Monster

Perspecta 40

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Perspecta 40

We came across a picture and had no idea what it was, where it was, or who took the photograph. All we could do was stare at the thing and wonder. Was it good? We couldn't really decide. Was it real? We couldn't really tell, but hoped that it was.

The thing didn't look particularly innovative to us, though it did appear to be trying. It was big, or perhaps more accurately, it aspired to bigness. It was awkward, willfully so, a couple of disparate parts cobbled together. It was almost normal, boring even. But just barely, it slipped into the territory of the deranged. Certainly it was ambitious—behold, the new trampling the old!

In any event, the thing seemed … a bit out of control. Somehow a very basic idea had run away from the architect who conceived it. Buildings lead strange, uncontrollable lives after their creators give them life. Sometimes they are accepted by the world, either immediately or after an occasionally painful adjustment period. Sometimes they run amok. Sometimes, the villagers fight back with wrecking balls and fire.

Suddenly, it occurred to us: we were looking at a Monster. And yes, we liked it.

Intentionally or not, in many ways this thing—this monster—is architecture today.

Big. Heterodox. Monumental. Ambitious. Soft. Dumb. Uncontrollable. Hybrid. Mutated. Random. Confused. Beautiful. Growing. Trampling. Ugly. Searching. New. Unfamiliar. Awkward. Reanimated. Undead. Mismatched. Misdirected. Hopeful.

Much like the book you now hold in your hands …

onster

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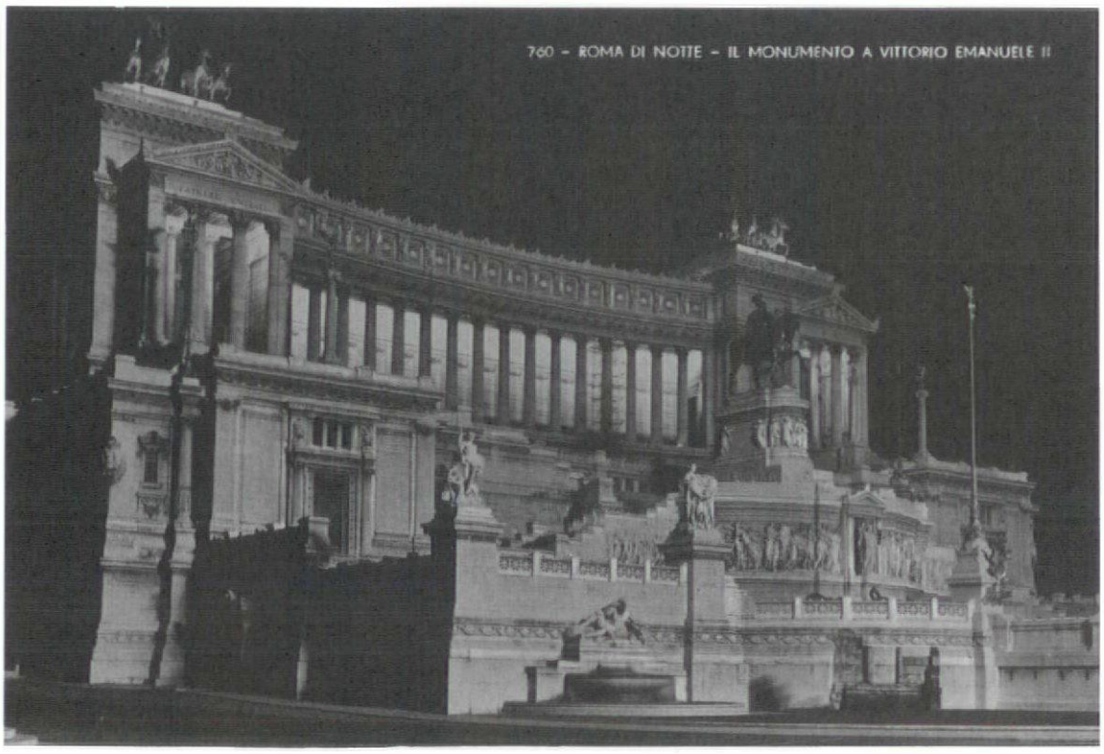
Monumental



Monumental Monstrosity
Monstrous Monumentality

Terry Kirk

This is a test of aesthetic tolerance. Varying reactions to the National Monument to King Vittorio Emanuele II in Rome trace a trajectory of a volatile reception of the sublime and prodigious through the monumental and on to the monstrous. Monsters mark the boundaries of cultural values. As outcasts from our constructed systems of self-definition they fascinate and frighten. In a pioneering 1962 study, Georges Canguilhem analyzed monsters as products of the social organization of knowledge. How monsters are made is symptomatic of how a culture conceives of collective inquiry to the tolerated limits of its self-awareness. As Ambroise Paré first explored in 1573, monsters warrant examination as evidence of nature's unbounded variety and our human response to it. Monsters embody our notions of otherness in abstract terms, things beyond the limits of imagination that cannot be thoroughly explained. Keala Jewell ably clarifies this in a recent study: monsters inscribe logic that is qualitatively different from rational thought. As such monstrosity is comparable in quality and in effect, I will argue, to specific notions of aesthetic philosophy pertinent to the culture of nineteenth-century national monuments. Monstrous feeds into monumentality through sublime. Monsters and sublime architecture both elicit reactions of astonishment, curiosity, and morbid wonder. This essay explores the relationship between monumental architecture and concepts of monstrosity.

Architecture comes late to a serious consideration of its monsters, so we must rely upon achievements in the neighboring disciplines of natural sciences and psychology, and more recently literary criticism and cultural anthropology.[1] "Monstrosity" is at present still only a dismissive epithet in architectural criticism. It is usually leveled against anything big, ugly, out of place, or dysfunctional, which in the popular eye implies most of Modern architecture but especially the products of 1960s Brutalism. A century ago the term appeared in defense of European cities against American-style skyscrapers and Antoni Gaudì's unclassifiable species of building. Even the Eiffel Tower was subject to character assassination in the 1923 science-fiction film La Cité foudroyée, in which in a classic formulation the monster of the Parisian skyline is ritualistically destroyed. Reaction to architectural monsters still smacks of a superstitious fear typical of primitive responses to otherness, while our colleagues in other disciplines have "naturalized" their monsters. As Michael Hagner puts it regarding the natural sciences, we too might seek "to integrate, incorporate, and domesticate them in the material and discursive arsenals of enlightened rationality."[2]

Monstrosity in architecture is a matter of reception. Having studied monstrously big, ugly, out-of-place, and apparently dysfunctional buildings for some time—but too fascinated with them to fear them as such—I was at first put out by the suggestion of P40's theme, until I reckoned with the pervasive reaction of horror to my work in Rome and took seriously the proximity of the monumental to the monstrous. "Monsters have their usefulness," wrote nineteenth-century scientist Étienne-Geoffrey St.-Hilaire. "They are a means of study for our intellects." This essay examines our reaction to the transgression of aesthetic limits that makes monuments monstrous, and perhaps monsters in the end monumental.

Monstrous

Monster comes from men, an Indoiranian root, whence also memory, thought itself. Cicero's Latin links monstrum with monere—to remind or warn, as in a portent or omen. "The noun 'monster,'" Augustine tells us, "evidently comes from monstrare, 'to show,' because they show by signifying something" out of the ordinary. For Aristotle, "anyone who does not take after his parents is really in a way a monstrosity, since in these cases Nature has strayed from the generic type." Monsters are deviant, transgressive, threatening, and therefore horrible, terrifying, and tremendous yet also astonishing, marvelous, and prodigious. The modern scientist orders monsters in terms of relationships to nature's norms. Paré classifed them as either prodigious apparitions beyond the course of nature or deviant creations entirely against its course. Even Linnaeus included dragons, satyrs, pygmies, and troglodytes in his Systema Naturae. "By a monstrosity," Darwin presumed, "is meant some considerable deviation of structures, generally injurious or not useful to the species." Monsters hold some distant but threatening relationship of difference to the norms we construct to order our world.

Deviations are terrifyingly monstrous to us when worked upon the human body. Gross congenital malformation where the canon of human proportions is horribly wrong encompasses the widest understanding of monsters. Monstrous bodies are compositions of disparate and unrelated elements, organisms that have failed to achieve a perfect final form. As a genetic monstrosity, conjoined twins fascinated many and raised existential questions such as whether these creatures had two hearts or one. In the context of the eighteenth-century academic debate on monstrous births, Samuel Thomas Soemmerring's epigenetic theory pitted scientific embryology against providential determinism. As deviations from natural processes of development, Soemmerring laid the pathology not in the hands of God but in each of us: damage to the embryo in the womb. Monsters are therefore worse than debilitating disease; they are disquieting miscreations of ourselves. All humans begin their existence not as perfect predetermined beings but as vulnerable embryos and potential monsters.

The nineteenth-century science of teratology set out the boundaries of biological norms through experimental interventions in embryo development. (The term is derived from the Greek teras, to differentiate from superstitious monstrosity.) "I sought to follow organisms along their uncommon paths," wrote St.-Hilaire, who filled collections of dissected specimens in formaldehyde jars to quantify birth defects. Georges-Louis-Leclerc Buffon's classification of monstrum per excessum (something too large or with too many), monstrum per defectum (malfunction), of per fabricam alienam (outside the species) served as a basic framework for the quantification and naturalization of monsters in modern science.

At a popular level, however, monsters remained culturally constructed repositories of superstition. Paré heads his list of thirteen causes of monstrosity with 1) God's glory, and 2) God's wrath. A supernatural origin made monsters portentous omens that fueled anxieties. At their most innocuous, monsters elicit wonder; at their most horrible, threatening aggression. Chaucer's monster is "a wikked beast, that was so cruel, horrible, stinking." As ominous portents, monstrous births were understood as a scourge not upon the hapless mother but as a collective curse

implicating an entire community. They were harbingers of locally targeted divine retribution and were promptly expelled. A hideous creature born in papal-controlled Ravenna shortly before a bloody battle against the French in 1512 was seized upon by Lutheran propagandists. Its bizarre physiology prompted an exegesis like an iconographical reading of emblematic Renaissance allegories: its horns symbolic of papal pride, its wings its fickleness, armlessness a lack of good works, tattooed chest of heresy, clawed foot for usury, eye located on the knee of worldliness, and hermaphroditism of sodomy.[3]

Monsters proliferate in times of crisis. They are born not of woman but of a prevailing apocalyptic mood, usually triggered by political upheaval and threatening loss of control. Be it Protestant schism, revolutionary France, or Cold War Hollywood, monsters emerge as concretizations of collective anxieties. The spectator experience of the monster, the curious paying public at a village freak show or a Hollywood monster flick, is essentially a sigh of relief: Schadenfreude. We hoist upon the expurgatory scapegoat our fears the unknown. In capturing, displaying, and killing the monster, we try to vanquish our anxieties.

The most fearful monsters are, then, those birthed of our own perturbed imagination. The imagination is a sense without an organ. It is self-nourishing, untiring, prolific, and the most prodigious of our faculties. Leonardo da Vinci fabricated little monsters out of parts of animals and motorized them with pressurized bladders, causing horror among his unsuspecting subjects, which Vasari relates as a metaphor of creative imagination. Maternal imagination was thought to cause monstrous births, such as the devout mother's prayers to John the Baptist and the birth of her monstrously hirsute child, or Frank Lloyd Wright's mother, who lined the nursery with photos of great cathedrals. This marks, however, the first step in shifting causes from supernatural to science.

Monsters continue to exert their power because they are ultimately products of culture. They are explicit recognitions of our norms—physical, psychological, and juridical—because they violate these constructed systems. They have what Canguilhem called a negative value and what Foucault specified as our discursive strategy through which cultures make sense of the world and legitimate their conceptions of it.[4] The abnormal challenges the order of things with troubling indeterminacy, violating regulatory cognitive, moral, and aesthetic decorum. They are organisms that not only fail to achieve the ideal but exist in defiance of the ideal. However, this challenging negative value also affirms the norm and helps us define ourselves by resistance to deformation. Monsters reinforce a dynamic polemical concept of normality and inscribe its values.

Imagined monsters continue to fascinate us, repulse our senses, and attract our attention. As repugnant creatures they are horrifying portents; as astonishing curiosities—a product of Paré's Glory of God—they are marvelous wonders. Lorraine Daston and Katherine Park explore the simultaneous and overlapping connotation of monsters that elicit wonder, the root of scientific curiosity. Dante's Virgil expresses an "ammirazione pieno" before the monstrous griffin, and Peter the Great is "merveilleusement espouventé" in his Wunderkammer of birth defects. A positive connotation of monsters courses through our language as something extraordinary, tremendous, marvelous—from Petrarch's "o de le donne altero e raro mostro" to Cocteau's "monstres sacrés." Exceptional examples—preternatural and prodigious qualities, even the exceeding perfection of genius—are framed as wondrous monsters. According to Aristotle, child prodigies are monsters in a positive sense, and the era of Romanticism endowed the creative genius with prodigious powers. Prodigious monsters affirm positive qualities that are exceedingly large or mighty. This sense emerges from the nineteenth-century, particularly in colloquial usage as a hyperbole for a great gathering or astonishing event. Daston and Park highlight an understanding of monsters as wondrous reflections of aesthetic variety. They fascinate us because they excite sensations of amazement. Reactions to the prodigious, particularly as they are explored in intellectual culture, played into the concurrent interest in eighteenth-century aesthetic theory of the passions and are encapsulated in the notion of the sublime.

Sublime

Baldine Saint Girons, our current authority on the sublime, characterizes this phenomenon of aesthetic philosophy as a field of shifting sentiment from a pejorative passion toward fascination that touched a nerve in the eighteenth century and set into motion a critical study of reception still relevant today.[5] The evolution of the sublime matches that of the monstrous in the period of its development as well as in its quality of cultural meaning. Early eighteenth-century aestheticians, such as Joseph Addison writing in The Spectator, fostered the first definitions of the sublime in English society while simultaneously commenting in judgmental astonishment on "monstrous flaxen Periwigs." Soon popular expressions like "monstrous"—as in bad—"taste" entered the language of criticism. The Earl of Shaftesbury marveled that monsters were "never more in request." Denis Diderot made the connection between teratology and art criticism when, at the Salon of 1767, he judged that no veritable beauty in art is possible when as our model even nature herself produces monsters. In his Encyclopédie, as Marie-Hélène Huet points out, Diderot also connected the imaginative genius of the artist to a monstrous genesis.[6] Edmund Burke's landmark 1757 inquiry into our ideas on the sublime and the beautiful charts the trajectory from the indeterminate passion of repugnance at the monstrous—"prodigious Darkness and frightful Sights," as a contemporary wrote—toward the positive aesthetic value of the sublime.

Burke's concept of the sublime is rooted in Longinus's treatise on rhetoric, Peri Hypsous, datable to the first centuries of the ancient Roman Empire. The Greek title means height, climax, while the term in Latin, as used by Quintilian, sublimis, suggests the upward direction toward that height, a rising oblique gaze, as in enthusiastic inspiration. In its first modern translation of 1674, Longinus's treatise carried the subtitle "On the Marvellous in Discourse" since it elaborated on the rhetorical techniques that excite awe. Longinus suggests abrupt rhythms of speech, comparable to a strike of lightning that suddenly reveals the idea and draws the listener up in wonder. "What is wonderful, with its stunning power, prevails over that which aims merely at persuasion and at gracefulness."[7] Longinus's sublime dazzles. It enraptures with irresistible empathy in a kind of violence that seizes the soul. "The sublime," Jean-Francois Lyotard summarizes, "really isn't something that tenders its own proofs and demonstrations, but a marvelousness that seizes, and inflicts sensation."[8]

Burke's interest lay in the unreasonable fear that affects mind and soul. Whereas beauty is merely pleasurable, the sublime terrifies, astonishes, and elevates the soul. Sublime light, like the brightness of the sun or abrupt contrasts of sunlight and shadow, overpowers the senses. Even sound can be sublime—like thunder, cannon fire, or gushing water that "awakes a great and aweful sensation in the mind." Burke gives an example: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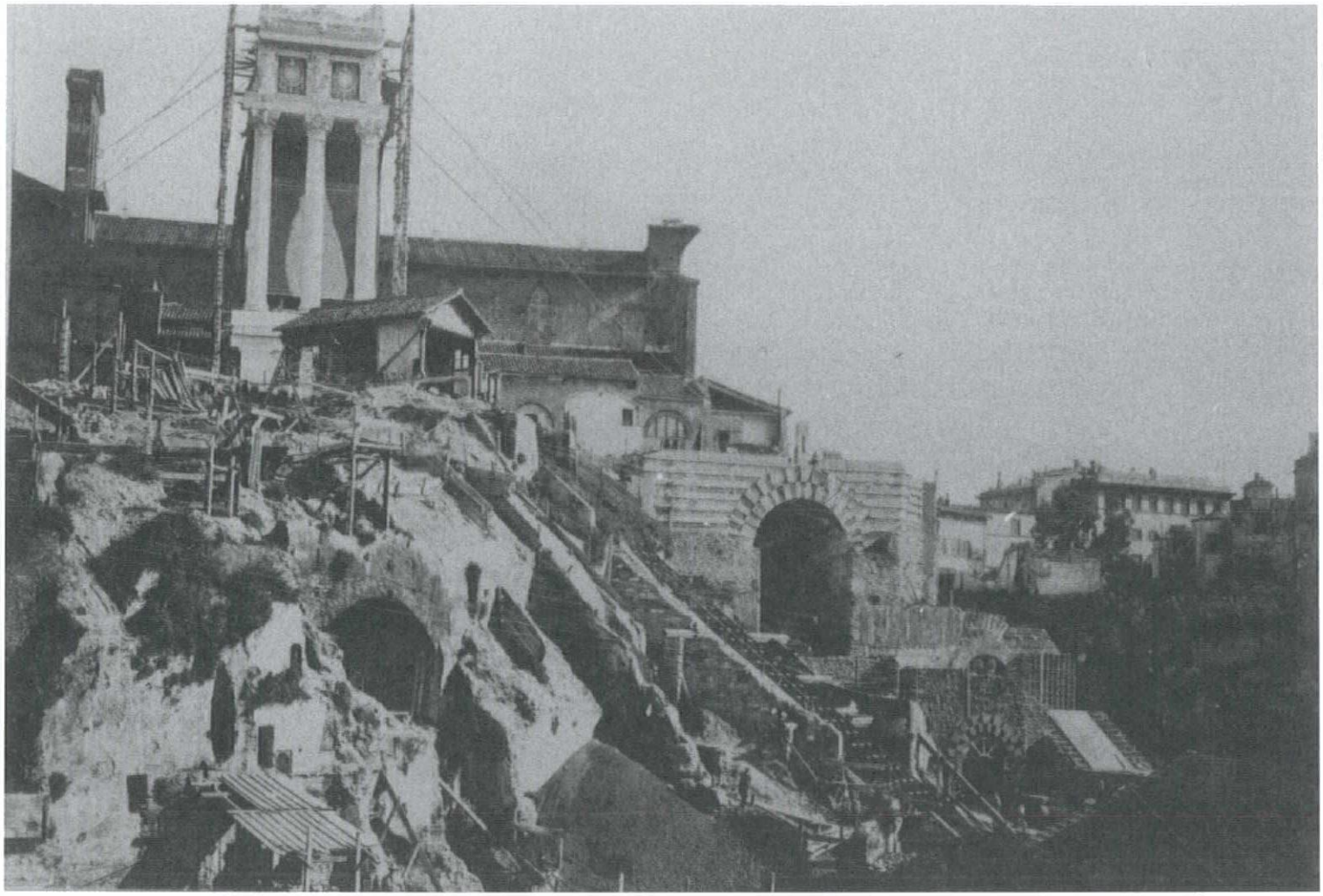
859 - ROMA - MONUMENTO A VITTORIO EMANUELE II



"The shouting of multitudes has a similar effect; and by the sole strength of the sound, so amazes and confounds the imagination, that in this staggering, and hurry of the mind, the best established tempers can scarcely forbear being borne down, and joining in the common cry, and common resolution of the crowd." The empathetic force of the sublime enraptures.

Architecture is sublime, Burke specifies, when it "fill[s] the mind with that sort of delightful horror." Contrary to the small, smooth, and soft of the beautiful, sublime architecture is massive, rugged, and hard-edged. An overwhelming scale—or at least the appearance of vast magnitude—of an arduous construction with strong contrasts of light, inside and out, day to night, create an overpowering effect. The work must cause our imagination "to rise to ... [an] idea of infinity." To do so, Burke admits, will involve a certain "generous deceit on the spectators [to] effect the noblest designs by easy means." The appearance of infinity can be created with an uncountable array of elements or a uniformity of composition, like a columned rotunda. Height is more effective than excessive breadth (and precipices into depth are the most terrifying), which implies here the original Latin etymology of a gazing obliquely upward and an inherent inferior status of the spectator.

The sublime exercises a power over the spectator. It always involves, as Burke notes, "some modification of power." The sublime, especially in architecture, is a strategy of domination by provoking an anxiety-charged response. "Astonishment is that state of mind, in which all its motions are suspended with some degree of horror. In this case the mind is so entirely filled with its object, that it cannot entertain any other, nor by consequence reason on that object." It is an enthralling violence upon the senses. Immanuel Kant's sublime also drew the rational mind into agitation in its trying to establish a relation to boundless objects. Mountain ranges, waterfalls, the pyramids of Egypt, and Saint Peter's in Rome elicit the sublime, according to Kant. The sublime object shows the mind its incapability of wholly grasping it, thus becoming a symbol of the mind's relation to transcendental order. Initial frustration or fear resolves in ultimate pleasure to "fill the mind with renewed and increased wonder and awe." In robbing the mind of its power to act and reason, the experience of the sublime pushes to the limits of human senses and tests the boundaries between known and unknowable.

As a test of tolerance, the sublime is synonymous with notions of the monstrous. Addison had already focused on the spectator's response to monsters—dreadful "hideous Objects" of "frightful Appearance"—in his essays dedicated to the imagination. For Burke the monstrous was the opposite of the beautiful, and Lyotard draws the logical conclusion that even ugliness can be sublime because its deviance shocks. The sublime object, like the monster, stuns and strains the imagination. Like dreadful monsters, the sublime inflicts an experience of fear, and "by distancing this menace," Lyotard writes, art "produces a pleasure of relief, of delight ... the soul is returned to the agitated zone between life and death, and this agitation is its health and its life," thus delimiting boundaries of existence.[9]

The idea of the sublime persisted and was enriched through the nineteenth century predominantly among the German Romantics. According to Friedrich von Schiller, "It is a composition of melancholy which at its utmost is manifested in a shudder, and of joyousness which can mount to rapture." The Romantic state of mind confronted tremendous and prodigious force deliberately to foster extreme modes of expression. Kari Elise Lokke, in her essay on the role of sublimity in the development of modern aesthetics, ties in the growing awareness of selfhood to the sublime as the essence of modernity.[10] For Coleridge, "The Greeks idolized the finite, and therefore were the masters of all grace, elegance, proportion, fancy, dignity, majesty—of whatever, in short, is capable of being definitely conceived in defined forms, or thoughts. The moderns revere the infinite, and affect the indefinite as a vehicle of the infinite; hence their passions, their obscure hopes and fears, their wanderings through the unknown, their grander moral feelings, their more august conception of man as man, their future rather than their past—in a word, their sublimity."

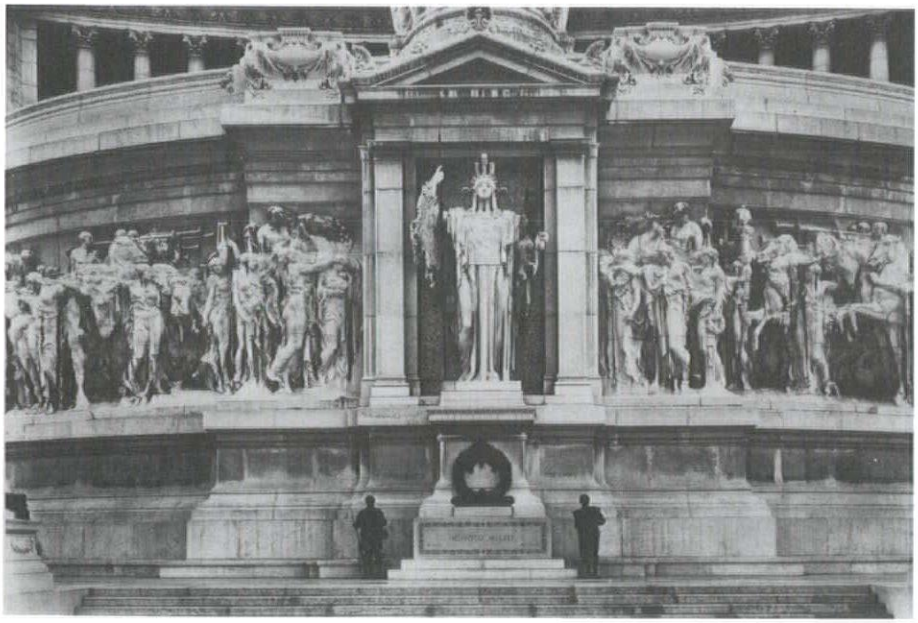
Thus the sublime infiltrated nineteenth-century architectural culture from many angles. Indeed the concept threads through the evolution of modern aesthetics to transform our criteria of reception. The inheritors of Burke's sublime no longer expected a building to be merely beautiful or pleasing, they expected to be confronted, moved, and uplifted by ingenious invention. The public became active participants, judges, and subjects of the architectural event. Its efficaciousness is measured not against learned criteria of beauty or allegorical references, but according to its success in moving the spectator. The sublime was understood as a universally efficacious language of form, therefore a potential universal instrument of communication. Coupled with emerging consciousness of nationhood, the aesthetic of the sublime endowed architecture with the means to marshal moral communities onto the foundations of modern civil society. The sublime was hence the most effective formal language for national monuments.

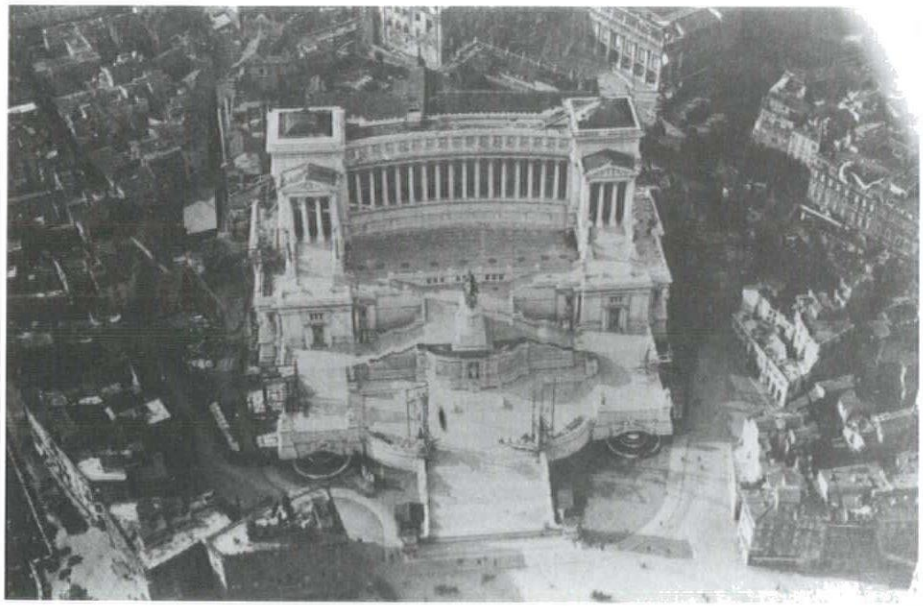
Monumental

Monument derives, like monster, from monere, to remind, and back to men, memory, thought. Monuments are constructions that concretize collective memory. Monument connotes the erection of a sumptuous edifice to keep in mind a notable person, action, or event. It commemorates, and as Shakespeare used the word, it warns: "And wherefore gaze this goodly company | As if they saw some wondrous monument | Some comet, or unusual prodigy." Addison also overlapped the notions of monsters and monuments in describing the rhetorical force of Cato's "dreadful looks: a monument to wrath." And in the German language, Mahnmal—from mahnen, to warn—specifies a monument to awful deeds, a portent. Monuments impose themselves upon our psychic and physical landscape with a dreadful purpose.

Monuments constitute the largest and most prominent architectural production of the nineteenth century. A "monumentomania" swept Europe and America, invading its cities in the crucial gestation of modern nationhood. Monuments served as focal points for moral civil society, legitimizing cumulative self-understanding. Rome's monument to King Vittorio Emanuele II was conceived with a carefully wrought aesthetic as the nation's foremost expression of the political relation between the state and its people.[11]

Vittorio Emanuele II, the first king of a politically united Italy, served his nation perhaps more effectively upon his death in 1878 than in real life. He is buried in the Pantheon, but the living presence of the monarchy is embodied in the monument to him. His commemoration afforded the first opportunity to express the nature of the new state in monumental and permanent form. The international architectural competition of 1880 elicited more than 300 responses: commemorative columns and arches, towers, domes, and pyramids, monumental bridges and open forums, and numerous piles of indescribable variety set in various





locations throughout the capital city and beyond. One proposal planned to rename the stars in the sky after Italian heroes. All the entries elaborated upon the language of the sublime as outlined by Burke and Kant: arduous constructions of awesome height, monuments of uniform composition or an uncountable array of elements, raising the mind to suggestions of infinity. The winning entry was a student project from Paul-Henri Nénot, drawn up during his Rome Prize. He was awarded a pat on the back, and a second competition was called with clearer parameters and opened only to Italian designers. A site high on the Capitoline Hill was determined, on axis with Rome's straightest and longest street, the Via del Corso. The choice necessitated the demolition of a fortification tower named after Pope Paul III. Edging out papal markers, the location places the new secular symbol of rule alongside Michelangelo's Renaissance civic forum at city hall and the memory of ancient temples that once crowned the hill.

The second competition for the monument opened in 1882 with a program that specified an equestrian statue of the monarch against a tall architectural backdrop, a screen designed to mask the only remaining religious presence (Santa Maria in Aracoeli). All 101 submissions were gargantuan. The winner of the competition was young architect Giuseppe Sacconi (1854–1905). In relation to the other entries, his was a comparatively restrained design of ramparts and terraces, with flights of steps that rise to a concave screen of Corinthian columns. Bronze quadrigae atop the end pavilions can be seen from most points in the city, and the structure below is covered with sculpture. Figures in the pediments and attic, processional reliefs, allegorical statue groups in white marble or gilded bronze, fountains, altars, pedestals, and inscriptions all serve as the setting for the colossal equestrian statue of Vittorio Emanuele II at the center. The logic of its rich visual language lies in its historicist references to public and political notions of ancient temples, basilicas, stoas, forums, and piazzas, and their complement of victory columns, rostra, river gods, and allegorical groups like those on papal tombs. The relationship of Sacconi's design to the Spanish Steps is most revealing: what was King Louis XIV's foiled attempt to command the skyline of the papal capital with a commanding site for his equestrian statue (designed by Bernini) was finally realized by King Vittorio Emanuele II.

The Vittoriano, as it is often referred to, is exemplary of late-nineteenth-century monuments. It is big, and it is prominent. High on the spur of the hill, the it rises squarely above the roofs of everything around it, emphatically redrawing with a horizontal bar the skyline of the city once characterized by curved church domes. The twinned temples and long connecting colonnade overwhelm with their sweeping symmetry and countless columns. The monument is massive, hard-edged, and blazingly bright. Botticino limestone was selected over the local creamy travertine as much for its striking effect as for the minister of public works' family connections to the Brescia quarry that supplied it. Sunlight plays in stronger contrasts and dazzles across this compact white stone. Unlike so many comparable national monuments, Sacconi's is made to be climbed. Long flights of stairs pull the stunned spectator to airy heights—surprising piazzas suspended in the sky.

Sacconi structured the monument upon the essential features of the sublime. The towering mass draws our gaze upward, marshals our movement up dizzying oblique paths, and seizes our rational minds with sensory overload. The Vittoriano is the epiphany of national consciousness, a setting for the liturgy of the nation-state enshrined in stone and bronze, and renewed in continual ritual. It is the keystone of national symbolism—an instrument of influence that communicates the moral and political messages of the monarchy—meant to forge collective memory and establish a historiography and hagiography of its players while counterbalancing ecclesiastical tradition. This is the "Altare della Patria" (Altar of the Nation), declared Primo Levi, "the altar of the new Religion. ... Here, more than ever, Rome will feel Italian, and Italy Roman, such that this will be the temple of Jupiter, this will be Saint Peter's, one fused and confused with the other." Papal historian Edoardo Soderini received a tour of the work in progress from the architect himself, who as his gaze swept across the skyline is reported to have said, "'Just look at Saint Peter's!'" Soderini elaborated that Sacconi "seemed to want to say that will be for us the eternal touchstone for comparison; we will never manage to do anything its equal. 'Just look at Saint Peter's!' And he could have added that the political ideal will never accomplish what the religious ideal has done and continues to do." Sacconi and the monarchic regime may never have had a chance of accomplishing it if it were not for the strategy of the sublime that lies at the core of the monument's affective force.

Everything about the monument has been designed for maximum impact. It has an irresistible empathy; it is difficult to remain indifferent before its shocking presence. At this place of mass gatherings, speeches, and rituals of the state, the shouting of the crowd provides the real experience of Burke's sublime sound that staggers the mind. Central to the monument's function is a modification of power. The senses of the spectator are worked upon with violence to the end of dominating the former papal city, its formerly divided citizens, and all subjects of its imperialist aspirations.

The sublime operates in environments marked by collective anxiety. The real magnitude of crisis is in inverse proportion to the force of the sublime employed. Architectural form, like the rhetoric of political speech during national crises, seeks to effect a modification of power. Be it the architecture of monumental cemeteries or the spaces of totalitarian rally grounds, the sublime manipulates mass subjects in a climate of fear to affect "that state of mind," to cite Burke again, "in which all its motions are suspended with some degree of horror." Boullée built would be unbearable, as Speer's Kongresshalle for Berlin forebode. The sublime is an aesthetic of sensory violence. Any concrete realization of it transforms a threat into reality: an architecture of ominous disquiet that oppresses.

The strength of propagandistic landscapes lay in constructed modes of reception: through liturgical events and crafted cinematographic representation (Leni Riefenstahl, as with Fascist Italy's Istituto Luce photographic and film service under Mussolini). Nothing captures this better for us still today at the National Monument to Vittorio Emanuele II than the annual ritualistic celebration of the state staged every November 4th on the Altare della Patria, when fighter jets flying in tight formation flash stunningly overhead streaming tricolor trails through the infinite skies.

The subjective aesthetic faculty worked, as Kant theorized, universally, but by shifting the parameters of reception—or deconstructing their cultural frames—the marvelous and tremendous may quickly become transgressive and terrifying. There is an inherent volatility in the aesthetic of the sublime. When a monument's sublime language is seen in a different light—in the flash of an atomic bomb—its force becomes repugnant. The monument turns into a monster.

The Italian monarchy laid the groundwork for the subsequent Fascist regime; in fact, it guaranteed it. The monument to Vittorio Emanuele II was the stage of the nationalist

rituals of Mussolini's rise to power. The Tomb of the Unknown Soldier was added on 4 November 1921 in a solemn crypt designed by the last of the great architects of the sublime, Armando Brasini. The theme of death—not part of the original meaning of the monument—was introduced and capitalized on by the Fascists. In 1926 Mussolini moved his office to Palazzo Venezia, opposite the site, and many conflate the Fascists with the entire conception of the Altare della Patria. It was the locus of the hypnotic nightmare of Fascism. Here for the war effort wives gave up their wedding rings and mothers their sons for worthless tin and anonymous broken bones in return. The monstrous trauma of nationalist hysteria found the ideal stage for its violence against the individual.

With these memories the monument is now perceived as a monstrum per excessum. It is unbearably large and unacceptable in today's scale of reference. The miniature and massless holocaust memorial by B.B.P.R. of 1946 in Milan is, by contrast, postwar Italy's most acclaimed monument. The Vittoriano seems a monstrum per fabriam alienam; its eclectic admixture appears an incomprehensible heap. It is finally a monstrum per defectum, effectively a nonfunctional remnant of former political regimes. The monument's continuing presence in the Roman landscape makes it unbearably monstrous to anyone with memory of the recent past. Indeed only tourists—by definition viewers without cultural memory—actually like it. It is an enduring reminder of egregious collective transgression that was the paroxysm of Italian nationalism. It remains a frightening monster in our midst, particularly unnerving for a collective conscience that has not seriously confronted in any other way its responsibility in supporting twenty-two years of dictatorship and its crimes against humanity. The Fascist period is dismissed blithely in common Italian speech as "the period between the wars," or a parenthesis.

This monstrous monument rising in the heart of the nation's capital is an omen of political pathology, a collective scourge. We can read it, like the monster of Ravenna, as a catalog of political miscreation: the emptiness of its structure, the inflated pride of its gargantuan elements, the vaporousness of its blanched surfaces, and the heresy of its superabundant decorations. There have been famous attempts to destroy it: architectural competitions for its removal or hurried reduction to a ruin, attacks with paint bombs, and closure for decades on end. These measures of dealing with the monster are fatuous insofar as they are not accompanied by recognition of guilt. The collective political conscience of Italy, unlike Germany's, is deficient in serious self-reflection, so comments on this monument remain naïvely restricted to dismissal of its formal qualities alone. This monster reveals the disquieting potential of miscreation from within, and therefore is most terrifying.

Monsters kill. Architectural monsters metaphorically stop our souls—and the Vittoriano literally killed its architect. Folklore has it that Sacconi hurled himself from its scaffolding rather than face his misdeed. In his 1987 film The Belly of an Architect, Peter Greenaway characterized the monument as carnivorous, and in his fiction it causes the death of the protagonist. Laying a honorific wreath at the Tomb of the Unknown Soldier remains ostensibly the Vittoriano's only present function. For this reason it was the locus for the nation's first spontaneous use of this stage since Fascism: the mourning of eighteen soldiers killed by terrorists at Nassyria, Iraq, in September 2004. The event inhabited an ambivalent space between Greenaway's carnivorous metaphor—a man-eating maw—and the former rhetoric of nationalism.

The National Monument to Vittorio Emanuele II tests the tolerance of our reception to prodigious architecture. By design, monuments inhabit the volatile region between tremendous and transgressive, exactly as monsters do. The fascination we feel for such experience reveals the dynamic nature of the architectural aesthetic of the sublime.

Examining the monstrousness of monumentality serves as a discursive strategy to make sense of the architectural world in crisis, to legitimate our norms, and to mark our boundaries. Monsters proliferated at the outset of Modernism and at its decline. The sublime was the monstrous face of architecture that filled the anxious space between wonder and warning. In our current cultural atmosphere of crisis, it is not surprising that the language of the sublime has returned. We have witnessed recently the proximity of our understanding of the monstrous, the prodigious, and the monumental. The sublime shifted once again from the pejorative to the positive when the frightening conjoined twin towers of Lower Manhattan, which had struck us all as monstrous apparitions on the skyline, were struck down. In our minds they rise again as monuments.

1. I refer particularly to collaborative research coordinated by Keala Jewell in Monsters in the Italian Literary Imagination (Detroit, MI: Wayne State University Press, 2001), as well as the probing contributions collected in volumes edited by Laura Lunger Knoppers and Joan Landes in Monstrous Bodies/Political Monstrosities in Early Modern Europe (Ithaca, NY: Cornell University Press, 2004); Michael Hagner, Der falsche Körper: Beiträge zur einer Geschichte der Monstrositäten (Göttigen: Wallstein, 1997); Andrew Curran, David Morrill, and Robert Maccubbin, "Faces of Monstrosity in Eighteenth-Century Thought" Eighteenth-Century Life 21, no. 2 (1997); Jeffery Cohen, Monster Theory: Reading Culture (Minneapolis, MN: University of Minnesota Press, 1996); G. Cerina et al., Metamorfosi Mostri Labirinti (Rome: Bulzoni, 1991); and the excellent study by Lorraine Daston and Katherine Park in Wonders and the Order of Nature, 1150-1750 (New York: Zone, 1998).

2. Michael Hagner, "Enlightened Monsters," in The Sciences in Enlightened Europe, ed. William Clark, Jan Golinski, and Simon Schaffer (Chicago, IL: University of Chicago Press, 1999), 178.

3. Daston and Park, op. cit., 180.

4. Michel Foucault, Les Anormeaux: Cours au Collège de France, 1974-1975 (Paris: Gallimard, 1999), 60-61.

5. Baldine Saint Girons, Fiat lux: Une philosophie du sublime (Paris: Quai Voltiare, 1993). See also Jean-Francois Lyotard, Lecons sur l'analytique du sublime (Paris: Galilée, 1991), Elizabeth Rottenberg, trans., Lessons on the Analytic of the Sublime (Stanford, CA: Stanford University Press, 1994); Frances Ferguson, Solitude and the Sublime: Romanticism and the Aesthetics of Individualization (New York and London: Routledge, 1992); and Kirk Pillow, Sublime Understanding: Aesthetic Reflection on Kant and Hegel (Cambridge: MIT Press, 2000).

6. Marie-Hélène Huet, Monstrous Imagination (Cambridge, MA: Harvard University Press, 1993), 1-3.

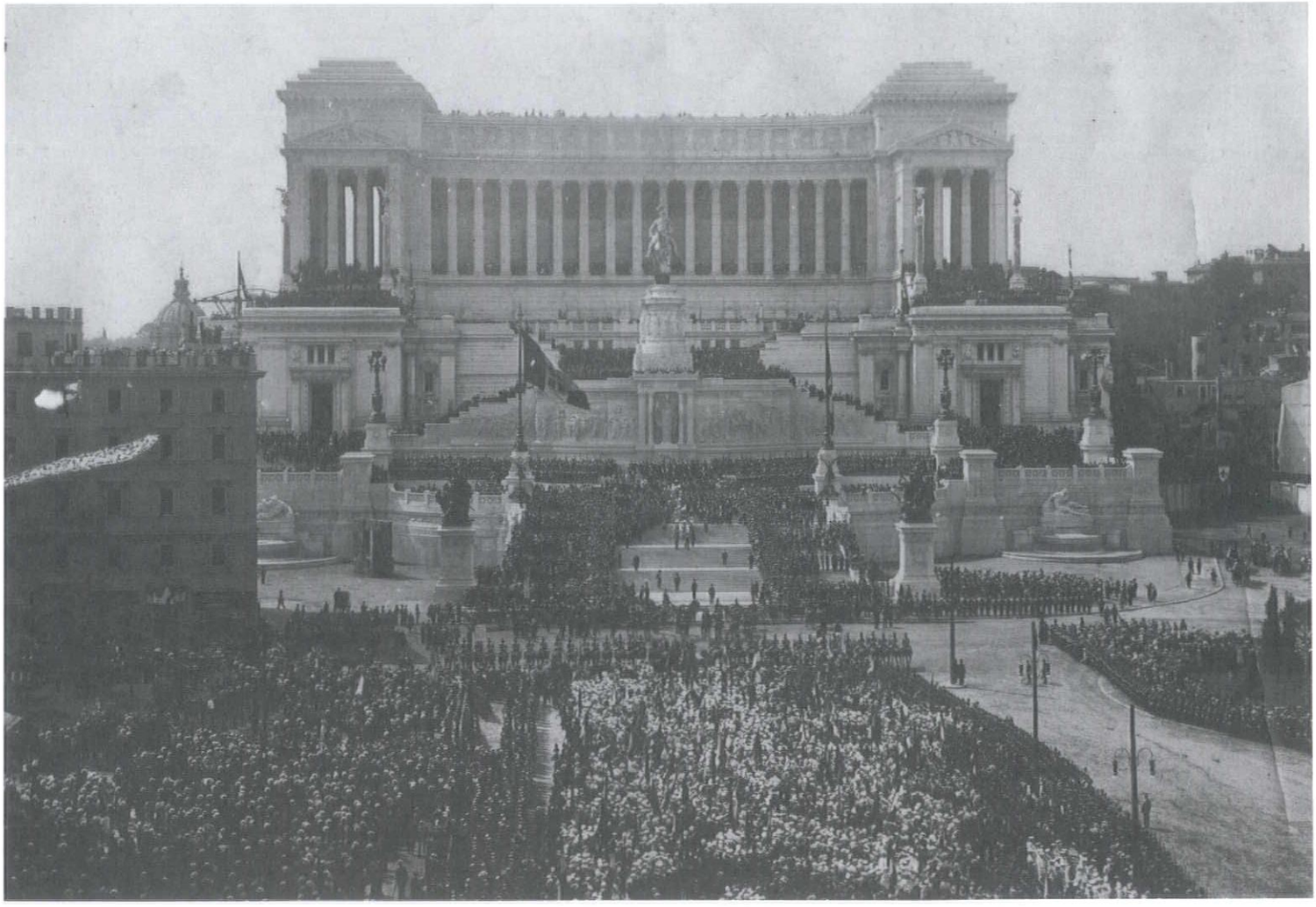
7. Longinus, On the Sublime, trans. James Arieti and John Crossett (Lewistown, NY: Mellen, 1985), 10.

8. Jean-Francois Lyotard, "The Sublime and the Avant-garde," Artforum 22, no. 4 (1984): 39.

9. Ibid., 40.

10. Kari Elise Lokke, "The Role of Sublimity in the Development of Modern Aesthetics," Journal of Aesthetics and Art Criticism 40, no. 4 (1982): 421-29.

11. On the Victor Emanuel Monument, see primarily Catherine Brice, Monumentalité publique et politique à Rome, Le Vittoriano (Rome: Ecole Francaise, 1998); Bruno Tobia, Una patria per gli Italiani, Spazi, itinerari, monumenti nell'Italia unita (1870-1900) (Rome and Bari: Laterza, 1991); Bruno Tobia, L'Altare della Patria (Bologna: Il Mulino, 1998); Maria Luisa Scalvini et al., L'Italia unita e i concorsi di architettura, ed., Verso il Vittoriano (Naples: Electa Napoli, 2002); Thomas Rodiek, "Das Monument Nazionale Vittorio Emanuele II in Rom," PhD dissertation, Lang, Frankfurt, 1983; and Robin Williams, "Rome as State Image: The Architecture and Urbanism of the Royal Italian Government, 1870-1900," PhD dissertation, University of Pennsylvania, 1993. See also Lars Berggren and Lennart Sjöstedt, L'Ombra dei Grandi, Monumenti e politica monumentale a Roma (1870-1895) (Rome: Artemide, 1996); and Terry Kirk, The Architecture of Modern Italy, vol. 1, The Challenge of Tradition (New York: Princeton Architectural Press, 2005) ch. 4.



Things

Monstrous Objects, Morphing Things. On Alberti, Wiki, and Bloggers†

Mario Carpo

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Mario Carpo

Old habits die hard. A few days ago I received by mail—real mail on letterhead stationery, with plenty of official stamps and seals—the mandatory request to submit Xeroxes of the receipts for some expenses that should, by law, be reimbursed by my employer on the basis of a conventional flat rate. This procedure is still routine, it seems, and does make sense somehow. It certainly did a few years ago. Evidently, one could now, if one so wished, produce what looks like a photocopy of anything, including of non-existent originals of all sorts, using a cheap scanner and its accompanying software. It is comforting to know that so many social practices are still based on mutual trust. After all, many administrations still reimburse airfare upon submission of the printout of an e-ticket—where anyone could print any itinerary and price for travel with any carrier (including fictional ones, such as the airline created, albeit not for this purpose, by Swiss media artist Res Ingold).

Institutions still tend to bestow some validity of proof upon the authority of machine-made reproductions such as a document in print (i.e., the printed e-ticket) or a printed picture (i.e., a photocopy, albeit the non-mechanical status of Xerox prints always somewhat restricted their trustworthiness). This power of the identical was legitimate in the mechanical world: in what is perhaps the most obvious case, mechanical reproduction could actually turn paper into gold (or sterling silver), as visual identicality used to be the only outward and visible sign necessary and sufficient to make a banknote worth the nominal amount of metal printed upon it. Credit cards do not work that way. They work, in the first instance, if the digital sequence they carry complies with a simple but invisible algorithm, known as Luhn's formula. This is why we can punch credit card numbers in to pay online, whereas it does not help, and it is illegal, to fax a banknote—the kind of prank that might have inspired Marcel Duchamp, had more fax machines been around during his lifetime.

In the digital world identical visual copies are rare, often irrelevant, and they prove nothing. A mechanical imprint is by definition stable, until its matrix breaks and must be remade. A digital file—a sequence of zeroes and ones—can be stable, but its sensorial manifestations inevitably change and morph all the time, randomly or by design. Of course we can still use a computer as a Xerox machine, in case of need, but this is not the smartest way to use it—and sometimes it is not even the easiest one: the PDF format of Adobe Acrobat© was developed specifically to maintain the fixity and stability of the printed page in the digital domain, and there is a certain logic in that the company that most profited from this is the same one that sells the most popular image-editing software. Thanks to Adobe Photoshop© we now all know that every version of the same digital picture is unique, and different from all others—basically, that all pictures can cheat. Not long ago photography, and all media based on camera obscura processes, such as cinema, were supposed to be "indexical." They were. But the notion that pictures are cheats is by no means a new one. No need to go back to Plato: when early in the seventh century Isidore of Seville wrote his famous tirade against pictures (all pictures mislead, they are never reliable and never true to reality)[1] he may simply have had in mind that it is difficult for a drawing to record vision, and equally difficult for a drawing to reproduce another drawing.

Identical reproductions of texts, images, and of manufactured objects are, in historical terms, fairly recent cultural and technical acquisitions. Variability was an inevitable material condition of all classical and medieval texts, as scribal transmission was known to be insecure, and the copy of images even more unreliable than the copy of words. In addition, recent philological studies have argued that for many medieval scribes and authors the very notion of an identical copy was but a tenuous one. In fact, insofar as scribes were often expected to edit and add and change and alter, almost ad libitum, the archetype they were copying, many medieval copies should in fact be considered as new originals, and scribes as new authors (and the other way around). Modern philologists have introduced a special term to characterize this state of fluidity or mobility that is inherent in medieval script culture in modern, vernacular languages—they call it "mouvance." The pursuit of identical reproduction in the Middle Ages was a rarity, limited to Scriptural texts, and to some classical authors.[2]

Identical copies came with the printing press, although the long-established authorial habit of revising a manuscript incessantly, hence "publishing" several different versions of the same work, all of them original so to speak, persisted well into the age of print. But print technology brought with it an inescapable and draconian divide between the free mouvance of manuscript and the frozen fixity of typography. At some point in time, the author must forward a final manuscript to the compositor, and authorize that his or her handwriting be turned into metal blocks of type.[3] After that, letters are cast in metal (or used to be), and changes are impossible or prohibitively expensive. In the contemporary technical parlance of prints the final proofs, those validated by the author, are still sometimes referred to as the "bon-à-tirer" or BAT proofs (literally, "good for printing" or "go-ahead" proofs). This is the watershed, as much a practical one as symbolic and historical, between the variability of hand-making and the identicality of mechanical reproduction. After the hand of the author has signed the "bon à tirer," the machine takes over. And we know what that means: all printed copies in the same print run are the same, and the same for all—including typos.

The transition from open-ended manuscript editing to identical and copyrighted editions of a literary work started with Gutenberg, but only came to full fruition (including in its legal implications) in the course of the nineteenth century. The rise to prominence of visual identicality followed a similar timeline. Alberti's linear perspective first defined pictures as the indexical imprint of light on a surface; only a few years later, relief and intaglio printmaking enabled such geometrically defined visual imprints to be mechanically printed and identically reproduced. These two almost simultaneous inventions crossed paths and made each other's fortune: printed images replicated their hand-made matrix, just as perspectival drawings replicated the natural optics of vision.[4] After this first epistemic shift, photographs and moving pictures amplified, and increased reliance on the same machinic paradigm: photographic pictures are machine-made, quasi-automatic imprints of reality, and their indexical value is transferred from the first shot to all mechanical reprints of it.

The same Alberti, who as it seems played a role in the establishment of many paradigms of modernity, extended what we could call, anachronistically, the "bon-à-tirer" model from the domain of texts and images to that of technical design and manufacturing. Alberti came to know of Gutenberg's press only late in life; yet a relentless, almost obsessive pursuit of identical reproductions is ubiquitous in all his work and theory.[5] In his treatise On Building, Alberti famously defined the modern principle of architectural design as an intellectual endeavor, expressed exclusively through drawings and models, then materially executed without change. This concept was manifestly at odds with the collaborative practice that was frequent on

medieval building sites, where many decisions were made on the fly, and the overall design of the building—insofar as this notion may apply in a pre-Albertian environment—was constantly revised and fine-tuned. Alberti's emphasis on the need for architectural designs to be fully completed before construction starts, and never altered thereafter,[6] introduced into the design process a line of no return that is functionally similar to the final version of a literary work that an author releases for publication. After that, as when the bon-à-tirer proofs are received in the printer's shop, authorial revisions stop; machinic processes step in, and identical replication follows (in the case of architectural design, proportional identicality, or homothety, as the author's archetype must be scaled up, then built in three dimensions).[7]

As was the case with literary works, the full implications of this new paradigm (including the legal value of contractual blueprints, and the author's intellectual property of the ensuing work) did not come to maturity until well into the industrial age, and of course the mass production of identical copies of real, three-dimensional objects of manufacturing did not begin in earnest until the industrial revolution, which in turn prompted those mantras of twentieth-century modernism—standardization and economies of scale. But it is at the dawn of modernity that Alberti—with a little help from some friends—forcefully shaped that pervasive and essential tenet of Western humanism, asserting that works of the intellect, including architectural works, have one author, and one archetype, which executors (scribes, or draftsmen, or builders) are requested to reproduce identically, and prohibited from altering.

In the case of architectural design, the emergence of the "bon-à-tirer" paradigm had another crucial and long-lasting effect. The separation of design from building made construction more and more dependent upon drawing, and on the capacity of drawings to define three-dimensional objects through sets of bi-dimensional diagrams. This capacity ultimately rests on the power of the geometrical tools that are available and usable at any given point in time: with few significant exceptions, up to very recently we could only build what we could draw, and measure in drawing. And this is where a long historical course of incremental change drastically accelerated at the end of the last millenium—not because new geometries were invented, but because most existing geometries were suddenly made available via new digital interfaces. These turned out to be far more user-friendly and better suited to design and manufacturing than nineteenth- and twentieth-century mathematics.

We all know the rest of the story. At some point around the mid-nineties of the last century, algorithmically generated continuous functions started to be used in two different ways: to design unique objects based on complex geometries, or to design series of objects based on differential variations.[8] Thanks to Gilles Deleuze and to Bernard Cache the design of a "generic" object, or objectile, has acquired a distinctive epistemic resonance, which can be aptly described in Aristotelian—and again, not coincidentally, Scholastic—terms. The debate on digitally driven mass-customization that ensued, and to some extent is still ongoing, suggests that non-standard seriality is a hydra with many heads, and that the same means can serve different ends. The collaborative design process that is made possible, and induced, by the new digital tools has already been related to the variability of digital texts, where more authors can intervene sequentially on the same file and all changes are automatically tracked and collated. The term that is often used to denote these new textual formats designed for open-ended variability, "versioning," was recently and suitably applied to similar digital-based, collaborative design processes.[9] But the increasing integration of digital design and production tools implies that versioning, or variability, may at some point include end-users, as well as designers and manufacturers, in the same collaborative process. Again, this stands to reason, as interactivity is widely seen as a defining feature of new media objects, and digitally manufactured architectural objects will most likely not be an exception.

This is already happening, at a demonstrative scale, in the work of some contemporary architects and artists. Non-standard technologies may be used to digitally mass-produce bespoke suits—both literally and metaphorically. The same technologies may also be used to involve customers, clients, or patrons in all phases of a fully interactive process of design and manufacturing, thus reversing or indeed obliterating the Albertian paradigm, and all that it implied. This may result in new forms of digital artisanship where variances are the rule, identical reproduction the exception, and where the line of no return between design and production can be crossed at will in both directions, as every prototype is a new copy and a new original at the same time.[10] With the disappearance of the "bon-à-tirer" model, the author and the authorial archetype (the final proofs, signed and ready for the printer; the final blueprint, signed and ready for the contractors) will also pass from sight. As was the case for centuries before Alberti and mechanical reproducibility stepped in, authorial identity may again deliquesce in a collective, communal, anonymous environment, or in a permanent feedback loop between design, production, and use, and their respective actors. This is the way of making things that used to be, and still is, peculiar to hand-making. It was eradicated by the ideology and the technical logic of mechanization, and digital tools seem now poised to revive it, to varying degrees. Architecture, which came to the machine age late, reluctantly, and partially, may embrace the quintessentially artisanal dimension which is inherent in a fully digitized design and production chain better and faster than most items of industrial mass production.

Does this sound far-fetched? Media scholars have long established a parallel between post-print and pre-print cultural technologies—between digital and script culture, for example, both based upon variance and both alien to the indexicality of mechanical imprints. Medieval philologists should have a look at Wikipedia when they have the time. It works more or less as they say medieval texts in modern vernacular did. Nor does the virtually unlimited outreach that comes with the internet inhibit the almost clannish feelings shared by many of Wikipedia's often anonymous contributors. Admittedly, building even the most trivial three-dimensional object of manufacturing is trickier than building an online encyclopaedia. But if this is a trend for digital texts and images, we have reason to infer that architecture in the digital age will see at least some of the same—for better for worse.

Bruno Latour remarked in a recent essay that sudden breakdowns of technology, accidents, or catastrophes, such as the explosion of the Shuttle Columbia in February 2003, may turn apparently external, neutral or hostile objects of technology into catalysts of communal feeling—in Heideggerian terms, transforming muted Gegenstand (Object) into active Ding (Thing).[11] Latour wrote that essay before the riots of the fall of 2005 in the Paris suburbs, when the ritual immolation of several thousand cars could have provided a similar case in point for techno-social analysis. But the gathering of a living community around the technical making (or unmaking) of Things may not

require human sacrifice. The often not-so-hidden agenda of many contemporary Heideggerians does contemplate the suppression of most existing technology, yet the ongoing mutation of our technological universe from mechanical to digital paradigms may fulfill, oddly, part of the same technophobic program. Digital tools no longer need to set apart the thinker and the making; on the contrary, if deftly interpreted and pertinently put to use, digital technologies may reunite most of what the mechanical revolution had alienated—including the various communities that in the pre-mechanical world were associated with, and dignified, all Things hand-made.

Again, the commonplace that digital technologies may ultimately humanize machines, and consequently the machine-made environment, should be met with prudent skepticism. Lewis Mumford had already vaticinated a similar catharsis in the early thirties of the last century: as he saw it, redemption from the sins of the steel-and-coal, "paleotechnic" machine age would have come from electricity.[12] That did not happen at the time, and no one can prove that we may be luckier now. And many architects and designers may resent or resist a change that appears to counter the raison d'être of their profession. After all, the Albertian model that is now at stake has defined the architectural profession for the last five centuries. Interactivity implies some loss of control on the end-product, and the traditional notions of iconic, visual, and authorial identities will inevitably be dented by digitally-based, open-ended variability. As I argued elsewhere, this general loss of visual stability may lead to the revival of older—again, pre-Albertian—patterns of visual identification.[13] And architects may find some comfort in that a morphing architecture of Things existed and thrived before the rise of the Albertian model: this may augur well for the lot of an architecture of variances after the demise of the mechanical Object.

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This essay was commissioned and written in the spring and summer of 2006.It is now published here without updates or revisions, but two years—even one—may mean a lot in the annals of digital technologies. Indeed, one of the central themes in this essay has recently taken on a particular significance, to become one of the foci of the current debate on new technologies in architectural design. What I called here "the end of the Albertian paradigm" referred to the ideal separation that Alberti first theoretically advocated between the intellectual act of design and the material act of building. As I argued, the new digital tools for design and manufacturing are blurring this traditional (Albertian, then modern) divide between authorial conception and material execution. The continuity between computer-based design and production, and the increasingly open technological platforms on which both design and production are now based have already brought into being new experimental forms of interactivity in design processes and in professional practices and inspired the production of new mediated objects, which can now be more interactive, more participatory but also more collective, more anonymous, and ultimately less "authorial."

Over the course of the last twelve months or so, interactivity and participation have become the digital catchwords of the day, and the architectural discourse on these matters is now (in the fall of 2007) as intense as the discourse on hypersurfaces, non-standard, and topological geometries was ten years ago. Interactive connectiveness may include human participants as well as machines of all sorts, and the architectural emphasis has recently shifted from technical interaction between networked (or smart) machines (a development that some have called "The Internet of Things") to digitally enhanced collaboration between several classes of actors in the design and construction process—including patrons, clients, or end-users. Among the most revelatory sources of this recent trend, see in particular: Christopher Hight and Chris Perry, eds., Collective Intelligence in Design, Architectural Design 76, no. 5, Profile 183 (London: Wiley-Academy, 2006); Lucy Bullivant, ed., 4dspace: Interactive Architecture, Architectural Design 75, no. 1, Profile 173 (London: Wiley-Academy, 2005), and its follow-up, Lucy Bullivant, ed., 4dsocial: Interactive Design Environments, Architectural Design 77, no. 4, Profile 188 (London: Wiley-Academy, 2007).

As I argue elsewhere, this architectural discussion follows and shares in the ongoing debate and polemics on the so-called Web 2.0 and its supposedly participatory, collaborative, and anti-authorial Geist. From this particular vantage point, a divide of sorts thus begins to appear between the "vertical" CAD-CAM integration of vintage, Web 1.0 descent, and the "horizontal" integration between actors in the design process that the recent techno-social developments of the Web 2.0 are now inducing and inspiring. We can see both tendencies as revolutionary and quintessentially post-modern. At the same time, both constitute, to some extent, a digital reenactment of the way of making things that was dominant for centuries before the Albertian revolution. Now that the wave of the mechanical index is receding, it is not surprising, as I suggested in this essay, that a new post-indexical techno-cultural environment may be more freely conversant with some spolia of the age that preceded the rise of mechanical copies—the pre-Albertian, pre-indexical age. (Paris, September 2007)

1 "Pictura autem dicta quasi fictura: est enim imago ficta, non veritas. Hinc est fucata, id est ficto quodam colore inlita, nihil fidei et veritatis habentia." Isadoreo Hispalensis Episcopi Etymologiarum sive Originum libri XX, ed. W.M. Lindsay (Oxford: Clarendon Press, 1911) XIX, 16, 1.

2 Paul Zumthor, Essai de poétique médiévale (Paris: Seuil, 1972) 65-75; Bernard Cerquiglini, Éloge de la variante. Histoire critique de la philologie (Paris: Seuil, 1989) 33-69, 120.

3 Cerquiglini, op. cit., 22-23.

4 Friedrich Kittler, "Perspective and the book," Grey Room 5 (2001): 44.

5 Mario Carpo, Architecture in the Age of Printing (Cambridge, MA: MIT Press, 2001) 119-124, and "Alberti's Media Lab," in Perspective, Projections, and Design, ed. Mario Carpo and Frédérique Lemerle (London: Routledge, 2007).

6 To the point that after the architect's design is completed all further changes and modifications can only be for the worse, and detract from it. See Leon Battista Alberti, De re aedificatoria, ed. G. Orlandi (Milan: Il Polifilo, 1966) I.III.1, 107.

7 This "translation of drawing to building," albeit purely mechanical in spirit, until recently used to be performed manually.

8 Mario Carpo, "Ten Years of Folding," Introductory essay to the reprint of Architectural Design 63, nos. 3-4, Profile 102, Folding in Architecture, ed. Greg Lynn (London: Academy Editions, 1993; reprint London: Wiley-Academy, 2004) 6-14.

9 SHoP [Sharples, Holden, Pasquarelli], ed., Architectural Design 72, no. 5, Profile 159: Versioning. Evolutionary Techniques in Architecture (London: Wiley-Academy, 2002). See in particular SHoP, "Introduction," 7-9; and Ingeborg Rocker, "Versioning. Evolving Architecture. Dissolving Identities," 10-18.

10 Mario Carpo, "Tempest in a Teapot," in Log 6, ed. Cynthia Davidson (New York: Anyone Corporation, 2005): 102-103. See also Branko Kolarevic, "Digital Master Builders?" in Architecture in the Digital Age: Design and Manufacturing, ed. Branko Kolarevic (New York and London: Taylor and Francis, 2003) 63-71; "Introduction," in Digital Tectonics, ed. Neil Leach, David Turnbull, and Chris Williams (London: Wiley-Academy, 2004) 4-12; see esp. 4-5.

11 Bruno Latour, "Why Has Critique Run Out of Steam? From Matters of Fact to Matters of Concern," Critical Enquiry 30, no. 2 (2004): 225-248.

12 Lewis Mumford, Technics and Civilization (London: George Routledge and Sons, and New York: Harcourt, Brace and Co., 1934). See in particular "The Dissolution of 'The Machine'" and "Toward an Organic Ideology," chapter VIII, 1-2, 364-372.

13 Mario Carpo, "Pattern Recognition," in Metamorph. Catalogue of the 9th International Biennale d'Architettura, Venice 2004, vol.III: Focus, ed. Kurt W. Forster (Venice: Marsilio, and New York: Rizzoli International, 2004) 44-58.

Autoportrait; Hektor & Alex Rich (Field Trip); By Trico, Fukuoka, Japan; April 2006 (During three days in Fukuoka, Hektor was offering a poster and portrait printing service to the visitors of the By Trico store in Fukuoka. The service was accompanied by two text wall paintings, one indoors, and one as Hektor's first outdoor roof-top piece.)

Soft

Soft Monsters

Jürg Lehni

Software in its purest form is a sequence of codes, a program of machine-executable instructions. This code is normally formulated for specific platforms and the dialects of their processors. In response to incoming data—or the interaction of human users through input devices such as a keyboard and mouse—the processor then works its way through the instructions and decides what to do next. Output devices such as a screen or a printer then display the state of the process or produce the final results, feeding them back out of the black box into the real world. Software is mostly written in dynamic, modular ways, by formulating reusable functional units (libraries) and clearly defining the interactions and communication protocols between them (interfaces). These parts are mostly hidden from the end users—us—who only get to see what we are supposed to see: the user interface that separates us from the black box and defines the language of interaction.

As today these black boxes become both smaller and more pervasive, software is becoming ubiquitous, embedded in countless everyday objects such as mobile phones, music players, cameras, watches, cars, bank machines, and more. In these capacities, software mostly works as a simple helper to assist a set of tasks. Of course, software is also a core component of the Internet, where it runs both the basic infrastructural protocols and the contents flowing through them. It seems that, influenced by the multi-authored and generally open character of Internet technology—along with ideas such as the semantic web (the next step of the World Wide Web where concepts of hypertext are applied on a semantic level as well), standard-definition by committee, social networks, collective efforts, information sharing, and fast innovation—companies have started to see the advantage of interconnections and extensibility. More specifically, some companies have discovered the potential for moneymaking in the realm of open source material and joint effort services. An alternate to simply controlling the production and distribution of products, these new methods have influenced industries beyond software making. For example, in China and India many small-scale car manufacturers have found a way to compete with larger, state-sponsored rivals by marketing their production services to small car design firms. By offering optimized communication interfaces and defined formats for the exchange of designs and information, these manufacturers are able to collaborate with designers throughout the world. Hence, it would appear that concepts first realized in software have started to inspire innovative companies to rethink and reinvent their business models and strategies.

But it has not always been this way. Software in many areas still develops in a different manner, driven by companies that mark and defend proprietary standards on the map of software technology. These softwares are often called applications. As they grow over the years and increase their version numbers, they often change shape due to changing marketing, PR strategies, or takeovers by other companies. In this process, the structure of the applications themselves starts to resemble that of complex architectural constructs or patched-together city districts with eclectic mixtures of styles

from different époques. An "unnatural" collection of mismatched parts, these applications are among the most pervasive monsters today, and contradict the inherently modular nature of software.

This metaphor—and the widespread use of terms like "software architecture"—suggests a parallel between planning, designing, and realizing a piece of software and the creation of a building or city. Viewing certain applications this way can help us better understand their nature, mechanisms, and the strategies of the companies that produce them. It may explain how these applications got where they are and why they do not change so easily.

Take the area of graphic design, desktop publishing and printmaking. For years, companies like Aldus, Macromedia, Quark and Adobe produced a variety of different applications that did things in different ways, providing consumers with a range of options and maintaining a healthy competition in the market. Most of the key technologies in this field such as pixel-based imaging and vector graphics are rather old and mature now, and the degree of innovation possible within these boundaries has decreased over the years. This has led some of these companies to focus on stabilizing their power and market-share and investing in takeovers of smaller, more innovative companies. For example, Macromedia bought Freehand from Aldus and Flash from FutureWave. Macromedia was in turn taken over by Adobe in 2006. The graphic design, desktop publishing, and printmaking software market is now at a point where almost all competition has disappeared, and Adobe controls the field. Quark is virtually the only competitor, but is struggling to keep its Quark Xpress user-base from switching over to Adobe InDesign. Through a series of acquisitions Adobe has become the Microsoft of the design world. In turn, Adobe applications have become monsters similar to Microsoft's operating systems and office suites.

The Adobe Creative Suite 3 was released in March 2007. It was the first major release from Adobe after that company acquired Macromedia, and its main innovation was that it attempted to unify the interfaces of all their applications, both old and new such as Photoshop, Illustrator, InDesign, Flash, DreamWeaver, etc ... Looking at the full family of new icons resembling a periodic table spread all over the color spectrum, one can see that the new fusioned company now covers a very broad field with a large number of different applications. The impression left by Adobe is that it is committed to being involved in every aspect of software for the creative sector. Other associations that come to mind when looking at the illustration might be that of battlefields and fleets, the image having a certain overwhelming, almost frightening aspect in its completeness.

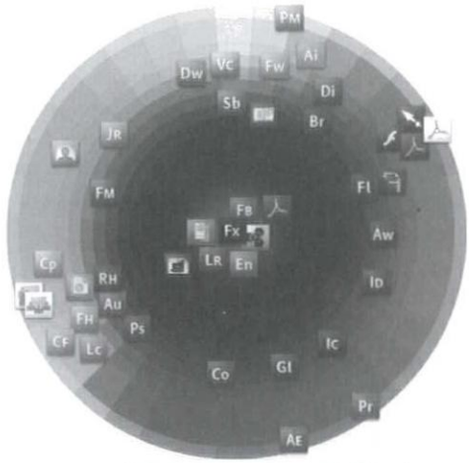
Far from being a unified family, however, each of these applications has a long, disparate, and complicated genealogical history, going back to different companies and software development teams, often having undergone more than one corporate takeover. With Creative Suite 3 Adobe has achieved a superficial unification by changing the interface and making all applications generally look and feel the same. Beneath the surface, however, Adobe is still dealing with many different code-bases that may have very little or no intersections at all, but often do similar things. Fully resolving this mess may very well prove to be as complex as starting over from scratch. In other words, the Adobe Creative Suite 3 remains a beast to be tamed.

Scriptographer

In 2002, I began an effort to open up one of these monolithic applications that plays an important role in graphic design, as well as architecture—Adobe Illustrator. The Illustrator plug-in Scriptographer was created with the aim of giving the user the possibility to extend Illustrator's functionality and standard set of tools through a simple scripting language. By doing this, I hoped to confront this closed Adobe product with an open-source philosophy and a community-based exchange of ideas and tools.

Scriptographer was conceived as a comment on today's desktop publishing and design, where so often product standards and software influence aesthetics. It is a call to not simply accept the limitations and predefined ways of working with current software, but rather to make the re-appropriation of tools and the invention of new ones a part of the contemporary vocabulary.

Through Adobe Illustrator's plug-in architecture and the software development kit (SDK) provided by Adobe to allow extension of the software, Scriptographer wraps Illustrator's functionality in a simple and cleanly designed scripting environment. It is based on the JavaScript scripting language, which is easy to learn and use and is widely known from its integration in web browsers and the Macromedia Flash software. The SDK itself is based on the much more complicated and advanced programming language C/C++, setting the bar for making extensions without Scriptographer too high for most designers. But the effort went beyond the wrapping and simplification of functionality, since often problems had to be fixed and workarounds had to be found for errors that at one point in the past nested themselves in this software.



Frightening in its completeness, the full family of Adobe CS3 Icons.

Scriptographer is freely distributed on www.scriptographer.com, together with a set of predefined scripts. The website was conceived to build a community around it and encourage the creation and exchange of new scripts along with discussions about ideas and support. This effort is ongoing; the next step will be using Scriptographer as a teaching tool for a series of workshops across multiple design schools. The aim here will be the integration of programming as a tool in the everyday workflow of designers, as opposed to its isolated use and exploration in related efforts such as Processing.org or NodeBox.

This didactic focus of the Scriptographer project, and corresponding efforts such as the writing of tutorials, examples, and the use of these for teaching, has become increasingly important for me. Without such efforts, Scriptographer might face the same fate as the chimeric yet monolithic applications which it is critiquing. With increasing publicity, more and more people may simply download the software and use existing scripts in their design work without modification or addition of their own elements. In this scenario, Scriptographer would become software in the traditional sense, and the results of such use risk becoming a recognizable style, no more original than images produced with overused filters in Photoshop.

More enduring, and promising, is the combination of automatized helper scripts with manually executed tasks. The symbiotic relation between something calculated by the computer and something executed by hand is a field for further exploration. Scriptographer is a good platform for this, since it facilitates this combination through its integration in software that is normally used to work manually on design tasks. Possible starting points for such work are drawing tools, where the user works with the mouse, and parametrized automatic tasks, with the parameterization and decision-making happening through a dialogue with the user over a graphical interface.

Hektor and Rita

Building upon the Scriptographer project and the motivations behind it, beginning in 2002 I started to extended my work beyond the limitations of the computer screen with the creation of two computer-based output devices driven by Scriptographer—Hektor and Rita.

Similar to Scriptographer—a parasitic extension of the complex virtual construct that is Adobe Illustrator—Hektor and Rita are pieces of technology that attach to physical architecture—i.e., walls and buildings—and work in relation to them. In the case of Hektor it is in the form of a portable, scalable output device that allows the reproduction of drawings and texts on existing surfaces using spray paint. Rita, on the other hand, is a communication device, a display technology. Again, it works on the existing structure of the building by drawing and erasing directly on its glass windows.

Hektor was created in a close collaboration with engineer Uli Franke. Its light and fragile installation consists of only two motors, toothed belts, and a holder for spray cans. The motors are mounted in variable dimensions on the wall, and a simple calibration figures out the positioning. Remotely controlled by a computer through a script written in Scriptographer, the can then is moved along drawing paths just as the human hand would move, and the nozzle is activated by a solenoid. During operation, the mechanism sometimes trembles and wobbles, and the paint sometimes drips, all leading to an ambivalent, human-like, imperfect expression between hi- and lo-tech.

The aim first was to create a new output device that went beyond the limitations of today's computer, screen, and vector graphic-based design, conveying abstract geometries in a manner different from normal printers. Hektor was intended to be a new tool that would output an inherently particular and distinctive aesthetic.

However, once created, Hektor turned out to offer more than that. It was a bit of a Frankenstein moment when it first came to life, moving across the wall. Somewhat to our surprise, the act of Hektor drawing proved to be as compelling as the final drawings produced. There is less potential for such surprises in software alone, since the system is very clearly defined and the boundaries and rules well-formulated. However, when physicality and gravity come into play, there is more room for the unexpected. It was partly our solution to Hektor's struggle with gravity that gave it its unique style and character when in motion.

These performative qualities of the machine in action were further explored in a series of exhibitions and events, mostly in creative collaborations with other artists and designers. This in turn led to both a respected body of work by the machine personified as Hektor—which increasingly started to seem like a being in its own right—and to the idea for its successor, Rita. Based on the narrative potential, as demonstrated by Hektor, of drawings produced by a machine, Rita was designed to be a machine that instrumentalized and further automated the act of drawing and its narrative qualities. By giving Rita the capability to work autonomously and erase its own drawings, the focus moved further to the act of reproduction rather than the finished result. Using whiteboard markers, an industrial plotter-like installation, and a tool-changing mechanism, Rita is able to constantly reproduce multicolored line drawings on glass and erase them partially or fully. Rita can then further add to and modify the drawing, or start over again with something new. Since the drawings are not permanent, the focus is on the moment of creation rather than the finished form.

An important aspect of Rita is the machine's relation to architecture. Ideally, it is mounted on the inside of a large window, drawing out towards the exterior passersby. People stop and read the displayed messages or look at the illustrations and stories being drawn. While looking at it from the outside, the focus is on the drawing rather then the construction of the machine. This way of reading can be supported further by the use of semi-transparent glass or indirect lighting. Upon entering the building, the focus of the viewer moves to the construction, mechanism, and functioning of the machine. Rita operates as a communication tool to the outside of the building, a slow display using drawing and erasing as its means of communication.

