information society was presented as the reason for the Modulor:

> *A new visual measure has become really imperative only in recent years, when high speed means of communication have worked a profound change in the relations between peoples… bringing about a complete*



9.2 Le Corbusier, maps of the world, *Le Modulor*. Copyright, FLC/ ADGAP, Paris, and DACS, London, 2006.

> *revolution (of which we have not yet chosen to take cognizance). This is not the place to develop that particular theme. The conclusion to be drawn from it is this: that everything is becoming—indeed, has already become—interdependent.*[12]

Le Modulor presents a full-blown, if nascent, depiction of a World Wide Web of global capital connected via media, "high-speed communication" and free trade in which bounded domains of knowledge, cultural identity, and order had been ruptured.

Le Corbusier declared this new interdependence "the problem of our day" because it produced a new condition for human existence and for architecture. Traditional spatial typologies no longer governed this world. Yet, the unbounded flow of information and matter seemed to further increase the alienating effects of modernity because it reduced the measure and meaning of everything to pure inter-exchangeability. Although the foot, inch mile, and *brachia* that governed the primitive hut depicted in *Vers une Architecture*, were indexically derived from the human body, culture and time had diluted the relationship between the body and these measures, and produced many local variants and therefore unsuited to a global society. On the other hand,

the metric system, although rational and systematic, was abstract and arbitrary. It facilitated the interlinked flow across the world, but provided only a *simulacrum* of order since it lacked any model outside pure exchangeability. Le Corbusier, for example, claimed that the metric system's abstraction from any body reference was "responsible for the dislocation and perversion of architecture" whose task he defines as "to contain men."[13]

What was required was a systematic ordering that referred to an external and "real" model, a new gold standard for the currency of space and forms. With the Modulor, Le Corbusier did not suggest simply replacing cultural and decorative embellishments with the efficiency of the engineer (as he demanded in *Vers une Architecture*, where the morality of the engineer contrasted with the decadent excess of architecture). Instead, the Modulor was to have traversed disciplinary boundaries, as suggested by the first book's complete title, *The Modulor: A Harmonious Measure to the Human Scale Universally Applicable to Architecture and Mechanics*. In so far as the Golden Section to which the Modulor was related was understood as a natural constant (as we saw in the last chapter), then the application of the Modulor to all forms of cultural production would seem to be an attempt to cohere culture to natural order. Le Corbusier also claimed the Modulor as a mediator between the subject and the environment since it supposedly revealed the relationship of the body to those same orderings of nature. Through this triangulation, the Modulor was to have provided a measure, "harmoniz[ing] the flow of the world's products" according to human scale and proportions.[14] The Modulor was to have reshaped this world of flow into a proper shape resembling that of Man, an orthopedic apparatus to have been applied to the world of flow and interconnection.

THE IDEAL AVERAGE

But what was this "scale of man"? Le Corbusier related the Red and Blue Modulor scales to anthropometric demographics through his conceit that they were based on the *average* height of a population (French, and later American, males) and was more a linear measure of this average height than set of proportional relationships between parts of the body. This *statistical body* of the Modulor operates as a *normative goal* such as that found in Durkheim's, Galton's or indeed Fechner's studies, an optimal condition that, once achieved, would produce an equilibrium condition.[15] Just as the Golden Section appeared in Fechner's research as a statistical equilibrium, the Modulor relied upon such normative concepts.

Here we need to introduce the relationship of statistical norms to orthography and the right-angle. As often noted, the Latin word, *norma*, denotes the drawing tool of the set-square; the normal angle is also the right angle.[16] Further, the normal has always been coupled with the Greek, *ortho*, and in geometry these terms have traditionally been synonymous. Of

course, the right angle was central to Le Corbusier's geometric propositions, including the Modulor.[17] This linkage however gains a different power in the development of modern structures of administration of populations and power. For example, Canguilhem described a tense and complex interaction between the terms *ortho* and *norma* wherein the former is bound by the latter in a formal, or morphological, relationship:

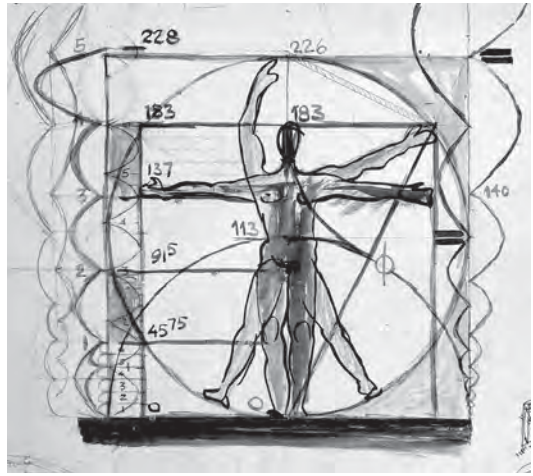
> *orthography, orthodoxy, orthopedics, are normative concepts prematurely… it began with grammatical norms and ended with morphological norms of men and horses for national defense… defining industrial norms assumes a unity of plan, direction of work, stated purpose… a norm is not an imperative to do something under pain of juridical sanctions.*[18]

These normalizations informed Taylorism, which arrived rather late in post-war France as a "national cure to renew the vitality of a society and economy which many believed to be in decline."[19] In Taylorism, elaborate motion studies of workers' bodies were used to retrain the laborer to be a more efficient component within a larger industrial machine. However, it is not the worker's body nor even the factory as an organism that was the ultimate target but rather the body politic. This "scientific management" attempted to instill a moral code of efficiency such that, "society's movements to produce a maximum return for a minimum outlay of effort."[20] The body was a site of training which would locate each subject in his or her proper location within the geometries of social order. Orthopedic correction of the body was seen as a way of producing normative subjects and, thereby, correctly proportioning the body politic through the institutions that trained these subjects and their bodies. Similarly, in Francis Galton's statistical project of eugenics, childbearing was to have been regulated by the State, selecting out undesirable deviants at the bottom of the scale and shifting the "average" closer to what had been the top end. Such techniques of body orthopedics can be understood as part of an "explosion of numerous and diverse techniques for achieving the subjectification of bodies and control of populations," the advent of what Foucault termed "bio-power."[21]

The relationship of the Modulor to such concepts of subjectivity and social orthopedics can be seen in its explicitly masculine gendering. In *Architecture and the Burdens of Linearity*, Catherine Ingraham detailed how Le Corbusier associated the "rational" rule of the straight line and right angle with masculine traits and the "irrational" weaving and curvilinearity with woman (and donkey's) subjectivity. In the Modulor, the relationship of gender to ideas of order is more complex. An instructive example comes at the end of *The Modulor*. The mathematician Elisa Maillard had donated her time to correcting a few of the Modulor's errors, and gave Le Corbusier a revised geometric diagram with her amendments. Le Corbusier rejects this diagram. First because it had a horizontal orientation, implying the supine position he

associated with femininity. Second, because it had too many circles, which he also saw as feminine.[22] As he had done with Einstein, Le Corbusier reclaimed his authority, setting "the *recumbent* Maillard drawing *upright*" and coloring it to convert "the reading of the circle to a reading of the rectangles and squares."[23] In the process, he erased the mathematician's signature and inserted his iconic and masculine figure. This literal erasure—of both what Le Corbusier construes as feminine and the sign of a woman mathematician's authorship—is revealing in that it mirrors the erasure of other women collaborators, such as Charlotte Perriand. But it also reveals the processes of subjectification at work in this orthopedic "correction." Elizabeth Grosz has noted that within dichotomous organizations of thought, such as the male and female, one of the poles operates as a model, to which the second term is merely a reflection, or copy, such that "all otherness is cast in the mold of sameness… It cannot tolerate any other."[24] Deleuze called this "the logic of the Same," in which there cannot be truly alternative orders but simply variants, or degraded reflections of the model. For Le Corbusier, the normative male and its orthographic geometry alone possessed an ontological positivity for architectural knowledge. In this sense, a truly feminist architecture remains impossible so long as the dichotomous structure is intact since the masculine continues to determine that which is "not male" as its reflection. In *The Modulor,* the logic of the Same is embedded through the use of an *a priori* normative geometry (the Golden Section), to which all bodies are then compared and located in relationship to its order, with the male body positioned as the primal identification. A supposedly feminine geometry is thus presented as a poor resemblance to the masculine model and its geometric order, and is subjected to an orthopedics, or even erased. In Le Corbusier's book, Maillard's original drawing and his "corrected version" are presented as the opposing pages in the last spread of the main narrative; they are literal dialectical reflections that present his act of orthopedic correction as the final mirror move in the Modulor narratives.

This dynamic becomes even more apparent in *Modulor 2*, where Le Corbusier devoted an entire page to an assistant's drawing of the Modulor as a female figure, which Le Corbusier immediately rejected as monstrously out of scale: "his man is a woman 1.83 meters tall: Brrh!"[25] Not only is this Modulor Woman an error—that is, an improper reflection of the Modulor—its exclusion must be dramatized in the most noticeable of ways, by a full-scale reproduction of the image followed by a collapse of language into an utterance of abject disgust and melodramatic revulsion, "Brrh!" By doing so he declared the Modulor woman as "a 'something'" that he cannot "recognize as thing."[26] It is tempting to think that Le Corbusier simply abjected the female figure because her subjectivity and thus her body were understood as iconic of the abject word of flow he diagnosed in his two maps, her body standing for the "breaking down of a world that has [already] erased its borders."[27]



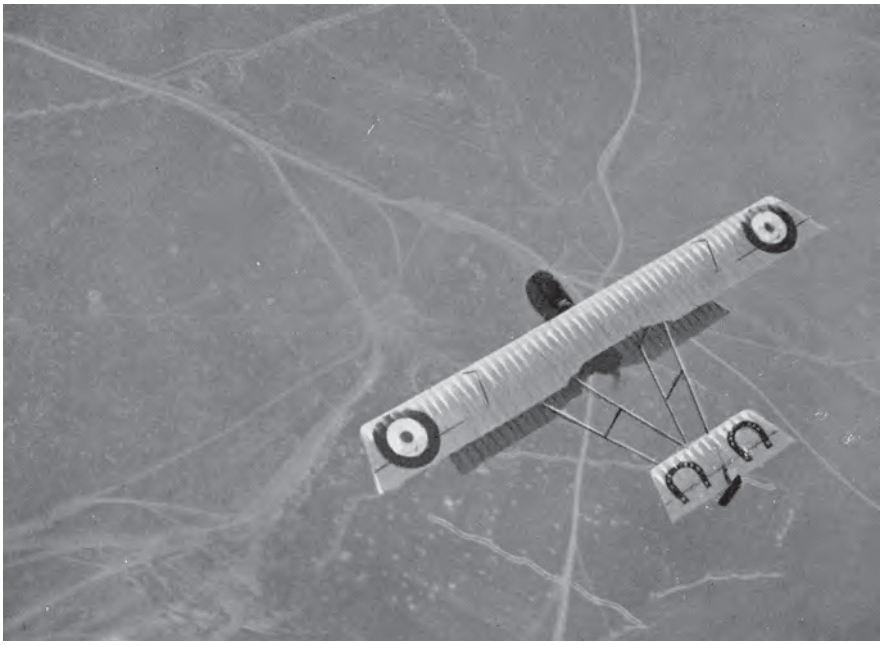
9.3 Modulor Woman, *Modulor 2*. Copyright, FLC/ADGAP, Paris, and DACS, London, 2006.

After all, in *The Modulor* Le Corbusier reproduced an image of North African women carrying goods that he implies would soon be transported on the (post-colonial) trade routes he depicted in his maps. In this image, one of the few photographic reproductions in the books, and one of the very few examples of the trade that was to have created the problematic flow of ideas and goods, women's bodies are intimately associated with the agents of de-territorialization and flow that Le Corbusier thought dangerously reduced everything to interchangeability.

However, it is important to note that abjection does not target the object but as Kristeva has argued, it is an introjection of the Narcissistic subject who finds himself, "uncertain, fragile and threatened… uncertain of its borders because the subject is unable to define its boundaries in relation to an object."[28] Le Corbusier's utterance signals a failure to sustain the order that constitutes his architectural subject. That is to say, the threat is to the body of architectural knowledge itself. What we see here is the fragile and uncertain questioning of architecture *vis-à-vis* this world of flow and his attempt to reassert architectural mastery over it.

CORRECTIVE LENSES

To understand further the Modulor as a response to nascent globalization, it is useful to examine the role one particular technology, the airplane, plays as a mirror of the architect's gaze and as an instrument of the global order that was to have been regulated by the Modulor. As Paul Virilio has noted, the city, the plane and the camera are intricately bound to each other via the technologies of warfare. The airplane was originally used in World War I as a tool of photographic reconnaissance, only later would this line of sight become



9.4 Le Corbusier, Frontispiece for section, "Eyes Which Do Not See II: Airplanes," in *Vers une Architecture*. Source: Copyright, FLC/ADGAP, Paris, and DACS, London, 2006. The view of the world from the plane or plan point-of-view introduces the airplanes as a model for architectural order.

a line of fire.[29] In his elegiac *Aircraft*, Le Corbusier reproduced numerous examples of aerial photography, and suggested that the view from the plane helped diagnose the maladies of urbanism:

> *The bird's eye view has enabled us to see our cities and the countries which surround them and the sight is not good…*
> *The airplane is an indictment.*
> *It indicts the city.*
> *It indicts those who control the city.*
> *By means of the airplane, we now have proof, recorded on the photographic plate, of the rightness of our desire to alter the methods of architecture and town planning… The brief and rapid history of aviation, so close to us, explains to us with certainty that soon the very laws of life will justify us.*[30]

Here, Le Corbusier argues that an order, or at least a disorder, only becomes apparent through the mediations of flight and photography. The plane places the observer at an orthogonal position to its object of study as if the city was a slide specimen seen through a microscope. In the process, nature and the city also become a specific sort of picture: a plan. In *Vers une Architecture*, Corbusier described the plane/plan as a prosthetic instrument, supplementing human vision the way the microscope allows the scientists to peer into

otherwise unavailable worlds. This position affords an "angle of vision [ninety-degrees]… inspired by the law of economy and governed by mathematical calculation… in accord with universal law."[31] Similarly, in *La Ville Radieuse*, Le Corbusier recounts his flights with the pilot St Exupèry. The aviator warns Le Corbusier of the vertigo that can be induced from viewing the world from such a height. Le Corbusier laughs and declares that as an architect he has seen this way for his entire life. Across Le Corbusier's pre-World War II texts, aerial images of the city and the order produced via the architect's plan are mirrors of each other. Both put the observer at right angles to the horizontal plan that he called the generator of social and spatial order.

Additionally, the observer is separated from the object of scrutiny, a distance enabled by the instrument itself. Whether from a thousand feet in the air or a couple of feet above the drawing board, from this "purely abstract point of view,"[32] of the plane or of the plan, the subject ceases to be simply a part of the urban environment and instead becomes an observer. From this augmented perspective, one can see the ordering, or the lack of adherence to order, whereas before it simply escaped comprehension because the subject was a small part of its dynamic flux. In the plane and plan, this relationship is inverted, with the city seen from a distance becoming small, its patterns and forms crystallizing in front of the eye. In other words, through the displacement and augmentation of the subject's position, the urban phenomena—otherwise a vast field of environmental stimuli and representations—become an object of knowledge that are revealed through a now apparently geometric order. It is the gap between the subject and the object that allows the latter to become available to the former as such. Thus, the plane and the plan are instruments in the same way the microscope is to the biologist, the camera is to the work-study engineer, or the drawing to the evolutionary taxonomist, revealing a reality that would otherwise escape human senses and creating new objects of study.

At the same time, the airplane served as a model for the properly organized object. In what Bruno Latour would see as the most modern of paradoxes, Le Corbusier continually argued that technology is produced by human culture, but at the same moment treats it as if it had arisen elsewhere and operated autonomously as a form of life, which, in turn, he understands primarily as a teleological drive towards organization:

> *The primary form of life consisted of cells that could reproduce by themselves, dividing themselves up, multiplying and forming an amorphous, quivering, but purposeless mass.*
>
> *Then an intention appeared, and an axis began to form in the center of the agglomeration. A current, a direction became apparent. An organism was born… The impulse towards organization exists throughout nature.*[33]

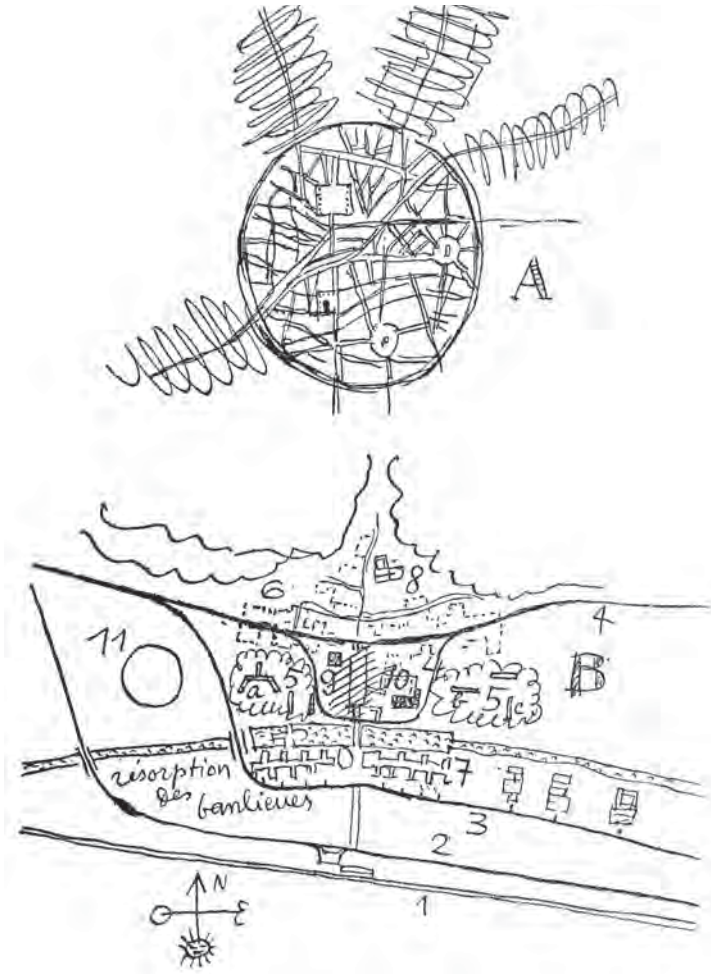
In *Vers une Architecture*, the plane served as the prime example of the machine as a "plastic organism created in response to a well stated problem."[34] These words, captioning a photograph of an airplane cockpit, described how, as a species adapts to an environmental niche, Le Corbusier rendered technology as an artificial nature. This "will to form" reverses entropy by ordering parts according to an organic unity, including laws of symmetry, conflating the teleology of nature with the architect's intentionality.[35] Nature is seen ultimately not as something opposed to architecture, but as evolving towards the increasingly architectonic.

Throughout Le Corbusier's pre-World War II texts, the problem of technology did not emanate from the fundamental nature of the machine, but in cultural resistance to its order. For example, the family, a fundamentally natural institution for Le Corbusier, was threatened not by shift-work or child labor, but by a cultural "servitude to anachronisms" clashing with the demands of this technologic order.[36] In *Vers une Architecture*, Le Corbusier claimed technology had traumatized tradition, yet argued the fault lay within human culture, not machines: "the human animal must learn to use his new tools. When this human animal has put on his new harness and knows the effort that is required from him, he will see that things have changed and for the better."[37] The airplane and plane-plan view was just such an orthopedic prosthesis. For Le Corbusier, architecture and urban planning must be similarly stripped of these cultural tendencies towards entropic decay.[38] Just as the airplane was a model organism for architecture, from its vantage point, the body of the city was seen as in peril, "human heedlessness has allowed a primarily organic form of life to exceed the dimensions proper to it. The mass has collapsed into decay and become a stagnant pool… nothing more than a mass of protoplasm."[39] That is to say, from the technologically enhanced position in the sky, where the city could be seen as plan, it became apparent that it was threatened, and it was from this position ninety-degrees from the ground that the architect could administer his masterful corrections and reshape its social order.

POST-WAR ANAMORPHOSIS

By the early 1940s, Le Corbusier reversed his pre-war diagnosis and its remedy, ruefully stating, "With the machine age arose an immense, voracious industrial monster… breaking the framework of centuries."[40] After this catastrophic break with tradition, "We face the first fruits of industrial civilization (the Machine Age)… the picture is disquieting—a complete cacophony. The machine has been the cause of every evil."[41] Now he argued that technology must be yoked to "the laws of human biology, to the laws of nature and to cosmic laws… under such conditions man will find himself."[42]

In his post-war texts, including the Modulor, the plane-plan point of view had become a problem. The airplane was the prime example of the



9.5 Le Corbusier, diagram of modern suburb and urban proposal, *À Propos d'Urbanisme*, 1947. Copyright FLC/ADAGP, Paris, and DACS, London, 2006. Le Corbusier describes and draws the suburb as effluent spilling out of the ruptured body of the city in Figure A and his proposed plan to reabsorb the suburbs in Figure B.