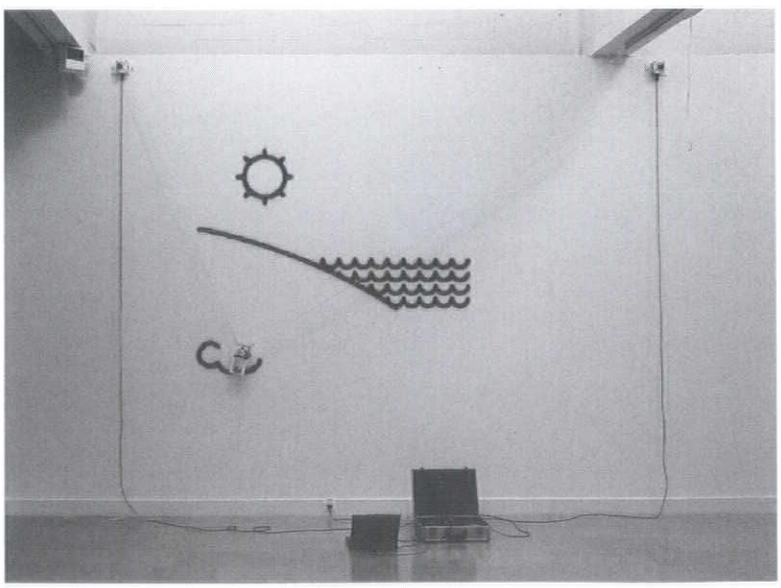
At least two possible—and as yet, untested—ways of using Rita are imaginable. If installed in an art institution, for example, Rita could be used to announce upcoming shows, guided tours, film projections, etc. Alternatively and more freely, it could be run as its own exhibition surface, displaying animated drawings developed in collaboration with invited artists asked to explore and play with the potential of this device. These different modes are non-exclusive, and Rita could switch freely between them, depending on what needed to be announced at a given moment.

In 2006, work started on a new version of Hektor that—by using four dynamic DC motors instead of only two stepper motors—is faster, more stable, and suitable for surfaces of dimensions up to 20m x 20m. These new capapbilities enhance the device's relation to architecture, since the focus moves further to the application on entire walls, both outside and inside.

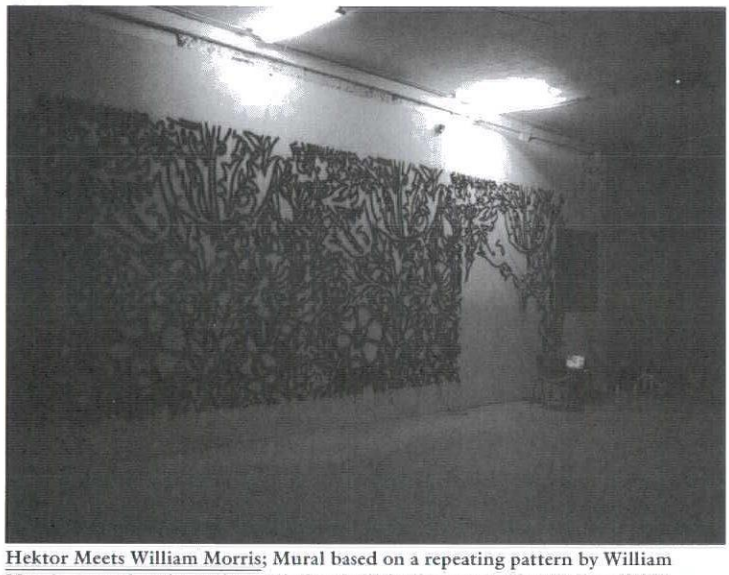
The Hektor interface, programmed in Scriptographer, calculating the motion path for the signage of the show YOU ARE HERE at London Design Museum, 2005.

The four motor modules for the new version of Hektor, currently in development.

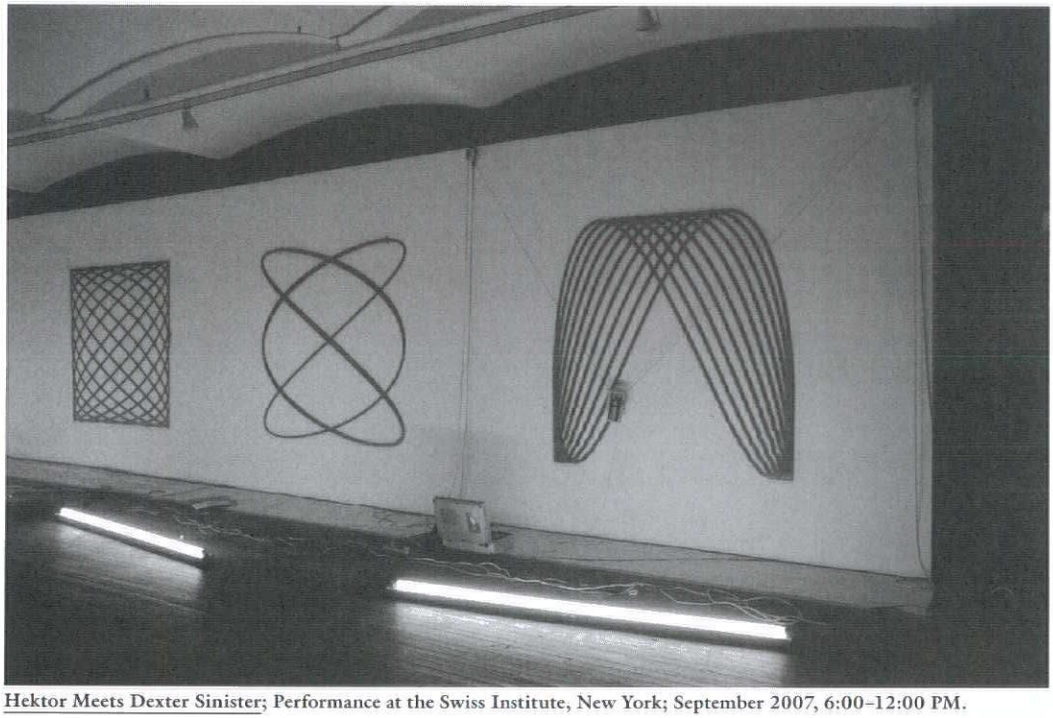
Hektor Test #8 (Typography); Zurich, September 2002.



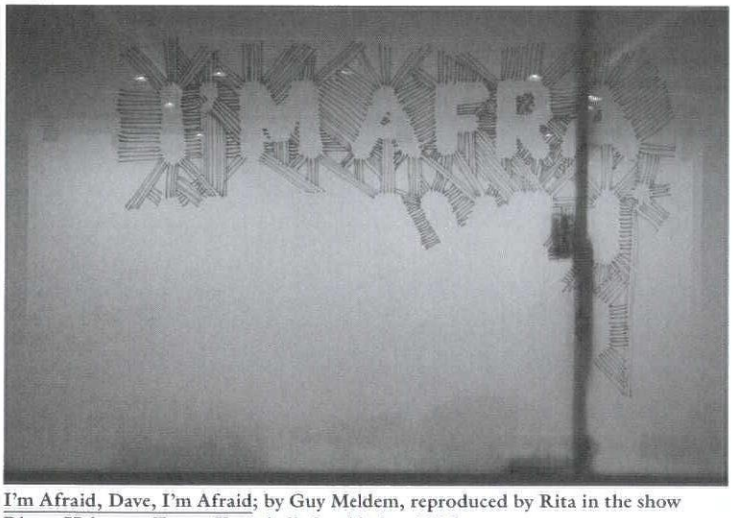
Hektor Draws a Landscape, 2003; Hektor & Alex Rich;
Lee 3 Tau Ceti Central Armory Show; Villa Arson, Nice, France.



Hektor Meets William Morris; Mural based on a repeating pattern by William Morris, reproduced together with Goodwill for Tourette's II at Gallery W139, Amsterdam; 2003.



Hektor Meets Dexter Sinister; Performance at the Swiss Institute, New York; September 2007, 6:00–12:00 PM.



I'm Afraid, Dave, I'm Afraid; by Guy Meldem, reproduced by Rita in the show Rita + Hektor at Tensta Konsthall, Stockholm; 2005.

Alternatively, the device can also be used to position an object in three-dimensional space, by turning the four motors into a horizontal plane and using them as pulleys that move around the object that hangs down from them. This is a new area to be explored. By moving a light source and using long-exposure photography, drawings could be realized in three dimensions. And there are many possible applications beyond image-making, such as the control of trajectories of moving objects like a sound source or a video camera.

Soft Alternatives

These projects can be seen as ways to subvert and tweak the monsters represented by software giants like Adobe, and, in the case of Hektor and Rita, the architectural constructs we are surrounded with on a day-to-day basis. They are parasitic in their approach, relying on their host and its context—whether that be Illustrator and its role in the design world, or an existing wall or window glass and the physical space where it is situated—to carry out their operation and leave their marks. As such, they are not about accusing and pointing fingers. The aim is rather to point out alternative methods and ways of working with and using technology. They represent gentle interventions that hopefully open eyes and let us question the mechanisms driving the production of softwares and the big companies behind them today, as well as the role of technology in architecture and public space.

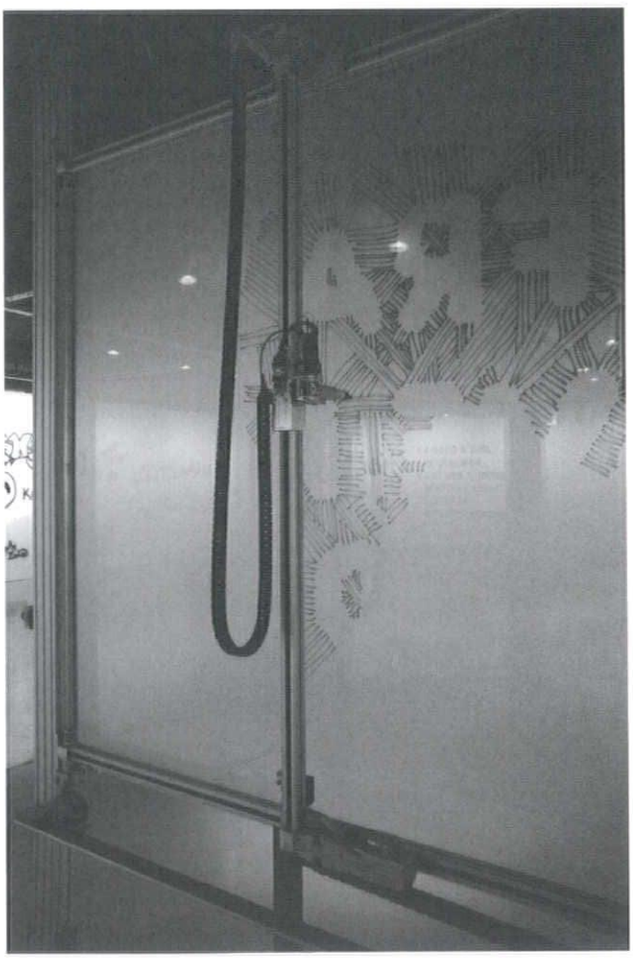
With Rita, my work has shifted away from the design-political components that were crucial to both Scriptographer and Hektor. While my observations about software's role in the field of design were the starting point and core motivation behind Scriptographer, these issues became one among many possible ways of reading Hektor. Touching upon issues such as the promise of WYSIWYG ("What You See Is What You Get," the slogan of desktop publishing) and the physical production of work through computer-controlled output devices, Hektor can be appreciated in a broader context without necessarily understanding the implications of software and hardware in the creative sector. In time, Hektor has been able to establish a career as an artist on its own and Rita, a machine built for communication, again introduced new elements that pushed my work further beyond an initial interest in purely software. Both projects, however, were consistent with a long-standing interest of mine—making visible the processes controlled by software, and revealing what is usually hidden by the user interface.

Nevertheless, each of these projects is ultimately a platform that offers certain processes to be explored alone or in creative collaborations with others. As such, they are never really finished. The exploration can always go further. In the recent past, it became apparent that Scriptographer, Hektor, and Rita all have the tendency to become complicated monsters in their own right, continuously demanding attention and care. It is partly in the nature of technology and software to be that way. In that sense, one needs to be careful not to go down the same path as the big software companies such as Adobe, Autodesk, et al., where the need for a continuous update becomes a continual burden on the user—and source of profit for the publisher—and with increasing complexity too often leads to a decrease in the quality of the product.

After six years of work on Scriptographer on and off, the project is beginning to take on a life of its own, gradually requiring less attention. It will continue to keep me busy at times, but my focus is shifting from the infrastructural work to more interesting questions such as the use of the platform in my own work, by revisiting the production of new scripts and the application of these in my projects. And in this sense, the next step carrying forward my work's critique of software applications, and their role in creative work today, will be to find other applications for these existing platforms such as Scriptographer, Hektor, and Rita, working more with them myself, and letting the community around Scriptographer grow and flourish. However, I acknowledge the need for a counter-balance to this rather infrastructural, fundamental and engineering-based work in order to maintain a lightness and dynamism in my future endeavors. In some ways, I feel that I am at a turning point. The next step will be a move towards more pragmatic and elegant approaches by making greater use of existing material. This will hopefully allow for faster projects and more dynamic methods. There is beauty inherent in using and subverting existing structures, as opposed to the production of new ones. I am just beginning the exploration of these possibilities …

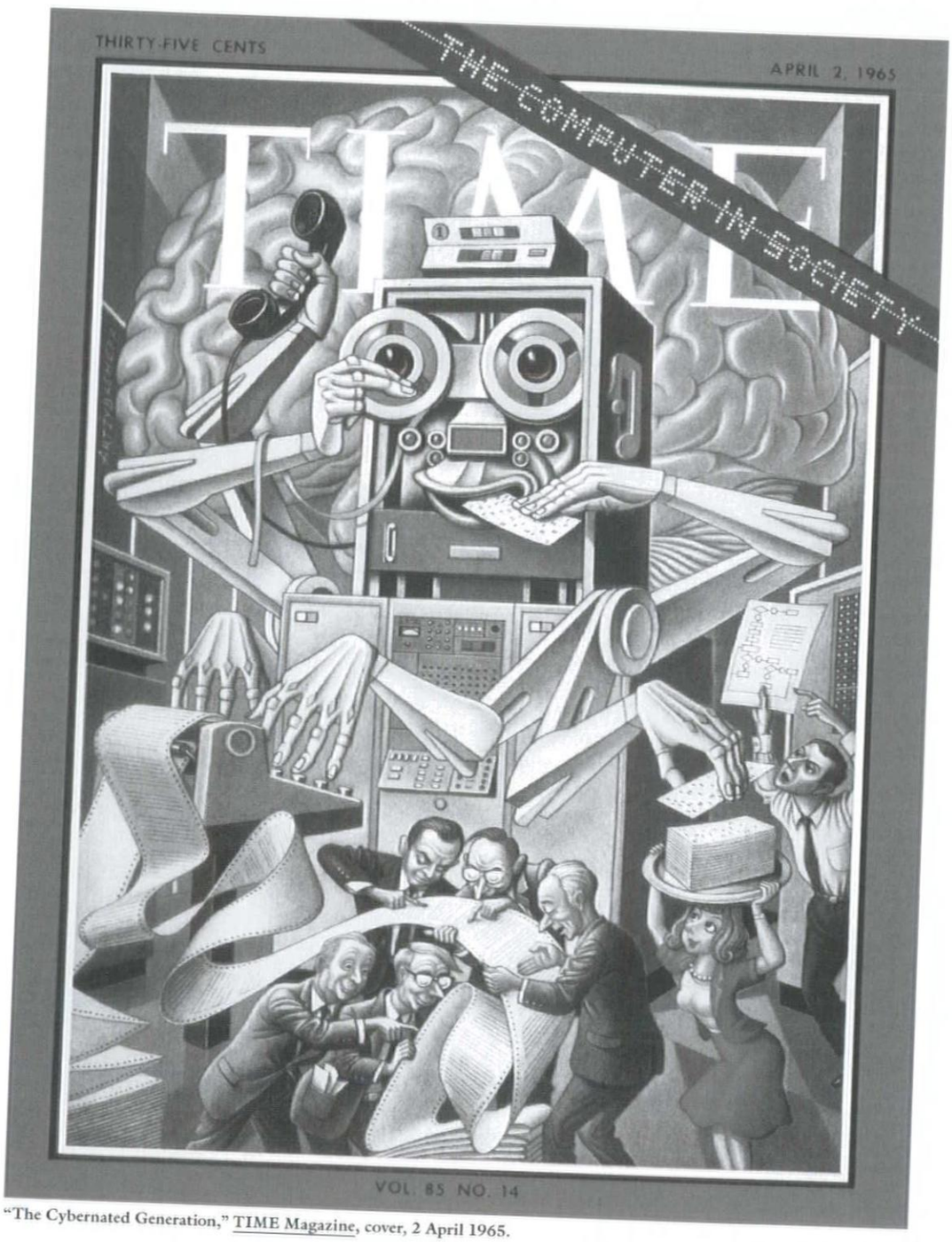
Hektor was created in collaboration with Uli Franke for Jürg Lehni's diploma project at the École cantonale d'art de Lausanne (ECAL) in 2002.

Rita was created together with Bruno Thurnher and Marcel Ackerknecht from Defekt GmbH, with support of Festo SE, Sitempaping.ch and Swiss Federal Office of Culture for the show Rita + Hektor at the Tensta Konsthall, Stockholm in 2005.



I'm Afraid, Dave, I'm Afraid; by Guy Meldem, reproduced by Rita in the show Rita + Hektor at Tensta Konsthall, Stockholm; 2005.

Hybrid



"The Cybernated Generation," TIME Magazine, cover, 2 April 1965.

Coming of Age:
A Soft Monstrosity

Marcelyn Gow + Ulrika Karlsson

> When the system of bits and pieces or impulses, or whatever is going to replace architecture, really starts thinking and acting as additions to our human nerve endings, the rules will be scattered. There is only really a rule-for-the-job-at-a-moment-in-time. Architecture is unresponsive.
> —Archigram [1]

Monstrosity, in the teratological sense, is characterized by structural or formal deviations from the norm. The combination of various morphological features constitutes a form of monstrosity. A soft monstrosity replicates this by intertwining material and electronic systems that respond to human presence. In some cases the soft monstrosity erodes the material envelope of its architectural host, operating as a voracious parasite. Embedded electronic networks enable materiality to become informed. Currently a soft monstrosity, bred in the context of the electronic paradigm that emerged in the late 1950s, is coming of age and nags at contemporary notions of materiality, propelling their erosion altogether. New architectural monstrosities appear in which hardware is partially subsumed by the atmospheric effects of software, and materiality deinstantiates itself into responsive networks. Rather than a return to the invisible nature of data, these deinstantiations potentially spawn invigorated architectural figurations. This strain of monstrosity probes beyond the superficies of formal ungainliness; it anticipates an ungainly and insidious conflation of biological and technological systems. The soft monstrosity permeates contemporary architecture, transforming materiality into architectural operating systems.

In 1965 TIME Magazine captured the essence of the "cybernated generation" that produced the soft monstrosity in the form of a voracious punch-card-consuming supercomputer endowed with arms for typing calculations, answering telephones, and simultaneously adjusting spools of reel-to-reel magnetic tape that functioned both as a programming device as well as a pair of gigantic eyes for the machine. The following year the development of satellite technology prompted Marshall McLuhan to observe: "With satellite and electronic antennae as probes, the planet ceases in a way to be the human environment and becomes an old nose-cone satellite itself—a probe into space, creating new space and environments for the planet. ... If the planet has become the content and not the environment, then we can confidently expect to see the next few decades devoted to turning the planet into an art form. ... I think the computer is admirably suited to the artistic programming of such an environment, of taking over the task of programming the environment itself as a work of art." [2]

The rather insidious exchange McLuhan posited between environmental programming, or software, and its hardware correlate of the "art form" raises the question of how technology alters the role of the art form itself. Architecture is the art form under consideration here. McLuhan's premise was that prevalent forms of media stage an environment that is invisible and can be apprehended only by the effects they have on older forms of media. This was exemplified by television's usurpation of the movie and radio's usurpation of the spoken word. This inevitable and covert exchange between media resulted in the mutability of the hard and soft categories. The "art form," architecture, becomes actively redefined by the very technology through which it is usurped. What this implies is that the integration of remote-sensing technology, electronics, and microcomputation into material systems alters their performance. The integration of these semivisible media conflates the material and communicative aspects of architecture to an extent they become inseparable, a soft monstrosity. The human-machine dialogues and responsive systems that proliferated in the semivisible electronic channels and interchanges through which the bits and bytes of the nascent information society coursed have now matured into full-blown technologically regulated environments that reveal a more multivalent implementation of the informational nexus than what could be captured through the hard dichotomy of pure image or pure performance.

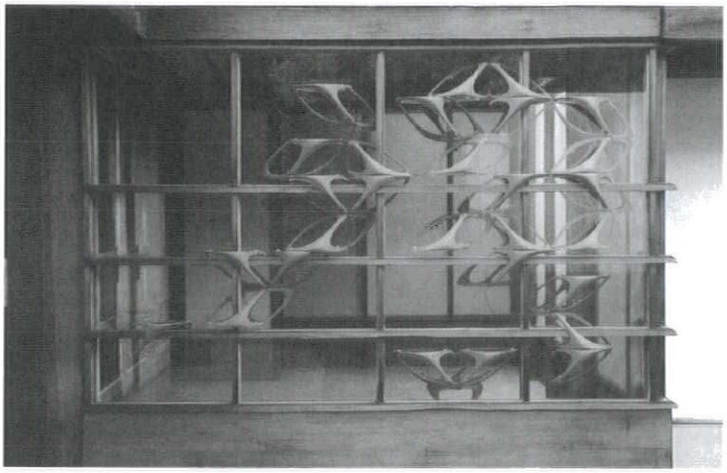
The presence of a soft monstrosity comes from a trajectory that originated in the early years of what sociologist Jacques Ellul dubbed "the technological society." [3] Ellul's emphasis on technologically regulated procedures and human-machine interfaces, collected under the rubric "technique," as opposed to objects posits the strategic use of technology as a kind of societal operating system.

This soft monstrosity, as with any monstrosity, is temporal in nature. By its very definition, monstrosity deviates grotesquely from the norm, from that which is apprehended as part of everyday life. However, these norms are contingent on specific locations and moments in time. They are inherently temporal and dependent on specific social and cultural contexts. Monstrosities gradually lose the quality of being monstrous and become integrated and entrenched in a cultural understanding of norms, those of our informed material environments.

> Spore (spôr, spr)
> n. A small, usually single-celled reproductive body that is highly resistant to desiccation and heat, and is capable of growing into a new organism, produced especially by certain bacteria, fungi, algae, and nonflowering plants.

Spoorg [4], a recent project by the architectural design collaborative servo, exemplifies the idea of the soft monstrosity by engaging species of informed materiality. It grapples with the extent to which the exchange of data instantiates itself in the material properties as well as the organizational qualities of a space and the extent to which this exchange is sometimes more immaterial in nature. In Spoorg, the material capacity of communication—the nexus of interacting channels for the management, processing, storage, and retrieval of data—reflects itself in the architecture. Spoorg performs as an active and multidirectional material site of intensive feedback.

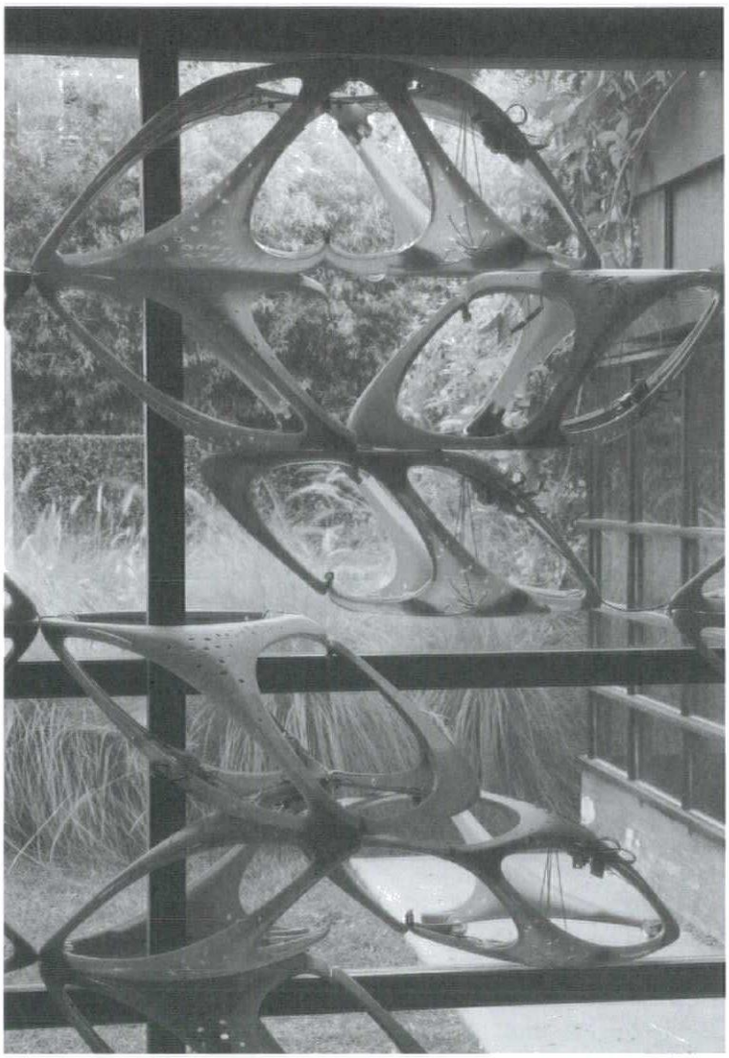
The spoorg, or semiporous operable organism, takes its name from a primitive, usually unicellular and often environmentally resistant dormant or reproductive body that is produced by plants and some microorganisms. These are capable of developing a new individual either directly or after fusion with another spore that is in some cases different from the parent. Each spoorg module is embedded with local intelligence, enabling it to communicate with adjacent spoorgs. It is, to a specified degree, responsive to selected local and regional environmental changes. The spoorg aggregate is locally in fluctuation but also produces larger-scale atmospheric effects



The Spoorg system was installed in the R. M. Schindler Kings Road House for the exhibition Gen(H)ome (October 30, 2006-February 25, 2007). It infiltrated the house through the nursery, which as the nexus of growth and cultivation is an ideal site for implementation. By registering atmospheric qualities in the house and exterior environments, the system inverted the convention of monitoring the nursery. Spoorg's elements adjust to the small scale of the nursery as well as to its program, considered here both as a domestic nursery and one for the growth of flora. The system communicates through the house envelope, attaching to the interior and exterior of the nursery and creating a porous configuration from the garden to the interior.

Spoorg enables the dweller to cultivate domestic space through growth, change, and manipulation of the cells. It simultaneously responds to environmental inputs, updating its behavior. The interaction between these agents enables the accumulation of information and its particular organization (both the physical manipulation of the cells and their local digital responsiveness to the environment) to generate pattern, lighting effects, and conditions of acoustic transparency/opacity, reshaping surfaces of the domestic interior.

The Spoorg system is a soft monstrosity of intertwined material and electronic systems, which responds to human presence and atmospheric change, slowly eroding and reconfiguring the material envelope of its architectural host. Its embedded electronic networks enable materiality to become informed, momentarily exposing the conflation of the biological and the technological. But Spoorg will also gradually lose the quality of a soft monstrosity at the Schindler House by becoming increasingly embedded in the architecture it acts upon.



Photographs of Spoorg installation at the MAK Center for Art and Architecture, Los Angeles.

in the space where it is located. Materially, it is equal parts architecture, decoration, hardware, and software.

servo's Spoorg system is a cellular network that attaches onto the interior and exterior of glass facades. It functions as a shading and speaker system, filtering sunlight and creating an ambient sonic environment. The intelligence of the system is distributed and based on wireless radio communication. Spoorg reacts to local as well as environmental changes of light and responds by generating ambient sound. Its behavior evolves over time through the modulation of sound textures based on a series of algorithmic rules.

Each Spoorg module is composed of a thin-walled plastic shell with hollow regions where local electronic programming devices are embedded. These include microcontrollers, phototransistors (light sensors), small-scale speaker elements, and RF modules for wireless radio communication with adjacent cells. The shells are manufactured through sintering and vacuum casting. This local infrastructure combines wired and wireless technologies. Instead of one computer (i.e., one complex processor) that performs one complex task sequentially, the function of Spoorg is composed of several simple processors, or cells, that operate parallel to one another and perform simple tasks. Here, local interaction and connections between neighboring cells give rise to global information processing.

The Spoorg system allows one to cultivate and decorate the domestic space (interior and exterior) by distributing and expanding shading and sound into a modular wall system. Shifts in the density and pace of ambient sound become apparent through modulations of frequency. Sensitivity in the modules can be programmed and adapted for specific forms of monitoring and interacting with the environment. Through cultivation, the interaction that visitors or inhabitants have with the Spoorg system, behavioral patterns will emerge. Lack of cultivation will result in decay of the system's performance. The differential between deterioration and growth renders the domestic space with subtle changes of atmospheric moods. Varying states of transparency emerge as Spoorg interfaces with natural lighting.

Spoorg revises the conventional notion of modularity in architecture as a material aggregate and proposes a composite information aggregate where modules of information take on material attributes in the architectural environment. Its components can be varied geometrically and modulated electronically to spawn emergent organizations of space, program, and material. This cellular approach allows for the assembly of material, electronic, and social networks having different modes and distributions of connectivity. Thus the architectural structures permit reconfiguration, fluctuation, or modulation of components in response to changing environmental conditions.

Spoorg cells can operate individually as well as in dense assemblies. They have the capacity to produce aggregates through stacking and clustering as well as through cell division, fusion, or nesting with other cells to create new individuals that are different from parent cells. The electronic infrastructure operates with a similar logic. Each unit is responsive to local sensory input and produces sound individually. The sound behavioral patterns can further fuse with others via input from neighboring cells through wireless communication. The aggregation of cells allows for different distributions and densities of electronic infrastructure, affecting the system's performative qualities.

1 "Indeterminacy: Relaxed Scene," Archigram 8 (1968).

2 Marshall McLuhan's talk, "Technology and Environment," was given at the Vision 65 conference "New Challenges for Human Communication," at the International Center for the Communication Arts and Sciences of the Southern Illinois University, in Carbondale, Illinois, on October 23, 1965. Transcribed as Marshall McLuhan, "The Invisible Environment: The Future of an Erosion," Perspecta 11 (1967): 163-67.

3 Although Ellul's book was originally published as La Technique ou l'enjeu du siècle (Paris: Librarie Armand Colin, 1954), it gained widespread recognition in 1964 with its translation into English - John W. Wilkinson, trans., The Technological Society (New York: Alfred A. Knopf, 1964).

4 Credits for the Spoorg project by servo: Project architect: Ulrika Karlsson, Design: Ulrika Karlsson, Marcelyn Gow, Design assistant: Erik Hökby, Electronic and algorithmic design: Pablo Miranda and Åsmund Gamlesæter, Sound design consultants: Leif Jordansson and Martin Q Larsson, Special thanks: Jonas Barre, Sue Huang, Jonas Runberger, With generous support from: Konstnärsnämnden, Sveriges Bildkonstnärsfond, Stiftelsen Framtidens Kultur, BSK Arkitekter, Wingårdh Arkitektkontor, KTH - Royal Institute of Technology, Caran, Atmel Norway AS, Object, servo: David Erdman, Marcelyn Gow, Ulrika Karlsson, Chris Perry.

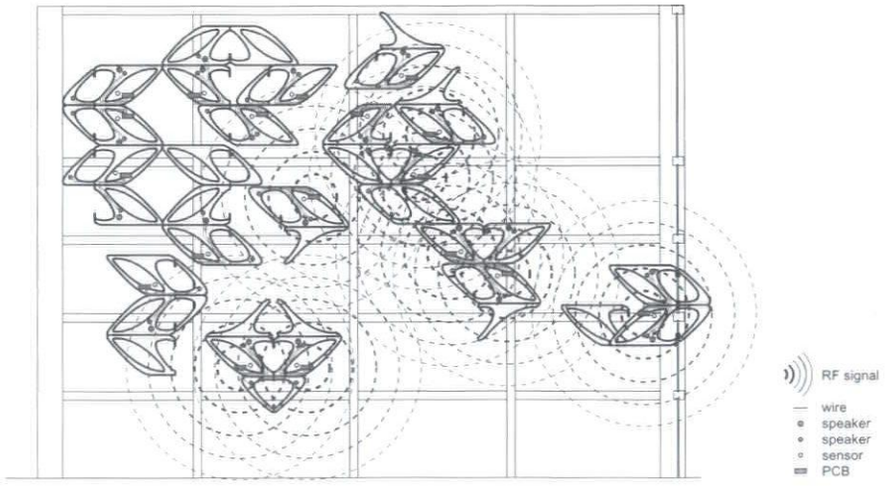


Diagram of inter-cell wireless communication network for photo-sensor, micro-processor, and audio-speaker relay — Diagram of sonic distribution patterns.

Tokyo

Typo-Morphology of Tokyo

Yoshiharu Tsukamoto + Ryuji Fujimura
[Translation by Eric Shiner]

The "Urban Renewal" Movement

A number of large business enterprises tied to massive redevelopment projects have recently opened in the heart of Tokyo, such as Tokyo Midtown and the New Marunouchi Building. Spurred on by a series of economic reform policies locally known as "Urban Renewal," two hundred skyscrapers have been built since the year 2000 in central Tokyo alone.[1] Even Tokyo Tower—once upon a time a local landmark—is now buried in today's forest of high-rise buildings. Fig. 1

"Urban Renewal" is certainly not limited to Tokyo. Indeed, the phenomenon is widespread throughout the world. As the industrial bases of British manufacturing cities such as Liverpool, Manchester and Birmingham evaporated in the 1970s, their populations were drastically reduced, in some cases by as much as forty percent. This was, in part, the result of competition from the rapidly-growing Japanese business and manufacturing machine, aided by an ever-more-globalized economy. Soon, the central areas of these British cities fell into ruin, a crisis that came to be known as the "inner area problem," and over time the same set of problems befell cities in Germany, the United States and the Netherlands. In order to reverse this trend, many national and local governments developed urban renewal policies, which by the 1980s began to take form as the so-called "urban renaissance" movement. These later initiatives often adopted enterprising and cross-linked means to deregulate development in an attempt to combine the strength of private business with the public good.

Japan began to face its own "inner area problem" in the early 1990s, after the collapse of its economic bubble led to widespread decline in both large metropolises and regional cities. It was only after the year 2000, however, that urban renewal policies began to take hold following the introduction of various so-called "economic and organizational reforms" throughout the country. These policies led to an unprecedented explosion in the number of construction projects which quickly—and radically—changed Japan's cityscapes unlike anything seen before.

1 A cluster of skyscrapers hiding Tokyo Tower.

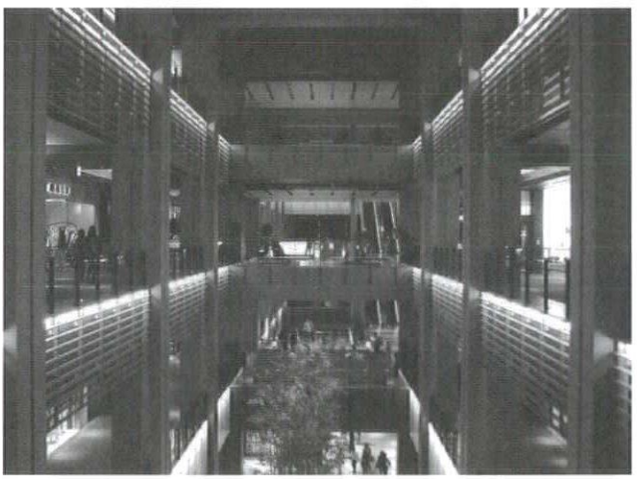
Roppongi-ism: An Estrangement Between the Surface Layer and the Deeper Layer

The mutation of urban space, as described above, can be described, studied, and documented at the scale of the whole city. But how can it be traced on an architectural scale? Perhaps one way is to examine the interior spaces of Tokyo Midtown, which are largely covered with chloride vinyl sheets that are printed with a wood grain effect. Fig. 2 Many well-known architects and interior designers have also utilized this technique of using "fake" imagery in the interior of commercial and cultural projects. For example, in his design for the Suntory Museum, architect Kengo Kuma covered 15-millimeter-gauge aluminum piping louvers with Paulownia wood. Fig. 3 In that case, Kuma was able to get around the code against using 15-millimeter wooden louvers by masking the stronger aluminum louvers with wood. Similar tricks are found in Hiroshi Naito's Toraya and its hole-punched screen blocks, as well as Takashi Sugimoto's MUJI store with its walls faced with wooden ties.

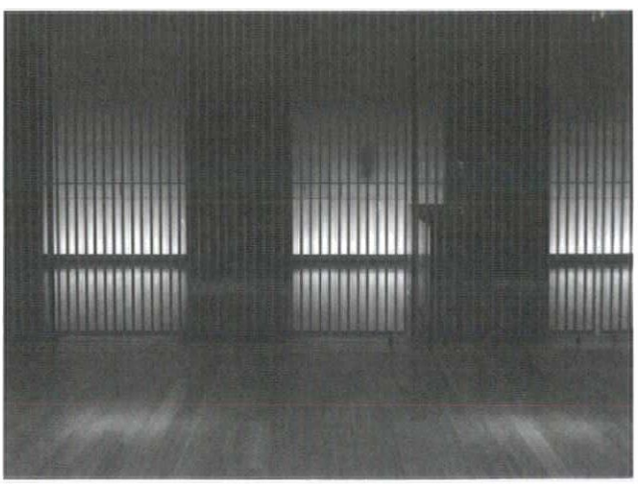
These attempts by designers to exert their ideas in the selection of materials and details might at first glance appear to be random in their sweeping variety. Their aim, however, focuses on one issue alone: how materiality can be introduced into a commercial space covered top to bottom with artificial sheeting. On the other hand, larger design decisions—such as siting, structure, overall volume and massing—are almost exclusively the domain of large architectural firms such as Skidmore Owings & Merrill and Nikken-Sekkei.[2]

In his 1978 book Delirious New York, architect Rem Koolhaas coined the term "Manhattan-ism" to describe the double-layered planning of New York City in the 1930s. Koolhaas's theory proposed skyscrapers as the superstructure of the city, and the city grid itself as the substructure. Transposing Koolhaas's ideas to Japan, the Tokyo Midtown project suggests that Tokyo's urban renewal movement post-2000 is also shaped by two factors: the large architecture firms that decide the overarching structure and design of these buildings (i.e., the "deeper layers") and the smaller boutique firms that handle the interior design and fine-tuning of the spaces (the "surface layers").[3] "Roppongi-ism" thus represents this divide between structure and materiality. However, while in Koolhaas's "Manhattan-ism" both skyscrapers and the city grid—superstructure and substructure—were visible, in "Roppongi-ism" only the materiality, which hides the structure completely, can be seen.

Until now, Japanese architects have often discussed the difference between private domestic architecture and public building projects. Architects themselves have traditionally been divided into two distinct groups—house designers and public projects architects—and conversation topics such as "the house is art"[4] and "there is no critical theory in a domestic house"[5] arise time and again. Since 2000 however, as Tokyo's rapid urban renewal has unfolded under the guise of "Roppongi-ism," the juxtaposition between "surface layer" and "deep layer" has become far more critical than the old binary of "private" vs. "public." Unfortunately mirroring the case of Tokyo Midtown where there is a complete disconnect between surface and structure (and between the work of large and boutique firms), architects and critics are having a conversation among themselves about architecture and urban space entirely separate from the discussions politicians and developers are having about architecture and urban policy. In order to change today's situation where policy consistently takes precedence over the spaces in which we live, is it not possible to somehow find a common critical axis of dialogue on the state of today's cities?

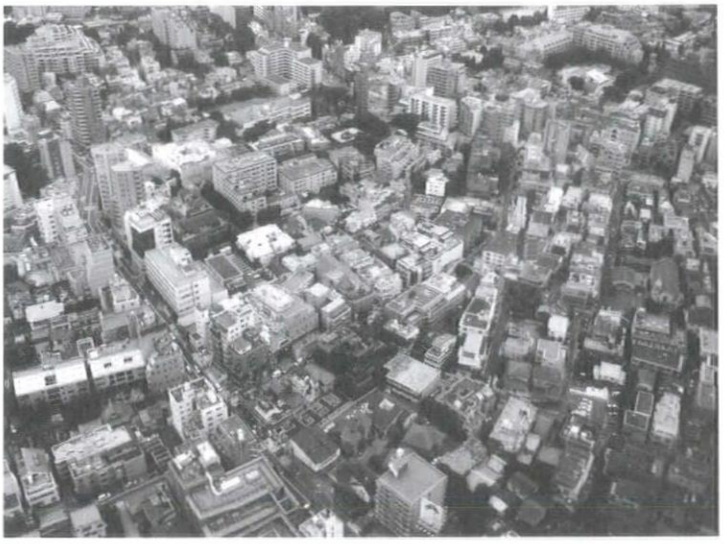


2 Tokyo Midtown interior, covered with synthetic sheeting.



3 Suntory Museum.

4 A vast residential district that extends to the edge of a skyscraper district.



5 "The urban space of Tokyo originated thanks to freestanding houses."

"Core Metabolism" vs "Void Metabolism"

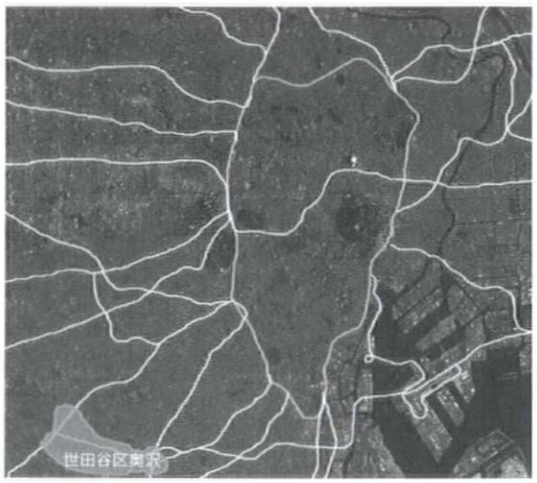
The massive redevelopment projects of Roppongi Hills and Tokyo Midtown produced a number of results, one of which was the dispersal of the already spread-out residential districts found in their immediate vicinity. The innumerable office towers pushed through thanks to global capitalism are much more than a symbol of the area, though; they are the environment. And yet the thing that envelops the towers themselves is a residential neighborhood. Fig. 4

Let us then throw out the binary of "domestic" versus "public" and introduce the hypothesis that "the urban space of Tokyo originated thank to freestanding houses."[6] In residential areas, countless small structures such as shops, apartment buildings, houses, offices, schools and public halls are built again and again, each according to unique circumstances. Fig. 5 If we examine the types of spaces that emerge from these places, we must also look closely at the construction of the buildings there, and we might also ask how these residential areas could be used to renew the urban space of Tokyo itself. Many architects of our generation in Tokyo are already devoting much of their work to designing these detached houses. This collective architectural practice could perhaps be called "Metabolism," but with a different spirit from the well-known 1960s version.

In an earlier period, the Metabolists integrated a building's equipment and structure into something known as a "mega-structure core," proposing that separate rooms would be arranged around the core and could be thought of as capsules, and that urban space could be made out of a network of slabs. This symbolized the urban dynamism of concentration in architecture in the 1960s, a time when it was thought that power and financial capital could be consolidated in urban development projects. But what really happened in the last fifty years is very different from what the 1960s Metabolists imagined. Instead, what we see today in Tokyo are the voids that exist between freestanding houses continually regenerated grain by grain. This symbolizes the urban dynamism not of concentration, but of the scattering of capital and political power in today's urban creation. In such urban spaces, there is no single organizing mega-structure. Instead, there are simply many freestanding houses scattered throughout the residential areas of Tokyo. Therefore, if we were to attempt to capture the idea of Metabolism in our contemporary society, we should thus call it a "Void Metabolism" as opposed to a "Core Metabolism."

Toward a Typo-Morphology of Tokyo[7]

In an attempt to understand the fragmented, double-layered nature of Tokyo today, let us then look at the residential districts of the city collectively and extract samples that represent characteristic patterns, in particular relationships between patterns in architecture from the past ("typology") and urban form ("morphology"). We present here four "species" of Tokyo development we have thus far discovered: Subdivurban, Urban Village, Pocket Blocks, and Commersidence.



6 The location of the Okusawa area.

Subdivurban

Okusawa, located in the Eastern part of Tokyo's Setagaya Ward, demonstrates how urban morphology changes in synch with the subdivision of land and the ownership of cars. A high-end residential district, the neighborhood was originally typified by a continuous row of hedges that goes back to the 1920s.[Fig. 6] However, in recent years, land there has been subdivided according to home rebuilding and inheritance, thus mutating the area into a collection of mini-developments arranged on rectangular grids, cul-de-sacs and narrow slivers.[Figs. 7-9] Reflecting the subdivided character of the area, the structured horizontal continuity of hedges has been fully broken-up today. Houses built there have certain characteristics according to the generation in which they were built, as well as a relationship with the shape of the land upon which they are built.[Figs. 10-12] The types of houses found in contemporary Okusawa are thus made up of a mixture of buildings from different generations. One can see the analogy of this mixture of building types clearly in.[Fig. 13] Although these markings don't exist in reality, they can be said to represent the true nature of the townscape in Okusawa. We can apply the term "subdivurban" to this condition.

7 Okusawa in the 1920s (first generation of building).

8 Okusawa in the 1950s (second generation of building).

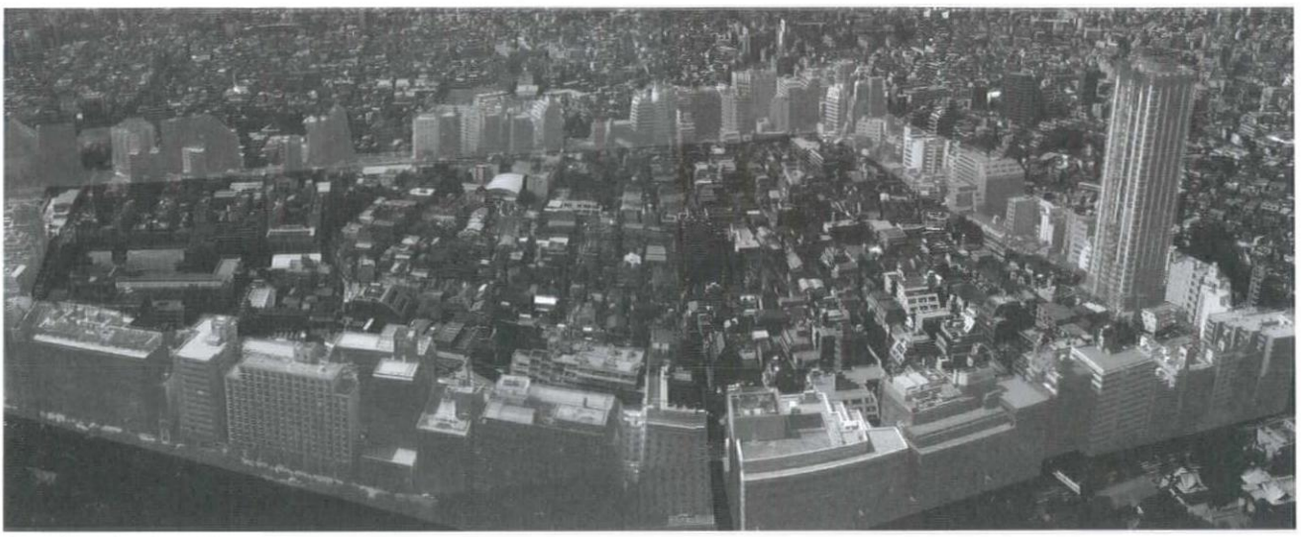
9 Okusawa in the 1980s (third generation of building).

10 *The first generation*: a home surrounded by a hedge. Houses face south and trees are planted around the gate, in the front yard and in the back yard. There is no parking.

11 *The second generation*: a home hidden by greenery planted in a concrete block planter. Trees are planted between the block wall and the house, and parking is located under the building. A fence provides access for inhabitants and car alike.

12 *The third generation*: Narrow homes in a mini-development. There are no hedges or walls, and cars are visible and parked directly beneath the homes. The shape of the homes is exactly the same, varying only in color and style of decoration.

13 The analogical townscape in Okusawa.



14 Nishi-Shinjuku viewed from a skyscraper.

Urban Village

Next, let us look at the Nishi-Shinjuku area of Shinjuku Ward. The majority of the neighborhood was never restructured, and a number of areas around major traffic routes such as Meiji-Dori and Gaien-Mae-Dori are often referred to as the "Wooden Apartment Belt Zone." Based on the idea of "disaster-resilient urban development," a series of medium-rise fireproof buildings are located in proximity to main arterial roads, establishing a "disaster prevention axis" such that buildings made from wood are surrounded by these fireproof structures, thus forming a ring of protection. This urban structure is nicknamed the "crispy chou and cream paste."[8] Figs. 14-15

The clustering of buildings around the main arterial roads and the construction of skyscrapers there gradually started in the latter part of the 1970s. Land-use changes brought about with the proclamation of "New Urban Planning Laws" in 1973 greatly influenced the relaxation of the uniformity regulations determining the ratio of a building's size to its lot along arterial roadways. The influence of the Japanese bubble economy of the latter half of the 1980s and the construction of the Oedo subway line in 1998 also greatly influenced the district's form. Figs. 16-18

15 A comparison between wooden buildings and fireproof buildings.

16 Nishi-Shinjuku in 1968.

17 Nishi-Shinjuku in 1985.

18 Nishi Shinjuku in 2005.

Pocket Blocks

In the midst of residential areas in Tokyo, we can find cases of vacant lots that are maintained for no apparent reason. Fig. 19 In these places, which extend far back from the road, we find that they are often surrounded by various buildings. They have been used for a variety of purposes, including temples, shrines, parks, schools and parking lots, all seemingly dictated by the unique histories of the area in which they are located.

19 Pocket Blocks seen in the 23 districts of Tokyo.

20 Jingu-Mae area where commercial shops and residences are mixed.

21 Jingu-Mae in 1977 (1st generation).

22 Jingu-Mae in 1996 (2nd generation).

Commersidence

Finally, in the Jingu-Mae area of Shibuya Ward, a variety of mixed-use residential and commercial spaces—all on the same scale—combine different age groups and uses blended together. We can apply the term "commersidence" to this condition.

The "Shibuya River Walk," known also by the name "Cat Street," acts as a commercial axis between Shibuya and Harajuku areas. Fig. 20 In 1964, the river was covered over and this pedestrian walkway was opened in its place. Fig. 21 After changes in urban planning regulations in 1980, some shops began to appear in the area, but the buildings were not refurbished, as they were located on a walk, not on a road. Fig. 22 Young entrepreneurs made use of these restrictions, turning residential structures into commercial shops. However, in 1996, the walk was redefined as a road, and some buildings were rebuilt. Fig. 23

In this area, first-generation buildings were usually apartment buildings and houses Fig. 24, while some of these buildings were converted to commercial spaces in the second generation. Fig. 25 After Cat Street was enhanced in 1993, several new three-story buildings were constructed in the area which represents the third generation. Fig. 26

The landscape of Jingu-Mae is thus informed by the relationships between these buildings constructed over three generations, as well as the change in urban form brought about by turning the river into a walkway and the enhancement and change of the walk in the early 1990s.

23 Jingu-Mae in 2004 (3rd generation).

Conclusion

Creating these new terms "Subdivurban," "Urban Village," "Pocket Blocks," and "Commersidence" is the result of our attempt to understand the relationships between the historical, political, economic and physical factors that helped to form these areas of Tokyo. In defining these, we have sought to evaluate the peculiar qualities and value of architecture that arise through cooperation and development on a broader level, not on a building-by-building case where these trends are impossible to grasp. The mutation of urban space might be negatively viewed as a "collapse in typology" when one analyzes individual buildings within this structure, but if we interpret this mutation as a response to urban morphology via the transformation of architectural typology, then the fluid nature of the micro level is confirmed, and the peculiarities of the macro level are brought to light.

These terms represent examples of our recent research on the "typo-morphology" of Tokyo. If we were to look at even more concrete examples, they would act in concert with the dynamism of the city and expand the ways in which we evaluate the quality of particular spaces. We believe that studies such as these provide the vocabulary that can open our imaginations to thinking about new types of landscapes. Thus, returning to the sweeping contemporary city generated by "urban renewal" and the concept of "Roppongi-ism"—with its visible rift between surface and deeper layers—the concept of "typo-morphology" presents an effective tool to approach architecture from the surface, and dig deep into what lies beneath.

1 Although skyscrapers are defined as being structures that surpass 60 meters in height, according to Section 36 of the Basic Laws of Architecture, in general, they are considered to be buildings that surpass 100 meters. According to the Skyscraper Database (www.eonet.ne.jp/~building-pc in Japanese only), 186 skyscrapers were built in all 23 wards of Tokyo in the seven-year period between 2000 and 2007.

2 Skidmore, Owings & Merrill is credited as being the Master Architect of the project, and Nikken-Sekkei was the Core Architect. Shin-Kenchiku, May, 2007, The Japan Architect Co., ltd.

3 Other examples include the pairing of Nihon Sekkei and Kisho Kurokawa on the National Art Center Tokyo project and Tadao Ando with Nikken Sekkei on the 21_21 Design Sight project.

4 Kazuo Shinohara, New Architecture (New Architecture Press, 1962).

5 Toyo Ito Special Issue on Residential Architecture (New Architecture Press, 1998).

6 Freestanding house refers to a domestic structure that has open space around its entire perimeter. The term freestanding is not limited to homes, however, it also includes shops, offices and apartment buildings.

7 The section "Toward a Typo-Morphology of Tokyo" was written with the assistance of Yuki Chida (Subdivurban), Elsa Uggla (Urban Village), and Mirei Uchibe (Pocket Blocks).

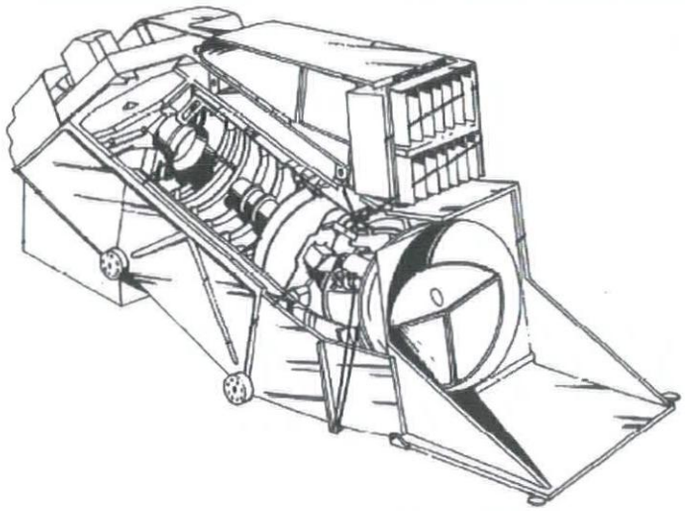
8 Refers to French sweet Choux à la Crème (cream puff).

24 *The first generation*: buildings with their "back" to the walk.

25 *The second generation*: buildings with their "front" facing the walk. Usage was changed from residential apartments to commercial shops.

26 *The third generation*: new building treats the enhanced road was its "front".

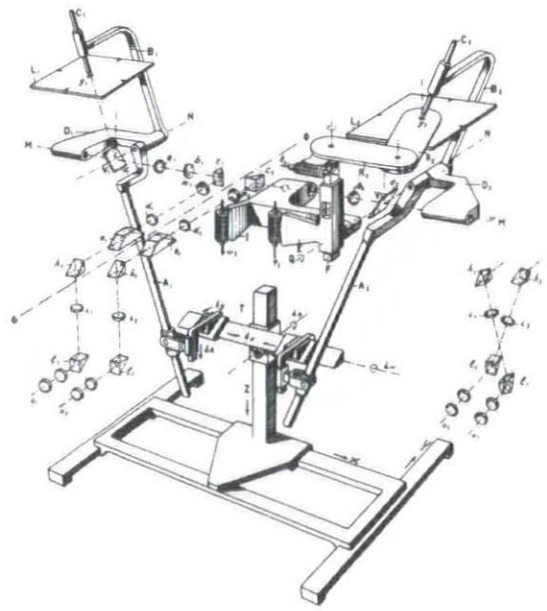
Sens ing



1 Cut-away axonometric diagram of the Landsat Thematic Mapper. (USGS 1984)

Preliminary Notes on the Emergence of Statistical-Mechanical Geographic Vision

John May



Santoni's Stereocartograph, Model IV (1933), an early analogue example of the use of stereography in the production of accurate terrain contour maps from two or more aerial photographs. (Burkhardt and Blachut 1989: 120)

If, on some later day, an autopsy of our modern conditions is performed, it will undoubtedly recover an archive of technologies whose purpose it was to reveal to us the character of our world. These devices and systems, owing the very fact of their existence to an insatiable appetite for control and comfort, pacify our pursuits and desires by seemingly disclosing to our senses the innumerable relations among those mass phenomena that scatter themselves, thick and mundane, across the surface of the earth. Today it is difficult to dream of this unsettling postmortem, not only for the disquiet it should bring to our most buried fears but more so because it is hard to form an even partly adequate idea of the ways of describing, of the disparate and unseen things, the veiled "family resemblances,"[1] that we so easily pass over at present and that might someday be required for access to our dangerously unbounded appetites.

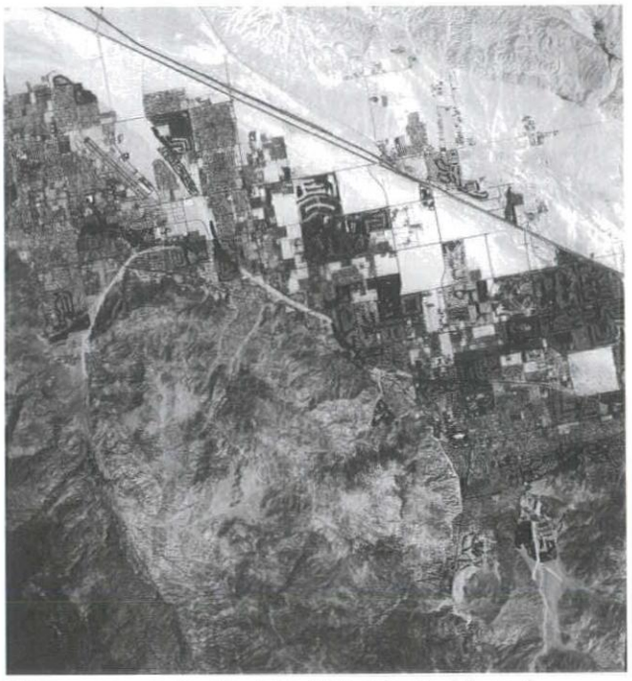
To speak of the world, or even some portion of it, within the space of a single breath is to press against the immense weight of a history of errors, against an encyclopedic catalog of failed gestures toward sufficient descriptions receding into the horizons of thought. Despite this weight there exists, alongside the haunting specter of a coming environmental collapse, a set of disciplines that are attempting to conjure the methods through which we might still be justified in seeking suitably totalizing descriptions of our so-called "natural" and "social" worlds[2]: principally geography, environmental science, and urban planning but also an ever-expanding class of disparate subfields, including architectural technology (or architectural "engineering"), landscape and urban ecology, infrastructure and transportation studies, as well as of climatology, forestry, geomorphology, and hydrology. The list grows with each

additional catastrophe.[3] Their concerted and collective imagining toward a kind of ecological totality—experiments in what Ernst Mayr referred to as "populationist thinking"[4]—has been accompanied in its recent becoming by the development and introduction of a set of modern geographic technologies, most notably satellite (or airborne) remote sensing and geographic information systems. The basic character of this accompaniment and some general qualities of its recent becoming are the subjects of this essay.

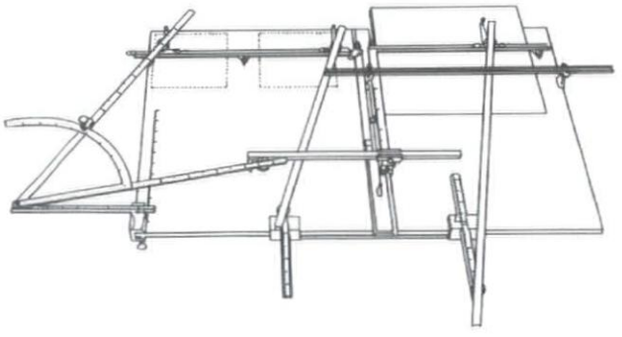
What follows is a raw framework, from within which we can begin to grasp the historical emergence of a relatively new epistemic mode of thought that cuts crookedly across disciplinary boundaries, organizing aspects of previously disparate fields around an as yet ill-defined form of consciousness. Call it territorial, ecological, or even environmental, and imagine each of these and more when confronted herein with the term geographic. This mode of thought is the result of an historical coalescing, operative since at least the outset of the twentieth century between a specific way of thinking about the natural and social worlds as aggregations of statistical regularities and a way of seeing that was from the outset rooted in certain technological devices and their attendant methods. I have provisionally labeled this mode of thought "statistical-mechanical geographic vision"—a phrase intended to circumscribe two distinct elements simultaneously: first, a statistical approach toward the innumerable processes that scientists (physical or social), theoreticians, and some philosophers associate with the natural and social worlds; and second, the application of various techniques and technical devices capable of perceiving and analyzing the character of those processes on a geographic scale.

Begin, then, with a drawing. Fig. 1 It is a quasi-technical diagram, a kind of disturbed axonometric of a space-borne optical-mechanical sensor. Research reveals that the drawing is of the Landsat Thematic Mapper, a satellite-mounted multispectral scanner that records energy in the visible, reflective-infrared, middle-infrared, and thermal-infrared regions of the electromagnetic spectrum, and first orbited the Earth in July 1982.[5] Landsat acquires seven bands of imagery, chosen for their ability to make visible certain physical processes and natural characteristics, ranging from water penetration to vegetation cover, from the differentiation of cloud formations to snow, ice, and rock types. The Thematic Mapper, and subsequent more advanced sensors, have for two decades returned Earth images that are increasingly familiar to our sensibilities Fig. 2—so much so that it no longer strikes us as odd that the physical characteristics of discrete natural phenomena, many of which are invisible to the naked eye even at close range, can be visually analyzed across enormous territories and time scales.

"We use the drawing of a machine," Wittgenstein claimed, "to symbolize a particular action of the machine," and the drawing of a machine is the "first of a series which we have learnt to derive from this one."[6] Yet the Landsat axonometric belies these remarks, revealing little, if anything, about the workings of the device under description. When placed alongside another representation Fig. 3 of a geographic technology—this time of a perspectograph from the late nineteenth century, whose functioning fits Wittgenstein's model, it is clear that something has changed both in the character of our technologies and in the forms of knowledge they inscribe through their operations. Their dislocation is evidence of an ongoing collapsing, a novel simultaneity, of statistical thought and statistical vision.



2 This image, acquired on May 10th, 2000, using the Advanced Spaceborne Thermal Emission and Reflection Radiometer (ASTER) shows the cities of Palm Springs, Cathedral City, and Palm Desert, California. As described in the official NASA literature, "the broad spectral coverage and high spectral resolution of ASTER will provide scientists in numerous disciplines with critical information for surface mapping, and monitoring dynamic conditions and temporal change. Example applications are: monitoring glacial advances and retreats; identifying crop stress; determining cloud morphology and physical properties; wetlands evaluation; thermal pollution monitoring; coral reef degradation; surface temperature mapping of soils and geology; and measuring surface heat balance."



3 The Hauck and Brauer Perspectograph (1891), an early attempt to mechanize certain aspects of the transference of arbitrary points between the vertical, horizontal, and perspectival projections of an object or landscape scene. (Burkhardt and Blachut 1989: 25)

Statistical Morality Among the Geographic

When we speak of statistical thinking, we do so in the following way: Although the causal chain of the physical world is no longer defined by perfect, reversible continuity, it is nonetheless subject to statistical regularities, as expressed by probabilities—predictive causal relationships prevail within large, diverse masses despite the chance character of certain individual phenomena.[7] This train of thought is supported by a host of associated mathematical techniques; taken together, the belief and the math can be said to constitute what Morris Kline has called "the statistical view of nature."[8] Statistical thinking as a type, as a way of thought, has been escorted along the entire length of its historical becoming by the coextensive appearance of a kind of statistical morality, a hardening of assumptions and beliefs that now appear as natural states of affairs: manifold processes and sums of relations between assemblages that have come to constitute certain axioms of thought and practice; that is, a "collective belief"—today having attained that status of a silent truth—"that the certainty stolen from us by Carnot and Maxwell can be restored by the theories of Gibbs and Boltzmann."[9]

The application of statistical methods entails a broad acceptance of the philosophical implications that are often latent in the statistical worldview, including the peculiar forms of knowledge implied by statistical causality, the role of inductive logic in scientific inquiry, and the limits of the predictive capacity of such inquiry.[10] Stemming from the recognition of a distinct and widely applicable set of procedures based on mathematical probability for studying mass phenomena, statistical thinking first began to impose itself on various fields of thought in the late nineteenth century.[11] Seen as especially valuable for uncovering causal relationships where the individual events are either unknown or are highly variable, statistical methods have played an essential role in the development of contemporary intellectual practice. And geographic thought—thought operating at the scale of populations and territories (regardless of disciplinary affiliations)—has been no exception to this truism.[12] Virtually all nontrivial statements made within this domain take the form of either statistical regularities derived from regression analyses or statistical metaphors relating types of action to degrees of indeterminacy.[13]

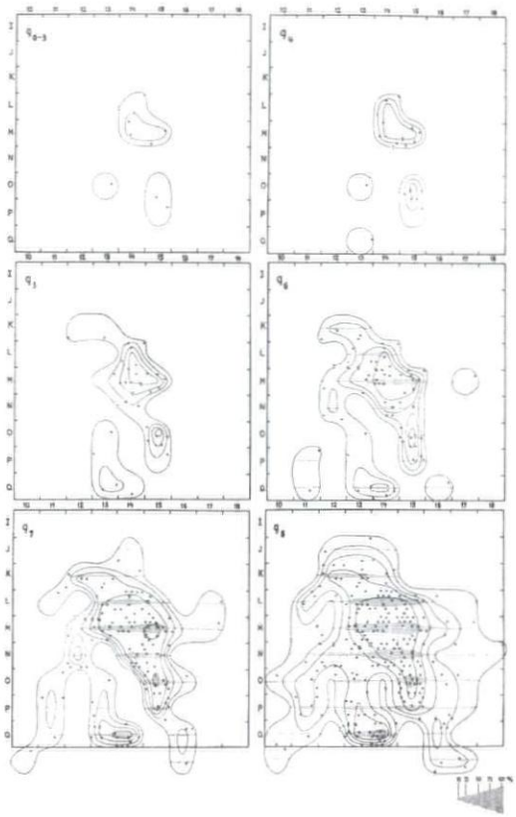
Although disagreement persists regarding the precise moment at which inferential statistical methods first entered the domain of geographic thought,[14] the late 1950s signaled an exponential rise in their employment within a range of disciplines associated with a then popular branch of geographic thought known as regional science. Variously described as a "quantitative wave" or the new quantitative branch of an historically entrenched "spatial-chorological identity,"[15] the use of new statistical mathematics by postwar geographers led to a restructuring of disciplinary approaches and a resuscitation of the belief that quantitative analysis could yield scientifically valid geographic claims. Seminal examples of this approach include Torsten Hagerstrand's Innovation Diffusion as a Spatial Process, published in Sweden in 1957 (first English translation in 1967), and William Bunge's seminal Theoretical Geography, published in 1962[16]. The latter is particularly useful in understanding the manner in which the postwar quantitative wave realigned geographic thought, modifying its parameters through a series of transformations that ultimately engendered deep and fecund mutualities between an entire domain of inquiry and a family of technologies whose genealogical chart bears scant reference to Bunge and his followers.

Bunge's work emerged from contact with many sources. Of particular influence were Richard Hartshorne's attempts in the 1930s to stabilize the discipline by recasting the scientific nature of geographic inquiry.[17] Equally critical and laudatory of Hartshorne, Bunge saw the work as crucially important but inadequate, its final result being a formulation of a geographic science that was both mystified and defeatist, having stemmed from a basic confusion concerning the concept of uniqueness as an inherent property of objects;

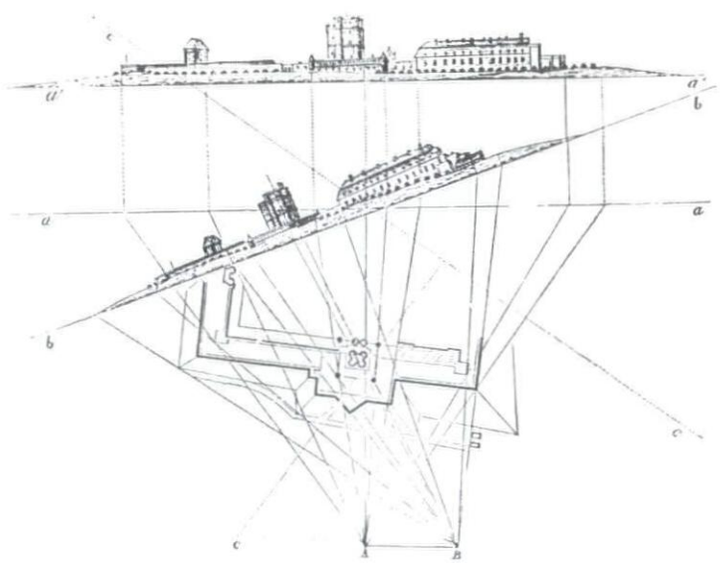
> Hartshorne confuses uniqueness with individual case. Individual case implies generality, not uniqueness ... This attitude is crippling because it leads us to distinguish between the unique and the general by the following process: if we have been able to construct theories involving phenomena, the phenomena are general. But if we have not been able to construct theories, it is because the phenomena are unique. Since unique phenomena cannot be explained, there is no sense in attempting to develop generalities. Thus we are defeated before we try.[18]

Bunge proposed to resolve this apparent contradiction by redefining the scope and goals of geographic inquiry to bring them more in line with those of contemporary (c.1960) scientific thought, informed by the mathematical techniques of the statistical worldview. He quoted Hartshorne: "In order to explain fully by scientific laws of cause and effect a single decision of any single human being, we would need ... far more data than we could ever hope to secure." In Bunge's reformulation, the uniqueness of those singular decisions was eliminated in favor the generality of probable states, a technique derivative of J. W. Gibbs's foundational work in statistical mechanics and gas theory.[19] "Science," Bunge argued, "has long since stopped pretending that it can explain fully ... It does not strive for complete accuracy, but compromises its accuracy for generality."[20] In the remainder of the work Bunge laid out the mathematical foundations for a theoretical generality in geographic thought, which, he argued, extended into every corner of the field, unifying it through a shared methodological focus on the processes associated with mass phenomena in space: hydrology, climatology, and biogeography; urban, economic, and political geography; even the diffusion of cultural and social events. His conceptual inventiveness reconciled geographic thought with an emergent statistical morality that was dominant in the natural sciences at the time and grew during the late nineteenth century as classical thermodynamics was being reduced to statistical mechanics. Bunge's work (and similar projects) effected a movement away from predictions based in causal determinacy toward predictions of causal probability, away from the statistical distribution of singular objects in a given area toward the relative distributions of processes in space, away from the reversible time of Newtonian mechanics toward the unidirectional time of statistical mechanics.[21]

A central concern of this movement surrounded its preferred modes of representation. For if, as Bunge and his followers contended, they were in fact analyzing and uncovering real processes, then some indication of their incidence in real space must be provided. Through various approaches to the cartographic plotting of statistical distributions Fig. 4, theoretical geographers developed graphic methods that gave rise to the collective desire within the sphere of geographic thought to produce efficiencies between the acts of observation, analysis,



4 An example, from Bunge's Theoretical Geography, of the application of "statistical movement theories" based upon the science of kinetic gas theory. This time-series set is taken from the work of Torsten Hagerstrand, who, as Bunge described was "the first geographer who has sought to develop statistical movement theory" and "applied it to the movement of peoples and ideas." (Bunge 1962: 119)



5 Map of the fort du Vincennes, made by Laussedat using camera lucida in 1850. (Burkhardt and Blachut 1989: 7)

and representation; to make immediately visible the statistical analysis of large-scale geographic phenomena —something that no human agent (given the brain's limited calculation speeds and the eye's limited visual domain) was capable of achieving. Thus the desire to see statistically found purchase alongside concurrently emerging forms of mechanized vision.

‡

Mechanization Becomes Sensorimechanization

The year 1950 will suffice (so long as we acknowledge its falsity) as a kind of shorthand notation for the nebulous moment that witnessed the introduction of two specific categories of technologies that together produced a set of devices and systems whose character and capabilities were undeniably distinct from those that had come before: the first was the introduction of electronic computing machines into geographic analysis via (in part) the field of photogrammetry; the second was the application of sensitive automata to geographic phenomena.[22]

The historical arc of mechanized geographic vision is traceable to the very first constructed landscape perspectives, insofar as they were mechanical reproductions of geographies, beginning in the sixteenth century. Development was greatly aided by the invention of photography, and subsequent experiments in aerial photography, first from balloon and later from airplane flight. Yet prior to 1950 enormous efforts were made toward a greater mechanization of geographic vision within the field of photogrammetry (in its most basic formulation simply the technique of deriving accurate measurements from photographs). An often forgotten category of developmental stages in our digitalization of the Earth's surface, photogrammetric research was indispensable to the incessant movement toward greater accuracy in map projections; and the methods and tools developed according to its principles are evidence against the reductive proposition that the history of modern geographic technologies need not wrestle with life before computers.

The foundations of photogrammetry predate the invention of photography. The basic principles of perspectival representation were worked out across several centuries, although German painter Albrecht Dürer is generally credited with providing the most exhaustive analyses of its fundamental principles. J. H. Lambert (1728–1777) provided the mathematical formulation of perspective relationships, and his work in projective geometry was critical to the development of basic photogrammetric techniques. It was the invention of photography, however, that made possible the birth of photogrammetry.[23] It is generally acknowledged that modern photogrammetry began with Aimé Laussedat's experiments using camera lucida devices in the reconstruction of architectural facades in Paris, in 1849; the next year he employed similar methods to construct a topographical map of the fort du Vincennes.[Fig. 5] Laussedat developed various topographic cameras and eventually standardized several methods for constructing topographical maps of large areas from photographic reproductions.[24]

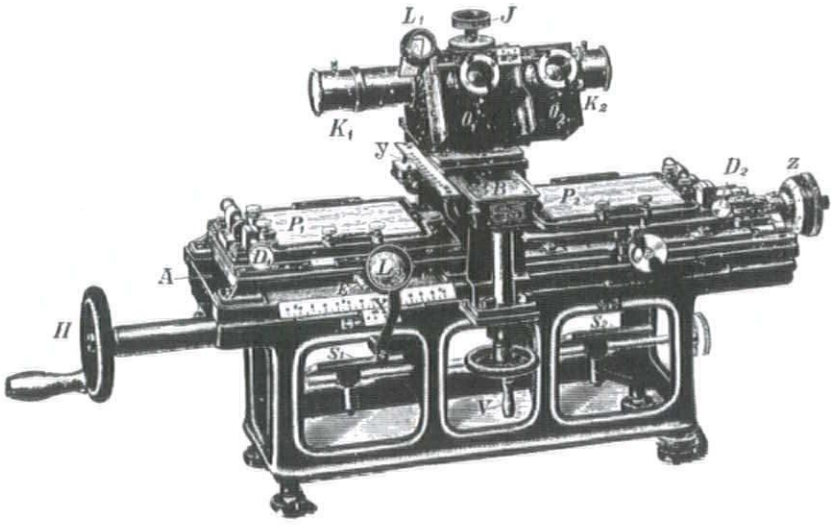
Three general tendencies informed the development of photogrammetric methods: First, photogrammetry was recognized as having numerous applications beyond mapping, restricted only by the limited capability of early technology. Second, from nearly the beginning of the modern period of photogrammetry, pioneers recognized that aerial photographs

were far superior and provided the best insight into the terrain. Finally and most significantly, there was a drive among early practitioners in the field to supplant the human dimension in the measurement process—just as photography had supplanted it in the recording process—to complement extant methods for the photographic recording of a space with a mechanism for the automated derivation of the measurements of a space, to automate the domain of metrology so that it might become sympathetic with the already automated (and instantized) visual domain. The drive toward automation eventually took the form of graphical or numerical plotting—instances of semiautomated processes predicated on dividing the labor involved in the orthogonal reprojection of the original aerial photographs between machinic and human operators. Steps were also taken toward the automation of the image-interpretation process. While most of the significant work in this field (a precursor to modern digital image processing) took place between 1955 and 1965, there were a few significant earlier steps. Most notable was the invention in 1901 of a device known as a "stereocomparator" Fig. 6, which permitted precise measurements of coordinates of any point within a stereoscope. This allowed for the determination of arbitrary terrain points, which, it could be argued, automated certain aspects of the image-interpretation process despite being unable to produce continuous plotting (that is, the total removal of the human operator from the process of generating cartographic representations from multiple aerial photographs, a substitution that was to remain a dream for some time to come).[25]

Photogrammetric methods —both those developed for the purposes of measurement and those later used in photo rectification[26]—can be divided into two basic categories: analog and analytical. Analog methods in photogrammetry provide solutions to the basically geometric problems of photogrammetry by visual means, whereas analytical methods do so mathematically. Prior to electronic computing, the time required to produce analytical results generally discouraged their employment on a broad scale due to the numerous tedious calculations required to project the requisite plotting points. Most early efforts concentrated on analog solutions. With the invention of electronic computers, computational techniques superseded many previous analog approaches and analytical methods developed rapidly along with corresponding instruments.[27] The introduction of analytical plotters in 1957 further automated the process, facilitating near continuous plotting without a human operator.