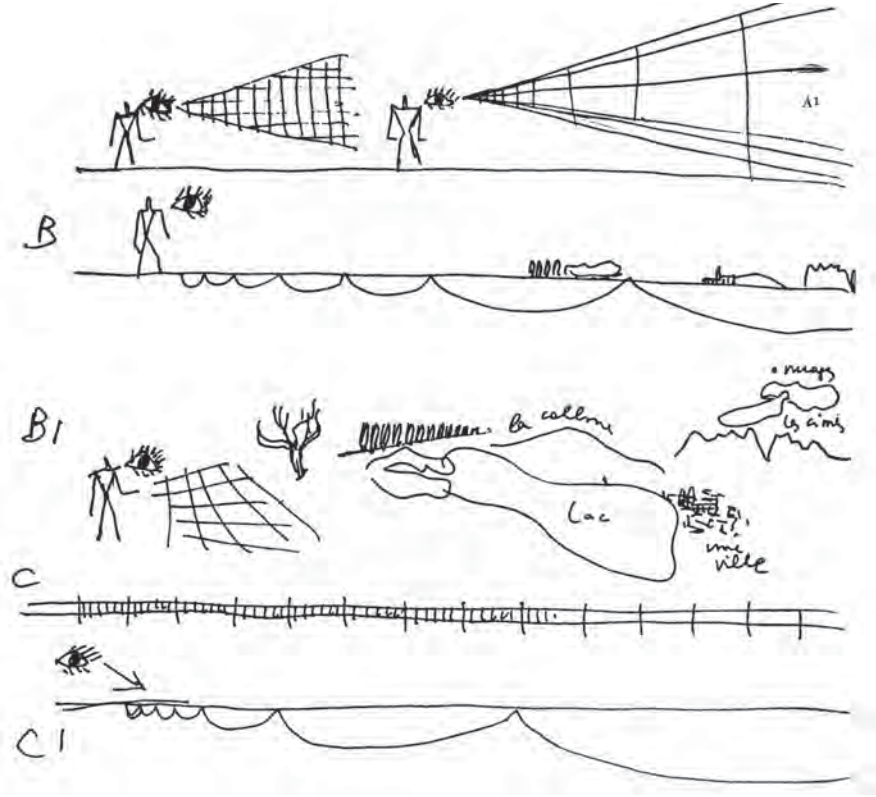
interdependent world depicted in the Modulor not simply as a medium of trade and transport but also as an agent of destruction:

> *Let us read the vital currents which flow throughout our land … The Allies won the war by blows from the air. We well remember the thrumming drone which filled our sky.*
>
> *For the time of peace, they are preparing a vast fleet, which will produce an unimagined upheaval in the transport of men and goods. We need not lose our heads. The skies of our towns will be full of the roar and the whistling of aircraft … engines, far and near, like the monsters which fill the skies of the fantastic paintings of Hieronymus Bosch.*[43]

Here Le Corbusier echoes Sartre's elegy (noted in my Introduction) that the aerial bombardment of World War II and its ballistic sequels had fundamentally altered the human condition. Whereas once the machine-view offered amelioration, now, "the advent of mechanization has only brutalized our lives."[44] Previously the point of the view of the plane revealed the mathematical order of nature, now it presented a "sinister balance sheet" of destruction.[45] Rather than serve as model for organization and a prosthetic, now the airplane was an agent of disorder and compared to Bosch's monstrous figures of violent depravity. In the prewar texts, it was the subject and society that needed to be trained for the abstract point of view; after the war, it was also technology that needed orthopedic correction. The straight line that moves from the airplane observer to the object is no longer one of knowledge but an anamorphic distortion of order that leads only to horrific visions of death.[46]

Likewise, life is not presented as an abstract will to order, best seen from the bird's eye view of the architect, the biologist or the pilot, but through the sensorial occupation of space through the body and the point of view of the embodied subject. In *Concerning Town Planning*, Le Corbusier declared that designs for cities need to be organized not according to plan but also "must be subject to the laws of gravity, to the laws of human biology, to the laws of nature, and to cosmic laws… under such conditions man will find himself, and communities will become effective bodies."[47] Recall how Rowe argued that, in contrast to the anthropocentric Palladian load-bearing architecture the occupant could always complete, Le Corbusier's *plan libre* dispersed the subject into a de-centered field of relations with a fragmented architectural object. In Le Corbusier's post-war texts, gravity reasserts itself as an overarching force that governs the organic production of bodies, including urban bodies. In fact, in the architecture held up as examples of Modulor ordering, such as the Unité de Habitation, the section is indeed the dominant organizational device in a building that replicated the hierarchies of the body. The goal, it seems, was to re-coalesce the interconnected world around the subject.

This explains the otherwise incongruous attempt in the Modulor to anneal issues of human scale with proportion. As we have seen, for Le Corbusier, the city as an object of architectural knowledge and as the home of the human subject, was in a state of dissolution. Therefore, the attempt to link such proportional geometries of objects to the height of the human body, or more significantly, to the approximate location of the eyes above the datum of the ground, is an attempt to relocate the position from which the object of architecture—be it a house or a city—could be understood. Organizational principles would, so it went, be integrated into the experience of the world. As a result, Le Corbusier attached the Modulor to Renaissance



9.6 Le Corbusier, Figure 31, *Le Modulor*. Copyright, FLC/ADGAP, Paris, and DACS, London, 2006. This diagram suggests that the Modulor measure is derived not simply from the proportions of the body so much as a normative height of the eye above the ground, and moreover, a single, perspectival station point, here indicated by the singular eye, rather than the biological binocular vision.

proportional systems only to finally dismiss their dependence on an aerial point of view:

> *The human eye is not the eye of a fly, placed at the heart of a polyhedron: it is situated upon the body of man, in twin positions on either side of the nose, at an average height of 1.60m above the ground. That is in every sense, our tool for the appreciation … the cone of vision is in front, concentrated on a concrete field.*[48]

Accordingly, the Modulor texts have a series of diagrams depicting an eye with a cone of vision (a motif that appeared in *La Ville Radieuse* in a different form). In these drawings, a Modulor Man stands on the ground plane, accompanied by a disproportionately large eye floating immediately above, often with the height of the Modulor Man written beside it. In one of these series, he attempted to demonstrate how perspectival vision also follows the Modulor progression rather than regular grids that would be seen in plan.

These images reveal that the average height of the body, indeed the body itself, to which Le Corbusier referred was really only an indicator of the position of a privileged orthographic line of sight and its angle of orientation.

Nevertheless, the "space occupation" of the human body described in the Modulor texts was also technologically mediated, this time as a cinematic apparatus. Le Corbusier provided a cinematic definition of the experience of architecture: "Architecture is not a synchronic phenomenon, but a successive one made up of pictures adding themselves to one another, following each other in time and space."[49] This series of images must be put into the proper, or orthographic, relationship to their observer in order that they do not appear distorted. Thus, in *The Modulor*, embodied perception is emphasized as a way of constructing images, rotating the privileged plane of representation from the horizontal plan to the vertical plane of perspectival representation, or more precisely, photographic and cinematic imaging. We can understand the Modulor as gridding the plane that hovers between the body of the subject and its world, rendering the latter as an ordered, or properly proportioned, image even as the former is orthopedically shaped and positioned by the same measuring.

Photography has often been employed as an instrument in the study and administration of normative order in modernity. Because the biopolitical techniques mentioned above operate upon individuals, at the level of biological life and its reproductions and productions, the body becomes the principal site through which to exercise power over subjects. Or rather, images of the body have been used to produce this normative subject. For example, Taylorist work studies used time-lapse photography as a means through which to analyze the movement of a worker's body, often by attaching lights or white spots to the joints and thus tracing movement against a black or gridded backdrop. The result would be a pure trace of motion, which could be shown to the worker to make him more "motion-minded," to redesign the space of work, or to retrain the movement itself. One such researcher, Frank B. Gilbreth, even re-translated these lines back into three dimensions as wire sculptures held in a gridded frame. Photographic guns and long exposure techniques would capture otherwise imperceptible order by collapsing a succession of movement into one image. Only by breaking up the Bergsonian durations into quantifiable intervals and then bringing those separate moments into close relationship was the human eye able to study the economies of the body; the discontinuity of the camera shutter striated smooth sequences of movement and condensed these instants of time into a single plane of representation—the photographic plate.

In another example, Galton superimposed many photographic portraits of individuals onto a single plate. The result was a composite image where shared features were reinforced and individual likeness faded ghosts. Galton argued that this composite portrait revealed a familial, racial

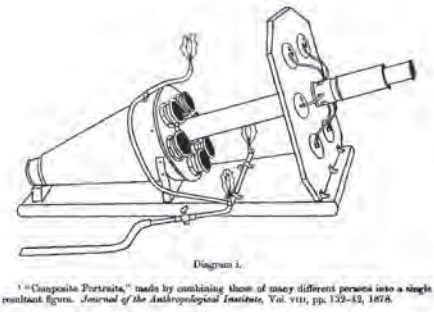


Diagram 1.

1 "Composite Portraits," made by combining those of many different persons into a single resultant figure. *Journal of the Anthropological Institute*, Vol. VIII, pp. 132–42, 1878.

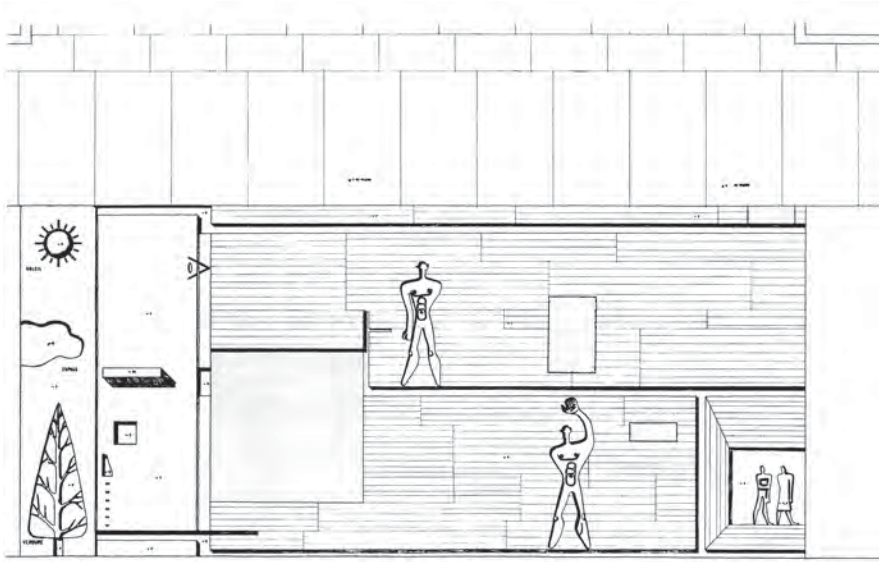
9.7 (left) Francis Galton, "Composites Made from Portraits of Criminals convicted of Murder, Manslaughter or Crimes of Violence," Plate XXVIII. Pearson, *The Life, Letters and Labours of Francis Galton, Volume Two: Researches of Middle Life*, 1924. 9.8 (right) Karl Pearson, drawing of Francis Galton's apparatus for aggregating six portraits into a composite portrait. Pearson, *The Life, Letters and Labours of Francis Galton, Volume Two: Researches of Middle Life*, 1924: 285.

or other ethnographic "type." This is rather similar to the way that Fechner argued that the Golden Section was the average of a range of rectangles. It was also in many ways the ancestor to digital morphing techniques, such as we have encountered with Daniel Lee's "Manimal" project, except that for Galton they always revealed the essence of a predetermined type rather than questioning the very concept of such types. It is important to note that Galton's composites could not be achieved by multiple exposure, for as Galton explained, this would result in a "mean" of tone values and result in a muddle; instead he needed to "aggregate" several images together at once.[50] To do so, he constructed an elaborate apparatus that could project several images onto a single screen and which could then be viewed, or re-photographed at right angles. In this case, photographic and orthographic visualization was literally a technique for constructing a normative subject.[51] Or more precisely, these techniques for visualization of the body become the instrument through which to reshape and locate a subjectivity within its proper space on the judicial grid of administrative power.

In regards to the discourses of proportion, Robin Evans noted that proponents of the Golden Section habitually argued for its presence in natural forms and faces, but that in fact they attempted to demonstrate this by drawing lines over photographs of these three-dimensional forms. For

example, Gyhka's book, *Nombre d'or* features a photo of a woman's face overlaid with lines to demonstrate that her features corresponded to the Golden Section. Of course, the Modulor Man is itself an example of the conflation of a representation of the human figure and the body. Le Corbusier's so-called "body" is a drawing, a figure, and not a pulsing, moving, sweaty, biological body. Really, it is simply a statistical average. Ghyka's analysis, as with so many others, was not of the face itself and its three-dimensional contours but the flat image and gradients of tone produced via photographic techniques.[52] This confuses the use of proportions as a drawing technique, as Da Vinci and Dürer employed them, with their status as a natural law of growth. Evans argued such studies merely reveal a naïve understanding of representation rather than evidencing universal geometries.

Yet, there is something else at work here. What we are seeing is the formation of new objects of new knowledges produced through the media of photography and mass-printing technologies coupled with statistical frameworks of explanation. An example is the recently popular "Cartesian Transformations" by D'Arcy Thompson. In his 1917 *tour de force, On Growth and Form,* Thompson claimed to be inspired by Dürer's proportional studies of the face and drew several examples of fish, crustaceans, and bones from various species (including human and ape skulls) upon a grid, which he then uniformly distorted to produce variations that corresponded to that of other species. In Thompson's process, the relatedness of species could be determined topologically rather than typologically. That is, species barriers and other classificatory boundaries would be measured by the degree of transformability of one form into another form. Of course, Thompson was as guilty as Ghyka of measuring a drawing rather than the thing itself. Yet, it is only through such mediations that a mutative world can be investigated and developed. And it is only through the ability to reproduce such images that these ideas can operate as agents in larger discourses. If everyone had to continually measure the artifact, and if the results could only be understood by having the object in hand, such knowledges would be very limited. This does not mean that such natural orders are "fictions" constructed by these media technologies any more than photographic techniques transparently produce a "true" depiction of reality. Both of these choices merely return to an unproductive dialectic of Nature and Culture we encountered at the end of the last chapter. Instead, what we see here are the formation of things that traverse these poles, or rather, refuse to be bound to such polarities and are instead complex assemblages. All the discourses mentioned here, and extending to archeology and taxonomy, were developed and disseminated through technologies for the high-quality and relatively affordable reproduction of drawings and photographs. In architecture, where realism is not the same sort of problem, the implications are slightly different. At least since Alberti, the discipline of architecture has been based, advanced



9.9 Le Corbusier, Modulor Man and Nature inscribed into entry way at the Unité Firminy-Vert. Copyright, FLC/ ADGAP, Paris, and DACS, London, 2006.

and disseminated by the knowledge of drawing (and other representation, like models) and its complex distance from the "built" work of architecture. The rise of the discipline of architectural history in the nineteenth century depended in part on the ability to mass-reproduce drawings and photographs of buildings and this media, as has been well documented by Beatriz Colomina, is integral to the formulation of architectural concepts and design in the twentieth century. Le Corbusier's regulating lines (and Wölfflin's formal analyses from which they were derived) required a photograph or orthographic drawing of the building being analyzed and favored the construction of an architecture based on such views, as we have seen with the pre-war plane-plan and as we shall see was relocated in the Modulor. His manifestos, from *Vers une Architecture* to *Le Modulor* depended on an unprecedented and dense interrelation of text, photos and drawings of both his work and other examples. These architectural bodies, this modern *corpus* of architectural knowledge, was produced via introjection through the statistically gridded image, the diaphanous plane of photography and the dot-screens of the offset press.

It is to these mediated bodies that the Modulor refers. The architectural implications are most fully apparent at the Unité de Habitation. The exterior walls, porches and fenestration were primary examples of the deployment of the Modulor. In *Modulor 2*, Le Corbusier reproduces photos of the built exterior and diagrams of its elevations as key examples of his measure's proper use. And of course, the Modulor figure is inscribed into

the concrete by the entrance to the structure, overtly signaling its guiding eye and implicating the inhabitants' bodies as reflections of its model. And while Le Corbusier liked to refer to the structure as a bottle rack, it is organized anthropomorphically along hierarchical circulation routes, spines of corridors and a distinct top–middle–base division, where the massive *beton brute piloti* express the weight of the structure. Most importantly, however, the plan of the Unité's apartments are extremely narrow, which at first seems perplexing given that the Modulor would seem to preclude such distended proportions. This is sometimes explained as a response to budget. In any case, the elongated apartments favor a certain line of sight, furthered by the fact that there are no fixed internal walls that transverse the space (only doors and screens), further subdividing the spaces into long rectangular tubes, assuring the subject is continually oriented orthogonally to the external wall, the only source of daylight. The Unité's *brise-soleil* and the Modulor subdivisions of each patio operate as frames across this bright opening. The external membrane of the building becomes a gridded plane of representation between the station point of its occupants and the vanishing point of perspectival convergence outside. The world seen through this screen is an image that has the Modulor proportioning system inscribed over it. The Unité's apartments are optical interfaces that were to have mediated the subject and the world.

If Le Corbusier is often criticized for isolating the body in predefined poses, we can now see that these are at least in part echoed by Muybridge's dismounting of movement into static moments via photography. It was therefore entirely logical that the Modulor was fashioned into an actual measuring tape by his assistant Soltan by transcribing it onto an exposed (and therefore clear) strip of celluloid, of the sort that one would find inside a film camera. This Modulor film-strip was carried by Le Corbusier around the world in its metal film canister; he would remove it from its protective case to measure whatever came into his field of vision. Here, the Modulor literally becomes a cinematic apparatus, like a film camera located between the observer and the object that allows the ordering of the latter to become apparent for the former. The world is transposed into an image, regulated by the Modulor grid in the way the grid measures the movements of bodies in work studies or just as movement in the film camera captures a rapid succession of still images. Since Le Corbusier presented human vision as just such a sequence of images, the Modulor would regulate the world of flow into architecturally static frames. These could be reassembled into an apparently smooth flow, just as the cinema projector produces the illusion of movement out of still frames. However, this apparent motion would have

become merely an architectural effect. The Modulor Man is a man with a movie camera, capturing "truth" twenty-four times a second.[53]

CONTAINMENT PROTOCOLS

The presentation of the Modulor as a visual interface that could regulate the flow of information by breaking it into discrete and static frames is significant in that it suggests a shift away from extensive planning in favor of biopolitical operations that would act on individuals and their sites of exchange. If Le Corbusier on his first journey to the East, had argued America, the land of the timid, required "top-down" planning to fully actualize its modernity, by the time he visited Einstein he was proposing the Modulor as a "bottom-up" system that would conform industrial processes to natural laws of growth and form. An orthopedic armature that placed the subject in the correct relationship to the world, and if that world is regulated by the Modulor, vice versa, Le Corbusier's measure was a homeostatic meter of flows. To do so, in *Le Modulor*, he redefined architecture's task from the administration of extensive space-time suggested by his pre-war urban plans to the management of information, energy and products across various thresholds of artificial and natural systems. Rather than enframe and ultimately threaten humanity, a technological world regulated by the Modulor would be an artificial nature "striving towards a molecular organization of things built on a harmonious scale of man."[54]

One result of this reframing of architecture into a molecular interface was the corresponding emphasis on the discrete units, or modules, of interaction. The Modulor texts are filled with images of containers, from drawings of Le Corbusier's Modulor-ized office (which he said was so carefully tailored to him that it was like a second skin), to technologies and artifacts of the interlinked world he drew, from airplanes, ocean liners, shipping crates, and suitcases. This idea that architecture's primary task was to produce discrete units of enclosure was reinforced by the CIAM IX "Charter of Inhabitation" for the reconstruction of European cities. This is especially true in the case of the Unité as a prototype for housing in the post-war period that reduced the problems of urban planning to the construction of autonomous and discrete bodies of housing, floating in the sea of Nature one sees as a regulated picture. In contrast to Le Corbusier's pre-war application of global geometries to correct the body politic through the extensive application of spatial planning, the Modulor attempted to link the geometries of the body, and the experience of the subject, with the processes of nature, and to use this supposed conjunction as a way of regulating technological production at the level of individual subjects and thereby to incorporate them into the new body-politic. This is literally the case in the Unité's repetitive cells and their clustering into an anthropomorphic frame. The open space of the *polis* would be replaced by the management of social and technical processes at the

molecular level of its individual units, at the level of life and its processes, in what Giorgio Agamben has recently called the triumph of *oikonomia*. Housing would therefore be privileged over institutional programs, both in Le Corbusier's Modulor work but also in post-war application of the Golden Section and other proportion systems, as a way of reshaping social order from the inside out.

This can be seen as well in Le Corbusier's Preface's elaboration of the terms "Architecture" and "Mechanics," in which all of human knowledge, labor and its products, from technical objects to intellectual properties, from typography to palaces from ships to bolts was to have been regulated by the Modulor.[55] The radical exchangeability across fields of knowledge and production complemented the diffusion of spatial boundaries that the Modulor was supposed to manage. On the one hand, its total deployment over physical production, from screws to cities to media would, so he claimed, produce a world sympathetic to the human scale and experience. On the other hand, all these artifacts would serve to integrate the domain of human experience and knowledge as a singular manifold. The Modulor therefore needs to be understood as an attempt to regulate an *ecology* of systems as an interface. Here, Uexküll's reading of the organism as sensory and affecting networks became an aesthetical administration of the social—including the society of things—according to the laws of life as inputs and outputs of information flow. Each point of exchange across a threshold, each interface between systems, becomes an opportunity for Modulor regulation. As we have seen, Le Corbusier described embodied vision as a cinematic apparatus. If the Modulor governed all human endeavors, it was to have provided a common order that would allow the communication of knowledge and transport of products across traditional boundaries of knowledge. This was to have been achieved by breaking the interlinked flow of the world's information, goods and commerce into frames, like those of the cinematic image, or better yet, in the way information is broken down into packets to flow across the internet. Since the Modulor was to have been patented, this means that the architect would gain ownership over the protocols of market and political practices as the manager of the household of humanity. It would be like owning the rights for the hypertext transfer protocol (http) and the human genome at once, a proprietary system for the universally harmonious exchange of life.

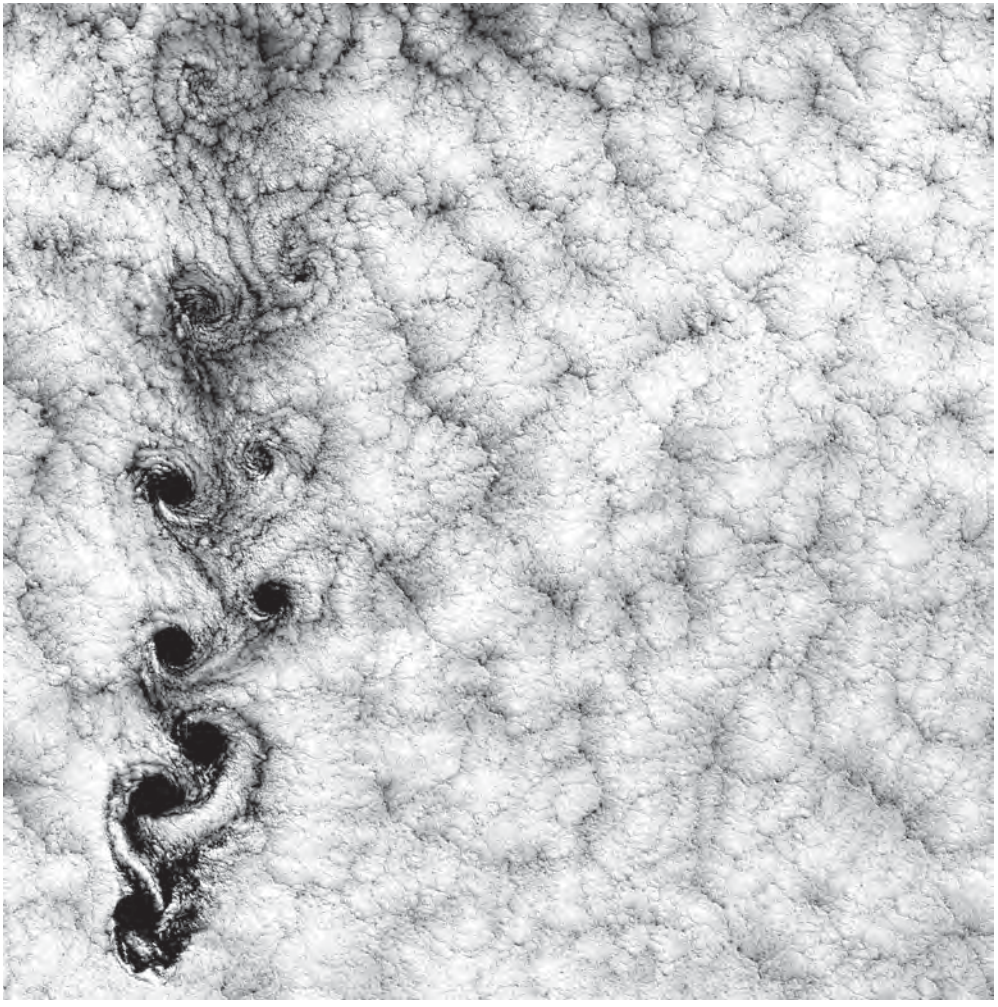
The Modulor was, in short, an attempt to reposition architecture as a biopolitical interface and as a media that operated through a multitude of subjects rather than coordinating planning of institutionalized masses. Far from reverting to a Renaissance humanism or recovering a lost tradition, then, the Modulor was to have operated as a distinctly modern and mediated anthropogenic machine, one that constructed subjects and moderated information through a complex relationship between optical alignments and reflections and a subject constructed through the apparatus of such

projections.[56] In turn, the architect would be master over the world of global flows and media. If the capitalists of America had shrugged off his pre-war macroscopic visions of urban utopia, he would be able to instill his visions at a molecular scale, wherein Einstein would find his rightful place as Minister of Nature.

10.
MEASURING VORTICES

We are nothing but whirlpools in a river of ever flowing matter.

—*Norbert Wiener,* The Human Use of Human Beings



10.1 Landsat 7 Satellite photo of Von Karmen Vortices over Alexander Selkirk Island in the southern Pacific Ocean, September 15, 1999. Image courtesy of USGS National Center for EROS and NASA Landsat Project Science Office.

Whenever we encounter a figure inscribed in a filigree of geometric lines, we believe it belongs to a genealogy of humanism in architecture, one that can be tracked as if their geometries and patterns are footprints of that subject left behind in the sand, or rather, imprinted in concrete. We think we can follow these marks back to an origin and that whenever we cross them we can choose to follow or diverge from their path.

This book has shown how accounts of architecture's past were written through a series of such diagrams and how these tales serve polemics about architecture's future. In the first chapters, we saw how a stable and shared organization of thought configures seemingly antagonistic frameworks of phenomenology and post-structuralism. For both, Vitruvius's *De Architectura* canonized a body-building metaphor and is the origin of an architectural tradition between the fifteenth century and modernity. For both, this Vitruvian tradition is humanist and its geometries metaphorically represent an anthropocentric ordering of the world. Today's architecture, in such narratives, is either a simulation of classical architecture or a forgetting of that tradition. Yet whether architecture now rehearses superseded values or has abandoned its necessary conditions, the discipline appears dangerously close to extinction or has died already. Both post-structuralists and phenomenologists define modern architecture—whether it arrived with the Enlightenment or has yet to come—as the break with this traditional system. That is, for both, modern architecture is defined through the absent—or at least suppressed—body. If the body is considered the original model for architecture, then it is also the anthropomorphized god-shaped hole around which architectural discourse orbits.

I also examined the status of Modulor within this same formation. It has been employed either as an example of how modernist architecture was actually contiguous with the classical tradition defined by Vitruvius or of how one might recover the content of that tradition within a modern idiom. In both cases, the Modulor Man operates isomorphically to the Vitruvian Figure. However, I have also shown how the Modulor presents a problem for these same discourses' historiographic presumptions. Analyzing this condition allowed the Modulor to serve as a hinge through which to construct a rather different account of the body in modern architecture, one in which the mid-twentieth-century's attempt to re-ground architecture through reference to a human figure does not reflect an anthropocentrism like that of Renaissance humanism any more than it marks a fundamental rupture with a classical or Humanist tradition.

More counter-intuitively, I hope to have mapped how the idea of a "Vitruvian" tradition, its "Renaissance" in fifteenth- and sixteenth-century Italy, and the architectural principles of humanism this tradition is said to embody, operate as the historical *a priori* of late-modernist architectural discourse on post-humanism. The mid- and late twentieth-century attempts

to anchor architecture through reference to a human figure or an order derived from the body do not mark a return to the anthropocentrism of Renaissance humanism any more than it marks a fundamental rupture with a classical or Humanist tradition. Instead, it indexes important conditions within modernity itself, and of architecture's condition therein as a modern body of knowledge.

What these figures indicate is architecture's constitutive lack of a theory of form for the subject of the modern sciences. And these figures surface within attempts to develop just such a theory of form. The lack of such a theory, I hope to have shown, is not something to overcome but rather is constitutive of the discipline in modernity. The apparent classical "humanism" of this discourse was merely a surface effect of its attempt to engage the problem of form for a modern subject, a problem poised between the poles of Nature and Culture and which it attempted to mediate. In other words, the architectural body, the Vitruvian Figure and its extension as Renaissance Humanism are constructed as a site of introjection that allows modern architecture to articulate problems that remain elusive in their own terms. The effort in the middle of the twentieth century was fleeting because, as we have seen in the Modulor, attempting to gird the figure of the human through architectural formalism could only reveal that subject as a construction and would unbind the very basis of the architectural knowledge that it attempted to conserve.

If so, then recent architectural discourse can be understood differently as well. However radical or critical the phenomenologists or post-structuralists appear to be, both are essentially conservative in that they seek to recover, protect and extend "Architecture" as a body of knowledge within the midst of external cultural and technological pressure. Post-structuralists, for example, present their architectures as "alternative" geometries or "other" architectures against a Vitruvian tradition; but, as we have seen, this dialectic of alterity necessarily depends upon *conserving* the husk of the model against which it is premised. The Vitruvian body continues to delimit the interiority of architecture, even in *absentia*, in the way negative theology continues to be defined through a religious cosmology, however inverted. Nowhere is this more true than in the latest fascinations with the genetic algorithm in architecture, which adopts wholesale a modern understanding of the Vitruvian dictates, including its emphasis on the organic integration of form and structure, however innovative the forms may appear. Thus, the rejection of the Vitruvian system is made in order to conserve the architectural discipline that has been defined in its historical shadow.

Ironically, as we have seen, within these histories of continuity, this can only mean preserving the discipline as traditionally construed since Vitruvius. Likewise, characterizations of modernity as a chaotic, schizophrenic condition or dramatic break inherently depend upon an unproblematized

model of normality (which in architecture gets the name Vitruvian, or classical). The whole, the stable, the continuous tradition of architecture are thus retained as models and any change can only be understood by degrees of resemblance to them. One might suppose that such a total historiography configured around a synchronic progression has been supplanted, but as we have discovered, it tacitly informs recent and contemporary architectural theory and causes them to be deeply invested in references to the continuity of tradition, the maintenance of models and the retracing of origins, however radical or conservative these theories may present themselves. A different sort of account is required than that of a historical tradition and modern rupture.

In this book, "history" serves as an epistemological terrain and only one way of making the past available to present knowledge. We need to question the assumption of resemblance and continuity and not presume that architecture is a continuous discipline but has distinct and incompatible formations at different moments in history. There is no eschatological crisis, but rather the possibility of a description of architecture that allows real transformation rather than mere resemblances to a Vitruvian model. Just as events that occur at the same moment are not necessarily isomorphic or commensurable, the repetition of an object of historical analysis—be it a statement, a text, a concept, a drawing, or a combination of these things in the Vitruvian Figure—does not mean it remains the same object. That is, objects of historical knowledge are not necessarily continuous simply because the same name is employed, nor does that to which this name refers necessarily operate within the same space of possibility and with the same function. Their network of relations and specifications need to be continually described and re-mapped according to the problem before us and its relationship to the present. This means that, for example, the Vitruvian Figure of the first century BC, of the Italian Renaissance and that object referred to by Wittkower in the middle of the twentieth century in Britain are not necessarily the same object of knowledge, that its tracks do not belong to exactly the same bodies (of knowledge), and that these are multiple.

Once we suspend the assumption of the continuity of objects, periods and knowledge, we might return to Vitruvius's text with different results. The passages from Vitruvius's treatise that refer to the body constitute only relatively brief sections, mostly confined to just one of the ten books, most of which are scarcely relevant to what we call architecture today. It is worth remembering that Vitruvius defined a three-fold definition of architectural practice:

> *There are three departments of architecture: the art of building, the making of timepieces and the construction of machinery. Building is, in its turn, divided into two parts, of which the first is the construction of fortified towns and of works for general use in public places, and the second is the putting up of structures for private individuals. There are*

> *three classes of public buildings: the first for defensive, the second for religious and the third for utilitarian purposes. Under defense comes the planning of walls, towers, and gates, permanent devices for resistance against hostile attacks; under religion, the erection of fanes and temples to the immortal gods; under utility, the provision of meeting places for public use, such as harbors, markets, colonnades, baths, theatres, promenades, and all other similar arrangements in public places.*[1]

One might argue that architecture now concerns only the first of Vitruvius's three departments, yet the nature of building itself has been altered: architects rarely design defensive structures, the delineation between public and private structures is not the same, and the place of religious buildings in culture is different. Distinctions of architecture from engineering are made differently; the relationship of a temple to a fortress is also rather foreign. The central role of the architect in the defense of the state alone should alert us to the rather different position of the architect and his craft within the broader configurations of culture and society. Moreover, Vitruvius included a series of knowledges and criteria for design unrelated to today's concepts or practices.[2] Vitruvius writes of an architecture embedded in a foreign world, one that enjoyed a different configuration of knowledge and practices. Most of the text deals with issues that are not just outdated but that can make no sense to us. Why should we assume that what we call architecture and what Vitruvius calls architecture are transparent to one another? For us, the experience of reading Vitruvius should elicit a similar response as Foucault's reading of Borges' Chinese Encyclopedia. We should laugh in shock of its strangeness to our way of organizing what seem to be the same materials.

That we do not guffaw suggests that the Vitruvius who configures contemporary architectural discourse was constructed through the modern conditions of architecture that I have described. As transparent as Vitruvius's fleeting passages of the body as model may seem, there is no reason to assume that they are any more accessible. Indeed, as I hope to have demonstrated, the apparent familiarity of these passages result from their role as a site through which modern architecture has interjected its own problems. This Vitruvian Body was constructed rather more recently than we might suppose.

This should not be confused with relativist claims. I am not arguing whether Vitruvius's text was central to what we call the Renaissance, or later. I am not disputing that someone called Vitruvius wrote a text at the turn of the millennium, and that this text contained a description of a human figure inscribed into a circle and square. What I am claiming is that the Vitruvian Figure is a different object for modern architecture than it was for the author called "Vitruvius" and for the architects and theorists of the *quattrocento*, and that an empirical account of the past does not provide its historicity in the present. Nevertheless, I am not simply saying that its

interpretation changes according to the context. The object does not even "mutate" or transform so much as its conditions of possibility are fluid and specify different objects of knowledge. Instead, I have been concerned with the construction of the classical tradition within the modern architectural practices and knowledge. We continually return to this as an origin not because it is opposed to modernity or speaks to eternal value, but because it has been immanent to the construction of modern architectural thought.

One implication is that one cannot properly speak about a continuity of the discipline of architecture before (roughly) the nineteenth century. Before that, one might refer to something called "architecture," but this name refers to something constituted through a different organization of discourses, institutions, practices, patronage, objects and representations. The history of architecture as we know it is the history of architecture as constituted as a field of practice and knowledge within modernity. Now different historical accounts become possible that no longer replay this dialectical identity between tradition and the new. I hope I may have contributed to this in some minor way.

UNTIMELY MEDIATIONS

The irony of my title, a play on Wittkower's own title should now be apparent. As previously mentioned, Wittkower's title, "Architectural Principles in the Age of Humanism," was itself a play on Geoffrey Scott's then influential book *The Architecture of Humanism*. Scott presented a theory of Renaissance architecture that Wittkower caricatured as "hedonist" because it referred to issues of order purely to the realm of the senses. Moreover, Wittkower argued that Scott anachronistically applied modern ideas to the world of Alberti and Palladio. In turn, Wittkower provided a different description of the same architecture, emphasizing the centrality of a religious belief and systems of philosophy to Renaissance problems of architectural form. Wittkower was also anachronistic to some degree, but more importantly, as for Scott, the Renaissance was constructed as a site of origin through which to parse problems and objects of modern architectural knowledge, including what he called the Renaissance itself and humanist architecture, its use of the Vitruvian Figure, and the geometries. His architectural principles are those belonging to modernity.

If Wittkower's Age of Humanism was not as secular as his predecessors portrayed it, my portrayal of Modern Architecture is not so humanist. Hence my "back to the future" invocation of cybernetics. Cybernetics and the cyborg stand in contemporary theory for the post-human, and moreover, mark the mid-century emergence of such a techno-social hybrid. This stands in stark opposition to the normal treatment of things like the Modulor as representative of a distinctly humanist past. Rather, as I have shown, they are always impure assemblages of subject, technologies and concepts that

cannot be explained by reference to ideal historical models, but which in fact enfold such references as components in their anthropogenic assemblages. Moreover, they referred to the same modern bodies of knowledge that would give rise to cybernetic frameworks of life.

In turn, I have described an anthropomorphic architecture that is never quite so "humanist" or anthropocentric as one might expect. Typically in architecture, and as represented by the common interpretation of the Vitruvian Figure of Modulor Man, anthropomorphism—the projection of a human form or human values onto non-human things—is seen to represent some sort of anthropocentrism, often conflated with Humanism. If phenomenologists argue that modern architecture broke with a humanist architecture, post-structuralists broadly agree, except that for them this modern break has been perpetually delayed. Yet they all agree that this system operates through metaphorical anthropomorphism and that this anthropomorphism is the formal embodiment of an anthropocentric world-view, which it both represents and which it, in turn, projects onto architecture's subjects.

In contrast, one of the implications of this book's analyses is that anthropocentrism and anthropomorphism must be distinguished because they refer to different conditions of possibility. Anthropomorphism is based upon representations of the world as available through that subject, while anthropocentrism relies on an ordering that is independent of the subject. The former refers to a previous organization of knowledge in which the human subject is located at the apex, or center, of a divine or natural order. Anthropomorphism, on the other hand, articulates the de-centering of the subject in modernity such that it becomes possible to conceptually, metaphorically and formally project an order thought proper to the human onto a world of objects defined as "inhuman."

Such projections are only possible once the subject is itself capable of representation as an object of knowledge in the same way as the rest of nature. This became possible when knowledge was involuted onto the subject—as, for example, with the so-called Kantian revolution—beginning in the late eighteenth century and the various ways subjects are produced through the biological, social and psychological sciences. Indeed, it is worth recalling that the word anthropomorphism itself was coined in eighteenth-century France—not ancient Athens or fifteenth-century Florence. Rousseau's *Emile* was probably the first text to employ it in a modern sense, though it did not become widespread until the latter half of the nineteenth century. An eminent theologian, for example, provided a long entry on the topic in the 1910 *Encyclopedia Britannica*, where it is placed in relationship to theological debates about secularism and biological and physical sciences in the wake of evolution; later it would emerge in relationship to epistemological questions that seemed to be raised by quantum mechanics.[3] This article demonstrates how in the early twentieth century the problem of

anthropomorphism hinged on a paradox. At the same moment, evolution and quantum mechanics seemed to displace humanity from a privileged center from which the world of Nature could be rationally deciphered *in toto*, this dislocation was accompanied by an involution of knowledge. The relationship, or situatedness, of the subject to the object of study, including the study of the human, now mattered. What could be known was to some degree necessarily anthropomorphic in that it was only the subject that provided the conditions for knowing about things.[4] Likewise, as we have seen, the "humanism" which concerned Wittkower, Le Corbusier and Giedion circulated within the space of representation across which modern knowledge is constructed—between mirrors of reflection, projection and distortion that occupy the modern axis of subject and object, Nature and Culture, organism and environment. Any study of animal intelligence or one that sought to find in nature models for culture, such as primatology and more recently complexity and sociobiology, immediately confronts the problem. In other words, anthropomorphism became a problem first in those discourses most concerned with the apparent displacement of humanity from a privileged position in relation to the natural and supernatural and the subject's immersion within a single plane of natural phenomena.

That is to say, anthropomorphism could only become a problem the moment it became possible to project human form (*anthropos*)—physical, cultural or conceptual—through an organization of things that suddenly included humanity as both its condition of knowledge and as one of its objects of knowledge, but which seems distant from the self and thus required a space of projection, or representation. This space of anthropomorphic projection is that of the modern subject. To forget this condition or confuse it with other forms of humanism, as architecture does, confuses effects for constitutive conditions.

Ironically, remembering anthropomorphism not as a thing but as a space of representation and dynamic of reflection and projection may offer the best alternative to its humanist interpretations. Tellingly, this paradox was most powerfully examined by Nietzsche's text, "On Truth and Lying in an Extra-Moral Sense."[5] Nietzsche famously began with the question, "What is truth? A mobile army of metaphors, metonyms, anthropomorphisms, in short the sum of human relations which were poetically and rhetorically transferred and adorned and long after use seem solid, canonical, and binding to a nation."[6] Nietzsche argued that truths appear as such only when the prodigious mobility of concepts produced via tropes become frozen by repetition. Indeed, what are commonly taken as truths are in fact:

> *[merely] worn out metaphors without sensory impact, coins which have lost their image and now can only be used as metal and no longer as coins…Whoever feels that coldness will scarcely believe that even the concept… is just what is left over as the* residue of metaphor.[7]

Exactly because they have lost their generative tropic effects, these *conceptual residues* appear as *cold*, hard facts.[8] Truths are *not* tropes but repetitions, trite clichés like: a "primal identification," the idea that the Modulor simply repeats a humanism fixed with the Renaissance rediscovery of the Vitruvian Figure, or that this figure was itself the origin of a Western tradition of architecture.

Ever the philologist, Nietzsche was well aware that within his sequence of terms "anthropomorphism" neither elaborates the previous two terms of metonymy and metaphor, nor serves as their dialectical synthesis. Unlike those figures of speech, anthropomorphism imposes a singular proper name (*anthropos*).[9] Accordingly, anthropomorphism emerges as the most important term in Nietzsche's sequence because it is prematurely residual. In the creation of concepts, the "human" is projected as:

> *[the] measure of all things, but his point of departure is the* error *of believing that he has these things before him as pure objects. He thus* forgets *that the original intuitive metaphors are indeed metaphors and takes them for the things themselves.*[10]

Nietzsche's reading problematizes anthropomorphism's status as a representation of humanism; he argues that "only insofar as man forgets himself as a subject, indeed as an *artistically creative* subject, does he live with some calm, security, and constancy."[11] To remember the projection can therefore be understood as the remembrance of this subject's conditions of enunciation, to remember the fluidity of forms rather than fixed names. Nietzsche shifted significance from *anthropos* to *morphe*, from the name of things to the processes of formation and naming of those things.

Bruno Latour suggests a similar reversal in *We Have Never Been Modern* as a way of understanding our promiscuous proliferation of forms :

> *If the human does not possess a stable form, it is not formless for all that… The expression "anthropomorphic" considerably underestimates our humanity. We should be talking about morphism. Morphism is the place where technomorphisms, zoomorphisms, phusimorphisms, ideomorphisms, theomorphisms, sociomorphisms, psychomorphisms, all come together. Their alliances and their exchanges, taken together are what define the* anthropos.[12]

When he traced the structuring of modern knowledge as a dichotomy between two poles of nature and culture, Latour also argued that while this constitution provides a set of ontological and epistemological distinctions, at another level modernity ignores these completely, proliferating forms of knowledge and objects that he calls hybrids and Michel Serres has termed quasi-subjects/objects that freely combine both poles, and indeed cannot ultimately be understood via these dichotomies.[13] Even as it guards its categories, modernity proliferates new forms, including the human subject made available to the sciences. We erect a variety of intellectual scaffolds, from Neo-Kantianism, to phenomenology, to behaviorism, to post-modernism,

to span the categories of Nature and Culture, Object and Subject, elevating one over the other or using one to attempt to bridge their gap, but nonetheless reinforcing their distinction. Each attempt to bridge the two categories has only succeeded in widening the intellectual gap. Meanwhile, problems, technologies and practices proliferate that belong to neither side but are rather irreducible mixtures. Latour suggests the systems and devices of empirical measurement are the mediators *par excellence* for all these exchanges and assemblages. I hope to have suggested, in turn, how the attempt to develop proportional measurement systems in mid-twentieth century architecture similarly.