Advancements made by photogrammetrists brought computational technology into the geographic-visual domain, but it was the introduction of "sensitive automata" into the field of geographic practice that provided the final link in forming the disciplinary conditions from which statistical-mechanical vision was to emerge. In 1948 Norbert Wiener elaborated a theory of sensitive automata:

> In such a theory, we deal with automata effectively coupled to the external world, not merely by their energy flow, but also by a flow of impressions, of incoming messages, and of the actions of outgoing messages. The organs ... comprise photoelectric cells and other receptors for light; radar systems, receiving their own short Hertzian waves ... and so on ... What is perhaps not so clear is that the theory of sensitive automata is a statistical one. We are scarcely ever interested in the performance of a communication-engineering machine for a single input. To function adequately, it must give a satisfactory performance for a whole class of inputs, and this means a statistically satisfactory performance for the class of input which it is statistically expected to receive.[28]



6 The Zeiss-Pulfrich Stereocomparator (1901), considered an early milestone in the general effort towards automating the production of maps from aerial photographs. (Burkhardt and Blachut 1989: 33)

The application of sensitive automata to geographic phenomena began during the Second World War (not after, as some accounts have suggested[29]), with the development of terrain-sensing guided missile systems. The general history of the mechanization of vision was transposed onto computation with the introduction of sensor technology via the differences between photographic and electronic imaging. Traditional photographic imaging is essentially a chemical process, involving the photochemical behavior of silver halide crystals exposed to light. Electronic imaging, by contrast, typically employs one- or two-dimensional detector arrays of light-sensing solid-state devices, known as photodiodes, for image acquisition, with each position within the array sensing one pixel in the image field. When electromagnetic energy strikes the photo site, electronic charges are produced, with the magnitude of the charges being proportional to the scene brightness. The magnitude of each charge is continuously quantified for recording on magnetic, optical, or solid-state media. The two processes differ in their means of image capture, storage, manipulation, transmission, and display.[30]

The instant of image acquisition: in both photographic and electronic processes (unlike in, say, sixteenth-century perspectival drawing) it is also the instant of image recording. But whereas the photograph is visual throughout, the electronic image is visually acquired but mathematically recorded, and thus simultaneously visual and statistical.[31] In electronic imaging the visual and the statistical are collapsed into a single sensorimechanical operation. Unlike the diagrams of the theoretical geography movement or the rectified plots of the photogrammetrists, in the sensorimechanical image the act of statistical reasoning is simultaneous with the act of visualization. They are, in fact, the same act.

When applied to geographical vision, early sensitive automata operated by perceiving the entire visual domain as a statistically based field of variable intensities.[32] Sensors such as the Landsat Multispectral Scanner and the Landsat Thematic Mapper receive continually variable reflectance intensities from optical-mechanical detectors. The voltage analog signals from each detector are converted into successive digital values and then amassed into sets from which sensed images are generated—statistical expressions (reductions, perhaps, but nonetheless expressions) of the dense variable conditions from which they are produced.[33] We need only examine any number of sensors deployed for Earth observation to recognize their fundamental complicity with the statistical view of nature, a fact that should not surprise. Such sensors were born of this worldview, and would certainly never have appeared absent the basic premise—whose time, relatively speaking, has only just recently arrived—that life is not only quantifiable but that the most appropriate methods of quantification belong to inferential statistics.

†

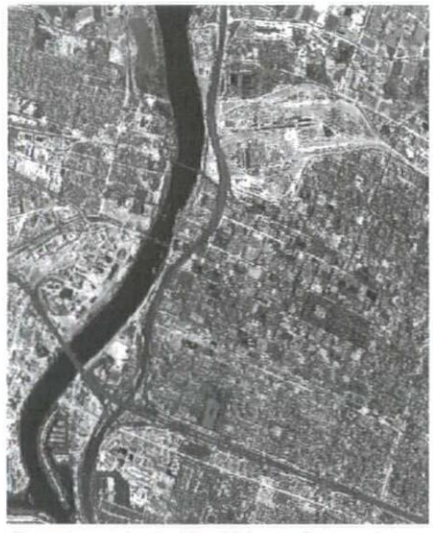
Epistemic Thought and the Processes of Conceptualization

Bachelard wrote that "it is when a concept changes its meaning that it is most meaningful." This, he said, "is where the dynamic history of thought is written … for it is then that it becomes, in all truth, an event, a conceptualization."[34] Disciplinary thought exhibits changes at the psychological level, and not just the content but the very character (what Bachelard called the "spirit") of inquiry mutates across time. In this same tradition, Foucault noted that for Canguilhem "the concept does not constitute a limit which cannot be transcended by analysis: on the contrary, it must give access to a structure of intelligibility such that elementary analysis (that of chemistry or physics) allows one to show up the specific processes of the living being."[35] In his historical epistemologies of biology and medicine, Canguilhem insisted that an idea becomes a concept at the moment in which "the reductive effects become obliterated for the benefit of a specific analysis."[36] This, according to Canguilhem, is how sciences are made.

Certain novel technologies for viewing the Earth have catalyzed the emergence of a new mode of thought. Although the conceptual roots of this mode were long in their historical development, and indeed present within geographic practice long before such technologies were in existence, the appearance of this form of rationality and its ultimate coalescing, was finalized—made ready for deployment—by the introduction of instruments and devices employing sensitive automata. Additionally, this mode of thought may be described as "statistical-mechanical vision." That is, as a consequence of the peculiar character of these new sensitive devices geographic thought today unfolds simultaneously within and is always-already imbricated with the qualities of statistical morality, including the uneasy tensions it projects between the unique and the general, the idiographic and the nomothetic, the individual and the population, between correlation and causation, tychism and determinacy. We should not downplay the role this mode of thought has played recently in marshalling a kind of still nascent environmental or ecological (even territorial) consciousness, incubating its delicate unformed foundations and gathering up ideas, techniques, and practitioners as it cuts crossways through vestigial disciplinary structures long held over from previous images of thought, each with their own underlying assumptions about the natural and social worlds. The durability of these contentions rests on the recent proliferation of new geographic concepts rooted in the deep sympathy between modern geographic technologies and new statistically based analytical and inferential methods in geographic practice, "new methods of rational thought."

Some rules, then, for the further elaboration of epistemic effects: the concern lies with concepts that deal either explicitly or implicitly with the visualization of geographic information and, more specifically, the visualization of the interrelations among mass phenomena across the Earth's surface. Secondly, in addition to visualization a concept must affect itself with geographic "processes," concepts that express the changing interaction of distributed elements across a given time period. Finally, it is crucial that a concept, or at least a portion of its constitutive essence, was preexistent (though perhaps not yet fully formed) within scientific or social-scientific literature—that its entry into the larger lexicon of scientific discourse in fact predated the deployment of modern geographic technologies. Yet by virtue of some component(s) of its structural makeup, the concept must have been made amenable to geographic thought, or rather to being thought geographically, and was thus drawn into practice in a statistical-mechanical manner. In short, if epistemic change has occurred, it will reside within the historicity of recent conceptual formations that have served to pry open geographic thought, such that the "elementary analysis" of established ideas "allows one to show up the specific processes" of the categories of mass phenomena that constitute the objects of geographic inquiry. The following is a minimalist catalog of these continually emerging concepts.

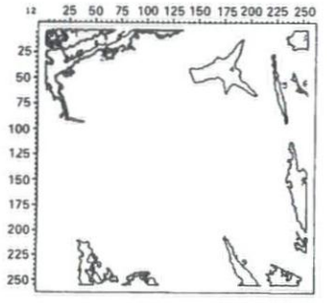
The concept of the "urban heat-island" Fig. 7, which first entered the discursive space of climatology in the early 1960s and has since produced an entire subfield. Urban climatology has become one of the most vibrant centers of human-impact research, thanks in large part to an explosion of airborne and space-borne monitoring techniques, and maintains significant connections with the fields of civil engineering and architectural technology, and the sustainable-design movement.[37]



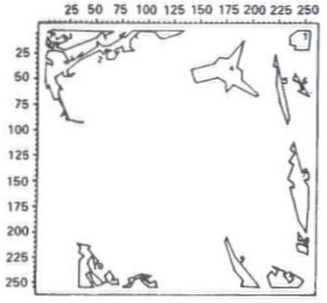
7 An instance of the use of remote sensing in identifying and measuring the extent of the "urban heat island effect" in Sacramento, CA. The top-left figure is a traditional aerial photograph, while the lower-right figure is a thermal infrared digital image of the same scene. In the thermal infrared image, the white areas, mostly rooftops, are about 122 deg. C (140 deg. F) and the dark areas are approximately 29-36 deg. C (85-96 deg. F). The hottest spots are buildings, seen as white rectangles of various sizes.

The idea, long present in landscape studies, of "landscape features" and its recent transformation through the discourse surrounding mechanized vision and automated feature recognition and extraction for the updating of vector data sets[38], or for digital image-processing applications. Landscape feature extraction lends itself to an enormous range of sub-disciplinary research.[39]

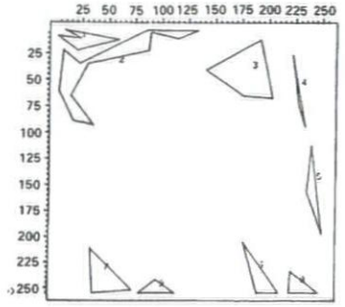
TERRAIN IMAGE



REGION BOUNDARIES

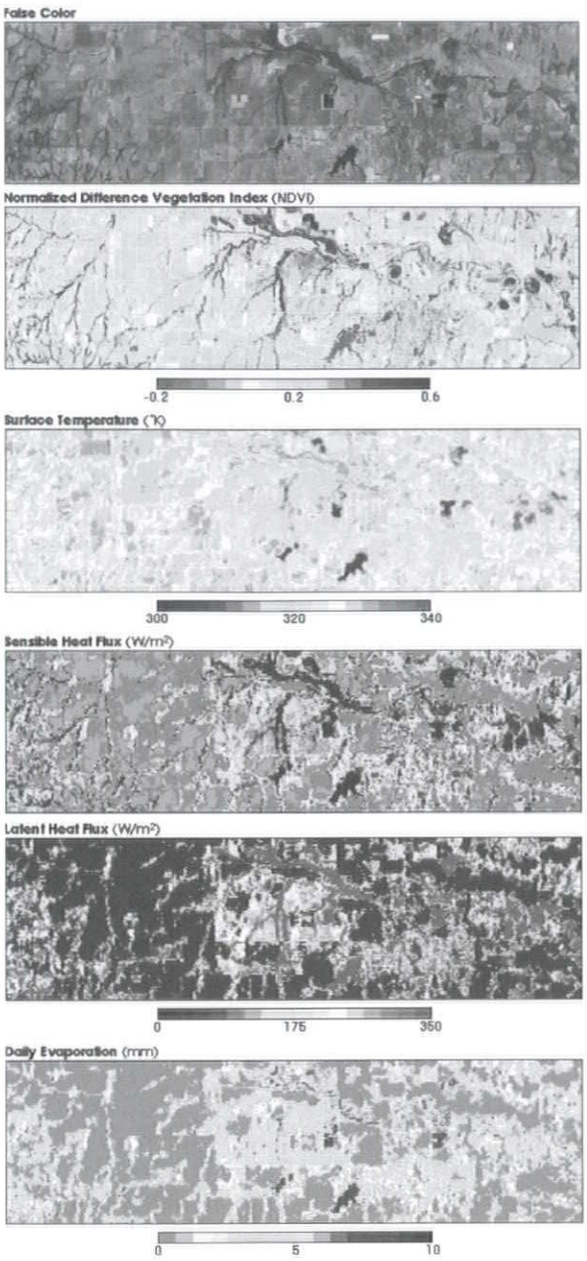


TIGHT TOLERANCE MODEL



LOOSE TOLERANCE MODEL

8 An early example of mechanized landscape feature extraction. Here, feature extraction is being employed in the development of early missile guidance technology. (Evans 1980)



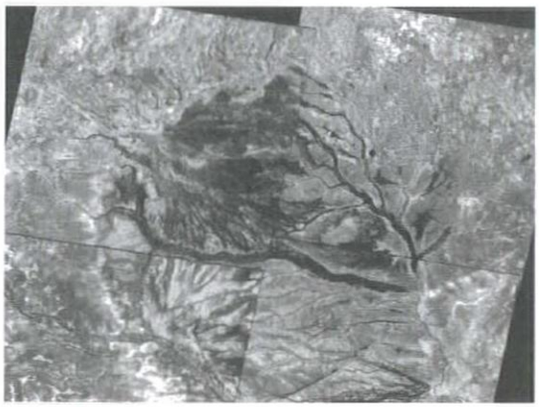
9 A September 4, 2000 image of the U.S. Department of Agriculture's Grazing Lands Research Laboratory near El Reno, Oklahoma, acquired using the Advanced Spaceborne Thermal Emission and Reflection Radiometer (ASTER). The latent heat flux measurements derived from ASTER data can be converted into rates of evaporation, shown in the sixth image, and is therefore a direct measure of water lost to the atmosphere. Before remotely-sensed, thermal infrared imagery became available, spatial changes in evaporation could not be effectively measured.

10 A multispectral analysis (recorded on August 7, 1997) of the total biomass in a portion of Murrells Inlet, SC. Each brightness value represents a statistical range of biomass accumulation, measured in grams/sq.m. (Jensen 2000: Plate 10-3)

"Evapotranspiration" [Fig. 9], which existed as a distinct scientific principle arguably since the mid-eighteenth century, and is thought to play a central role in the regulation of global and regional temperatures, but has only become a subject of major interest in geographic thought since the 1970s, due to the amenability of its constituent variables to detection from geographic imaging technologies.[40]

"Biomass," and in particular "biomass estimation" [Fig. 10], concepts that prior to modern geographic technologies held little scientific value beyond the scale of the individual organism but have been applied (through airborne spectral-reflectance technologies) at the scale of populations since 1980 with remarkable and lasting disciplinary repercussions.[41]

"Soil-surface" or "surface soil," which is associated with various methods of noninvasive large-scale analysis (aerial or space-borne) of the physical properties of the uppermost layer of soil, and the relationship between those properties and regional or global environmental patterns.[42] Fig. 11



11 Remote sensing analysis of the soil-moisture content of the upper Zambezi catchment region in eastern Angola, approximately 300km across. (Wagner, W., K. Scipal 2000)

In each of the cases listed (and many more could be furnished) we are confronted with an idea or a notion, perhaps even a fully formed scientific concept with applications in the elementary sciences, whose parameters were made technologically accessible to geographic thinking. Each has undergone a process of dramatic conceptualization in which ideas and systems resonate against one another across a disciplinary space, with the specific effect that ideas that were largely absent from geographic thought have become, through modification and redefinition, central nodes of research and theorization, opening up new avenues of practice. The net effect of these successive, continued conceptualizations has been the emergence of a way of simultaneously seeing and thinking on a scale commensurate with our contemporary ecological concerns.

+

> [T]he world is what we see and, nonetheless, we must learn- to see it—first in the sense that we must match this vision with knowledge, take possession of it, say what "we" and what "seeing" are, act therefore as if we knew nothing about it, as if here we still had everything to learn. If the philosopher questions, and hence feigns ignorance of the world and of the vision of the world which are operative and take form continually within him, he does so precisely in order to make them speak, because he believes in them and expects from them all his future science. It is for philosophy the only way to conform itself with the vision we have in fact, to correspond with what, in that vision, provides for thought, with all the paradoxes of which that vision is made, the only way to adjust itself to those figured enigmas, the thing and the world, whose massive being and truth teem with incompossible details.[43]

Considerations

The world opens itself onto our knowledge, but not without considerable struggle. Aspects of our experience are available to us, incomplete and indistinct, but life leaks out of explanation at every point along its trajectory, taking refuge in the invisible connections that determine our realities. If Merleau-Ponty is to be believed, we must come to terms with an intimate, somewhat mysterious, and continuously operative exchange between vision and knowledge. One, it seems, is always asking certainty of the other.

How did it become possible to imagine the entire visual domain as a field of variable regularity, perceptibly vibrating around nodes of identifiable consistency? What mode of thought unfolds alongside the idea that a mechanical device can be made to sense our surroundings at scales and attuned to properties of phenomena that are utterly beyond our individual sense perception? What relations (causal or otherwise) are constituted through practice between that machinic sense data and our statistical worldview? Can contemporary devices and systems, shot through as they are with the uncertainties that accompany probabilistic reasoning, provide answers to the most intractable, largest-scale technologically associated environmental problems of our dawning days? Or are they simply part of an accumulating panorama of feedbacks, meticulous and patient, engendering entirely new statistical realities, always and everywhere, silently sowing ambiguity and torpor within the domains of prediction, planning, and action?

The processes of conceptualization associated with the reciprocity between statistical thinking and sensitive automata, within the domain of geographic thought over the past half-century, are the historical objects that, when taken together, form the epistemic mode of thought I have labeled statistical-mechanical vision. These processes, and the concepts they engender, will likely determine the actions we will adopt wishfully toward a grand and ceremonious (and inevitably self-congratulatory) technical resuscitation of our collapsing environment.[44]

This essay aspires toward neither a doomsday scenario nor a science-fiction novella. We are increasingly asking remarkably and ever more complex devices to perceive, interpret, and act upon the world in our stead—not so much because we lack the energy or the determination but because the problems created by our modern lives have outstripped our means for resolving them. Modernity, like statistical thought, can be written through our various attempts to comprehend and control the mass phenomena we encounter in the natural and social worlds. The most pressing environmental issues are those that inevitably point toward the effects of mass phenomena. Logically it must be so: exponential accumulations are the only forces generous enough to affect entire territories, whole ecosystems, the Earth. I've done little more here than pose a research question, and still roughly at that. Disciplinary thought involves the formation of concepts necessary for its practice. Tracing this process of formation across a given period can, in the case under consideration, disclose a great deal regarding the modern relations between vision, technology, and knowledge—relations that can never be fully understood but only gazed at obliquely in a series of vignette perspectives whose incompleteness is unavoidable, but whose outlines may be of some use in capturing the character of contemporary thought.

Assuming, however, that an historical approach of this sort can lead to some understanding, it is as yet entirely unclear what such understanding will resolve. Surely it cannot disentangle the many troubling questions that surround the topic of statistical inference.[45] Nor can it draw any specific conclusions regarding the value or validity of statistical knowledge, or its capacity to furnish the promises of control and comfort that our modern sensibilities have come to expect from human inquiry—our deep, visceral hope that a long gaze at the past still allows us a brief glimpse of what is yet to come. Nor does it settle the fact that whole fields of thought (geography, environmental science, urban planning, urban and landscape ecology—the list is endless and growing at precisely the moment that all distinctive categories are being rendered obsolete) are today caught in a cycle of technical catalysis in which the obvious failings of both human intentions and our modern lives, the degenerate tyrannies of our swollen goals, are continually plied against one's own forlorn, perhaps misplaced, resolve toward future possibilities.

Thoughts, methods, and their associated technical systems play out in equal parts with one another in fits and starts, exchanging glances, alternatively bearing the immense weight of practice with its ravenous desire for definition, categorization, and clarity. In the cool distance that separates our ideas and devices from the terrain we occupy sits a measurable haze, ever increasing in depth and opacity as we struggle toward knowledge and technologically multiply the scale and character of our perceptual field. It seems worthwhile now, under the thunderclouds of our baroque moment, to wander through that haze, looking all the while to illuminate the incompossible details of those figured enigmas, the thing and the world.

And on our wander we will confront "the most insidious question of all," delivered to us first in The Gay Science and countless times since: "Whether science can furnish goals of action after it has proved that it can take such goals away and annihilate them."[46] With each passing day our goals become at once narrower, more urgent, and yet somehow more difficult to discern. Until then solutions become problems in need of solutions. Repeat.

Acknowledgments

I would like to thank Michael Curry, Antoine Picon, Nick Entrikin, and Larry Smith for their early comments, Norton Wise and Soraya de Chadarevian for helpful conversations, and Jacob Reidel for his editorial assistance. This work is dedicated to the memory of Denis Cosgrove, whose thoughtful criticism and encouragement were central to the development of the larger project from which this essay has been drawn.

1 Wittgenstein, L. Philosophische Untersuchungen (New York: Macmillan Company, 1958) Sec. 67.

2 Both having become empty signifiers - "coins which have lost their pictures and now matter only as metal" - that I employ here for expediency alone, and whose emptiness requires a far more extended redescription (although certainly Latour has recently gone some distance toward initiating a "reassembling" of the first term).

3 See the following: Frohn, R. C. Remote Sensing for LandscapeEcology: New Metric Indicators for Monitoring, Modeling, and Assessment of Ecosystems (Boca Raton, FL.: Lewis Publishers, 1998). Hinz, S., R. Balmer, et al. "Theme Issue: Airborne and Spaceborne traffic monitoring." ISPRS Journal of Photogrammetry and Remote Sensing 61 (2006): 135-280. Brekke, C., and A. H. S. Solberg. "Oil spill detection by satellite remote sensing." Remote Sensing of Environment 95 (2005): 1-13. "Frontispiece: Progress towards automated feature extraction?" The Photogrammetric Record 21 (2006): 12. Joshi, B. "Hydrology and nutrient dynamics of spring of Almora-Binsar area, Indian Central Himalaya: Landscapes, practices, and management." Water Resources 33 (2006): 87-96. Ma, J., and X. Han, et al. "A study of the endangered plants of the West Ordos Plateau, China, using remote sensing data." International Journal of Remote Sensing 26 (2005): 2297-2310. Makela, H., and A. Pekkarinen. "Estimation of timber volume at the sample plot level by means of image segmentation and Landsat TM imagery." Remote Sensing of Environment 77 (2001): 66-75. See also endnotes 36-41.

4 Mayr, E. Populations, species, and evolution: an abridgment of animal species and evolution (Cambridge, MA.: Belknap Press of Harvard University Press, 1970). Mayr, E. The growth of biological thought: diversity, evolution, and inheritance (Cambridge, MA.: Belknap Press, 1982).

5 Jensen, J. R. Remote Sensing of the Environment: An Earth Resource Perspective (Upper Saddle River, NJ: Prentice Hall, 2000).

6 Wittgenstein, op. cit., Sec. 193.

7 Particularly useful for background are the following: Porter, T. The Rise of Statistical Thinking, 1820-1900 (Princeton, NJ: Princeton University Press, 1986). See also Hacking, I. The emergence of probability: a philosophical study of early ideas about probability, induction, and statistical inference (London and New York: Cambridge University Press, 1975). Kline, M. Mathematics, the loss of certainty (New York: Oxford University Press, 1980). Hacking, I. The taming of chance (Cambridge, and New York: Cambridge University Press, 1990).

8 Kline, M. Mathematics in Western culture (New York: Oxford University Press, 1953).

9 As I've described elsewhere, my use of the term morality is consistent with Nietzsche's formulation of the concept: NOT the degree of conformity to a particular ethical framework, but rather as a set of collective beliefs that have been raised to, or that have attained, the status of truth in a particular context. As will hopefully be made clear, my interest in statistical thinking, and in our statistical view of nature in general, has absolutely nothing to do with its validity or with its possible correspondence with some reality external to its propositions and techniques. Nor am I interested in the so-called "effects" of the statistical worldview; the term effect is more or less nonsensical in this context. Rather I'm concerned with the ways of life - ways of knowing and acting, and the resonances between the two - that have unfolded alongside and are coextensive with statistical thinking, with the activities, accumulations, devices, values, and events that have been, and continue to be, coextensive with its appearance. Descriptions of this sort require a recording of the comprehensiveness of statistical thought. See also the following: May, J.

" … Such as that Elegant Blend of Philosophy and Hardware: Preface to History of Geographical Autonomy." Thresholds: The MIT Journal of Art, Architecture, and Media Culture 31 (2006) Ephemera: 8-15. May, J. "Missile Guidance and Statistical Morality (… or, Such as that Elegant Blend of Philosophy and Hardware)," lecture presented at "Loopholes: Conference on Discourse and Practice," Harvard University, April 16, 2005.

10 I am referring here to the "problem of induction" as first formulated by David Hume in the early eighteenth century. For a brief synopsis of the problem, see Hacking, I. Historical Ontology (Cambridge, MA: Harvard University Press, 2002) 9-14. For more extended discussions, see the following: Kyburg, H. E. Probability and the logic of rational belief (Middletown, CT: Wesleyan University Press, 1961). Nagel, E. The structure of science: Problems in the logic of scientific explanation (New York: Harcourt Brace & World, 1961). Hempel, C. G. Aspects of scientific explanation and other essays in the philosophy of science (New York: Free Press, 1965). Also of note is David Freedman's 1998 discussion on the difficulties of utilizing inferential statistics in the social and life sciences (D.A. Freedman, "From association to causation: Some remarks on the history of statistics." Statistical Science, vol. 14 (1999) 243-58. Reprinted in Journal de la Société Francaise de Statistique, vol. 140 (1999) 5-32 and in Paneretos, J. ed., Stochastic Musings: Perspectives from the Pioneers of the Late 20th Century (Lawrence Erlbaum Associates, 2003) 45-71.

11 Kline, M. Mathematical thought from ancient to modern times (New York: Oxford University Press, 1972). Hacking, I., 1975, 1990. Porter, T., 1986. Stigler, S. M., 1986. The history of statistics: the measurement of uncertainty before 1900 (Cambridge, MA: Belknap Press of Harvard University Press, 1986). Krüger, L. The Probabilistic revolution (Cambridge, MA: MIT Press, 1987). Daston, L. Classical probability in the Enlightenment (Princeton, NJ: Princeton University Press, 1988).

12 Wright, J. K. Geography in the Making (New York: American Geographical Society, 1952). Lavalle, and H. McConnell, et al. "Certain Aspects of the Expansion of Quantitative Methodology in American Geography," in Annals of the Association of American Geographers 57 (1967): 423-36. Entrikin, J. N. The Betweenness of Place (Baltimore, MD: Johns Hopkins University Press, 1991).

13 When I refer to the use of "statistical thinking" in geographic analysis during the period under consideration, I am referring exclusively to statistical methods for the inference of causal relations or to those concerned with the inductive inference of causal laws among variable or indeterminate phenomena, and not to "descriptive" statistics. As Westergaard (1932), Lavalle (1967), and Porter (1986) have shown, geographic thought and empirical (or "descriptive") statistics have been intimately tied to one another since the eighteenth century, when governments and scientists first began to gather numerical data for the purposes of cadastral and taxation maps. Interesting though these early interactions may be, they are not relevant here.

14 Lavalle points to a 1928 study by Fisher and Hoblyn that utilized an analysis of variance in climatological research, as well as a 1932 study by a Japanese geographer that employed the Poisson probability function in the analysis of settlement patterns (Lavalle, and H. McConnell, et al. "Certain Aspects of the Expansion of Quantitative Methodology in American Geography" in Annals of the Association of American Geographers 57 (1967): 423-36.). Theodore Porter, however, cites Spottiswoode's work in 1860 as the first application of modern statistical inference to geographic thought.

15 Hagerstrand, T. "The Education of a Geographer," reprinted in Leighly, J. Land and Life: A selection from the writings of Carl Ortwin Sauer (Berkeley, CA: University of California Press, 1963) 252. Turner, B. L. "Contested Identities: Human-Environment Geography and Disciplinary Implications in a Restructuring Academy," in Annals of the Association of American Geographers 92 (2002): 55.

16 Bunge, W. Theoretical Geography (Lund, Sweden: Gleerup Publishers, 1962).

77 Hartshorne, R. The Nature of Geography: A Critical Survey of Current Thought in Light of the Past (Lancaster, PA.: Association of American Geographers, 1939).

18 Ibid., 10.

19 See Sklar, L. Physics and Chance: Philosophical Issues in the Foundations of Statistical Mechanics (Cambridge: Cambridge University Press, 1993).

20 Hartshorne, op. cit., 12.

21 For a basic discussion of this historical shift, see Wiener, N. Cybernetics: or Control and communication in the animal and the machine (New York: MIT Press, 1961), in particular chapter 1, "Newtonian and Bergsonian Time."

22 Standard historical accounts of the development of modern geographic technologies, scant in number though they are, have inevitably focused on this patently obvious shift by merely indicating the fact of its occurrence at the outset and then proceeding forward in time, all the while expressing astonishment at the "profound" nature of the changes. (See for example Sui and Morrill, "Computers and Geography: From Automated Geography to Digital Earth," or Harvey and Chrisman, "The Imbrication of Geography and Technology: The Social Construction of Geographic Information Systems," both in Brunn, S. D., and S. L. Cutter, et al. Geography and technology (Dordrecht and Boston: Kluwer Academic Publishers, 2004). Lost in the euphoria (or nostalgia) are the qualities of this "rupture," as though the term itself indicates a fixed object or definite process, as though the long and perilous climb to the apex of a precipitous historical canyon is without merit, as though the dissociation between "before" and "after" was actual, total—in short, as though "tears" in some fabled "historical fabric" are really existing things. Tokenized caricatures of Foucauldian metaphors aside, "they" are not. Which is not to suggest that nothing happened (witness the drawings summoned at the outset of this very essay), but rather, quite the opposite, that the happening was far more difficult, far more agile and unsettled, far more comprehensive, than any of these accounts have suggested. The concept of rupture provides initial access to these changes but is useless (and arguably misleading) beyond that.

23 Blachut, T. The Early Days of Photogrammetry: Prior to the Application of Airplanes (Falls Church, VA: American Society for Photogrammetry and Remote Sensing, 1989). Burkhardt, R. (1989). Historical Development of Photogrammetric Methods and Instruments (Falls Church, VA: American Society for Photogrammetry and Remote Sensing, 1989). Jensen, J. R., 2000.

24 Sander, W. "The Development of Photogrammetry in the Light of Inventions, with Special Reference to Plotting from Two Photographs," in Von Gruber, O. Photogrammetry: Collected Lectures and Essays (London: Chapman and Hall, 1932). Von Gruber, O. Photogrammetry: Collected Lectures and Essays (London: Chapman and Hill, 1932).

25 H. G. Fourcade, "On a Stereoscopic Method of Photographic Surveying," in Transactions of the South African Philosophical Society (1901).

26 One way of producing maps for survey use relies on conducting aerial surveys of the geographic region. Although it is known that such photographs are subject to distortions and errors, the photos obtained during the aerial survey can be used to produce maps. However, the photographic images must first be processed manually to rectify or correct the distortions and errors.

27 For example, by projecting backward a photograph placed in an aerial camera, a bundle of image-projecting rays can be reconstructed to solve photogrammetric problems in an analog manner. Conversely, by using the camera's constraints and its characteristics known from calibration and the measured image coordinates of pertinent points, the photogrammetric problems in question can be solved analytically.

28 Wiener, op. cit., 44-45.

29 Compare my discussions (May 2005a, 2005b, 2006) of the Goodyear Corporation's ATRAN terrain-recognition system - first tested in 1948 - with Manuel Delanda's account of the inauguration of autonomous weapons systems into warfare. He asserts that "it was not until the miniaturization of electronic components had reached the integrated circuits stage that computerized guidance and navigation devices were built into projectiles, thus creating the first generation of "smart" weaponry in the 1960s." Delanda, M. War in the Age of Intelligent Machines (New York: Zone Books, 1991) 43. The entire ATRAN project, along with several like it, seems to contradict his account; though to be fair, this judgment may hinge on the precise meaning of terms such as "computerized guidance" and "smart weaponry."

30 Lillesand, T. M., and R. W. Kiefer, et al. Remote sensing and image interpretation (New York: John Wiley and Sons, 2004) 4-112.

31 The statistical basis for electronic imaging ultimately resides in Boltzmann's work on thermodynamics, and specifically to its application, as the Stefan-Boltzmann Law, to the quantification of energy radiated by any physical body. See Klein, M. J. "The Development of Boltzmann's Statistical Ideas." In E. G. D. Cohen, and W. Thirring, ed., The Boltzmann Equation: Theory and Applications. Acta Physica Austriaca Suppl. 10 (Vienna: Springer, 1973) 53-106.

32 A worldview entirely consistent, c.1960, with that not only of the physical sciences but also of the emergent methods of theoretical geography.

33 Long, F. "Natural scene statistics as the universal basis of color context effects," in Proceedings of the National Academy of Sciences 100 (2003): 15190-93.

34 Bachelard, G. The new scientific spirit (Boston: Beacon Press, 1984) 53-54 (emphasis original).

35 Foucault, M. in Canguilhem, G. The normal and the pathological (New York: Zone Books, 1989) 18.

36 Thus the idea of reflex, long present in mechanics, was made a biological concept through its application in Willis's rudimentary analysis of sensorimotor functions in the brain, exposing explicitly biological processes to larger frames of inquiry. See Canguilhem, G., and F. Delaporte, A Vital Rationalist: Selected Writings from Georges Canguilhem (New York: Zone Books, 2000) 179-202.

37 One of the earliest articulations of the concept being: Chandler, T. J. The Climate of London (London: Hutchinson, 1965). Recent research examples include: Lo, C. P., D. A. Quattrochi, and J. C. Luvall. "Application of high-resolution thermal infrared remote sensing and GIS to assess the urban heat island effect." International Journal of Remote Sensing 18, no. 2 (1997): 287-304. D. R. Streutker. "A remote sensing study of the urban heat island of Houston, Texas." International Journal of Remote Sensing 23, no. 13 (2002): 2595-2608. Weng, Q., and Lu, D. "Estimation of land surface temperature-vegetation abundance relationship for urban heat island studies." Remote Sensing of Environment 89, no. 4 (2004): 467-83.

38 May, J. " ... Such as that Elegant Blend of Philosophy and Hardware: Preface to History of Geographical Autonomy," op. cit., 15.

39 Burns, K. L., and G. H. Brown. "The human perception of geological lineaments and other discrete features in remote sensing imagery: signal strengths, noise levels, and quality," in Remote Sensing of Environment 7, no. 2 (1978): 163-76. Badhwar, G. D., and J. G. Carnes, et al. "Use of Landsat-derived temporal profiles for corn-soybean feature extraction and classification," in Remote Sensing of Environment 12, no. 1 (1982): 57-79. Long, H., and Z. Zhao. "Urban road extraction from high-resolution optical satellite images," in International Journal of Remote Sensing 26 (2005): 4907-21. Miliaresis, G., and N. Sabatakakis, et al. "Terrain Pattern Recognition and Spatial Decision Making for Regional Slope Stability Studies," in Natural Resources Research 14 (2005): 91-100. Bruce, L. M., and A. Mathur, et al. "Denoising and Wavelet-Based Feature Extraction of MODIS Multi-Temporal Vegetation Signatures," in GIScience and Remote Sensing 43 (2006): 67-77. Couteron, and N. Barbier, et al. "Textural Ordination Based on Fourier Spectral Decomposition: A Method to Analyze and Compare Landscape Patterns," in Landscape Ecology 21 (2006): 555-67. Ouma, Y., and T. G. Ngigi, et al. "On the optimization and selection of wavelet texture for feature extraction from high-resolution satellite imagery with application towards urban tree delineation," in International Journal of Remote Sensing 27 (2006): 73-104.

40 Heilman, J. L., and E. T. Kanemasu, et al. "Thermal scanner measurement of canopy temperatures to estimate evapotranspiration." Remote Sensing of Environment 5 (1976): 137-45. Thunnissen, H. A. M., and G. J. A. Nieuwenhuis. "A simplified method to estimate regional 24-h evapotranspiration from thermal infrared data." Remote Sensing of Environment 31, no. 3 (1990): 211-25. Caselles, V., and M. M. Artigao, et al. "Mapping Actual Evapotranspiration by Combining Landsat TM and NOAA-AVHRR Images: Application to the Barrax Area, Albacete, Spain." Remote Sensing of Environment 63, no. 1 (1998): 1-10. Boegh, E., and H. Soegaard, et al. "Evaluating evapotranspiration rates and surface conditions using Landsat TM to estimate atmospheric resistance and surface resistance." Remote Sensing of Environment 79, no. 2-3 (2002): 329-43. Batra, N., and S. Islam, et al. "Estimation and comparison of evapotranspiration from MODIS and AVHRR sensors for clear sky days over the Southern Great Plains." Remote Sensing of Environment 103, no. 1 (2006): 1-15. El Maayar, M., and J. M. Chen. "Spatial scaling of evapotranspiration as affected by heterogeneities in vegetation, topography, and soil texture." Remote Sensing of Environment 102, no. 1-2 (2006): 33-51.

41 Tucker, C. J. "Spectral estimation of grass canopy variables," in Remote Sensing of Environment 6, no. 1 (1977): 11-26. Nelson, R., and W. Krabill, et al. "Estimating forest biomass and volume using airborne laser data," in Remote Sensing of Environment 24, no. 2 (1988): 247-67. Harding, J., W. Lawrence, and E. C. Itsweire, et al. "Estimates of phytoplankton biomass in the Chesapeake Bay from aircraft remote sensing of chlorophyll concentrations, 1989-92," in Remote Sensing of Environment 49, no. 1 (1994): 41-56. Luckman, A., and J. Baker, et al. "Tropical Forest Biomass Density Estimation Using JERS-1 SAR: Seasonal Variation, Confidence Limits, and Application to Image Mosaics," in Remote Sensing of Environment 63, no. 2 (1998): 126-39. Zheng, D., and J. Rademacher, et al. "Estimating aboveground biomass using Landsat 7 ETM+ data across a managed landscape in northern Wisconsin, USA," in Remote Sensing of Environment 93, no. 3 (2004): 402-11. Montes-Hugo, M. A., and K. Carder, et al. "Estimating phytoplankton biomass in coastal waters of Alaska using airborne remote sensing," in Remote Sensing of Environment 98, no. 4 (2005): 481-93.

42 Evans, R., and J. Head, et al. "Air photo-tones and soil properties: implications for interpreting satellite imagery," in Remote Sensing of Environment 4 (1975): 265-80. Curran J. "The use of polarized panchromatic and false-color infrared film in the monitoring of soil surface moisture," in Remote Sensing of Environment 8, no. 3 (1979): 249-66. Cierniewski, J. "A model for soil surface roughness influence on the spectral response of bare soils in the visible and near-infrared range," in Remote Sensing of Environment 23, no. 1 (1987): 97-115. Otterman, J., and T. Brakke, et al. "Effects of leaf-transmittance versus leaf-reflectance on bidirectional scattering from canopy/soil surface: an analytical study," in Remote Sensing of Environment 54, no. 1 (1995): 49-60. Weidong, L., and F. Baret, et al. "Relating soil surface moisture to reflectance," in Remote Sensing of Environment 81, no. 2-3 (2002): 238-46.

43 Merleau-Ponty, M., and C. Lefort, Le visible et l'invisible: suivi de notes de travail (Paris: Gallimard, 1964).

44 Canguilhem and Delaporte, op. cit., 28.

45 For one case study in this emergent project, see May, J. "Bringing Back a Fresh Kill: Notes on the Technical Resuscitation of Nature," in Verb: Crisis (Barcelona: Actar, 2007) 5.

46 For an accurate description of the epistemological problems surrounding the application of statistical methods to ecology (particularly regarding the impossibility of deriving ecological universals) as well as a discussion of the seriousness of the implications of these problems, see Hull, D. Philosophy of Biological Science (Englewood Cliffs, NJ: Prentice-Hall, 1974) 45-49.

47 F.W. Nietzsche, and B.A.O. Williams, et al. The gay science: with a prelude in German rhymes and an appendix of songs (New York, Cambridge University Press, 2001) 82.

Calcut ta

1 Frontispiece to Ford Foundation Basic Development Plan for Calcutta, 1966.

Computing Alibis: Third World Teratologies

Arindam Dutta

> A "going-on"; yes, anastasis is the word
> for research a virus has defied,
> and for the virologist
> with variables still untried—
> too impassioned to desist.
> —Marianne Moore, The Staff of Aesculapius

Why does one compute? The question might appear to have many answers. In 1857 Charles Babbage, the draftsman of the Analytical Engine, gives us a lexical response: the machine will take up the "menial," mensurative, quantitative work of the brain, as opposed to the qualitative ones. In the documents of the Ford Foundation's landmark urban planning exercise for Calcutta carried out between 1961 and 1974,[Fig. 1] Edward Echeverria, Ford's head in Delhi, outlines a peculiar collaborative potential of the computer particularly germane to preempt the political challenges faced by a First World group of "experts" operating in the Third World. In Echeverria's letter to Prasanta Chandra Mahalanobis he argues that the computer has the ability to anticipate the babble of tongues erupting from the ground that may otherwise overwhelm the determinate language of the urban planner:

> In planning activities, systematic co-operative use of such devices as the new graphic data processing equipment could be a powerful force working for the coherence of related efforts. Conversely, non-cooperative use of even identical equipment in very similar activities can lead to a confused situation characterized by technical rivalry, linguistic incompatibility, redundancy of information and of information processing, and practical inaccessibility of bought and paid-for information. The introduction of new information processing equipment always provokes the development of a using [sic] technology. In the case of graphic data processing equipment, which I believe will play a major role in planning activities at all levels. [sic] I hope that a cooperative development using technology should begin before arrival of the equipment spurs an immediate wild growth of techniques that defies control ...[1] At this point I would like you to know of our problems with a gravity model that we propose to use in projecting urban travel patterns, 25 years in the future ... This is done on an IBM 650 computor [sic]. We would like to know at this time whether your computer is radically different from this, as we would not like to change drastically the program that has been prepared by [us].[2]

Is your computer compatible with ours? Observe that the conversation is not between expertise and a lack of expertise, between modernization and its opposite—the mode in which some "post-colonial" critiques are often unwittingly posed—but rather between two forms of expertise, two kinds of computers, two kinds of planned modernity. Prasanta Chandra Mahalanobis, Ford's interlocutor in the above correspondence, was no mere "native informant"; in many ways he was the literal embodiment of an institutional apparatus more distinguished than that of Ford itself. Mahalanobis founded the Indian Statistical Institute in Calcutta in 1931 and the National Sample Survey in 1950 as a supplement to the Indian census and as an aid to the fledgling Five-Year Plan exercises then being initiated by the Indian government. The "Mahalanobis Model" of development—involving selective investment into heavy industry and restricted growth in the area of small industry—was the official credo adopted for the second Five-Year Plan (1956-1961). Mahalanobis had also been appointed the Honorary President of the International Statistical Institute and the first Chairman of the United Nations Subcommission on Statistical Sampling. In other words, Ford was speaking to the very marrow of Indian statism, the totem of a certain model of decolonization. The above correspondence—with its anxious gambit to remove "non-cooperation," "confusion," "rivalry," "redundancy," "wild growth," and the defiance of "control"—alerts us to a desperate attempt to secure against a lack of correspondence between two models.

The purpose of this paper is to decipher "globality" as an epistemological project, discerned in the intimate schism between two distinct but complementary vectors: the state/"nation" on one hand and "transnationality" on the other. These two contingently competitive logics inscribe within their rupture the seed of a productive difference, never quite cancelling each other, nor completely affirming the other. Rather, within the dissonance between the two is the cognitive fount for discerning new kinds of categories, from which new subjects can be produced.

As the Ford documents point out, there is never a contest between planning and the unplanned. No terra incognita exists that the state (or its transnational proxies) will suddenly discover around the bend of some unknown river. The conflicts that emerge between the state and transnationality, between place and space, are not between those of knowledge and its absence, between computation and the lack of computation, modernization and the lack of modernization (late CIAM), architects and the lack of architects (Bernard Rudofsky), between "unself-conscious" and "self-conscious" design cultures (Christopher Alexander),[3] between "Orient" and "Occident" (Edward Said). This essay points towards the archive where the transnational embeds itself in the national, not through exogenous frames descending from on high, but through infinitesimal plays of difference within a given context. To our question asked at the outset, "Why does one compute?" the answer would look something like this: One computes never to address the uncomputable or the non-computational, but to contest, critique, censor, and circumscribe already available modes of computation, whether material or human.

This minimal shift is patent in the above correspondence between Echeverria and Mahalanobis. "Calcutta" in this archive is less a place-name than an epistemic stand-in, a locus inviting a conflict of competing teleologies, a contest of narratives. Computers have the ability to preempt all manner of heterogeneous problems that might erupt in a planning exercise, with one caveat: it is critical that all the computers involved—both machine and human—speak the same language. The conflict of computation that confronts us here presents something of a structural isomorph with what we may call "organicism,"[4] in that the latter also purports to legislate the categorical structure of variation as such—nothing to do with biomimesis then, a genre with which organicism is commonly confused, but rather the format to study the extra-mechanical discontinuities between causes and effects, wholes and parts.

Organicism is the rigorous reminder that the whole is of a radically different order than its parts; one cannot build up to totality purely from the study of the finite.[5]

This is a lesson we must learn in order to understand the proper province of monsters. Monsters are not other from a given norm. Monsters present a particular kind of epistemic paradox, a particular genre of anomaly: they are of a norm and yet embody the failure of the norm to establish its normativity. Teratologies are always of, contingent to, the episteme in which they are spawned. In a Christian epoch of "miracles", monsters were celebrated as "wonders," In the Renaissance, an age that emphasized symmetry, the defining characteristic of monsters was their asymmetry. In the eighteenth century, monsters follow the transition from the cabinet of curiosity to the tabulated laboratory specimen. In the nineteenth, monsters were stripped of their status as emblems of causal alterity, becoming examples of irrepressible, unfortunate variations in an eugenist's / statistician's field of reproductional types. Today, when the design paradigms of nanotechnology are seen to confront the microuniverses of genomes and proteins, teratogens emerge at the scale of acid receptors and molecules, zygotes and lipids.[6]

Monsters are not liminal beings, Fig. 2 creatures from some Other or "dark Africa" of the Western mind; rather they present a special problem of knowledge itself. In a predicable spectrum of chance, they present an exceptional instance, a chaotic effect where a known law acts lawfully to produce unknown outcomes. In a field defined by the calculus of error, monsters represent error that is incalculable, variation unhinged from the norm. Monsters open up the suture where a scientific/ disciplinary "will to power" is revealed as conflating its "positive" and "normative" aspects.

"Calcutta"

When the Ford Foundation made its initial infrastructure proposals for Calcutta in 1961, its first rhetorical move was to cast the city as a sort of wild growth of modernity. Fig. 3 Its ethical self-sanction for its ability to manage the Calcuttan morass turned on this epistemological translation: that chaos could be computed as complexity. Fig. 4 To be sure, this desired translation bears some of the key traits of the Cold War. It would be hard to distinguish between Ford's interests abroad and those of the United States government. According to Ford's Bernard Loshbough in his request to US ambassador Chester Bowles for USAID funds, Calcutta was merely the first in a byzantine pattern of semi-urban, agrarian dominoes ready to tumble against a Communist onslaught or worse, across the breadth of Asia and the Third World:

> Unquestionably the most blighted urban area in the free world today is the Metropolitan District of Calcutta ... Partly because of extremist pressures in over-populated and poverty-stricken Calcutta ... the importance of Calcutta's setting an example in physical, economic and social well-being can hardly be overestimated. If Calcutta falls into the Communist camp, or into suicidal anarchism, all of Asia will take heed and probably follow ... strengthening Calcutta is a matter of vital concern to the whole free world ...[7]

India was Ford's first foray into international development work, and Calcutta was the biggest metropolis in a teething and teetering democracy in an area of the world where ideological "spheres of influence" were very much in contention.[8] Ford consultant Arthur T. Row described the project as nothing less than the "toughest planning job in the world in operation," the "biggest and most important [job] that would ever engage [the] minds" of its participants.[9]

The very breadth of Ford's ambition would produce counteractive results. On the one hand, their focus on disciplinary elaboration prior to coherent action would significantly defer any visible changes in Calcutta's infrastructure. On the other, their involvement would become in fact an exacerbating factor in the public perception of Calcutta's continuing degradation as an emblem of the failures of the Congress party, the party in power in both Delhi and the state of West Bengal. With increasing food scarcity in the countryside, by 1967 the Communists, pursued and harried by police, had formed a coalition government in Bengal. Pointing to Ford, Communist party manifestoes explicitly cited US "imperialist aid" as a key element of the state's ideology which had to be confronted and fought against.[10] In the next five years, the dominant political conflict that emerged was no longer between the "centrist" Congress and the left, but different factions within the left,[11] as Calcutta became the proxy battleground of an armed conflict between an insurgent Maoist militia movement and the electoral Marxists.[12] Figs. 5-8 By 1977, West Bengal had passed securely into Communist control, and continues to be so today. A visit by Robert McNamara to review and bolster support for the Ford effort was met with mass protests against the war in Vietnam, and Harrington Street, the address of the United States consulate in Calcutta, was renamed Ho Chi Minh Avenue to drive home the point.

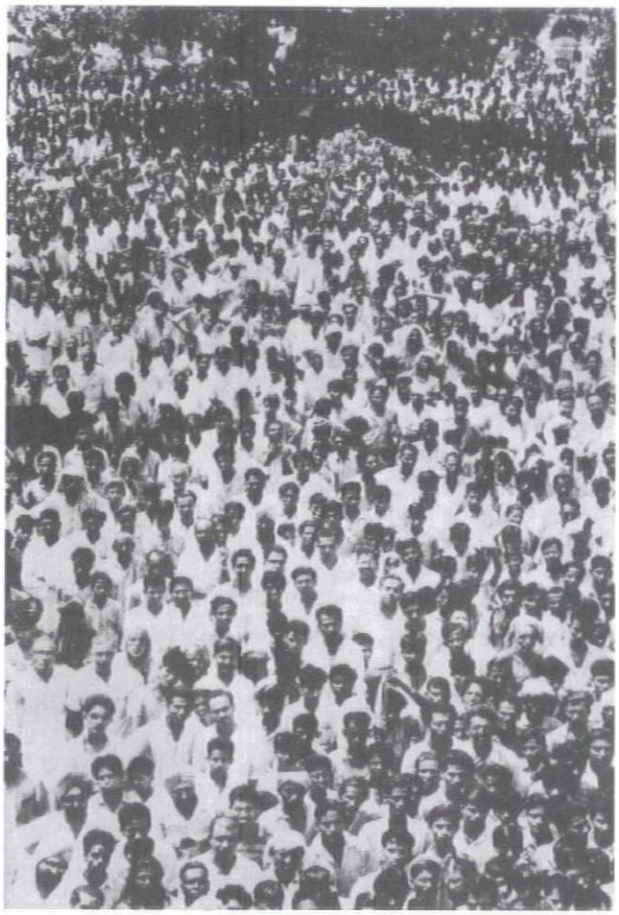
By the turn of the decade, Ford struggled to save face, battling media accounts that it had been asked to leave by the Communists (wags noted how the anti-Communist ethos of the early mission had been replaced by a new-found willingness to "work with" the Marxist government). The psychological effect of this outcome within Ford can be described as nothing less than traumatic, given the decade-and-a-half-long exercise of troops on the ground and the millions spent with practically nothing to show. Arthur T. Row's The Great Experiment, a report left unfinished by Ford's last chief consultant on the Calcutta mission, reveals some of the internal dynamics of this failure. The report is a somewhat tragic document of a dying planner's anxious effort to salvage the pedagogical value of the Calcutta mission in light of the well-entrenched feeling within Ford that "the Foundation should never repeat the Calcutta effort."[13]

What is evident in Row's account is that this failure was seen not simply as the respective shortcoming of the operational modus itself, but rather the failure to coordinate strengths between the involved disciplines. Note how, for instance in the following paragraph, the cognitive deficiencies of planning as a discourse is—even in the moment of failure—located in an internal disjuncture. The key problem of expertise is not some inadequacy of the understanding, but an inability for experts to agree:

> How could one disagree? What was wrong with employing a traffic engineer to devise the means for sorting out the traffic; a highway engineer to improve the roads; an urban planner to choose a location for a new bridge; a bridge engineer to design it; ... an anthropologist to see that the housing reflected the social milieu and the culture of the people for whom it was designed; an architect/engineer to plan a development that mixes residence with work on an accessible site; a demographer to estimate the future population for which these several programs would be planned; and all this under the direction and coordination of an experienced and able urban planner?[14]

2 Migrant head-carriers transport prefabricated steel building element. Louis Malle, Calcutta (1969)

3 Between 1967 and 1969, Louis Malle found himself in Calcutta as a cultural emissary of the French government. His trips were to generate a series of documentaries on the India of the period, among them Calcutta (105 mins., 1969). For long stretches of the film, the camera pans around the slums, leprosy shelters and urban poverty of Calcutta, as if too stupefied to offer commentary. Ford could not have done better than the French avant-garde.



4 Frontispiece to Ford Foundation Basic Development Plan for Calcutta, 1966.

5 Communist demonstration, Dharmtala downtown, Calcutta. Louis Malle, Calcutta (1969)

6 Communist demonstrators flee police tear gas. Louis Malle, Calcutta (1969)

7 Police chasing communist demonstrators. Louis Malle, Calcutta (1969)

8 Police chasing communist demonstrators. Louis Malle, Calcutta (1969)

9 Migrant homeless sheltering in Hume pipes requisitioned by the Calcutta municipality.

10 Frontispiece to Ford Foundation Basic Development Plan for Calcutta, 1966.

The asphalt and the electricity lines would not be laid. Setting out to provide new infrastructural materiel for an impoverished city, Ford would unwittingly provide Calcutta with its greatest icon of poverty, in the shape of the unlaid Hume pipes in Mark Edwards' photographs.[Fig. 9] As the Hume pipes gathered moss by roadsides, a vast population of homeless moved into the shelter provided by these durable, concrete structures. Nonetheless, these failures have not blunted a certain judgment by Ford's American and Indian apologists, for whom the key success of the mission lay not in its failure to devise a successful plan but in the creation of its institutional inheritor, the Calcutta Metropolitan Development Authority (CMDA), a permanent, appropriately localized infrastructure for the production of phrases in the same regimen. The primary work of planning is not to produce plans but more planners, subjects that will continue to posit planning as an effective theater of epistemological conflict.

Keeping Up Generalities

Rather than attending to the objective stipulations of the Ford plan—what road got laid, how traffic and sewage were handled, how wealth and income were sought to be augmented—given their non-realization, what is much more important for us here is the modus, the genre of intervention that Ford attempted to put into play, drawn not from the particulars of the ground but as the determining terms of agreement amongst a potentially untrammeled field of conflicting disciplinary inputs. For one, Ford's involvement was considerably more protracted than the routine paratrooper missions carried out by UN planning personnel such as Charles Abrams and Otto Koenigsberger.[15] Secondly, Ford's contribution was not meant to be in the form of a comprehensive plan or report that it described as the "conventional" mode of planning. Ford's intervention was designed to produce a model for intervention itself. With a long-term mission staffed by rotating, short-term staff from Western universities and with requisite input from local professionals and state officials, the Ford team envisaged inserting itself into the marrow of the government's decision-making apparatus. Policy directives would be initiated and monitored from the inside, giving Ford's input an organic face. This organic evolution of policy had a double-edged potential. In the decolonizing context where political contestation was the hardest defended legacy of the anti-colonial struggle, this access to the executive gave the Ford mission a privileged lever to manage the legislature. To be sure, Ford described this as a planning innovation: the post-colonial planner was to be contrasted, by descriptive sleight of hand, against the "apolitical" colonial improvement trust and administrative officer. "Planners need to find political support for their proposals and to reflect political and economic realities by incorporating pragmatic implementation strategies within them."[16] To husband this support, the "anti-politics machine" came with carrots: conditional World Bank bounty for a destitute government.[17]

Ford's benevolence was not assembled under the direction of a given population or its representatives to provide the material means requisitioned, as a supplier or contractor would. Expertise was not construed here as a means of answering the needs of the population in question but rather in determining those needs, since what the indigenous beneficiaries lack, by definition, is not their ability for language, but the categorical or comparative hindsight that will allow them to properly phrase their requirements into a truly compatible and computable language. The indigene can only operate from

the exigencies of the local, offer a hodge-podge compendium of speech-acts without grammatological reflection. Fig. 10 This distinction is critical, and on it turns the difference between coloniality and the coupling of the neocolonial and the post-colonial, between Ford and Mahalanobis: knowledge is understood as the ability not only to speak for the clientele in question but to appropriate the role of translator, a characteristic exemplified by the Ford Foundation's description of its role alternatively as an impartial, external advisor and as an organic extension of government from within. No muffling, sequestration of the speech of the other, but a rewriting of the dictionary.

This characteristic suffuses the outlines of both the promulgation and the failure of the Ford plan. Well in advance of the telephone lines, the sewer lines, the roads and the electricity, Ford's primary intervention was in the form of a phrase regimen, a terminology of optima, matrices, standards, coefficients, indices through which a state of decay would be engineered into a vibrant economic organism. The physical city was the last concern of this overbearing urbanism; throughout, Ford's reports evince an anti-architectural bias, instead privileging processes and patterns underlying habitation in its generality, a point to which we shall return. The objects in the Ford archive that we come across therefore have the paradoxical status of being anti-objects—they are designedly in the genre of the performative: diagrams, charts, maps that bring different kinds of events into being. Figs. 11-12 Like green highway signs that guide well-acculturated subjects on their way, these diagrams are also calls to particular enclaves of skill, instrumentally coded, procedural, monstrative, gestural, indexical. Such is "expertise" in its new, postcolonial denomination: everything hinges on description, not the efficiency of things and machines, but prerogative and power of description. Phrases acquire meaning not by reference to a given reality but by contiguity, relation to each other. Calcutta here is a crossroad of phrases, a juncture where words lose and gather meaning. Fig. 13

In a way, the object referred to—the Asian city—can only mirror what is in the first instance a failure of epistemological synergy. The cognitive deadlock of the Asiatic mode of urbanism was, according to Ford, owed precisely to its lack of differentiation of categories. This cognitive morass is, quite literally, a traffic jam. Traffic is "a conglomerate of automobiles, trucks, pedestrians, handcarts, rickshaws, bicycles, bullock carts and a miscellany of animals ... an uncontrolled mixture of incompatible kinds of traffic."[18] Figs. 14-16 For a discipline like planning, whose task is to address the "totality of the problems,"[19] design by computation not only appears to have the power to process great amounts of data but to synthesize the disciplinary input of diverse forms of expertise. This aggregate mechanism has the function of disaggregating the face of any unitary agency of design, thus dissipating the target of opposition. A curious ruse takes place, the substitution of the "judgmental / original" by the "theoretical":

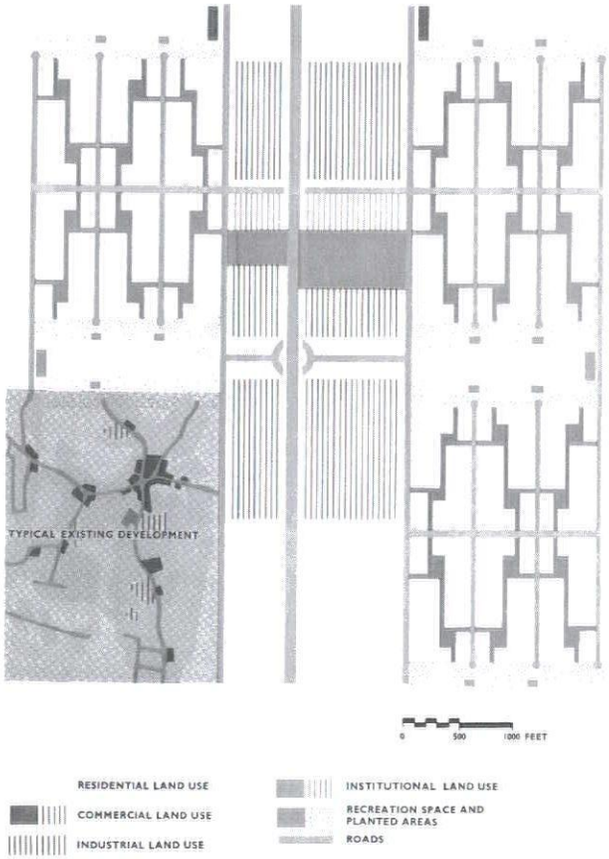
> Where design is a team effort, the capabilities of immediate display or recording of various functions provides a superb form of communicating both the design and its implications—a form that is usually considered too costly in time and effort except for the final product. Many iterations of the design process can take place in the time it now takes to accomplish one. The preparation of computer programs needed for using the equipment forces an examination of design methodology and the techniques of design criticism. This examination distinguishes the judgmental and original from the algorithmic while explicating the theoretical; the whole scheme of operation becomes more susceptible to improvement.[20]

This is the computer's political agon: to preempt the conflict of the faculties. Computation is not merely the lapse into quantification, nor is it a compartmented, antiseptic alleviation of certain kinds of intellective labor. Rather, its theology depends on keeping alive the modern vestiges of an archaic dream of melding together heterogeneous regimens of thought into so many coefficients of a continuum. The computer's work is in the order of the a priori, of reverting the cognitive faculties back to a primordial soup from which all categorical differentiation can only be posterior. "Technology ... before ... the ... growth of techniques," as Echeverria's letter has it. Computing and planning therefore have a relationship that describes something like a chiasmus: computing is of the order of causality, planning that of the determinant.[21] Computing portends to attend to thought prior to its disintegration into heterogeneous realms of expertise; by comparison, planning coordinates the active disciplines at the point of their convergence. This chiasmus is the nub of the computer's substitution of, to borrow an expression from Georges Canguilheim, "a technological anthropomorphism ... for a political anthropomorphism."[22]

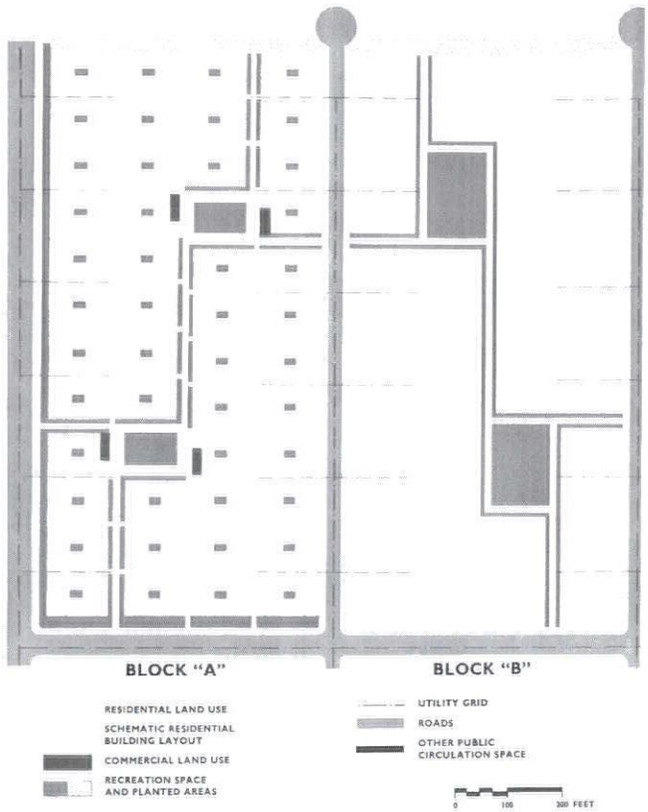
Statecraft and Statistics

This substitution has specific purport for our context: the contingent calculus of the global—the production of "society"—cannot operate unless it has something like a "national" sanction. India was the first country whose constitution in principle conferred the rights articulated within, immediately upon effect, to all the constituent populations contained within the geographical boundaries of the state (without qualification of sex, language or ethnicity). The primary reference of the Indian state was to a conceptual totality, not to the empirical populations contained within it. The legitimacy of this totality thus drawn necessarily lay in its mobilization of a subsequent mensurational task through which the heterogeneous constituents of a geography could identify themselves as citizens and subjects of this named entity called India. The notification of the Mahalanobis's Indian Statistical Institute (ISI) and the National Sample Survey as national institutions, in addition to the five-year planning and ten-year census exercises, were explicitly in keeping with this mensurational work. Needless to say, a problem emerges here: the mensuration of heterogeneity necessarily brings with it a larger, commensurational work, the problem of coordinating differences of kind. Take, for instance, the following note by Samar K. Mitra, head of computing at the ISI, to Mahalanobis, delineating a distinct role for the computational expert above that of mensuration alone. The computational "expert" in Mitra's view is not just a mere programmer but defined by his dexterity in translating broader problems into computational ones; Babbage's relegation of the qualitative in the work of computation had now swung to its diametrical opposite:

> A computer can be fully engaged by a clever mathematician almost eternally to solve a problem. But what useful result it will [sic] turn out? ... This type of stereotyped thinking and blindly aping some foreign institutions will not carry anyone very far. The computer will become a junk piece in no time ... Our attitude has never been that "here is the computer at your disposal for this period, program and run your problem, if you get a 'solution,' well and good, if not, do not bother us." Knowing the state of scientific and technological

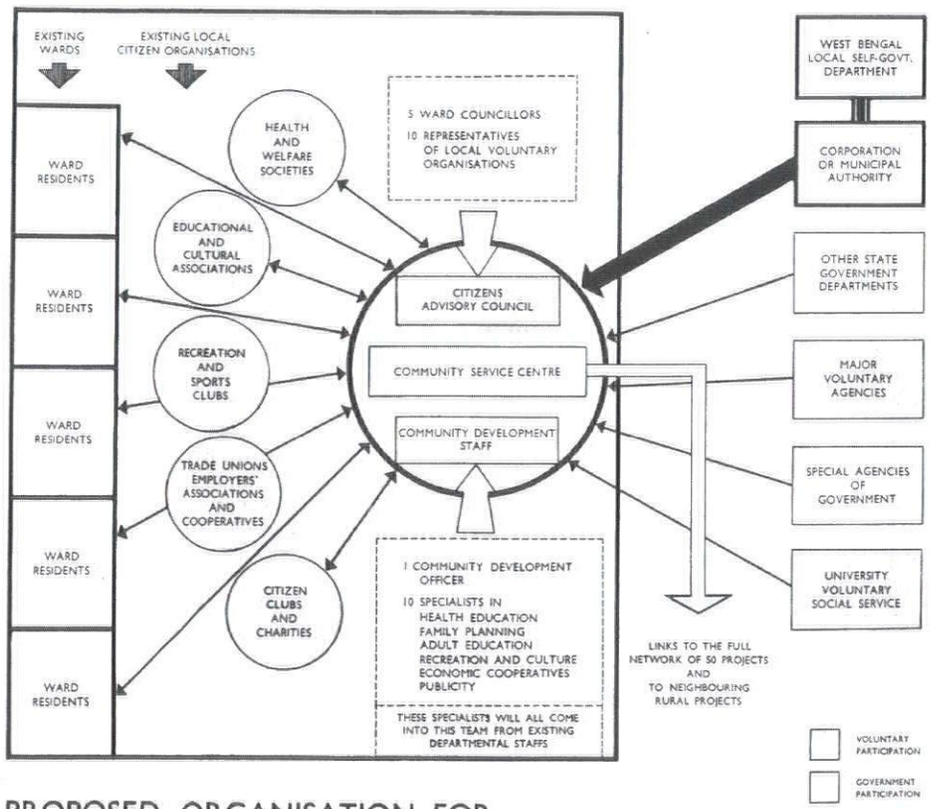


COMMUNITY CORE AND RESIDENTIAL AREA
SCHEMATIC PLAN 2



RESIDENTIAL BLOCKS
SCHEMATIC PLAN 1

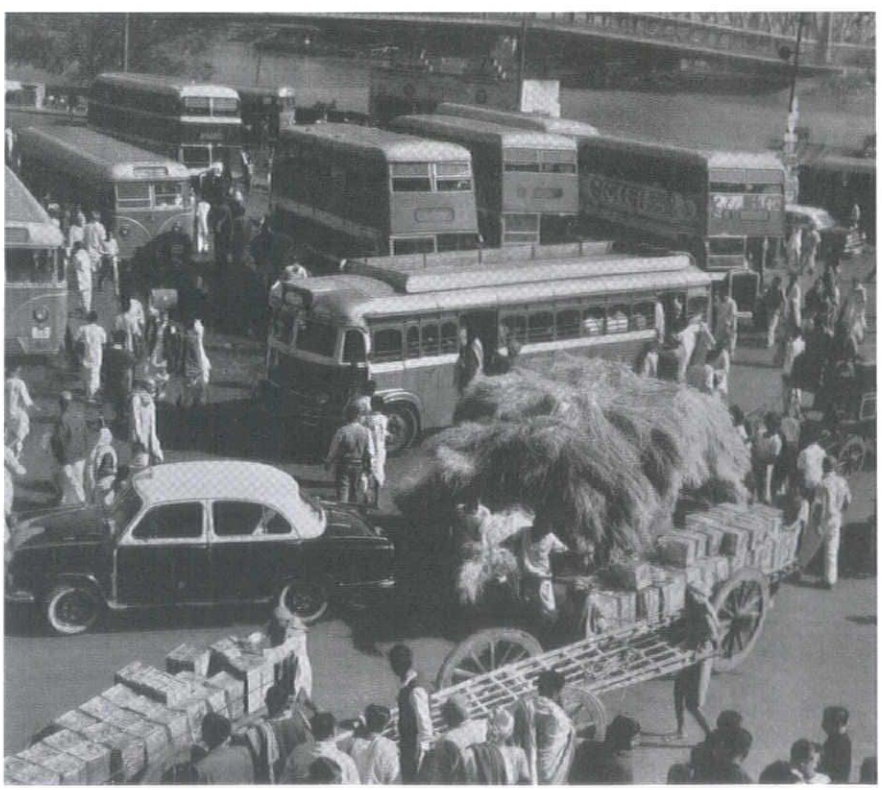
11-12 Residential block diagrams, Basic Development Plan, Calcutta Metropolitan Planning Organization (Ford Foundation), 1966.



PROPOSED ORGANISATION FOR URBAN COMMUNITY DEVELOPMENT

DIAGRAM 8

13 Urban Community Development Plan, Calcutta Metropolitan Development Organization (Ford Foundation), 1966.



14-16 **Illustrations provided to capture Calcutta's traffic problems, Calcutta Metropolitan Planning Organization, Traffic and Transportation Plan, 1966.**

development in India, we felt that this "western" attitude will not ultimately help. We know that people cannot yet correctly formulate their problems, we know that by and large they are ignorant of numerical methods and analysis, and their ideas about the potentialities of a computer are not clear ...[23] The man who owns the most expensive piano cannot be the best pianist. In computers there is no exception to this rule ... A real musician can create magical tunes out of a mere bamboo flute, but a non-musician cannot, though he can be proud of his expensive and glamorous instrument.[24]

A certain para-computational logic emerges here, an artisanal pattern next to the machine, an other science of translational skill next to the conceptual, self-referential, domain of "pure" science. The unity of comprehension—in the nation, in cognition, or in objects—that one seeks in computational labor cannot be wrought without an unverifiable power of judgment that one can describe only as aesthetic.[25] In the final analysis, expertise rests not on skill but on intuition. Mahalanobis' academic cultivation drew from a well-articulated intellectual program—within the liberal national program—of associating aesthetic consonances and scientific ones. His technical training and association with the founding personas of statistics, Karl Pearson and Ronald Fisher, cannot be dissociated from the vegetal obsessions of the aesthete and poet Rabindranath Tagore's Santiniketan school, the fount of Indian aesthetic thought in its nationalist phase. Confronting the vast interstitial failures of a colonial administration marked only by piecemeal investment, both nationalist aesthetics and nationalist science in India are marked by their overwhelmingly generalist and categorical thrust: it is not by coincidence that Mahalanobis began his career as Tagore's amanuensis, and the founding support for statistics as a nationally significant field was given support by a poet strongly marked by Romanticism. The following extract from Tagore was published in the second issue of Sankhyā (Numbers), the journal of statistics founded by Mahalanobis in 1933; the formulation is thoroughly and rigorously Kantian—the authority of the judgment explicitly eschews an objective referent:

> The enchantment of rhythm is obviously felt in music, the rhythm which is inherent in the notes and their grouping. It is the magic of mathematics, this rhythm which is in the heart of all creation, which moves in the atom and in its different measures gold and lead, the rose and the thorn, the sun and the planets, the variety and vicissitudes of man's history. These are the dance-steps of numbers in the arenas of time and space, which weave the maya of appearance, the incessant flow of changes that ever is and is not. What we know as intellectual truth, is that also not a perfect rhythm of the relationship of facts that produce a sense of convincingness to a person who somehow feels that he knows the truth? We believe any fact to be true because of a harmony, a rhythm in reason, the process of which is analyzable by the logic of mathematics.[26]

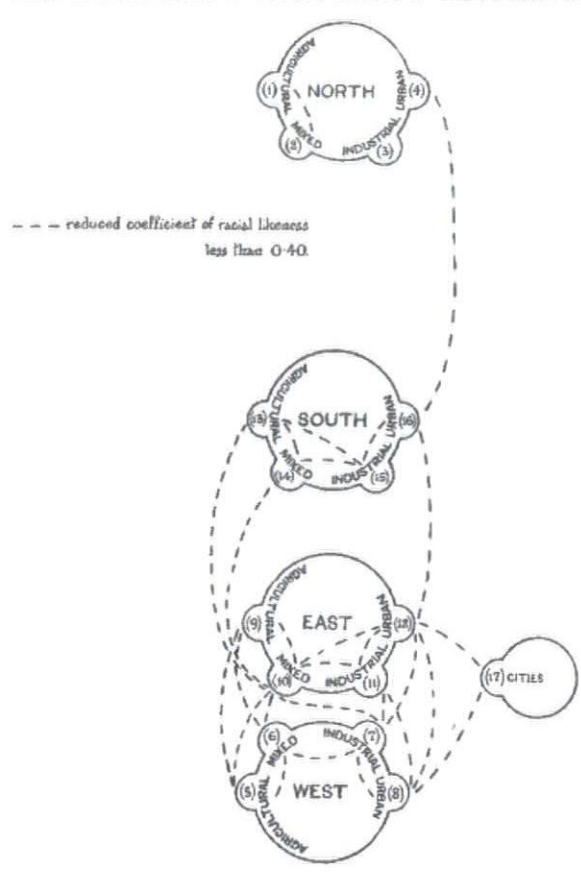
Both the aesthetic's two key attributes—the intuition of a phenomenal unity (maya) on the one hand, and its lack of objective referent on the other—are critical to the establishment of expertise. It is only through this intuitive passage ("the sense of convincingness") that we can understand the manner in which the minimal art of apprehension (of the fragment or sampling) that, in Mahalanobis' language, could acquire cognitive control over the whole.

There is thus something of an intuitional transference between the pervasiveness of chance and the totality of knowledge claimed by disciplines that use the techniques of probability—physics, economics, sociology, planning—that distinguish them strongly from their pre-modern counterparts: their "imperialist" tendency, in Nancy Cartwright's words, "to account for almost everything."[27] Once again, this ability to discontinuously project the (categorical) whole from the (empirical) part is the hallmark and the tremendous pouvoir-savoir bind that constitutes the force of organicism as the opening into governmentality itself: a part, a chink whose undifferentiated unexceptionality testifies even more strongly to its elemental relationship with the inner determination of the whole. The proper horizon of statistics is to motorize everything, at once, in all of its entangled complexity with the minimum of possible tools, with the state as the metonymic agent of willed change. Pace Mahalanobis:

> With the emergence of the scientific view of an objective world of physical reality in which events were regulated by laws of nature, the choice was between making an exception of the outcome of games of chance or bringing them within the world of physical reality governed by laws of nature ... In this way chaos and random chance were integrated in the world of reality ... In advanced countries with established scientific tradition there is continuing concern with validity of data and validity of conclusions. In underdeveloped countries the principle of authority is still dominant; the question of validity can scarcely arise. Statistics, therefore, necessarily remains a matter of formal or administrative sanctions ...[28]

We must understand well the monstrous domain of this field: it is not just a matter of cropping, reducing, and contorting the axioms of the universal into the manageable dimensions of the quantitative; rather it is an entirely new apparatus of marshalling this translation that needs to be built. To use the conventional term "social science" for this field—for indeed this new apparatus encompasses the specifically "modern" fields of economics, statistics, planning, and policy that are under examination in this essay—would be a misnomer, or at least a metalepsis, in the sense that it is not that science is being applied to society, or even that the sciences are socially derived, but that "society" is only the image of this apprehensibility of an infrastructural field, a field that correlates systems, organizations, predicable subjects, of open-ended calculi without causal compass.