If we should limit our continuity of architecture to a modernity through which its practices and objects are specified, and if that modern architecture is articulated through a specifically modern formulation of anthropomorphism, then it might appear that I am arguing that architecture is necessarily anthropomorphic, and thereby end up supporting aspects of Pérez-Gómez's and Rykwert's arguments. At least, I seem to unearth Geoffrey Scott's arguments from the grave dug by Wittkower. However, all these writers treat anthropomorphism as a transcendental *a priori* of architecture while I have shown through my analyses of the mid-century discourses on proportion that this condition is neither eternal, given by a body, nor transcendental but rather is historical. It is a condition of possibility for a specific set of discourses within modern architecture, not every possible architecture.

All this suggests that a post-humanist architectural future lay neither in a space "beyond" modernity, a return to the past, nor in finally becoming modern. The relationship of the body to architecture is neither a primal originary metaphor nor an obsolete archaism, but residual, worn out. Whatever the "body" may have been for architecture, it is not an object given by its historical, natural, metaphorical or even phenomenological conditions; the body, Vitruvian, fragmented, hybrid, or blobby, cannot provide a foundation for architectural order because it has itself been constructed as a site through which to articulate a theory of form for a modern subject.

AQUEOUS SOLUTIONS AND CONCLUSIONS

If modernity is defined as a something other than as simply a break with a classical model, and if architects return to the body, they do so not to return to an eternal truth nor because some original model has been superseded, but because it is a hybrid site of mediation. This, in turn, belies the image of architecture as an eternal and stable structuring of knowledge. For example, architecture entered Nietzsche's argument as a system of anthropomorphisms, wherein "the great structure of concepts displays the rigid regularity of a Roman columbarium."[14] This understanding derives from Nietzsche's accelerated Kantian aesthetics, in which the subject plays the role (conceptual persona) of the architect:

> *Man can probably be admired as a mighty architectural genius who succeeds in building a cathedral on foundations that move like flowing water… man builds out of the much more delicate material of concepts which he must fabricate out of his own self.*[15]

We could oppose here the anti-architectural ontology of Norbert Wiener's suggestion in this chapter's epigraph that "we" are but temporary informational patterns, "whirlpools" in a river of matter. Wiener's vortices might also be contrasted to the spiral forms so often found in architectural discussions of ordering. If tropic displacement produces individual concepts, an architectural trope assembles them into an edifice, or schema, of thought. Architectural anthropomorphism is powerful not because it produces the conditions of Being as dwelling, but because it arranges clichéd residues into a normative schema. We act as priests who guard this cathedral with all the power and limitations this entails, turning Wittkower's description of Renaissance architecture as a religious symbolic form into a belief system in itself. We remove architecture from the fluid forces of the built environment, and through the institutions of architecture, buttress this cathedral and guard the entrance as a sacred domain. Access is granted by belief in narratives, interpreting sacred texts, *De Architectura*, *Architectural Principles*, and so on. Meanwhile, the economic, social and physical processes of the built environment freely flow across the territories they guard, oblivious to the tenuous foundations of our holy archipelago.

If architecture as we know it is a product of this same formation of modern knowledge, its patterns will not outlast its division of Nature and Culture. As mentioned in the Introduction, we live in a time when theories of form and new formalisms, often derived from scientific or technological metaphors and enabled by computation, seem to proliferate with an accelerating rate of obsolescence. At the same time, these forms and various formalisms are disparaged as superficial, overly abstract, or academic. The architect's future is sometimes presented as that between becoming a super-specialized designer of form, and becoming a manager of extra-architectural forces, often accompanied by eschatological claims as to the end of architecture.[16] This choice is often presented as either to revitalize the essence of architecture as understood historically or at least partially to dismantle this historical identity. Both the post-structuralists and phenomenologists examined in this book are committed to the first option. However, seeking recourse in the specialization in design forgets the historical contingency of this form of architectural practice-knowledge. The other choice, however, is also misguided because a simple rejection of the formal in architecture perpetuates a caricature of formalism that endlessly replays in the history of modern architecture and is in fact integral of its innovations. Thus, the formalists and the anti-formalists perpetuate the same economy of knowledge. Yet, the apparently endless churn of theories of architectural form has

served as a central avenue for its development. And I mean this not in the usual sense of an autonomous and introverted discourse about so-called "formalism" but rather in the relationship of the specificity of architectural thought and production to broader assemblages of practice and concepts that cannot be reduced to a facile essentialism like the *Zeitgeist*. That is, this very dialectic or pattern of disagreement preserves the body of architectural knowledge as an image formed in the late nineteenth century. However, we need not mourn its premature demise in a pathos of authenticity as do phenomenologists, nor celebrate its imminent eclipse only to conserve it as do post-structuralists. Nor must architecture choose between obsolescence and chasing technology. In the so-called "information age," a different configuration of practices, representations and objects may arise as different questions and constitutive problems become too pressing. There is no need to dream of the day that humanist architecture and its subject might be erased. The figure of the *anthropos* was never so clearly drawn. Its contours were not etched in a sandy firmament soon to be washed away by the tides of "history," but are indeed more like the turbulent flow of the waves themselves, emerging as momentary singularities, vortices measurable only amidst the laminar and nonlinear flows of history. It is within this turbulent space of formation that architecture and its subjects whirl. And it is within this immanence that we can measure resistances and currents to surf alternative tangents.

APPENDICES, NOTES & INDEX

APPENDIX 1: NOTES ON TERMINOLOGY

MODERNITY AND MODERNISM I maintain a distinction between the terms modernist and modernism, on the one hand, and modernity and the modern, on the other. I also differentiate the term "classicism" from the "classical" in a similar manner. By the first set, I refer to the stylistic and ideological movements typically understood to arise in the mid-nineteenth century. My use of these terms intentionally depends upon definitions produced within discourses of modernism, such as offered by Giedion's *Space, Time and Architecture* and Hitchcock and Johnson's *The International Style*[1] for the simple reason that the critics of modernism I examine more or less base their revisions upon these once dominant characterizations of modern architecture. These terms become less significant by the end of the book but are temporarily useful for describing a historical object of inquiry.

By "modernity," "modern," and the "classical," however, I refer to a specific configuration of knowledge, a relationship between subjects, objects, discourses and representation defined not through an appeal to simultaneity or homogeneity, nor even limited to consistencies of statements but rather the difference which exists, patterns of diffraction, the range of possible disagreements, the organization of institutions, texts and actors that operated therein, and so on. The media through which ideas are formulated, organized and disseminated is also integral to this; in the time period I am examining, the proliferation of architectural publications and an internationalized readership made possible both by media and air travel are crucial. Often, I employ modernism and modernist in the register of empirical histories while the modern and modernity refer to what Foucault described as an "archaeological" form of description in which architecture operates according to "discursive formations" not necessarily determined by conventional disciplinary boundaries or periods. Likewise, the questions that constantly emerge are those concerned with the conditions of possibility for modern architecture and the relationship of modernist discourse to it.

In this sense, it should be obvious that it is possible that modernist architecture is not necessarily modern; inversely, it is possible to have a classical architecture that does not appear in the classical style or a classicist architecture that is modern. But by the same token, it is possible to have a modernist architecture that appears to retain elements and even underlying orders of classicism but which remains, in fact, definitively modern. Finally, it is possible that within modernity something that conventionally belongs to the "classical" past in fact operates as a component within a modern organization of knowledge.

This should not be confused with the definitions offered by Joseph Rykwert (which Peter Eisenman conflated with Foucault's historiographic terms), or Demetri Porphyrios's distinctions. Refer as well to Bernard Smith's

Modernism's History[2] as well as R. G. Collingwood's treatment of the ontological and epistemological operations of history in *The Idea of History* and *The Idea of Nature*[3] which argue for a fundamental connection between the rise of historical disciplines and those of the natural science in the nineteenth-century. Other works for further reading are by Matei Calinescu, Hilde Heynen; and Panayotis Tournikiotis.[4]

BODY AND FIGURE Architects often talk about something they call a "body," but what is usually being referred to is in fact a figure, or a representation of the body. This is, in turn, treated as if it were transparent to a physical body or at least to ideas of its organization. Wherever possible, I try to use the terms distinctly but often this would make my analyses more confusing since so many of the texts in question use the term "body" for figure.

Here a meeting of psychoanalysis and Kantianism might be useful in recalling the idea of the body image, in which, before we can say that we have a body of a certain form and organization, we need to have a schema through which we are able to recognize it. This is not the same as a model, nor an ideal body detached from lived experience or material reality, but nor is it delimited by these conditions. Instead, such schema informs what types of bodies, what sorts of things are recognized as such (as Parveen Adams argues in "Versions of the Body"[5]). This body image is a vital mediator between things and subjects. This complex relationship is crucial to understanding what might be at stake in recent attempts to formulate a humanist or "post-humanist" architecture.

Thus, while this book refers to an object of architectural knowledge called the "body," it is not an account of the body in architecture. Instead, my arguments concern the ways in which an object of knowledge called the body operates as a site through which to formulate problems of the relationship between form and systems of order with the subject, on the one hand, and epistemology and questions of ontology, on the other.

PROPORTION AND SCALE Proportion and scale are often confused within architectural writing and so I have not always been able to keep their uses distinct when referring to the work of architects and writers. In fact, the Modulor was in many ways based on their conflation. Proportion can be thought of as ratio, out of which a system of relationships can be developed that relate parts to wholes. It concerns the ordering of objects. Scale concerns the relationship of the subject's sense of embodiment to the object or a field; it concerns representations for the subject and his projections. The body has served as a model for rules of organic proportioning in architecture, but this is not quite the same as saying this relationship should be apparent through the subject's sense of scale.

APPENDIX 2: PROGRAM OF THE "PRIMO CONVEGNO INTERNAZIONALE SULLE PROPORZIONI NELLE ARTI"

Convened at the Ninth Milan Triennale, Milan, 27–29 September, 1951

27 SEPTEMBER

Introduction and convocation by Rudolf Wittkower
Topic: Proportion in history of art and history of thought
Chaired by: Rudolf Wittkower, Siegfried Giedion

Papers

Rudolf Wittkower, "Studies of Proportions in the Middle Ages and Renaissance"
Matila Ghyka, "Pentagonal Symmetry and Golden Section in the Morphology of Living Organisms"
James S. Ackerman, "Proportions in Gothic Architecture, Milan 1400"
Charles Funck-Hellet, "Golden Section in Italian Painting of Renaissance"

NB: Wittkower was unanimously elected President of the Congress at the end of the day.

28 SEPTEMBER

Topic: Mathematics proportions, music proportions, technical proportions, architectural proportions
Chaired by: Francesco Severi, Giuseppe Samona

Papers

Andreas Speiser, "Group Theory"
Hans Kayser, "Harmonik, the Sound in the World"
Siegfried Giedion, "The Whole and the Part in Contemporary Architecture"
Pier Luigi Nervi, "Proportions and Technics"
Ernesto Rogers, "Measure and Size"
Le Corbusier, "The Modulor"

29 SEPTEMBER

Topic: Proportion and intuition in the Arts
Chaired by: Giovanni Ricci

Papers

Max Bill, "The Idea in Space"
Gino Severini, "Harmonic Reflections between Antique and Modern Art"
Georges Vontongerloo, "Proportions and Symmetry"
Siegfried Giedion, "Synthesis of the Congress"

OTHER CONTRIBUTIONS

The following were positions and topics either circulated prior to the conference, presented in session debates or issues of discussion in the different sessions:

Cesare Bairati, "Greek Geometry and Hambridge's Theory"
Caronia Roberti, "The Geometric Basis of Proportion, Symmetry, and Eurhythmy"
Gillo Dorfles, "Incommensurability on the Musical Scale"
Carola Giedion, "Proportion in Paul Klee"
Nico Fasola, "Speaking on Proportion"
Lucio Fontana, "Proportions in the Space of Modern Architecture"
Mario Labò, "Equal and Unequal"
Mario Mollino, "Rhetorical and Aesthetic Theories on Proportion"
Giovanni Ricci, "Geometrical Rhythms and Clarity in 'Colleoni' by Verrocchio"
Alfred Roth, "Anarchical or Ordered Architecture?"
Piero Sampaolesi, "Proportions in the Arts"
Eva Tea, "Medieval Sources of Leonardo: Human Proportions in Baldinucci"
Adrien Turel, "Thesis of the Milan Triennial, 1951"
Bruno Zevi, "The Fourth Dimension and the Problem of Proportion in Modern Architecture"
Giorgio Castelfranco, "Bergson's Concept of Time and Space in his Criticism on the Figurative Arts"
Luigi Cosenza, "Researching a Modern Language to Speak about Architecture"
Gino Levi Montalcini, "Relativity of Real Proportions"

A NOTE ON SOURCES

Because I hope this book might be useful to students and instructors, and because even recent articles within architectural journals and texts often quickly go out of print, I try to refer the reader to the most available edition when there was no significant change in the text from its original publication or where any amendments are immaterial to my argument. In addition, when adequate English translations are available and most influential to the discourses I am examining, I tend to refer to these editions. When necessary in considering historical materials, I employ either the first edition or the edition most germane to the historical formation in which it operated. In any case, I provide the original publication data and where important an annotated bibliography.

1. INTRODUCTION

1 Lewis Mumford, *Myth of the Machine*, vol. 2: *The Pentagon of Power*, New York: Harcourt Brace Jovanovich, 1970.

2 Slavoj Žižek, "Welcome to the Desert of the Real!," *The South Atlantic Quarterly* vol. 101, no. 2 (2002), pp. 385–389. For the aftermath of this instant memory, refer to, among others: Andreas Huyssen, *Present Pasts*. Stanford, CA: Stanford University Press, 2003, pp. 158–163.

3 What Žižek, after Lacan, terms the symbolic real.

4 Jean-Paul Sartre, *Being and Nothingness*, trans. Hazel E. Barns, London: Routledge, [1969] 2000, p. 325.

5 Anthony Vidler, *The Architectural Uncanny*, Cambridge, MA: MIT Press, 1992, pp. 69–82.

6 Judith Butler, *Precarious Life: The Power of Mourning and Violence*, New York: Verso, 2004.

7 Giorgio Agamben, *State of Exception*, Chicago: University of Chicago Press, 2005.

8 Beyond architecture, the Vitruvian Figure plays a walk-on role in the popular New Age paranoid imagination, whether in the *Da Vinci Code*, or as the hook for the latest diet craze.

9 As Sanford Kwinter has recently restated in *Architectures of Time*, Cambridge, MA: MIT Press, 2002.

10 Sylvia Lavin, "Theory into History: Or, the Will to Anthology," *The Journal of the Society of Architectural Historians*, vol. 58, no. 3 (Sept. 1999), p. 498.

11 Louis Marin, *Portrait of the King*, Minneapolis: University of Minnesota Press, 1994.

12 For how these tropes of the body informed scientific thought, refer to Fernand Hallyn, *The Poetic Structure of the World*, New York: Zone Books, 1990, pp. 73–103.

13 William J. Mitchell, *The Reconfigured Eye: Visual Truth in the Post-Photographic Age*, Cambridge, MA: MIT Press, 1992, pp. 18, 27, 182.

14 Jonathan Crary, *Techniques of the Observer*, Cambridge, MA: MIT Press, 1990, p. 1. Crary's and Mitchell's theories are incompatible in other respects (the latter depends upon an empirical scientism incompatible with the former's theoretical framework of French post-structuralism) but both present a very similar historical understanding of the image-producing technologies of modernity and their successors. The idea that digital technologies are fundamentally altering visuality and its

subject is a leitmotif in art, media and technology studies.

15 Fredric Jameson, "Postmodernism, or the Cultural Logic of Late Capitalism," *New Left Review* vol. 146 (1984), p. 87.

16 Martin Heidegger, "The End of Philosophy and the Task of Thinking," in *Basic Writings*, 2nd edn, New York: HarperCollins, 1977, p. 434.

17 Georges Canguilhem, "The Knowledge and the Living," in *A Vital Rationalist: Selected Writings from Georges Canguilhem*, New York: Zone Books, 1994, pp. 303–320.

18 Giorgio Agamben, *The Open: Man and Animal*, Stanford, CA: Stanford University Press, p. 75.

19 N. Katherine Hayles, *How We Became Post-human: Virtual Bodies in Cybernetics, Literature and Informatics*, Chicago: University of Chicago Press, 1999.

20 Ben van Berkel, Caroline Bos, UNStudio, *MOVE*, vol. 2 Netherlands: Good Press, 1999, p. 85.

21 The three category distinctions that Donna Haraway argued distinguish humanism from a post-humanist ontology. Donna Haraway, *Simians, Cyborgs, and Women: The Reinvention of Nature*, London: Free Association Books: 1991, pp. 151–153.

22 As Walter Benjamin stated, theoretical history "grasps the constellation which his own era has formed with a definite earlier one." Walter Benjamin, "Theses on the Philosophy of History," in *Illuminations*, New York: Harcourt Brace Jovanovich, 1968, p. 263.

2. THE PHENOMENAL ORIGIN OF ARCHITECTURE

1 Joseph Rykwert, "Body and Building," *Daedalus* vol. 45 (Sept. 1992), p. 109.

2 Greg Lynn, "From Body to Blob," *Anybody*, Cambridge, MA: MIT Press, 1997, pp. 171–172.

3 Joseph Rykwert, *The Dancing Column*, Cambridge, MA: MIT Press, 1996, p. 373.

4 Vitruvius Pollio, *The Ten Books on Architecture*, trans. Morris Hicky Morgan, London: Oxford University Press, 1914, pp. 73–74.

5 Rudolf Wittkower, *Architectural Principles in the Age of Humanism*, 2nd edn, London: Tiranti, 1952, pp. 6–7.

6 Rykwert, *Dancing Column*, pp. 373–374. This "primal identification" is evidenced through a repetition of images of statuary photographed in isolation in a museum and ruins of temples which show only a few remaining standing columns. The primal identity is apparently clearest in fragments, suggesting that it is perhaps as much a curatorial or art historical identification as anything else. Indeed, it is a historical identification produced by the forms of history amenable to representation within museums.

7 Alberto Pérez-Gómez, "Hermeneutics as Architectural Discourse: Cloud-Cuckoo-Land," *International Journal of Architectural Theory*, vol. 2, no. 2 (November, 1997), p. 1. This assertion is rather problematic in its naturalization of the history of Western European architecture as the model for all architecture. It is especially odd considering Pérez-Gómez is originally from Mexico while the tradition he champions was an agent of colonialism in Central and South America. He basically writes other traditions of architecture out of history, elevating the Greek and Italian Renaissance as the model for all others. The colonialist implications of his arguments lay beyond my present scope specifically, though my critique and the end of this chapter show that his and Rykwert's history operates according to a logic of the Same which could be the theoretical basis of such. See also: A. Pérez-Gómez, "The Case for Hermeneutics as Architectural Discourse," in Halina Dunin-Woyseth and Kaj Noschis (eds) *Architecture*

and Teaching: Epistemological Foundations, Lausanne: Comportements, 1998.

8 Alberto Pérez-Gómez, *Architecture and the Crisis of Modern Science*, Cambridge, MA: MIT Press, 1983, p. 3.

9 Ibid., p. 3.

10 Rykwert, *Dancing Column*, pp. 373–374.

11 Mary Douglas, *Purity and Danger*, London: Routledge, [1966] 1991, pp. 115–116. Rykwert's archeological and ethnographic reconstruction of ancient Greek culture replays the cultural projections evident in Douglas's work, wherein an "other" culture serves as the site through which to introject understandings of Western modern society. In classic anthropology, such sites tended to be "traditional" and non-Western, so that examining them supposedly allowed insight in the origin of more "advanced" civilizations. In architecture a similar process occurs, with the ancient Greeks serving as a "primitive" origin of our condition.

12 Martin Heidegger, "Building Dwelling Thinking," in *Basic Writings*, London: Routledge, [1954] 1993, pp. 347–363.

13 On the violence of naming, see Jacques Derrida, *Of Grammatology*, Baltimore, MD: Johns Hopkins Press, 1974, pp. 81–87, 101–140.

14 On the relationship between the animal open and the bounded human world, refer to: Giorgio Agamben, *The Open*, Stanford, CA: Stanford University Press, 2004.

15 Pérez-Gómez, *Architecture and the Crisis of Modern Science*, p. 35.

16 Pérez-Gómez takes the phrase "beginning of the end" from Peter Eisenman but uses it differently, as will be examined shortly. Pérez-Gómez, "Hermeneutics."

17 Claude Perrault, *Ordonnance for the Five Kinds of Columns after the Method of the Ancients*, trans. Indra Kagis McEwen, Santa Monica, CA: Getty Center for the History of Art and the Humanities, 1993, pp. 51–53.

18 Perrault, *Ordonnance*, Ch. 7.

19 Claude Perrault, *Ordonnance for the five kinds of Columns after the method of the Ancients*, Santa Monica, CA: Getty Center for the History of Art and the Humanities, 1993. Originally published: *Ordonnance des cinq espèces de colonnes selon la méthode de anciens*, Paris: Jean Baptiste Coignard, 1683; 2nd enlarged and revised edition, 1684.