The national, in this sense, can exist only to the degree that its heterogeneous constitution can be covered over by an epistemic image of congruence. What would the Saidian critique of Orientalism make of texts such as Mahalanobis' "A Statistical Study of Certain Anthropometric Measurements from Sweden," published in July 1930 in Biometrika, the vaunted international journal established in 1901 by Francis Galton, Karl Pearson and W. F. R. Weldon?[29] On their part, contemporary development economists in whose disciplinary formation Mahalanobis has had a key role to play—particularly through his establishment of the National Sample Survey—would very likely have a convenient apologia: Mahalanobis' key contributions are to the refinement of quantitative formulae. Popper would be the patron saint here: one must separate "the context of discovery from the context of justification."And yet, it would be hard to completely erase the eugenicist locus of Mahalanobis' equally piquant eighteen-year, tripartite study carried out for the Zoological Survey of India, Anthropological Observations on the Anglo-Indians of Calcutta.[30]



17 Mahalanobis, "A Statistical Study of Certain Anthropometric Measurements from Sweden," Biometrika, 1930.

On studying these documents, it is clear that Mahalanobis' primary interest is not in painting an effigy of white raciality but to finesse the scientific relationship between measure and mixture, a science which is deemed particularly apposite to the epistemologies of complexity by which the emergent Indian nation-state will be defined, but are not exclusive to it. The nation is itself in the traffic of norm and variation from the universal that is at the core of eugenicist / statistical / probabilistic research; as such, it is defined only in the mode of uncertainty. "Society" (i.e. the nation in transnationality) is the sanctioning alibi of this new genre of the sciences of the heteroclite. The basis for the affinities that will be continually drawn between humans and monkeys, between population and agriculture, between logic and trees, between sadness and genes, is not therefore one of mere miming, but constitutes a full-fledged displacement from mimesis into a systematic logic of assembling and disaggregating, tabulating parts and wholes through a contingent calculus.

The problem with measuring Swedish heads Fig. 17—such that one can derive a "Coefficient of Racial Likeness"—is not just that of establishing what the problem sets out to do in the first place, that is to establish craniometric means and standard deviations, but that the integument of the body appears to escape a certain definability. Good calipers are critical to the measurements that enable one to derive standard tendencies in population groups and yet, how does one standardize the pressure that one applies to the caliper, the weight of the hand, the clench of the fist? The aesthetic, the locus of unverifiable intuition, once again rears its head in the very core of science. Despite any number of prescribed, normative practices, there is this perceived difference between the laboratory and the field, between the controlled environment from which the law is derived and the "natural" / "social" environment for which the law is held applicable: the control exerted on the latter cannot ever be completely determined. There will always be the irregular wind that brings foreign spores into the agricultural field under experiment for productivity. In addition to the first order problem of determining the coefficient of the referent in question based on a certain measure, a second order problem arises: of determining the accuracy of the measure, of factoring the force of the hand, the human, the organic as inbuilt error, that will carry out the measure.

This second order determination is the prime calling of statistics in its modern, twentieth-century form. By the turn of the century, statistics increasingly adopted probabilistic formulae into the core of its calculations: the project was no longer so much to decipher the mean and deviation of a given set of data, but to cancel out the inconsistencies embedded in the very collection of data by a calculative estimation of possible error, the deviation possible in any such field of inconsistency. To adjust for this deviation, the enterprise is no longer to close off the inconsistencies of field observations, but, assuming that this is irreducible, to average out the scope of possible error. Inconsistency must be corrected not in the field but back in the office, since "error [cannot be prevented but] is inherent in the very structure of statistical reasoning."[31] Once the aporia between randomness and probability has been bridged by an epistemological sleight of hand, the "science" of statistics can step out to its proper province and authority: to predicate the rules of reality over and against the chance, empirical, manifestations of the real. What appears like paradox here is also the ideological masterstroke: to announce the normative tendencies of a reality whose actual empirical fullness is essentially understood as non-purposive. The biological is only the alibi for a science whose address is in fact elsewhere. (Redux Kant: "nature" straddles a fundamentally different teleology from the "human.") Not only is a first-order, exhaustive enumeration of plenitude seen as impossible and unnecessary, but in Mahalanobis' words, techniques could be derived that would understand phenomena "better than complete enumeration".[31] Indeed, the potency of this form of expertise will be to determine the broadest possible conclusions from the minimal, least necessary number of facts, in order to make statistics "[especially] in the underdeveloped countries ... purposive," neither mere mathematics nor pure economics, "but a fully developed technology of a multi-disciplinary character."[32] The task is to adumbrate the structure by which the piecemeal impression is to produce the categorical enunciation, by cancelling itself out to be sure, but also by normativising the domain of error.

Once subjective error has been rendered manageable by a calculus that presumes to harness both categorical discontinuity and the problems of infinity, a system has been laid down that appears to schematize the very morphology of correlation itself, certainly between subjective and objective worlds, but also between random phenomena and teleology, between part and whole, rendering them into a continuum. Expertise thus rests on a substitution, of phenomenal plenitude as such by the potential full, analytical extrapolation of the statistical fragment (i.e. the sample). Infinity has been replaced by a totalizing field. Radical doubt has thus been displaced by a computable doubt, the difference between infinity and totality measured in margins of error.[33] Codependence—the collapse of "differend" between general and particular[34]—has now

acquired a mathematical mimesis, and if the collation of data and corrective methodologies were to proceed apace, the story goes, in a future that will only remain speculative rather than actual, statistical part and phenomenal whole could potentially become indistinguishable from each other. No Archimedean point in space, this, but rather an ectoplasmic teratogen deduced from within the interstices of labyrinthine nature itself. What is critical here is not merely that these two kinds of doubt are radically heterogeneous, incommensurable, incompatible, but that, through this substitution, expertise also lays claim, by way of a transferred epithet, to a project that will infinitely continue to unravel, riding the back of chance itself.

Third World Teratologies

In the nationalist imagination, this class of teratological statecraft has a sister-species: Planning. And just as in Marx's use of the word "Ideology," to elide the adjective "German" would simply mean to miss the point of reference, for one cannot emphasize enough the adjective in the first question in the paragraph quoted below, an adjective that it would become the Ford Foundation's mission to elide:

> What is meant by National Planning? Planning means a comprehensive, scientific, systematic development of all the available resources of a country, material as well as cultural, so as to meet the obligations or requirements considered collectively up to a given predetermined standard within a given period.
>
> The resources of the country must be taken stock of in all their various forms. They consist not merely of the several kinds of raw material necessary for productive industry or for preparing consumption goods, whether from the cultivation of the soil, or the exploitation of the mineral wealth, or the development or working of forests, rivers and other gifts of nature, but also the different agents of production, including the human factor, experience [sic] or skilled and unskilled labour, and enterprise; the equipment by way of tools, implement or machinery; power supply and consequently sources of fuel or other such energy producing industry; organization in the shape of the most efficient forms of conducting or controlling productive venture [sic], and the several accessories of the same. A list must, therefore, be made by a competent experienced body (or sub-committee) ...[35]

These words are the opening paragraphs of what may be considered the foundational document of Indian planning, articulated a full eight years before independence as part of the Indian National Congress's deliberations on planning through its National Planning Committee—a short-lived body scuttled within two years of its inception. The history of Indian planning—and Mahalanobis and Jawaharlal Nehru's role in it—is a complex one, one that has been better told in a slew of writing on the subject, but this much is clear: "national" planning is the overdetermining exigency resorted to as the various, internally contradictory factions that comprised Congress came to ask for their pound of meat at the cusp of independence.[36] Congress's attempt to cast itself as the sole negotiator limning the framework of the future independent state meant painting itself as the monopolistic representative of all the varied, mutually opposed factions of the Indian political spectrum. In this context, for all intents and purposes, Ford was only complementing the Indian government's exercises to obtain a synthetic portrait of its own economy, particularly in areas where it was either overstretched or inattentive, thus appearing merely to shore up the "national sanction" given to the epistemology of expertise granted to figures like Mahalanobis.

The Cold War tilt here was subtle, measured in slight shifts of epistemic emphasis, intangible given the multi-determinate emphases of the Indian "mixed" economy, but palpable nonetheless given the global ideological conflicts of the first decades of decolonization. The Marshall Plan in Europe had been modeled on a Keynesian, demand-driven logic; a logic conveniently adapted to integrate European economies with American industrial output through the widespread absorption of American commodities.[37] Given the dominantly non-industrialized basis of Indian capital and resources, and the tenuous monetary situation, the Indian planning effort (with the exception of business lobbies) had rejected the Keynesian model in favor of strategies that emphasized capacity-building. What is interesting in Ford's "research" support of Indian institutions in this period is its inordinate emphasis on demand. Fig. 18 Through "home science" programs in universities (a principal arena of Western intervention in this period) and the like, the techniques of planning—behavioral studies through statistical and quantitative analysis—were mobilized to set up an enterprise whose implications could only have been to undermine the considered biases of Indian planning. Upon studying the various Ford programs in urban and rural areas, one sees an entire archaeology of this sort of second-guessing—para-planning in its true sense.

Once the move has been made, a strange set of experiences come to be encompassed in the Ford projects under the rubric of expertise. Ford study #1: Which of the following metals used for cooking, 1) brass, 2) aluminum, 3) stainless steel with copper bottom, gives the most return in terms of time consumed, nutritive value and palatability of food consumed? (Answer: 3).[38] To be sure, there were the usual, "developmental" agendas that were also pursued: copious nutrition, the proteins in milk, immanent energy in cattle dung, family planning attitudes in Gujarat, the psychological needs of adolescent girls, their relationship to parental control, and so on. And yet, a peculiar panoply of concerns enter the Ford Foundation's ecumenical plate, defined more by their amenability to statistical experiment rather than any sense of crisis-led apprehension. Ford study #2: What is the iron content of Amaranth cooked with and without tamarind in iron, aluminum and in brass pans? To press the course of decolonization towards the deductibility of demand-driven "choices," the "free" subject must be fully illuminated, exposed in all its rationales, choices and exertions. Slowly but surely, the practices of the everyday are being nudged in the direction of commodification, towards the integration of the Indian market with its American counterpart. Sometimes, Ford more nakedly reveals its hand. Ford study #3: Which aspects of kitchen design are immigrant Indian homemakers in the United States most receptive to?

More vivid, however, is the application of the premises of a science—probabilistic statistics—whose other axis we have already identified in Mahalanobis's writing. The more humdrum or prosaic the study, the more the claim to authority of a science that purports to unravel the very workings of life processes, the organum of the organism, in their everydayness, of phenomenality as unexception. "Science" is here constituted as the measure of the difference between the unexceptional normal and the error, all covered over by a calculus of "distribution"; this is "modernization" in its grander, niggling, insinuative, tactical denomination. Ford study #4: Take a hundred children from

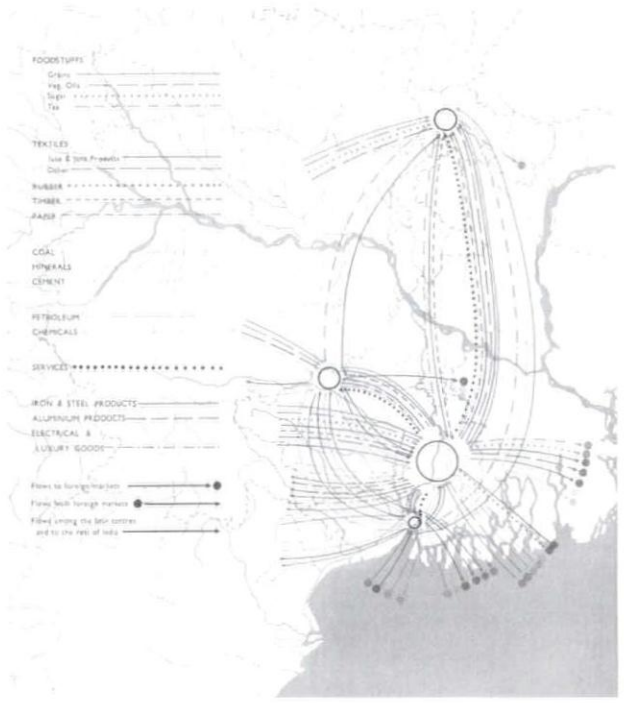
Alembic Vidyalaya School. Group them in three size groups A, B, C, based on thirty-three measurements, recorded in centimeters and taken next to the skin, "except for a knit pantie which was supplied freshly laundered for each subject." To make accurate measurements, it will be important to devise an appropriate series of instruments, all of which can be made at the Baroda Arts and Crafts Department: Anthropometer, Bitochanteric meter, weighing scale, steel tape, Raja tape of cloth, colored pencil, neck chain, small chair.

Ford's Calcutta project is pervaded by this very ethos of taking measure, only now colored pencils and anthropometers have been surmounted by the IBM 650. The computer therefore comprises the apex implement of an entire machinery of analysis assembled to deconstitute the terms of the urban into a series of measures.

> It would be greatly appreciated if you take immediate steps to purchase four hand-operated "Facit" calculating machines, and two electric "Facit" calculating machines, and one hydraulic Calculator to be airfreighted to ... our office in New Delhi ... [which] will then forward this equipment to Calcutta for the use of the Calcutta Metropolitan Planning Organization. The Hydraulic Calculator is a small slide rule used for measuring the inside of pipes.[39]

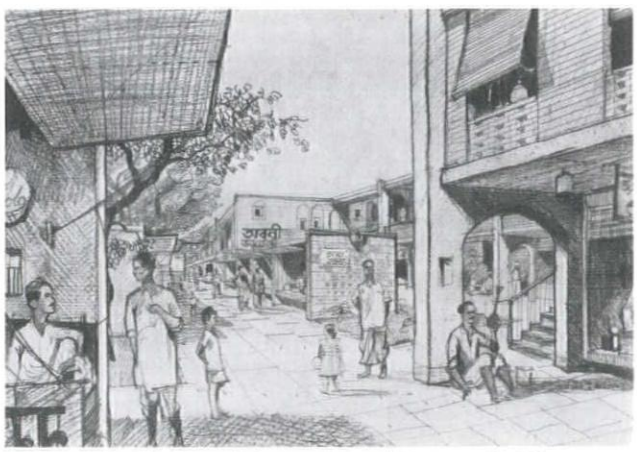
Dismissive of architecture's picturesque "stunts," Fig. 19-20 the city of Ford's urbanism is a city of increments and infinitesimal differences. From the traffic jams, the impedances, and the stickiness emerges an image of particulate liquefaction. Between suspect calipers and inefficient calibers, the city has made into a "hydraulic" organism—to use a derisory term for Keynesianism—a phantasmatic mechanism of fluxes and capillary flows.

It is in the vein of the sample that we see the housing types propounded in the UCOPAN (Universal Concrete Panel System) / Tapsia-type designs for mass-produced housing, which Ford, in consultation with Indian architects and engineers, designed for indigent migrants to Calcutta. Figs. 21-23 "These concrete panels are universal in the sense that many types can be cast in the same mould, and they can be used for all types of dwellings without being restricted to a single floor plan."[40] By only designing the component, a sort of differentiated minima for occupation, one refrains from using architecture to "propose architectural solution[s] to non-architectural problem[s]" at the same time as making available the means to "replicate them on a scale that would have any significant impact on the problem."[41] One designs not just a house, or a set of houses to address a discrete set of cultural demands, but all housing at once, coterminously; the problem of housing reduced into a problem set.



COMMODITY FLOWS IN THE FOUR CENTRES MAP 16

18 Commodity flows into Calcutta, à la Benton MacKaye and the Regional Planning Association of America, Basic Development Plan, Calcutta Metropolitan Planning Organization (Ford Foundation), 1966.

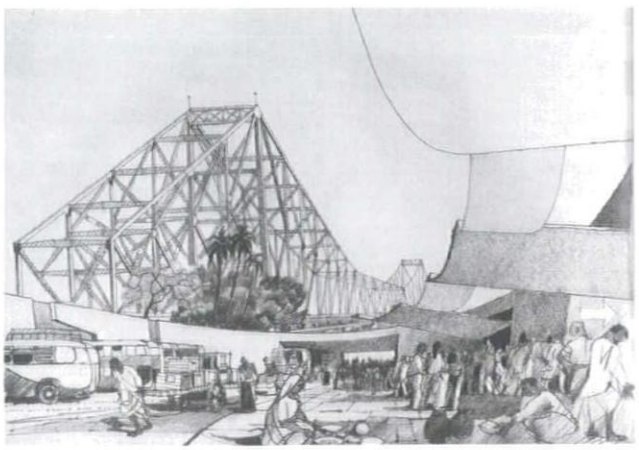


19 Sketch of Maniktala "work-cum-living center", Calcutta, by the British "townscape" theorist Gordon Cullen commissioned by Ford, dismissed by Ford's Arthur Row as visual "stunts".

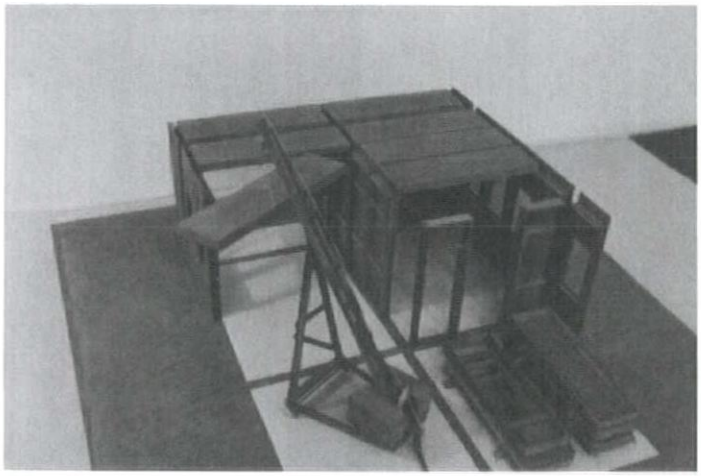
Overdetermination and its Discontents

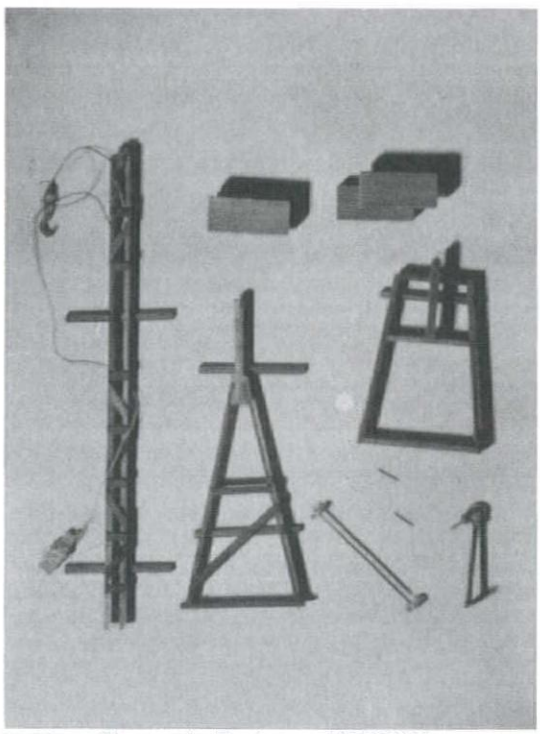
In its attempt to insert itself into the decision-making apparatus of the postcolonial state, Ford had sought to graft its overdetermining epistemology onto the already extant planning apparatus of the Indian state embodied by the Mahalanobis-Nehru axis defined, as we have seen, by its own overdetermining, organicistic structure of reconciling the conflicting aims of all its different factional constituencies. For Mahalanobis, this overdetermination was a necessary one. Planning was the necessary instrument to correct a situation where the economic inequality of underdeveloped countries offered precisely the lever for manipulation by neocolonial powers of a select elite defined by its excessively asymmetrical monopolization of resources.[42]

Given that it was operating in a nominally sovereign country with a political tide increasingly turned against its

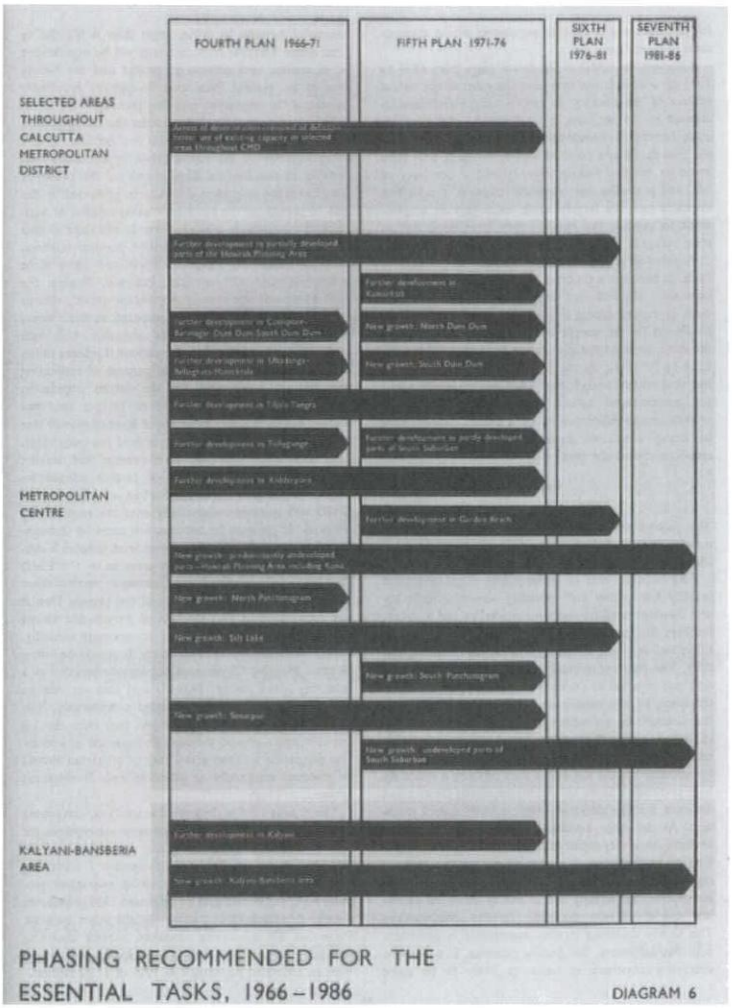


20 Sketch plan for improving Howrah Bridge approach.



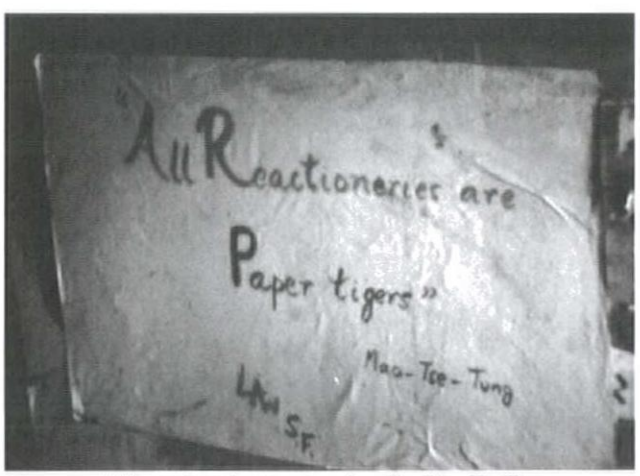


21-22 Elements for Tapsia-type / UCOPAN mass housing for urban immigrants and poor developed as part of the Ford Foundation initiative.



24 Phased plan development for the Calcutta Master Plan, "1966-1986", aligned with the Five-Year National Plan process, projected in 1966. The Five Year Plan process went on "holiday" in 1966.

23 Tapsia-type mass housing, cluster plan.



25 "All reactionaries are paper tigers" —Mao-Tse-Tung Communist-aligned Student Federation poster. Louis Malle, Calcutta (1969)

epistemological authority, Ford scrupulously couched itself as merely an advisory body, agonistic rather than antagonistic. It is clear that the agency was caught between two institutional vectors: on the one hand, the imperative of "intervening," in an interested way, into ever-changing political dispensations and cross-currents in order to effect its objectives through the state, and the pressure to retain the veneer of professional disinterestedness through which planning can appear to bear the thrust of a universal good rather than a specific ideology. To say the Ford mission was a failure, a defeat by political change, is to beat a dead horse, except for the caveat that it had been Ford which had foregrounded "political" engagement in the decolonizing context as the basis of long-term efficacy, and it was Ford's politics of co-opting weakened governmental arrangements which were put into the dock by the left politics of the 1960s and the 1970s.What it had not calculated in its contest with Indian nationalism was that nationalist expertise itself could be contested from below, and indeed the 1967 election—where Congress lost its national dominance, leading to the rise of regional entities including the Communists in Bengal—put paid to an entire configuration of epistemic authority, Mahalanobis's included, as the state slid from its liberal dispensation to a neoliberal one. Fig. 24

If in the wider sense, the broad insinuations of US experts and institutional advice in the post-independence period did therefore succeed in the 1970s with the Indian state's adoption of a demand-driven economy and the "free trade" fiscal ethos pursued by the native business elite, one regional and ironic effect of this success was the eviction of Ford's Calcutta effort itself. In the increasing shift towards neoliberalism, as feudal landlordism reigned newly triumphant with the collapse of the national planning effort, food and commodity prices underwent exponential inflation with the relaxation of monetary controls, state procurement and price controls epitomized by the five-year planning process. In 1967 a military insurgency, the Maoist Naxalite movement, was born in the very landscape in and around Calcutta that Ford had sought to compute with, an insurgency which pervades large pockets of agrarian eastern India, from Nepal to Andhra Pradesh, even today. Fig. 25 The analysis of this movement and its usage of its own set of overdeterminations is best left for another occasion, but what is of consequence to our analysis so far is its critical engagement with the very overdetermined geography with which the American and (socialist) Indian planners had jointly—albeit in the terms of an ideological dispute—sought to rewrite the Indian landscape. The cognitive multiplication of determinants carried with it a geographic expansion as well, "Urban planning is regional planning," a move implying within it a surreptitious gerrymandering of political boundaries: "in a federal union such as India, regional planning means interstate planning."[43] Fig. 26 In the following passage from a revolutionary pamphlet entitled Spring Thunder over India, we see something like an involution, a turning inside-out rather than upside-down, of the overdetermined landscape of the nation-state. A theoretical counter-totality nestles within the geographic totality of India, a totality sutured out of the neglected particulate elements of the rural socius, programmed into its own "wave," its own rhythm of periodic oscillation. And if for Ford—as for the American RPAA, manifested in all those Benton MacKaye diagrams—the "region" was the proper frame from which the city would unravel its organic inference, in the following communiqué this modus has been folded unto itself. If the work of the developmental state is to reduce chaos to complexity, the threads of these reductions can themselves become the programmatic sites for detonation, turning the devices of the state itself into a countervailing set of outcomes:

> India is an enormous country; the countryside, where the reactionary rule is weak, provides the extensive areas in which the revolutionaries can maneuver freely. So long as the Indian proletarian revolutionaries adhere to the revolutionary line ... and rely on their great ally, the peasants, it is entirely possible for them to establish one advanced revolutionary rural base area after another in the huge backward rural areas and build a people's army of a new type ... they will eventually develop them from isolated points into a vast expanse, from small areas into extensive ones, in a wave-like expansion. Thus, a situation in which the cities are encircled from the countryside will gradually be brought about in the Indian revolution to pave the way for the final seizure of the cities and winning nationwide victory.[44]

Parts and wholes, territory built of bits and pieces, subjects as fragments, tenuously tied; projects protracted into projection, the state extrapolated from geography: the reversal that confronts us in this communiqué is not just of socio-military (or police) strategy alone. The territorializing gambit of the Ford and the Mahalanobis-Nehru axes had turned on a gamble—of displacing politics into epistemology—a gamble whose advance would be justified on its incremental scrutiny of accumulated error(s). In cutting open the threads of that normative patchwork, of state and transnationality, to reveal the displaced totality as in fact disjoined from the sum of its parts—that representational apparatus was not representative—the aporias that inhabit organicism have turned towards another putative organum, in effect reverting epistemic teratology back to territoriality. Monsters are not other from a given norm; indeed, norms themselves also generate monsters.

1 "Copy of Letter Dates 7 September 1965 from Mr. Michael R. Lackner, Advisor in Information Processing, The Ford Foundation Advisory Planning Group, 8 Rawdon Street, Calcutta-16, to Professor P. C. Mahalanobis, ISI, Calcutta-35"; File No. 317, Calcutta Metropolitan Plan Organization (Ford Foundation), 1961-69, ISI-PCM Archives. Research for this paper was conducted, in addition to published material in various libraries, at the Ford Foundation archive in New York, the Prasanta Chandra Mahalanobis Memorial, Museum and Archives at the Indian Statistical Institute in Calcutta (henceforth ISI-PCM Archives). In addition to various microfilm documents kept at the Ford archives, my account of Ford's involvement in Calcutta is also gleaned from the following published accounts: Arthur T. Row, An Evaluation of the Calcutta Planning and Development Project, 1961-1974 (New Delhi: The Ford Foundation, 1974); Arthur T. Row and Kalyan Biswas, Calcutta: The Great Experiment, Unpublished document, Reports 013484, Ford Foundation Archives; The Ford Foundation: Drafting a New Blueprint for India's Largest Urban Center (New Delhi: The Ford Foundation, 1964). The Calcutta Metropolitan Planning Organization (CMPO), the para-statal unit that was formed expressly to facilitate the advisory input of the Ford Foundation into governmental action, published a series of annual reports that were also crucial in forming this account.

2 Italics added, letter from Edward G. Echeverria to Mahalanobis; File No. 317, Calcutta Metropolitan Plan Organization (Ford Foundation), 1961-69, ISI-PCM Archives.

3 For a study of Alexander's computational agenda and some of the American institutional background undergirding at least some of Ford's logic, see Alise Upitis, Natural Normative: The Design Methods Movement, 1944-1947 (Ph. D. Dissertation, MIT Department of Architecture, 2008).

4 This chapter is extracted from a larger chapter in my forthcoming book on organicism, titled TransNational HaHas: Totality and Architecture. For a definitional elaboration of organicism, see Arindam Dutta, "Learning from Organicism: Interdisciplinarity / Para-Architectures," in Journal of the Society of Architectural Historians (December 2006).

5 See Arindam Dutta, "Cyborg / Artisan: On a Certain Asymmetry Deriving from the Binary System; or, Notes on a Moment in the Development of a Taylorist Feudalism," in The Bureaucracy of Beauty: Design in the Age of its Global Reproducibility (New York: Routledge, 2006).

6 See, for instance, recent articles in the journal Teratology, published by Wiley Press.

7 Bernard E. Loshbough to Chester Bowles, "A Proposal for a US-AID for Calcutta," May 22, 1964, "Training and Research Activities of the Calcutta Metropolitan Planning Organization," 1961-1970, Grant Notification Letters, Reel No. 2640, Ford Foundation Archives.

8 For Ford's own account of its interventions in India, see The Ford Foundation, 1952-2002: Celebrating 50 Years of Partnership (New Delhi: The Ford Foundation, 2002). The eleven volumes of the report list interventions in the sectors of public governance, law and human rights, urban planning, regional security, the environment, agriculture and water resources, women and poverty, reproductive health, human resource development and arts and culture.

9 Row, An Evaluation of the Calcutta Planning and Development Project, op. cit., 79, 89.

10 R. Chandidas, India Votes: A Source Book on Indian Elections (New York, Humanities Press, 1968).

11 See T. J. Nossiter, Marxist State Governments in India: Politics, Economics and Society (London: Pinter Publishers, 1988).

12 See Rabindra Ray, The Naxalites and their Ideology, 2nd ed. (New Delhi: Oxford University Press, 2002).

13 Arthur T. Row, "A Note on CMPO/Ford Foundation Efforts 1961-1971", Reports 006795, Ford Foundation Archive: 5.

14 Row and Biswas, op. cit., 84.

15 On this subject, see Arindam Dutta and Ijlal Muzaffar, "Housing the Indigene: The Making of a Third World Architecture," unpublished paper, Expertise: Consultants, Connoisseurs, Con-men. Conference, Graduate School of Design, Harvard University, October 2002. Also see the work of Ijlal Muzaffar on the interrelationship between modern architects and international aid agencies, The Periphery Within: Modern Architecture and the Making of the Third World (Ph.D. Dissertation, MIT Department of Architecture, 2007).

16 Preface by David Willcox in Row and Biswas, op. cit., 2.

17 For a study of the depoliticizing effect of developmental agencies on Third World governments, see James Ferguson, The Anti-Politics Machine: "Development," Depoliticization, and Bureaucratic Power in Lesotho (Minneapolis, MN: University of Minnesota Press, 1994).

18 CMPO, Basic Development Plan for the Calcutta Metropolitan District, 1966-1986 (Calcutta: CMPO, 1966): 29.

19 CMPO, First Report, 1962 (Calcutta: CMPO, 1962): 8.

20 Letter from Lackner to Mahalanobis, op. cit.

21 The difference between causality and determinant derives from Kant. I have written about this relationship elsewhere: "'Causality' describes a procedure where the phenomenon, the effect, is given first; the process of reflection must extend back through the exercise of reason toward the generality of a principle … 'Determination' is the inverse of this procedure. The generality (i.e. the rule, principle) is made available first, and from this it works down towards the particular." See Dutta, The Bureaucracy of Beauty, op. cit., 291.

22 Georges Canguilheim, "Machine and Organism," in Incorporations, ed. Sanford Kwinter and Jonathan Crary (New York: Zone Books, 1992) 54.

23 Note by Samar K. Mitra, File no. 310, Electronic Computer, (UNIVAC) I, 1959-67; ISI-PCM Archives.

24 "Discussion between Homi Bhabha and Mahalanobis about location fast computer in India, (suggested UNIVAC) whether TIFR or ISI. Computer in Bombay suggested to be of the CDC 3600 or IBM 7090 type, to serve needs of the Atomic Energy Establishment at Trombay." File No. 513 - Electronic Computer (Univac) II, 1957-62; ISI-PCM Archives.

25 See Dutta, "Unmaking Beauty: Aesthetics in the Shadow of History," in The Bureaucracy of Beauty, op. cit.

26 Anikendra Mahalanobis, Prasanta Chandra Mahalanobis (New Delhi: National Book Trust, 1983) 44.

27 Nancy Cartwright, The Dappled World: A Study in the Boundaries of Science (Cambridge: Cambridge University Press, 1999).

28 P. C. Mahalanobis, "Statistics as a Key Technology," The American Statistician, Vol. 19, No. 2 (April 1965): 44.

29 P. C. Mahalanobis, "A Statistical Study of Certain Anthropometric Measurements from Sweden," Biometrika, Vol. 22, No. ¾ (July, 1930): 94-108.

30 P. C. Mahalanobis, Anthropological Observations on the Anglo-Indians of Calcutta (Calcutta: Zoological Survey of India, 1922-40).

31 See Mahalanobis, "On Large-Scale Sample Surveys."

32 Mahalanobis, "Statistics as Key Technology", op. cit., 46.

33 See, for instance, Mahalanobis thoroughgoing tract "On Large-Scale Sample Surveys," 329-451.

34 For an elaboration of this particular employment of Jean-François Lyotard's theory of the different, see Dutta, "Learning from Organicism: Interdisciplinarity / Para-Architectures," op. cit.

35 All India Congress Committee Archives, File No. PL-14 (III)/1939, Archives of the Nehru Memorial Museum and Library, New Delhi, henceforth AICC Archives.

36 The terminology of overdetermination and contradiction is not a chance use. See Louis Althusser, "Overdetermination and Contradiction," in For Marx, trans. Ben Brewster (London: Verso, 1969).

37 See Robert Skidelsky, John Maynard Keynes: Fighting for Britain, 1937-1946 (New York: Penguin, 2000); Also see Antonio Negri, "Keynes and Capitalist Theories of the State Post-1929" (1968), in Revolution Retrieved: Selected Writings on Marx, Keynes, Capitalist Crisis & New Social Subjects, 1967-83 (London: Red Notes, 1988).

38 These cases are cited from a report on Ford Foundation-supported studies in the field of "Home Science" across India, under the rubric of the Home Science Project, coordinated jointly by the University of Baroda and Iowa State University. See Mattie Pattison w/ Shakti Chhaya, Annotated Bibliography of Research related to Home Science in India (Baroda: Faculty of Home Science, M. S. University of Baroda, 1967). Also see Kim Berry, 'Lakshmi and the Scientific Housewife: A Transnational Account of Indian Women's Development and Production of an Indian Modernity' in Economic and Political Weekly (March 15, 2003).

39 Letter to Eugene Stedtman in the New York Ford office, July 25, 1962, "Supplemental Support for Project Specialists and Consultants in Planning for the Calcutta Metropolitan Planning Organization" 1968-1972, Reel no. 1620, Grant Notification Letters, Ford Foundation Archives.

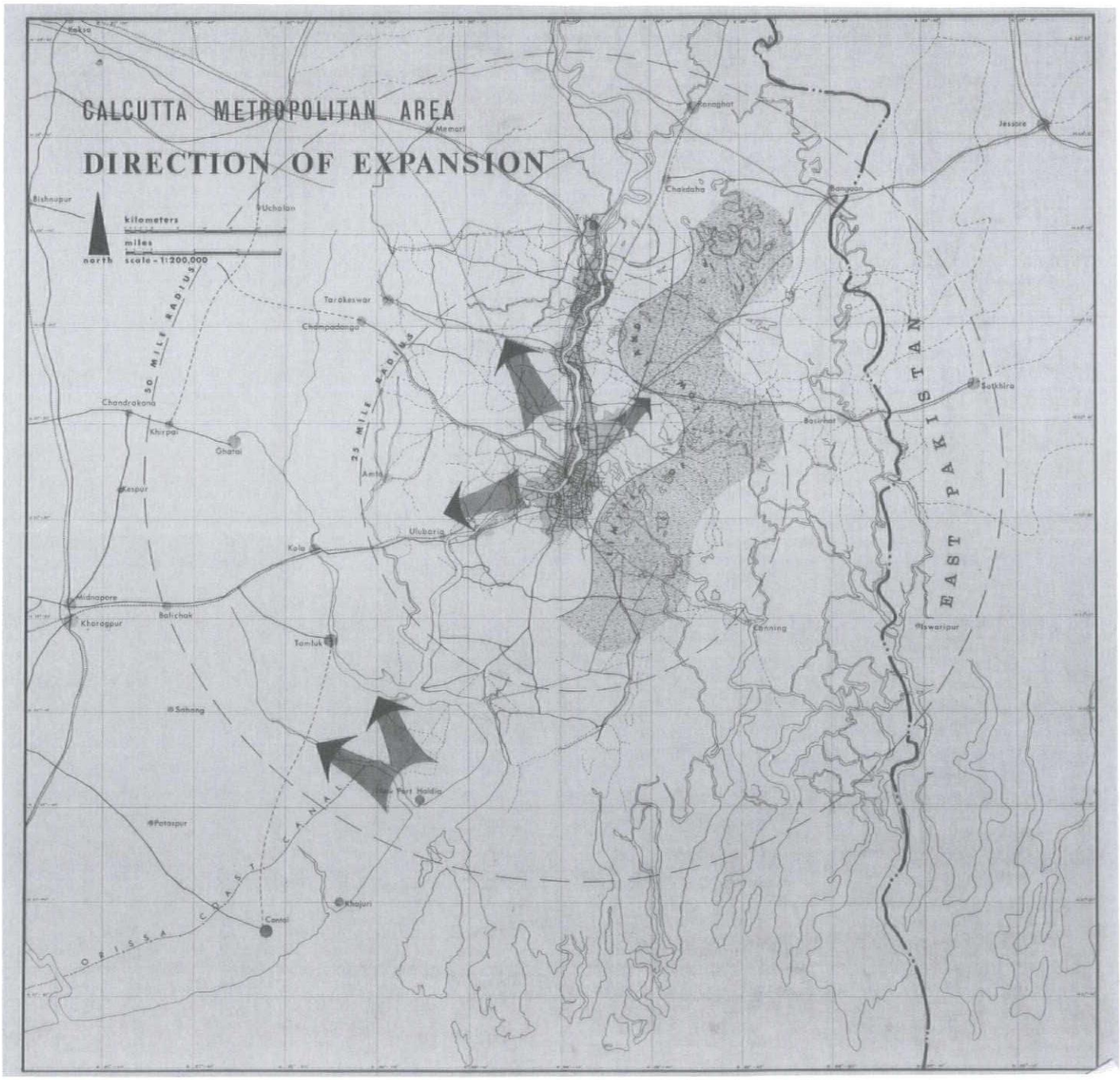
40 CMPO, Single-Storey Housing Unit: Tapsia-Type / Housing Designs / The Ucopan System (Calcutta: CMPO, 1970). Also see Sujit Banerji, "Innovative Techniques in Low-Cost Housing: The North Bengal Experience," in D. J. Dwyer, The City as a Centre of Change in Asia (Hong Kong: Hong Kong University Press, 1972).

41 Row, The Great Experiment, op. cit., 71.

42 Prasanta Chandra Mahalanobis, "Industrialization of Underdeveloped Countries - A Means to Peace" (1959), in Papers on Planning, ed. P. K. Bose and M. Mukherjee (Calcutta: Statistical Publishing Society, 1985) 185.

43 Row, The Great Experiment, op. cit., 182. Row offers a set of reasons for the failure to follow through with this understanding, the main thrust of which was that Ford was hardly equipped to move the governments of four states and the Centre with the limited resources at its command. Interestingly, in his 1974 report, Row describes Ford's grasp of this problem as a continuing effort. See Row, An Evaluation of the Calcutta Planning and Development Project, op. cit., 55.

44 "Spring Thunder over India," reproduced from Peking Review No. 29 (14 July, 1967); Appendix II in Marius Damas, Approaching Naxalbari (Calcutta: Radical Impression, 1991).



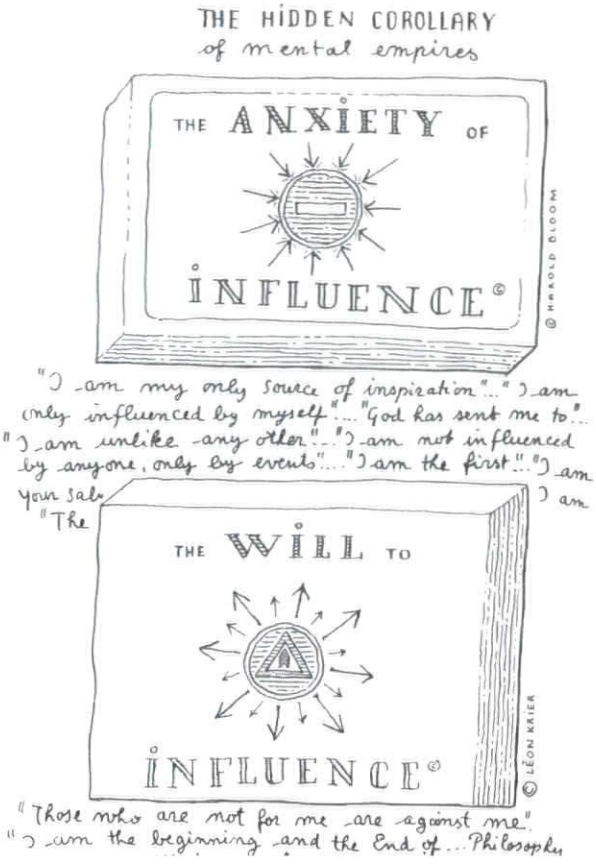
26 Calcutta, Metropolitan Plan Expansion, Calcutta Metropolitan Plan Organization (Ford Foundation), c. 1960s.

James

Hors Echelle: Remembering James Stirling

Leon Krier

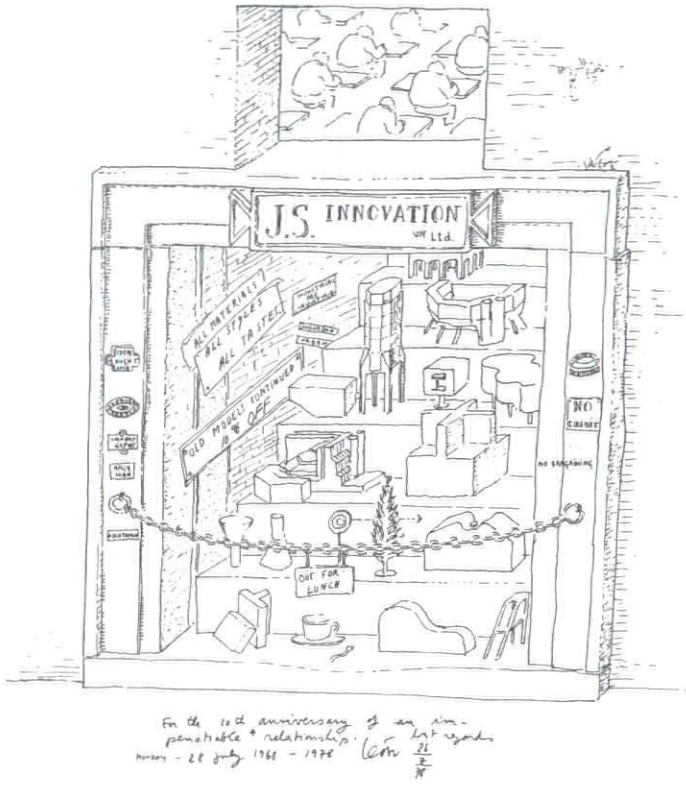
Dreamt 21/10/76: Jim. Laden with plans, exotic fruit and with half-a-dozen new projects in the style of arts and crafts.
From Leon Krier's Sketchbook, 1976.



Anxiety of Influence, From Leon Krier's Sketchbook, 1976.

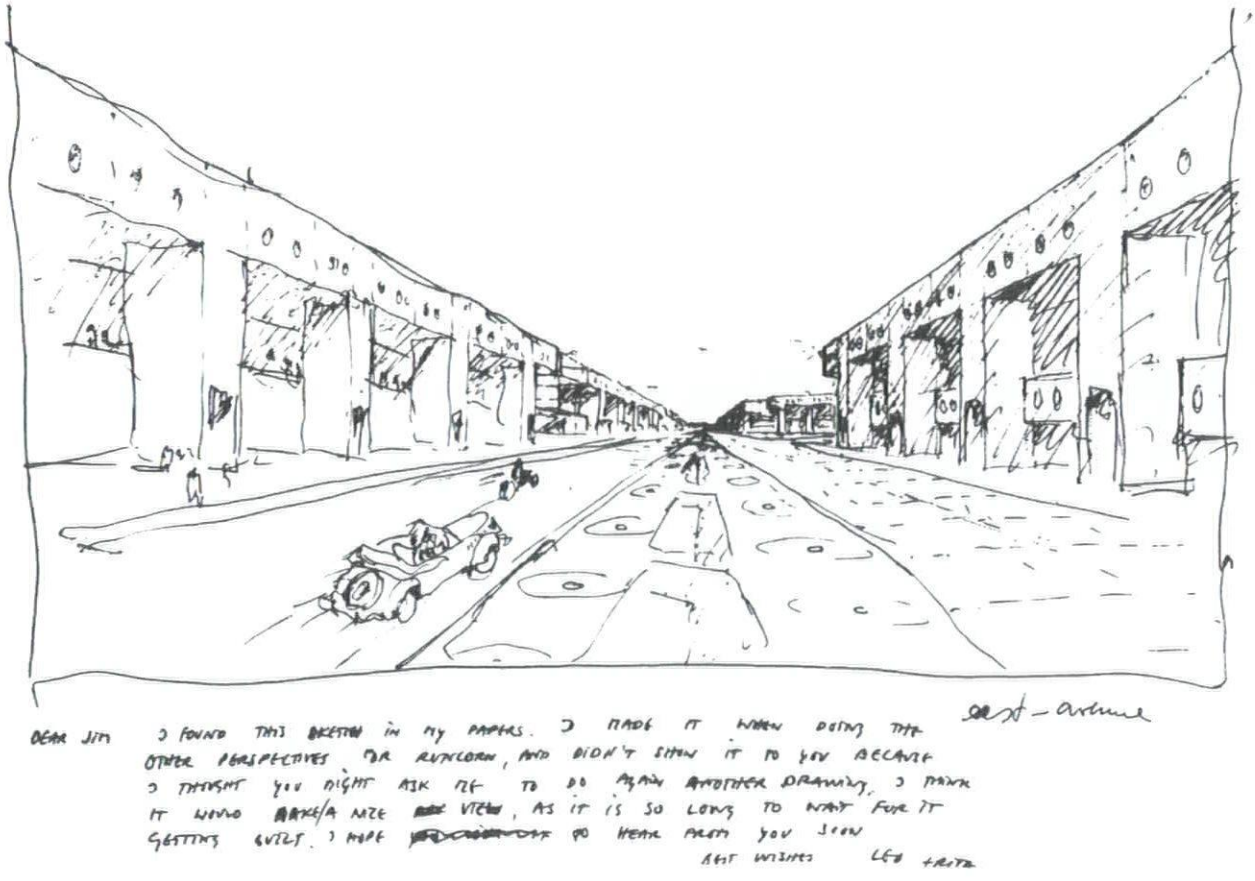
James Stirling is the most impenetrable person I have come across in my life. I worked for him, traveled with him, saw him privately and didn't get to know him in something like 25 years. I sat with him for hours and days in rooms, cars and planes and unless addressed, he would not speak. He would talk, when he wanted something specific. One day, while driving with him for three hours on the M1, I put him to the test: not one word was uttered, not even a "see you," when I closed the door of the DS 21, my stomach in knots. And yet he did not appear to be a cold person, nor was he a sulking type. The U.K. Jim had an air of joviality about him, an impression slowly but surely eroded by experience, and yet the U.S. or German Jim seems to have been an easy-going, cordial chap. The scarcity of our exchanges outside work would extend to all subjects: politics, women, architecture, his own life and circle. And yet it was great to work for him, to be with him. He was clearly somebody, and he was good to me, professionally and privately.

When I arrived at Gloucester Place, I hardly spoke the language or knew anything about England. I immediately had a very comfortable relationship with him because, quite simply, I didn't read the invisible barriers and codes which regulated the office hierarchy. I had applied for a job, because Leicester and Sheffield were for me creations of genius. The rest of his work left me cold. My awe was partial, but I didn't know where else to go ... Le Corbusier was dead, Kahn's maniera was too shallow and Ungers' built work, just too awful.



J.S. Innovation Unlimited, From Leon Krier's Sketchbook, 1976.

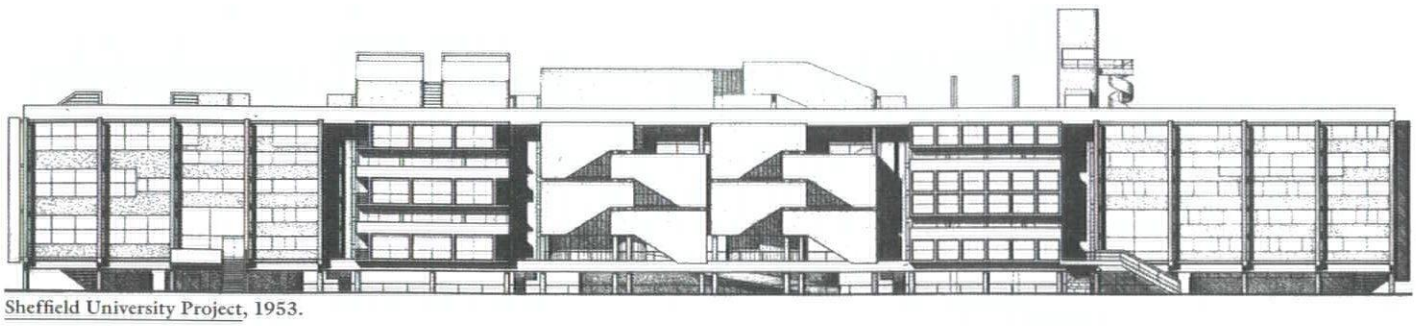
Over the years, I queried Jim about the contradictions and incompleteness of his work, but he would not be engaged. I proposed, "Clearly Leicester was just a beginning." He did not see it that way, nor would he be drawn. "You rediscovered the alphabet, but why do you stop at the beginning?" "No, no, no," he would laugh. "You just got it all wrong." "And what about grammar or syntax?" I would reply. When expressing my dislike of Blackheath he would snarl, "You are wrong." When the 1,500 dwellings of his Runcorn Town Center housing were demolished I ventured, "Any regret?" "They are wrong," he grumbled. Or again, "Water will get into those rooms." "You don't get it," he would reply. The ceiling falling off the concrete for the third time? "They are wrong," shrugging his shoulders. For a man who was involved with building for over 30 years he was astonishingly aloof from the technical and social consequences of his buildings and ideas.



Runcorn New Town, Liverpool, England, 1967–76
Sketch by Leon Krier.

When I worked on the Siemens Headquarters project, the size of a town of 10,000 people, Stirling would come to the competition office in Montague Street, asking, "So what's the image?" I didn't quite understand his use of the term, nor did I ever quite grasp the idea. Begging him for clarification, he would mutter "A boat? A bridge? A radio set? You know what I mean." I didn't. I suggested it could perhaps be a town??? "We are already doing Bath in Runcorn." He was drawn to the sections of ship turbines and rocket engines I had glued on the site "hors echelle" (out of scale). J. Stirling had become endeared with his reputation as "enfant terrible" of the architecture scene.

I kept wondering what had happened to the author of the Engineering Faculty, its elegance, its intelligence, its classicism. While he loved to cause scandal he had an unshakeable belief in certain (modernist) conventions. For Runcorn Town Center, housing engineers and quantity surveyors kept demonstrating to him that no savings, in time or cost, would be made by repetition of large-scale elements, i.e., by prefabrication or off-site production. Yet he decided to dress, at great cost, 1,500 "in situ" built dwellings with pre-cast concrete panels, not for reason of speed or economy, but for the sheer metaphysics—namely, to make them look "prefabricated."



Sheffield University Project, 1953.

He evidently didn't care a lot about the users' opinions and yet was extraordinarily sensitive about his reputation with peers and the professional press. He regularly handed me foreign language articles with a "Just let me know, is it for me, or against me?" meaning that the latter were not to be translated or archived.

Having spent a year at Stuttgart University, I was disgusted by the gray sterility of the teachers, the school buildings and above all, the teaching. I sent my "book" to Stirling because I was desperately looking for a master and mind who could readily answer all my questions and expectations. Instead, I found somebody remarkably vague about matters of theory or practice, unsure where to go after Leicester, Cambridge and the failed Oxford. Unprepared to debate fundamentals, certainly not with a freshman.

It was the very immaturity of this very big, very illustrious, very intelligent and inspiring man, which finally rang all my alarm bells. I kept wondering: If he doesn't have a clue about a greater picture and what his work and ideas are supposed to add up to, who possibly can? Like so many of his peers, James Stirling was more interested in conducting experiments than with building good buildings or cities. He chose to forget that his prototypes were not to be flown by test pilots, but experienced by chance passengers.

Stirling was truly a man of his age, and his work is, consequently, extremely perishable. Nevertheless, the ideas behind the Leicester Engineering Faculty and Sheffield University projects transcend their frail envelopes and may hopefully one day be resurrected in more robust bodies.

University Faculty of Engineering, Leicester University, 1959–63.

Dis
appear
ance

The Disappearance of Charles Perrault: A Cautionary Tale

Edward Eigen

> [T]he sun when it rises conquers and dissipates all the monsters of the dark.[1]

This is about how Charles Perrault (1628–1703) was made to disappear, or if not to disappear then to cease "to figure" (être de quelque chose). Thus Louis de Rouvroy, duc de Saint-Simon, wrote in his secret Mémoires of the fatal ostracism that was the penalty for disturbing the finely sprung machinery that governed all appearances at the court of Louis XIV.[2] (Exposure would no doubt have led to Saint-Simon's own exile from that "precarious homeland.") Yet in some more disturbing sense, Perrault was already estranged from himself, or from that still more difficult self anamorphosed in the catoptrical imagery of his beloved Tales of Mother Goose ("Contes de ma mère l'Oye"). This other, refracted likeness is introduced in the opening lines of his Mémoires: "I was born on the twelfth of January 1628, and born a twin," Perrault writes, as if to separate and thereby censor the prodigious facts attending his birth. Yet he was not to enjoy the special kinship of his twin (whether fraternal or identical, it is not known). "He who arrived in the world a few hours ahead of me was named François, and died six months later."[3] Long before Charles could imaginatively reconfigure his twin's loss, François had perfected the art of disappearing.

The attempt here is not to analyze François's restless place within the family romance that is the talented brothers Perrault. Rather it is to address the symptoms of "building sickness," as Charles referred to the siblings' engagement in construction projects both practical and grandiose, real and literary, for which his brother the doctor-assassin-architect Claude Perrault possessed no remedy. The image of "perfect twins" reproduced in Marc Sorriano's revealing dossier on Charles, an engraving from Fortunius Licetus's De Monstris (1668), usefully points to the dual derivation of monster from the Latin monstrare (to show) and monere (to warn). Fig. 1 The presumable opposite of the decorous Horatian formula "to instruct and delight," the monstrous is a matter of beholding and beholder, self and other.[4] How multifaced this encounter became with Louis XIV's leviathan assertion "L'état, c'est moi." What follows is a cautionary tale about the "mystic fiction" of this other fantastically twinned conception: the king's two bodies.[5] The organs of its "fabrication" are precisely those that noiselessly conspired in Charles's disappearance.

1 Twins, Fortunius Licetus, De Monstris (Padua: Paulus Frambottius, 1668).

2 Medal commemorating the King's recovery, January 1687. Deo Conservatori Principis (God the Protector of the Prince).

Le Siècle de Louis le Grand

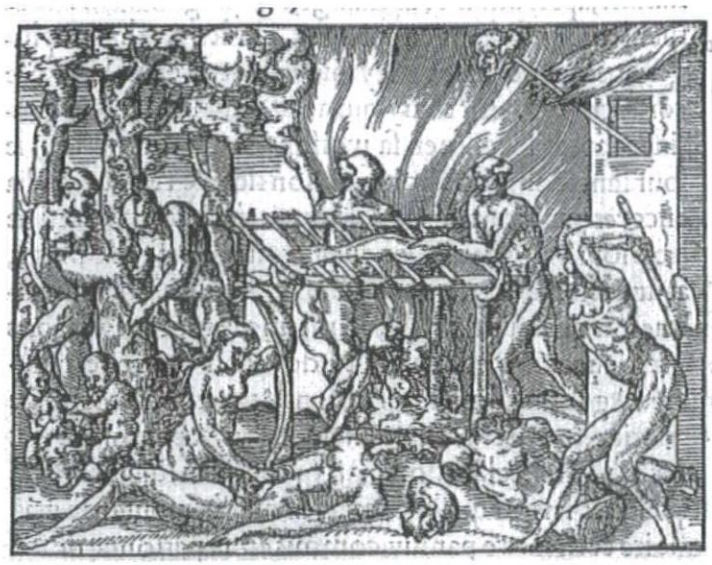
Let us begin with the final paragraphs of Perrault's Mémoires, which recount the courtly stagecraft of his disappearance and, before the récit ends abruptly, the reading of his panegyric "Le Siècle de Louis le Grand."[6] The latter took place at the special session of the Académie Française, held 27 February 1687 to express publicly the learned company's joy over the king's recovery from a serious operation. Fig. 2 This was the repair of an anal fistula, ably performed by the premier chirurgien du roi Charles-François Félix, but only after he had read "all that the ancient authors had written on the king's malady." Félix's advertence to Galenic sources might be interpreted as a sign of the agitation that would soon roil the corps of the Académie itself. In what conventionally marks the outbreak of the Quarrel of the Ancients and the Moderns, a plainly exasperated Nicolas Boileau-Despréaux interrupted the recitation of Perrault's poem to decry its falsity. There was in fact some prior basis for Boileau's state of pique. He elaborated its clinical history in his reflections on the rhetor known as Longinus, which otherwise served as occasion for Boileau, the so-called Legislator of Parnassus, to answer Perrault's objections to Homer and Virgil among the other literary forebears disavowed by the leader of the Modern camp. Longinus was for Boileau "a soul far above ordinary"; his writing possessed that ineffable je ne sais quoi, the sublime effect of which posed the irresistible threat of self-annihilation. As it happens Boileau suffered rather more cruelly

from the medical attention paid to him by Claude Perrault, who "strangely" advised that he be bled from the foot to relieve a bout of asthma, leaving him with a limp.[7]

As for the literary basis for his state of pique, in Boileau's own breathless diagnosis a certain "strangeness of mind" stirred the brothers Perrault and their literary confreres to a collective "hatred" of those ancient authors so revered by the unfailingly tasteful but unoriginal critic. What is closer to the case is Perrault's reluctance to genuflect before his own image. His offending poem begins: "The Ancients I with unbent Knee behold / For they, tho' great, were Men as well as we." Perrault saw in the ancients none other than a vernal self that came to maturity under the sovereign tutelage of Louis XIV, a theme Perrault developed throughout his polemical Parallèle des anciens et des modernes (1688), its dialogue set principally in the royal gardens of Versailles. Yet complicating this schema of rational progress is an Enlightenment perspective upon pagan antiquity stimulated by anthropological comparisons with contemporary "barbarian" cultures.[8] In one of his more clever and spiteful epigrams inspired by the Quarrel, Boileau referred to the Moderns as les Topinambous of the Académie, which might be regarded as a symptom of his own digestive distress. Fig. 3 The unsavory anthropophagic rituals of the Brazilian Tupinamba tribe, so memorably essayed by Montaigne in his "Des Cannibales," proved a ready-made exemplum on how not to serve up the anointed corpus of the classical canon. Boileau made out Perrault and his fellow disparagers of Homer—whose texts they indifferently ingested—to be no better than savages.[9]

For Boileau, theirs was a ghastly rather than a ghostly repast, but one strangely in keeping with the Académie's vocation of representing and consuming the king's radiant body. This sacrament, according to Louis Marin's Pascalian analysis, adhered to the Eucharistic formula Hoc est corpus meum ("This is my body"). And it is a decidedly uncanonical text that attests to the mortal estate of that body, bled of all mystery; to read the Journal de la Santé du Roi Louis XIV is to marvel at the unstinting attention paid to the king's "normal functions," as it were. For Joseph-Adrien Le Roi, editor of manuscript memoranda kept between 1674 and 1711 by the king's successive premiers médecins, the Journal's laconic account of the king's intimate sufferings had the effect of stripping "the veil of grandeur that hides him from our eyes, to show us the ordinary man."[10] He was a man as well as we, to adopt Perrault's usage. One reader of the Journal records being moved by the pathetic infirmity of the king while at the same time suspecting that its clinical details were excerpted from Molière's Le maladie imaginaire.[11] (In fact the dramatist died 17 February 1673 only hours after having performed the role of the hypochondriac Argan in his last play.)

Le Roi's was a symptomatic reading of the "Louis XIV of the historians," the portrait of majesty limned by a Saint-Simon, a Voltaire, a Perrault, upon whom the eyes of France and Europe were fixed as if by dint of a heliotropism. For so it was on 5–7 June 1662, the first year of his personal rule and amid the cruel "famine of the accession," that Louis conferred upon himself the symbol of the sun during Carrousel. The all-pervading imagery of le Roi-Soleil illuminated even the manuscript version of the Journal preserved in the Bibliothèque Nationale. The relic was bound with the frontispiece that the premier peintre du roi Charles Le Brun designed for the Hortus Regius (1665), the first catalog of the Jardin Royal des Plantes Médicinales.[12] Fig. 4 In the engraving's deific imagery the king, in the guise of a chariot-borne Apollo, assumes the sun's power to fructify those plants



3 André Thevet, Les Singularités de la France Anatartique (Paris: M. de la Porte, 1558).

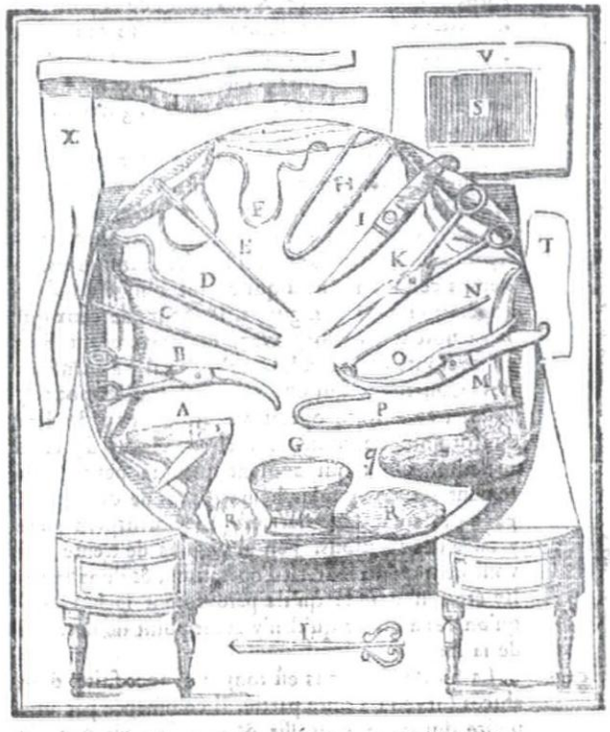
4 Charles Le Brun, frontispiece to Antoine Vallot Hortus Regius (Paris: Dionysium Langlois, 1665).

from which the garden's keepers, including his own physician Antoine Vallot, sought sovereign remedies for man's bodily vulnerabilities.

Uncertain at best was the course of remedies prescribed for the king during l'année fistulaire. Beginning 15 January 1668 Louis complained of a small tumor toward the perineum, at the apex of the raphe, two finger-widths from the anus. At first the "incommodité" did not interfere with his normal functions, most importantly his habit of vigorous horse riding.[13] By the end of January, the tumor having grown and hardened and an abscess having formed, the king sought treatment from his coterie of doctors. No root, leaf, or stem from the king's medicinal garden went unsampled as the doctors applied poultices of esoteric decoction. When these treatments failed, the doctors turned to lancing and cauterization, caustics, vulnerary waters, and occasional leeching. For all their efforts, the king developed agonizing gout in one and then both his feet while the affected region became further inflamed. Their remedies having run their ineffective course, on 21 May the doctors officially recognized that Louis suffered from a classic fistula-in-ano, and the king's surgeons were called. The grande opération—so-called for the palpable fear it inspired in none other than the surgeon who was to perform it—proved an opportunity for the king to demonstrate his fortitude. As attested by the select few who attended the procedure in the king's bedchamber, "he let out neither a cry nor a word."[14] Silence was his kingly autograph. The surgeon Félix did not fair as well: according to legend his dreadful ministrations to the king's "fundament" left him with a debilitating tremor in his operating hand.

As reported in the Mercure Galant, that lively forum of informed opinion, the delicate nature of his affliction did not so much level the king as elevate him above those who did not possess the courage to go under the knife. Indeed the instrument designed by Félix for the procedure, a curved bistoury with a flexible stylet, came to be known as le bistouri à la royale.[15] Fig. 5 But while the king stoically "abandoned himself with confidence to the talent of his surgeon," the bedchamber-become-operating room was crowded with the virtual presence of his docile but suffering subjects on whom the grande opération, as well as other unproven therapies, were first tried. As word of the king's condition spread, the prime minister—and as such, ultimate guardian of the king's body—Monsieur Louvois, was plied with accounts of "miraculous cures." Among the most promising were the mineral baths of Barèges, where the king ordered four fistula patients to be sent under the observation of a surgeon. Skeptical of the water cure, Louvois turned several rooms of his official residence as Surintendant des bâtiments du roi—a role in which he will be heard from again—into a fistula ward directed by Félix. There and at the hospitals of Paris, Félix worked to perfect his procedure on as many fistula sufferers as that obscure benefactress Charity was ready to provide. One dubious tradition holds that the bodies of those who did not survive Félix's clinical trials were disposed of at night, their deaths attributed to poison.[16]

Better documented is the veritable epidemic of fistula-in-ano observed following the king's recovery. The malady, as surgeon Pierre Dionis writes in his Cours d'opérations de chirurgie, démontrées au Jardin Royal (1705), was positively "à la mode." Such was the success of the grande opération that courtiers came to Versailles "eager to expose their derrières to a surgeon"; several of them were sent away disappointed when told they suffered from simple hemorrhoids.[17] Those who had earlier taken pains to hide their fistula affliction, Dionis observes, no longer felt any shame in "making it public." Let us pause here to



Instruments for operating on fistula-in-ano. The bistouri royale is labelled M, N, O. Pierre Dionis, Cours d'opérations de chirurgie demontrées au Jardin royal (Paris: La Veuve de Charles-Maurice d'Houry, 1757).

insert a word on the potentially monstrous act of demonstration. Dominique Garrigues draws a compelling analogy between the king's cherished practice of showing [montrer] his gardens of Versailles and the touching of the king's evil (scrofula), the solemn and spectacular ceremony during which the thaumaturgic sovereign exhibited his occult virtue.[18] Applied to the art of gardening, this exceptional faculty permitted him to demonstrate that, not content merely to govern and heal his subjects, he could also dominate and discipline nature, causing it to flourish.[19] But it was over the king's irredeemable subjects that Dionis exercised a special privilege.[20] He was named anatomical demonstrator at the Jardin Royale in the same year, 1673, when a royal ordinance granted it first right to the bodies of executed criminals. If the dissection of these accursed souls was a morbid exercise of reason and curiosity, the lectures in which Dionis described autopsies he had performed on well-known members of the court and aristocracy attracted crowds in the hundreds.[21]

While the veritable mode for anatomical demonstration fostered new and renewed models of visual surface and depth, opinion was the final ratio of perception in the court of Louis XIV; rumor, intrigue, ridicule, and above all sharp wit were the instruments for shaping it, often beyond all reasonable measure.[22] The very evening of his procedure the king held a council of his ministers to suppress the "false rumors" of his debility that had spread throughout the courts of Europe.[23] Though attempt as he might to suppress such "noise," the king's suffering proved too rich a source of derision for some authors to resist. As described in the catalog announcing its sale at auction, Les suites du plaisir, ou desconfiture de Grand Roi dans les Païs-Bas (1686) was "a libel of disgusting cynicism on the subject of Louis XIV's fistula. One of the illustrations represents le derrière royal in the form of a sun surrounded by rays, with the famous motto: "Nec pluribus impar" ("Not unequal to many").[24]

How could such base sentiments be allowed to pass into circulation? "In France it is only pure French or, better yet, the language of the court that may be used in a serious work," Perrault wrote in regard to the codification of usage that was the newly granted mandate of the Académie Française. Les suites du plaisir certainly did not merit on that account, though it might pass as one of those clever judgments on the infinite assertion of authority that stem from what Pascal termed "la pensée de derrière" ("thoughts in the back of the mind").[25] The libel drew its cynical bite from counterfeiting those very emblems of power for which Perrault was responsible as original secretary of the Petite Académie; that is until he himself ceased to figure. Founded in 1663 by the king's ever resourceful minister Jean-Baptiste Colbert, the Petite Académie was charged with devising mottoes and inscriptions for monuments charged with promoting the physical manifestation of the monarch's glory.[26] If the Journal de la Santé du Roi provides a loose thread with which to unravel the veil of majesty, then the crowning production of the Petite Académie, the Médailles sur les principaux évènements du règne de Louis le Grand (1702), armored his renown against any such assault. Nominally a numismatic history, the Médailles was a document-become-monument, a palace of the sun, its building blocks medals commemorating so many sterling acts of majesty.[27] The king's recovery from fistula-in-ano did not go uncommemorated in this register of representation. But what is base and what is noble are often finally of the same stuff. As Jonathan Swift would have it, the king, who took his first growth from the "worst Excrements of Earth" and suffered his "vile disease" (fistula), was all but destined to fall "sick in the Posteriors of the World."[28]

Building Sickness

Noble sentiment was the order of the day at the session of the Académie Française held, in Perrault's words, "to give evidence of the joy which we felt over the convalescence of His Majesty." Despite the awesome solemnity of the occasion, however, Perrault's chief ambition was to repair his own literary reputation, which had suffered the cruel critical barbs of Boileau. Perrault's career owed its inception to a well-placed word exchanged between minister Colbert and his own patron, the king's prime minister, Cardinal Mazarin, praising Perrault's "Ode sur le mariage du Roi." As Perrault advanced in Colbert's trust, more than the usual degree of resentment was focused upon his literary talent by his justly suspicious colleagues.[29] In a role for which he was accredited by the accident of his birth, Perrault came to be viewed as the minister's shadow self. Thus he is mentioned in the Histoire de l'Académie Royale des Inscriptions et Belles Lettres (as the Petite Académie was renamed in 1691) neither as poet nor writer but as a "man in the confidence of Colbert, who held the pen [took notes], in order to be always in a position to report to Monsieur Colbert what had taken place."[30] To the extent that this characterization is true, Perrault's openly secret role as Colbert's eyes and ears provides history with a source of expert testimony on the function of those organs established by the minister himself to fabricate the effects of majesty. That said, the Mémoires expose the discord that stirred beneath the carapace of corporate identity fostered within the royal academies. In the case of Perrault's quarrel with Boileau, which by means of vindictive contagion spread to his brothers—especially to Claude, whom the injured critic made to undergo a "metamorphosis" from doctor-assassin into a self-thinking architect—discord was not at all contained within the Académie's grand assembly room in the Louvre palace.

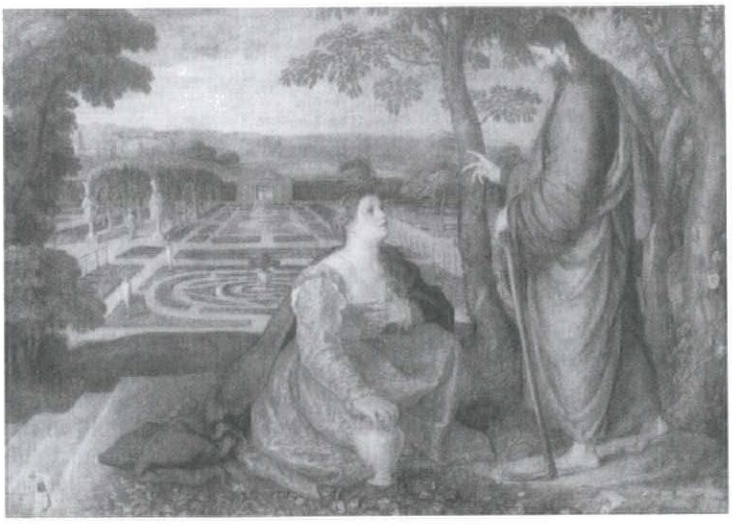
In his satires and epigrams Boileau ventilated not only his low opinion of Perrault's poetry but also his resentment over the not-so-invisible hand Charles exerted in his brother's appointment to the petit conseil set up by Colbert to advise him on the design of the Louvre facade. But it was his L'art poétique, in which he despaired of those indecorous authors who beget so many "monstrous verses," that Boileau had his revenge. "Once upon a time there lived in Florence a doctor who was a learned braggart, they say, and a celebrated assassin." So begins the fourth canto of Boileau's poem, as if it were one of Charles's fairy tales. "At the sight of this doctor a cold turns to pleurisy, and with his help an aching head is soon delirious." The celebrated assassin betrays his true witlessness when he is run out of Florence, universally detested. The one friend who has survived his killing cures takes him into his house; like the brothers Perrault, this man is "mad for architecture." From the outset the doctor speaks as if he had been born into that art, and he talks about building like a Mansard. "Finally (to cut these wonders short) our assassin renounces his inhuman art, taking leave of the suspect science of Galen, turns himself from a bad doctor into a good architect, henceforth to be found with a rule and square in hand." The metamorphosis complete, Charles cried foul to Colbert. Boileau's friends urged him to adopt a more moderate tone lest he run afoul of the minister. Boileau heeded their remonstrations in his own way. He made a "sincere apology" in a subsequent epigram: "You are, I avow, an ignorant doctor / But not a clever architect."[31]

Happy it was that the king was not delivered into the hands of such a doctor. But the roi thaumaturge was sensible to the great risk posed by the grande opération. Perhaps he found consolation in the canvas Noli me tangere ("Let no one

touch me"), which hung in the Salon des Bassans, through which the king passed into his bedchamber.[32] Fig. 6 As told in the Gospels, the resurrected Christ appears to Mary Magdalene, whom he has come to comfort in the guise of a gardener. The king's gardens of Versailles were his ultimate salve. It is reported that on the eve of the procedure the king dissipated his well-disguised dread by mounting his horse and visiting his gardens, its reservoirs, and the numerous other works then in the course of construction. Until only recently Charles Perrault had supervised these works as Premier Commis des Bâtiments du Roi. Setting a course for the Sun King, the magnificent Grotto (since destroyed) realized by Charles according to Claude's design represented Thetis's watery home, where Apollo nightly came to lie down after having labored for the good of the whole world.[33] Yet Charles's most ambitious project was to thwart the ruinous proposal authored by Pierre-Paul Riquet, the engineer responsible for the Canal du Midi, to divert the Loire River to Versailles. For this meant diverting Colbert's own most cherished ambition, which was to satisfy the king's unquenchable desire for water to supply the fountains of Versailles.