20 Pérez-Gómez, *Architecture and the Crisis of Modern Science*, p. 32.

21 Pérez-Gómez, "Introduction," to C. Perrault (1993) *Ordonnance*, p. 3.

22 Ibid., p. 35.

23 Rykwert, *The Dancing Column*, pp. 373–374.

24 Ibid., p. 374.

25 Rykwert and Pérez-Gómez do not engage Kantian aesthetics. They refer to Burke and Hume, but not to Kant's "Third Critique." What Rykwert and Pérez-Gómez mean by aesthetics seems to be the notions of aesthetics as taste and subjective preference. They do not engage it as a problematic of modern thought as Kant did in his critical project. The avoidance of Kant in favor of easier targets is noteworthy.

26 Pérez-Gómez, *Architecture and the Crisis of Modern Science*, p. 311.

27 Ibid., p. 311.

28 Ibid., p. 300.

29 Ibid., p. 300.

30 The saying "Ornament is crime" stems, of course from the title of Adolf Loos's famous manifesto. Though taken as a slogan of modern architecture, out of context, it misrepresents Loos's arguments, which present a far more nuanced argument about the decoration and order. Rykwert does not seem concerned with this distinction, however.

31 One only needs to think of some common tropes to see this sense at work: one "strips bare" the "raw" reality, etc.

32 This is a misrepresentation of Mumford who was actually arguing that as

with traditional cities, most of the fabric of the modern city should not call attention to itself but provide a background against which monuments and symbolic spaces could be read. See, for example, Mumford's *The Culture of Cities* or *The History of the City*.

33 Ironically, this repeats the arguments that the supreme apologist for modernism, Giedion, made in *Mechanization Takes Command*, as we will see in a later chapter.

34 Gianni Vattimo, *The End of Modernity*, Cambridge: Polity Press, 1988, p. 34. Vattimo problematizes this position. For a different but equally strong critique refer to Langdon Winner, *Autonomous Technology*, Cambridge, MA: MIT Press, 1977.

35 Rykwert, *Dancing Column*, p. 383.

36 Pérez-Gómez, *Architecture and the Crisis of Modern Science*, p. 311.

37 Ibid., p. 4.

38 Vattimo, *The End of Modernity*, p. 32. In *Über den Humanismus* (1946), Martin Heidegger argued that humanism is part and parcel of the Western metaphysical system.

39 See Pérez-Gómez, *Architecture and the Crisis of Modern Science*, pp. 323–324.

40 Sanford Kwinter, *Architectures of Time*, Cambridge, MA: MIT Press, 2002, pp. 35–36.

41 Marta Braun, *Picturing Time*, Chicago: University of Chicago Press, 1992; Brian Coe, *Muybridge and the Chronophotographers*, London: Museum of the Moving Image, 1992; François Dagognet, *Etienne-Jules Marey*, New York: Zone Books, 1992.

42 Jonathan Crary, *Suspensions of Perception*, Cambridge, MA: MIT Press, 1999, pp. 138–148.

43 Ibid., p. 140.

44 Lisa Cartwright and Brian Goldfarb, "Radiography, Cinematography and the Decline of the Lens," in *Zone 6: Incorporations*, New York: Zone Books, 1992, pp. 190–201. See also: Evelyn Fox Keller, "The Biological Gaze," in *Future Natural*, London: Routledge, 1996, pp. 107–121. Stan Allen has written extensively on the importance of cinema, with its mobile mise-en-scène rather than the fixed perspectival subject viewpoint for the conceptions of modern architecture.

45 Cf. Catherine Caufield, *Multiple Exposure: Chronicle of the Radiation Age*, Chicago: University of Chicago Press, 1989, pp. 2–38.

46 Edmund Husserl, *The Origin of Geometry*, London: Bison Books, 1989.

47 As quoted in Vattimo, *End of Modernity*, p. 19.

48 Marshal Berman, *All that is Solid Melts into the Air: The Experience of Modernity*, London: Penguin, 1986, Introduction.

49 Walter Benjamin, *The Arcades Project*, trans. H. Eiland and K. McLaughlin, Cambridge, MA: Harvard University Press, 1999, p. 111. This statement was made as a way of understanding history and as a point of contrast to Louis-Auguste Blanqui's view in which "the universe repeats itself endlessly and paws the ground in place" (Blanqui, *L'Eternité par les astres: Hypothèse astronomique*, Paris, 1872, as quoted by Benjamin, in *The Arcades Project*, p. 115). One can see this dialectic between Benjamin and Blanqui replayed today in much of architectural discourse between those who see the modern world as one of radical strife and those who see it as a repetition of instabilities that have always existed.

50 In reference to Durand, this sentence summarizes the conclusion to Pérez-Gómez, *Architecture and the Crisis of Modern Science*, pp. 323–326.

51 Rykwert, *Dancing Column*, p. 373.

52 Ibid., p. 274.

53 Rykwert and Pérez-Gómez both claim that there is no such thing as meaningless structure but what this statement itself means is a bit nebulous. Is it that meaning is a requirement in

order to call a building architecture or is it that all construction has meaning? If the former, then it would seem to contradict parts of the hermeneutic and phenomenological theory they employ. If the latter, their critique of modernism would be that it simply refers to what they think are superficial references rather than "real" poetics. In that case, the argument collapses into simple moralism.

54 Pérez-Gómez, "Hermeneutics," p. 3.

55 In this way, they also mobilize Hegel's idea of the death of art, in which we supposedly continually re-experience this death or loss as an ongoing crisis.

56 Vattimo, *The End of Modernity*, p. 23. It is this pathos of lost authenticity that is far more dangerous than nihilism; in its most sinister, Vattimo argues that this tendency within Heidegger's writings for a nostalgia for Being was symptomatic of that which attracted him to National Socialism's promises of a recovered mythic past through nationalistic and racial identification with a pure origin.

57 Pérez-Gómez, "Hermeneutics," p. 3.

58 Matei Calinescu, *Five Faces of Modernity*, Durham, NC: Duke University Press, 1987, pp. 27–30.

59 Bruno Latour, *We Have Never Been Modern*, Cambridge, MA: Harvard University Press, 1993, pp. 57–58.

60 Latour criticizes phenomenology as an attempt "to establish the great split… it jettisoned the two poles of pure consciousness and pure object and spread itself, literally, over the middle in an attempt to cover the now gaping hole that it senses it could no longer absorb." Ibid., pp. 57–58.

61 Their characterization of structuralism certainly bears little resemblance to the nuanced texts of Lévi-Strauss or Lacan.

62 Winner, *Autonomous Technology*, pp. 2–43.

3. THE STRUCTURAL CONTINUITIES OF CLASSICISM

1 The Deconstructivist show at the Museum of Modern Art in New York is perhaps the best known—though misconstrued—attempt to establish this agenda.

2 Diana I. Agrest, "Architecture from Without: Body, Logic, Sex," in K. Nesbit (ed.) *Theorizing a New Agenda for Architecture*, New York: Princeton Architectural Press, 1996, p. 543. Originally published in *Assemblage*, No. 7, Cambridge, MA: MIT Press, 1988, pp. 29–41. Agrest primarily focuses on how the feminine is excluded and/or repressed from the system, performing a classic post-modern reversal by arguing that it is what is excluded that defines the system as much as what is included.

3 Agrest, "Architecture from Without," p. 543.

4 Ibid., p. 544.

5 Ibid., p. 545.

6 Greg Lynn, "Body Matters," *Journal of Philosophy and the Visual Arts: The Body*, Andrew Benjamin (ed.) London: Academy Group, 1993, pp. 61–69. Republished in: Lynn, *Folds, Bodies, Blobs: Collected Essays*, Belgium: la Lettre Volée, 1998.

7 Agrest, "Architecture from Without," p. 546.

8 Ibid., p. 543.

9 Ibid., p. 544.

10 Lynn, *Folds, Bodies, Blobs*, p. 143. Involution is a concept of transformation developed by Deleuze as a critique of "evolution." Refer to Keith Ansell Pearson, *Germinal Life*, London: Routledge, 1998.

11 Agrest, "Architecture from Without," p. 552.

12 The distinction between sex, gender and sexual identity is not always consistently made in architectural discourse.

13 In this regard, Agrest's text remains a landmark in a burgeoning field of gender and

feminist studies of architecture that has greatly expanded since Agrest was writing in 1988. The accounts of gender in architecture are now a vast archive, a comprehensive account of which lie far beyond the scope or possibility of the present work.

14 Agrest, "Architecture from Without," p. 542.

15 Ibid., p. 543.

16 Ibid., p. 542.

17 Ibid., p. 549.

18 Ibid., p. 542.

19 Ibid., p. 549.

20 Ibid., p. 543.

21 Catherine Ingraham, *Architecture and the Burdens of Linearity*, New Haven, CT: Yale University Press, 1998, p. 110.

22 However problematic it may be to personify a field as if it were an individual *psyche*, it continues to inform the idea of the repression of gender; it also points out the gap which lay between the discourses of psychoanalysis and architecture and the work required to employ the first in understanding the second.

23 Mark Wigley's *White Walls, Designer Dresses*, Cambridge, MA: MIT Press, 1996, examined how fashion and clothing related to the gendering of pre-war modernism and its spaces, or how architects employ these fields as proxies for gender, perhaps as a means of inoculating the field against its dangers.

24 Ibid.

25 Greg Lynn, "Multiplicitous and In-organic Bodies," in *Folds, Bodies, Blobs*, 34. Originally published in *Assemblage 19*, December, 1992.

26 Lynn, "Multiplicitous and In-organic Bodies," in *Folds, Bodies, Blobs*, p. 35.

27 Lynn, "Body Matters," JPVA (1993), p. 61.

28 Ibid., 1993.

29 Lynn, "Probable Geometries," in *Folds, Bodies, Blobs*, p. 82.

30 Lynn adapts this, like many others, after Denis Holier's text on Bataille, *Against Architecture*, Cambridge, MA: MIT Press, 1992.

31 Lynn, *Folds, Bodies, Blobs*, p. 11. By referring to "ideal villas," Lynn invokes Rowe's famous analysis that argued that both Le Corbusier's and Palladio's architecture relied on a similar geometric organization, one Lynn calls "eidetic," whole and exclusive. Refer to chapters 5 and 6.

32 Lynn's association of the "fluid model of viscosity" inherent in the dynamic form generation of blob architectures with the writings of Luce Irigaray's *Mechanics of Fluids* suggests an implied "feminist" critique. Lynn, *Folds, Bodies, Blobs*, p. 145.

33 Greg Lynn, *Animate Form*, New York: Princeton Architectural Press, 1998.

34 Lynn, *Folds, Bodies, Blobs*, p. 61.

35 For what it is worth, Pérez-Gómez and Rykwert would also be critical of Rowe's method. However, Lynn uses Rowe in incompatible ways, on the one hand, criticizing Rowe's methods and presuppositions while maintaining his findings that modernism is a classical architecture. Lynn, "New Variations on the Rowe Complex," *ANY Magazine* 7/8 (1994), pp. 38–43; republished in *Folds, Bodies and Blobs*.

36 Peter Eisenman, "The End of the Classical, the End of the Beginning, the End of the End," *Perspecta: The Yale Architectural Journal*, no. 21 (1984). This article has been re-published in many different journals and in several languages. Eisenman seems to acknowledge its seminal place in his own work by reproducing it in catalogues of exhibitions such as the joint Wexner Center and Musea de Arte de São Paulo, *Gridding, Scalings, Tracings and Foldings in the Work of Peter Eisenman*, 1993. It appears in a couple of the compendiums of post-modern architectural theory, including Kate Nesbit (ed.), *Theorizing a New Agenda for Architecture, An Anthology of Architectural*

Theory, 1965–1995, New York: Princeton Architectural Press, 1996, from which all subsequent page references refer, as this is the most available version.

37 Eisenman, "The End of the Classical," p. 244, note 3.

38 Foucault, *The Order of Things*, New York: Vintage Books, 1973; originally published as: *Les Mots et les choses*, Paris: Editions Gallimard, 1966.

39 Eisenman, "The End of the Classical," p. 244. Eisenman seems to confuse Foucault's epistemes as exclusive to the possibility of other configurations; for Foucault, they are decidedly not. As I will detail in Chapter 4, Eisenman's account has more in common with Hegel's closed succession of ages than with Foucault's open sequence.

40 These fictions seem analogous to what Foucault, after Kant's *transcendental a priori*, calls *historical a priori*. However, Foucault would have never employed such a term as "fiction" since it unnecessarily invokes ideas of objective truths and representation. Eisenman's use stems from his reliance on the Baudrillardian *simulacra* and Derrida. As an aside, Foucault's term suggests how he revises Kant by displacing the transcendental *a priori* by immanent historical processes. They share the idea that there must be organizations of knowledge (schema, epistemes) in place in order for specific things to become objects of knowledge. While Kant sees these as transcendental, Foucault sees them as contingent to the irreducibly complex historical conditions of a culture. For example, for Foucault, the category "Man" as subject was made possible only by the reconfiguration of knowledge that gave rise to the human sciences in the nineteenth century.

41 Eisenman, "The End of the Classical," p. 215.

42 Ibid., p. 212.

43 Ibid., p. 215.

44 Eisenman states this as an economy that privileges appearance above all: "If an architecture looked rational—that is, represented rationality—it was believed to represent truth." This is why he calls all architecture after Durand merely simulations, or to use Baudrillard's term *simulacra*; they no longer repeated an authoritative order but merely recalled the appearance of that order after its authority had long been superseded. Eisenman, "The End of the Classical," p. 215.

45 Here Eisenman is implicitly dependent on Rowe's "Neo-Classicism and Modern Architecture I" as well as "Mathematics of the Ideal Villa."

46 Eisenman, "The End of the Classical," p. 217.

47 This paraphrase from Pérez-Gómez's article, "Hermeneutics as Architectural Discourse," claims at once an affinity to Eisenman but is also an attempt to reclaim the ground Eisenman seeks to occupy via Foucault, Baudrillard and Derrida by hermeneutics and phenomenology.

48 Eisenman, "The End of the Classical," pp. 213–214.

49 Ibid., p. 214.

50 In this regard, post-structuralist critiques of the Vitruvian Figure (like Lynn's and Agrest's) can be understood as focusing upon the body as a trope that operates in all three of Eisenman's fictions.

51 Eisenman, "The End of the Classical," p. 216.

52 Ibid., p. 218.

53 Karsten Harries, "The Ethical Function of Architecture," *Journal of Architectural Education*, vol. 29, no. 1 (September, 1975), pp. 14–15; Christian Norberg-Schulz, "The Phenomenology of Place," *Architectural Association Quarterly*, vol. 8, no. 4 (1976), pp. 3–10.

54 Eisenman is aware of the almost impossible position into which he has put himself by acknowledging that a call for a "not-classical architecture" would be simply another *Zeitgeist* argument. He attempts to solve the problem by arguing that not-architecture is not a new model but the deconstruction of models. Nevertheless, he argues that "this is necessary since classical signs are no longer significant." Eisenman, "The End of the Classical," p. 220.

55 Ibid., p. 219.

56 Gianni Vattimo, *The End of Modernity*, Cambridge: Polity Press, 1988, p. 32.

57 Martin Heidegger, "The End of Philosophy and the Task of Thinking," in *Basic Writings*, London: Routledge, 1978, p. 434.

58 Vattimo, *The End of Modernity*, p. 26.

59 Eisenman, *House X*, New York: Rizzoli, 1983, p. 40.

60 Vattimo, *The End of Modernity*, p. 29.

61 Robert Mugerauer has posed the use of Heideggerian phenomenology as a way to move beyond Eisenman's adoption of deconstruction. However, Mugerauer seems to utterly fail to understand that Derrida is not in fact opposed to Heidegger or phenomenology but has consistently unfolded a line of Heideggerian and phenomenological argument. See Robert Mugerauer, "Derrida and Beyond," in *Buildings and Reality: Architecture in the Age of Information*, Center vol. 4, 1988, pp. 66–75. Rykwert's sporadic attempts to refute the anti-humanist thought of Bataille are similarly misguided and unconvincing. When pushed, he reverts to truisms and essentialisms that at once reveal his conservative version of phenomenology but also the limitations of phenomenological frameworks in general.

62 Eisenman reflects on this thesis with around 35 years of hindsight in his article, "Diagram: An Original Scene of Writing," in *Diagram Diaries*, London: Thames and Hudson, 1999.

63 Peter Eisenman, *Giuseppe Terragni: Transformations, Decompositions, Critiques*, New York: Monacelli, 2003.

64 As Gianni Vattimo might say, they seek to transform the naïve nihilism of the Modernists into an accomplished nihilism aware of its conditions.

65 Eisenman's reading also follows an entirely conventional reading of the Renaissance as deeply respectful to the authority of the ancients, replicating ancient forms in order to be "faithful" to the spirit of their Greek and Roman culture. This reading is in itself at best highly suspect.

66 In fact, Eisenman's narrative of a single episteme between the fifteenth and twentieth centuries owes more to Chomsky's *Cartesian Linguistics* than to Foucault's archeology. Such dependence can be detected in Eisenman's treatment of representation in language and its meaning as a constant organization that is unaltered through time and place. Chomsky assumes, first, that signification and meaning are interchangeable and, second, that the way these operate remains the same across times and cultures. Whatever the merits of Chomsky's arguments as a theory of linguistics, they are problematic as a framework for the history of language.

67 Eisenman, "The End of the Classical," p. 217.

68 Greg Lynn, "New Variations on the Rowe Complex," *ANY* no. 7/8, New York: Anyone Corp, 1994, pp. 39–41.

4. MODULOR RESIDUES OF HISTORY

1 These dates are somewhat complicated. Le Corbusier stated that he substantially finished the book by the end of 1948, sending it to print only in late September 1949. Various revisions and addenda were added and proofs were corrected during this period [*The Modulor*, 239]. The first copies were not ready until March 1,

1950. Le Corbusier, however, pointedly calls it "*Le Modulor* du 1948" in the opening page of *Modulor 2*. It might also be mentioned that authorship of the Modulor is a similarly debated topic. Jerzy Soltan appears to have played a pivotal role in its development. Maisonnier and Serralta also worked on its development, including a notorious "female" version (to be examined in Chapter 9). Robin Evans has also noted that one Elisa Maillard, a mathematician, was involved in the early stages of work. Robin Evans, *The Projective Cast*, Cambridge, MA: MIT Press, 1995, pp. 286–287.

2 Le Corbusier, *The Modulor*, 2nd edn, trans. Peter de Francia and Anna Bostock, London: Faber and Faber, 1954. Originally published as *Le Modulor*, Boulogne: Seine, 1950. Le Corbusier, *Modulor 2*, London: Faber and Faber: 1958; originally published as *Modulor 2*, Boulogne: Seine, 1955. All notes and references on the first text are given to the 1954 English edition and those for the second text to the 1958 English edition (unless otherwise noted), as the present study primarily examines the discourses in Britain and the United States and these versions were the most widely circulated during the principal period of examination. They are also the most currently available versions (the 2000 Birkhäuser edition is a reimpression of the first Faber and Faber edition).

3 Both because of some visual resemblances and because of the reference to the Golden Rectangle, many—including its author—understand the Modulor as a continuation of the "trace regulators" Le Corbusier began to draw into his architecture in the 1920s. Because Le Corbusier reproduced pages of grids derived from the Modulor and the grid is an emblem of modern rationality, the Modulor can be inscribed within a history of modernism as rationalization. Yet, because the Modulor supposedly derived from the proportions of the human figure, it is taken to mark something irrational. Many have been tempted to situate the Modulor as a hinge between an early Le Corbusier interested in rationalism and what Banham later parodies as "machine aesthetics" and a late Le Corbusier who turned increasingly to iconographic, metaphorical expression. Those who seek to emphasize this "late Le Corbusier" emphasized the very same traits to evidence Le Corbusier's increasing shift towards a mystical and more personal, intuitive architecture, such as Ronchamp. Still others see its mysticism as revealing a revision of the modern project from within, a recovery of iconography and poetics. Often these two approaches have merged, so that the Modulor appears as a "rationalization" soon side-lined by the spectacularly idiosyncratic architectures of Ronchamp and La Tourette. All of these approaches attempt to incorporate the Modulor within a coherent representation of Le Corbusier's *œuvre*. Robin Evans has noted how Le Corbusier's personal metaphysics of dialectical oppositions underlaid much of the scholarship on the architect's work, dialects the architect provided as ways of reading his work [Evans, *The Projective Cast*, p. 277]. Evans stated that typical histories of Le Corbusier were based on a dialectic that Le Corbusier himself attempted to install. These histories, he implies, remain entirely trapped within the image Le Corbusier sought to project and thus could never be truly critical or expose more than Le Corbusier authorized, even in death. Within such dualisms, the Modulor appears as an attempt to synthesize the rational and poetic sides of Le Corbusier's production. This is to understand Le Corbusier's career and the status of the objects within it through the biography and psychology of its author, who remains entirely authorizing and authoritative.

4 Robin Evans has said that the Modulor was developed between 1943 and 1955, implying that its development effectively ended with

the publication of *Modulor 2*. This is true in the strict sense of development; after *Modulor 2* very little more was published. However, the archives at the Foundation Le Corbusier indicate that Le Corbusier continued to proselytize, gather materials and actively corresponded for *Modulor III* well into the 1960s.

5 For a lengthy analysis of the Modulor's role in the design of Ronchamp, see Evans, *The Projective Cast*, pp. 273–320.

6 Le Corbusier, *Modulor 2*, pp. 33–34.

7 Paul Rudolph, letter to Le Corbusier, 6 August, 1962, Fondation Le Corbusier, File F2 07256; Le Corbusier, letter to Paul Rudolph, 13 September, 1962, Fondation Le Corbusier, File F2 07266.

8 Robert Slutzky, "Aqueous Humor," *Oppositions* vol. 19/20 (1980). The test offers a parallel argument to Colin Rowe's "Mathematics of the Ideal Villa." If, as examined in upcoming chapters, Rowe famously "demonstrated" that the same plan organization underlay Palladio's and Le Corbusier's domestic architecture, Slutzky offered a similar reading concentrating on section and elevation.