Charles, who would see to the posthumous publication of Claude's Recueil de plusieurs machines de nouvelle invention (1700), approached his campaign of persuading Colbert with no less precision than that with which Saint-Simon engineered a matrimonial plot of his own design. Secretly operating the pulleys and levers of his "machines" (the betrothed), Saint-Simon kept apprised of "the various obstacles they faced, and of the progress they made."[34] Perrault engineered a meeting between Riquet and Picard, his report of which to Colbert forced the calculating minister to consider the "obstacle to the pleasure he hoped to give the king." As surveyed by Picard, these obstacles were to be found in the lay of the land. This precaution, Perrault proudly allowed, not only saved the king an enormous sum but spared him the embarrassment of having endorsed a "mad and unfortunate enterprise." Such acts of saving grace, however, proved the ruin of Perrault. Having been reproached by the king for the "frightful sums" spent at Versailles with little visible result, Colbert ordered that all work be advertised for reduced fees. Perrault had the onerous responsibility of preparing the signs posted publicly to request bids. These avertissements (signs) point to the touching drama of Perrault's undoing.[35]

For Perrault, whose stories are peopled with the dangerous alter egos, doubles, and phantoms that appear in the depthless recesses of mirrors, the bidding system revealed the flaws in the edifice designed to embody the majesty of the king.[36] Perrault writes, "There were carpenters who, having only flawed wood in their lumber yards, did such poor work for Versailles that when the pieces out of which they had made their casement windows were closed, one could see out almost as clearly as when they were open."[37] Could the very frame through which the "eye of the king" surveyed the metaphysical effects of his theatrum mundi be constructed of such crooked timbers? The "paradoxical" condition of advertising a cheap price with the expectation that the best work be delivered not only taxed Perrault but made Colbert "so difficult and peeving" that a rift opened between them. Vexation turned to distrust when Colbert, wishing to have his nineteen-year-old son work under him in building affairs, shifted to the young man most of Perrault's responsibilities. The minister and Perrault continued to argue over unpaid accounts until the latter offered his resignation, which was gladly accepted. "Buildings are a bottomless pit," Colbert was later reported to say. Fittingly the only historical attempt to reconcile the facts of Perrault's fall from favor appear



6 Lambert Sustris, Noli me tangere, oil on canvas (136 x 196 cm), Lille, Musée des Beaux-Arts.

in the edition of the Comptes des Bâtiments du Roi, the fiscal history of vast expenditures made at Versailles—which was quite different in tenor from Perrault's own Contes.

The final act of Perrault's disappearance came with Colbert's death, when the king's minister, Louvois, was made surintendant des bâtiments. Perrault and his fellow members of the Petite Académie, François Charpentier, Abbé Tallemant, and Philippe Quinault, went to Fountainbleau to ask Louvois if he wished them to continue their duties. Perrault had drafted the memorandum explaining why the Petite Académie was formed, which Louvois gave to the chancellor, his father, to read. His was not a sympathetic ear, considering as he did that no money was more ill-spent than that which Colbert gave to those wits who made up "rebuses and ditties." But upon reading the memorandum he changed his mind and advised his son to preserve the institution "because nothing can bring greater honor to the king and to the kingdom, at such small cost."[38] Colbert's propagandists returned to see Louvois though without Perrault, who feared the Minister would provoke him to anger. His forbearance was perhaps evidence of the valuable lesson he had learned from Colbert, who when exasperated by Cavalier Bernini, "revealed nothing outwardly." For Perrault, who had mounted an aggressive whisper campaign against the Roman architect's design for the Louvre, Colbert's studied poise was an epiphany. "I was astonished, and at the same time I praised God for making me see so clearly what kind of dissimulation one is forced to practice when one is at Court." Perrault faithfully reports the dramaturgy of his disappearance as follows:

Louvois said: "You have until now, gentlemen, done marvelous things; but you must, if possible, do even better in the future. The king will give you such good material that it will only be left to you to say admirable things. "How many are you?" he asked.

"We are four in number, Monseigneur," replied Monsieur Charpentier.

"Who are they?" said Monsieur de Louvois.

"There is," began Monsieur Charpentier, "Monsieur Perrault ..."

"Monsieur Perrault?" said Monsieur de Louvois; "you are joking, he was never among you; he had enough to do with buildings. And the others, who are they?"

"There is," said Monsieur Charpentier, "Monsieur the Abbé Tallemant, Monsieur Quinault, and I."

"But there are only three of you ... where is the fourth?"

"I had the honor of telling you," replied Charpentier, "that there was Monsieur Perrault."

"And I tell you," said Monsieur de Louvois, in a raised voice which indicated that he did not wish to be contradicted any further, "that he was not there."[39]

Avertissement aux Lecteurs

Avertissement belongs to the parliament of demonstrative monsters; a form of information, a notification, it is also a warning. For us, in conclusion, the term instructively appears in the title of Charles Sorel's Avertissement sur l'Histoire de la Monarchie Française (1628). In treating the history of France as intrinsically bound up with the imaginary body of the prince, Sorel affirmed that "the accidents which happened to monarchs are included without separating them from the state."[40] This sort of reasoning is plainly apparent in Dr. Émile Deguéret's Histoire Médicale du Grand Roi (1924), in which it is related that the king, wishing to "clarify" where his intestine was pierced, introduced a sound with his left hand and, with the finger of his right hand, probed his anus until it encountered the device. The doctor observes that wishing to perceive all that took place in his kingdom, Louis XIV did not neglect that which touched his own self.[41] The king's solicitude for clarifying the most brilliantly obscure patch of his kingdom is evident in his volume Manière de montrer les jardins de Versailles (1689). And with montrer we encounter yet again another member of the parliament. A complete syllabus of cautionary texts would include Perrault's own Le Labyrinthe de Versailles (1675).

But before we are done, it is necessary to provide the following avertissement aux lecteurs (preface), which went missing earlier. Les suites du plaisir, the mischievously aforementioned libel on Louis XIV's fistula, is not to be found in any library, especially the king's library, for which Perrault, at Colbert's behest, wrote the catalog.[42] Rather the tract and very person of Jean-Népomucène Auguste Pichauld, Comte de Fortsas, from whose estate it was offered for sale, were the invention of one Renier Hubert Ghislain Chalon. Fig. 7

> Those of my English readers who take a special interest in the curiosities of literature, will certainly be pleased to find in the fifth volume of **The Bibliographer**, 1884, a reprint of that amusing mystification by M. René Chalon the **Catalogue** *&c., de feu Mr. le Comte J.-N.-A. de Fortsas*, of which I previously made mention,* and which has now become extremely rare. The reprint is preceded by some interesting particulars concerning both author and publication.

7 Henry Spencer Ashbee (also known as "Pisanus Fraxi"), Catena Librorum Tacendorum: Being, Notes Bio-, Biblio-, Icono-Graphical and Critical on Curious and Uncommon Books (London: 1885).

A great reader of Rabelais and sometime numismatist, Chalon led dealers and collectors from across Europe on a fruitless trek to the town of Binche, in southwestern Belgium, in search of the catalog's fifty-two fantastical offerings. The covetous bibliophiles went from one door to the next, inquiring after the whereabouts of the equally fictive Maître Mourlon, who was to oversee the sale. At each door they were met with the same response: "Unknown M'sieu." As it was with Mourlon, so it became with Perrault. As Walter Klinefelter describes the scene, the initial amusement of the Binchoise gave way to perplexity, and perplexity finally to fear. "What did the sudden appearance and the strange actions of so many suspicious-looking characters in their streets portend? Who was this Mourlon? they asked themselves. An anarchist, perhaps, who had summoned his confederates to their peaceful town for a secret meeting? The police should know of this."[43]

1 Ernst H. Kantorowicz, "Oriens Augusti–Lever du Roi," Dumbarton Oaks Papers 17 (1963): 171. The author here wishes to express his deep gratitude to Carol Rigolot for her unwarranted confidence in his manière d'écrire l'histoire, and to DL for her sagesse humoristique.

2 On the machinery of court, see Jean-Marie Apostolidès, Le roi-machine: spectacle et politique au temps de Louis XIV (Paris: Les Editions de Minuit, 1981); Norbert Elias, The Civilizing Process, trans. Edmund Jephcott (New York: Urizen Books, 1978).

3 Charles Perrault, Memoirs of My Life, trans. Jeanne Morgan Zarucchi (Columbia, MO: University of Missouri Press, 1989), 29. Perrault's memoir was first published in 1755 at Avignon. In 1759 the architect Pierre Patte published a second edition. In 1909 Paul Bonnefon issued a critical edition based on the manuscript conserved in the Bibliothèque Nationale.

4 Lorraine Daston, Katherine Park, Wonders and the Order of Nature 1150-1750 (New York: Zone Books, 1998), 213.

5 See Peter Burke, The Fabrication of Louis XIV (New Haven, CT.: Yale University Press, 1992). The seminal study on the ruses of representation is Ernst Kantorowicz, The King's Two Bodies: A Study in Mediaeval Political Theology (Princeton, NJ: Princeton University Press, 1957); see also the important work Louis Marin, Portrait of the King, trans. Martha Houle (Minneapolis, MN: University of Minnesota Press, 1988).

6 The poem was read by Louis Irland, abbé de Lavau, who was received into the Académie in virtue of title as Garde des Livres du Cabinet du Roi.

7 Édouard Fournier, ed., "Réflexions Critiques sur quelques passages du Rhéteur Longin," Oeuvres Complètes de N. Boileau (Paris: La Place, Sanchez, 1873), 285.

8 Clayton Lein, "Boileau, the Moderns, and the Topinamboux," Papers on Language & Literature 10 (1974): 24.

9 On the trope of "digestion" as a means of transmitting texts, see Terrence Cave, The Cornucopian Text: Problems of Writing in the French Renaissance (Oxford: The Clarendon Press, 1979).

10 Joseph-Adrien Le Roi, Journal de la Santé du Roi Louis XIV de l'Année 1647 a l'Année 1711 (Paris: Auguste Durand, 1862), v.

11 Auguste Corlieu, La Fistule de Louis XIV (Paris: Librairie Germer-Baillière, 1874), 1.

12 Denis Joncquet, Hortus regius (Paris: Langlois, 1665).

13 The king's physician Guy-Crescent Fagon attributed the tumor to damage done to the anal duct by excessive horse riding.

14 In attendance were the minister Louvois, Monseigneur le Dauphin (the king's son), la marquise de Maintenon (his wife), Père La Chaise (the king's confessor), D'Aquin, Fagon (the king's doctors), Bessière (consulting surgeon), a student of Félix, and four apothecaries to hold the king still during the operation.

15 Le Roi, op. cit., 404.

16 Charles Bodemer, "France, the Fundament, and the Rise of Surgery," Diseases of the Colon and Rectum 26 (November 1983): 747.

17 Le Roi, op. cit., 404.

18 See Marc Bloch, The Royal Touch: Sacred Monarchy and Scrofula in England and France, trans. J. E. A. Anderson (London: Routledge & Kegan Paul, 1973).

19 Dominique Garrigues, Jardin et Jardiniers de Versailles au Grand Siècle (Paris: Champ Villon, 2001), 247.

20 In homage to Ernst Kantorowicz, Michel Foucault refers to these juridical objects as the "least body of the condemned man," Discipline and Punish: The Birth of the Prison, trans. Alan Sheridan (New York: Vintage Books, 1979), 29.

21 Anita Guerrini, "Duverney's Skeletons," Isis 94 (2003): 587.

22 On the newfound realm of opinion, especially with reference to Perrault, see Joan DeJean, Ancients against Moderns: Culture Wards and the Making of a Fin de Siècle (Chicago, IL: University of Chicago Press, 1997).

23 Le Roi, op. cit., 551.

24 The rare item, which might be translated as The Consequences of Pleasure, or King's Affliction in the Nether Regions, is listed as no. 43 in the Catalogue d'une Très-Riche Mais Peu Nombreuse Collection de Livres, Provenant de la Bibliothèque de Feu M.r le Comte J.N.-A. De Fortsas (Mons: Hoyois Libraire, 1840), 4.

25 Marin, op. cit., 24.

26 Perrault, op. cit., 1.

27 Apostolidès, op. cit., 31.

28 Jonathan Swift, "Ode to the King on His Irish Expedition," in The Poems of Jonathan Swift, ed. Harold Williams (Oxford: The Clarendon Press, 1937), I, 10.

29 Perrault, op. cit., 11.

30 Perrault, op. cit., 22.

31 Robert Berger, The Palace of the Sun: The Louvre of Louis XIV (University Park, Penn.: Pennsylvania State University Press, 1993), 213, n. 158.

32 Garrigues, op. cit., 214.

33 Perrault, op. cit., 95-96.

34 Emmanuel Le Roy Ladurie, Saint-Simon and the Court of Louis XIV, trans. Arthur Goldhammer (Chicago: University of Chicago Press, 2001), 152. Saint-Simon hoped to arrange a marriage between "Mademoiselle," the daughter of the duc d'Orléans (and grandniece of Louis XIV), and her second cousin, the duc de Berry, son of Monseigneur and grandson of Louis XIV.

35 Elias, op. cit., 340

36 Allen Weiss, Mirrors of Infinity: The French Formal Garden and 17th-Century Metaphysics (New York: Princeton Architectural Press, 1995), 84.

37 Perrault, op. cit., 111.

38 Ibid., 113.

39 Ibid., 114.

40 Jean-Marie Apostolidès, "Review: The Problem of History in Seventeenth-Century France," Diacritics 12 (Winter 1982): 60.

41 Émile Deguéret, Histoire Médicale du Grand Roi (Paris: Librairie Marcel Vigné, 1924), 172.

42 André Jammes, "Louis XIV, sa Bilbiothèque et le Cabinet du Roi," The Library 20 (1965), 6.

43 Walter Klinefelter, The Fortsas Bibliohoax (Newark, NJ: The Carteret Book Club, 1941), 38.

Teach

Un-Messy Realism and The Decline of the Architectural Mind

Mark Jarzombek

ing

The last ten years have seen subtle changes in architectural education, so subtle that one cannot identify one or the other school or one or the other approach as playing a leading role. The basic fact, however, is indisputable: the pedagogical systems that were put in place in the postmodernist era of the 1970s and that were developed in the '80s and '90s are slowly and irrevocably dying. Their skeletons are still moving about, giving the appearance of still being alive, but the body is withering. This is no lament; history is dynamic, and change inevitable. But when—and how—will we come to terms with these changes?

The irony is that the current architectural education in the U.S. is in its most uncontroversial position in decades, sitting comfortably within a political domain that is essentially capitalist and centrist. In some places, the increasingly pervasive agenda of the phenomenologists has pushed architecture even further to the right or has at least eaten away at the more liberal-leaning agendas of the former pop-culturalists. Similarly, Sustainability has all but purged itself of the old leftist associations. And as to History-Theory, which had originally served as a type of intellectual corrective to the excesses of postmodern neo-historicism, it is being increasingly pushed aside as not relevant to practice or as introducing issues so remote as to be considered distractions to the mind of the young architect. Topics like philosophy, psychoanalysis, literature, and even painting and film, once central to debates about ethe nature and purpose of architecture, are now pursued haphazardly at the very margins of architectural education. Architecture's messy disciplinarity is being cleaned up, sanitized, and simplified.

What stands before us is a historical moment of great significance. I am not trying to condemn this moment, for there are aspects of this transformation that are yet unknown and thus undeveloped; it can still produce good architecture, but the question I am trying to raise is, Can it produce good architectural discourse? There is a big difference. The future of architectural education is dependent on the latter, not on the former.

Though the rapid growth of computation and technology in architectural teaching has added to the demise of discourse, this in itself is not the cause, but has created a symptomatic response in the form of a claim for a return to "practice." But the call to practice does not fill the gap and anyway should be recognized for what it is, a convenient cover for a system of education adrift in academic uncertainty. Possibly worse, it is a cover for a pernicious anti-intellectualism. Practice, I would argue, is a field of cultural production; it is not about how one makes a building. The sooner we expose the practices-of-practice, the better architecture will be. That was certainly the ambition of both Modernism and Postmodernism. The interrogation of practice—and the special role that a non-practice practice had within that interrogation—has gone by the wayside or withered itself down into banal critiques of the star architects.

Frederic Jameson, once the darling of intellectuals, has disappeared somewhere. But it was not just one or the other theorist or philosopher that energized architectural discourse. Architectural academe defined itself as challenging the conventions of practice. In fact, the M.Arch program was originally designed to do just that; put together in the 1970s their purpose was to elevate architectural education (and practice) in the eyes of academe. They aimed to bring in more mature students with different and interesting backgrounds as well as professors with a deeper appreciation for architectural culture. The M.Arch program was a dialectical response to corporate modernism, and for a while it certainly worked. But now it is the victim of its own success.

This does not mean that excellent pedagogies don't exist today. A few years ago MIT held a conference on pedagogy, and recently so did Columbia University and other places, with several speakers presenting their approaches. But the truth was that the line between pedagogy and PR was frequently blurred. There was a lot of epistemology, but no episteme.

The strangeness of our architectural teaching is nowhere more visible than when we study the National Architectural Accrediting Board (NAAB), which at first accredited only the lower reaches of the academic food chain, namely the Bachelor degree, but now accredits the M.Arch as well, though it makes no distinction between these two degree programs! The NAAB accreditation board, just a year ago, voted in favor of creating an D.Arch, a doctorate of architecture, equivalent to a law school degree, thus increasing the range of their control. So now we have not only two but three so-called "first professional degree programs." And with the old bachelor programs in many schools being retooled into M.Arch programs by allowing the last year to count as "graduate level," and M.Arch programs sounding more and more like graduate-level versions of the old B.Arch programs, we have nothing short of a massive confusion in the pedagogical environment about where to locate architecture discourses. Architectural pedagogy is basically being flattened—and repressed—and all of us, myself included, who teach in schools of architecture are in one way or another part of this tragedy.

Concomitant with the increasing bureaucratization of academe is the fact that in recent decades we have faced the rise of the power of the architectural profession with important complicating consequences for pedagogical practice. Twenty

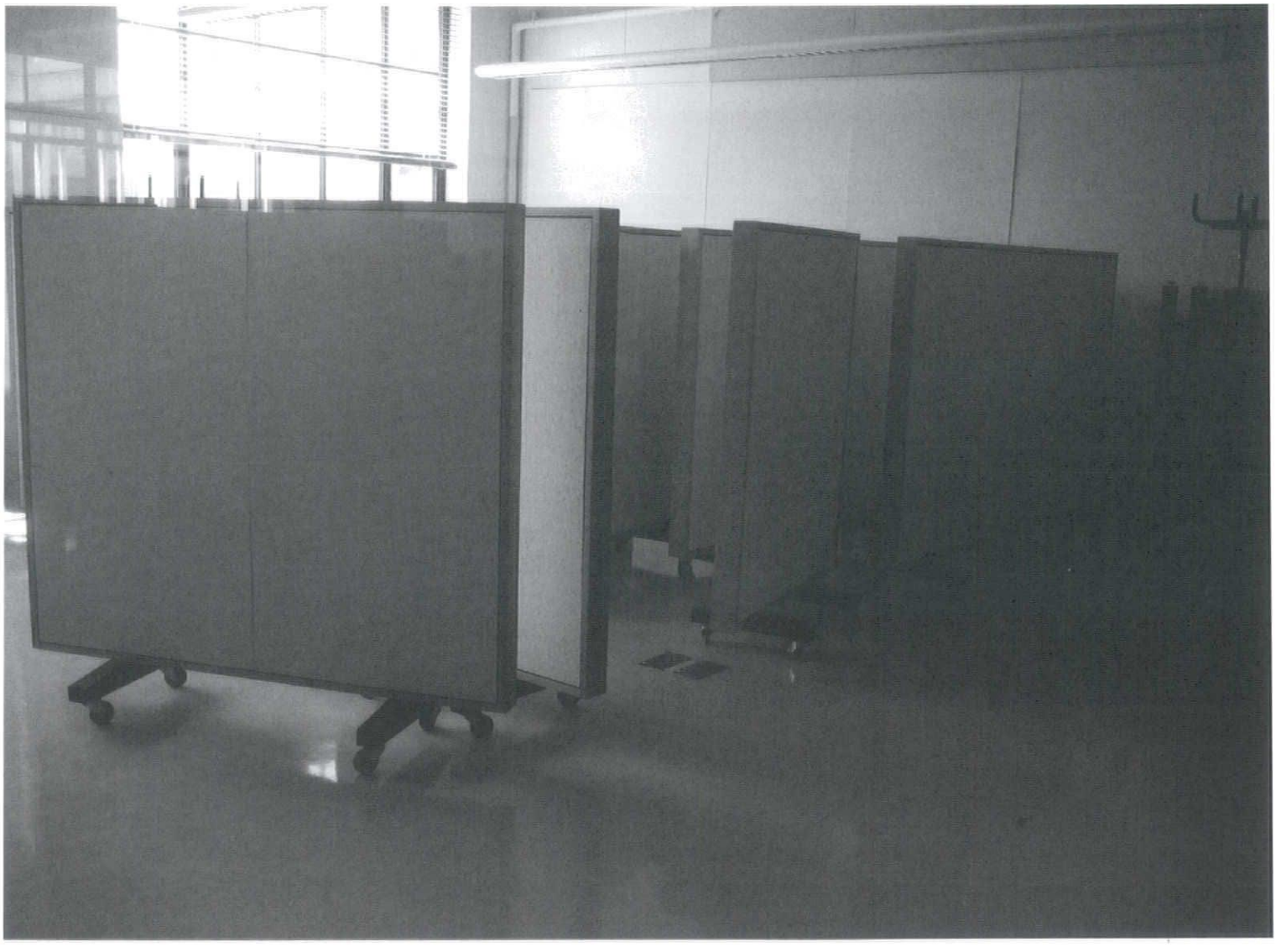
years ago the balance between large architectural firms and one-designer and small to mid-sized firms was weighted to the small and mid-sized. Eighty percent of firms in the U.S. were small firms. In the last twenty years, one has seen the rapid decline of the number of middle-size firms, most of which were unable to compete under the strain of computer software purchases and the rise of insurance premiums. The pull toward the professionalization and corporatization of design—still under-studied and under-theorized—has been felt throughout the US, if not the world, and has had a silent pedagogical imperative that has had only negative consequences erasing the already thin potential for a political gesture into breezy, computer-generated fly-throughs. The advances of women in the field that were made in the 1980s and '90s have slackened, and African-Americans in the field have still not risen to more than 1.5%.

The first thing to do in order to get a handle on the situation is to establish historical doubt about the instruments of power that are embedded in the production of architectural knowledge. I would argue that we must start to see pedagogy no longer through the presumably beneficial system of regulations and activities (that in their final analysis circumscribe the abstractions of The Architect as a good and productive citizen), but, very directly, as an economy of production. This is not easy to do. Of all the books and literature on modern architecture, how many deal with the instrumentalities—and economies—of teaching or the ideology of pedagogy? The reason for this is not the lack of scholars, but the disciplinary cunning that wants to protect pedagogical ideologies from historical critique. This is why I am interested in pedagogy's history, its anthropology and sociology, as a way to get to a history of the present, to diagnose, reformulate, and problematize and thus ultimately to politicize our efforts. To say it succinctly, we have to see pedagogy not as a question of how we train architects, but as a question of how it trains architecture. As much as we would like to see ourselves as productive and meaningful agents of change, we should also see ourselves as part of changes that are far larger than what we can actually control. And this means that what we need is a condition of negative pragmatics in which the limited—and limiting—spatial and temporal conditions of our teaching are allowed to be actually spoken about.

Some examples: over the last decade, the cost of "producing" Ph.D.s in the history and theory of architecture is now in the range of several hundred thousand dollars. This means that the expansion of Ph.D. programs in the future is limited, and that Ph.D.s—though being needed increasingly to feed the ravenous belly of the tenure system—are becoming more and more precious and simultaneously more likely to leave the architectural studio environment where their work is valued less and less. As to teachers of architecture, most of whom now have an M.Arch degree, publishing is difficult since they have to compete with those with Ph.D.s. Think of the trajectory of journals like Oppositions, Assemblage, and Grey Room, and list how many architects contributed to these journals. It gets fewer and fewer, and for Grey Room, probably close to zero. This is not a critique of Grey Room, but an indication, perhaps, that architects have less and less to say. The result is that students become less and less capable of envisioning—and thus participating in—the discourses that define their field.

What I am trying to argue is that a discussion about our teaching is not about how good we are as teachers, or about how many of our students go off to work in the offices of the star architects. It is certainly not how well we conform to NAAB. We have to realize that our discipline is undergoing an inner transformation of historical import and that sooner or later it will yield an educational system far different from the one we grew up with in the last twenty years. But whether this is for better or for worse is difficult to ascertain since there is also a collusion of silence in academe about where the ghost ship is heading. That is the disturbing part, especially since it is the architecture students who are getting short-changed.

Most Ph.D. programs are now moving toward a five-year package of tuition and stipend. Fifteen years ago, funding was minimal. Ten years ago, the three-year package was the norm. Furthermore, because of the need to finish, the old model where Ph.D. students would supplement their income by working in a firm during the summer to pick up extra dollars is now frowned upon.



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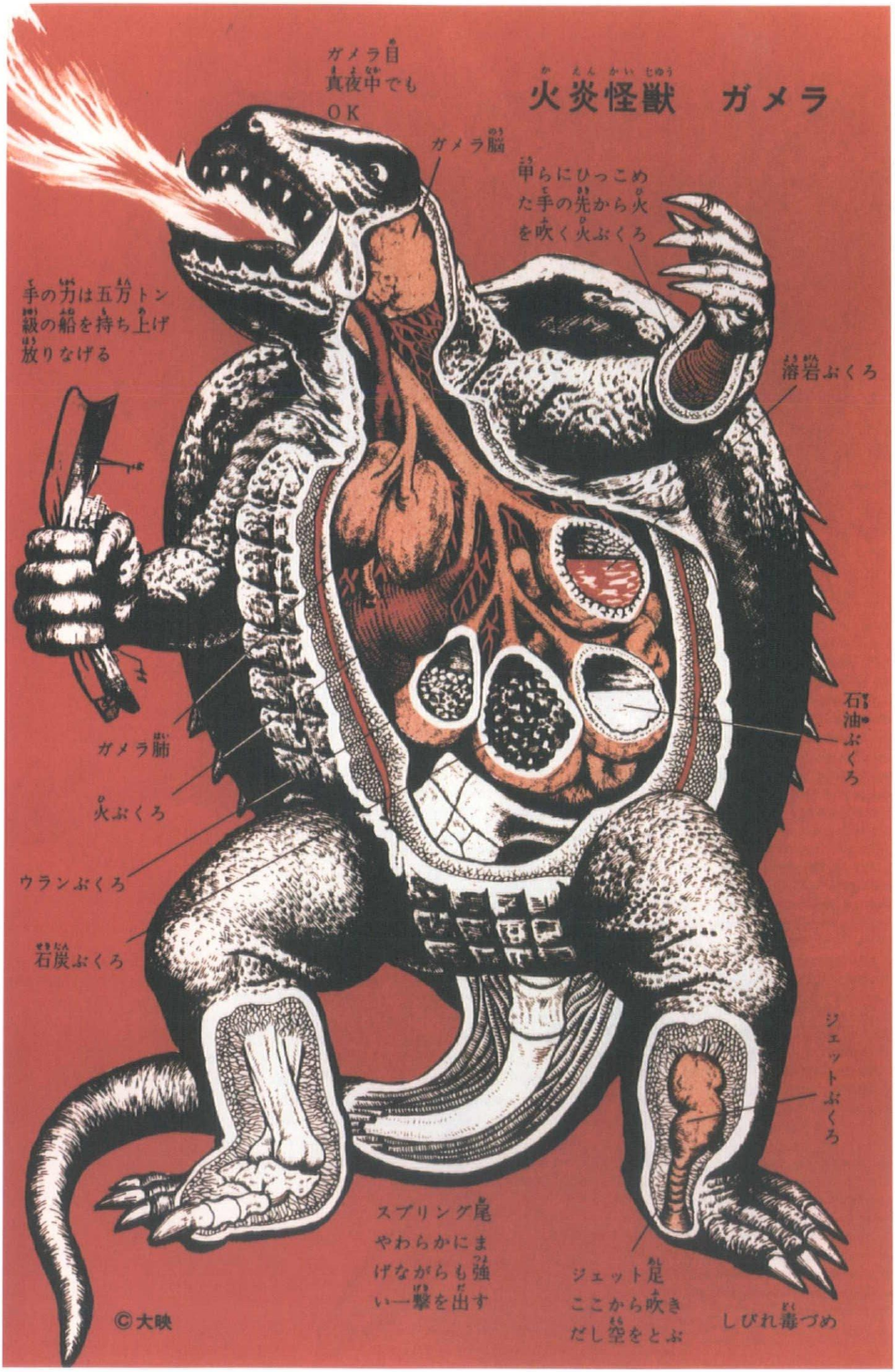
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Etiologies of Beauty:
Architecture and the New Physics of Appearances

Mark Foster Gage

Be

> In this frustrated humor, criticality suppresses other moments, other moods, livelier ones, giddier ones, ones wetter, more freshly, more rhythmic, more transporting, more creative and much more intelligent. Its potency ossifies into a regime of manners, a sadistic stultification that, like a vampire, eroticizes the bloodless ennui it engenders, an ennui that continues to pose as sobriety, as depth, but is now merely the ache of unrealized potential.
> —Jeffrey Kipnis[1]

> From so simple a beginning, endless forms most beautiful have been, and are being, evolved.
> —Charles Darwin[2]

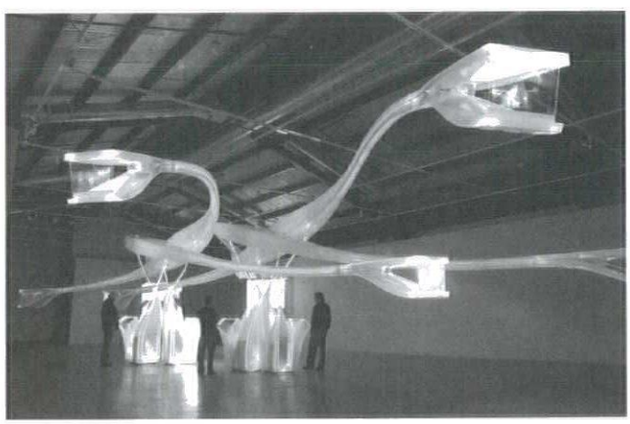
Having seemingly exhausted the reservoirs of autonomy through multiple recyclings of its own history, the dismantling of its functions, and the paralyzing criticism of its intellectual intent, architecture is now ready for a new openness to contemporary aesthetic discourse—perhaps even the radical pursuit of the beautiful. Such formal optimism has certainly been prompted by the simultaneous deflation of critical intellectualism and a decade of vivacious digital experimentation resulting in imagery as fantastically foreign as it is seamlessly supple and seductive.

Computation has enabled architecture as well as virtually every design discipline to produce fresh work of uncommon visual prowess. Even a cursory glance at the supple motion-graphic sequences by Tronic Studios, the calligraphic digital portraits of Alberto Seveso, or the intricately complex vectoral illustrations by Marian Bantjes should be sufficient to convince us that we are simply not inhabiting the same universe of design that we were merely a decade ago. Coincidental to this formal speculation is the explosion of networked communication, which has facilitated the recent interdisciplinary sharing and popular spread of the results. Like snowflakes on a gale of former repression, the aesthetic concerns of beauty have blown over the barrier of the twenty-first century, seeding themselves throughout the landscape of contemporary design culture.

The contemporary blossoming of beauty is not a resurrection as much as a rebirth. Beauty is now fulfilling a role above and beyond its role in Romanticism, aestheticism, and its subsequent twentieth-century suppression as an aureate and functionless end.[3] Instead beauty is acting as the very tool that prompts the vital cross-pollination of ideas that promises to resuscitate architecture from the looming paralysis of both critical and programmatic narcissism. This new effervescing of beauty, as it percolates between the allied disciplines of design and architecture, not only promises new formal and moral ground for dialogue but anticipates a renewed pubic access to the deeper contents of the profession—the exquisite tweakings, meanings, and associations previously barricaded by the land mines of intellectual pretension and popular uncertainty.

The rebirth of the beautiful should come as no surprise. Intermittently throughout history we are reminded that nothing propagates through culture better than beauty. Its suppression,

Gage/Clemenceau Architects, Stockholm Public Library.



servo, David Erdman, Dark Places, installation.

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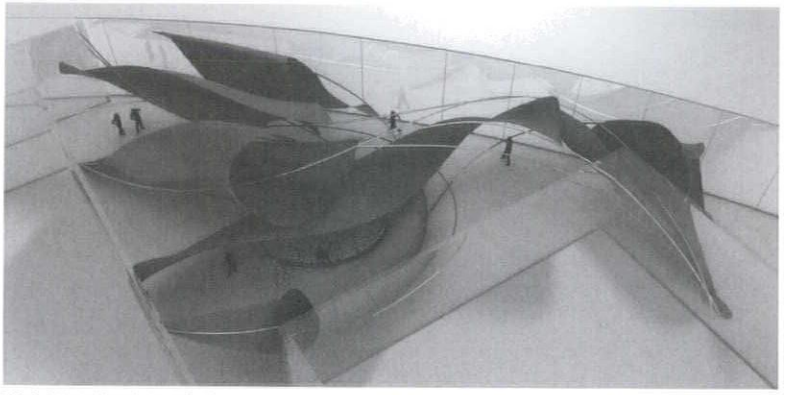
Xefirotarch, Hernan Diaz-Alonso, Seroussi Pavillion.

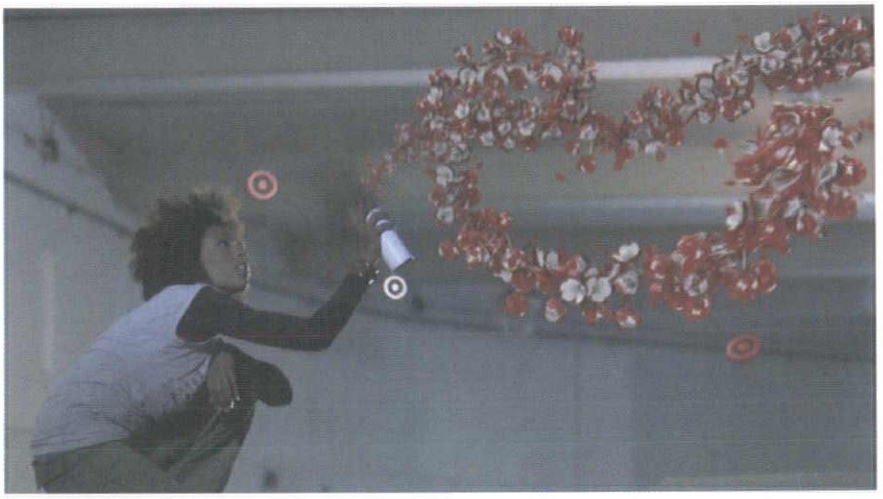


Kivi Sotamaa, Spanish Dancer.

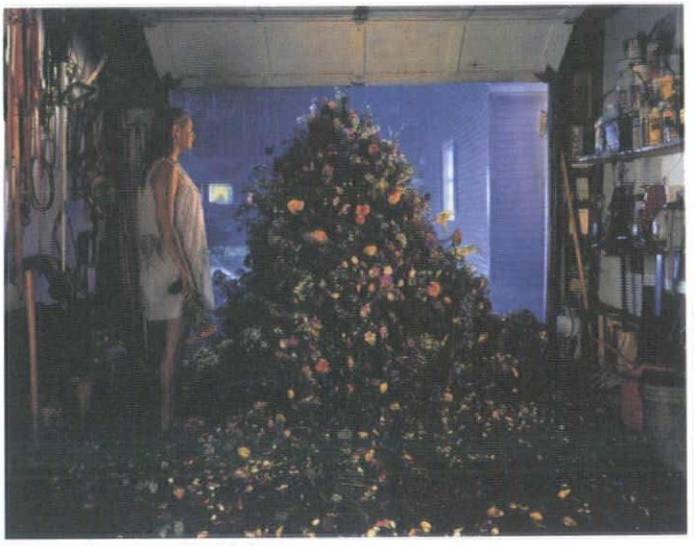
Bart van Leeuwen, ylf.

Tauba Auerbach, The Letter I.

Gage/Clemenceau Architects, PS1/MoMA finalist pavillion.

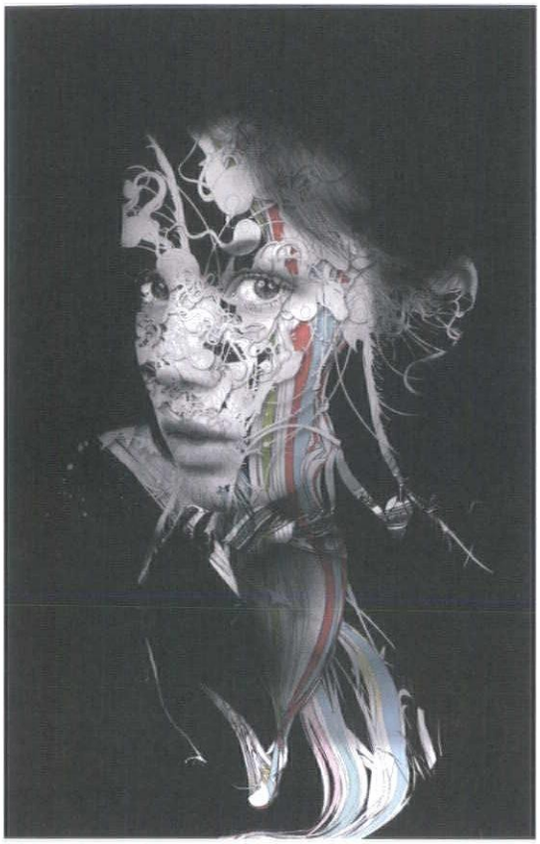


Tronic Studios, project for Target.



Gregory Crewdson, Untitled.

Andrew Zuckerman Studio, egg.



Alberto Seveso, Portrait.

First Avenue Machine, Clams.

Patricia Piccinini, Car Nuggets.

Bumblebee from Transformers, 2007.

while long and perhaps fruitful, could never be indefinite. A line of historic variations of this observation spans the millennia from Plato to Wittgenstein to Elaine Scarry—all of whom speak to new generations of beauty's ability to entice us to stare at its presence, to draw it, to photograph it, and to write about it in an attempt to prolong the glimmer of its iridescence.[4] Scarry writes regarding this act, "Sometimes it gives rise to exact replication and other times to resemblances and still other times to things whose connection to the original site of inspiration is unrecognizable."[5] In turn such acts of representational translation produce new iterations that, like an Old Testament patriarch, beget generation after generation of new images, texts, drawings, and forms. Beauty is not a static concept as it passes through culture—it migrates, shifts, and reproduces itself in the fertile territories of human interest. As such there is nothing that will always be considered beautiful, nor anything eternally exempt. Instead the propagation of beauty through our cultural consciousness prompts an ever-continuing reappraisal, thereby evading the shackles of permanent categorization.

The contemporary fields of bioinformatics, social biology, and evolutionary psychology have begun to offer insights into the acts of evolution and replication, not only of genes and species but of thoughts, emotions, and other, perhaps less biological, devices of cultural production. The migration of the beautiful and its relationship to ugliness and monstrosity are all ideal candidates to benefit from the output from these disciplines. Yet instead of conducting yet another "scientistic" apology for formalism—such as justifications based on overriding mathematical proportions, the optimized efficiencies of calculation, or the valorization of form as a nifty result of pseudogenetic aggregation processes, let us instead speculate on the way the aesthetic judgments instigated by these forms operate across the contemporary landscape of design.[6]

To better understand the role of such judgments in design culture, it is critical to determine how they move beyond mere individual assessments and how they colonize into larger collective ideas about contemporary aesthetic culture. That is to say, how are aesthetic ideas replicated and translated from individual to individual and organized into collective aesthetic sensibilities with cultural consequences? Among the more adventurous theories of replication to emerge in recent decades—and likeliest candidate to assist in understanding collective aesthetic judgments—is the concept of a "meme." Based on observations of genetic reproduction, yet loaded with the ambition to prove that all evolution is not necessarily genetic, the theory of memes was developed by evolutionary biologist Richard Dawkins at Oxford in 1976.[7] Since its introduction the theory has infiltrated numerous other fields, including mathematics, physics, religion, and psychology.[8] The description of the term meme is a "noun that conveys the idea of a unit of cultural transmission, or a unit of imitation."[9] The most successful memes are highly infectious, guaranteeing their future propagation through continued imitation and translation. Memes can be used to account for everything from the viral behavior of fashion trends to addictive new turns of phrase in language, simultaneously explaining the near explosive appearance of trends such as urban trucker hats, fingerless gloves, skinny jeans, or terms such as like. Beauty, as described by its characteristic of prompting translation and replication, behaves according to such rules of memetic theory. Beauty's behavior is mimetically common in that it pollinates through nongenetic replication, passing through culture and absorbing variations—it is mimetically unique in that it demands continued replication while continuously altering its ability to be perfectly described. This relationship between the replication of the beauty meme and its resistance to capture is never so eloquently described as by Scarry, whose passage on da Vinci must be presented in full, as follows.

> A beautiful face drawn by Verrocchio suddenly glides into the perceptual field of a young boy named Leonardo. The boy copies the face, then copies the face again. Then again and again and again. He does the same thing when a beautiful living plant—a violet, a wild rose—glides into his field of vision, or a living face: he makes a first copy, a second copy, a third, a fourth, a fifth. He draws it over and over, just as Pater (who tells us all this about Leonardo) replicates—now in sentences—Leonardo's acts, so that the essay reenacts its subject, becoming a sequence of faces: an angel, a Medusa, a woman and child, a Madonna, John the Baptist, St. Anne, La Gioconda. Before long the means are found to replicate, thousands of times over, both in sentences and the faces, so that traces of Peter's paragraphs and Leonardo's drawings inhabit all pockets of the world (as pieces of them float in the paragraph now before you).[10]

In this aspect beauty is unique—a meme that prompts replication but has a continued relevance that not only possesses but depends on dramatic disciplinary leaps for such replication. Embedded in this act of replication is variation, or in evolutionary terms, mutation. When describing memes as replicators, Susan Blackmore notes, "Memes certainly come with variation—stories are rarely told the same way twice, no two buildings are absolutely identical, and every conversation is unique—and when memes are passed on, the copying is not always perfect."[11] Thinking through beauty in memetic terms one can assume that its replication as a cultural meme includes the possibility of mutation, or a punctuated Gouldian evolution,[12] not aimed at a definitive universal perfection but encoded with the ability to create new aesthetic sensibilities in which to exist. Reprocessing beauty through imitation includes far-reaching acts of alliteration—or as Wittgenstein and Scarry more eloquently suggest, "When the eye sees something beautiful, the hand wants to draw it."[13] The drawing of the hand then begets other creative acts that continue beauty's quasi-genetic trajectory onward.

In the genealogy of beauty, as in biological evolution, such errors and mutations produce far more insignificant results than significant ones. Of the significant ones, some are immediately recognized as beautiful, some are sentenced to mediocrity, some are simply ugly, and some still belong to the critically important but exquisitely unbeautiful category of the monstrosity—monstrosity not as a scalar description but rather as an enabling one that intertwines memetics, beauty, and ugliness in the service of contemporaneity.

The etiquette of aesthetics occasions some specificity in defining the often-confused ugly relative to the monstrous. Contemporary ugliness, as defined by figures including Sylvia Lavin and K. Michael Hays, has been used to explain aesthetic effects that evidence the progressive use of techniques and materials.[14] While useful in anticipating newness, ugliness also indicates a certain lack of skill in execution—as early forays into any new technique understandably cannot benefit from a history of cultivated expertise. Ugliness heralds innovation but is a dead end—providing a moment of ecstatic inspiration, shortly thereafter condemned to the diasporas of aesthetic dismissal.

In other words, ugliness is avant-garde but clumsy, and more often than not, permanent—never so excruciatingly tallied as in Churchill's famous "I may be drunk ... but in the morning I will be sober and you, madam, will still be ugly."[15]

Monstrosity, on the other hand, unites the skillful requirements of memetic translation aimed at the beautiful, with the heralding foresight of ugliness. Monsters share none of beauty's uniquely reproductive qualities, but they nonetheless continue to produce reactions of awe and fascination, and tease with what is typically the exclusive domain of the beautiful—the fleeting sublime that, without imagery, can be found in the alliteration of Shakespeare's "Light seeking light doth light of light beguile."[16] Monstrosity, the recombinant offspring of the beautiful and the ugly, is a moment of exquisite expertise, a beautiful meme twisted into an entire new genus of aesthetic speculation.

So what are the architectural monsters of today? As a rehearsal of Brunelleschi's quattrocento flirtations with perspective and Alberti's following valorization through supportive publication, new techniques of production are being adopted and disseminated into culture at a staggering pace. For the early Renaissance, however, the distances between disciplines were limited, the variations smaller and their migration slower. Today our monsters are being quickly produced, imported, and exported from brazen new genres of exchange between design disciplines—including but by no means limited to graphic design, fashion, toy culture, typography, illustration, cinematography, and industrial design. As the memes of beauty are carried by the current of an increasingly liquid design culture, other fields absorb the scalar and spatial ambitions of architecture—and a new species of space flows back into the profession. These spatial forays fuse again with existing expertise, enabling the production of new architectural matter, currently more monstrous than beautiful yet more expert than ugly. A new generation of architectural designers is emerging from this exchange—an informed, intelligent, and interconnected movement unimpeded by the barriers of aesthetic bashfulness. Monsters are their currency, and contemporary beauties are their aim. Despite their seeming youth they sense change and pursue the irony of replacing criticism's vampires with new monsters—livelier ones, giddier ones, ones wetter, more fresh, more rhythmic—with a new vocabulary of contemporary, democratic, and endless forms, most beautiful.[17]

1 Jeffrey Kipnis, "On the Wild Side," originally published as text for a collaborative exhibition by Fabian Marcaccio and Greg Lynn at the Secession Building in Vienna in 1999, republished in Phylogenesis: Foa's Ark (Barcelona: Actar, 2004) 569.

2 Charles Darwin, The Origin of Species, rev. ed. (New York: Norton, 2002).

3 Elaine Scarry writes that "beauty is, then, a compact, or contract between the beautiful being (a person or thing) and the perceiver," suggesting newly recognizable relationships between people, other people, and their surroundings. See Elaine Scarry, On Beauty and Being Just (Princeton, NJ: Princeton University Press, 1999) 90.

4 Ibid., 3-4.

5 Ibid., 3.

6 For the definitive anatomy of verdictive vs. substantive aesthetic judgments, see the chapter "The Beautiful, the Dainty, and the Dumpy" in Nick Zangwill, The Metaphysics of Beauty (Ithaca, NY: Cornell University Press, 2001) 10-23.

7 See Richard Dawkins, The Selfish Gene, 30th anniversary ed. (New York: Oxford University Press, 2006).

8 See Richard Dawkins's forward to Susan J. Blackmore's, The Meme Machine (New York: Oxford University Press, 1999) ix.

9 Ibid., 192.

10 Scarry, op. cit., 3-4.

11 Blackmore, op. cit., 14.

12 In contrast to evolutionary phylectic gradualism, the slow and steady evolution of species, the theory of punctuated equilibrium proposes primarily that evolution happens in spurts. I am proposing this is a far more likely trajectory for the infrequent mutation of beauty, and more specifically that the last decade of architectural production has been among the most productive aesthetic spurts in centuries. See the recently elaborated text Stephen Jay Gould, Punctuated Equilibrium, 1st paperback ed. (Cambridge, MA: Belknap Press of Harvard University Press, 2007). Originally found in Stephen Jay Gould, The Structure of Evolutionary Theory (Cambridge, MA: Belknap Press of Harvard University Press, 2002).

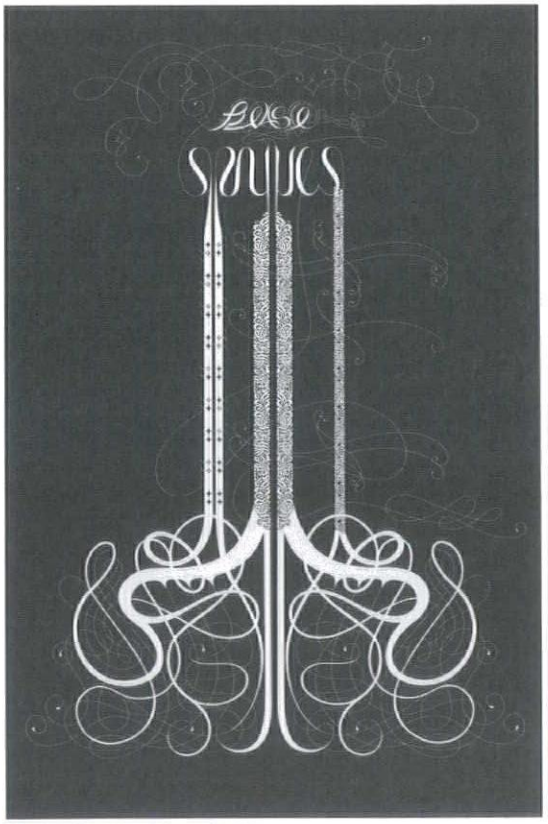
13 Scarry, op. cit., 3.

14 Sylvia Lavin introduced me to this reading of ugliness during the final symposium discussion for "Seduction: Form, Sensation, and the Production of Architectural Desire," held at the Yale School of Architecture, January 19-20, 2007. It has also been referred to by K. Michael Hays in his published discussion with Hansy Better, Robert Campbell, Dan Monroe, Elizabeth Padjen, Louise Sacco, and Deborah Weisgall in "Pretty Ugly," Architecture Boston (May 2006): 18-24.

15 Quoted from the famous, if not apocryphal, conversation between Winston Churchill and Elizabeth Braddock.

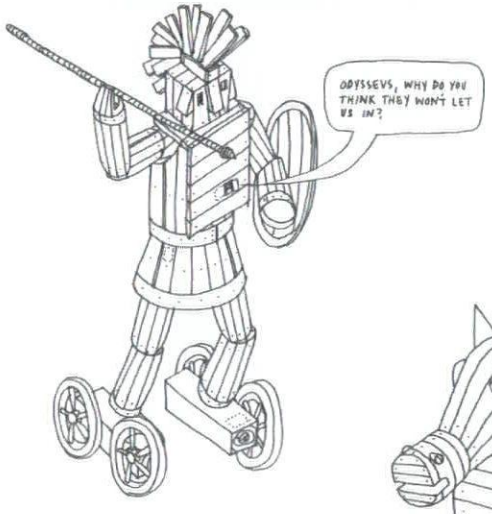
16 See Harold Bloom's exquisite unpacking of Shakespeare's "Love's Labor's Lost," in Shakespeare, the Invention of the Human (New York: Riverhead Books, 1998) 126.

17 Borrowed from both Charles Darwin's observation "From so simple a beginning endless forms most beautiful and wonderful have been, and are being, formed." See Charles Darwin and Philip Appleman, The Origin of Species, rev. ed. (New York: Norton, 2002); and Kipnis, op. cit.



Marian Bantjes, Please Say Yes.

Agency



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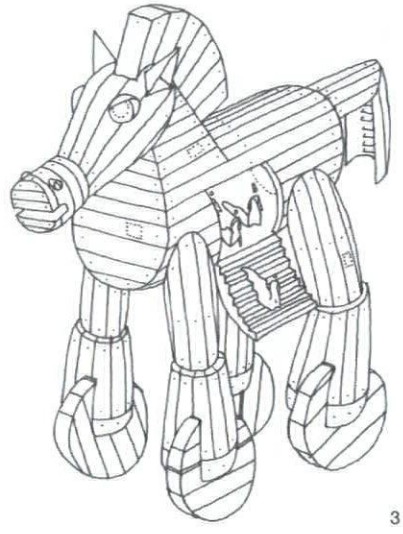

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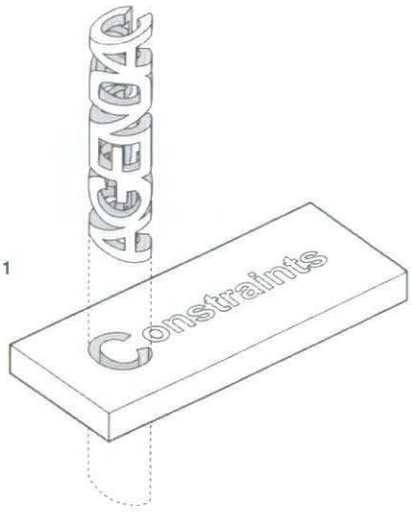
Every architectural practice has an agenda. For most contemporary architects, the agenda is formal. REX is fundamentally driven to challenge and advance type; we feel it's time for Architecture to do things again, not just represent things. But realizing any agenda in architecture—formal or social—is difficult. The modus operandi revered by our puritanical profession is to hold fast to one's vision, denying any accommodation of the Owner's realities for fear of compromise. This leads to a lot of unhappy architects, unhappy clients, and unfulfilled desires. We believe architectural agency can be resurrected if piggybacked upon the Owner's needs. Metaphorically, if the Owner's constraints form a round hole, why not pick an embodiment of your agenda that is a round peg? Then your vision will slip right through the Owner's needs without either being compromised. Fig. 1 Said more provocatively, if you want to get your soldiers into Troy, would you really roll a huge, wooden Greek soldier up to the gate? Fig. 2 Museum Plaza is a Trojan horse, but one filled with maidens, not soldiers ... Fig. 3



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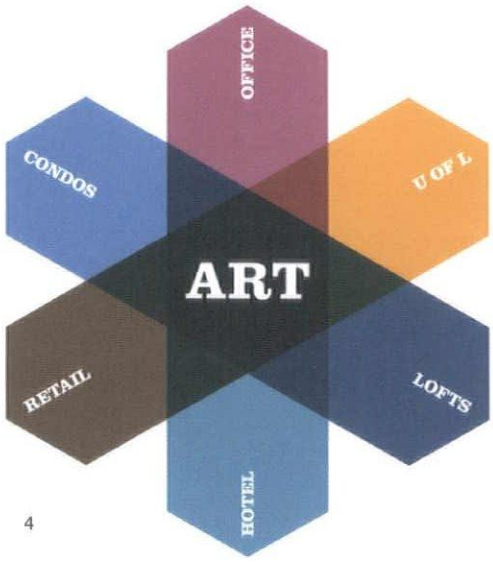
Two years ago, we were approached by an unusual, four-headed client. Two of the heads were a married couple with seemingly unrelated passions: contemporary art and saving Kentucky's horse farms from suburban sprawl. The third head was a developer who builds hotels in Southern Indiana and Northern Kentucky. And the fourth was a young lawyer and a leading Midwestern expert on tax-increment financing.

The client approached us with an even more unusual request. The couple wanted to build a 35,000-square-foot, contemporary art institution in downtown Louisville. Though the couple had the money to pay for it outright—she was an heiress to the Brown-Forman liquor fortune—they dared instead to demonstrate how wealth can be used as leverage to induce cultural benefits and to revitalize downtowns. They therefore assembled a client team to construct a for-profit development, the profit of which would go to offset a large portion of the capital cost of the art institution. With the exception of the art institution's size, they had no preconception of what or how much they would build. Only later did we realize how the project intertwined the couple's passions: by building a for-profit mega-structure with art as its physical and metaphorical center, they would simultaneously promote contemporary art in Louisville and divert development from rural areas back to the Central Business District. Fig. 4

Sliding a Round Peg through a Round Hole: Museum Plaza[1]

Joshua Prince-Ramus



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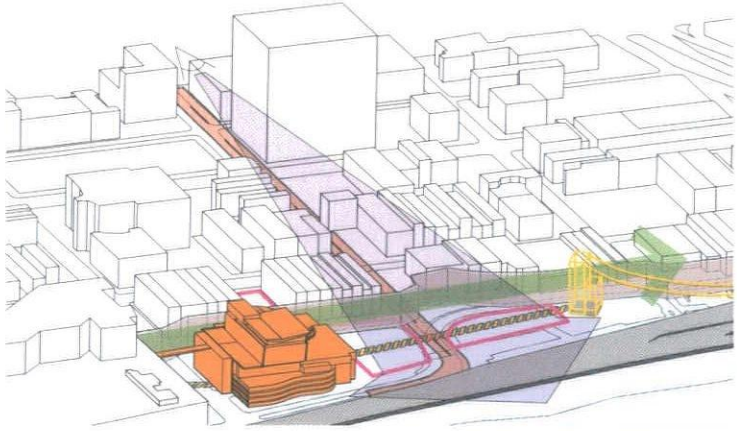

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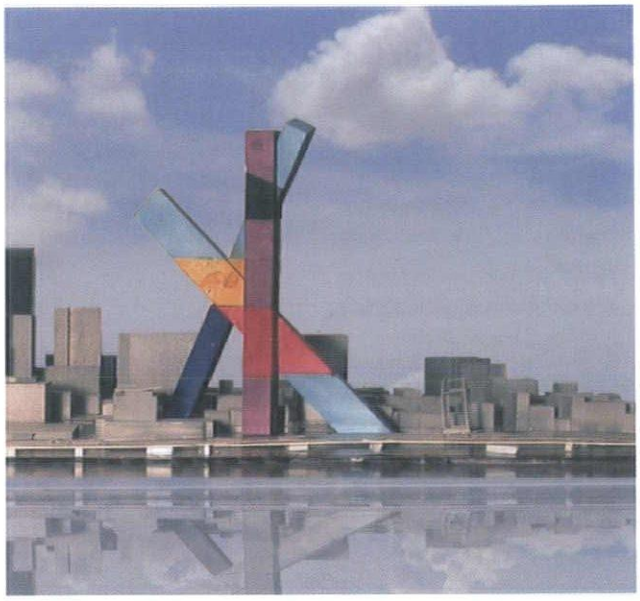

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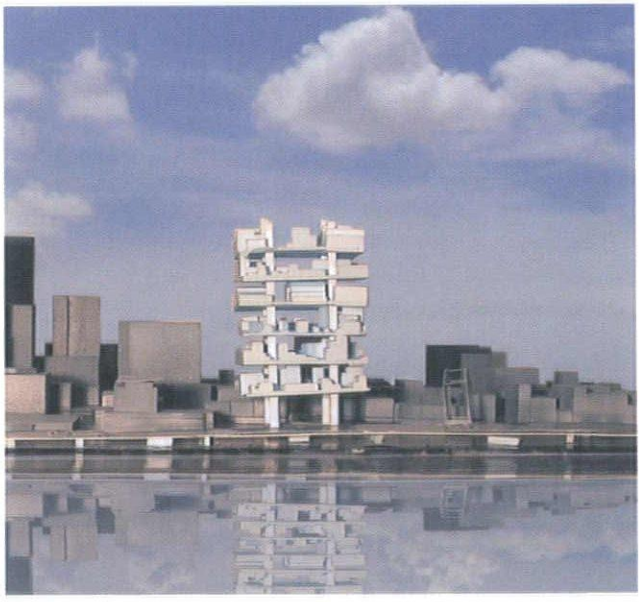

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The physical constraints were significant. Fig. 5 First, our site included three discrete parcels. Seemingly impossible to develop, the City sold the parcels to the client for one dollar. Second, the site was adjacent to the Muhammad Ali Center, an important, new civic monument which had to be respected. Third, we were operating in an active flood plain. The two larger parcels were bound to the south by a 25 to 35-foot-high concrete flood wall. The Ohio River floods these parcels two or three times a year, sometimes as high as 15 feet. Fourth, the two larger parcels were bound to the north by I-64, an important—and loud—east-west highway running through the Midwest. Fifth, 7th Street, the main arterial connecting downtown to I-64, bisected the two larger parcels. Sixth, the Louisville Gas and Electric duct bank divided the larger parcels into quadrants. If we were to disrupt the duct bank, we would cut power to downtown Louisville for up to nine months. Seventh, the City asked us to provide an east-west pedestrian corridor that extended the existing Belvedere. And eight, the City required that we maintain the existing view corridor to the river. As you can see, we were working within a noisy, wet bucket, separated from the CBD by a concrete wall, and compromised by City infrastructure.

The economic constraints were equally significant. To meet the challenge posed by the client, we had to invent the program for, and realize, a mega-structure that overcame the site constraints, and which produced enough profit to offset a significant portion of the art institution's costs. In collaboration with the developer and his in-house team, we derived the project's size and programmatic mix through an iterative design-calculate-design-calculate process. Ultimately, the pro forma dictated a 1.1-million-square-foot development. To avoid over-saturating the market, it was necessarily multi-use, including luxury housing, offices, hotel, lofts, retail, a component of the University of Louisville's MFA program, and the art institution.

During Concept Design, we performed two simultaneous investigations: one focused on the building's overall organization, and the other focused on the art institution's core concepts. If we couldn't adequately resolve the site and economic constraints of the former while generating profit,the project would terminate and we would lose the opportunity to advance the latter.

While playing with the pro forma, two building organizations eventually stood out. One had very clear structural advantages, performing like a tripod that touched each of the three sites. Fig. 6 By leaping over the floodwall and connecting the bulk of the project to Main Street, this organization also had positive impacts on the pro forma: the office and hotel components could be rented as Main Street properties. This scheme was structurally sound when complete, but due to its inclined legs, incurred insurmountable temporary-shoring expenses. The other organization naïvely stacked six of Louisville's city blocks atop one another. Fig. 7 Like the first scheme, this posed nightmares for vertical circulation, but the potential of replicating the urban fabric vertically was compelling.

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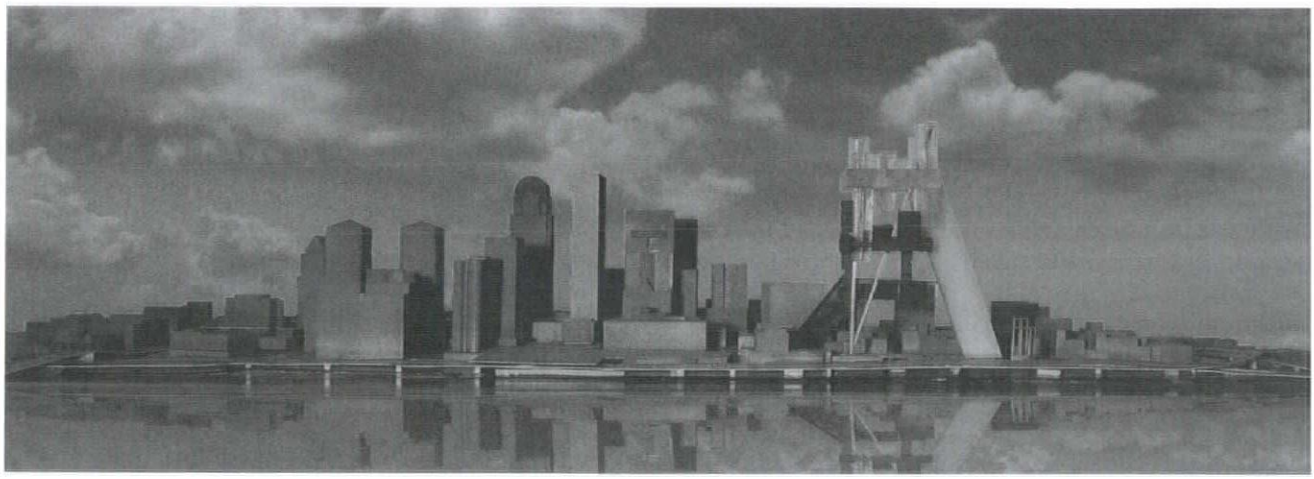

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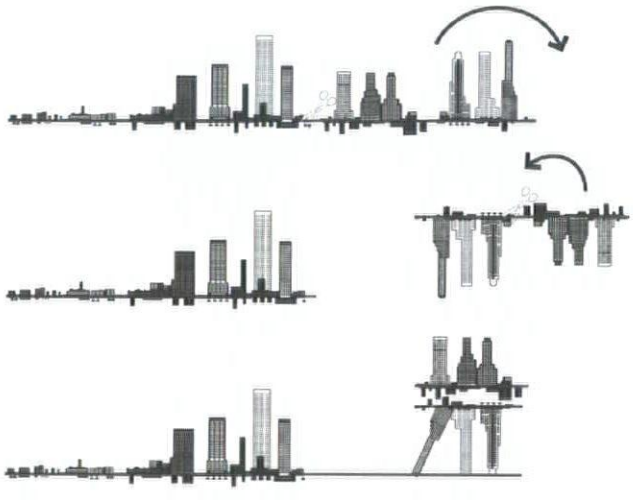

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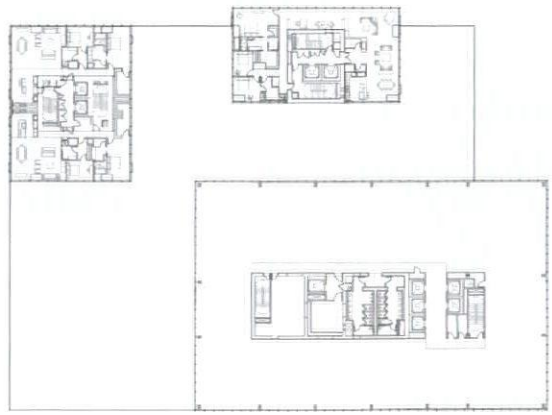
Ultimately, we created a hybrid that stole the most promising qualities from each. Fig. 8 We didn't know if this "thing" was a building yet, but we liked the collisions between culture and commerce that it nurtured, and we could prove that it was fundamentally buildable. From a costing standpoint, the redundancy of its four plates was extremely inefficient, so we packed them together into what we now call the "Island". Fig. 9 The conclusion of our investigation was the following diagram: cut out a portion of Louisville's skyline, turn it upside down, and flip half of it back on top of itself. Fig. 10 The study models that ensued began to look a lot like the final design: generic, speculative towers with a really dense, urban condition in the center.

Through this process one would expect that the developer was the client representative most difficult to please. While the couple was providing the financial backing, they relied on the developer—with the help of the attorney to secure public funding—to pronounce if the project was even feasible. Latent beneath the massing studies were three design strategies that identified, then appeased, the developer's fundamental concerns about the project's economic viability. By pursuing these issues doggedly, we arrived at solutions that we would never have otherwise conceived. And in the end, the developer was actually an important ally in convincing the other members of the client team that the design was "beautiful." How perverse is that?

The first strategy focused money where it should be intelligently spent. In our early studies, the towers were too articulated; their "design" negated any profit they might produce to pay for the complexity of the Island. The developer came back to us and said, "If the pro forma is really going to pencil out, then the towers must be dumb boxes." We therefore collectively agreed that the five towers—two luxury condos, one loft, one office, and one hotel—would be profit machines conforming to the ideal floor shapes, areas, and quantities dictated by the market. Fig. 11 Ideally, each tower could be taken to a bank and its financing easily secured because of its obedience; the unusualness of the overall massing would thereby be rendered irrelevant. By accepting these parameters, we could generate profit to offset the project's architectural "juice": the contemporary art institution, the University of Louisville's MFA program, and the towers' amenities, all marinating within the Island.

The second strategy reduced the client's exposure to market fluctuations. Large, multi-use projects often die on the vine because the developer is forced to set the program in stone before the architect begins. Over the several years it takes to design a building of this size, market forces change and the pro forma upon which the building's initial design was based is no longer ideal. By the time the developer attempts to secure financing, the gamble might not look as good, and parties get cold feet.



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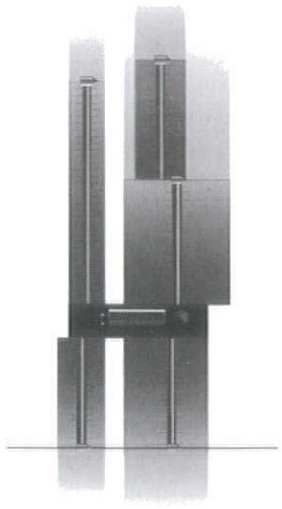
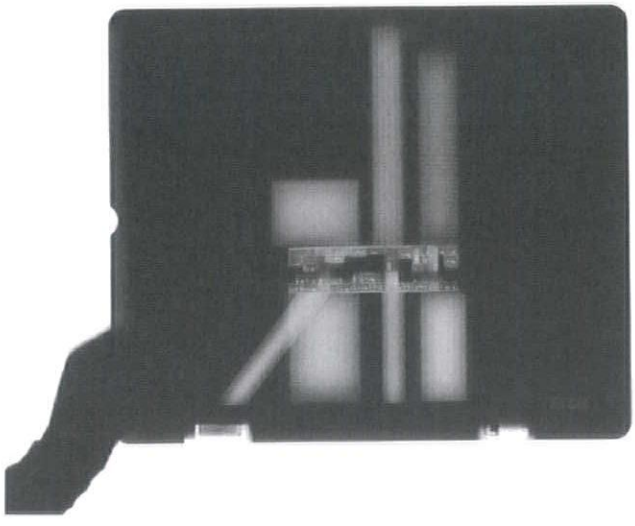


Museum Plaza's massing—its image—is a direct response to this problem. By keeping the "dumb" towers discrete from each other and from the Island, the developer had the freedom to adjust each component's dimensions—sort of like a stereo equalizer—until submitting the building's envelope for wind tunnel analysis. Fig. 12 Every few months, the developer performed a gut check and tweaked the numbers of office floors, the number of keys in the hotel, the number of loft units, etc. The Design Team set performance limits. For example, at a certain height the office block will get too large for the elevator core to provide Class A service; or a luxury condo tower will exceed the core's allowed structural slenderness ratio; or the condo towers will begin to resemble the World Trade Center's twin towers. But anything in between the upper and lower limits was fair game for the developer. The client's market exposure was reduced to only three months: from the moment the exterior envelope was set to the time we were able to use the wind tunnel information to finalize the foundation design and start construction.

The third strategy reduced the client's overall financing exposure. While many projects are "fast-tracked," Museum Plaza's organization is explicitly conceived to maximize the overlap of design and construction. If you were to X-ray the building, you would see that all of its intricacy is isolated within the Island. Fig. 13 With our engineers, we developed the most efficient structural cage, suspended in the air on the three cores. Into this cage, we dumped all the project's amenities, and therefore all of the project's difficulties, such as exiting, circulation, and security. Because these programs were consigned to the Island—whose structure was pre-determined—we were able to suspend their design (and temporarily ignore their problems) and rapidly advance Construction Documentation of the towers and foundations. The General Contractor was able to get into the ground over a year before we finished the Island's tender documents.



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For these three reasons, architecture didn't come at the expense of—or at odds with—the developer's needs. We therefore didn't get mired in the typical arguments about form. There were other possible organizations and massing solutions that could have solved the site constraints, economic constraints, and developer's issues; this is the one that we felt was the most beautiful. Figs. 14–16 But since the building's massing concept grew in direct responses to the developer's concerns, we didn't have to justify why we preferred this massing to any other. He was elated. And the result is that we bought time and resources to achieve the project's initial premise: a world class art institution.

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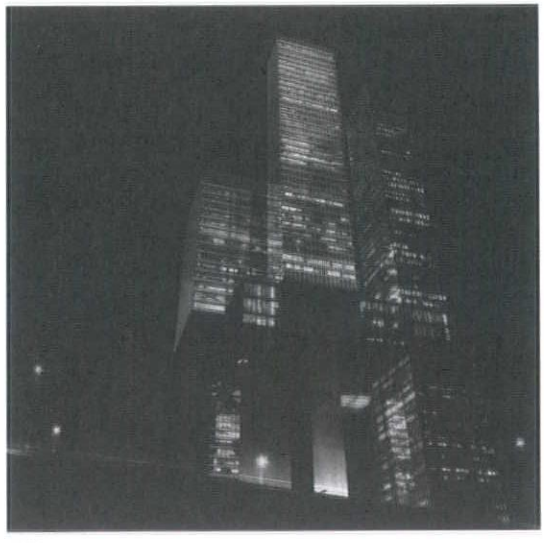

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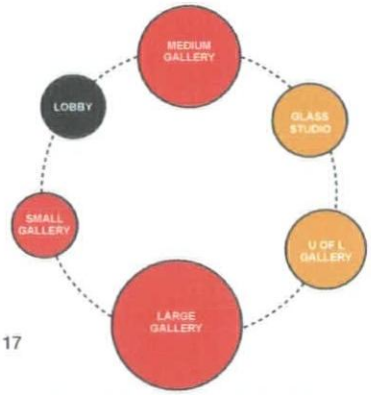

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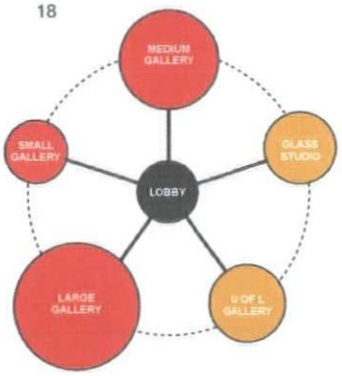

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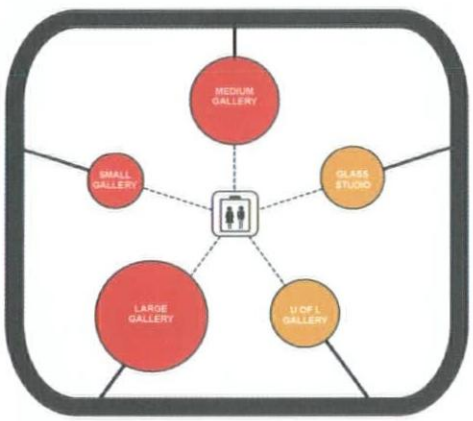

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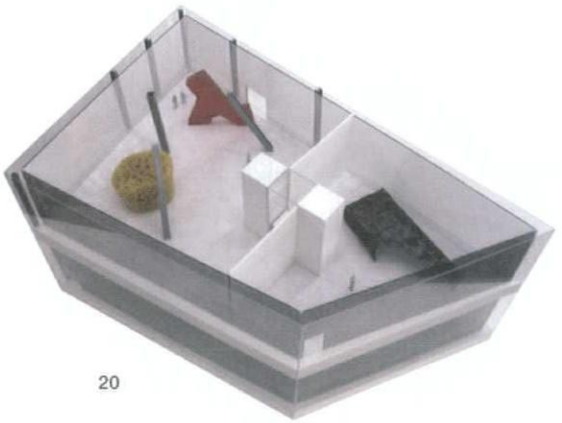

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In many ways, the first investigation set up an ideal scenario for pushing the agenda of the second: the mix of uses in the building, and their collision within the Island, lent themselves to questioning the contemporary art institution's typology. In most large developments, culture is an afterthought, a bone thrown to mollify the municipality. At best, the mix between culture and commerce is parasitical, such as in MoMA's or Carnegie Hall's condo towers. Museum Plaza created an opportunity to mix culture and commerce in a legitimate, mutually beneficial way. After touring notable precedents in the U.S. and Europe with the client, we identified three cores issues confronting contemporary art institutions, and took positions on these issues that we used to evaluate all subsequent proposals.

The first issue addressed the problems associated with a forced, linear procession. The conventional museum sequence is a lobby that starts and concludes a linear loop of galleries. Fig. 17 This compulsory circulation causes major curatorial and operational problems for its institutions: they must use all their galleries at once and cannot easily subdivide their space for simultaneous shows. The most obvious example is the Guggenheim: it simply can not exhibit a small show—or a host of small shows—within the main space. The drum's spiral and size demands blockbusters. All institutions with this sequence have to continuously "feed the beast," exhibiting blockbuster after blockbuster after blockbuster. And they have to support organizations capable of managing shows this size. We sought a lobby / gallery arrangement that would grant the freedom to use only one, or two, or three galleries; or to allow multiple, concurrent shows. Not surprisingly, our initial response was a hub and spoke system, with the lobby centered within a loop of galleries. Fig. 18 Once we started to design, however, we discovered that placing the lobby on the perimeter of the galleries, though unconventional, actually provided the most flexibility. Fig. 19 We extended the notion of lobby to include all non-ticketed areas, including store, auditorium, education, and event spaces. The perimeter lobby accesses any portion of the galleries, and can easily support multiple shows.

The second issue confronted the tension between capital costs and operational costs. Americans love putting their names on things, and are willing to donate a lot of money to do so. But we no longer deem sponsoring an institution's annual operating budget as sexy. This dichotomy has not yet adequately informed the design of cultural institutions. In new construction, the exuberance to build "the biggest and/or best museum ever" bequeaths an operational behemoth onto the new museum's director and infrastructure, with little or no means for perpetuating financial support. The two normative gallery typologies—the white box and, since Bilbao, the articulated box—exacerbate this problem. With the white box, a director must spend copious funds to invent unique environments for each new show. With the articulated box, a director must spend copious funds to quiet the overriding voice of the architecture for each new show. In all the precedents we visited, either gallery type taxed its institution's operational budget beyond its limit. We sought a hybrid that combined the white box's flexibility with the uniqueness of the articulated box, thereby requiring limited operational funds. Could we spend capital costs on infrastructure to limit operational costs? We learned a lot from the Whitney's main gallery: it's a big, reconfigurable box made remarkable by Breuer's oculus. Our response was what we termed the "Gallery Dump": two floors of banal galleries that can be subdivided with movable display walls. Fig. 20

The third issue, and probably the issue most important to our client, recognized the conundrum that many living, contemporary artists do not want to operate within institutional walls. How do you allow a contemporary artist to operate on real life, on real community, on real activity, while exhibiting within an institution? Our position began within a naïve collage, whereby a gallery was placed next to a swimming pool. Fig. 21 In this image, an artist who wants to operate within the pool can slide the glass wall open and co-opt it. Security requirements and environmental control pushed the promise of this collage to a much more exciting idea. In the 1990's, 3M developed a simple film, often placed on buses and trams, with a dramatic optical effect. A basic dot matrix, when rendered in color, is perceived by the brain as opaque; when rendered in black, the brain fills in the black with the image behind and perceives the matrix as transparent. By adapting this idea to the perimeter of the Gallery Dump, we were able to bleed culture and commerce together without compromising the galleries' performance. Using a ceramic frit that is black to the exterior of the galleries and white to the interior, the art is visible from, and infused with, the everyday activities of the hotel, offices, condos, and lofts. Fig. 22 Yet, it maintains the pristine quality of the white box for the art patron. Fig. 23

These three positions led to the final concept design: the Gallery Dump in the center, surrounded by the non-ticketed cultural spaces and the commercial amenities. Fig. 24 The non-ticketed zone serves as the main circulation for the entire Island. Its ultimate architectural manifestation is a plate, bent to tie the cores together Fig. 25, as well as reach the cardinal points of the galleries and commercial areas. The central galleries and their glass walls create a space for art that is not an enclosed temple, separate from life and commerce, but one which allows a range of interactions with art, from the peripheral to the engaged. The galleries' translucence allows art to perform in a whole new way—to both "see" and be seen—generating a new kind of energy and interaction between the art and the viewer.

In Museum Plaza, our agenda was to challenge the museum typology. To do so, we had to first invent the program for, and then realize, a vehicle for this to happen. The reward met both the client's desires—a structure that literally and metaphorically places art at its center and inserts 10,000 people per day back into the CBD—and our own—a structure that engenders real dialogue between culture and commerce. Fig. 26 This is architectural agency.

1 Adapted by the author from the Eero Saarinen Lecture delivered at Yale University, October 29, 2007.

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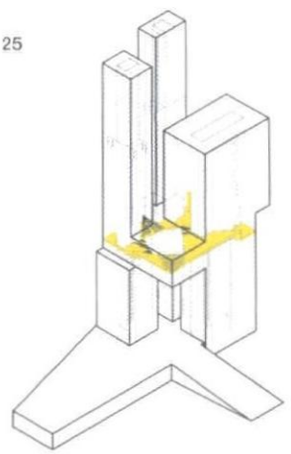

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Ugly?

REX, Museum Plaza, Louisville, KY, 2011.

'You are playing a fool's game.'

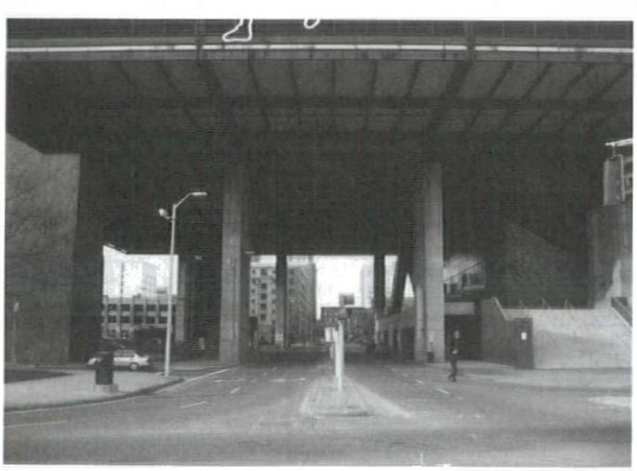
A Public Exchange Between
Mark Foster Gage and Joshua Prince-Ramus
on Museum Plaza and Beauty

October 29, 2007

Mark Foster Gage I want to ask you a question about the Louisville project. You tried a number of different things, but you said that you selected this final version because it was the most beautiful. What do you say to someone who says, "No, that is ugly"?

Joshua Prince-Ramus I say that is why we don't play that game. With any project, some people will think it is beautiful and some people will think it is ugly. The worst thing you can do is create architecture based on beauty alone because, by definition, you are playing a fool's game. It's not to say that beauty is not an important issue, but you have to take the debate out of that arena. You still do what you think is beautiful, you still have your own personal aesthetic agenda, but that is not what you are debating with the client.

What do you do when you stand before a client and you have based your argument on beauty and they say "I think it is ugly"? YOU ARE SCREWED. It is much more powerful to know what you think is beautiful and be able to justify it on issues that simply have nothing to do with that. One of the weirdest things about Museum Plaza in Louisville is that we never once had a discussion about beauty with the developer. How weird is that? It just wasn't an issue.



Kevin Roche John Dinkeloo and Associates, New Haven Veterans Memorial Coliseum, New Haven, CT, 1972.

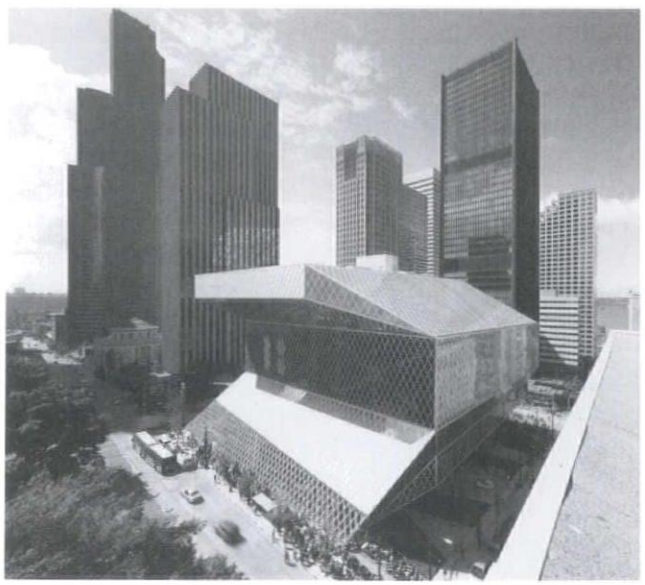
To my partner Erez Ella's credit, I have to temper what I say slightly. I was once quoted in a conference about our process being hyper-rational, and now that quote has been repeated over and over again. When I got back after the conference, Erez took my head off and said, "You misled everyone because it makes it sound like we don't care about beauty," and he was right. We do care about beauty. A lot. The difference is that we simply don't discern between anything that produces performance. Sometimes beauty is the issue that produces performance. There will be times when we will generate projects solely based on their beauty. There will be times when the performative issue will be program. Sometimes it's 10% program, 40% organization and 50% beauty. There will be times when it's 5% beauty, 85% organization and 10% program. These performative mixes argue vehemently for pulling the debate out of the realm of beauty alone.

MFG But I want to take this back to the question of beauty. With Museum Plaza in Louisville there seems to be an acceptance of a certain level of compromise. You said you had to get rid of all the articulation on the facades and make them six solid Platonic boxes, and that you couldn't get a curtain wall to go around the whole thing, but instead that you had to use a collage of two curtain walls—at what point can one say that this is actually destructive to the city? I am not saying that it is, but the same logic was used years ago for the New Haven Coliseum—a similar attitude about elevating something in the city for a particular reason—and that building, while controversial and nostalgically loved by some people, was hated by the public. I believe impregnating the argument with an aesthetic agenda would have helped the Coliseum, and I would love to hear your ideas about how you reconcile that with the aesthetics of the Louisville project.

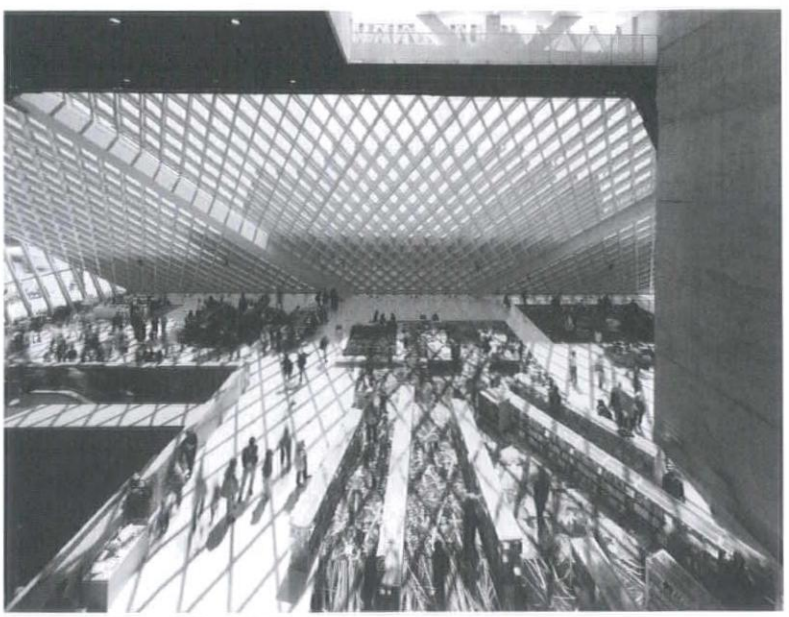
JPR With regards to Museum Plaza, all I can say is, "Only time will tell." Will people fall in love with it when it opens? I hope so. Otherwise we are going to blight the city with this thing that is going to sit there for a hundred years. I can say that there are a lot of people who say it's fucking ugly. There are a lot of people who say it's really beautiful. On that scale, we are getting a strong reaction.

You've asked, "When is it okay to compromise?" We wouldn't see the acceptance of making the towers Platonic in order to make the island exciting as a compromise. We just wouldn't. Maybe we should. Maybe people will look at it and say, "Gosh, the previous iterations were better." But what we see is that the previous iterations will always be paper and we are able to achieve this agenda of actually, legitimately mixing culture and commerce in a really exciting way. Frankly, a lot of the time in the studio we consciously say that we have to tone that project down because it is just too much. We might be wrong, but that is what we believe. We would never see accepting a constraint as a compromise. We say, "OK. Here is a constraint. It's real. Invert it, use it to our advantage, and have it be a catalyst to do something really interesting."

Maybe the best example I can give is the Seattle Central Library. Far and away, the largest reaction to it during design was, "It is terribly ugly and it is going to blight the city." The general public did not inform themselves of the ideas behind the project or understand its performative ambitions. So this remained the reaction of 95% of the people up to Opening Day. On Opening Day, they used it and got really excited with how they used it. They came out and some of them said, "Oh, now I understand it and I am actually intrigued by it." And some of them said, "I still think it is ugly but I don't care." And some of them said, "I still think it's beautiful AND it works." The whole issue of how it was evaluated transformed. People don't talk about that building being a crystalline form any more, except the architectural community. That is how they talked about it up until opening day. Now they talk about it in terms of "Does the Book Spiral work? Does the Mixing Chamber work?" Maybe it doesn't, but at least the debate has completely left the realm of a subjective issue such as "Do I like it or not?"



OMA | LMN, Seattle Central Library, Seattle, WA, 2004.



OMA | LMN, Seattle Central Library, Seattle, WA, 2004.

Scale

Interview with Kevin Roche, 1970
Conducted by John W. Cook and Heinrich Klotz[1]

Heinrich Klotz Johnson and Rudolph think of themselves as artists. What about you?

Kevin Roche I wouldn't want any part of it. I think that kind of description is meaningless. I've been accepting the term "artist" in a very narrow sense. If you use it in the general sense of creativity—sure, fine! But, if one uses it in the sense of making decisions which are essentially concerned with visual aspects of a problem, or in the sense of making an architecture which comes solely from stylistic concepts, from Gothic or two-dimensional or three-dimensional or volume principles, then I simply don't want anything to do with it.

HK And yet, you create architecture which demands visual response.

KR As I have said, that is one of the responsibilities as one proceeds down the path. The total responsibility is much, much greater.

HK That means that when you get to the visual questions, you could go far beyond a functional solution, even far enough to symbolize a force in society. You would not exclude this possibility from the design process?

KR Oh, no. One might even search for it. One needs to find out what "role" a building will play in society. We are talking about a democratic architecture, as opposed to the architecture of a monarchy or a totalitarian state. One architecture must exist for people.

HK But as a pluralistic society?

KR In a pluralistic society, there are multiple needs. In a society which also has an inheritance of violence, and destruction, and fracture of moral standards, architecture must help stabilize. I don't want to say "restore," because that suggests going back, but you should help create a more stable society. It isn't just the business of being visually pleasant, or exciting, or stimulating, or momentarily titillating, or anything like that. It truly has a role, an organizing role, which produces satisfying results for people who live, and for the few years they have to live.

I'm fond of thinking of the island of Manhattan, for all of its faults. It tends to be an unguided prototype of where we're heading. The nice things of New York, and the evil things of New York, will simply spread …

—Kevin Roche, 1970

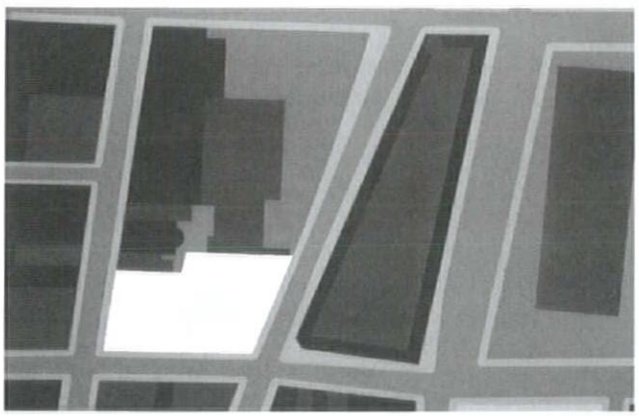
Federal Reserve Bank Tower[2]

John Cook Mr. Roche, New York City obviously raises crucial questions for the architect. The Ford Foundation is your major building there, to date [in 1970]. Among the many New York projects you now have in process is the Federal Reserve Bank Building. What problems do you face in this special case? It is a very unusual solution and surely will raise many questions.

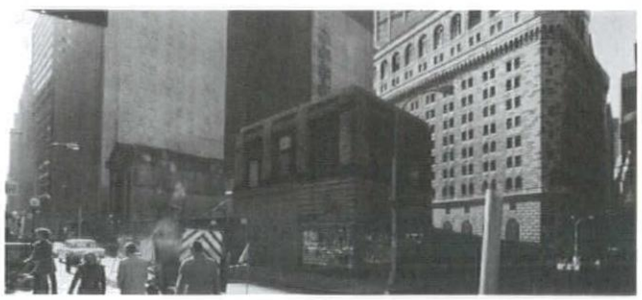
Kevin Roche I can summarize an illustration of the process in a very abbreviated form. As far as the owner is concerned, this is a very simple problem. They want to build 400,000 square feet of office space, just straight office space; they are desperately in need of space. The requirements are very simple, since they have no desire for anything else but this space. However, they would like to be responsible about it in some civic way.

JC Do they prescribe what they mean by civic responsibility, or do they just indicate general sensitivity?

KR No, they just feel something should happen. This is a site in Lower Manhattan.



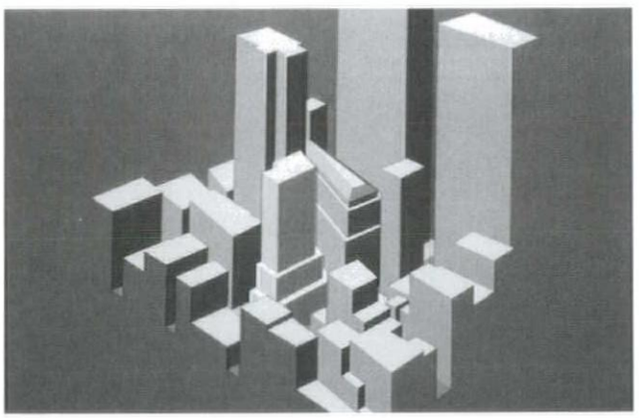
It is approximately 21,300 square feet [area in white] and has an irregular shape surrounded by three narrow streets, Nassau Street, John Street, and Maiden Lane. We are dealing with a block in which there are relatively new buildings, a plaza, and a church which is a landmark. This is the piece of property they have been able to acquire. The building is an expansion for the Federal Reserve Bank, which occupies one of the adjoining blocks.

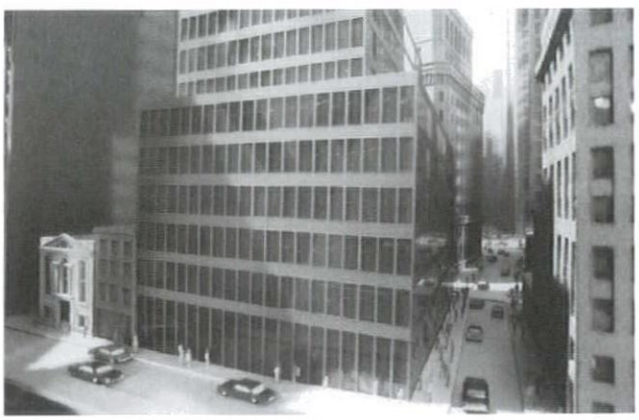


The site has some peculiarities. The problem is to provide the maximum sensible office on a small constricted block, and at the same time achieve maximum public good in terms of open space and proper relationships to other buildings. First of all, the area is very congested. There are street vendors on the sidewalk, which is fine. It is legitimate activity and one would want to encourage it. And there's an extraordinary scene when they close Nassau Street to traffic. Even closed, the population still crowds the whole street.

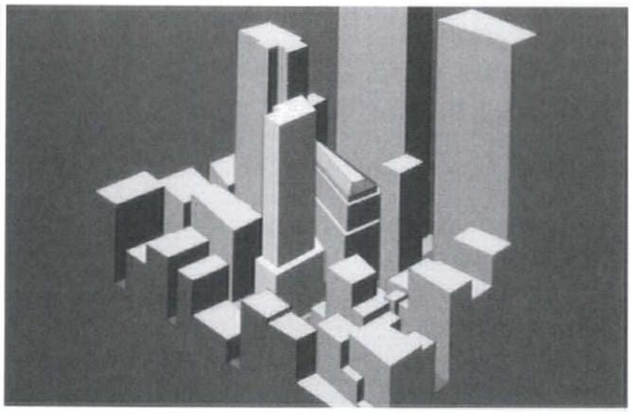
Up to this point, all these people were on the sidewalks. Now, one feels that the public good would have something to do with providing a little bit of space, in this case, on the ground.

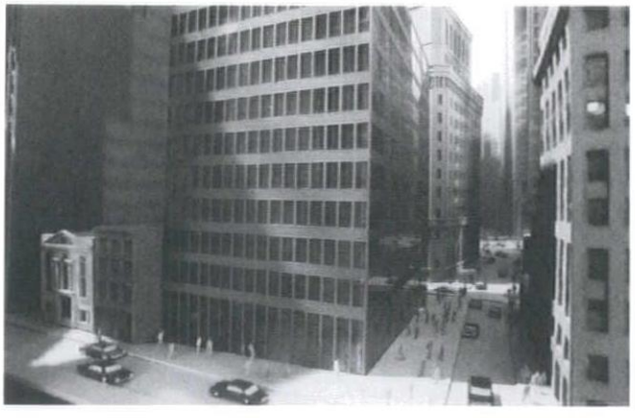
How can this be achieved inside existing zoning regulations, regulations which really work best for usual rectangular blocks? Given the existing zoning laws, there were three basic possibilities. The first is called standard zoning.



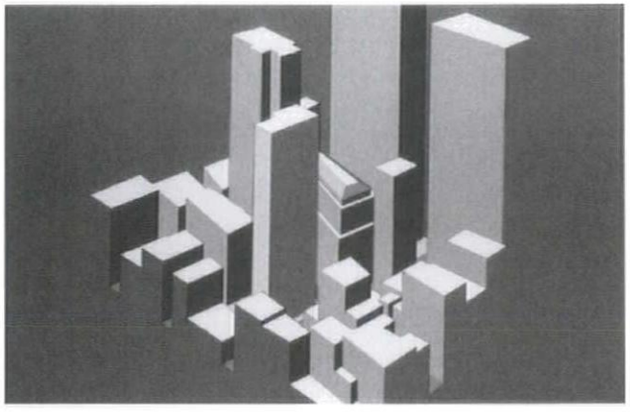


and that means that you build right off the property line. You can go up 85 feet and set back, and you get inside a sky-exposure plane, which is an imaginary plane receding at an angle of 2.7 to 1, until you reach a point at which the area of the building is 40 per cent of the area of the site. For this, you can build fifteen times the area of the site. Now, in order to encourage the widening of the sidewalks and to set back from the street, there is the so-called alternate zoning.





In this, the sky-exposure plane is relaxed and the bulk is increased to a maximum 18 FAR [Floor Area Ratio]. If you do this, and if you provide the required plaza, you can build eighteen times the area of the site. The third possibility permits a sheer tower to be built by increasing lot occupancy for reduction of permitted bulk.



So these are the three basic alternatives. Now we apply these general restrictions to our particular site. With standard zoning, we could build a building which consists essentially of three boxes stacked up. The first box is 6 stories high at 21,600 square feet per floor, the second is 14 stories high at 14,000 square feet per floor, and the third is 16 stories high at 8,500 square feet per floor; this makes 15 FAR. This solution does not fully utilize the site potential, for more than half the floors in this building would be too small to be useful. It provides no public space and generates no satisfactory relationships with existing buildings.

JC What is the total square footage in this proposal?

KR It would be about 320,000 square feet.

JC Wouldn't that be sufficient?

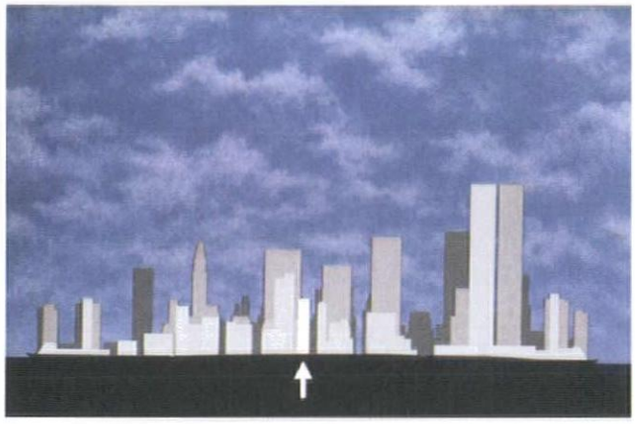
KR Well, it doesn't reach the maximum potential of the site, and it doesn't reach the requirement of the owners, who would like to have about 400,000 square feet. And, also, it doesn't really relate to the other buildings in the area, so there's no reason to build it.

The second possibility would be alternate zoning. It gives maximum bulk for setbacks from the building line and creates a building composed of two blocks, one of 11 stories at 14,000 square feet and another of 28 stories at 8,500 square feet. You get in the same dilemma. Here we could realize 380,000 square feet in bulk, but much of it is unusable because the floors are too small. Also, the relationships to other buildings are really not improved very much.

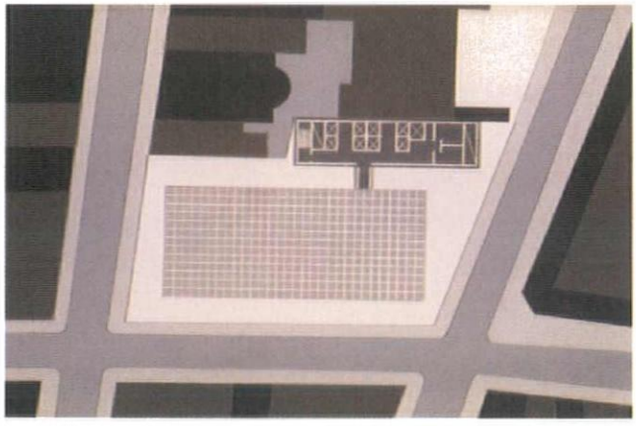
The third possibility would be the sheer tower at 50% of the site. This would give us the first chance to make a rectangular building. The other ones were following the lines of the property, which would result in odd-shaped office spaces very difficult to use. In the tower proposal, we could build 34 stories at 10,300 square feet each, still too small a floor.

With this piece of property, and with the existing zoning, we can't build a sensible building. It is apparent that no satisfactory solution is available inside existing zoning, neither in terms of functional requirements nor in terms of public good. We could build it right off the street, but we would be compounding an already hopeless situation. If we set it back, we improve things a little bit, but then we've broken the street line. On the one hand you achieve something, on the other hand you don't.

This is the point at which you decide there is obviously nothing productive in the existing situation. If we restate the objectives, perhaps a solution can be developed which will make a variance from the zoning ordinances desirable. The first objective which we have to consider is the providing of sensible office space. Sensible office space means a rectangular floor of a large enough area, at least 13,000 or 14,000 square feet. The second objective, in view of the congestion of the area, is to provide the maximum open space that can be provided, possibly landscaped, and certainly accessible from the street. But, in fact, if one were to follow this objective to its logical conclusion, he just wouldn't build the building at all. The third objective has to do with relationships of one building to another. It needs to relate to the tall office buildings on the block and to the other large rectangular buildings in the vicinity, Chase Manhattan and Marine Midland. That's the containment. If we don't pick up the responsibility for establishing those relationships, then it will never happen in New York. The fourth objective has to do with planned development on the lower tip of Manhattan. These are enormous projects, the two towers of the World Trade center near Battery Park, the U.S. Steel Building under construction, and the existing towers just mentioned. Our building will be surrounded by these monsters. They would place us in a hole. From the occupant's point of view, he would be in a canyon.



Let us reconsider the whole project with new objectives in mind. First, an office building has a core. Then, the rectangular floor space should have a minimum of about 13,000 square feet. We place this floor space in the center of the site, but remove the service core of the adjoining building, thus providing clear, unobstructed space with a maximum window exposure.

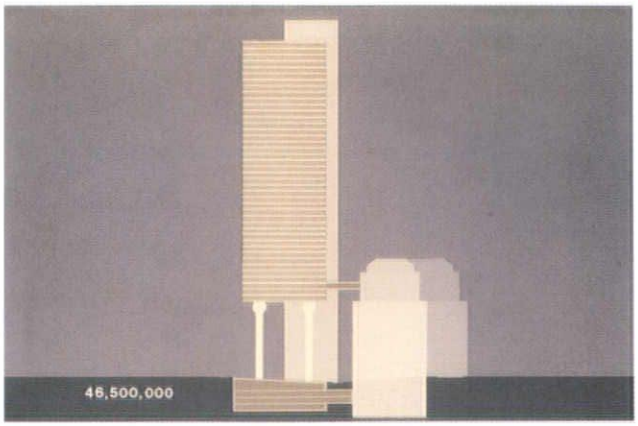


To do this, of course, we have to violate certain setback regulations, but we'll proceed anyway and see how we come out. The resulting building block would normally look like this.

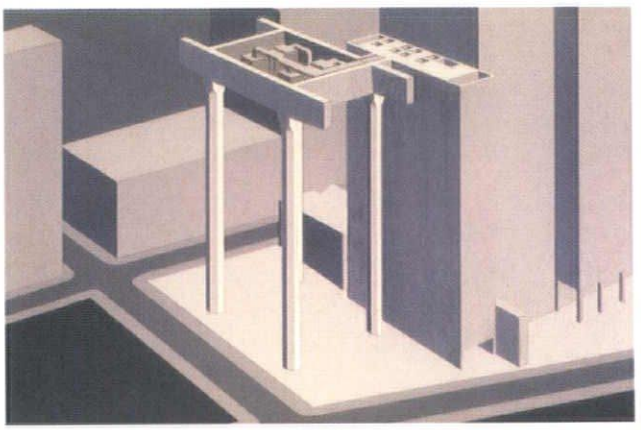
It has some kind of lobby, 20, 30, or 40 feet high. Another objective is to relate the buildings to the old Federal Reserve Bank across the street. After all, they are occupied by the same people.

Now, here's the point where we make the big step. We say we don't want a lobby down there anyway. That's not anything for the public good. Also, we would like to get out of the hole. Let's take the whole building and move it up! Let's move it up to be in line with the cornice of the old building across the street.

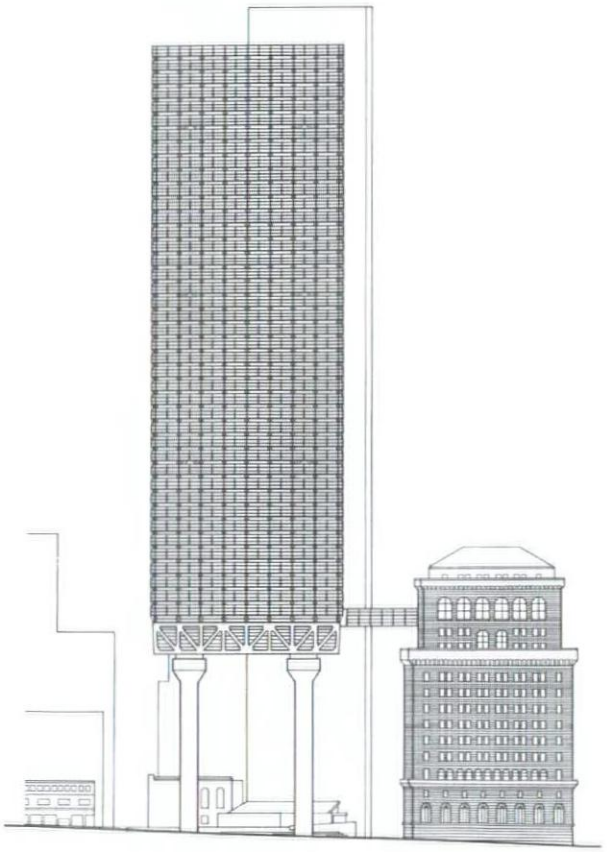
There the building starts. Now, we have space down below which is unobstructed, and a new relationship is established with Chase Manhattan and Marine Midland. The building would be carried on legs 165 feet tall, 11 feet in diameter, and covered with the same stone as the old Federal Reserve Bank. This vertical location is now sufficiently high that, for all practical purposes, the building doesn't exist on the ground, and a public space can be formed.



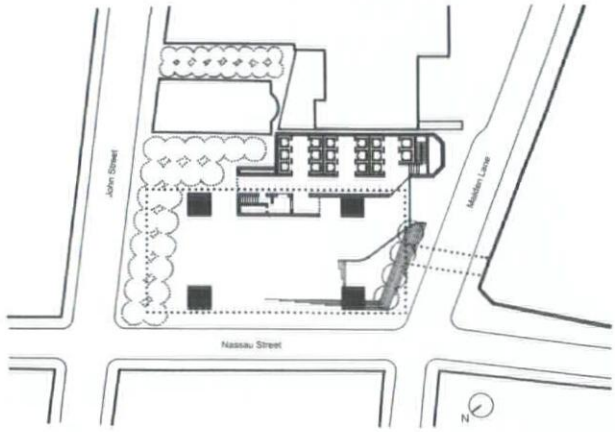
The four columns support beams which enclose the mechanical system.



The office block sits on these beams and goes 31 stories high. This is the building we can build. The public space on Nassau Street can be provided in consideration of certain violations of public zoning regulations.

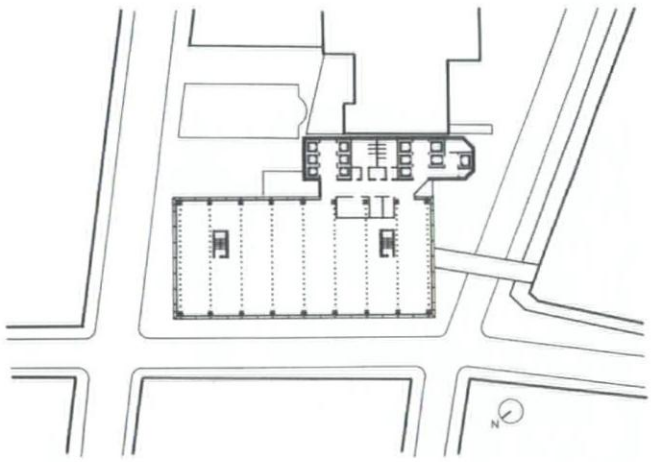


100ft

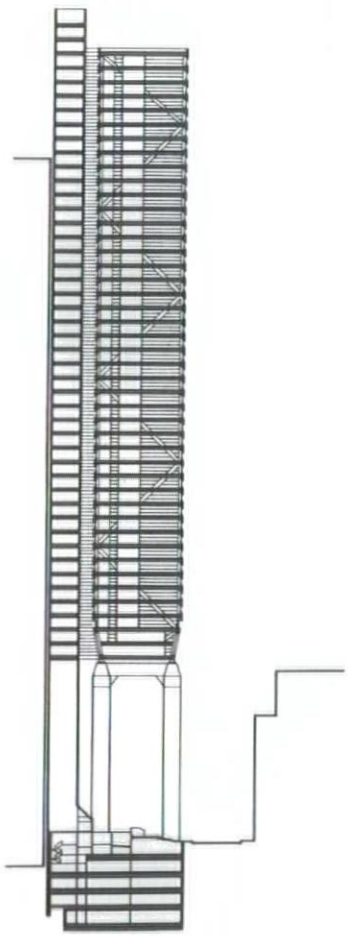


Ground level plan.

50ft



Typical plan.



JC In this abbreviated presentation, you have given us the process out of which this astounding result grew. When the building is completed, the casual observer will not be aware of this background. One first impression will be the strong difference between those very brutalistic legs and the thin glass skin of the building itself.

KR The supporting system is all concrete. The steel structure rests on this. We proposed reflecting glass as a complete skin on the outside so the structure is isolated from the thermal movement. We are shedding the bulk of the thermal load. We would have three different reflectivities at each floor. The lower section would be 100% reflective. The section above the head level would be about 75% reflective. At eye level, the glass would be relatively clear. Every office would be shaded above and below.

JC How do you treat the space beneath the building?

KR The plaza could, of course, be designed in many different ways. It's such a small space that one might use a kind of cobblestone similar to the Swiss or Bavarian towns where you get a moving surface.

Heinrich Klotz No concrete?

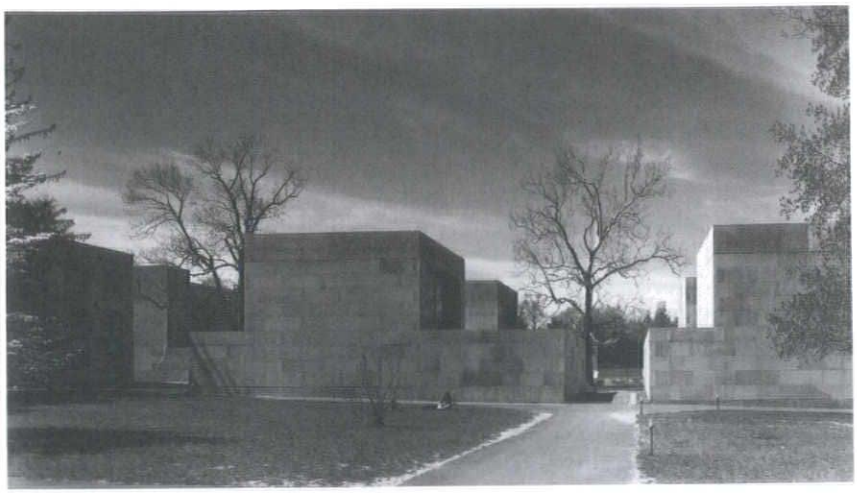
KR No. The plaza is accessible all the time from the street. Of course, the relation of the church building to the plaza is important as well. It's the site of the first Methodist church in the United States. The first two buildings burned down, and this is their third, built in 1850. It's an historic monument. For the plaza, we will provide a very strong central light, so that late in the afternoon there will be some illumination, even in this space.

HK A substitute for the sun.

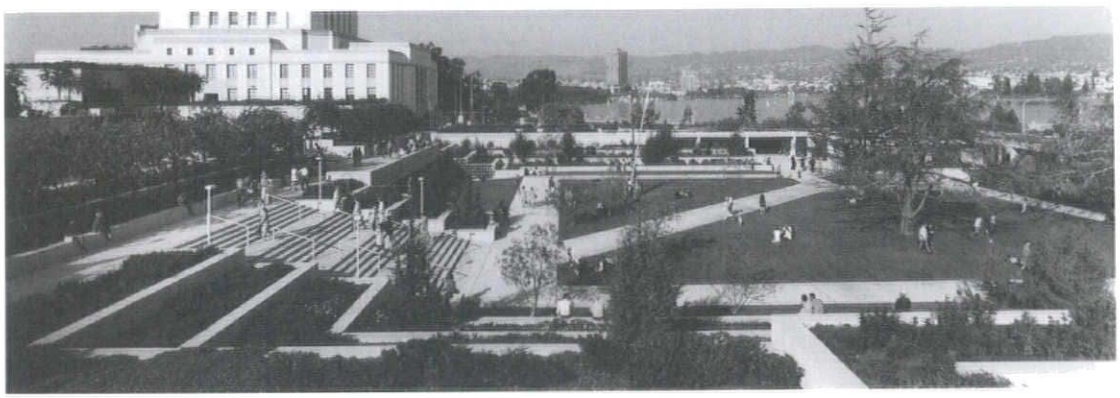
KR The sun cannot penetrate down onto the street.

HK Was there any objection from the clients?

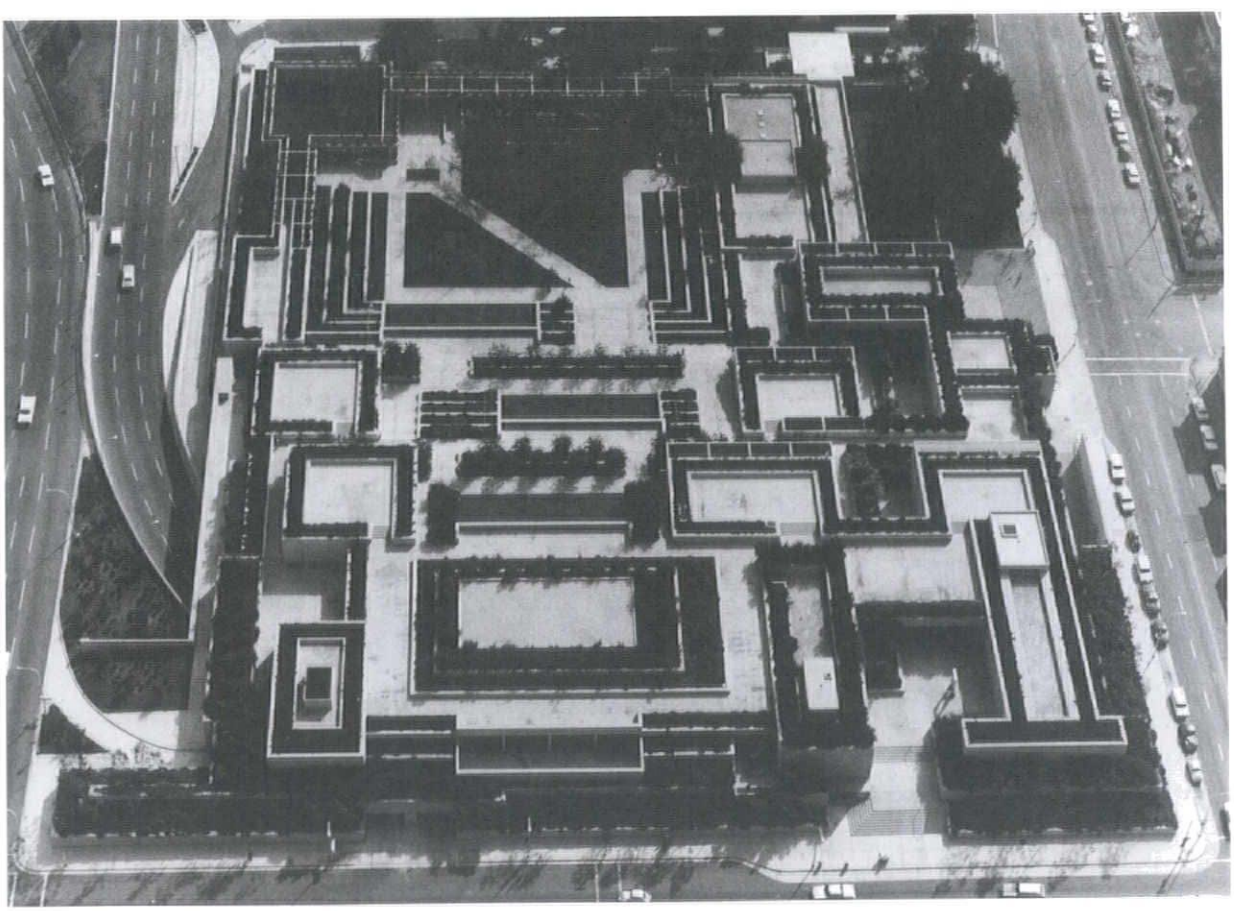
KR The point that you couldn't build a sensible building going the normal way didn't get through at first to everyone. But they finally approved it.



Center for the Arts, Wesleyan University, 1973.



Oakland Museum of California, 1968.

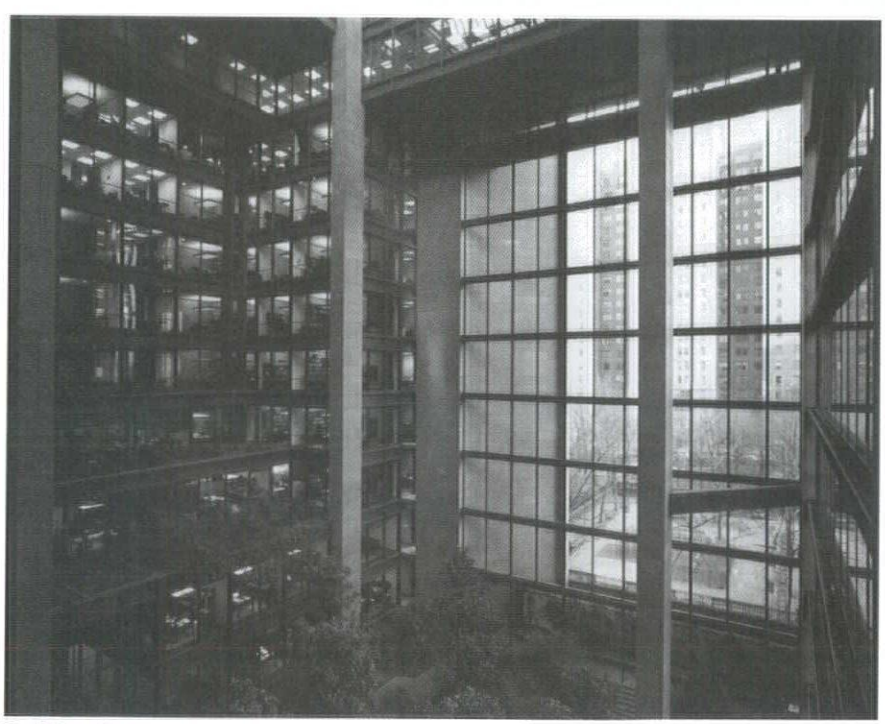


Oakland Museum of California, 1968.

Federal Reserve Bank Tower (unbuilt), New York City, 1969.

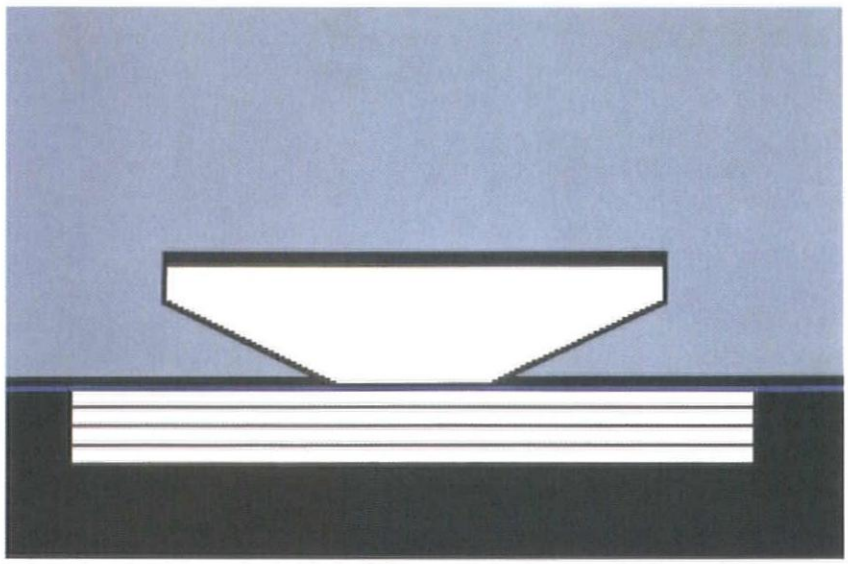
Federal Reserve Bank Tower (unbuilt), New York City, 1969.

Ford Foundation Headquarters, New York City, 1968.

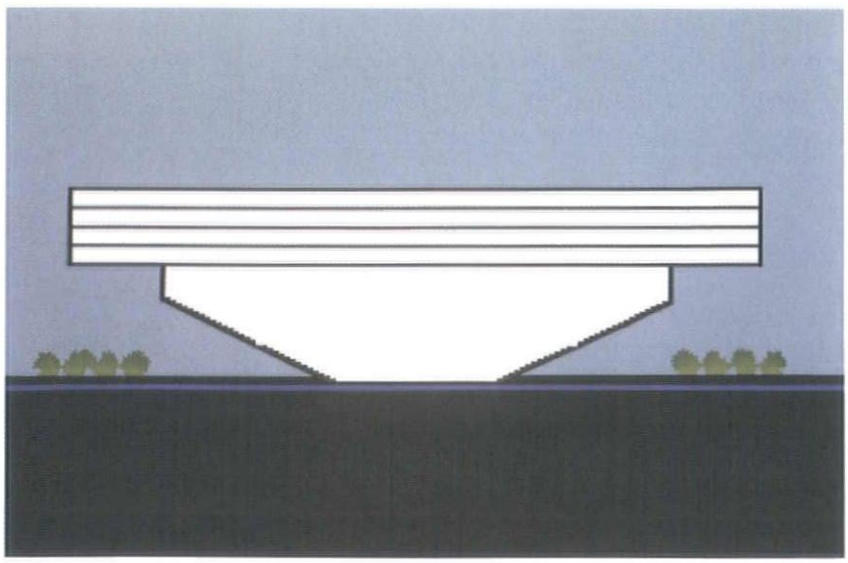


Ford Foundation Headquarters, Interior Court.

Knights of Columbus Headquarters (1969) and New Haven Veterans Memorial Coliseum (1972), New Haven, Connecticut.



"The technical problem we had with the Coliseum was that there was a high water level on the site; we couldn't put the parking underground."



"If it couldn't go on grade, the next logical thing was to put all parking on the top."

Monumental architecture is something I don't want any part of. I don't believe in it. I don't think it has any part in our society ... You now have the aesthetic tools for making larger buildings. How do we go from this small thing to the next thing? Of course we have to have a scale whereby we can build a whole city.
—Kevin Roche, 1970[1]

P40 We see in your work—especially in the late '60s and early '70s—an interesting approach to addressing scale. With the Oakland Museum of California [1968], the large building almost disappears below ground. With the Center for the Arts at Wesleyan [1973], you break the large program up among smaller pavilions. In the case of the unbuilt project for the Federal Reserve Bank Tower in New York [1969], you proposed lifting the building off the ground plane, in a way entirely removing its presence from the street while elevating its prominence on the skyline. How have you approached scale throughout your work, in particular reconciling the monumental with the day-to-day activities of the street?

KR Scale is a very elusive aspect of architecture and of course it relates to the particular nature, use, environment, and location of the building. Scale is something that was very well understood in Classical and Islamic architecture, and while it was fairly well understood in Revival it was always better understood in the original form.

I was fascinated in the mid-sixties by highway construction and by the Golden Gate Bridge—fabulous structure, great sense of scale, perhaps a bit overwhelming when you stand underneath the bridge. In terms of the modern aesthetic it is not so good, but in terms of an abstraction of scale it is absolutely fabulous. The highway engineers, in addition to solving the problem of getting from one place to another, stumbled into large scale by dealing with cost-effectiveness—how to make the longest span in the best possible way—and I found that very interesting as an accidental aspect of our environment which began to emerge after General Eisenhower committed the country to building the interstate highway system.

I use that analogy of the "highway scale" in a building such as the Ford Foundation, which has two different aspects to it from an urban design point of view. It has 42nd Street, which is a large-scale street, and then it has a medium-height residential area adjacent. I use that as a contrast in development to the idea of accommodating the individual. How do you deal with the individual, the one person who is committed to that boring day-in and-day out—working at a desk or now staring at a computer—how do you make something which accommodates the worker and gives a little aspect to his or her life?

We have done this in several different locations by introducing greenery, based on the old Jung theory that humans must connect to greenery or to nature. In the case of the Ford Foundation the site is an urban environment, so on one hand you say, "Let's get something that reminds people of the outside." On the other hand you have this element of the larger scale that deals with the immediate environment and also makes the statement, "Hey! Here I am. This is me. I am the Ford Foundation. I am important." This brings up an important aspect of monumental architecture. Why do we care about scale? Because it arrests us. It makes us stop. We look and we pay attention and the message is understood.

The same applies to the Knights of Columbus Headquarters in New Haven [1969]. The site is next to the highway—the Oak Street Connector. Place yourself in that moment in time, in 1960 when Mayor Dick Lee was trying to revitalize the city. The site that we had was right on the edge of the Connector. The project needed to recognize that. And so this fairly strong set of four cylinders established an identity right there that you are now entering the city—this is the gate, this is the formal entry. Again the scale is modified as you look at it from the cylindrical towers to the smaller scale of sun-shading in the steel, to the multiple floors. The other aspect which I felt was very important was to keep the floors small so that there would be a fairly intimate relationship in the working environment, and there would be wonderful views all around.

P40 In the case of the Interstate Highway, you mentioned cost-effectiveness as one driving mechanism that can help steer the actual form or materials being employed. I wonder if you see anything today, in current work, which is a mechanism that architects like yourself or others are employing in their work to achieve large-scale projects.

KR That is a very good question. I guess probably Frank Gehry is a good example of a person dealing with very large-scale projects such as the Atlantic Yards development in Brooklyn. It is a very, very tough problem. How do you deal with the underlying drive to provide as much possible rental space—which is the reason the project is being built—and at the same time do that in a way that is sympathetic to the community, the urban design, and the humanist aspects of it. It will be interesting to see how that develops; it will be interesting to see how it will be experienced. Certainly he has shown his genius at providing these forms that become interesting.

It is another way of saying "Here I am." When you see this distortion of the rectilinear form into something else, it immediately arrests your attention. It is not the same old cube. It is a twist of a cube, or a bent cube, or a broken cube, an exploded cube or something else and so your attention is immediately attracted to it. You never get the message across unless you wake people up. People don't see architecture. Most people are only peripherally aware of architecture. They don't see any of the details of architecture that we worry so much about. Their preoccupations generally are elsewhere.

P40 Do you think there has been a change over time in how buildings can say, "Here I am?"

KR Oh yes, and there are many, many ways it can be done. It is rather simplistic, but when you have a large building—and the building has a special relationship either to the environment or the city—you have to undertake some method for arresting people's attention, because otherwise it doesn't exist. It only exists when people see it, and this is as old as the profession of building itself. This goes back to when somebody first put one stone on top of two stones and then a king or prince or chieftain or a leader said, "I want more. I want something that expresses my God-like presence."

P40 How do you make that transition from the first monumental gesture that arrests our attention, to more intimate details that relate to the scale of the occupant or user?

KR I like to start not with the person who is hiring us, but with the person who is intimately going to be using the building—in the case of an office building, the office worker. I

have interviewed thousands and thousands of office workers, laboriously asking them "What do you want? What do you see? What do you care about?" and it is a very humbling experience. I recommend it to you when you are practicing architecture to really talk and understand and listen, because we as architects tend not to. We tend to decide "This is what is going to be," but we should never start that way. We should start with the person who has to use the building.

Next you must concern yourself with the person who is going to see the building but not use it, the passerby. Then you begin to consider why this is being built. If it is a purely commercial venture it's one thing. However, if it has a more elevated reason—let's say it's a public building of some sort, a museum or a temple or a church or a monument—then you begin to think of that. Moreover—of course that which we all strive for—is how to achieve the most lasting effect, not in the sense of being overwhelmed, but in the sense of creating an object of real beauty. That is where classical architecture had that great virtue and why it became so popular and why it so relevant even today.

P40 The prioritizing of the user brings to mind Eero Saarinen. Of course, we've heard the stories of when he was doing Dulles Airport in the late '50s, for example, and interviewing every worker about how much light they needed and other details ...

KR I certainly learned that from Eero. I had a brief encounter with Mies where I learned that there is a right and a wrong way, and the wrong way was any way other than his. But Eero didn't have a right and a wrong way. He had an almost research approach to his buildings.

P40 In your work how do the small-scale details fit into the large gesture? Is that a place where you can bring it down to the scale of the individual occupant?

KR Well that is an interesting point because when I started working in architectural offices in 1945 you pretty much had to invent everything from door handles, to door knobs, to hinges. There wasn't anything off-the-shelf. There was no such thing as a Sweet's catalog, for example. In the '60s when we were working on General Motors at Saarinen's office virtually everything was invented—the door pulls, everything. That is quite different now. A curtain wall for instance is really an off-the-shelf element. When you put stone cladding on a building it is an off-the-shelf element. Manufacturers come back with a video showing you how they are going to put on the rain screen and how they are going to do this and that, which 40 years ago you would have had to invent.

P40 One could argue that this is a good thing. Have we as architects lost anything as a result of these developments?

KR What is lost is the individual inventive aspect. What is gained, I suppose is some sort of universal experience, but again what is lost is that everything looks the same. But it is changing, these things gradually keep developing.

This is all by way of saying that the circumstances under which we practice are changing quite rapidly, and of course the use of the computer, which has allowed Frank Gehry and many other people to do what they do, could not have occured forty years ago. I just happened to be flipping through a magazine this morning and someone was saying—maybe Thomas Mayne—that now with the computer every office has the ability to make these odd-ball shapes, so to speak. It is no longer identified with the single creative individual, it is becoming universal.

There was once a time when an architect had a position in society and in the culture, where people recognized that the architect had a right to make decisions and could be relied on to produce a significant work of art. Nowadays you, as an architect, get pushed around by the client—very severely—as if you were a draftsperson and didn't really have any particular skills. It is as if all you are bringing to the table is your ability to work on the computer, and the client is going to make the decisions for you. This is also driven by the commercialization of buildings being built for profit. When they are being built for profit, the person who is in charge of the profit aspect of the project is a controlling voice.

P40 You mentioned earlier some of the opportunities afforded to architects by the computer. Although, as you stated, there may be less autonomy for the architect given the relationship to the public and the client today, could you say that technology, on the other hand, may allow the architect to reclaim the master-builder role?

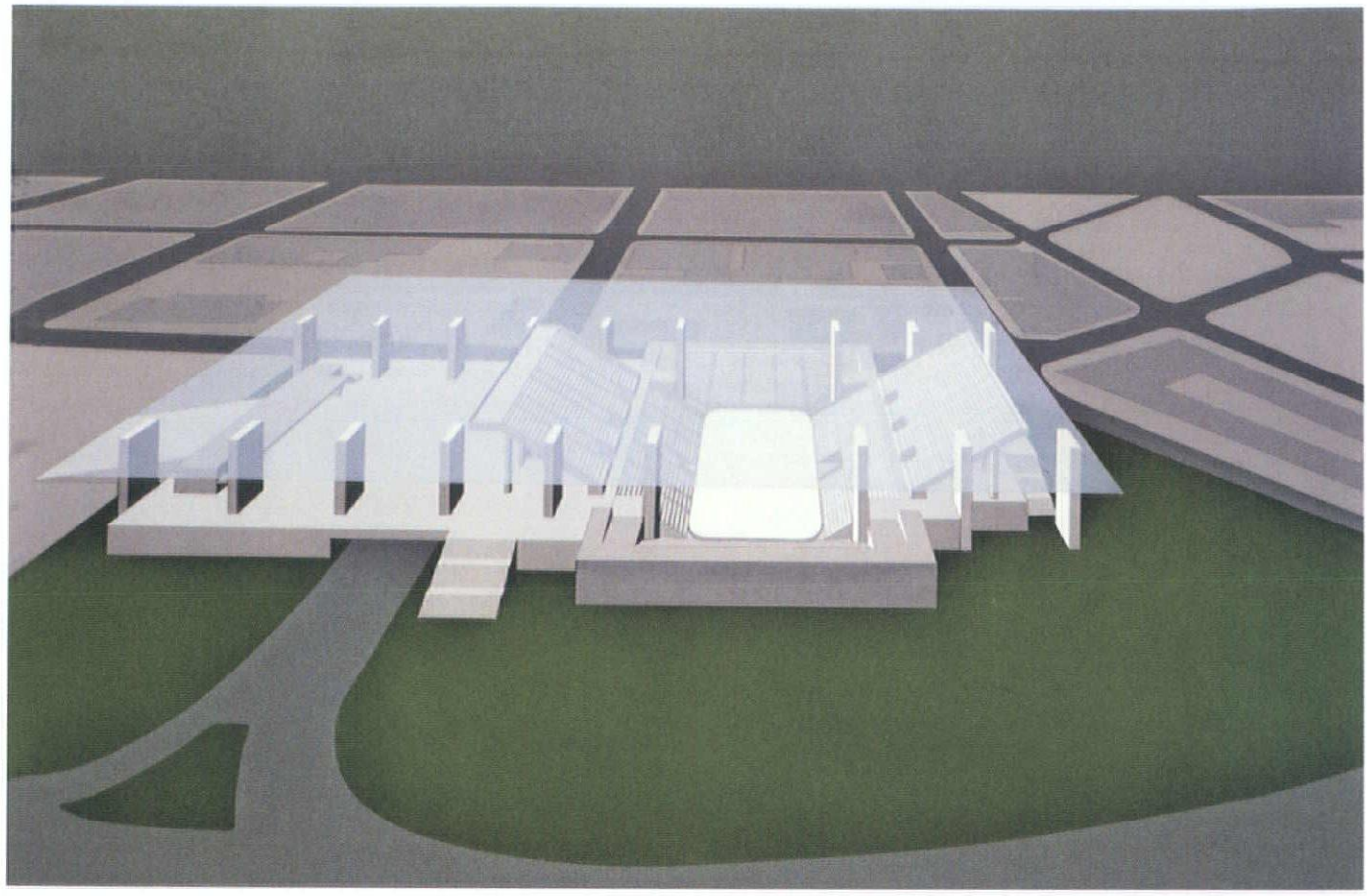
KR It will be very interesting to see what will happen 100 years from now. I think that there is going to be more of what you get in Japan for instance, where you have large construction / engineering/architectural firms with 3,000 employees and the architects are simply cogs in the wheel. They are not what you like to think of yourself as—an individual creator. They are simply cogs in that gigantic wheel which is serving the construction industry, and I think that is what is beginning to happen here.

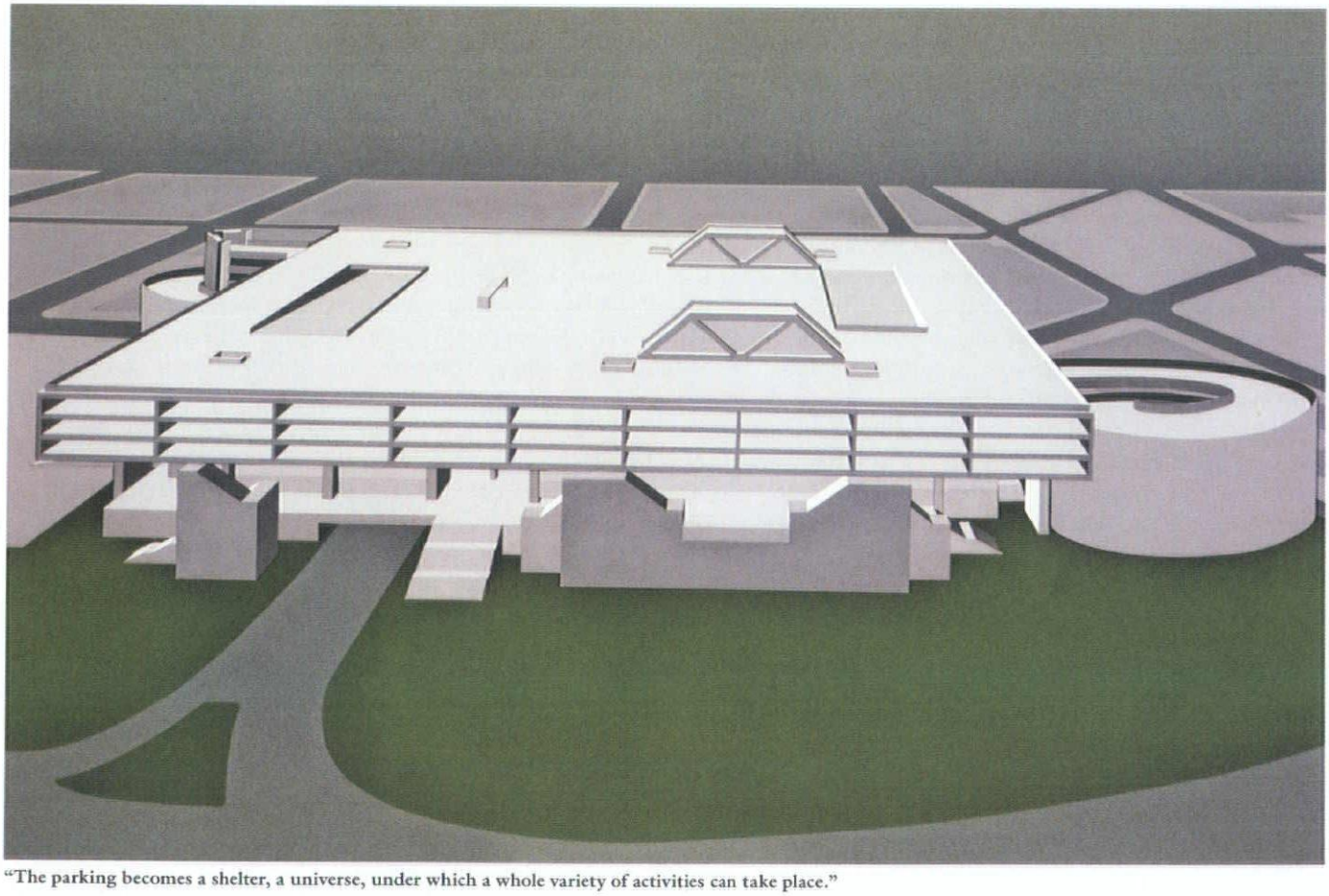
All it will take will be for some of our large architecture firms to stop taking on construction management—which many of them have done already—and then to be bought out by a construction firm. That will give you a full-service entity, but that is a whole different profession from the typical architectural practice we have today. However, this is happening.

P40 Looking back on your work in the '60s and '70s with the City of New Haven—where you built the New Haven Veterans Memorial Coliseum [1972] and the Knights of Columbus Headquarters—do you believe projects of that scale could be realized in a place like New Haven today?

KR It would be very difficult today for a lot of reasons. The first is the reason that I just mentioned. The second reason has to do with the community. You could be building in the middle of nowhere and a community suddenly emerges out of the woods and begins to tell you what is wrong with you. And what is wrong with you is almost inevitable; it is never going to be about what is right with you. You, the architect, are always the wrong guy.

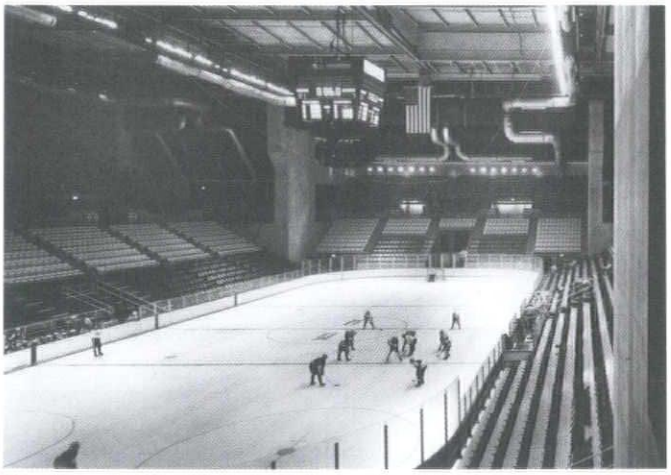
The participatory aspect of architecture—which I believe in and I encourage—is on the other hand a tremendous pain in the neck at times. You get people who have absolutely no idea what they are talking about ranting on and on and on. I'll give you an example. At the Metropolitan Museum of Art in New York they desperately need space, but they have nowhere to expand. They can't go up, so in the American Wing courtyard—we are redoing that at the moment—we are excavating underneath the courtyard in order to provide about 10,000 square feet for desperately needed facilities and storage.





"The parking becomes a shelter, a universe, under which a whole variety of activities can take place."

Millennia Singapore, 1994.



New Haven Veterans Memorial Coliseum, Arena Interior.

New Haven Veterans Memorial Coliseum, Model with Intended Exhibition Hall. ("Unfortunately, the other program elements such as exhibition space never materialized.")

So at the Upper East Side Community Board hearing, I was making a presentation about this and a woman said to me, "You simply don't understand geometry." She said, "If you understood geometry, you would know that if you are building under the museum, you are building into Central Park." I wasn't able to make the connection myself, but she was able to make a very strong point of that, and it took about fifteen minutes to get through it all. That's a pretty good example of the kind of argument that you will get.

P40 And that didn't happen before?

KR No. It did when we designed the original master plan for the Metropolitan Museum of Art [1967].

P40 You worked with Mayor Dick Lee in New Haven during the '60s. What was he like as a client?

KR Dick was great. Wonderful, wide-ranging, fine mind and personality. Dick had a great vision for New Haven. Unfortunately, he retired before he succeeded in pulling it all together, and he was succeeded by a series of relatively less active governments. But he was a visionary.

P40 One of the major projects you designed for New Haven under the Lee administration—the Veterans Memorial Coliseum—was recently demolished. We certainly wouldn't be the first ones to say that this was a remarkable building. Could you perhaps tell us a bit about the project, and what led you to make the heroic gesture of elevating the parking so high into the air?

KR The technical problem we had with the Coliseum was that there was a high water level on the site; we couldn't put the parking underground, and I was concerned that if you put 2,400 cars underground it would be such a vast parking lot that nobody would use it because it would be too scary. The city wanted to keep Orange Street open, which divided the lot into two parts. A coliseum, which is going to have circuses, is going to have to deal with very large trucks which have to be driven onto the floor. Elephants have to be taken to that level. It was important to get the floor of the ice rink at grade level. Parking couldn't go underneath. If it couldn't go on grade, the next logical thing was to put all parking on the top. In my mind this would remove it. It doesn't visually remove the parking, but it removes it from the activity along the street. The parking becomes a shelter, a universe, under which a whole variety of activities can take place. Unfortunately, the other program elements such as exhibition space never materialized, partly because Dick retired in the middle of the whole project, partly because it was one million dollars over budget, partly because the succeeding administrations really just didn't have the stomach for it, and partly because—although the arena had a few years of pretty good success bringing in events—the Coliseum faced new competition with the opening of the Foxwoods [1986] and Mohegan Sun [1996] Casinos. At the casinos there are events going on every night to which they practically give away the tickets. What group of dentists, for example, wants to have a convention in New Haven at the Coliseum when they could go to Foxwoods or Mohegan Sun and see all of the other entertainment?

And so the convention market disappeared, and the local hockey team didn't make it, and there were no sports. So the Coliseum got off to a bad start. Then, of course, the exhibition part of it was never built ... so the combination of all of these elements made it pretty much inevitable that a coliseum would not work in New Haven.

P40 When we look at the Coliseum, we can't help recalling El Lissitzky's Cloud-hangers, or perhaps Yona Friedman's Superstructure drawings ...

KR Superstructures were in the air at that time, but I wasn't thinking of that. I was really thinking of the project one small step at a time, and going forward with the process.

P40 Almost like the research method you were talking about with Saarinen?

KR Right. Exactly. Where else are you going to put it? And how do you do that? And parking lots are 62 feet wide and you put a truss every 62 feet ... Of course, you have to have a pre-disposition to do a monumental building as well.

P40 So in your process, do you sketch out the initial monumental idea, establish what that is going to be, and then step back?

KR No, I never do that, because if you do that you lose the opportunity to find out where you are going. It is much more interesting ... the way you start on this little journey, you push yourself forward, and things suddenly start to appear and begin to emerge and the light comes on at a certain point.

I got the idea for the Ford Foundation as I was crossing the Quinnipiac Bridge one morning because we lived in Guilford at the time. I remember exactly the moment on the bridge when it suddenly occurred to me to wrap the building around and make the atrium. Prior to that we had done a lot of legwork, a lot of research. There is just a moment when it all comes together.

P40 We'd like to talk to you about some of your work in Asia, in particular the Millennia complex in Singapore [1994].

KR Well, it is two office buildings and a hotel. There was an opportunity to do something that would be a statement when you come from the airport that would say, "Now, this is Singapore."

With the hotel we decided several things. We decided first of all that we were going to put the bathrooms on the outside wall. You can have a room and a bathroom beside it, both with windows. Now this was a radical departure for hotel design; the bathroom has an octagonal window so that visitors can see the central city framed through an octagonal opening. And in the bedroom/living room area there is a rectangular window with an awning—both buildings have awnings on them, because Singapore is on the equator, and a relatively small awning gives you shaded windows.

The massing of the building is a slab. I felt that if you put a slab on the ground, then when you approach the site on the highway all you will see is the hotel. If the hotel is raised up 90 feet in the air—a little bit of a memory to the Federal Reserve building—it is possible to see the Central Business District.

Then with the two office buildings, the first was rotated so that it related to the CBD. I put it up on four big columns to get it up in the air and have a public space underneath, making it part of the plaza. The other building was determined by the way the boulevard curves around.

So all three buildings—the hotel and the two office buildings—are responding specifically to that site and the geometry of the site. The first office building was rotated in such a way that it was on axis with the arrival from the airport and illuminated at the top so that it can be seen from quite a distance. It serves as an announcement to the city ... a little bit like the Knights of Columbus Headquarters in New Haven.

P40 Have you found that it is easier to think big in places like Singapore? How does it compare to working in the United States, for example?

KR Not particularly. I must say there seems to be a general problem of clients becoming more bureaucratic. It used to be that one could deal with a single responsible person, but this appears to have morphed into large groups with very disparate ideas as to what should be done.

P40 For better or for worse, the heroic building and urban renewal decades of the '50s and '60s in the United States demonstrated a popular willingness to think big. Are we simply afraid of that now?

KR I think that Ground Zero is a good example of what we cannot do. We seem incapable of rebuilding there. It's been five years this November [2006] and nothing has really happened ... it is this constant manipulation and negotiation. Now, New York is a complex city to build in during the best of times, but I don't think it would be any different at any other major urban center. No matter how much will there is, there still must be the authorization and ability to do it. But somehow we don't seem to have that at the moment, and part of it is the participatory nature again, for whatever reason, of the people who feel intimately involved with 9/11, part of it is the complexity of the city government, part of it is the whole nature of politics which is really not dedicated towards the best in building.

P40 Coming back to New Haven, how was the city different under Mayor Dick Lee?

KR That was a different time because Dick was committed to doing something, and he had connections in Washington. New Haven was one of the premier cities with regards to government plans for urban renewal. Looking back, there were some good things that happened and others not so good. But it is always easy to criticize after the fact. Too often today we criticize before the fact.

You have to destroy something to build something in any urban environment. I will be curious to see if New Haven can pull something off on the Coliseum site. How long will it take to actually realize something there? There has been a lot of talk for the last couple of years, but it will be interesting to see how much can be done.

I gave a lecture series once in Sweden, and they took me to various places in Stockholm to show me new developments. The interesting thing was that the architects who were showing me around weren't living in any of these developments. They were all living someplace else. I think there is a little lesson in that. The architects prefer to live in the old city with attractive, quirky spaces. That is more attractive than the rational world of development. What grows naturally is perhaps richer, in the final analysis, than anything that can be suddenly imposed.

P40 In the end, is it possible for a large, monumental building—such as some you have designed throughout your career—to reconcile with the life of the neighborhood and the street?

KR Well it depends on the particulars. I can say yes and no. In Europe a large church, for instance, can—and has—developed entire cities and towns around it. But that is because the whole civilization of that town was focused on that church. If today the alternative to the church or the temple is the shopping center ... well, the difference with the shopping center is that the people are driving from wherever they live. The act of driving has eliminated the city in that context.

The fact that you are driving means that you don't necessarily want to live where you work, or want to shop where you work, or want to do anything else where you work, because you have all of this imagined freedom to bridge. You can go anywhere at anytime. I go to New York two or three times a week, and I used to be able to drive from here to midtown Manhattan in eighty minutes. Now it can be up to three hours, and that is in a matter of twenty years.

The only answer is to probably revert back to where communities are pedestrian, and New York is an interesting example, because it could easily be a pedestrian city. If you live there for a little bit you think, "what the hell are all of these cars doing?" You can get around. It has perfect subway, bus and pedestrian movement, and you have a very large population. New York in my mind is one of the great urban lessons, central Manhattan is what I am talking about, largely because of the river. This lesson hasn't been learned in any other city.

Urban sprawl is endemic to every large city anywhere in the world. It is a frightful problem. When I went to Beijing for the first time in 1973 or so, there were no cars. Everyone was on bicycles, and all of the city was essentially one and two stories. Twenty years later you have high-rises, Mercedes, traffic jams, and you can see the old city in the first stages of being destroyed by a new city. I suppose this has to go through a cycle, and I'm not sure where it is going to end up later on, but it is a very interesting subject to try to fathom ... where are we actually going with all of this? What role can/might the architect be able to play in this? That said, I don't think that we architects should delude ourselves. Unless we become politically active, we can never affect this in any way. I wish I could have ended on a more optimistic note.

1 & 2 Texts reprinted with permission from John W. Cook and Heinrich Klotz, Conversations with Architects (New York: Praeger Publishers Inc., 1973).