9 Michel Graves, "A Case for Figurative Architecture," in K. Nesbit (ed.) *Theorizing a New Agenda for Architecture*, Princeton, NJ: Princeton Architectural Press, 1996, p. 87. Originally published in: K. Wheeler, P. Arnell, and T. Bickford (eds) *Michael Graves: Buildings and Projects 1966–1981*, New York: Rizzoli, 1982, pp. 11–13.

10 Evans, *Projective Cast*, p. 227.

11 Ibid., p. 277.

12 Peter Eisenman, *Diagram Diaries*, 28. Eisenman stated enigmatically:

> *As a generator there is not necessarily a one-to-one correspondence between the diagram and resultant form. There are many instances, for example, in Le Corbusier's Modulor, where the diagram is invisible in the building, yet reappears as a repetitive element that occurs at many different scales… Thus Le Corbusier's statement that the plan is the generator will be seen to be different from the diagram is the generator.*

The positioning of the Modulor as an ancestor to today's use of diagrams in architectural design is provocative, though it remains entirely undeveloped. This thesis might be seen as an attempt to develop Eisenman's suggestion.

13 Joseph Rykwert, *The Dancing Column*, Cambridge, MA: MIT Press, 1996, p. 390.

14 In this, Rykwert repeats the claims made by Le Corbusier himself and assumes uncritically the latter's authority and intent as author.

15 Rykwert, *Dancing Column*, p. 391.

16 Alberto Pérez-Gómez and Louise Pelletier, *Architectural Representation and the Perspective Hinge*, Cambridge, MA: MIT Press, 1997, pp. 353–354. More precisely, the authors interpret the Modulor as an opening in Le Corbusier's work that is further developed in *Poème de l'angle droit* and which marks his increasing estrangement from what had become the dominant "modernist tradition" of instrumental reason (ibid., p. 361). Thus, this reading presents an all too conventional interpretation of later Le Corbusier, one in which he is somehow moving away from his Modernist persona into a personal mythology.

17 Le Corbusier, *The Modulor*, p. 72.

18 Rykwert, *Dancing Column*, p. 390.

19 Anthony Vidler, *The Architectural Uncanny: Essays in the Modern Unhomely*, Cambridge, MA: MIT Press, 1992, p. 69. Vidler, borrowing from Elaine Scarry's eloquent text, *The Body in Pain*, suggests architectural history is conceptually characterized by a successive abstraction of the body metaphor from specific formal correspondences to the idea that architecture expresses bodily states and finally to where the entire world is seen as having attri-

butes of a living body. He links, for the sake of his argument, each of these to the Renaissance, the late nineteenth-century empathy theory discourse, and modernist city planning of Le Corbusier, respectively [Vidler, pp. 70–71].

20 Vidler, *Architectural Uncanny*, p. 75.

21 Nesbit, *Theorizing a New Agenda for Architectural Theory*, p. 62.

22 "Even Le Corbusier's Modulor is entirely based on a male body," Diane Agrest, "Architecture from Without," in K. Nesbit (ed.) *Theorizing an New Agenda for Architecture*, New York: Princeton Architectural Press, 1996, p. 552, note 2.

23 Cynthia Davidson (ed.) *Anybody,* Cambridge, MA: MIT Press, 1997, p. 15.

24 An almost identical phrase easily served as the back cover sales pitch, a statement designed to establish this recent symposium as not simply more radical but also an important event in the evolution of architectural thought. Here, the Modulor plays a role in defining what is radical in architecture.

25 Greg Lynn, "Charles Gwathmey: A Physique out of Proportion," in *Folds, Bodies, Blobs*, p. 187. Originally published in: *ANY Magazine*, (1995), p. 11.

26 Lynn, "Charles Gwathmey," *Folds, Bodies, Blobs*, p. 187.

27 Ibid., p. 184. The irony of this account is in Lynn's unspoken reversal of these bodies: the Modulor emerges in the late 1940s, while the boxer appears earlier.

28 The tendencies Lynn ascribes to the New York Five can also be detected in Le Corbusier's last works, such as the Carpenter Center, which shares the Five's vocabulary of disproportionately large bulbous forms, their penchant for 45 degree grid shifts, the hyper-articulation of the façade as a set of frames (Le Corbusier's huge brise-soleil, which in the curved sections also literally flex according to a Modulor pattern) and the exaggeration of the circulation diagram as an organizational device for the building's *parti*.

29 It is of course in the wake of the New York Five's demise—Eisenman's deconstructive defection, Graves's descent into po-mo historicism, Meier's self-parody, and Heduk's retreat into obscurity—that Lynn locates his blob architecture as an alternative. Here of course Lynn is merely taking up the Oedipal anxiety he found in the New York Five's relationship to cher Corbu. If so, his architecture also might be the exhaustion of Corbusian classicism rather than a break with it. Like a horror movie's monster, modernism seems to have more stamina than its eulogists suppose.

5. A MID-CENTURY RENAISSANCE

1 Rudolf Wittkower, *Architectural Principles in the Age of Humanism*, 2nd edition, London: Tiranti, 1952. All subsequent references and notes refer to this edition (unless otherwise noted) as it was most widely circulated during that time. The three original articles were: "Alberti's Approach to Antiquity in Architecture," *The Journal of the Warburg and Courtauld Institutes* IV, 1940–1941, pp. 1–18; "Principles of Palladio's Architecture," *The Journal of the Warburg and Courtauld Institutes,* Part 1, VII, 1944, pp. 102–122; Part 2, VIII, 1945, pp. 68–106. These were originally collected as *Architectural Principles* in Volume XIX of the *Studies of the Warburg Institute*, London: University of London, 1949. A revised third version was published by Tiranti in 1962, republished with minor changes and a new introduction by the author in paperback by W.W. Norton in 1971. This version was reprinted with additional visual material in a larger format by Academy Editions for the fifty-year anniversary in 1998; a flurry of new texts, such as Lionel March's *Architectonics of Humanism* and Richard Padovan's *Proportion*, accompanied this anniversary.

2 For the influence of *Architectural Principles* on architects and historians of the time refer to: Henry A. Millon, "Rudolf Wittkower, Architectural Principles in the Age of Humanism: Its Influence on the Development and Interpretation of Modern Architecture," *JSAH*, vol. 31, no. 2 (May 1972), pp. 83–91. Millon's article is exhaustive in terms of documenting the archival material and debates between 1949 and the mid-1960s. For its relationship to the writing of the history of modern architecture and to the role of history within modern architectural theory itself, refer to Alina A. Payne, "Rudolf Wittkower and Architectural Principles in the Age of Modernism," *JSAH* vol. 53, no. 3 (September, 1994), pp. 322–342. This article was important for the development of this chapter, although the conclusions we have drawn from the same historical material differ greatly.

3 Wittkower, *Architectural Principles*, p. 7.

4 Ibid., p. 23.

5 Ibid., p. 14.

6 Ibid., p. 16.

7 Ibid., p. 7.

8 Michel Foucault, *The Order of Things*, New York: Vintage Books, 1973, pp. 26–27.

9 Paul Hirst, "Foucault and Architecture," *Space and Power: Politics, War and Architecture* (London: Polity Press, 2005), pp. 158–162. Originally published in the *AA Files*, No. 26 (1993), pp. 52–60.

10 Foucault's description is very contentious, as is Wittkower's, among scholars of the period. Many argue that both seriously distort the importance of Neo-Platonism and neglect, for example, the dominance of Aristotelian philosophy. See, for example, Ian Maclean, "Foucault's Renaissance Episteme Reassessed: An Aristotelian Counterblast", *Journal of the History of Ideas*, no. 59.1 (1998), pp. 149–166. I am not trying to argue for either Foucault's or Wittkower's description but rather pointing out issues that arise from their propositions and a surprising conceptual relation between the two that allowed subsequent architects and writers to elide them with one another.

11 Foucault, *The Order of Things*, p. 23.

12 Wittkower, *Architectural Principles*, p. 16.

13 As quoted in Wittkower, *Architectural Principles*, p. 15.

14 Wittkower, *Architectural Principles*, p. 97.

15 Ibid., p. 99.

16 Ibid., p. 97.

17 Recounted by Margot Wittkower to Henry Millon, 10 November 1971. See Millon, "Rudolf Wittkower," p. 89.

18 Eva-Marie Neumann, "Architectural Proportion in Britain 1945–1957," *Architectural History* no. 37 (1996).

19 Reyner Banham, "The New Brutalism," *Architectural Review*, no. 118 (1955), p. 361.

20 Alison and Peter Smithson, letter, *RIBA Journal*, vol. 59, no. 4 (February 1952), p. 140. A second letter by John Voelker (then a student) offered a different retort.

21 Kenneth Clark, "Humanism and Architecture," *Architectural Review*, no. 109 (1951), pp. 65–69.

22 Cf. John Coolidge, review, *Magazine of Art*, December 1950, p. 317; James Ackerman, review, *Art Bulletin* no. 33 (1951), pp. 195–200; A. Trystan Edward, review of 2nd edition, *RIBA Journal*, vol. 60, no. 10 (August 1953), pp. 418–419. The notable negative review rebutted by the Smithsons and Voelcher was by A. S. G. Butler, *RIBA Journal*, vol. 59, no. 2 (December 1951), pp. 59–60. For a full account of the book's reception, refer to: Millon, "Rudolf Wittkower," pp. 87–89.

23 Nikolaus Pevsner, *Foreword to Wittkower, Art and Architecture in Italy 1600–1750*, 2nd edn, London: Pelican Books, 1965.

24 James S. Ackerman, "Rudolf Wittkower's Influence on the History of Architecture," *Source* no. 8/9 (1989), pp. 87–90.

25 Alina A. Payne, "Rudolf Wittkower and Architectural Principles in the Age of Modernism," *JSAH* vol. 53, no. 3 (September, 1994), p. 324.

26 Ibid., p. 441.

27 Ibid., p. 341.

28 As reported by Peter Smithson in a letter to the editor, *RIBA Journal*, February 1952. Giedion was a visiting Professor of Engineering and History at the MIT Department of Architecture in the spring of 1950. Cf. Millon, "Rudolf Wittkower," p. 89 fn. 34. Confirmed by myself in conversation with Smithson, November, 2001.

29 Ruth Olitsky and John Voelker, "Form and Mathematics," *Architectural Design*, October 1954, p. 306.

30 Reyner Banham, *The New Brutalism: Ethic or Aesthetic?*, London: The Architectural Press, 1966, pp. 14–15. The relationship of Banham and the Smithsons to the discourses of proportion in the 1950s and problems of formalism deserves its own study, which lies beyond the current scope but which I intend to pursue through Banham's theorization of the role of "image" in the Smithson's work.

31 Banham, "The New Brutalism," p. 361.

32 Wittkower, *Architectural Principles*, p. 135.

33 Le Corbusier, *Modulor 2*, pp. 190–193.

34 Rudolf Wittkower, "Systems of Proportion," *Architects' Yearbook 5*, 1953, p. 18. Of course, Rykwert made the same claim 42 years later in *The Dancing Column*.

35 Wittkower, "Le Corbusier's Modulor," in *Four Great Makers of Modern Architecture*, New York: Columbia University Press, 1963, p. 199. This book is a transcript of a lecture given as part of a symposium on Le Corbusier, Ludwig Mies van der Rohe, Frank Lloyd Wright and Walter Gropius at Columbia from March to May, 1961.

36 Wittkower, "Le Corbusier's Modulor," p. 201.

37 Wittkower, "Systems of Proportion," *Architect's Yearbook*.

38 Smithson in "Report on a Debate about Proportion," *RIBA Journal*.

39 Howard Hibbard, obituary, *Burlington Magazine*, 114, March 1972, p. 175.

40 Alina A. Payne, "Rudolf Wittkower and Architectural Principles in the Age of Modernism," *JSAH* vol. 53, no. 3 (September, 1994), p. 324. While Payne suggests the contemporary field is "identical" to Wittkower's, I argue instead that Wittkower's text partly but crucially inscribed the preconscious topology of thought upon which current arguments are formulated. Any transparency is only apparent, itself an effect of this terrain and not due to some underlying homogeneity or Weltanschauung that the term "paradigm" implies.

41 Erwin Panofsky, "History of the Theory of Proportions as a Reflection of the History of Styles," in *Meaning and the Visual Arts*, London: Penguin Books, 1955, pp. 82–138. Originally published as "Die Entwicklung der Proportionslehre als Abbild der Stielentwicklung," *Monatshefte für Kunstwissenschaft* no. XIV (1921), pp. 88–219.

42 Wittkower, *Architectural Principles*, 3rd edn, p. 164.

43 Panofsky's "Iconography and Iconology" immediately precedes that article on proportion in his collected volumn *Meaning in the Visual Arts* and employs a similar argument and structure. Erwin Panofsky, "Iconography and Iconology: An Introduction to the Study of Renaissance Art", *Meaning in the Visual Arts*, London: Penguin Books, 1993, pp. 51–81; originally published in: *Studies in Iconology: Humanistic Themes in the Art of*

the Renaissance, New York, Oxford University Press, 1939, pp. 3–31.

44 Not accidentally, Panofsky's previously obscure article on proportion was translated into English for the first time and republished in a 1955 collection aimed at a more general Anglo-American audience, scarcely six years after *Architectural Principles*.

45 For a detailed account of this proposition, refer to: Eva-Marie Neumann, "Architectural Proportion in Britain 1945–1957," pp. 197–211.

46 Johnson, telegram to Le Corbusier and the Primo Convegno Internazionale Sulle Proporzioni nelle Arti, 27 September, 1951. Fondation Le Corbusier Archives.

47 The name would be changed to the only slightly less cumbersome: 'Comité provisoire d'étude et d'application de la proportion dans les arts et la vie contemporaine'.

48 Letter to Le Corbusier, 7 November 1951, Fondation Le Corbusier.

49 Le Corbusier was absent due to financial constraints.

50 Unpublished summary document mailed to the Committee by Le Corbusier, 21 October 1952, Foundation Le Corbusier. Refer to Appendix 2 for more details.

51 A paraphrase of Einstein's reported assessment of the Modulor.

52 For example, Neumann's conclusion to "Architectural Proportion in Britain 1945–1957," p. 217.

53 Curated by Eduard Sekler and Hans Buchwald. See Sekler's catalogue, *Proportion, A Measure of Order*, Cambridge, MA: Harvard University Press, 1965.

54 Wittkower's arguments about the Modulor did not make this distinction as clearly.

55 At least, this is the part of the article everyone remembers (see Chapter 6).

56 Colin Rowe, "The Mathematics of the Ideal Villa," in *Mathematics of the Ideal Villa and Other Essays*, Cambridge, MA: MIT Press, 1976, p. 15. Originally published as "The Mathematics of the Ideal Villa: Palladio and Le Corbusier Compared," *Architectural Review*, vol. 101 (1947), pp. 1010–1104.

57 Alina A. Payne, "Rudolf Wittkower and Architectural Principles in the Age of Modernism," *JSAH* vol. 53, no. 3 (September, 1994), p. 339.

58 Robert Somol, 'Dummy Text," in *Diagram Diaries*. Of course, this statement is subject to the critique provided in the first chapters.

59 Rowe, "Mathematics," p. 18.

60 Ibid., p. 18.

61 Greg Lynn, "Multiplicitous and Inorganic Bodies," *Assemblage* no. 19 (1992), p. 33.

62 Greg Lynn, from text provided to explain the illustration included in this book.

63 Michel Foucault, "What Is an Author?" in *Aesthetics: Essential Works of Foucault 1954–1984*, vol. 2, London, Penguin, 1998, p. 218.

6. THE SCHEMA AND THE DIAGRAM

1 Ernst Cassirer, *The Problem of Knowledge: Philosophy, science, and history since Hegel*, New Haven, CT: Yale University Press, 1950, pp. 219–220.

2 Latour, *We Have Never Been Modern*, Cambridge, MA: Harvard University Press, 1993, p. 13.

3 Cassirer, *The Problem of Knowledge*, p. 220.

4 Michel Foucault, *The Order of Things*, New York: Vintage Books, 1973, Chapter 10.

5 One can see here the extent to which Foucault coheres to a Kantian explanation between the noumena and phenomena, the schema and the manifold.

6 Effectively, this is the shift from an explanation of the subject given by Kant's

transcendental *a priori* to Foucault's "historical *a priori*."

7 Ernst Cassirer, *Philosophy of Symbolic Forms*, vol. 1, New Haven, CT: Yale University Press, 1955, p. 189. Here one can begin to detect the divergence of structuralist theories of the symbolic and Cassirer's account. For the former, the symbolic is that through which the subject knows; for the latter, the symbolic is also that through which the subject is thought.

8 Cassirer, *Essay on Man*, New Haven, CT: Yale University Press, 1944, p. 22.

9 Cassirer, *Philosophy of Symbolic Forms*, vol. 1, p. 84.

10 Wittkower's debates with Hans Sedlmayr were sparked by Wittkower's survey of Bernini drawings published in 1931 with Heinrich Brauer. Their privileging of drawing and diagramatic formal analysis drew Sedlmayr's ire in a published review ("Geschichte und Kunstgeschichte," *Mitteilungen des Österreichischen*, Instituts für Geschichtsforschung 50 (1936), pp. 185–199. Wittkower's work did not meet Sedlmayr's criteria of art historical scholarship. Wittkower answered his critic in another article, "Zu Hans Sedlmayrs Besprechung von E. Coudenhove-Erthal: Carlo Fontana." *Kritische Berichte* 4 (1930–32), pp. 142–145. For an account of this debate, refer to: J. Montagu and J. Connors, "Rudolf Wittkower 1901–1971," *Introduction to Art and Architecture in Italy: 1600–1750*, 6th edn., vol. 1, London: Pelican, 1999, pp. ix–xi. This well-known exchange suggests the incompatibility between Sedlmayr's use of "principles" drawn from Riegl and Gestalt Theory (Gestaltungsprinzipien) as abstract frameworks to be applied to art and Wittkower's Cassirerian use of the term "principles" as an aesthetical subjective universal.

11 The use of the term "phenomenology" in both the way Hegel employs it and especially in the usage of Cassirer should not be confused with the phenomenological strains of architectural theory outlined in previous chapters.

12 Take for a moment, a pretend exchange of the sort one might find in an architectural classroom:

Great Architectural Theorist: This example of modernist architecture represents the *Zeitgeist*!

Bewildered Architectural Student: What is this *Zeitgeist*?

GAT: New concepts of relativistic space–time as seen in physics, and cubist painting!

BAS: But how do you know this building is an example of that?

GAT: Its forms look sort of cubist and exemplify relativistic space–time! Architecture is always a bit behind the *Zeitgeist* curve since its synthesis of art and science is harder, you know.

Of course this is a parody of Hegel's far more nuanced arguments, but it is more representative than one might think of their use in architecture; Cassirer in any case thinks the circular reasoning cannot be avoided by simply adding layer upon layer of complication.

13 Cassirer, *Symbolic Forms*, vol. 1, p. 83. These problems, it must be said persist in the Marxist adoptions of Hegelian methods in history, especially in the history of art and architecture.

14 Georg Wilhelm Friedrich Hegel, *Aesthetics: Lectures on Fine Art Volume II*. Translated by T. M. Knox, Oxford: Clarendon, 1975 [1835–1838], pp. 661–683.

15 Cf. Wittkower, "Art History as a Discipline." *Winterthur Seminar on Museum Operation and Connoisseurship*, Winterthur, Delaware: 1961, pp. 55–69; originally presented as a lecture.

16 I. Kant, *Critique of Pure Reason*, trans. Werner S. Pluhar, New York: Hackett Publishing, 1996, pp. 210–211.

17 Ibid., p. 218.

18 Cassirer, *Symbolic Forms*, vol. 1, p. 76.

19 For an example of the application of Kant's schema to complexity theory, refer to: Ben Martin, "The Schema," in G. Cowan, D. Pines and D. Meltzer (eds) *Complexity: Metaphors, Models, and Reality*, Reading, MA: Addison-Wesley, 1994, pp. 263–286.

20 In 1961, Wittkower presented a paper on "Art History as a Discipline" where he most fully acknowledged his debts to Panofsky.

21 Wittkower's analyses repeated many of the problematic aspects of Panofsky's essays. It is beyond my scope here to enter into a detailed analysis of the relationship of Panofsky to Cassirer. For the relationship between Panofsky, Wittkower and Cassirer, I refer the reader to: Alina A. Payne, "Rudolf Wittkower and Architectural Principles in the Age of Modernism," *JSAH* vol. 53, no. 3 (September, 1994), pp. 328–332; for Panofsky's adaptation of Cassirer, see Hubert Damisch, *The Origin of Perspective*, Cambridge, MA: MIT Press, 1994, Chapter 1. For a longer analysis, refer to Michael Ann Holly, *Panofsky and the Foundations of Art History*, Ithaca, NY: Cornell University Press, 1984, Chapter 5. All these texts were instrumental in the development of the material in these chapters.

22 Cassirer, *Symbolic Forms*, vol. 1, p. 86. Payne notes this as well.

23 E. H. Gombrich, *Aby Warburg: An Intellectual Biography*. London: The Warburg Institute, 1970, p. 331.

24 Cassirer also worked with Panofsky in re-organizing the Library and Warburg's manuscripts after Warburg's death. Gombrich, *Aby Warburg*, p. 332.

25 Refer to Payne, "Rudolf Wittkower," p. 328.

26 Wittkower's tenure at the Warburg, where he was the first editor of its journal, was from 1934 to 1956. He moved to Harvard University in 1954, as visiting professor of art history and thereafter became chair of the Department of Art History and Archeology at Columbia University from 1956 to his retirement in 1969 (transforming it into a preeminent school). Panofsky emigrated to the United States in 1933, first to New York University and from 1935 as professor at the Institute for Advanced Study at Princeton from 1947 to 1948. He died a year before Wittkower's retirement.

27 Erwin Panofsky, *Perspective as Symbolic Form*, New York: Zone Books, 1993; originally published as a long article, "Die Perspektive als 'symbolische Form'," *Vorträge der Bibliothek Warburg*, 1924–1925, Leipzig and Berlin, 1927, pp. 258–330.

28 The details of this attempt have been analyzed by Hubert Damisch, *The Origin of Perspective*, pp. 9-–55.

29 Erwin Panofsky, "History of the Theory of Proportions as a Reflection of the History of Styles," in *Meaning and the Visual Arts*, London: Penguin Books, 1955, pp. 82–138. Originally published as "Die Entwicklung der Proportionslehre als Abdild der Stielentwicklung," *Monatshefte für Kunstwissenschaft*, XIV (1921), pp. 188–219.

30 One might compare this to the architectural discourse of diagrams in the 1990s.

31 Wittkower, *Architectural Principles*, p. 1.

32 The criticism that either very few of the projects he studied were actually built or that when built they either do not have the exact proportions, or that it is impossible to measure it due to the thickness of walls, etc., miss the point that Wittkower is making.

33 Payne's article "Rudolf Wittkower and Architectural Principles in the Age of Modernism," *JSAH* vol. 53, no. 3 (September, 1994), also made this link between Cassirer, Panofsky and Wittkower, although my formulation of their relation differs.

34 Wittkower, *Architectural Principles*, p. 1.

35 Wittkower, statement in "Report of a Debate," *RIBA Journal*, vol. 64, no. 11 (September 1957), p. 462.

36 It is not accidental that Kant develops his propositions on the schema and the manifold in the section of *The Critique of Pure Reason* entitled the *Analytic of Principles*. Wittkower's use of the term principles corresponds to Kant's and relates to the concept of the schema in the same way.

37 Wittkower, "Le Corbusier's Modulor," p. 197. This same duality underlies Panofsky's *Perspective as Symbolic Form*.

38 Of course, these are the same terms through which phenomenologists and post-structuralists understand modernity as a break with classical tradition.

39 Wittkower, *Architectural Principles*, p. 131.

40 Hume, "On the Standard of Taste," as quoted by Wittkower, *Architectural Principles*, pp. 131–132.

41 Kant's critical philosophy was initially planned in order to rebut Hume; Wittkower positions *Architectural Principles* as a similar dismissal of a previous work. Geoffrey Scott is Wittkower's Hume.

42 As quoted in Wittkower, *Architectural Principles*, p. 132.

43 Wittkower, *Architectural Principles*, p. 132.

44 Again, here Wittkower also played the role of Kant, who upon recognizing the implications of Hume's work attempted to develop a theory of aesthetics for the subject that would not be relativist but still be able to make general and universal claims.

45 Cassirer, *Essay on Man*, p. 177. This was most explicitly developed in the third volume of *Symbolic Forms*, subtitled *The Phenomenology of Knowledge*.

46 Kant, *Critique of Pure Reason*, A 176; B 176.

47 Wittkower, *Architectural Principles*, 3rd edn, p. 164.

48 For example, Pérez-Goméz frequently claims that, "formalistic strategies in architecture, regardless of their legitimizing frame of reference (in Marxist theory, linguistics, physics, or evolutionary biology) may be dangerously irresponsible." Pérez-Goméz, "Hermeneutics as Architectural Discourse," *Cloud-Cuckoo-Land: International Journal of Architectural Theory*, 1997, paragraph 13.

49 This is clearly the sense of his criticism of their portrayal as "purely formal." For Wittkower's Ruskin, the Renaissance lacked any legitimate reference to God or nature; for his Scott, it was an architecture purely motivated by pleasure.

50 Wittkower, "Report on a Debate," p. 462.

51 On the relationship of information theory to Gestalt and its predecessors, refer to E. H. Gombrich, *The Sense of Order*, London: Phaidon, 1994. This trajectory would also lead to the attempt to develop a psychology of art, as Gombrich, another Warburg colleague, would pursue.

52 Geoffrey Scott, *The Architecture of Humanism: A Study in the History of Taste*, New York: W.W. Norton, 1974, p. 159 (originally published 1914).

53 Ibid., pp. 162–163.

54 Ibid., p. 161.

55 Ibid., p. 167. This empathic equipoise is as equally important to Siegfried Giedion's work of proportion.

56 Philip Johnson, *Mies van der Rohe*, New York: Museum of Modern Art, 1947; as quoted in Rowe, "Neo-'Classicism' and Modern Architecture I," *Oppositions* no. 1 (1973), p. 125.

57 Since rationalization is, by definition, an article of the subject, the invocation of biology, function or structure should not be confused with it but rather with the erosion

of the ability of the rational subject of the Enlightenment.

58 I owe a debt here to a conversation with Paul Lewis in which he noted how his students and many architects seem to have never read beyond the first part of the text, or forget they had, or indeed, seem to have just looked at his grid diagrams.

59 Rowe, "Mathematics," p. 12.

60 Ibid., p. 15.

61 Eliel Saarinen, *The Search for Form in Art and Architecture*, New York: Dover Press, 1985, pp. 11–27; Originally published as *Search for Form: A Fundamental Approach to Art*, New York: Reinhold Publishing, 1948.

62 Wittkower, "Le Corbusier's Modulor", p. 203.

63 UNStudio, *MOVE*, vol. 2, p. 85.

7. THE SYMBOLIC STRIKES BACK

1 Giedion's colleague, Jacqueline Tyrwhitt collected and archived these materials. She was also instrumental in the editing, translation and production of *The Eternal Present*. The two first met at the 1947 CIAM VI General Congress at Bridgewater. Through their collaboration, she came into possession of many of his original lecture notes, drafts and manuscripts deposited at the London RIBA library after her death within a collection of her papers. It is largely from this archive that I draw upon in this chapter.

2 Siegfried Giedion, *Mechanization Takes Command: A Contribution to Anonymous History*, New York: W. W. Norton, 1969, p. 2; originally published by Oxford University Press, 1948.

3 Giedion, *Mechanization*, p. 3. One might compare *Mechanization* to Manuel Delanda's *A Thousand Years of Non-Linear History*, both in scope, organization and method and as a non-humanist account of historical processes.

4 Mark Wigley has discussed this use of images of meat and the association between the Holocaust and the thesis of *Mechanization*. His arguments have informed some of my descriptions of *Mechanization* in this part of this chapter. Wigley, lecture at the Architectural Association, 1999.

5 Mark Wigley first brought this original cover to my attention.

6 Siegfried Giedion, *Mechanization*, p. 209.

7 Paul Virilio, *War and Cinema*, New York: Verso, 1989, p. 83.

8 Giedion, *Mechanization*, p. 120; caption to Figure 63.

9 Ibid., pp. 244–245.

10 Giedion structured the text around a repetition and assemblage of otherwise unrelated images to construct arguments often contrary to his more comforting text. In this two-page spread, he does not so much reference *Le Chien Andalou*, but revealed how his text was in many ways intended as an extension of this scene over seven-hundred-odd pages.

11 One might compare this to Bataille's interest in the abattoir, as described by Yves-Alain Bois and Rosalind Krauss in *The Formless: A User's Guide*, New York: Zone Books, 1997, pp. 43–51.

12 Giedion, *Mechanization*, p. 714.

13 Ibid., p. 723.

14 Giedion, "The Humanization of Urban Life," lecture at ETH, Zurich, 12 October, 1951, Tyrwhitt Papers, RIBA, 57/9.

15 Siegfried Giedion, lecture at Harvard/MIT, 1951, The Jacqueline Tyrwhitt Papers, Royal Institute of British Architects, Library box 57/folder 3; this is virtually the same phrasing he used in the Introduction to *Mechanization* itself.

16 Taught with then Dean Sert, Professor Sasask and Seckler. The course syllabus lists four topics: "The Use of Proportion in the

Organization of Plane Surfaces; Symmetry in Architecture; Sequence in Architecture; The Human Scale in Urban Design."

17 The reading list ranged from Rudolf Arnheim's skeptical "A Review of Proportion," in *Dimension*, to *The Modulor*, Panofsky, Ghyka, Wittkower, Cook, Hambridge, and Weyl's *Symmetry* and even Adolf Zeising's *Neue Lehre von der Proportionen*. Topics covered included: "The Use of Proportion in the Organization of Plane Surfaces"; "Dynamic Symmetry in Architecture"; and "The Human Scale in Urban Design." Giedion, Tyrwhitt Papers, RIBA, 57–59/22–26.

18 Giedion, Tyrwhitt Papers, RIBA, 29/1/959.

19 Giedion, Introductory lecture to "Urban Design Seminar," course at Harvard, 6 February, 1957, Tyrwhitt Papers, RIBA, 29/1/959.

20 Peter Smithson, letter to the editor, *RIBA Journal* (February 1952).

21 His Zurich lecture series on human scale and proportion were repeated at MIT, and then summarized at a signal lecture at Harvard (see above).

22 Giedion, "Art as Fundamental Experience," *Explorations*, Toronto: University of Toronto Press, 1956.

23 Giedion, "Symbolic Expression in Prehistory and the First High Civilizations," in Gyorgy Kepes, *Sign, Image and Symbol*, London: George Braziller, Inc., 1966. This article had shifted towards the formulations of *The Eternal Present* and can be seen as a transition from the work on proportion in the 1950s and early 1960s.

24 Giedion, Tyrwhitt Papers, RIBA, 58/1; Original drafts along with Giedion's handwritten revisions.

25 Giedion, Tyrwhitt Papers, RIBA, 57/3/1.

26 He suggests as much in a lecture at Harvard. Giedion, Harvard Lecture, 1950, Tyrwhitt Papers, RIBA, 57/3/5.

27 Giedion did not use the term "symbolic" consistently. At times, he adhered to the Cassirerian conception of the symbolic as the (Kantian) abstract schemata that organizes concepts and sense perceptions. At others, he used a more representational, banal understanding, for example, he quotes Sartre: "we need tidy signs and symbols which spring directly to the senses without explanation." Here he confused signs and symbols with Cassirer's Kantian symbolic, which could never be "tidy" nor simply spring to the senses since they provide the schema through which perceptions are made cognizable as such.

28 For a detailed account of the relationship between the two texts, see (among others) the Preface by Charles Hendel to the first English translation of *Symbolic Forms* [1955]; see also, Cassirer's Preface to *An Essay on Man*.

29 In Anglo-American philosophy, his reputation rested primarily on his work in the philosophy of science. At that time, no one had undertaken the onerous task of translating the three completed volumes of *Symbolic Forms*; the fourth was published posthumously, putting much of the Essay back into the more formal and rigorous terms that characterize his earlier volumes.

30 It is interesting to recall here Heidegger's suggestion that cybernetics was to supplant metaphysics as the unifying field of knowledge; in Cassirer's use of proto-cybernetic theory suggests a similar but more general unification of knowledge under an informatic model of life.

31 Ernst Cassirer, *Essay on Man*, New Haven, CT: Yale University Press, 1944, p. 22.

32 Ibid,. p. 21.

33 Giedion, *Mechanization*, p. 719.

34 In this chapter, I maintain a distinction derived from Giedion's and Cassirer's use of the terms "Man," the human, and homo sapiens. The proper name, "Man," refers to

their definition of the symbolic subject, human to the conditions of this subject as a living organism. Homo sapiens refers to the biologically defined species, usually in the sense of a human-as-animal, that is, before becoming "Man."

35 Cassirer, *Essay on Man*, p. 25.

36 Ibid., p. 26.

37 Giedion, "Art as Fundamental Experience," a seven-part lecture series given at Harvard, Yale, University of Chicago, Berkeley, and other locations; Third Lecture, Harvard, March 14, 1950 Tyrwhitt Papers, RIBA, 57/3; other similar lectures as: "The Humanization of Urban Life," written in Zurich, Oct. 1951, Tyrwhitt Papers, RIBA, 57/9; " The Mellon Lectures," 1957, Tyrwhitt Papers, RIBA, 58/1; See also: Cassirer, *Essay*, pp. 23–26.

38 Bergson, *Creative Evolution*, New York: Henry Holt, 1911, pp. 137–139.

39 Cassirer, *Symbolic Forms*, vol. 4, p. 41.

40 Cassirer's definition of the tool is very similar to Deleuze and Guattari's understanding of the diagram in *A Thousand Plateaus*.

41 These questions are inferred from Cassirer's text.

42 Cassirer, *Symbolic Forms*, vol. 4, p. 46. One might compare this to Latour's concept of anthropos as the form giver described in the last chapter. The difference is that while Cassirer argues that the symbolic is that through which man articulates his Being, for Latour and Foucault the symbolic structures of culture are that through which the name of man becomes possible of being spoken.

43 This term in adapted by Giedion from S. I. Hayakawa, *Language in Action* (Chicago: Institute of General Semantics, 1940); other texts from the field of primate studies upon which Giedion drew in reference to language include: Wolfgang Köhler, *The Mentality of Apes* (London: Kegan Paul, Trench, Trubner & Co., 1925); Robert Yerkes, *The Mental Life of Monkeys and Apes: A Study of Ideational Behaviors* (New York: H. Holt, 1916). Giedion also drew upon the linguistic theory of Henri Delacroix, *Le langage et la pensée* (Paris: Félix Alcan, 1924).

44 Giedion, "Art as Fundamental Experience," second lecture, "Symbolism: the Beginning of Art", 1950, Tyrwhitt Papers, RIBA, 57/3/5.

45 Giedion, "Symbolism: The Beginning of Art," Tyrwhitt Papers, RIBA, 57/3/6.

46 The Mellon Lectures themselves present a more nuanced understanding edited out in *Eternal Present*. The misunderstanding of the "symbolic" is of course not limited to Giedion; post-modern architecture—historicist, phenomenological and radical alike—is premised on a misapprehension of the difference between the symbolic, the symbol and the sign. Giedion's symbolic reawakening opens onto a long series of banalities.

47 Cassirer, *Essay on Man*, p. 45.

48 Cassirer, *Symbolic Forms*, vol. 4, p. 46.

49 Clearly but implicitly, Panofsky's "Perspective as Symbolic Form" was the model for such a theory of art. Also, refer to my earlier arguments about the role of the human body within Kant's *Critique of Judgment*.

50 Cassirer thought this was a transcendental a priori of humanity, though Foucault would argue that this concept of man itself only becomes historically possible under the representational order that exists after Kant.

51 Giedion, "The Role of Art in Contemporary Culture," 1950, Tyrwhitt Papers, RIBA, 57/3/6.

52 Giedion, Tyrwhitt Papers, RIBA, 57/3/5.

53 Giedion, Tyrwhitt Papers, RIBA, 57/3/8.

54 Giedion, "Symbolism: The Beginning of Art," Tyrwhitt Papers, RIBA, 57/3/5–6. This point will be important later in this chapter as well.

55 Cassirer, *Essay on Man*, p. 23. Because a close reading of Giedion and Cassirer's texts

reveal the marked similarity in reference to Uexküll's work, it is probably correct to say that Giedion's understanding of this is largely mediated by Cassirer's presentation.

56 Cassirer, *Essay on Man*, p. 23.

57 Ibid., pp. 23–24.

58 Husserl's and subsequent phenomenological use of this term are derived from Uexküll.

59 Keith Ansell Pearson has noted that such a definition of the organism is far closer to Greek and Latin etymology than the Darwinian or Linnaean use in which species refers to the specification of and the ability to specify things from the undifferentiated milieu. Cf. *Germinal Life*, London: Routledge, 1997, p. 187. He also described how Deleuze and Guattari, especially in their concept of "becoming animal," drew extensively from Uexküll. Merleau-Ponty also depended on Uexküll, from whom he took *Umwelt*, a concept that has found more recent expression in the cognitive scientists and the "philosophies" of Lakoff and Johnson. Cf. George Lakoff and Mark Johnson, *Philosophy in the Flesh*, New York: Basic Books, 1999. Merleau-Ponty drastically simplified and transforms Uexküll's ethnology by reducing his Netz to conventional categories of "the body" perception and phenomena which Uexküll's proto-systems theory approach obviously problematizes. Nevertheless, this shows how phenomenology is compelled, indeed, can ultimately find its only stable ground of argument, by appealing exactly to the empirical sciences that it pretends to disdain as overly rational and abstract.

60 Pearson, *Germinal Life*, p. 187.

61 This definition of the organism directly informed what Deleuze and Guattari somewhat misleadingly called the "body-without-organs."

62 For more on the shift to an informatic theory of the organisms, refer to: Georges Canguilhem, "Knowledge and the Living," *A Vital Rationalist*, New York: Zone Books, 1994, pp. 316–319.

63 Cassirer, *Essay on Man*, p. 24.

64 Ibid., p. 24.

65 Giedion, *Mechanization*, p. 721.

66 Such an idea has been more recently developed by Stuart Kaufmann as "fitness landscapes" in order to explain the evolution of forms. Refer to: Stuart Kaufman, *The Origins of Order*, Oxford: Oxford University Press, 1993. Humberto Maturana and Francisco Varela's theory of autopoiesis also is commensurable with Uexküll's work. Refer to: Maturana and Varela, *Autopoiesis and Cognition: The Realization of the Living*, London: D. Reidel Publishing, 1980.

67 Reinhold Martin, "The Organizational Complex: Cybernetics, Space, Discourse," *Assemblage* no.37 (1998), pp. 102–127.

68 As Martin recounts, they met when Wiener invited Giedion to the 1950 Inter-science Committee meeting at MIT. He also notes that a year later Marshal McLuhan introduced himself to Wiener as a student and "friend" of Giedion, evidence that the relationship between fields of media, architecture and science cannot be thought of as opposed but as a continuous differential network of institutions, relations and archives. Martin argues this suggests that there was a stable discursive formation in the 1950s (which he calls an "organizational complex") configured around the conception of all processes and entities, including life and the living, as a recombination of simple information as well as the preservation of these informational patterns, be they physical, aesthetic or biological. Martin, "The Organizational Complex," p. 109.

69 Norbert Wiener, *Cybernetics: or, Control and Communication in the Animal and the Machine*, Cambridge, MA: MIT Press, 1948.

70 Early in the Macy conferences on cybernetics, there was much discussion about W. Ross Ashby's use of the homeostat (like

a thermostat but with the general function of maintaining a state rather than only temperature). It is clear in Ashby's device that homeostasis entails the preservation of the organism while excessive deviation equals death. N. Katherine Hayles, *How We Became Posthuman*, Chicago: University of Chicago Press, 1999, p. 65.

71 Giedion, *Mechanization*, p. 721.

72 Ibid., pp. 719–720.

73 Ibid., p. 720.

74 Donna Haraway, *Primate Visions*, London: Routledge, 1989, p. 82.

75 As quoted by Giedion, "The Role of Art in Contemporary Culture," 1950, Tyrwhitt Papers, RIBA, 4.

76 It is possible that Giedion visited the center during research at Yale for *Mechanization*.

77 For a full account of Yerkes's many chairmanships and funding body activities, see Haraway, *Primate Visions*, pp. 67–68; for the activities of the NRC and other similar funding bodies, refer to David Nobel, *America by Design: Science, Technology and the Rise of Corporate Capitalism*, New York: Knopf Publishers, 1977.

78 Haraway, *Primate Visions*, pp. 65, 70. One might compare this to E. O. Wilson's controversial theories of socio-biology.

79 Yerkes, as Haraway states, was not detached from his objects of study, but deeply emotionally invested in his chimps, providing, for example, human doctors when they became ill. He positioned himself as the patriarch while the chimps played various roles as children, patients, slaves, or perhaps more strangely still, daughters. Haraway, *Primate Visions*, p. 63.

80 As quoted in Haraway, *Primate Visions*, p. 64.

81 Cassirer, *Essay*, p. 63.

82 On the difficulty anthropology has in discussing contemporary scientific cultures, see Bruno Latour, *We Have Never Been Modern*, Cambridge, MA: MIT Press, 1993.

83 Haraway, *Primate Visions*, p. 62.

84 Ibid., p. 62.

85 As quoted in Haraway, *Primate Visions*, p. 64.

86 Haraway, *Primate Visions*, p. 64.

87 For more on the development of testing procedures and the administration of subjects, refer to: Stephen Jay Gould, *The Mismeasure of Man*, New York: W.W. Norton, 1981; Marek Kohn, *The Race Gallery: The Return of Racial Science*, London: Jonathon Cape, 1995.

88 Haraway, *Primate Visions*, p. 72.

89 While Haraway suggests that there may no longer even be a need to make the distinction, Cassirer maintained that it is perhaps unimportant for everyone except the philosopher.

90 *Modulor 2*, p. 25.

91 Ibid., p. 22.

92 The inversion of the Modulor Monkey operates according to the same logic as D'Arcy Thomson's "Cartesian Transformations," in which a co-ordinate grid system is distorted to show how the morphology of one species could be derived from another according to a coherent proportional distortion. Species were no longer Linnaean types, but merely—and as Thomson privileges skeletal structures, literally—the historically and evolutionarily calcified moments in a continual mutation.

8. MEASURED RESPONSE

1 Peter T. Barefoot, "Alvar Aalto at the A. A. School," review of a lecture, *AA Journal*, October 1946, pp. 49–50.

2 Cf. Letters to the Editor, *AA Journal*, October 1946 to October 1947.

3 J. Beloff, Letter to the Editor, *AA Journal*, June–July 1947.

4 Hartland Thomas, Letter to the Editor, *AA Journal*, June–July 1947.

5 J. Lawrence, Letter to the Editor, *AA Journal*, April 1947.

6 Peter Barefoot, Letter to the Editor, *AA Journal*, February–March, 1947.

7 W. Keating Clay, Letter to the Editor, *AA Journal* May, 1947.

8 Hartland Thomas, Letter to the Editor, *AA Journal*, June–July 1947.

9 Manning Robertson, "The Golden Section or Golden Cut: The Mystery of Proportion in Design," *RIBA Journal* no. 55 (1948), pp. 536–45; Letters, *RIBA Journal* no. 56 (1949).