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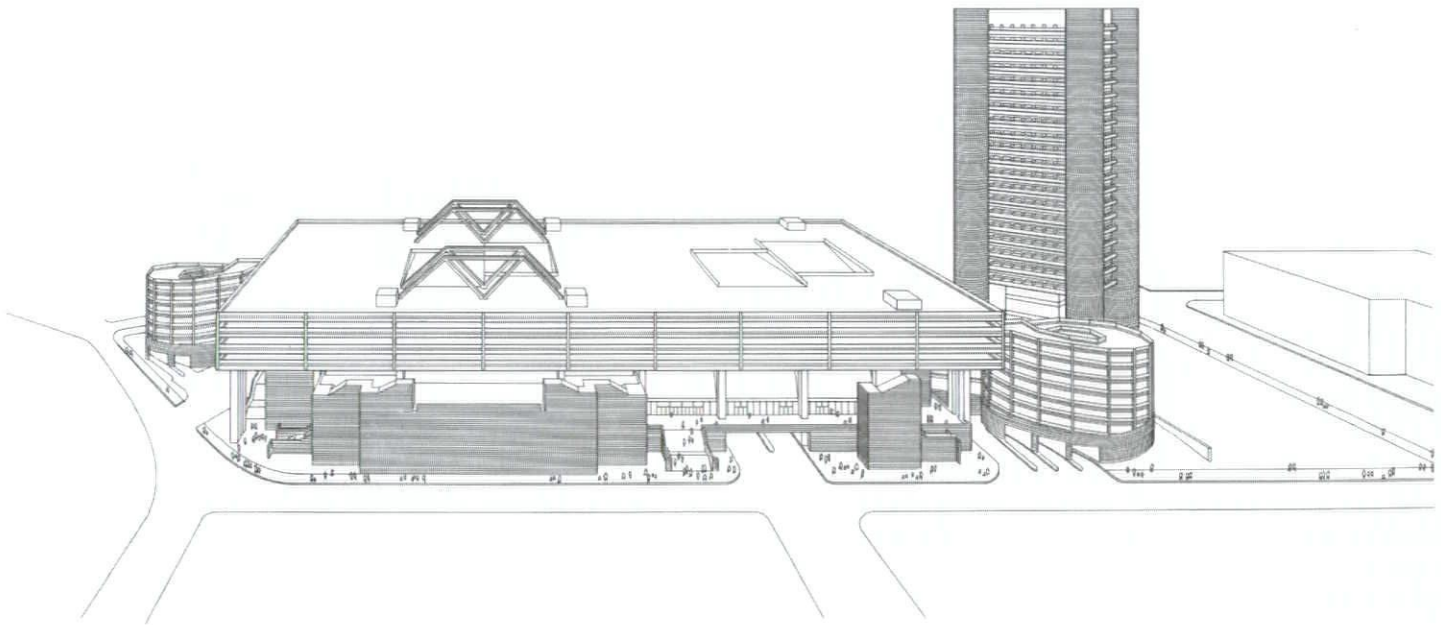
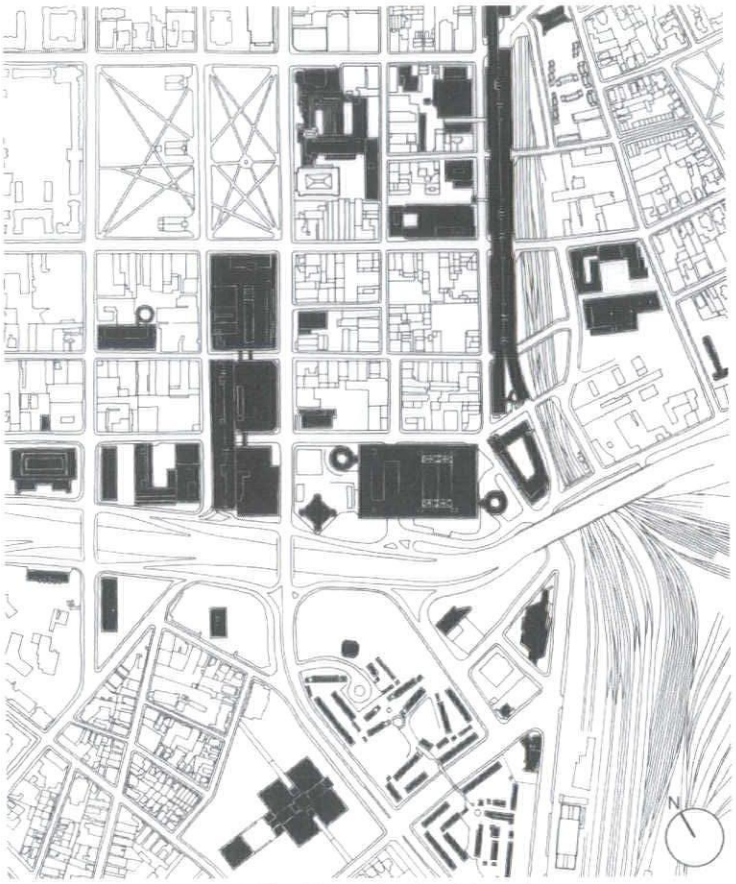
"to show"

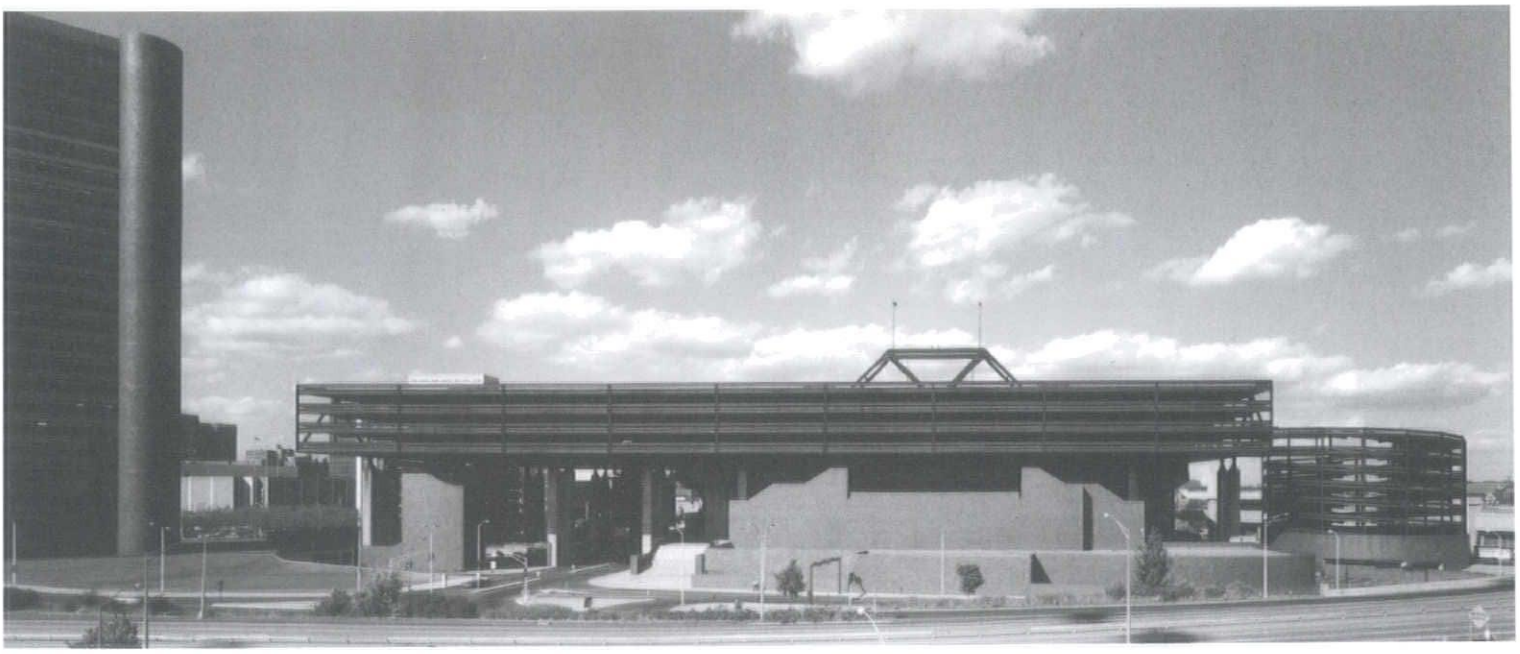


New Haven Veterans Memorial Coliseum

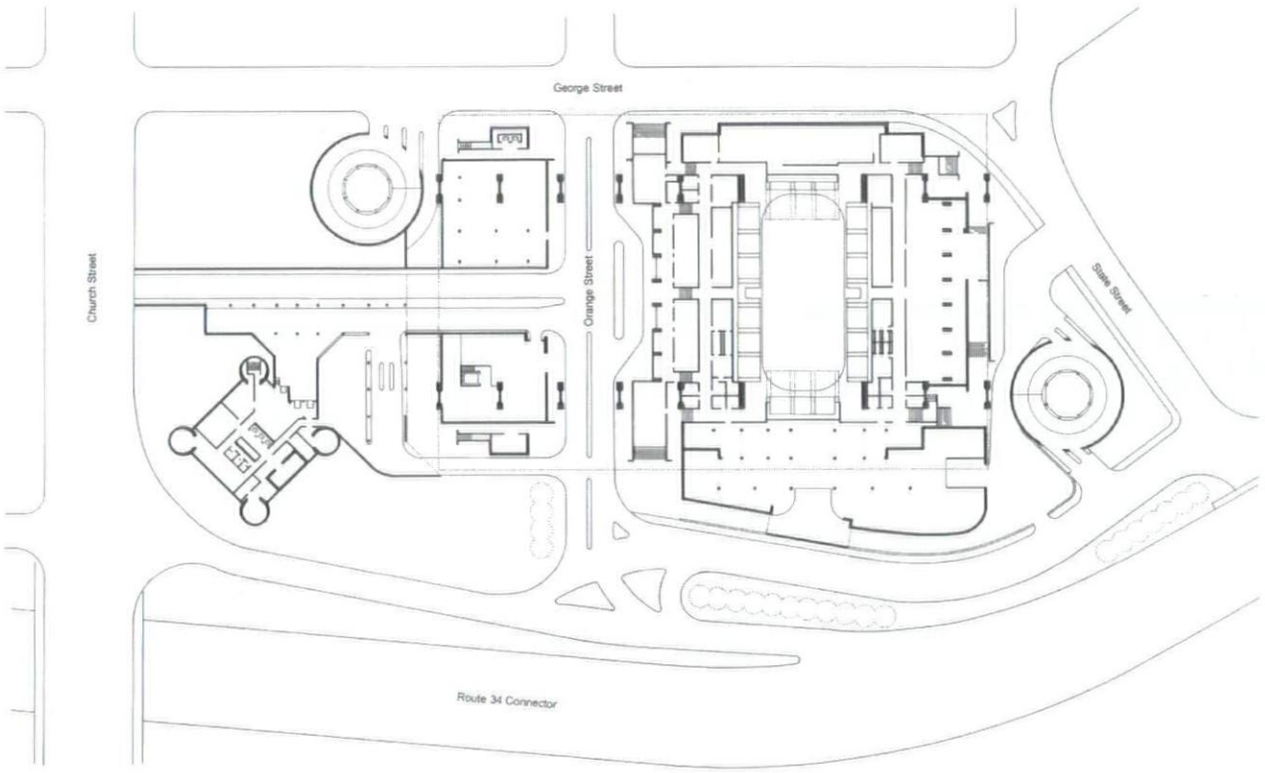
Kevin Roche John Dinkeloo
and Associates, 1972



Downtown New Haven c. 1973 with completed and planned urban renewal projects highlighted.

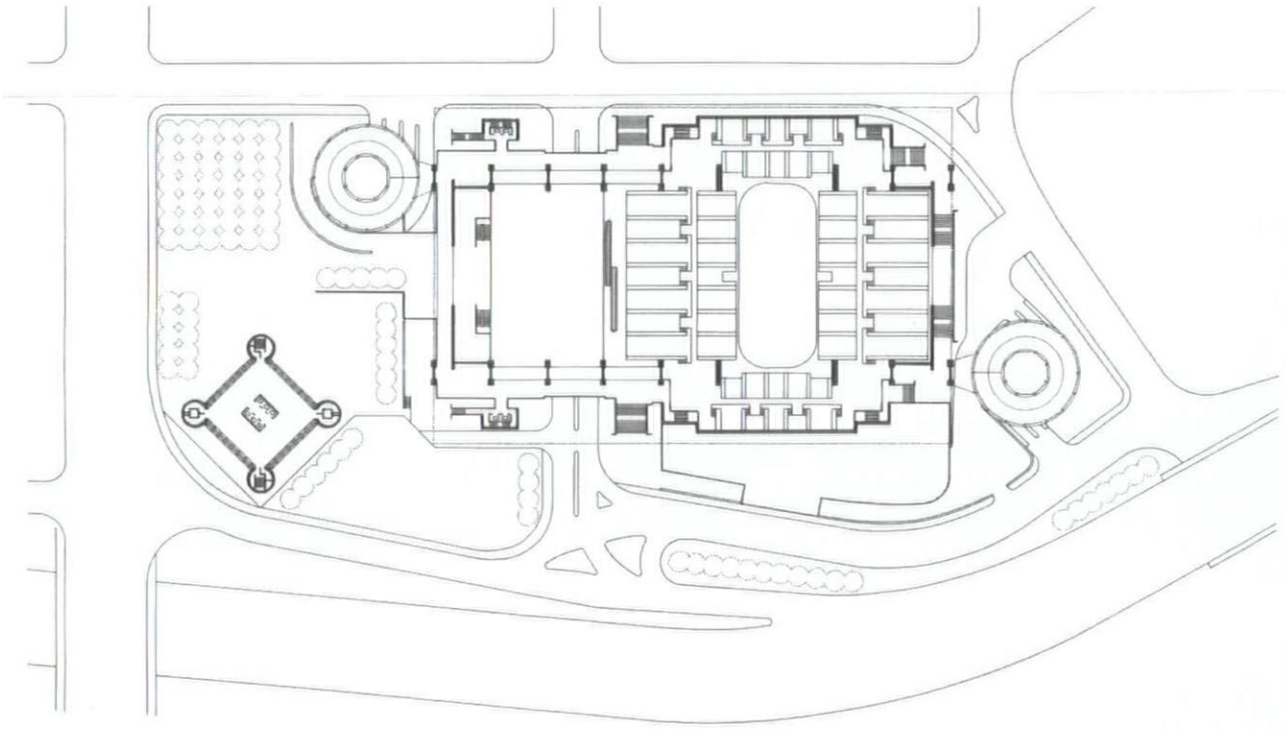


Route 34 Connector elevation.

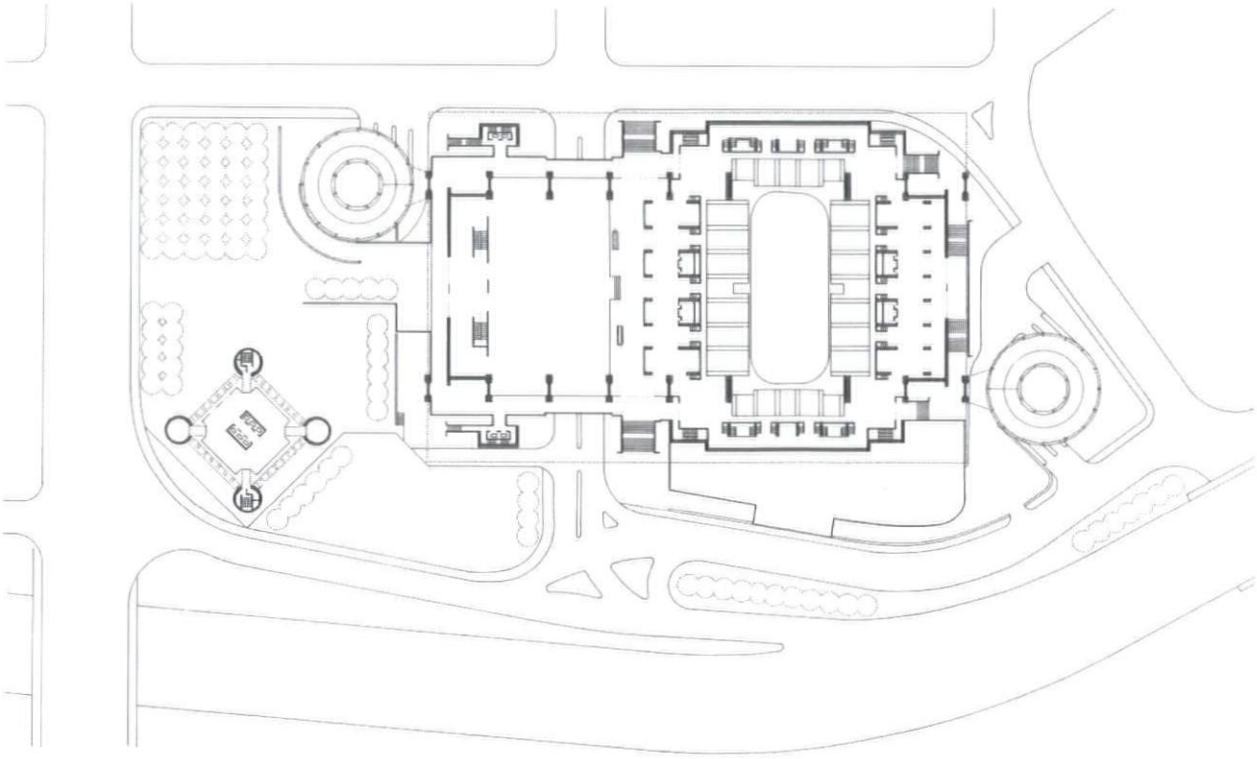


Floor Seating Level.

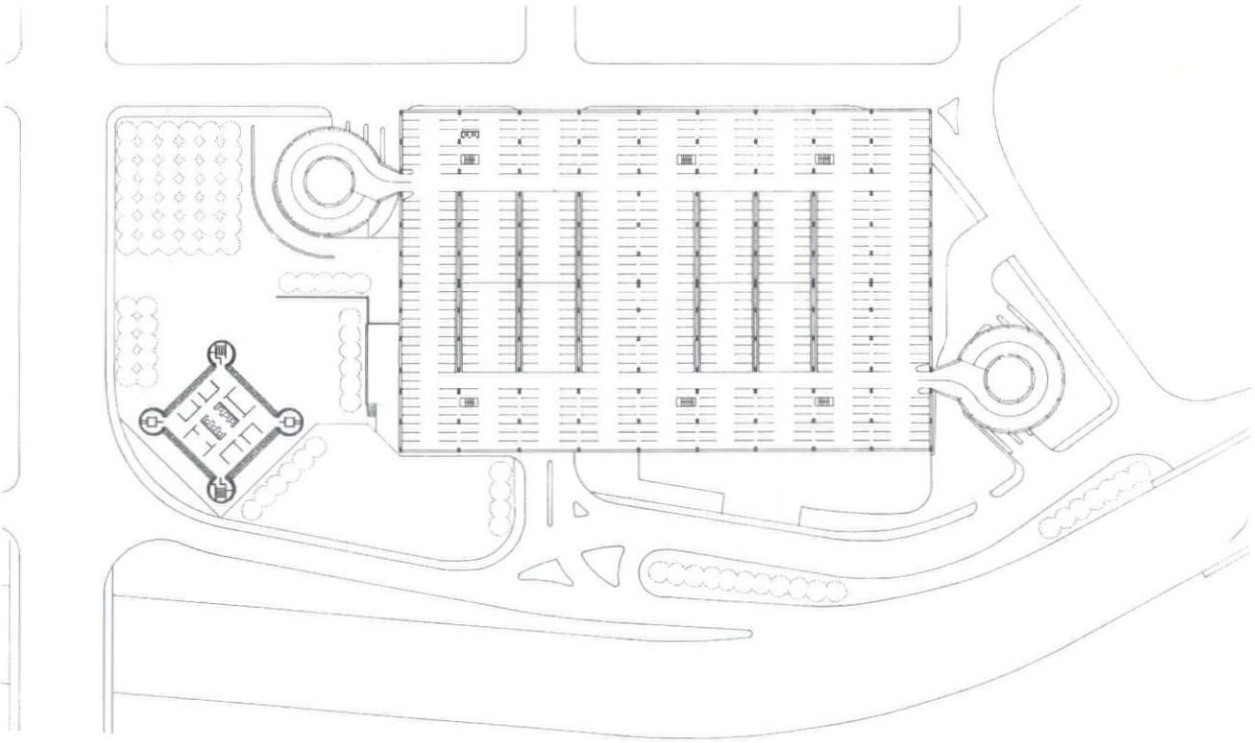
100ft



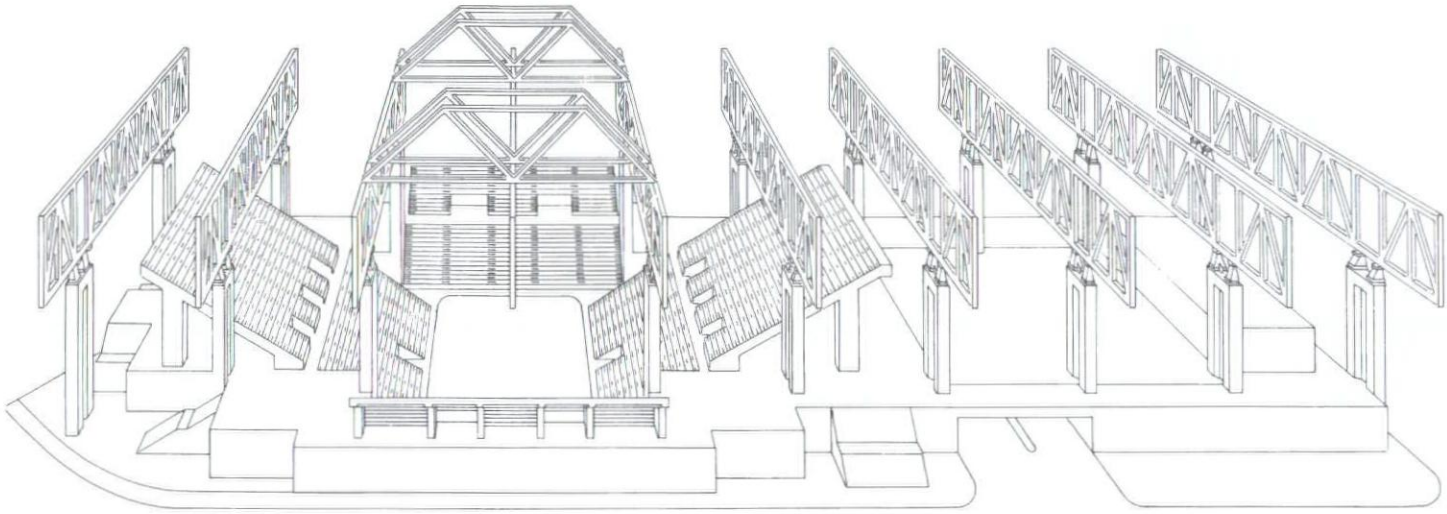
Mezzanine Level.



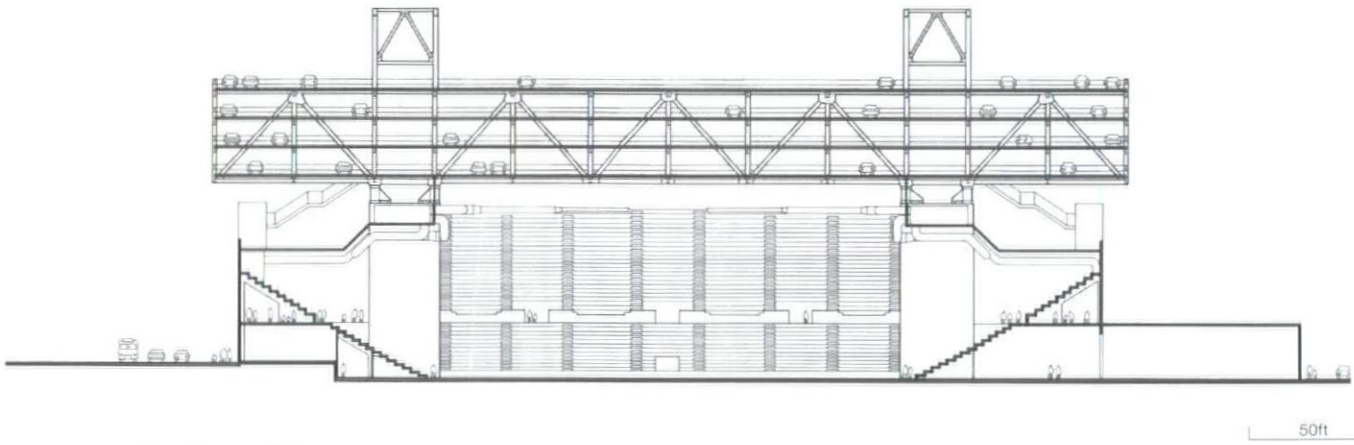
Concourse Level.



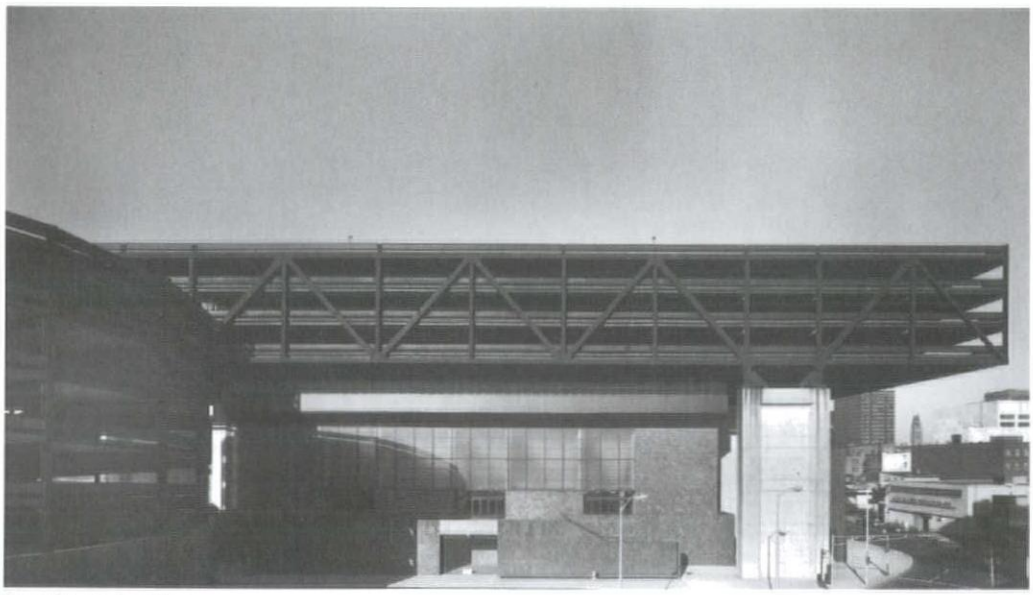
Parking Level.



Structural system.

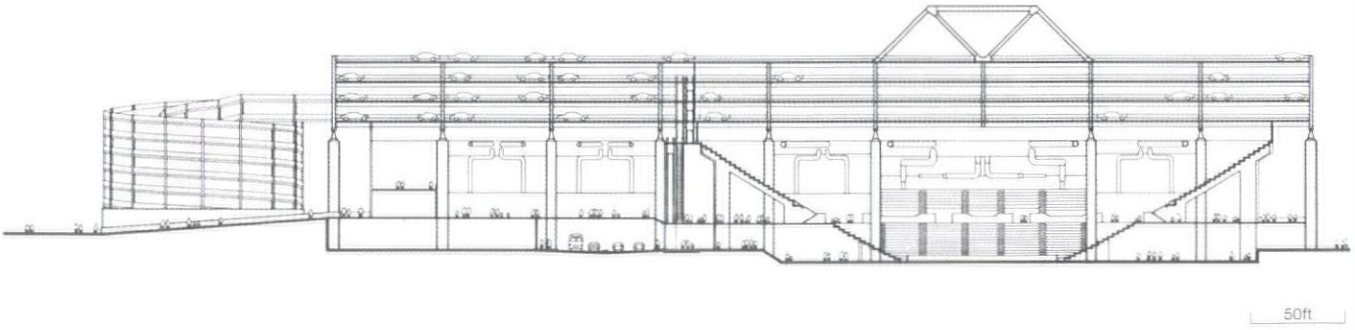


Transverse section through arena, facing south-east.



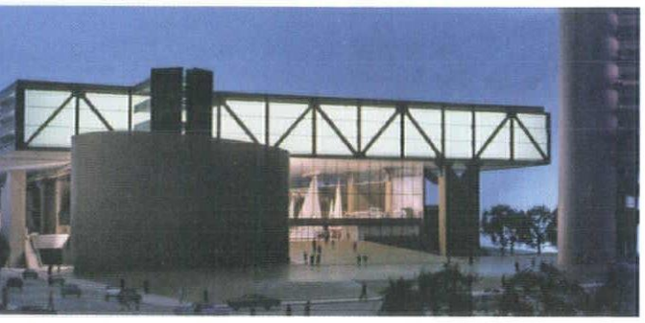
State Street elevation.

Model of arena interior.

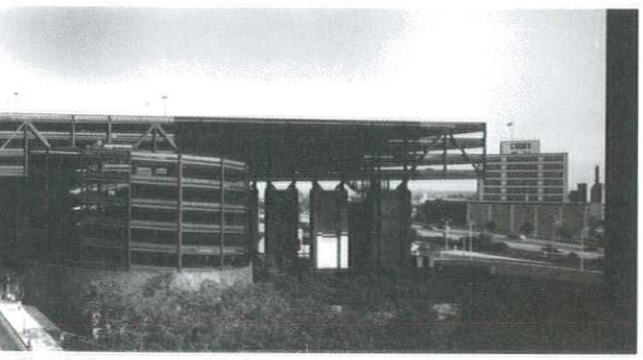


Longitudinal section, facing north-east.

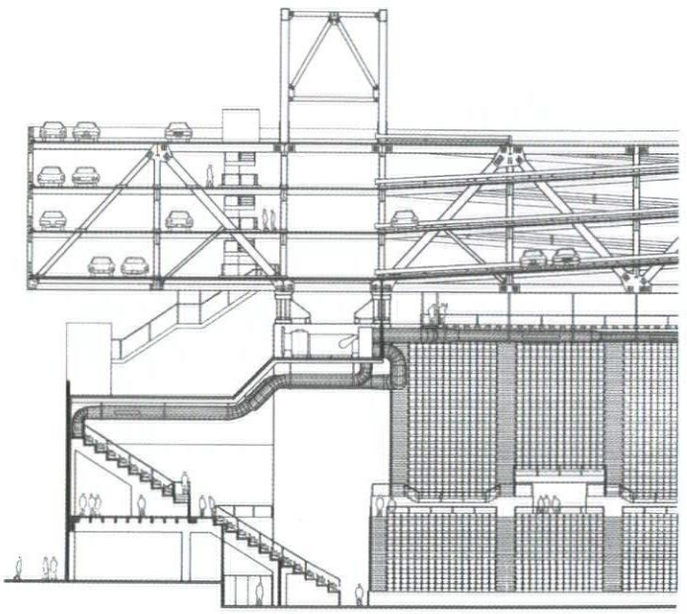
Arena interior configured for hockey.



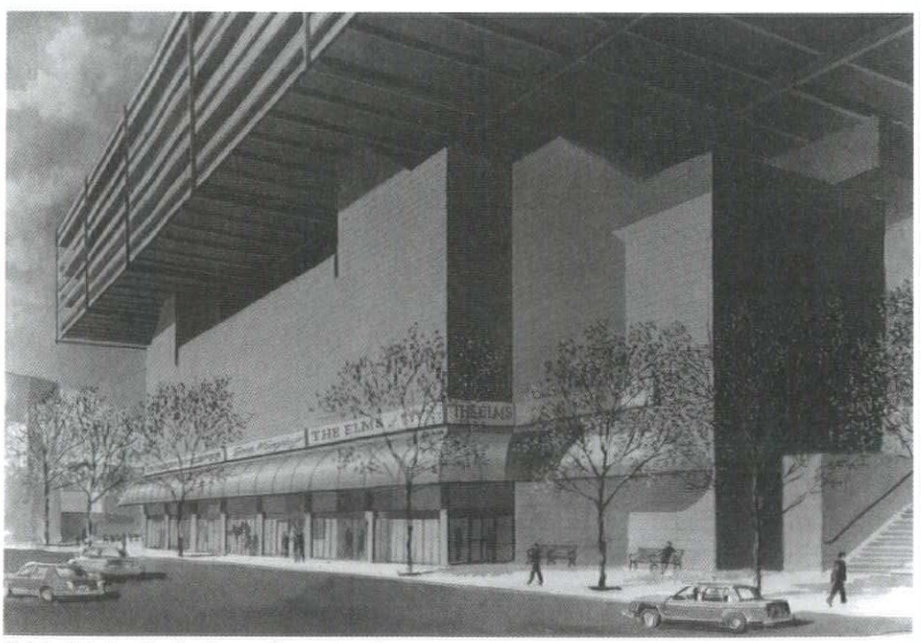
model view from Church Street with exhibition hall.



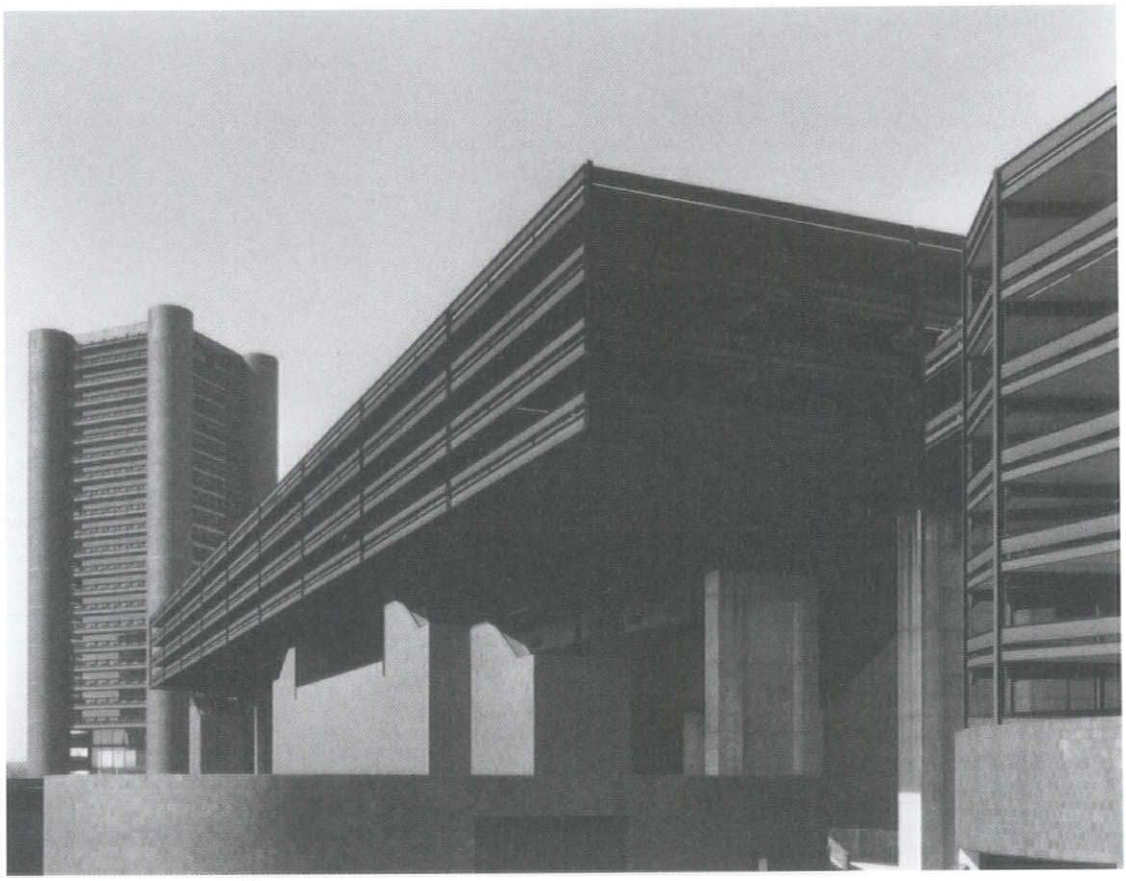
n Church Street as completed.



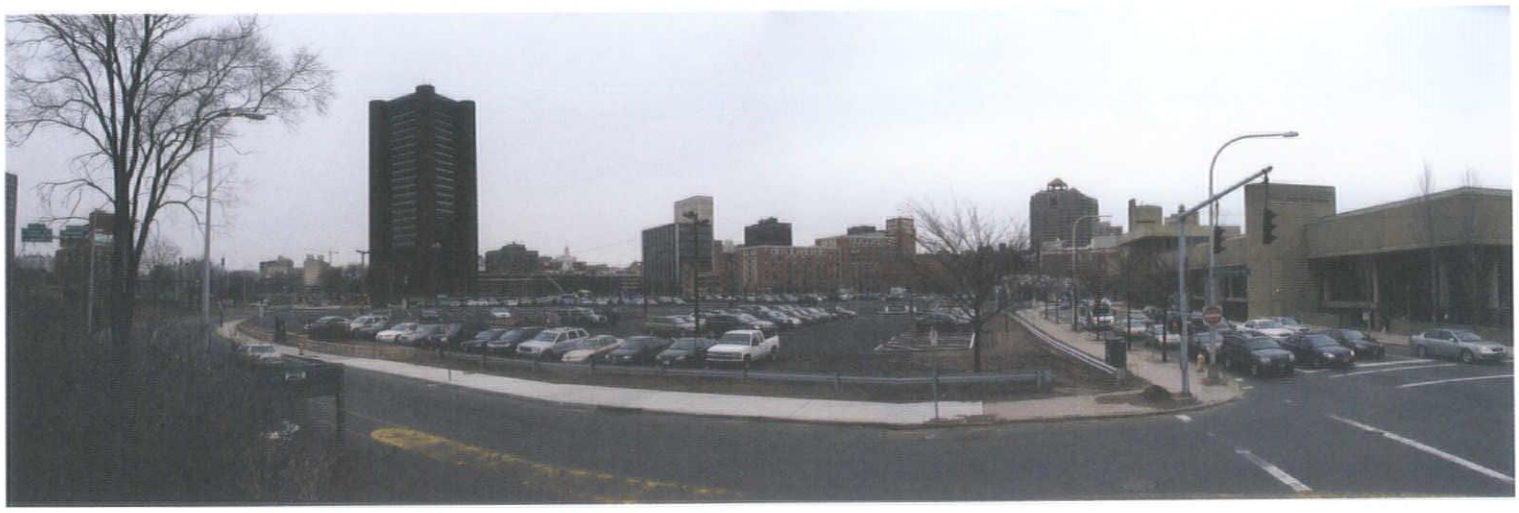
Transverse section detail.



Original design for the George Street elevation
with unrealized street-front retail.



View from the south, c. 1972.

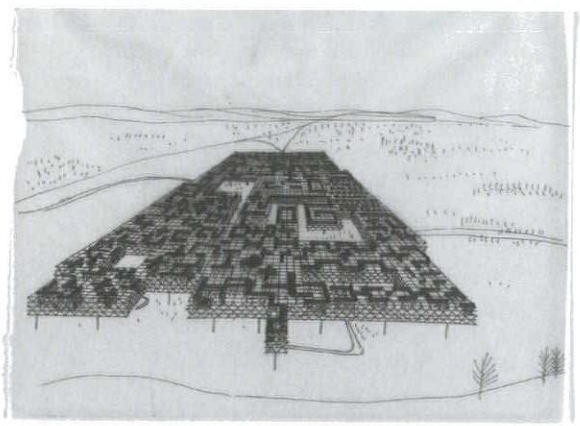


View from the south, fall 2007.

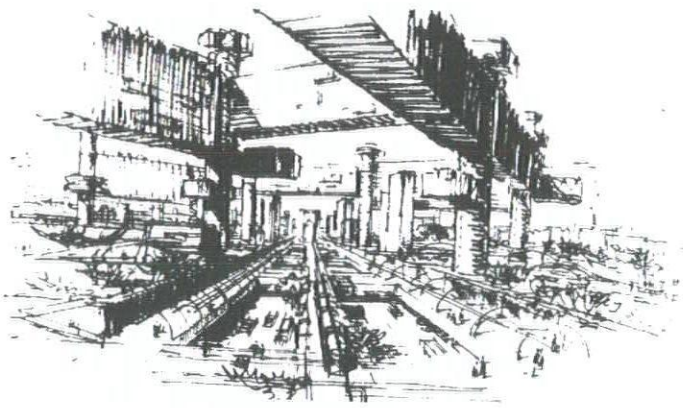
Subtext

The New Haven Veterans Memorial Coliseum: Urban Subtext

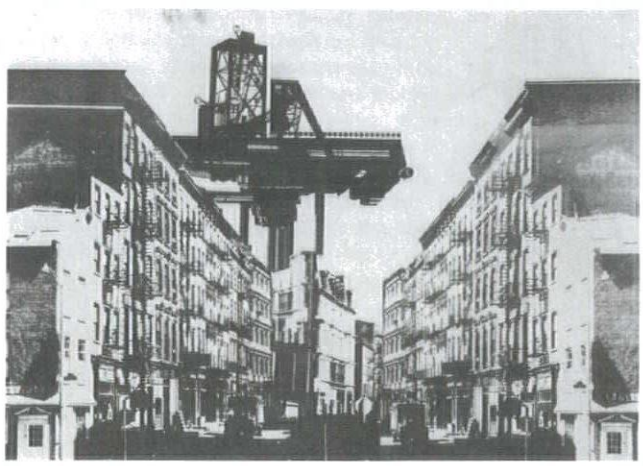
Eeva-Liisa Pelkonen



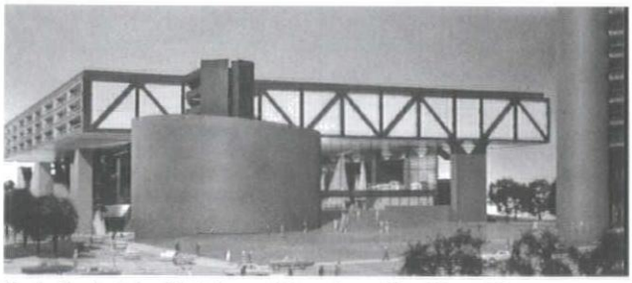
1 Yona Friedman, Spatial Urbanism, project, 1958.



2 John M. Johansen, "Leapfrog City", project for Manhattan, 1966.



3 Hugh Hardy, Community Center for Brooklyn, 1968.



4 Kevin Roche John Dinkeloo and Associates, New Haven Veterans Memorial Coliseum, View of the model from Route 34.

On January 20, 2007, at 7:45 a.m., the four-story-high, 569-foot-long by 425-foot-wide parking garage that hovered 70 feet above a 4.5-acre lot in downtown New Haven was demolished. This ill-fated structure was part of the New Haven Veterans Memorial Coliseum—a large sports and entertainment complex designed by Kevin Roche John Dinkeloo Associates—which had been commissioned by the New Haven Coliseum authority in 1965 and built between 1969 and 1972. Manual destruction of the sports arena that hung underneath the parking structure, which had a capacity of some 10,000 people, had been completed earlier. Next door the Knights of Columbus Building, also designed by Roche Dinkeloo Associates and built in 1965–69, still stands.

The building's fate had already become contested in the early 1980s, when economic losses and structural problems started to burden the city.[1] The fact that the exhibition hall at the Knights of Columbus end of the structure was never built due to budget cutbacks certainly contributed to the building's demise. Cost cuts had also left parts of the Coliseum incomplete: for example, the escalators from the entrance platform were never enclosed as planned. Moreover, poor maintenance saw the building fall into a state of decay by the late 1980s. In 1988 the mayor, Biagio DiLieto, first proposed that the building be torn down and its site to be used for a new mall.

Despite the problems, much of the general public stood by the building, which had attracted world-famous performers and athletes to the city throughout the 1970s and '80s. As a 1988 poll conducted by the New Haven Register revealed, more than 60% of area residents opposed tearing down the building.[2] However, by the mid-1990s regional competition from newer arenas such as the Chevrolet Theatre in Wallingford, Bridgeport's Arena at Harbor Yards, and the Mohegan Sun Casino's large concert venue made it increasingly difficult to attract events. Thus the New Haven Veterans Memorial Coliseum was finally closed in 2002. In its derelict condition, the once vibrant public building was easily reduced to an emblem of all that was wrong with New Haven's postwar urban-renewal projects. Mayor John DeStefano's decision to cast the implosion as a public spectacle—a move that can be read as politically motivated—had the effect of further demonizing the building. It was treated as an ugly monster deserving of public execution, in a demise witnessed by some 20,000 people from the nearby Temple Street garage, designed by Paul Rudolph, and watched by many others on television.[3]

The lack of any serious effort to preserve the Coliseum is shocking considering that it was one of the most iconic buildings of the late 1960s. It is in fact one of the only built versions of its type: a megastructure belonging to a group of great visionary projects of the postwar era that called for a completely new approach to city design. Similar projects—such as Yona Friedman's Spatial Urbanism housing schemes for Paris (1959) and the Hudson River (1964), John M. Johansen's "Leapfrog City" project for Manhattan (1966), and Hugh Hardy's Community Center for Brooklyn (1968)—were never realized.[4] Figs. 1-3 Until the very end the Coliseum remained a site of pilgrimage, especially for avant-garde European architects, including recent visiting professors at the Yale School of Architecture such as Winy Maas and Zaha Hadid.

Certainly the Veterans Memorial Coliseum was one of the most controversial buildings of its time. Writing circa 1967–68, when the plans had been made public, Vincent Scully condemned the building—along with Roche Dinkeloo's two prior buildings in New Haven, the Knights of Columbus Building and the Richard C. Lee High School—as an example of "paramilitary dandyism." Writing during the Vietnam War in the late 1960s, Scully considered it "particularly disturbing at the present moment in American history."[5] In his 1969 book New Directions in American Architecture, Robert A. M. Stern lamented that the Coliseum project demonstrated a lack of concern for "the scale of the city and the pedestrian."[6] But William Jordy, reviewing the building after it was completed, was more sympathetic: "If the initial fierceness of the image may be off-putting, the very intensity of the emblematic quality of the design draws one into the complex, making one eager to participate in an architectural experience that, even from a distance, indicates that participation is of its essence."[7] Considering all the strong emotions the Coliseum aroused during its forty-year history, it is worth revisiting the way the architect addressed issues of scale, urbanism, and architectural sensibility that lie at the heart of these critiques.

Like many architects of his generation—the Italian group Superstudio being the most extreme case—Roche believed that a new approach to scale was needed: "Large projects are the things we have to face if we want to solve the urban dilemma."[8] In the case of New Haven, highways such as the Oak Street Connector built during the 1950s and '60s had caused this "dilemma" by tearing apart the traditional pedestrian-orientated urban structure. Both of the Roche projects for downtown New Haven—the Knights of Columbus Building and the Veterans Memorial Coliseum—attempted to mediate between the scale of the highway and that of the city. The plan of the Coliseum was integrated into the downtown grid, while the Knights of Columbus Building was placed diagonally on the southwest corner of the Oak Street Connector and Church Street to "minimize the

fracture that the Oak Street Connector initially made."[9] The fact that an increasing number of people experienced and entered the city from the highway justified the bold scale of both buildings; when viewed from the highway, the parking structure of the Coliseum would appear as a large billboard. Fig. 4 The practical justification for lifting the garage was the high water table on-site, which made an underground parking structure overly expensive, while ordinary on-grade parking would have created a large and unwanted boundary between the public functions of the building and the preexisting city around its north and east flanks. Fig. 5

Overall the Coliseum's structural system reflected Roche's infatuation with bold scale. He described his structural logic after the completion of the building as follows: "When the highway engineer carries, he tends to use concrete. When he spans, he tends to use steel."[10] An axonometric drawing depicts nine pairs of 6-by-24-foot concrete columns with bronze-colored brick cladding supporting 34-foot-deep and 340-foot-long steel transverse trusses, which carried the four-level garage. The tenth transverse truss in the middle was suspended from two Warren or "railroad" trusses to make a 128-foot open span for the main arena. Fig. 6 Roche summed up his structural and functional reasoning in a press statement: "A simple bold structure is thus created in which the functional needs are dealt with directly and the problem of access both for the pedestrian and the automobile is solved for the maximum convenience of the user."[11]

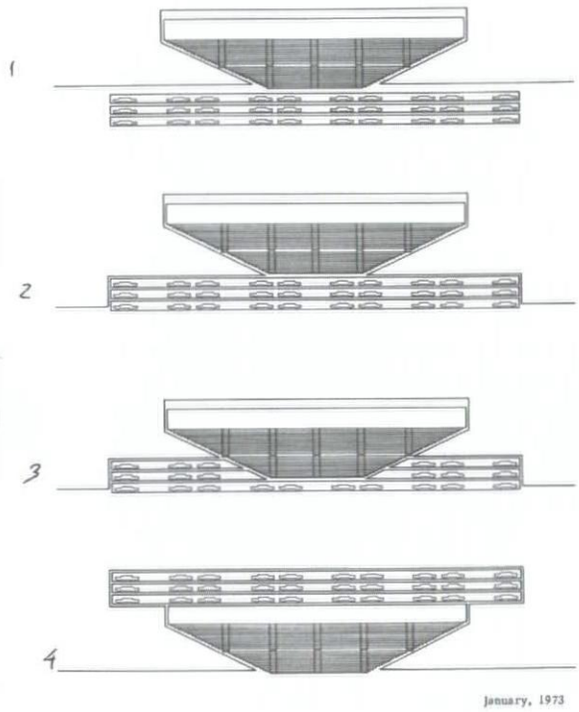
Considering this infatuation with bigness it might come as a surprise that Roche thought of the building also in very traditional urban terms. A close-up photograph of a design model from the street level demonstrates how Roche conceived the experience of entering the building: an open public space filled with people that continued through the building and back into the city. Fig. 7 Roche explained this experience as follows:

> We deliberately forced this building right out on the sidewalk because we wanted to establish an urban presence as soon as possible for the visitor coming to New Haven. It really produces the same kind of effect you get when you go into the old walled city in Europe. You go through a narrow gate, which is twelve feet wide, and you're forced through it, and you're in the city, the heart of the city. We're trying to produce that feeling of a direct urban presence the very moment you walk in.[12]

The key word is effect, whereby Roche seems to suggest that one of the building's tasks was to arouse associations and to heighten the sense of arrival in the city. The manner in which the plan is drawn gives an idea how various architectural elements contributed to the urban feel: all space-defining elements are represented with the same line-weight to emphasize the totality of psychophysical experience. The tartan-like matrix gives the viewer—or the designer, for that matter—a sense of spatial experience defined by rhythm, scale, and the density of the built fabric, anticipating the pulsating urban life that would eventually occupy the site. Fig. 8

The treatment of the plans bears witness to Roche's early architectural training. His Beaux Arts education at University College Dublin equipped him with the traditional techniques of repetition, symmetry, and solid-void hierarchies. The Illinois Institute of Technology—where he came to study with Mies van der Rohe—reinforced the idea that architecture can be achieved through a few carefully controlled moves. Roche later assessed the legacy of his former teacher as follows: "[Mies] produced a simple, readily understandable expression that was coincident with various movements in the graphic arts of his time and the desire to shed redundant elements and decoration ... he was a very great man and a great architect."[13] After a year at IIT and a brief stint at the United Nations planning office, Roche somewhat accidentally found his way to the office of Eero Saarinen in Bloomfield Hills, Michigan. From Saarinen, with whom he collaborated on design through the 1950s and whose many major projects the office of Roche and Dinkeloo completed after Saarinen's untimely death in 1961, Roche learned to strive for the "total environment" and the importance of making all elements "sing with the same message."[14] Roche's first job at Saarinen's office, the General Motors Technical Center, exemplifies this approach: a complex of twenty-four buildings, all executed in the same Miesian idiom, communicate through sheer magnitude and technical perfection.

Therefore, although the New Haven Veterans Memorial Coliseum certainly bears a formal resemblance to the megastructural schemes of the 1960s, I believe this project should more accurately be placed within the legacy of Mies. Arthur Drexler's description of the architect's 1942 Concert Hall proposal could well be used to describe Roche's Coliseum: "Free space-defining plane and the predetermined, seemingly immutable structure. By asserting structure as a still more rigorously defined necessity, Mies expanded the realm of freedom, at least in theory."[15] The building now gone, all we are left with are the memories of a once-vivid monumental hub of activity. We can only speculate that had the critics and politicians taken the time to discover the original aspirations behind the project, they might have been able to imagine reasons and ways to recycle the building for new uses in the spirit of the metropolitan urbanism that the Coliseum—in its own boldly heroic fashion—once sponsored.



5 Kevin Roche John Dinkeloo and Associates, New Haven Veterans Memorial Coliseum, diagrams showing alternative locations of the garage.

1 See Charles Kochakian, "Coliseum has history of losses in operations," in New Haven Register (June 21, 1981): 1.

2 Janet Koch, "Demolishing Coliseum for new mall opposed," in New Haven Register (October 2, 1988): 1, 9.

3 Hundreds of demolition videos are posted on YouTube.

4 For information about Yona Friedman's "Spatial Urbanism" projects see, for example, Sabine Lebesque and Helene Fentener van Vlissingen, Yona Friedman Structures Serving the Unpredictable (Rotterdam: NAi Publishers, 1999) 28-47. For information about the Johansen and Hardy projects see Robert A.M. Stern, New Directions in American Architecture (New York: George Braziller, 1969) 107-109.

5 Vincent Scully, American Architecture and Urbanism (New York: Frederick A. Praeger, 1969) 201. Scully revisited the building after it was built and learned to appreciate the fierceness of its scale and technological might. He compares the Knights of Columbus Building and the Coliseum as follows: "... in highway terms the Coliseum is stronger. Its piers lift a great stretch of elevated road, carrying real, if parked, automobiles; the vast steel members span from widespread concrete pier to pier high up in space above the city; advancing right alongside the Thruway Connector itself." See Vincent Scully "Thruway and Crystal Palace. The symbolic design of Roche and Dinkeloo," in Architectural Forum (March 1974): 19.

6 Stern, op. cit., 23.

7 William Jordy, "New Haven Veterans Memorial Coliseum" in Architectural Review (April 1973): 229.

8 Kevin Roche quoted in John W. Cook and Heinrich Klotz, Conversations with Architects (New York, Praeger Publishers Inc., 1973) 64.

9 Ibid., 78.

10 Jordy, op. cit., 229.

11 Project statement for New Haven Veterans Memorial Coliseum, Undated KRJD Archive Document, 2.

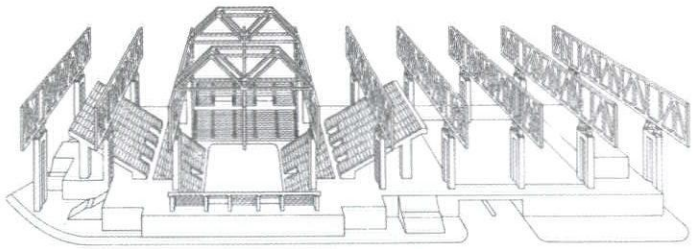
12 Kevin Roche quoted in John W. Cook and Heinrich Klotz, Conversations with Architects (New York, Praeger Publishers Inc., 1973) 80.

13 Kevin Roche quoted in Francesco Dal Co, Kevin Roche (New York: Rizzoli International, 1985) 21.

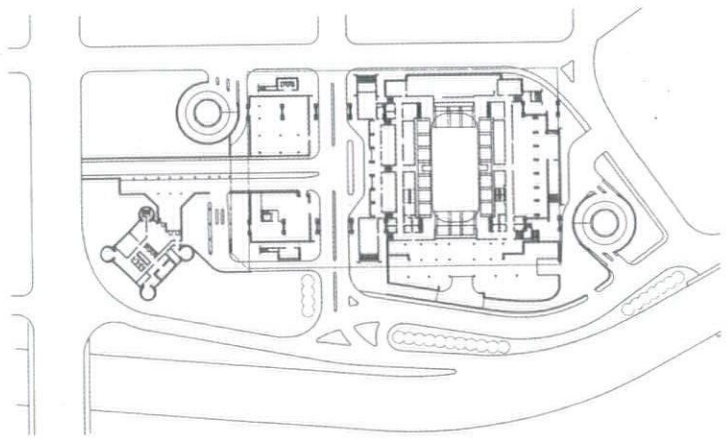
14 Eero Saarinen in an interview regarding TWA Air Terminal from January 1959, excerpted from Eero Saarinen, Eero Saarinen on his Work: A Selection of Buildings Dating from 1947-1964, with statements by the architect, ed. Aline B. Saarinen (New Haven, CT: Yale University Press, 1962) 60. For further discussion about Saarinen's notion of architectural "expression" see Eeva-Liisa Pelkonen, "The Search for (Communicative) Form," in Eero Saarinen: Shaping the Future, ed. Eeva-Liisa Pelkonen and Donald Albrecht (New Haven, CT: Yale University Press, 2006) 82-97.

15 Arthur Drexler, "Engineer's Architecture: Truth and its Consequences," in The Architecture of the Ecole des Beaux-Arts (New York: The Museum of Modern Art, 1977) 53.

7 **Kevin Roche John Dinkeloo and Associates, New Haven Veterans Memorial Coliseum, model view of the Coliseum on the Mezzanine Level.**



6 **Kevin Roche John Dinkeloo and Associates, New Haven Veterans Memorial Coliseum, structure diagram.**



8 **Kevin Roche John Dinkeloo and Associates, New Haven Veterans Memorial Coliseum, ground floor plan.**

Monere

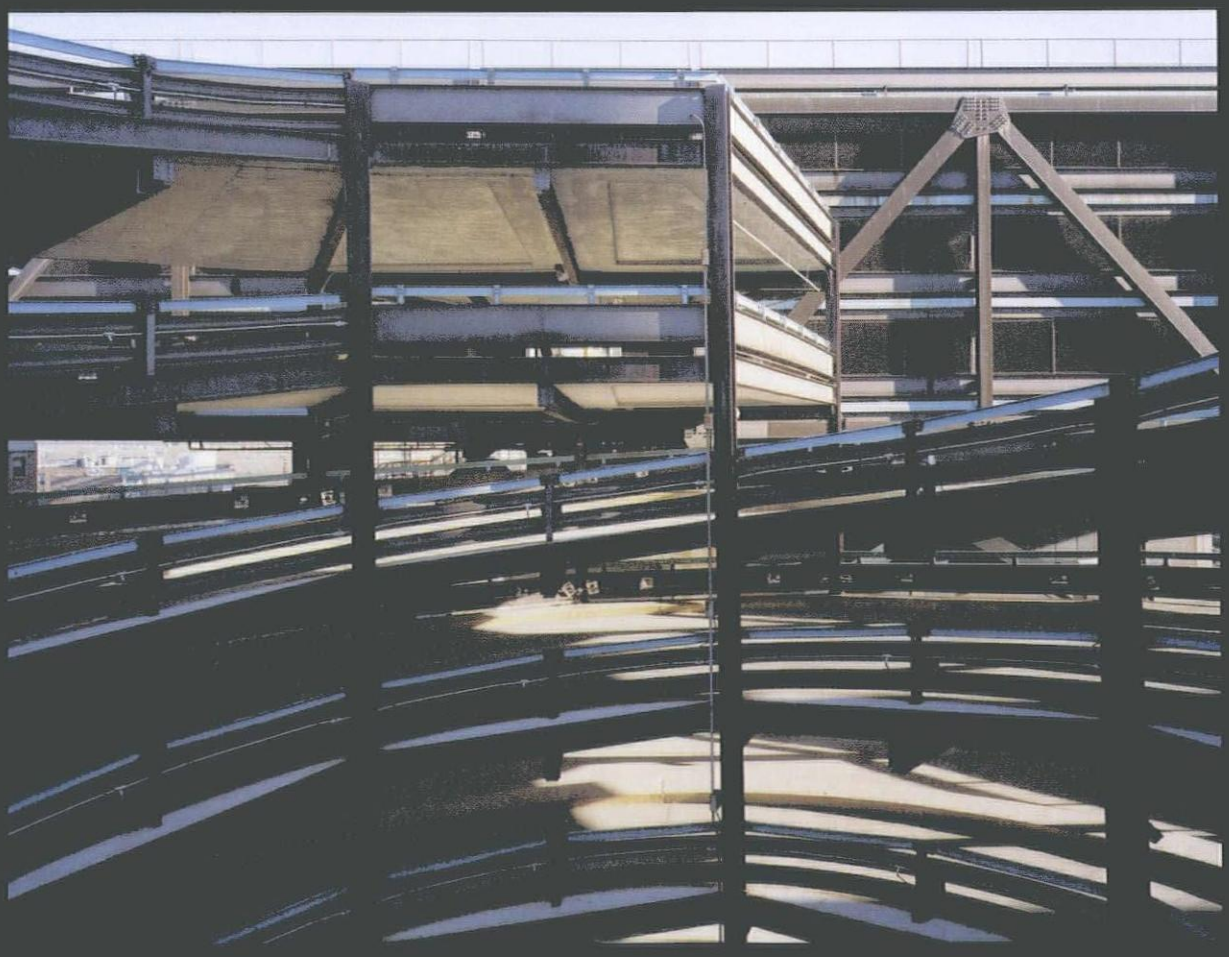
"to remind, to warn"

New Haven Veterans Memorial Coliseum

Photographed by
Colin Montgomery in 2006


9
10
11
12
New Haven Register

Monsters are born too tall, too strong, too heavy; that is their tragedy.



-Ishirō Honda

Hyperb

Film still from Gojira, Dir. Ishirō Honda, 1954.

The Monster Magnified: Architectural Photography as Visual Hyperbole

Claire Zimmerman

> Scale has its own power ... Small pieces you can turn around in your hand, you can look down at. Big pieces you have to look up at. It's the difference between looking at a flower or up at a tall tree or a mountain.
> —Jun Kaneko, potter[1]

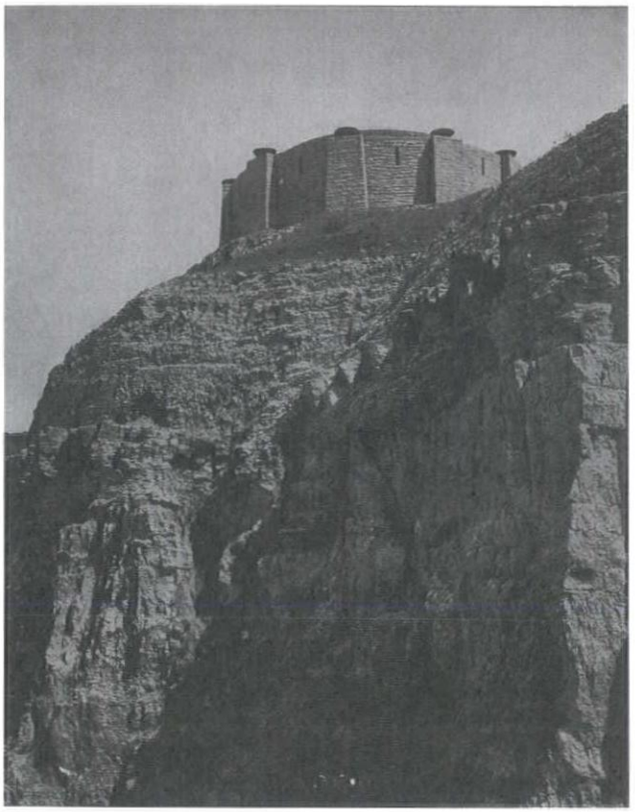
The Monsters of Photography

Architecture has always enlisted forces from other realms to help it retain its complex disciplinary shape. One of the most agile and versatile allies to have made common cause with Modern architecture (and it has done so since the very day of its invention) is photography. Architects need photography, not only to publicize their work but also to produce the visual evidence that lets them maintain themselves as architects on a world stage, acting as parts of increasingly large conglomerations. More than ever, the camera (and increasingly the computer, producing the digital model of the project that prefigures the photographs of the building to come) is a critical collaborator in the ongoing formation of architecture as a media-sensitive enterprise. And the discrepancies between photographic image and construction on the ground are now a presumptive condition of both practices. As consumers of images, we have grown sufficiently sophisticated to know that the picture and the place were never meant to be more than affiliated entities.[2] Photographs create different things from the buildings they document, and those things—perceptions, opinions, effects, spatial constructs, utopian realities, subsequent histories—have become the subject of illuminating analysis in recent years.[3]

Since the concept of absolute scale in photographs can be created only under particular technical circumstances, and is generally deployed in a very limited fashion, the bulk of this essay narrates a fictional subject. Photographs typically create the illusion of largeness or smallness through technical manipulations and the skillful juxtaposition of objects of recognizable scale. To consider the way in which photography "operates on" our perceptions of size in architecture is to explore a murky territory with few fixed points for logical argument. But almost the same statement can be made with respect to the vast majority of photographic images of buildings that are used to promote the causes of architecture and photography in a more general way: photographs of architecture create illusions of spatial properties of all sorts. Thus, attacking this subject head-on for the question of size (absolute or illusory) seems an illogically logical way to continue the analysis of architectural photography that has been only recently launched.

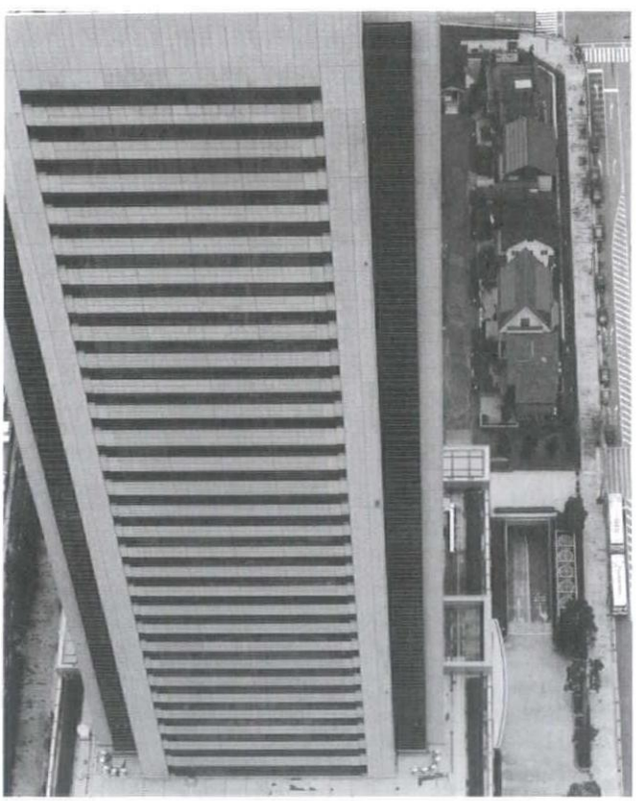
The appearance of overweaning size has been present in the photography of architecture since its inception; from nineteenth-century images of large structures to photographs of National Socialist architecture in the 1930s and 1940s, to postwar architectural photography in the United States and the more recent encyclopedic projects of Japanese photographer Yukio Futagawa. Each of these moments provide glimpses of a versatile medium that influences architecture in meaningful but elusive ways. Imagine these episodes as frames mounted on

ole



Freikorps Memorial to the fallen of World War I, on the Annaberg in Silesia, built 1938 (destroyed, 1946). Evocations of the sublime enhance the vast size of the construction shown in this photograph.

Heiner Schilling, Entropic Forest. The vast and inconsistent scale of the contemporary metropolis (Tokyo).



Heiner Schilling, Entropic Forest. Schilling's photographs of Tokyo juxtapose objects of radically different scale. A related technique of scale juxtaposition is also found in Gojira; Schilling, however, uses juxtaposition not so much for visual persuasion, as for commentary on current urban disjunctions and the physical evidence of uneven development.

a reel that arrogates to photographs of architecture the same rhetorical and dramatic power found in film, whether documentary or fictional. Such a claim would be overblown and exaggerated; photography and film are certainly not isomorphic media, as has been frequently noted since the 1930s, when Theo van Doesburg, Laszlo Moholy-Nagy, and others wrote of them as part of a single continuum of new media developments. Commercial photographs of buildings, while they have narrative elements, also have other purposes that complicate their history.[4] Yet I will briefly follow the architectural "monster" in photographs, analyzing how the manipulation of apparent building size results in and from the different forms of visual hyperbole that came to prominence in photography in the Modern period, partly as a result of new capacities of several kinds.[5] My purpose here is to trace changes in the visually hyperbolic image—the activist image that conditions what it represents through specific techniques of photography. As architectural photography made its way through the pre- and post-World War II years as the avant-garde of a changing way of building, an expanding set of technical capabilities accompanied its growth as a mass medium. This ongoing technical development adds a dynamic mobility to the history of building images, where technical challenges were met with a changing set of new photographic parameters adding another layer of complexity to that supplied by an existing range of possible image rhetorics drawn from the history of visual representation.

Filmic Monsters

In the 1954 Japanese film Gojira (released in an Americanized version two years later as Godzilla), an ancient sea creature is transformed into a monster by hydrogen bomb experiments following World War II. It emerges from its home in the waters of Tokyo Bay to rampage through downtown. Unhindered by onslaughts of artillery and aircraft, Gojira breaks down diminutive power lines and broadcasting towers, and charges through the streets of the city spraying a flammable mist from its mouth, a radioactive emanation that bursts into flames as it reaches its target. After decimating the Lilliputian Tokyo, Gojira returns to the waters of the bay, a latent but threatening menace to the future.[6]

The spectacle of a Japanese city destroyed by an overwhelming alien force—a monster run amok in the city—was achieved in this instance through a full range of technical sleights of hand. Gojira emerged from a large tub of water and rampaged amid a series of scale models of buildings, streets, and urban infrastructure. Toy houses aflame were spliced into footage of full-scale buildings; citizens of Tokyo in the foreground were set against the monster rampaging along the skyline of the city in the background. The models look tiny, and the Gojira suit wrinkles around the actor's legs and thighs. Nevertheless, the special effects work, partly thanks to their transparency. We know how the movie was executed, but we still believe it.

The images of post-Gojira Tokyo are pictures of a world in the immediate wake of cataclysm. Japan confronts its own unviewable past and resultant wartime destruction in a spectacle of mass entertainment.[7] That the cityscape of Tokyo is miniaturized (both from a technical standpoint and in comparison to the monster) suggests more than cinematographic necessity. As Mark Anderson and others have pointed out, it emblematizes the diminution of an entire nation.[8] It may be this correspondence between fact and fiction that makes the movie visually persuasive in spite of its obviously conjured special effects. But the suspension of disbelief that accompanies cinematic viewing also persuades us of the veracity of the scene in spite of its scalar disjunctions.

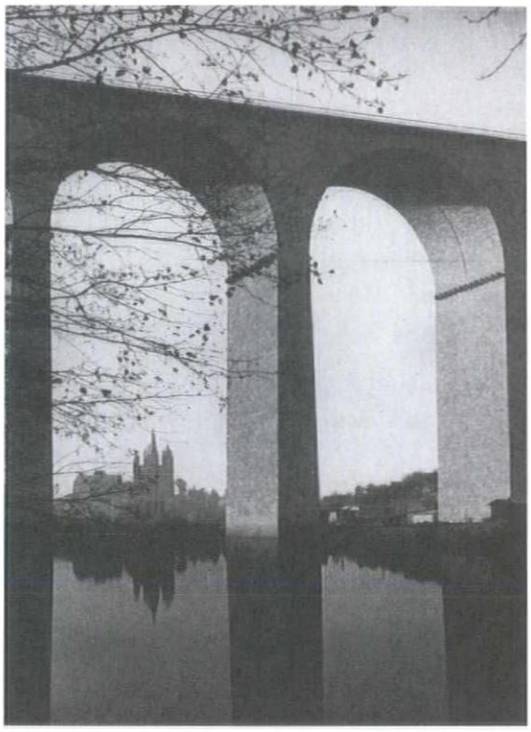
What does Gojira have to offer a discussion of scale in architectural photography? Like many films that used scale models to achieve special effects before computers could do the same work, the movie is a jumble of different scale juxtapositions. The main characters are normative "human" scale; the monster (also played by a normal-size human) appears grossly oversize; the scenes of Tokyo are both "real scale" scenes of the actual city and scale models of diminutive houses, vehicles, and street infrastructure; the model of Tokyo Bay is also diminutive. In a few critical scenes, these objects were then layered from foreground to background so that citizens of Tokyo could be juxtaposed with the miniature version of the city in flames. Objects filmed separately were then overlaid and montaged to represent different spaces within the same spatial continuum. This simultaneous overlaying of different scales to create an illusion of great size offers a hint for understanding architectural photographs that play with our perception of building scale. What film does in a continuous layered montage, photography approximates through seriality and repetition. The multiple images of any single building are alternative representations capable of enhancing building size through juxtaposition, framing, and lens choice. Each image records one registration of size; their aggregate effect creates an impression of the object that often must reconcile conflicting or contradictory information.

Perhaps the most important observation to be made about size in architectural photographs has to do with its mutability, the ease with which photographers can alter apparent building scale through a range of technical devices that serve as the stock in trade of the film technician but retain the status of magician's tools for the architectural (and documentary) photographer. A film like Gojira simply outlines possible approaches.

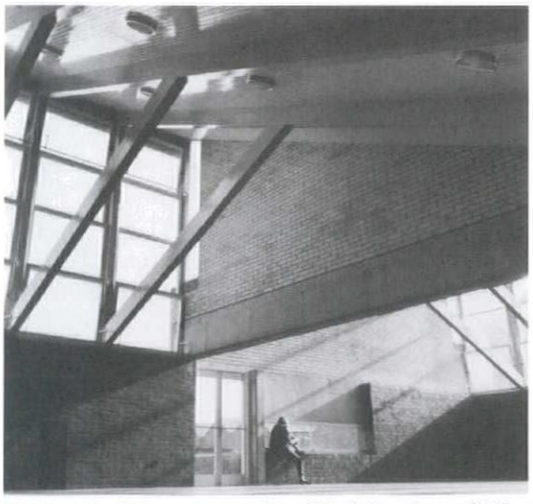
Compensatory Effects

In terms of monstrous photographs of buildings, a series of technical parameters govern the creation of an appropriate mise-en-scène for a given image. Framing, composition, the use of a wide-angle lens, and manipulation of both depth and breadth of field are generally used in combination to manipulate scale for rhetorical or narrative purposes. Two effects result: the first is an enhanced contrast in scale; the second is an exaggeration of spatial depth. These constitute two recurrent variables of the visual hyperbole characteristic of architectural photography, deriving at least in part from the technical limitations of the medium itself but amounting to a form of visual intensification. And the desire for enhanced or intensified effect in photographs is almost certainly a compensatory desire put into play by the collapse of three dimensions into two. In other words, the apparent exaggeration of spatial effects embedded in many images of architecture constitutes an imprecisely calibrated form of compensation for the loss of bodily experience inherent in photographic viewing. Photographers and architects sometimes refer to a photographer's effort to capture the "spirit" of the architecture, which is surely another way of saying the same thing: the transformation of elusive "spirit" into flat image requires the enhancement or exaggeration of certain features and the suppression of others.[9]

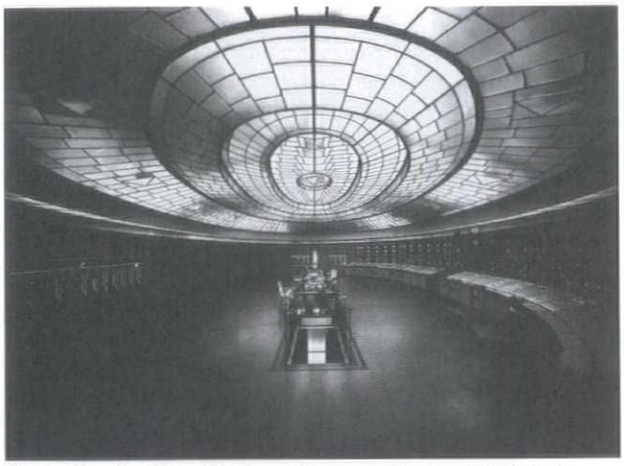
If this is true, how might one then describe the difference between the agency of images and that of buildings? Images of architecture play with our perception of scale in at least three



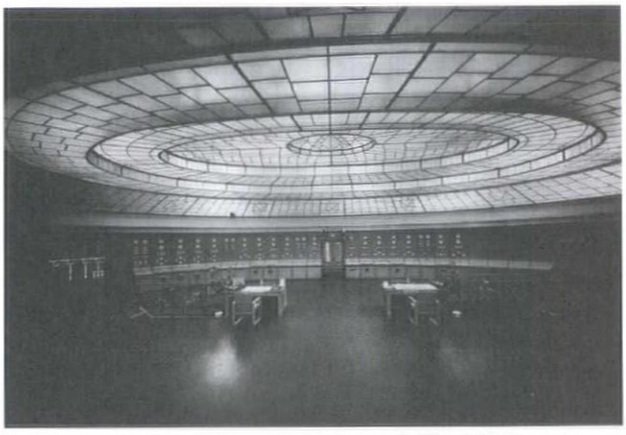
In Fritz Schurig's early 1940s photograph of Paul Bonatz's Reichsautobahnbrücke outside of the cathedral town of Limburg, the bridge dwarfs the diminutive icon of a medieval German town. Visual rhetoric underscores the power of the Third Reich as it encircled the German Volk. Bigness is invoked here in relation to smallness, neither an absolute reckoning of their objects (the town is much bigger than the bridge), both in ideological play created by the genius of photography.



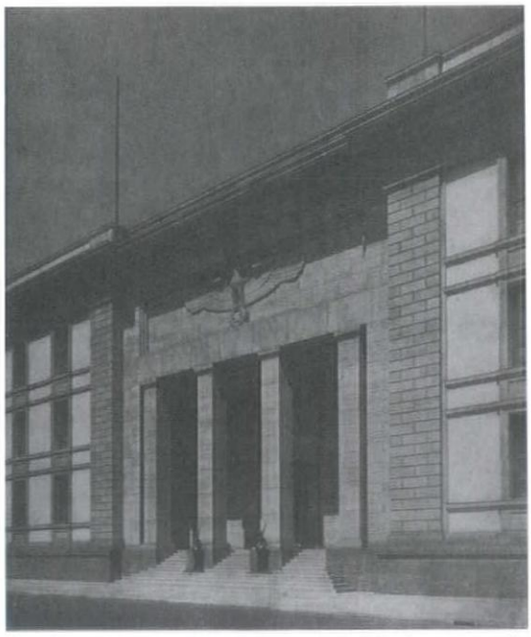
Photograph of the monumental small building: James Stirling and James Gowan, Brunswick Park Elementary School Extension, Camberwell. Photography by James Stirling with Eldred Evans.