10 Leonard Roberts, "R's Method: The Achievement of Proportion in Architectural Design," *Architectural Design* no. 18 (1948), pp. 536–545.

11 Editors, *RIBA Journal* no. 56 (1949), p. 287.

12 "Report on a Debate," p. 458.

13 "Report on a Debate," p. 460.

14 Rudolf Wittkower, *Architectural Principles in the Age of Humanism*, 2nd edn, London: Tiranti, 1952, p. 135.

15 In this regard, in his conclusion, Wittkower acknowledged the skepticism that greeted all attempts to develop systems of proportion.

16 This appeal to the Golden Section as a mathematics of nature continues in popular mathematics, for example, Ian Stewart, *Nature's Number*, London: Basic Books, 1995.

17 Matila Ghyka, *The Geometry of Art and Life*, New York, Dover, 1977, Ch. 6. Originally published in 1946.

18 Cecil Balmond, *Number 9: The Search for the Sigma Code*, New York: Prestel, 1998, pp. 183–187. The text's endless numerations are also very similar in tone to Le Corbusier's Modulor books.

19 For that, one might turn to Roger Herz-Fishler, *A Mathematical History of the Golden Number*, New York: Dover, 1987.

20 In fact, the need to trace its origin is itself a condition of modernity. Michel Foucault, *The Order of Things*, New York: Vintage Books, 1973, pp. 328–335.

21 Adolf Zeising, *Neue Lehre von den Proportionen des menschlichen Körpers*, Leipzig: R. Weigel, 1854.

22 A correspondence proved mathematically by Robert Simson only in 1753; David Wells, *The Penguin Dictionary of Curious and Interesting Numbers*, Harmondsworth: Penguin Books, 1986, p. 62. Because of this derivation, the "Golden Number" is often called the "division in extreme and mean ratio." Joseph Gies and Francis Gies, *Leonardo of Pisa and the New Mathematics of the Middle-Ages*, New York: New Classics Library, 1969.

23 Herz-Fishler, *A Mathematical History of the Golden Number*, pp. 134–158.

24 Johannes Kepler, Letter to Joachim Tanckius (1698); as quoted in Herz-Fishler, *A Mathematical History of the Golden Number*, p. 174.

25 Fernand Hallyn, *The Poetic Structure of the World*, New York: Zone Books, 1990, p. 196.

26 As quoted in Herz-Fishler, *A Mathematical History of the Golden Number*, p. 174.

27 Foucault, *The Order of Things*, p. 26.

28 For example, Richard Padovan claims that the recovery of the Golden Section occurred at the same moment as the sciences were becoming increasingly abstract and divorced from human experience. Refer to: Richard Padovan, *Proportion: Science, Philosophy, Architecture*, London: E&FN Spon, 1999. Wittkower implied the converse in regards to aesthetics. I must here acknowledge Padovan's text as a historical survey of the Golden Section, however, my great disagreement with the ultimate premise and conclusions of his text should become clear.

29 The term "golden section" is typically said to have first appeared in a footnote in the 1835 edition of Martin Ohm's, *Die Reine Elementar-Mathematik*. Some would trace this earlier, so, for example, Moebius in 1824, or even to Lorenz in 1781. In any case, Ohm's use does not indicate its invention, but is the origin to which subsequent discourse on the "Golden Number" refers. In any case, it seems to have emerged as a commonly used term between the time of Ohm's first edition in 1926, where he uses the generic expression "continuous proportion," and 1835 when his footnote states: "One is also in the habit of calling this division of an arbitrary line in two such parts the golden section." D. H. Fowler, "A Generalization of the Golden Section," *Fibonacci Quart*. vol. 20, no. 2 (1982), pp. 146–158; R. Herz-Fishler, *A Mathematical History of the Golden Number*, pp. 168–170; Martin Ohm, *Die reine Elementar-Mathematik*, Berlin, 1844, p. 195.

30 As quoted in Padovan, *Proportion*, p. 306.

31 Adolf Zeising, *Neue Lehre von den Proportionen des Menschlichen*, Leipzig, 1854, Preface; as quoted in Padovan, *Proportion*, p. 306.

32 Ian Hacking, *The Taming of Chance*, Cambridge: Cambridge University Press, 1990, pp. 170–188.

33 Ibid., p. 57.

34 Ibid., p. 57.

35 Ibid., pp. 2–3.

36 Ibid., p. 57. Babbage owned this text.

37 Charles Babbage, "On the advantage of a Collection of Numbers, to be Entitled the Constants of Nature and of Art," letter to David Brewster, *The Edinburgh Journal of Science* no. 6 (1832), p. 334. Quoted from Ian Hacking, *Taming of Chance*, p. 58. Babbage would later describe such activities as central to his "contributions to human knowledge." Cf. Babbage, *Passages from the Life of a Philosopher*, London: William Pickering, 1994, pp. 323–331.

38 For the importance of militarization in standardization and normalization, refer to Georges Canguilhem, *A Vital Rationalist*, New York: Zone Books, 1994. The uniforms of the Napoleonic wars introduced standardized clothing sizing.

39 The emergence of natural constants is not a mark of an increasing mathematization or rationalization so much as marked the rise of empiricism and measurement, along with concepts such as the "normal." If, as Deleuze argued, machines are cultural before they are technical, it is vital not to simply invert the arrow of technological determinism but rather to understand technology and social developments as a single irreducibly complex field.

40 Canguilhem, *A Vital Rationalist*, pp. 370–371.

41 Ibid., pp. 378–384. Even critical and theoretical interrogation of the norm has remained surprisingly stable; almost 50 years have passed since Canguilhem described how the norm and the ideal occupy the same epistemological space.

42 Annemarie Mol, "Lived Reality and the Multiplicity of Norms," *Economy and Society* no. 27 (1998), pp. 260–274. Mol argues that even if human nature is invoked, it is within a normative framework alien to the proper sense of the Enlightenment phrase.

43 A view most forcefully promulgated by Lord Kelvin, who importantly established a different sort of constant by proposing a new scale of temperature at which zero marks not the freezing of water but "heat death," the cessation of molecular motion entirely and thus the breakdown of all matter in an entropic finality. T. S. Kuhn, "The Function of Measurement in Modern Physical Science," in *The Essential Tension*, Chicago: University of Chicago Press, 1977; originally published in 1961.

44 See Bruno Latour, *We Have Never Been Modern*; A. C. Crombie, *Science, Art and Nature in Medieval and Modern Thought*, London: Hambledon, 1996.

45 Cassirer, *The Problem of Knowledge: Philosophy, Science, and History since Hegel*, New Haven, CT: Yale University Press, 1950, p. 50.

46 Robert Vischer, "On the Optical Sense of Form: A Contribution to Aesthetics," *Empathy, Form, Space*, Santa Monica, CA: Getty Center, 1994, p. 104.

47 Ibid., p. 95.

48 Ibid., p. 98.

49 H. Mallgrave and E. Ikonomou, "Introduction," in Vischer, *Empathy, Form, Space*, p. 23.

50 Vischer, "On the Optical Sense of Form," p. 98.

51 This is fundamentally different from the Neo-Platonic argument that the subject can be unaware of the similitude between a well-shaped man, a centralized church and a divine order. This similitude aligned the subject within the space according to the chain of resemblances; what mattered was that the divine resemblance was installed, not whether this was available to subjective experience, aesthetical, intellectual or emotional. For Vischer, on the other hand, the Golden Section only operated through the subject's projection and reflection, however unconscious.

52 Gustav Fechner, *Vorschule der Aesthetik*, Leipzig: Breikopf and Hätel, 1897.

53 Also called Weber's Law.

54 Gustav Fechner, *Elemente der Psychophysik*, translation from B. Rand (ed.), *The Classical Psychologists*, Boston: Houghton Mifflin, 1912, p. 572.

55 Fechner would thereby take a place with Galton, whom Hacking argues established the autonomy of statistical law.

56 Gustav Fechner, *Vorschule der Aesthetik*, pp. 184–202.

57 Rudolf Arnheim, "The Other Gustav Theodor Fechner," in *New Essays on the Psychology of Art*, Berkeley: University of California Press, p. 45.

58 Gustav Fechner, *Vorschule der Aesthetik*, p. 260.

59 Ibid., p. 217.

60 I am here indebted to Padovan's citations that served as an initial bibliography of the topic. For example, O. Kuelpe, *Grundriss der Psychologie auf experimentelle Grundlage*, 1893; L. Witmer and E. Pierce, "Aesthetic of Simple Forms," *The Psychology Review*, 1894, 1896; R. P. Angier, "The Aesthetics of Equal Division," *The Psychology Review*, 1903; Theodor Lipps, *Aesthetik: Psychologie des Schoenen und der Kunst*, 1903; C. Lalo, *L'esthétique expérimentale contemporaine*, 1908. Later experimental papers include: M. Borissavlievitch, *The Golden Number,* New York: Tiranti, 1958; I. C. McManus, "The Aesthetics of Simple Figures," *British Journal of Psychology*, no. 71 (1980).

61 Sigmund Freud, *Beyond the Pleasure Principle*, (New York: WW Norton & Company, 1961[1920]), pp. 6-7.

62 Padovan, *Proportion*, p. 309.

63 Ibid.

64 Rudolf Arnheim, "The Other Gustav Theodor Fechner," in *New Essays on the Psychology of Art*, Berkeley: University of California Press, 1986.

65 Foucault, *Order of Things*, p. 312.

66 Jonathan Crary, *Techniques of the Observer*, Cambridge, MA: MIT Press, 1990, p. 150. Crary's modern subject, the "Observer," seems a visual theory adaptation of Foucault's "transcendental-empirical doublet" translated from the latter's study of the "human sciences" to the former's art-historical theory.

67 Crary, *Techniques of the Observer*, p. 148. Crary's treatment of Fechner was influential for my account, but to my mind, places too much emphasis on Fechner's work as the rationalization and homogenization of vision and of the subject. Fechner's work is more usefully understood as developing measurement as analogy between the modern domains of the subject and object or nature and culture, and therefore in making exchangable hybrids.

68 Of course questions remain as to the veracity of the world made available via statistics.

69 P. H. Scholfield, *The Theory of Proportion in Architecture*, Cambridge: Cambridge University Press, 1958. Scholfield argued that the Golden Section was not "rediscovered" in the nineteenth century but was actually discovered. Scholfield wrote in the late 1950s and must be understood as a part of the discourse I am examining. He has a naïve understanding of the nature of discovery and assumes in the use of the term itself that the Golden Section is a natural object awaiting discovery. On similar grounds, I disagree with Richard Padovan's more recent arguments. While his account is more thorough than many of his predecessors, he errs in understanding what is at stake in the historicity of proportion and its problems. Nevertheless, in its espousal of Wittkowerian formalism, this text must be understood as part of the current resurgence of formalism in architecture, an inverse marker to Greg Lynn's arguments, for example, which wish to recover formalism without its formalists' prejudices for the whole and the classical.

70 Alina A. Payne, "Rudolf Wittkower and Architectural Principles in the Age of Modernism," *JSAH* vol. 53, no. 3 (September, 1994), p. 327, fn. 30. Payne notes that Wittkower questioned this ascription of the Golden Section to the Renaissance, which, he argued, could not have employed such a device.

71 Latour, *We Have Never Been Modern*, pp. 29–32.

72 Ibid., pp. 13–16.

73 Smithson, comment in "Report of a Debate," p. 460.

9. REFLECTIONS OF THE MODULOR

1 Alain Pottage has noted this authoritarian positioning and its ramifications both for the Modulor and for the architectural discipline in general. His formulations will be examined more fully below and were generally very informative of my thoughts here. Refer to: Alain Pottage, "Architectural Authorship: The Normative Ambitions of Le Corbusier's Modulor," *AA Files* 31, London, 1996, pp. 64–71. In this chapter's examination of gender and geometry I am indebted to Catherine Ingraham, *Architecture and the Burdens of Linearity*, New Haven, CT: Yale University Press, 1998.

2 Le Corbusier, *Le Modulor*, p. 58.

3 Ibid, p. 58.

4 Stanislaus von Moos suggests that the statement might have been fabricated by Le Corbusier. Refer to: Stanislaus von Moos, *Le Corbusier: Elements of a Synthesis*, Cambridge, MA: MIT Press, 1979, p. 367, fn 101.

5 Giedion drew a general (though as Robin Evans among others has noted, misguided) parallel between Cubism's "artistic means" of forging a "new space–time" conception and Einstein's ideas of simultaneity in *Elektodynamik bewegter Körper* (1905). He described Ozenfant and Jeanneret's *Purisme* in 1917 as the climax of this research, beginning with the first cubist exhibit at the Salon de Indépendents in 1911. See Giedion, *Space, Time and Architecture*, Cambridge, MA: Harvard University Press, 1941, pp. 436–439.

6 Le Corbusier, *The Modulor*, p. 58.

7 The revocation of the Modulor rulers and tapes was recounted to Robin Evans by Jerzy Soltan, Le Corbusier's assistant and

collaborator in developing the Modulor. Robin Evans argued Soltan most likely first related the Fibonacci series to the Modulor. In any case, Le Corbusier's revocation of the tapes appears as much about reserving the almost magical proprieties ascribed to the Modulor for the master as it is about its misuse by his assistants. Refer to: Robin Evans, *The Projective Cast*, Cambridge, MA: MIT Press, 1995, p. 396, fn. 5, 7.

8 Think of Jacques Derrida's dalliance with architecture in the 1980s, in which Derrida (not exactly intellectually chaste himself) reportedly turned down Peter Eisenman's repeated advances until, at once worn down and seduced, he embraced architecture only to be left the morning after. Peter Eiseman, *Jacques Derrida, Choral Works*, New York: Monacelli Press, 1997.

9 Refer to: Mark Wigley, *The Architecture of Deconstruction: Derrida's Haunt*, Cambridge, MA: MIT Press, 1993; Kojin Karatani, *Architecture as Metaphor*, Cambridge, MA: MIT Press, 1995.

10 I draw upon Alain Pottage for this linkage.

11 Le Corbusier, *The Modulor*, p. 125. Emphasis by Le Corbusier.

12 Le Corbusier, *The Modulor*, p. 17.

13 Ibid., p. 21.

14 Ibid., p. 53.

15 This discrepancy of terminology is further exacerbated by the translation from the French, in which average denotes the norm always, and the English translations most often cited use average exclusively without comment. For an excellent examination of the average versus the norm, refer to: Ian Hacking, *The Taming of Chance*, Cambridge: Cambridge University Press, 1990.

16 Ian Hacking, *The Taming of Chance*, p. 163.

17 Alain Pottage and Catherine Ingraham have argued this ancient etymological conjunction seems the locus of authority in the Modulor.

18 Georges Canguilhem, "Norm and Normativity," in *A Vital Rationalist*, New York: Zone Books, 1994, pp. 370–371.

19 Georges Humphreys, *Taylorism in France, 1904–1920: The Impact of Scientific Management on Factory Relations and Society*, New York: Garland Publishing, 1986, p. 245.

20 Robert H. Wiebe, *The Search for Order*, 1877 to 1920, New York: Hill & C. Wang, 1967, p. 155.

21 Michel Foucault, *History of Sexuality,* vol. 1, New York: Vintage Books, 1976, p. 140.

22 Robin Evans, "Le Corbusier and the Sexual Identity of Architecture," in *Columbia Documents of Architecture and Theory*, New York: Columbia University Press, 1993, p. 161.

23 Le Corbusier, *The Modulor*, p. 235.

24 Elizabeth Grosz, *Volatile Bodies: Towards a Corporeal Feminism*, Bloomington, IN: Indiana University Press, 1994, p. 211, note 1. Moreover, no amount of inversion, reclamation, or multiplication of terms, identifications or values will resolve this condition. The avant-garde or disruptive alternative, like all deviations from normative frameworks, merely reinforces the place of the model. We cannot simply champion that which is excluded or repressed since this seemingly radical gesture itself continues to operate under the "mold of sameness" and appears as a critique only so long as we remain within its domain.

25 Le Corbusier, *Modulor 2*, p. 52.

26 Julia Kristeva, *The Powers of Horror*, New York: Columbia University Press, 1982, p. 2.

27 Ibid., pp. 321–322.

28 Ibid., p. 18.

29 Paul Virilio, *War and Cinema: The Logistics of Perception*, New York: Verso Press, 1989.

30 Le Corbusier, *Aircraft: Frontispiece to the Air*, London: The Architectural Press, 1992, p. 11.

31 Le Corbusier, *Towards a New Architecture*, p. 19.

32 Ibid., p. 19.

33 Le Corbusier, *The Radiant City*, p. 81.

34 Le Corbusier, *Towards a New Architecture*, p. 95.

35 It is worth pausing here to note how recent discourses of emergence and complexity replay such organistic concepts and explicitly attempt to produce a "negative entropy," in which architectural form is produced by processes of morphological differentiation and "higher levels of organization" that are said to be analogous to the processes of natural formation.

36 Le Corbusier, *Towards a New Architecture*, page 279.

37 Ibid., p. 251.

38 Ibid., p. 19.

39 Le Corbusier, *The Radiant City*, p. 83.

40 Le Corbusier, *The Four Routes*, London: Denis Dobson, Ltd., 1947, p. 69.

41 Le Corbusier, *Concerning Town Planning*, London: The Architectural Press, 1947, p. 110.

42 Ibid., p. 104.

43 Ibid., pp. 120–121.

44 Le Corbusier, *The Four Routes*, p. 13.

45 Ibid., p. 108.

46 Lacan argued anamorphosis is typically used to produce castration and death effects in paintings.

47 Le Corbusier, *Concerning Town Planning*, p. 104.

48 Le Corbusier, *The Modulor*, p. 73.

49 Ibid., p. 73.

50 Francis Galton, "Composite Portraiture," *The Photographic News*, vol. 32, no. 1547 (April 27, 1888), p. 237.

51 Karl Pearson, *The Life, Letters and Labours of Francis Galton*, vol. 2: *Researches of Middle Life*, Cambridge: Cambridge University Press, 1924, p. 285.

52 Robin Evans, "Translations from Drawing to Building," in *Translations from Drawing to Building and Other Essays*, Cambridge, MA: MIT Press, 1997, pp. 184–186.

53 This phrase comes from Laura Mulvey's extended examination of filmic technology and psychoanalysis, which, in turn, takes on Jean-Luc Godard's statement that cinema is truth 24 times a second, Laura Mulvey, *Death 24x a Second: Stillness and the Moving Image,* London: Reaktion Books, 2006.

54 Le Corbusier, *The Modulor*, p. 106.

55 Ibid., p. 9.

56 Giorgio Agamben has argued that the history of modernity is filled with such anthropogenic machines. As he demonstrates, the human subject—as an object of scientific study—is produced as such through a series of projections onto inhuman things, which then define humanity in relationship to these reflections.

10. MEASURING VORTICES

1 Vitruvius Pollio, *The Ten Books on Architecture,* trans. Morris Hicky Morgan, London: Oxford University Press, 1914, pp. 16–17.

2 For a recent book that powerfully elucidates the historical context of Vitruvius, and which rather proves what in this book can remain only a provocation, I recommend: Indra McEwen, *Vitruvius: Writing the Body of Architecture*, Cambridge, MA: MIT Press, 2003.

3 Rev. R. Mackintosh, "Anthropomorphism," *Encyclopedia Britannica*, 11th edn (1910–1911), vol. 1, p. 120.

4 Accounts of this debate include: Stewart E. Guthrie, *Faces in the Clouds: A New*

Theory of Religion, Oxford: Oxford University Press, 1993; R. Mitchell, N. Thomson, and H. Miles (eds) *Anthropomorphism, Anecdotes, and Animals*, New York: State University of New York Press, 1997; Eileen Crist, *Images of Animals: Anthropomorphism and Animal Minds*, Philadelphia, PA: Temple University Press, 1999. These debates have re-emerged today, for example in debates surrounding the ideas of sociobiology. Cf. John S. Kennedy, *The New Anthropomorphism,* Cambridge: Cambridge University Press, 1992. This suggests that, as in architecture, scientific debates about anthropomorphism concern not the enforcement of a humanism so much as its eclipse.

5 Friedrich Nietzsche, "On Truth and Lying in an Extra-moral Sense" (1873), in *Friedrich Nietzsche on Rhetoric and Language*, Oxford: Oxford University Press, 1980.

6 Ibid., p. 251.

7 Ibid., pp. 250–251.

8 Nietzsche's concepts might be thought of as a general economy of concepts wherein truths are exchange-values that have become naturalized.

9 Paul De Man, *Allegories of Reading*, New Haven, CT: Yale University Press, 1979, pp. 126–127.

10 Nietzsche, "On Truth and Lying," p. 252 (emphasis added).

11 Ibid., p. 253.

12 Bruno Latour, *We Have Never Been Modern*, Cambridge, MA: MIT Press, 1993, p. 137.

13 Ibid, pp.51-55; Latour derives his terms "quasi-subjects" and "quasi-objects" from Michel Serres, *Statues*, Paris: Bordas, 1987.

14 Nietzsche, "On Truth and Lying," p. 251.

15 Ibid., pp. 250–251.

16 Ibid., p. 251.

APPENDIX 1

1 Hitchcock and Johnson, *The International Style: Architecture Since 1922*, New York: WW Norton & Company, Inc, 1932.

2 Bernard Smith, *Modernism's History*, New Haven, CT: Yale University Press, 1998.

3 R. G. Collingwood, *The Idea of History*, Oxford: Oxford University Press, 1960; *The Idea of Nature*, Oxford: Oxford University Press, 1945.

4 Matei Calinescu, *Five Faces of Modernity*, Durham, NC: Duke University Press, 1987; Hilde Heynen, *Architecture and Modernity*, Cambridge, MA: MIT Press, 1999; Panayotis Tournikiotis, T*he Historiography of Modern Architecture*, Cambridge, MA: MIT Press, 1999.

5 Parveen Adams, "Versions of the Body," *M/F* vol. 11/12, 1986, pp. 27–29.

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