Tivadar Kozelka, Helenföld Power Station (arch. Virgil Bierbauer), Budapest, 1927–33. Control room, long axis.



Tivadar Kozelka, Helenföld Power Station (arch. Virgil Bierbauer), Budapest, 1927–33. Control room, short axis.



The Neue Reichskanzlei was photographed by the younger Rudolf de Sandalo, formerly of Czechoslovakia, where he had worked with his father in photographing the modern architecture of Brno and Prague, and where he had shot the series of grandly abstract plates of Ludwig Mies van der Rohe's Tugendhat House.

ways: by exaggeration, by suppression, and through ambiguity. In all three instances visual perception of scale interacts with and sometimes becomes contingent on other visual effects of the photograph, and does not therefore function independently. In spite of this caveat, a discussion of how the treatment of scale conditions our understanding of images has the potential for some degree of analytical precision. Such a discussion acknowledges, and perhaps unleashes from their protective architectural framework, some of the many photographic effects that architects have lived with for more than a hundred years.

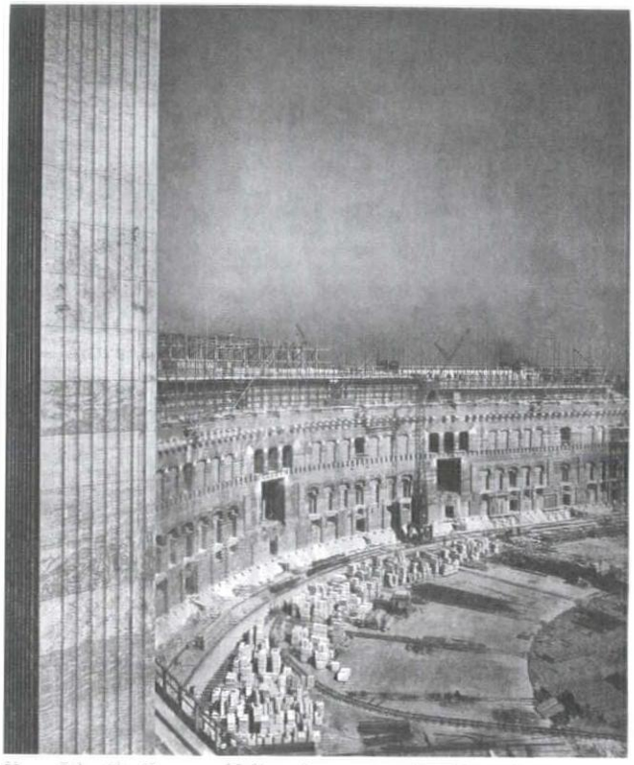
Images that invert big and small with a distinctly polemical intent became easier to construct following technical advances in the control of depth of field, when photographers were able to focus two objects distant in space simultaneously. The development of the leaf shutter in 1902 and the increasing sensitivity of dry-plate film after the 1880s freed photographers to experiment with depth of field, which is best achieved through the smallest possible lens aperture. Examples of photographs that juxtapose distant objects with those close to the camera proliferated throughout the 1920s; familiar examples include the well-known photograph of Brno's Spilberk framed by the central aperture in Ludwig Mies van der Rohe's Tugendhat House.[10] The wide-angle lens, which shortens focal length for the sake of recording a wider cone of vision, enables the viewer to take in—and visually participate in—a much larger object than any normal lens can capture. But it has another effect that helps construct photographic bigness by altering the dimensional appearance of architecture. In the case of interior photography, it expands the cone of vision into a trumpet shape that grabs more at its outer edges (close to the camera) and compresses more distant objects at its center. This results in a substantial dimensional alteration to any architectural object. The foreground is enlarged immediately around the camera, becoming inordinately big in relation to the background. Just as this stretching process renders depicted architectural interiors longer than they appear on-site, or with a normal lens, it also has a corollary effect. If the object is stretched in depth, then the proportional relationships between height and width are necessarily altered as well. Thus while the space appears deeper, it also appears lower, or narrower, than expected, with an enlarged foreground in which various sorts of haptic effects may be staged to draw the viewer into the body of the trumpet-shaped beast more effectively. This exaggerated effect might be considered one of the monsters of the architectural photograph; it presents a spatial representation that entices the viewer to step into an elongated tunnel that differs in essential characteristics from the object it purports to describe. Paradoxically, what makes this altered reality so convincing is the undeniable resemblance between photographed space and constructed space: the wide-angle image is almost the same as the object photographed some other way. We accept it as visual evidence through the logic of approximation that characterizes photographic viewing more generally.[11] Thus in the case of a building like the Tugendhat House, which became known through the distended spatial tubes depicted in its images, the compensatory effect of photography elongated space in a manner that transformed notions of spatial abstraction as developed in Weimar architectural discourse from experiential ones into visual ones.[12]

Ways of Seeing Monsters

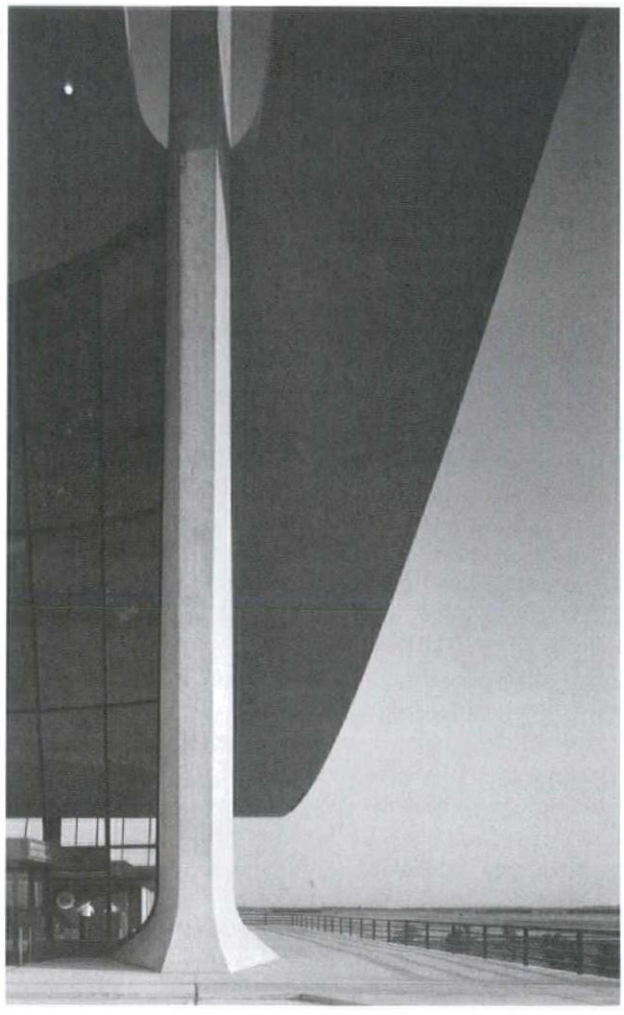
By the late 1930s and early 1940s, the same photographers who shot the buildings of the Neues Bauen in Germany and Eastern Europe were taking pictures of the new architectural projects being built there under the aegis of the National Socialist government. The behemoths of National Socialist architecture included complexes such as the Zeppelinfeld and Congress Hall, at Nuremberg, and buildings like the Olympic Stadium and the Neue Reichskanzlei, in Berlin. Their photographs show the continuous development of photography over the years of the Weimar Republic, with sharp focus and good depth of field over broadly framed images. The buildings have simply grown to an enormous size. Their images produce a perceptual ambiguity: markers of absolute scale, such as stairs and balustrades, are themselves oversize, requiring the occasional human-scale figure to render this gigantism perceptible in photographs. Without the evidence provided by a recognizable object, the images resort to conventions of representing the sublime (where scale is no longer reckoned in terms of human size) or to juxtapositions of large and small through parallax and framing, where the largeness of a new state building project can be reckoned against the artificial smallness of an object or settlement far away.[13] In both cases photography either creates the monster or enhances its monstrous effects. These images are constructed according to the rules of conventional perspective, returning to the norms of pre-Weimar photography and to a form of spectatorship that deploys the notion of empathy (Einfühlung), as the perceptual model through which the viewer pours himself or herself into the image, projecting emotion onto the object in view.[14] This way of seeing is still common for commercial photographs of architecture.

In the 1930s and '40s increasingly sophisticated perspective correction provided an additional tool that radically changed the way architectural photographs could depict large and small buildings while still maintaining conventional modes of viewing. Photographers Julius Shulman, Ezra Stoller, Balthazar Korab, and the firm of Hedrich Blessing were at the forefront of this development, which saw its most vigorous growth in postwar America. Notably, the work of these photographers had continued relatively unimpeded during the war years, at least by comparison with their European colleagues.[15] In images by these photographers, compositional norms from earlier periods survive but are gradually altered by improved technologies and the expanding scale of both photography and architecture. These incremental improvements in existing technologies were not so much new inventions as accelerations; new affects appear (like continually enhanced depth of field) that have been in evidence in less sophisticated versions for years. The increased flexibility in swing cameras, for example, kept the negative plate parallel to vertical surfaces in the subject while allowing the lens to angle or tilt upward or downward as necessary to capture tall buildings, sidelong facades, or interior views oriented toward corners. The lenses in cameras of the 1930s and '40s could also be moved vertically or horizontally with increasing flexibility. The result of these technical improvements were images that maintained stable vertical lines but that could also capture an increasing range of angled views with little apparent distortion.[16]

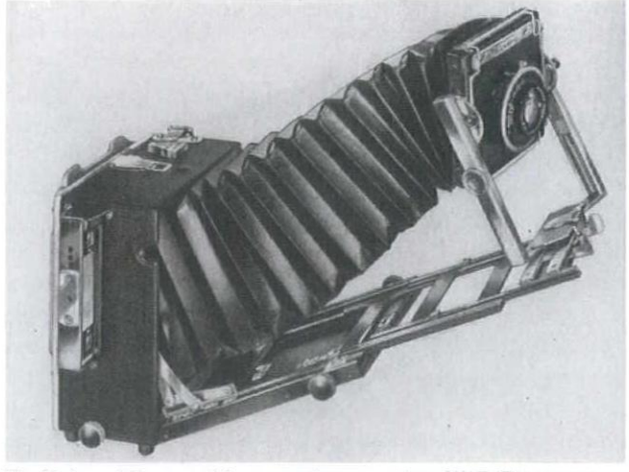
This enhanced ability is part of the ongoing calculus of developments in architectural photography; maintaining continuities with an existing tradition of visual imagery but continually transforming them when new technical possibilities, and a new set of architectural concerns, effectively update the logic of the original tropes. Stoller's images maintain the stable vertical lines made possible by camera swing and shift—also reasserting the well-established convention of architectural photography that "verticals stay vertical." In photographing skyscrapers, he (and others) substituted these older viewing conventions for an earlier view of the skyscraper that emphasized



Hugo Schmölz, Congress Hall, under construction, Nuremberg, c. 1943 (archs. Ludwig and Franz Ruff).



Ezra Stoller, Dulles Airport Terminal, (arch. Eero Saarinen).



The Universal Camera with perspective correction, 1947. The camera swing existed as early as 1908; but the flexibility, and the degree of potential swing were radically improved around 1947. This sort of equipment is also eloquently illustrated by Julius Shulman in his book, Photographing Architecture and Interiors of 1962, which shows the degree of technical improvement between 1947 (above) and 1962.

its verticality through converging vertical lines—the tradition of Alexsandr Rodchenko or of Erich Mendelsohn in his influential Amerika: Bilderbuch eines Architekten of 1926—or indeed of any number of photographs of skyscrapers from earlier decades, including the whole tradition of avant-garde street photography of the 1920s and '30s.[17] Thus the conventions of commercial practice, maintained and strengthened by technological improvements, were preferred to a different set of viewing norms from the avant-garde. This provides an additional clue to the symptomatic reading of photographs of buildings marketed commercially. The paradox of these images is that while the consistent vertical produced an image more or less consonant with daily visual experience for buildings that are not very tall, in the case of the skyscraper the technical challenges of producing such images are substantial and demand that the photographer abandon a station point on the ground. Limits on the position of the camera are now dispersed vertically as well as horizontally, precisely in order to compose images that appear to be entirely independent of the distracted view of the inhabitant of the city. The floating station point Stoller used for his images of the Seagram Building paradoxically decontextualized their intensely urban subject by adopting an elevated viewing point. While the images emerged from an empathetic model encouraging a mental projection into the image, they also constitute visual evidence of a disembodied perspective. Only an act of conscious cognition reminds the viewer that the photographer was probably standing in the high-rise next door. An inversion results: the embodied viewer is displaced from the ground, elevated, and potentially replicated.[18]

By contrast Manfredo Tafuri and Francesco Dal Co's Modern Architecture (1976/1986) included skyscraper photographs from commercial stock archives that illustrate an opposite development.[19] Stock photographs occupy a different sector of the commercial market for images of buildings. Less closely indexed to conventions of architecture, photographers of these sorts of image are more likely to rely on broader conventions of image making; they are also more likely to photograph urban fabric (such as skylines) than they are to take pictures of single buildings alone on a densely crowded site. Modern Architecture includes views of the Seagram Building (juxtaposed with an image by Stoller) and other New York skyscrapers presented from the perspective of the passerby. In the 1920s this sort of urban photography eschewed the norms of contemplative empathetic viewing to emphasize the contingency of urban life and the realities of unexpected, mobile, fragmented viewing. Angled cameras and unexpected points of view signified a shifting paradigm for visual culture, relegating the contemplative view of the empathy theorist to the dustbin of conservative traditionalism. But by the latter half of the twentieth century, progressive avant-gardism had itself become normative; fragmentation in urban experience was more expectation than surprise, and vertically angled views a common feature of urban life.

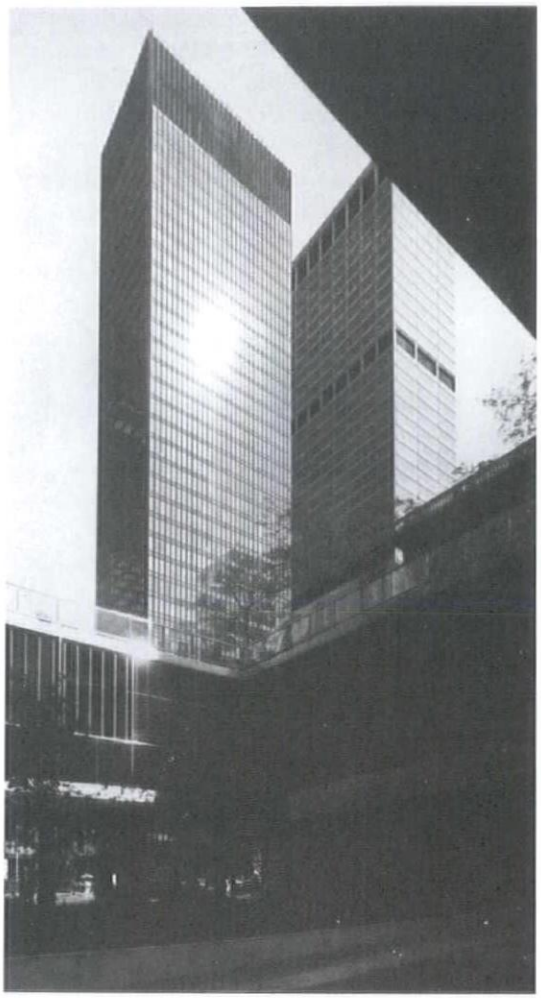
These images of Marlo Thomas's New York (which abounded in the opening credits of That Girl), offered by commercial houses for a modest fee for any sort of application (advertising, documentary, illustration, even possibly exhibition), demarcate a different zone of culture from similarly composed images in more limited circulation in 1920s Europe. No longer radically innovative, these photographs of monumental architecture now serve the culture industry as items of popular spectatorship or elements of kitsch. Stoller's normative perspectives, by contrast, reinstated the sort of empathetic viewing discarded by the avant-gardes. Thus by the 1960s both viewing norms (empathetic and alienated) coexist in the realm of commercial image making, producing two alternative renditions of the gigantic architecture of New York City. This seeming elision of the prior historical distance between the empathetic and the alienated or estranged (from Berthold Brecht and Viktor Shklovsky)—two modes seen as diametrically opposed and mutually exclusive throughout much of the Modern period—attests to their persistence, despite a mutual obsolescence, in the broadest form of commercialism in the American city: that of the exchange of images.[20] Two different versions of monster photography happily coexist, each describing the same building through a very different sort of architecture.

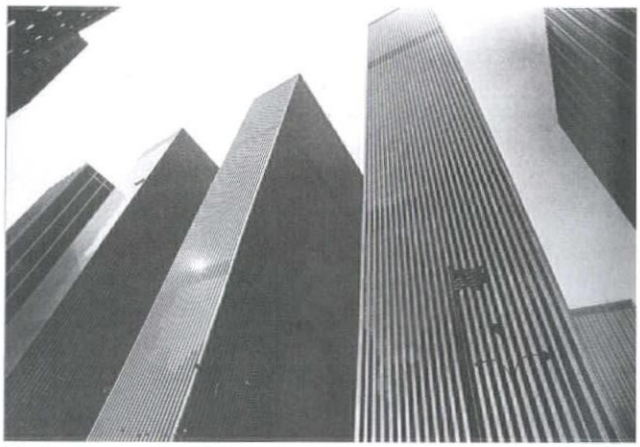
Monsters Networked

The scale of global commerce and media society in the postwar years, as described by Marshall McLuhan, demanded more than two photographic monsters. For the global enterprise of architectural photography, we return to postwar Japan to find a third sort. Japanese photographer Yukio Futagawa created an extensive body of architectural photographic work after World War II, continuing to the present day.[21] His encyclopedic photography is mirrored by the larger engagement of Japanese industry with the market for photography.[22] In the years after the war, the production of camera equipment passed gradually from Europe to Japan, although Japanese firms had been manufacturing precision instruments based upon European designs prior to 1920. From the 1950s Japanese camera manufacturers produced an unprecedented number of new lens types, surpassing their German competitors by the 1980s. By 1989 Nikon was producing more than 50 lenses for a single camera, their 35 mm. single-lens reflex.[23]

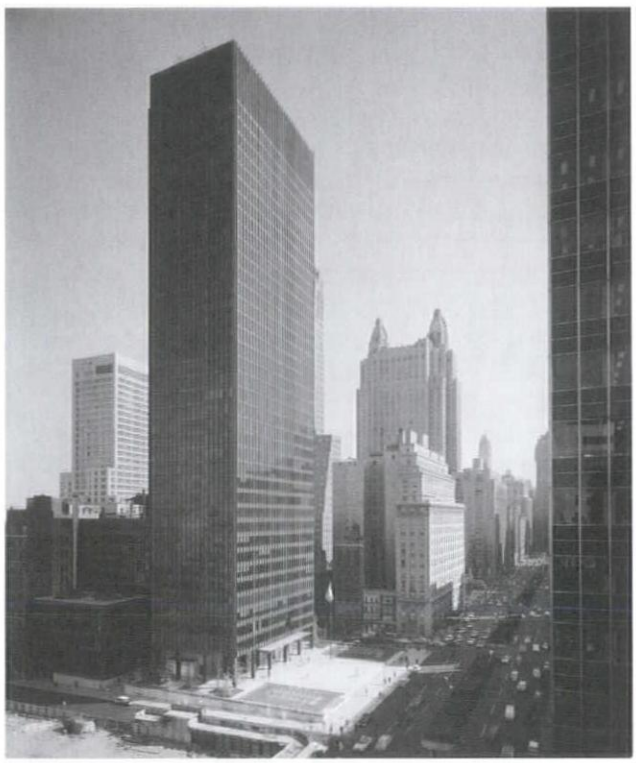
Futagawa's photographs engage the question of scale in at least two ways that have less to do with image composition and more to do with infrastructures of photographic circulation. First, his images consistently appear in large-format publications that are substantially larger than most architectural periodicals (the vertical format at about 364 x 257 mm is roughly 10 x 14 in.). The images fill the entire page through full-bleed printing right to the edge. The format is bigger, and the printing technique—at least in much of his work of the 1960s and '70s—produced images that appear more intensely saturated than those in other architectural publications, thanks to photolithographic printing. Second, Futagawa's photographic work constitutes a systematic visual encyclopedia of current architecture, a gigantic network of its own. The subtitle of the original publication, Global Architecture, is An Encyclopedia of Modern Architecture.[24] Its comprehensiveness results from more than 50 years of productive work. The Global Architecture series alone represents a highly systematic presentation of contemporary architecture; the original series has been subdivided and reproduced in subjournals such as GA Houses, GA Architect, GA Japan, GA Interiors, GA Traveler, and others, targeting ever more precisely defined subcategories of architectural practice.[25]

Futagawa preceded his work on global Modern architecture with an ambitious catalog of Japanese vernacular architecture presented in a broad array of publications (some translated into English) beginning in the 1950s. These include a ten-volume work on the Japanese house, in a format that almost precisely predicts the Global Architecture series.[26] These books and journal numbers, like GA, feature page after page of large-format, full-bleed images, often using grainy black-and-white





The skyscraper images in Tafuri and Dal Co's Modern Architecture were supplied by Photo Researchers Incorporated, NY. See http://www.photoresearchers.com/main.html. None of the images published by Tafuri and Dal Co appear on the current website.



Ezra Stoller's work includes images taken from non-standard camera heights, from low down or high up in the air rather than the conventional camera position roughly five feet above ground level, so that the viewer's investment in the image is restricted by the evident impossibility or discomfort implied by the position of the camera. In one of Stoller's images of Mies van der Rohe's Seagram Building, he returns to a time-honored motif: the image of architecture framed by architecture, faintly nodding back to a famous image of the Galerie des Machines of 1889. The alteration in camera position and depth of field, and the transformation of the frame from horizontal to vertical (the side of Lever House defines the right hand edge of the image) renders this photograph both startlingly new and strangely familiar. In this image, we don't enter the frame, except to float in the ether; a technique originally used to ground the viewer and thereby anchor the image has been turned into an instrument of nearly infinite vertical extension. Framing elements no longer naturalize the image, drawing us in; instead, they bounce the eye from one hard vertical surface to another, off down the length of Park Avenue.

Yukio Futagawa, Nihon no minka, volume 4, plate 1.

film richly printed using a photogravure technique. The result is a journalistic photographic counterpoint to cinema verité—a gritty, hard-edged picture of architecture that, despite the use of grainy film, dwells intensely on the surfaces of things. The richly saturated images deploy intense chiaroscuro, evoking Jun'ichirō Tanizaki's In Praise of Shadows. Futagawa developed a particular photographic language in these early works, in which presence is often conveyed by th e portrayal of the fragment in lieu of the whole. Thus his photographic catalog of vernacular architecture is not comprehensive through extent of coverage but rather through synecdoche; each photograph of a building fragment serves as representative of the whole building, and even of the building type. (Stoller's eloquent photograph of Eero Saarinen's Dulles Terminal uses a similar strategy in a very different sort of image.) Gigantic size can be relayed partly by elision (of much of the building) and framing, and partly through the introduction of scale figures that are calibrated against the overwhelming vertical composition of the image. In the case of Futagawa's early images of vernacular architecture, a different aesthetic relies on close focus and textured lights and darks to convey a sense of immediacy and size within a realist depiction of weathered textured surfaces and variegated light. This work produces a sense of material presence of architecture through printing technique, size, and careful framing of parts of buildings.

Here are two considerations accompanied by a third: firstly the encyclopedic pretensions of the lifelong photographic project itself; and secondly the large-format, full-bleed printing that delivers large scale as a phenomenon of photographic printing rather than camera work. The framing of fragmentary architecture supplies a third rhetoric of bigness for Futagawa's work—the bigness of the only partially seen. His architectural catalog presents photographic historians with a challenging project: a double-pronged effort in which a diachronic local history and a synchronic global history of contemporary developments join as complementary aspects of a way of understanding architecture and perhaps a portrait of Japanese architectural interests, ambitions, and technical capabilities over a limited span of years. Futagawa has done more than any other photographer to author a new account of Modern and contemporary building, one that incorporates an intensified notion of size in its own internal structure. The "monster" here has multiplied; it includes the system of publication itself, one that blankets the globe with an increasingly consistent mechanical reproduction of architecture.

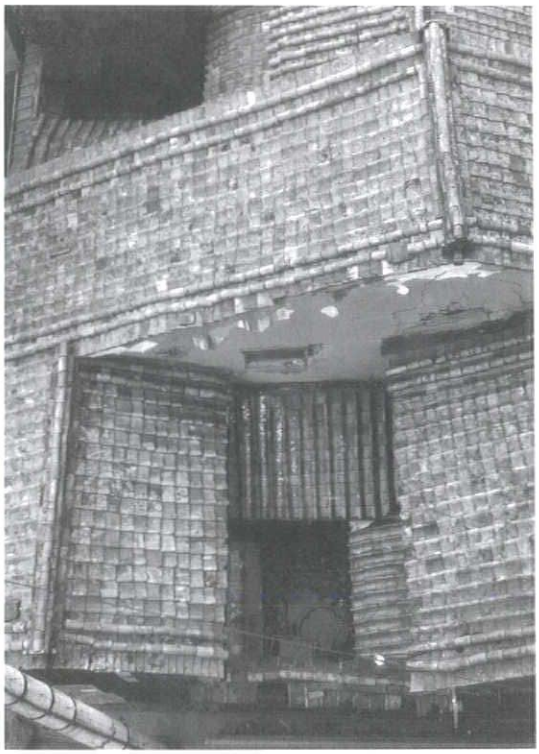
Not surprisingly the development of Futagawa's project shares historical roots with Gojira; as the film came out in 1954, Futagawa was soon to begin his ten-volume series, Nihon no minka, on Japanese domestic architecture (he later carried out a similar less—extensive study of European vernacular architecture). Whether and how these constitute parallel efforts to construct a postwar Japanese cultural consciousness awaits further study. In this early photographic catalog, however, Futagawa surveyed domestic vernacular architecture province by province; his systematic geographical approach is belied by surprisingly whimsical images that attempt to portray the specificity of local buildings. What is implicitly an effort to catalog and account for the patrimony of Japan in the postwar years winds up deploying a set of photographic procedures that convey nothing so much as immediate particularity. Despite the compositional resemblances already referred to, this effort shares more with Edward Weston than with Stoller. This is even more striking in the early black-and-white work than in the later juggernaut of GA, although Futagawa's realist/formalist program remains intact throughout that series.

In the early pictures, Futagawa calls on photography to convey a sense of immediacy that often eludes the medium, but without abandoning the larger representational project of the self-proclaimed documentarian. Here, then, his photographic strategies diverge from that of abstract formalist architectural photographers like Judith Miller, whose photographs of the "Five Architects" depict fragments of building as abstract composition rather than synechdoche. Instead they describe a self-conscious documentary project with potentially operative ends, to return to Tafuri's formulation. In what sense is Futagawa "operating" on history with these images? This is a wide-ranging photographic encyclopedia that calls on photography's most materially expressive aspects—large size, grainy film, velvety blacks and grays, heavy chiaroscuro—to supplement breadth of coverage with the whimsical "touch" that photography conveys through its intrinsic indexicality as a medium. By virtue of subject matter (the history of Japanese architecture, on the one hand; the breadth of Modern and contemporary architecture, on the other), Futagawa's overall publishing project extends along two axes: the synchronic and the diachronic. In terms of photographic method, it is also aimed at two independent trajectories; first, the axis of encyclopedism (a tradition going back to Diderot); and second, the axis of close reading, of an intimate gaze bestowed by the penetrating eye of the camera. The GA publication series might be understood in roughly the same terms: it began, after all, as a series of monographic treatments of single architects and, in some cases, single buildings.

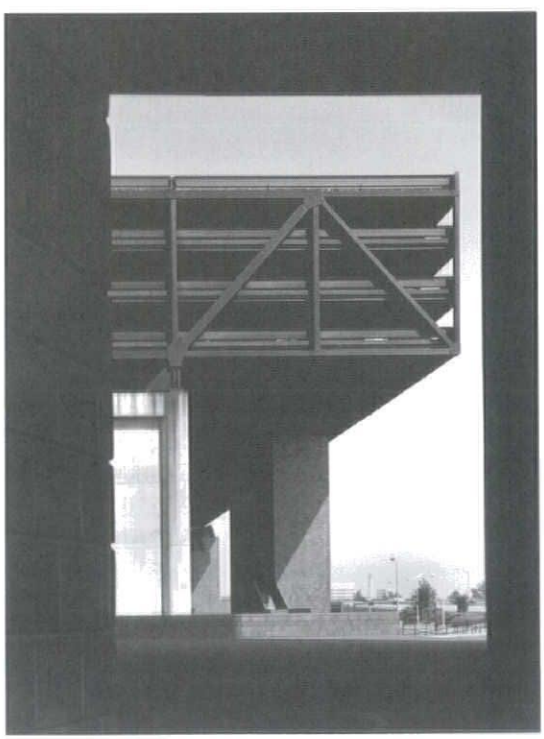
Is it fair to claim that the success of Futagawa's massive undertaking cannot be assessed in relation to specific images or an early body of work, but that it rises or falls rather on the monstrous global network he has attempted to constitute? Or irrespective of the market for his images, that he authored a new way of looking at architecture, one that draws on a visual tradition tied in with the history of Japan? These two questions cannot be considered separately, in my view. It is on the question of the audience for these images that we find Futagawa marking out a terrain distinct from those already described. Although he occasionally worked for architects on commission, Futagawa's efforts as photographer and publisher remain somewhat independent of the market for commercial architectural photography commissioned by architects or by journals for publication. Equally, despite its encyclopedic nature, the GA publishing house (A.D.A. Edita) does not function like a commercial stock house, where images can be bought for a multitude of uses. Nor has Futagawa ever actively marketed himself as an art photographer. His publishing empire marks out a small semiautonomous region in which photography occupies a particularly activist space in the history and production of architecture. Futagawa's "operative photography" works on current architectural practice as much as history. His project delineates a space closely bound to the history of Japan, its place in a globally constituted world, and the history of its images.

The Monster Decomposed

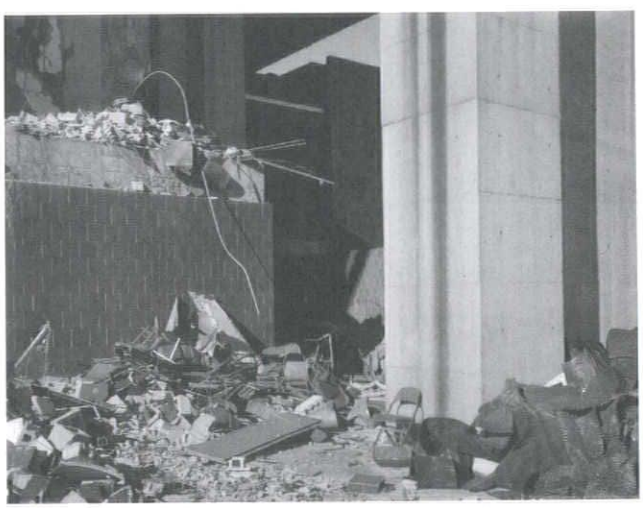
Futagawa photographed one of the giants of late Modern architecture: the New Haven Veterans Memorial Coliseum, by Kevin Roche and John Dinkeloo. With their panoramic perspectives and impressive depth of field, his photographs make a vast megastructure appear even vaster. As the coliseum was being demolished in 2005–7, it was



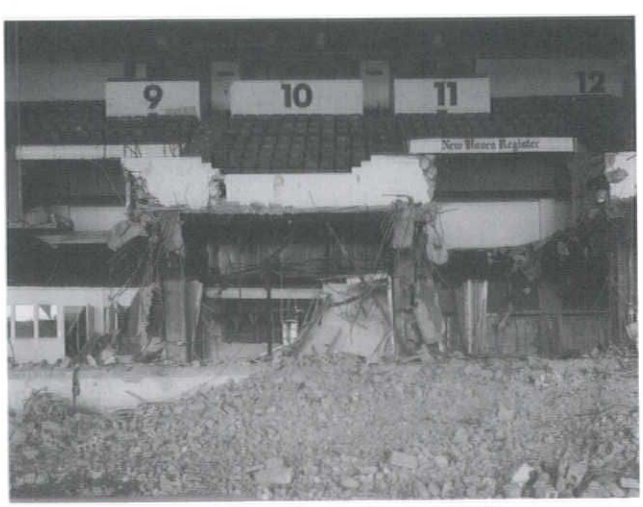
Yukio Futagawa, Nihon no minka, volume 1, plate 18.



Yukio Futagawa, New Haven Veterans Memorial Coliseum.



Colin Montgomery, New Haven Veterans Memorial Coliseum.



Colin Montgomery, New Haven Veterans Memorial Coliseum.

Colin Montgomery. His images belong to a particular genre: photographs of buildings in a state of transition between existence and nonexistence. This genre has existed since the nineteenth century and appears to constitute a form of diagnostic image within which conditions of building can be examined with anatomical precision. Both Futagawa's and Montgomery's photographs reveal construction in relation to surface conditions that conceal or clothe the inner structure of architecture.

Montgomery deconstructed the half-demolished building precisely by restoring scale to the architecture through the recording of its entrails: seats, staircases, handrails, and scoreboards, dramatically exposed during the process of demolition, retain the record of its size. His images underscore how current analyses of architectural photography are tellingly carried out by photographers themselves—including Thomas Struth, Gursky, Thomas Demand, Heiner Schilling, and others. At the New Haven Coliseum, scale comes back through delamination: traces of human occupation return scale markers to a scaleless architecture. Just as photographers have the power to turn big buildings into small, and vice versa, they also have the capacity to deconstruct their own practice, returning scale to the realm of the visible and setting up unexpected adjacencies between the belly of the beast and its mottled, glossy skin.

Acknowledgments

My thanks to the editors of Perspecta 40 for including me in the "Monster" project. I also thank Michael Berk, Kevin Carr, Eve Zimmerman, and the energetic students in my seminar "Transactions between Architecture and Photography," at the University of Michigan, winter 2007.

1 Quoted in Michael Kimmelman, "Giants of the Heartland," New York Times (14 January 2007) section 2, 1, 26.

2 Mario Carpo and others correctly point out the extent to which the digital age confronts us with unprecedented relationships between image and object, such that we must rethink the hierarchy of image to building. See program statement "Architecture, Technology, and the Historical Subject," Ecole Nationale Supérieur d'Architecture de Paris La Villette, Conference call, 2007.

3 Reyner Banham, Jean-Louis Cohen, Beatriz Colomina, Robert Elwall, Robin Evans, Andreas Haus, and Rolf Sachsse all address this issue in their work on Modernism and its mediums. Simone Förster, Roland Jaeger, Daniel Naegele, and Philip Ursprung have joined the conversation more recently and have been followed by many other young scholars interested in the subject, myself included. Richard Pare has conducted his investigation into the history of architecture and its photography through the camera more than the written word.

4 Georges Didi-Hubermann's discussion of images as "symptoms" (following Aby Warburg) is particularly relevant to the further development of this project. For his opinion on monsters, see "Dialektik des Monstrums: Aby Warburg and the symptom paradigm," Art History 24, no. 5 (November 2001): 621-45; idem; L'image survivante: histoire de l'art et temps des fantômes selon Aby Warburg (Paris: Editions de Minuit, 2002); and Confronting Images: Questioning the Ends of a Certain History of Art (University Park, PA: Pennsylvania State University Press, 2005; French edition 1990). Also see W. J. T. Mitchell, What Do Pictures Want? The Lives and Loves of Images (Chicago, IL and London: The University of Chicago Press, 2005); and Hans Belting, Das echte Bild: Bildfragen als Glaubensfragen (Munich: Beck, 2005).

5 Visual hyperbole is defined as the use of a variety of photographic and extra-photographic effects (such as printing techniques, format, and captioning) to modify or destabilize photographic representations of "absolute size." It brackets a range of effects deployed by photographers to compensate for aspects of architecture that are not visible in photographs. Scientists and archaeologists often include a ruler or other calibrated scaling device to create precisely scaled photographs of objects where the picture can then be printed at real size. Mapmakers have developed their own set of techniques for accurately scaled images. But in the world of architectural photography, the representation of size depends on a much less definitive set of techniques. For essays on visual rhetoric from the fields of linguistics and literature, see Charles Hill and Marguerite Helmers, Defining Visual Rhetorics (Mahway, NJ, and London: Lawrence Erlbaum: 2004).

6 The spectacle of a Japanese city decimated by flames and crushed under the feet of an alien force recalled the recent trauma of destruction by the Enola Gay and an unnamed B-29 bomber (later christened "Bockscar"). Gojira stands as a repetition and a redemption—the monster is ultimately destroyed by the same technologies that created him. But with his death the instrument of destruction also dies: the research scientist who invented the "Oxygen Destroyer" that slays the monster in his undersea bed grandly cuts his own oxygen connection to the ship above. This act of selfless self-immolation follows the scientist's earlier destruction of all the technical data documenting its invention and his accompanying observation, "Who knows what they will make me do if I am still alive." The enemy's moral compass has come, by 1954, to exceed that of his erstwhile adversary, as Mark Anderson has emphasized. See Gojira (1954) and, from a recent collection of essays on the subject: Mark Anderson, "Mobilizing Gojira: Mourning Modernity as Monstrosity," in William Tsutsui and Michiko Ito, In Godzilla's Footsteps: Japanese Pop Culture Icons on the Global Stage (New York: Palgrave Macmillan, 2006) 21-40. Anderson analyzes the film's relationship to media society and provides historical context for the film and the debates that were part of its reception in Japan. I am grateful to Kevin Carr for this reference and to Eve Zimmerman for my initial introduction to the Japanese version of the film.

7 For a discussion of images that cannot be viewed (and how they are viewed), see Georges Didi-Huberman, Images malgré tout (Paris: Minuit, 2003).

8 Anderson, op. cit.

9 Architects and their photographers often speak of the need to enhance and intensify the distinguishing features of any given building in its images. Both attest to this when they discuss the need for photographers to serve as "interpreters" of architecture. The photographer's task is often understood as representing to the public the "essential" qualities of the architecture, translated from three dimensions to two. These essential qualities are often determined in consultation with the architect, who thus influences the representations that will circulate his or her ideas to a larger public. In place of these essentialist claims, two things can be observed: one, photographers often attempt to create constructs analogous to those they observe in the architecture they photograph (thus monumentality in a tiny building like Ludwig Mies van der Rohe's Riehl House of 1907, which indeed had monumental pretensions); two, these analogous photographic constructions often emerge from developments in photography that may in turn have an impact on new architecture in surprising ways. See Richard Neutra, "The Photographer and Architect," in Julius Shulman, Photographing Architecture and Interiors (Los Angeles: Balcony Press, 2000) vi; Daniel Naegele, "An Interview with Ezra Stoller," History of Photography 22, no. 2 (1998): 105-15.

10 The introduction of the handheld Leica in the mid-1920s had an indirect impact on commercial photographers. Although the Leica was not used for commercial work, it introduced a new set of vocabularies for architectural photography, as its flexibility changed expectations for many genres of photography. Architectural photographs for publication and exhibition (as well as architects' direct marketing to clients) were shot with large-format view cameras equipped with ground-glass focusing screens. Commercial architectural photographers witnessed the revolution in photographic modes that gave rise to such events as the 1929 Film und Foto exhibition in Stuttgart, where Laszlo Moholy-Nagy, Franz Roh, and others brought a new set of visual parameters and experiential potentials to photographic practice, many of these techniques pioneered by Aleksandr Rodchenko, El Lissitzky, and other photographers in the Soviet Union and Eastern Europe. These included raking and angled views of buildings reflecting the shifting mobile viewpoint of the modern urbanite. Some of these new compositional habits began to appear in commercial architectural photographs in the 1920s and early 1930s, although they were generally restricted, both by conventions of the medium and by technical considerations. The view cameras used in the field in the 1920s were simple box models, sometimes with bellows. Although they could be adapted to angled viewing positions, this was probably not a primary functionality until later.

11 For a discussion of the relations between representation and resemblance, see Nelson Goodman, Languages of Art (Indianapolis, IN and Cambridge, MA: Hackett, 1976). Although writers like John Tagg claim that photographs cannot be considered reliable sources of evidence because they are highly susceptible to manipulation, photographic or quasi-photographic imaging techniques continue to be used to provide evidentiary documents in numerous fields, architecture included. It is precisely the fact that many sorts of photograph are evidentiary, and will continue to be so, that makes their analysis so interesting. Equally important is the fact that photography accomplishes many other tasks while it provides a certain kind of visual evidence (just what sort is continually under discussion). Many of these tasks are unrelated or even opposed to the provision of visual evidence. Instead they fictionalize the realist image in different ways. See Rosalind Krauss, "Photography's Discursive Spaces," in The Originality of the Avant-Garde and Other Modernist Myths (Cambridge, MA: MIT Press, 1985) 130-50; and Robin E. Kelsey, "Viewing the Archive: Timothy O'Sullivan's Photographs for the Wheeler Survey, 1871-1874," The Art Bulletin 85 (December 2003): 702-23. See also John Tagg, The Burden of Representation: Essays on Photographies and Histories (Amherst, MA: University of Massachusetts

Press, 1988); and Victor Burgin, Thinking Photography (London: Macmillan Press, 1982). For a penetrating discussion of the earliest of architectural photographers, see Geoffrey Batchen on William Henry Fox Talbot, in "A Philosophical Window," History of Photography 26 (Summer 2002): 100-112.

12 See Claire Zimmerman, "Photographic Modern Architecture: Inside 'the New Deep'," Journal of Architecture 9 (Fall 2004): 331-54, for a fuller explanation of this effect at the Tugendhat House. Also see Claire Zimmerman, "Variants of Modern Abstraction," in Modernism, Media, Abstraction: Mies van der Rohe's Photographic Architecture in Barcelona and Brno (1927-31) (PhD dissertation, CUNY Graduate Center, 2005) for a description of differing modes of abstraction, photographic and spatial.

13 For a related discussion in literary history, see Susan Stewart, "The Gigantic," in On Longing: Narratives of the Miniature, the Gigantic, the Souvenir, the Collection (Baltimore, MD: Johns Hopkins University Press, 1984) 70-103. My thanks to Davide Deriu for this reference.

14 For recent work on empathy theory, see Juliet Koss, "On the Limits of Empathy," Art Bulletin 88 (March 2006): 139-57; and Harry Mallgrave, ed. Empathy, Form, and Space: Problems in German Aesthetics 1873-1893 (Santa Monica, CA: Getty Research Center, 1994). While conventional perspective in photographic composition governed most architectural photographers during the Weimar years, professional photographers showed their awareness of photographic experimentation through limited borrowing of avant-garde conventions. See, for example, Albert Renger-Patzsch's pictures of Rudolf Schwarz's women's school in Aachen, in Rudolf Schwarz, Albert Renger-Patzsch, Der Architekt, der Photograph, und die Aachener Bauten (Aachen: Suermondt-Ludwig-Museum, 1997).

15 Access to new equipment was curtailed for several years after the war in the United States. See Norman Goldberg, Camera Technology: The Dark Side of the Lens (San Diego, CA: Academic Press, 1992) xiv. Photographer Wilhelm Niemann, proprietor of the Berliner Bild-Bericht, reputedly lost his entire archive and studio on Eisenacher Street to a bombing raid; photographers like Arthur Köster were often compelled to wash old negative plates so that the glass might be used to replace broken windows. For information on Niemann, I am grateful to the photographic historian Janos Frecot, formerly of the Berlinische Galerie; see also the Niemann files in the photography department of the Berlinischer Galerie Berlin.

16 Julius Shulman, Photographing Architecture and Interiors (Los Angeles: Balcony Press, 2000, reprint of 1962 edition) 23-24; see also Lewis L. Kellsey, Corrective Photography (Chicago, IL: L. F. Deardorff, 1947).

17 In conventional images of architecture (such as commercial architectural photographs), the postwar years are replete with a kind of visual hyperbole first discovered in Weimar-era photography but perhaps developed most systematically in the photographic documents of the National Socialist years. Hitlers's new Reichskanzlei disappeared under a bulldozer before 1950, its imagery equally removed from public perception. One might ask: Where is the architectural equivalent of Gojira, either in Japan, Germany, or Italy? Where do we see architects of the vanquished Axis nations exorcising the destruction of their country as a result of their own nationalist ambitions? Perhaps in the heroic techno-assemblages of the Metabolists, or particularly in Kenzo Tange's plans for extending the city over the surface of that same Tokyo Bay, or in the assemblage of fragments that constitutes Hans Scharoun's Staatsbibliothek in Berlin. This return of the repressed as catharsis seems to have depended on an important ritual of symbolization. Just as the martyred heroism of Gojira scientist Serikawa exorcises the humiliation of wartime defeat, so does the altruistic goal of public knowledge made accessible to the masses exorcise the decrepit ruins of the Reichskanzlei, which had lain a mere stone's throw away from Scharoun's library site or the flaming books on the plaza of Berlin's University library, just a little farther. The architect's massive Kulturforum projects perform a similar act of exorcism on the postwar consciousness, both embodying and ejecting the memories of a fragmented urban landscape brought into being by the megalomania of the very same national imagination that produced it.

18 See Reinhold Martin, "Atrocities. Or, Curtain Wall as Mass Medium," Perspecta 32, "Resurfacing Modernism" (2001): 66-75.

19 Tafuri has come closest to meeting the challenge of analyzing the agency of photographs of architecture in his description of "operative photography." See Manfredo Tafuri, "Operative Criticism," in Theories and History of Architecture (New York: Harper & Row, 1980; Italian edition 1968) 141-70. In Modern Architecture, Tafuri and Dal Co mounted an image campaign, pitting radically different sorts of images—archival images, stock-house photography, self-authored pictures, and newly commissioned professional photographs—against one another. They sowed seeds of doubt about the transparency of photography among readers of architectural images, suggesting instead that photographs are always documents of propaganda and operative history. By refusing to restrict themselves to a single genre, they indicated the breadth of the arena in which images of architecture function in society, a vast representational space that ranges from personal snapshots to banal commercial imagery. The book serves to illustrate, as Tafuri puts it, the notion of a varied "meta-language" of photographic imagery. It comes close to presenting architectural photography in the symptomatic terms laid out by Georges Didi-Huberman, avant la lettre. See Manfredo Tafuri and Francesco Dal Co, Modern Architecture (New York: Rizzoli, 1980; Italian edition 1976). For other Italian work on the subject, see Eugenio Miccini, Retorica della fotografia: semiotica dell'architettura rappresentata (Florence: Alinea, 1984); Gabriele Morrione, Fotografare l'architettura (Rome: Kappa, 1984); G. Basilico, G. Morpurgo, I. Zannier, Fotografia e Immagine dell'Architettura (Bologna: Gallerie d'Arte Moderna, 1980).

20 Tafuri's chief point in his discussion of "operative photography" is that photography makes evident the arbitrary relationship between any given moment in time and the identity of a building. The fact of architecture's temporality – its existence over a long span of years and its usage over that time – is registered only by a succession of images of a single entity; and any single image has to be understood thus – as a single image drawn from an infinite number of similar but slightly different images of the same building. For this reason we might understand the duplication of images of the same building in Modern Architecture as critical – perhaps accepted by the press on the argument that the color plates might show something radically absent in the black-and-white (or on the vagaries of producing the English edition). But in addition the usage of a range of photographic genres in the book makes the same point – that any single style of photograph should be considered in relation to its alternatives and that all should be considered in relation to the dynamism of time in architecture.

21 Futagawa's press, A.D.A. Edita, has produced a wide array of original photographs of old and new buildings in the extensive series of monographs they have published since the 1960s. These include the Global Architecture journal and the GA Houses series, among other serial publications. See http://www.ga-ada.co.jp/index.html for a full listing of the publications.

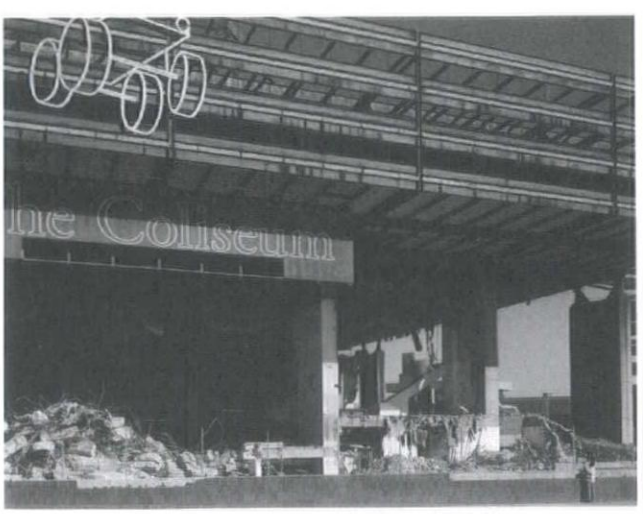
22 See Gordon Lewis, ed., History of the Japanese Camera (Rochester, NY: George Eastman House, 1991).

23 See Eaton S. Lothrop, A Century of Cameras from the Collection of the International Museum of Photography at George Eastman House (Dobbs Ferry, NY: Morgan & Morgan, 1982) 150; see also Kinglsake, A History, p. 9.

24 See http://www.ga-ada.co.jp/english/ga_original/index.html or http://www.ga-ada.co.jp/japanese/ga_original/index.html.

25 The GA series reached no. 77 in 1999; the GA Document series is currently at no. 95; GA Houses has reached no. 98; GA Japan is at no. 86. Other series are less numerous. See also Anthony G. White, Yukio Futagawa, Japanese Architectural Photographer: A Selected Bibliography (Monticello, IL: Vance Bibliographies, 1990).

26 See Cervin Robinson and Joel Herschman, Architecture Transformed: A History of the Photography of Buildings from 1839 to the Present (New York and Cambridge, MA: MIT Press and the Architectural League, 1987) 156-60.



Colin Montgomery, New Haven Veterans Memorial Coliseum.

怪獣図

特別図解であか

かわりだね怪獣のひみつ

たくさんいる怪獣の中でも，と
めずらしい怪獣のひみつ断面図

怪獣たち

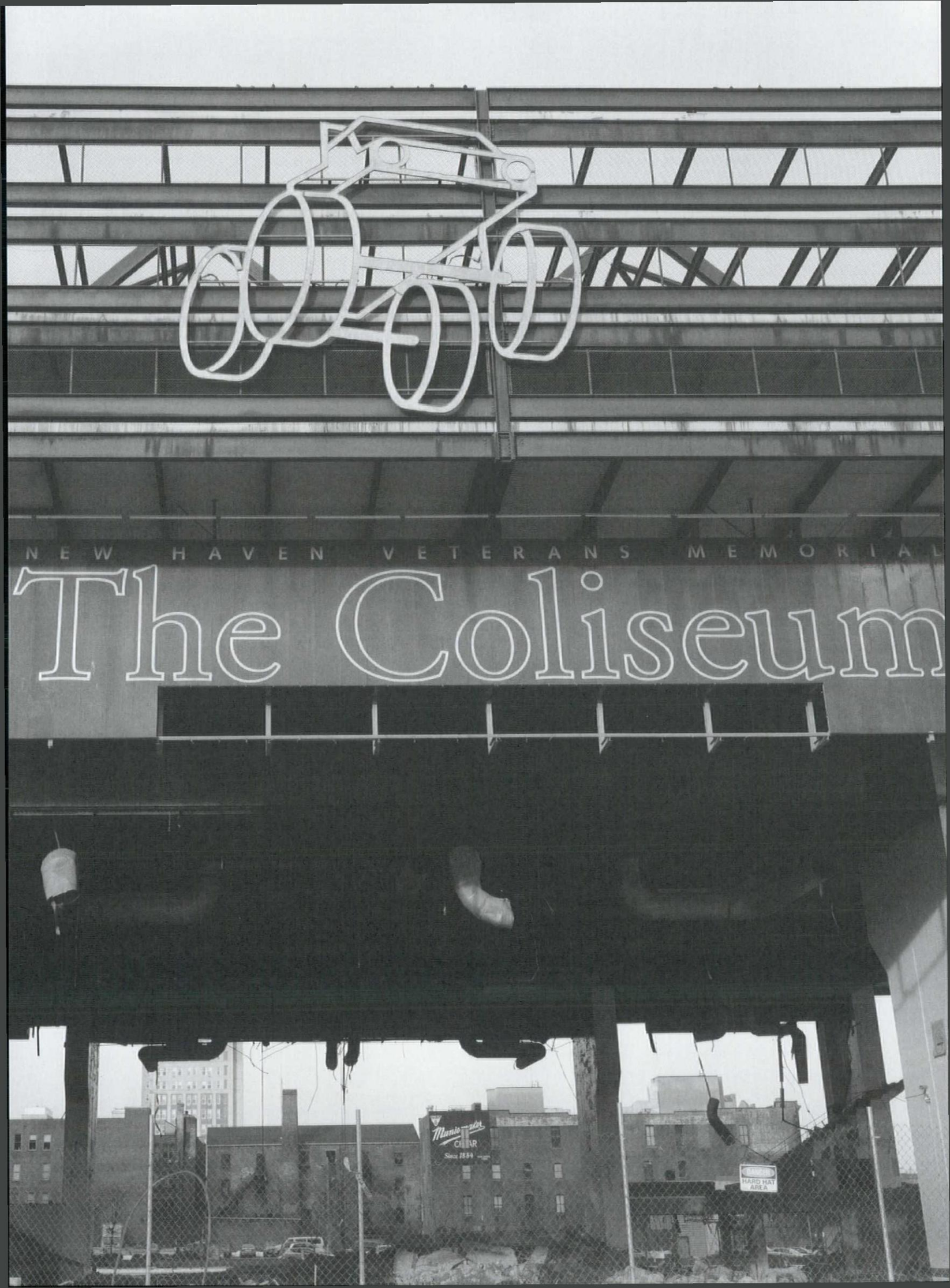
REVEALED BY SPECIAL ILLUSTRATION

Secrets of Unique Monsters (Kaiju)

These are anatomical drawings illustrating the secrets of especially unique monsters.

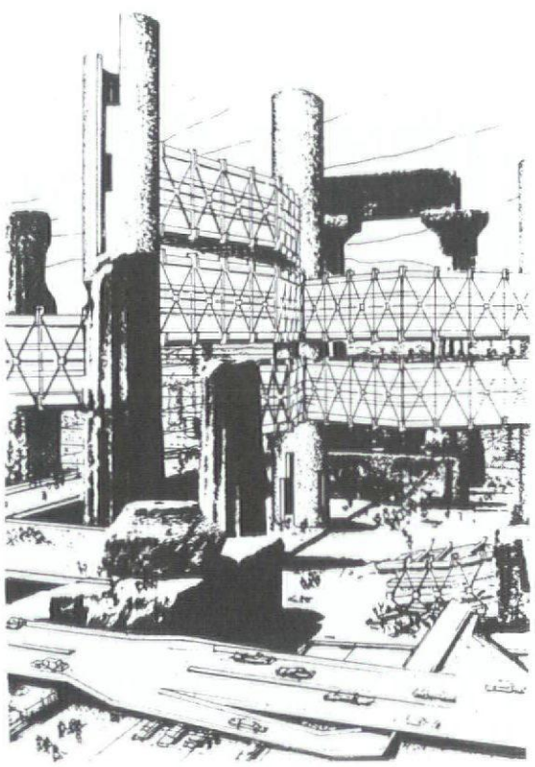
Anatomical diagrams of "Money-Eating Monster: Kanegon" and "Four-Dimensional Monster: Bullton"

Illustration: Kei Kudo and Takayoshi Mizuki
Translation: Nobuki Ogasahara


NEW HAVEN VETERANS MEMORIAL
The Coliseum
HARD HAT AREA

Reanimation

1 Boris Karloff as the Frankenstein Monster, 1930s.



2 Arata Isozaki's montage Incubation Process, (Silk Screen), Shinjuku, Tokyo, Japan, 1960–61.

Incubation and Decay: Arata Isozaki's Architectural Poetics – Metabolism's Dialogical "Other"

Emmanuel Petit

> I paused, examining and analyzing all the minutiae of causation, as exemplified in the change from life to death, and death to life [...]. I became myself capable of bestowing animation upon lifeless matter.
> —Victor Frankenstein[1] Fig. 1

> The Cube is an enemy.
> —Arata Isozaki[2]

The Singular Image of Death

In 1961, Arata Isozaki creates a photomontage entitled Incubation Process, in which his earlier metropolitan vision called City in the Air, partly in decay, is grafted onto ruins of a giant columnar order.[3] Fig. 2 While this urban vision builds on certain theoretical assumptions and the biological analogies used by the Japanese Metabolist group, to which Isozaki never formally adheres, his image is to be seen as an early critical comment against their positivist, linear, and optimistic views.[4] In the montage, a fiction of the past and the imagination of the future are nurturing each other as a growing and evolving urban entity, while the text alongside the collage reads: "The ruin is the future of our city; the future city is the ruin itself."[5] In the aftermath of the World War, the contemporary city in Japan is represented in analogy to a vulnerable living body, which is not only constructed through the positive and aesthetic "will" of its planners, but also shows signs of its own decomposition. Against this background, Isozaki insists that the Metabolists' attention to the forms of life have to be in dialogue with life's dialectic "other," i.e., the traces of death, to eventually form an architecture that is poetic and paradoxical. Since death cannot be experienced firsthand though, only its mediation through the image of death can figure as a truthful site of the "poetic imagination" that Isozaki is after. He sees this poetic imaginary as the only way to reanimate architecture at a historical moment, when it suffers from the creative lethargy of late-modernism. A poetic reaction to the complex question of the Japanese city has to reflect the monstrosities of the disastrous war—monstrosities which, alas, define the human condition, and therefore ought to be integrated into the image of architecture.

While borrowing many of the Metabolists' biological metaphors, Isozaki attempts to distance himself from this group, which, in his view, concentrates too much on instrumental processes and general methodologies while omitting to theorize the singular character of every project. Isozaki's interest in the city parallels the Metabolists' as a kind of field of relationships that alters, adjusts, and grows, but he emphasizes the poetic force of their metaphors. Unlike them, he doesn't hope to find in the biological procedure an effective and immediate instrument of action. He therefore challenges their technical positivism with the advocacy of a poetic commentary, based on creative freedom rather than on methodical and "projective" procedure. One of his projects in the late seventies, the Tsukuba Civic Center, becomes Isozaki's demonstration object for an alternative approach to the Metabolists' illusion of immediate instrumentality: Isozaki here defines a more mediated approach to poetry through "architectural irony." His Tsukuba building complex recasts Doctor Frankenstein's ambition in architectural terms, i.e., to reanimate the body of the Japanese city by suturing a new architecture out of the lifeless members of architectural history.

Ruined Body

Isozaki's mediated attitude is conditioned by the analogies he draws between architecture and the human body—both subject to a sense of finitude. On the one hand, he insists on the beholder's bodily immersion in the spaces of his architecture and the ephemerality of the affective experiences it generates, and on the other, he presents architecture itself as a kind of artificial body with an autonomous life. As a consequence, the themes of organic growth and decay appear frequently in his texts and projects. Already in the first building he designs and builds independently from his teacher Kenzo Tange, the Oita Prefecture Library from 1962–66, the biological metaphor is used to explain the complex assemblage of the building's diverse structural, technical, and spatial systems: "The original inspiration for the design was an analogy with the human body's skeletal system (concrete skeleton), circulatory system (ducts), and musculature (interior spatial composition) [...]."[6]

Careful to avoid universalizing abstractions, Isozaki relates the features and processes of the "architectural body" to his own physical body. He does this, for example, when Tange invites him to contribute to the design of the Osaka Expo '70, in which he is asked to celebrate the achievements of a technological society that he is skeptical of. Haunted by guilt for collaborating with a paradigm he reproves, Isozaki feels physically exhausted to the point of collapse. He describes the situation as if his own body was rebelling against the cooperation with what in fact he could no longer defend, i.e., Tange's optimistic, abstract, and instrumentalist views of Modern architecture. After finishing the work for the Expo's Festival Plaza, Isozaki is overworked and finds himself in hospital; he describes the incident as follows:

> [...] confronting hospital gloom, I resolved then to make darkness and ruin the basis of my theories of space and time.
>
> I had found myself in the embarrassing position of being a critic of Modernism who was taking a professional part in Expo '70, a national event in which the Modernist vocabulary was the only one permitted. This predicament created great nervous tension and ruined me physically. Under these circumstances, colors faded for me and I began to see only blanks. Substances lost mass and became only shadows. I felt as if twilight, known as the devil's hour, had settled on the whole world.[7]

In this moment of bodily ruination, Isozaki conceptualizes the principles of his architecture: His physical distress symptomizes the aporetic situation created by his desire to depart from the modernist abstractions in city planning and architecture, on the one hand, and the impossibility to do so, on the other. When he mentions twilight, darkness, ruins, and fragments as the persistent matter of his architecture, he capitalizes on the hallucinatory effect, which arises from an oneiric passage through darkness, in which objects appear as merely disconnected fragments. Out of this delirium, he develops a new aesthetic.

Isozaki never presents the metaphorical human body as a complete system closed on itself, but on the contrary, it is seen as an assembled organism of amalgamated fragments. The architect is not solely seen as the life-giver, able to create the permanent

infrastructure of the city that sustains the growth of its organism. According to him, the architect also needs to foresee the state of decay of the body he has created: death should not be eradicated from the realm of aesthetics, because it enriches the dominant narratives with the poetry of paradox.

Sure enough, for the Metabolists, the short-lived, "soft" cells that constitute the city in the form of individual housing units and that are attached to a more permanent technical and structural infrastructure, are simply to be replaced when they turn obsolete. While this is the expression of efficiency, for Isozaki it nevertheless misses the opportunity to relate to the poetics of life, which is never disconnected from the finitude at the basis of each life-cycle: "Since change is half-destructive and half-constructive, it should be permissible for architecture to create the exact appearance of ruins."[8] Certainly, Isozaki's comment does not only apply to the city, but also to the status of human creativity at large—a view that has its conceptual antecedent in European Romantic thought, which Isozaki is well aware of.

"Architecture With or Without Irony"

The cycle of self-positing and self-annihilation paradigmatic of Romantic irony, and important to Isozaki, is theorized in the writings of the German Jena Romantic Friedrich Schlegel. The dilemma presented by Schlegel's irony arises from the impossibility to express the categorical and the ideal within any single aesthetic creation; any conception is but a fragmentary representation of the continuously evolving reflection of the creator. For that reason, Schlegel holds that it is impossible to reach the highest idea positively; instead, any creation has to forebode its own obliteration: "That, which doesn't annihilate itself, is worthless."[9] He identifies this "complete," i.e., double-edged, engagement with the historical process in his ideal of the art of ancient Greece: "The majesty of antiquity is felt to be indissolubly linked with the images of decline and ruin, for both arise from the same source—the dominion of instinct, and the spontaneous development of nature. [...] Grecian art itself, which rose to absolute perfection, ended also with itself, and it presents a remarkable instance of the perishable nature of merely instinctive greatness."[10] In other words, art can only allude to perfection by expressing its aesthetic absolute in a state of decay.

Much has been written specifically about irony in Isozaki's architecture, not least because he himself articulated an architectural manifesto in 1985, called "Architecture With or Without Irony,"[11] in which his Romantic disposition becomes most explicit.[12] The text argues for both an aesthetic and an ethics of excess, of fragmentation, and of recollection—all forwarded against the naïve utopianism of modernist precedents in city planning and in architecture. The manifesto is to be counted as an aesthetic object in its own right, and hence deserves a quotation in its entirety:

> For the first twenty years of my career as a professional architect, I believed that architecture could only be accomplished by irony.
> It was to make the very gap that would never be filled up, a springboard.
> It could combine even what was unreasonable.
> It could allude to treason.
> It made it possible to create architecture as criticism.
> It could admire the vulgar against the noble, the secular against the sacred, without shame.
> It could justify various vexations such as political estrangement, the handicaps of a foreigner coming from a remote region, minor culture, bad conditions of economy, poor devices, non-orthodoxy, etc.
>
> Ruins, doomsday, collapse, and death were woken in nostalgia.
> It was an unfulfilled wish, a mourning for what was lost - Hiroshima, holocaust.
> To bridge over the gap, a wit, a sense of humor and paradox were adopted.
> It was a limited measure to allow speech in an inorganic architectural language.
> It could also relieve an architect from falling into a trap which would make him anonymous.
> After twenty years of practical experience, I am now going to find a method to create architecture without irony.
> The architectural languages which I have adopted up to the present will be continuously used, and some new ones will be developed in addition to the old.
> However, ruins, regardless of the pathetic sentiment towards what was lost, will remain as they are, according to the law of nature.
> Doomsday, not as a fear for what is coming, will become the fact which can be actually seen.
> Death will also be loved just like life.
> A wit, to be as light as possible.
> A sense of humor evokes what would vanish.
> Paradox is used to make what is invisible, visible.
> But, not cynically, not desperately.
> To be dreaming of architecture as a pleasure machine.

In order to avoid the mere replication of the positivist methods of the CIAM modernists and the Metabolists, directed towards the production of a better future, Isozaki writes a retroactive manifesto, in which he claims to have finally overcome the ironic phase of his work. Echoing the aesthetic of ruins in his architectural projects, he annihilates his own ironic strategy at the very moment he announces it: his manifesto presents itself as an amalgamation of ideas that already belong to the past as soon as he formulates them. The determining aspect of Isozaki's irony is the sentiment—shared by both existentialist and Romantic thought—that an author can posit an alternative reality and equally, put an end to his own creations.

Cyclical time here replaces the forward-looking utopianism of modernist city planning—a view which Isozaki finds increasingly difficult to maintain in the postwar years: "Throughout my youth, until I began to study architecture, I was constantly confronted with the destruction and elimination of the physical

3 Still from Isozaki's slide projection "Electric Labyrinth" at the Milan Triennale in 1968.

objects that surrounded me. Japanese cities went up in flames. Forms that had been there an instant earlier vanished in the next." [13] The impressions of war thus stayed with him, and largely determine his view on the ephemerality of anything physical.

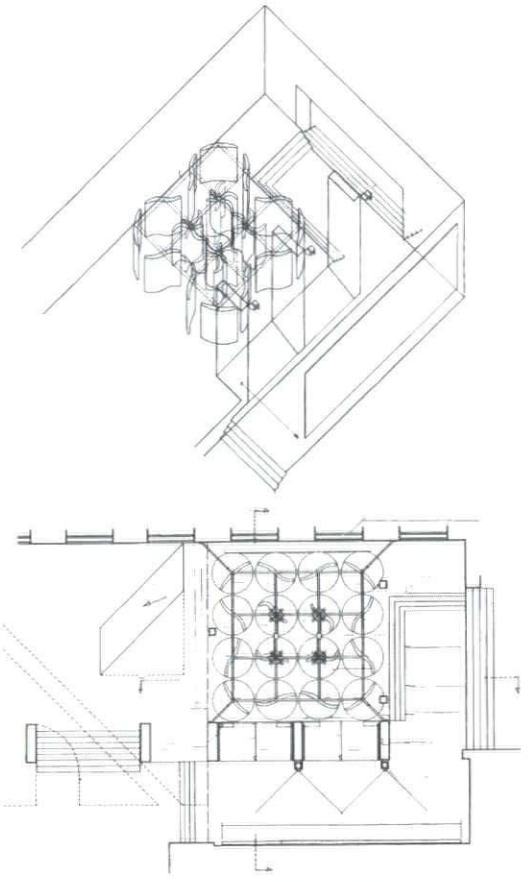
The Fall of Ideas

In his exhibition contribution to the fourteenth Milan Triennale in 1968, the "Electric Labyrinth," Isozaki parallels the cyclicality of the biological human body with the one of architectural visions for the city. Each such vision is displayed as a temporary construction exposed to deletion. One part of the exhibition shows big photographs of the devastated cityscapes of bombed Hiroshima and Nagasaki, on top of which Isozaki projects slides of futurist designs by contemporary Japanese architects. Fig. 3 Every architectural creation appears as merely another one in a series of ephemeral utopias to be fatally overthrown. The "Electric Labyrinth" makes thematic the topic of the dramatic "Fall of Ideas": once the architect concretizes one moment out of a creative process that sees itself permanently in movement, the dynamic ideas degrade into inert objectivity. This constitutes the drama of human creativity and a true monstrosity of any creative act.

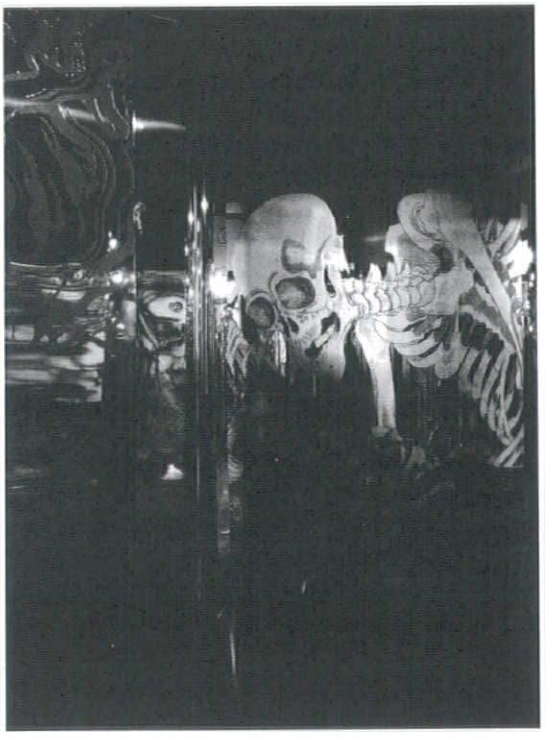
Romantic irony is dependent on such a moment of the Fall, which conveys the idea that subjective imagination is always "other" than, and exceeds, any particular one of its concrete creations; no doubt, the strictly singular character of any "fallen idea" appeals to Isozaki. In the Irony manifesto, it is easy to discern the theme of the Fall, which, in all of his architectural representations, translates into motives of ruins, destruction and spatial destabilization.

Another part of the "Electric Labyrinth" installation consists of a maze of sixteen revolving and mirroring panels that visitors activate when passing in between them. Fig. 4 The panels have imprinted images of death, torture, and horror—among them demons of Japanese iconography, ghost figures from the Edo period of Japanese history (1600–1867), and photographs of real nuclear bomb victims. Fig. 5 Again, Isozaki uses the motive of the human body to communicate parallels between the finitude of human life with the precariousness of architectural fantasies. Through the combined effects of distorting and moving mirrors, sound, light and images, Isozaki creates an affective and bodily experience that turns the mirror-image of the exhibition visitor into a monster among monsters—and uses the exhibition as a statement against any abstract and sterile approach to architecture. The "Electric Labyrinth" allows Isozaki to both test strategies of spatial destabilization and to juxtapose unusual combinations of elements taken from different cultural contexts. The revolving panels produce a kaleidoscopic visual illusion, in which the reflections of the real bodies of the visitors and the mounted images overlap and blend. The bodies of the visitors thus "preview" with the help of their own bodies Isozaki's architectural "project."

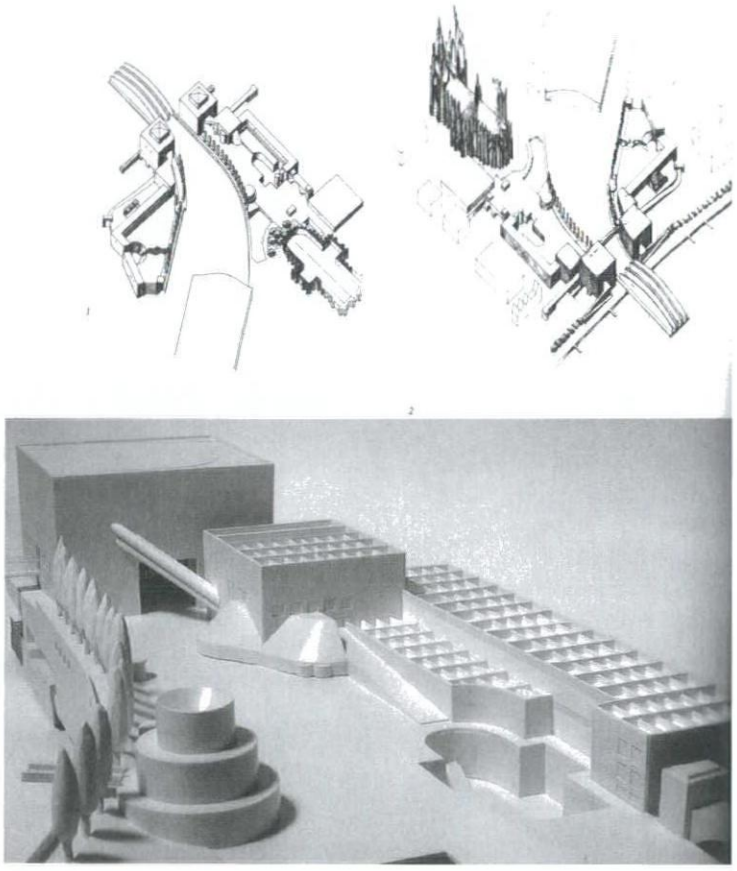
In the quest to construct an alternative architectural world of boundless thinking, always exceeding the immediate actuality of socio-political concerns, the concept of Bildung becomes a visible commentary in Isozaki's oeuvre and, consequently, the notion of the past as a resource for inspiration is made thematic. For example, Isozaki's explicit reference to a Greek ideal past is illustrated in his unbuilt competition entry for the Tegel Harbor Complex in Berlin in 1980, the perspective view of which is a free adaptation of Schinkel's Building Academy from his Collection of Architectural Drawings. [14] In this project, Isozaki recalls the former presence of the Building Academy by



4 Plan of the maze of mirrors in Isozaki's "Electric Labyrinth"; reconstruction in the Castello di Rivoli in 2002.



5 Iconography of death on the rotating mirrors of Isozaki's "Electric Labyrinth"; reconstruction in the Castello di Rivoli in 2002.



6 James Stirling's competition project for the Wallraf-Richartz Museum in Cologne.

transforming the footprint of Schinkel's edifice into the shape of an open plaza. The inversion of the building mass into the void of Isozaki's plaza demonstrates simultaneously an association with, and a detachment from, the historical antecedent. This kind of spatial inversion—the transformation of solid into void—is a technique Isozaki frequently uses to put his architecture under erasure.

It should be mentioned that the doubled relationship to the past, as well as the related aesthetic of fragmentation, comes to use in a multitude of projects by Isozaki's contemporaries, like prominently with the British architect James Stirling. In Stirling's Cologne project of the Wallraf Richartz Museum from 1975, the footprint of the historic church is carved into the ground as a sort of negative reference; Fig. 6 also, while Stirling conserves the facade of the old library on the southwest corner of his Düsseldorf Northrine-Westfalia museum project, he preserves it in a state of ruin. Similarly, in his Neue Staatsgalerie in Stuttgart, Stirling inverts Schinkel's domed central hall from the Altes Museum in Berlin (1822–30) into a cylindrical, central and outside void. And finally, at one point of the building's plinth, the façade alludes to a state of decay by simulating that some stones have tumbled out of the wall, providing an opening into the museum's parking garage. Stirling explains that "the casually monumental is diminished by the deliberately informal," [15] and thus the abstract idea of monumentality of a museum can be combined with the local and immediate conditions of the town of Stuttgart.

Like Stirling, Isozaki uses the paradoxical reference to the past as a way to expose his critical "knowingness" about the nature of human creativity. The witty and ironic transformation of the past is used to demonstrate the particular agility of the creative architect's mind; both wit and irony loosen the architect's bond with the impositions from the outside of his mind, and grant him a great degree of creative autonomy. The gained capability to combine even what is "unreasonable" and to evade what reality dictates as pressing and compulsory "facts," allows the architect to stay creative in the face of the modern spirit of mass production, always aiming at equalizing all of its productions. Isozaki's irony thus profits a strategic undoing and dismantling of accepted relationships of Modern architecture and CIAM urbanism with the intention to recuperate the possibility of a singular, subjective and poetic statement in architecture. In his own words, "[i]f the architect wants to evade a net of mass consumption cast by the technocrat and not abandon design, he has to keep an ambivalent relationship with reality, which then will be often ironical and paradoxical." [16]

In his philosophical Fragments, Schlegel theorizes the ambivalent attitude of the creative mind towards the world, describing how it negotiates for itself an in-between and "suspended" position between rational systems and imaginative leaps: "It is equally deadly for the mind to have a system, and not to have one. It will just have to decide to combine both." [17] Isozaki links the two strategies evoked by Schlegel and justifies the resulting personal aesthetic by referring to the Japanese tea culture and to the spatial arrangement of the objects in a tea ceremony, which follows only the aesthetic preference of its host. The spatial relationship between the elements of the tea ceremony therefore cannot be made into a systematic theory, but is contingent on the subjective interpretation of the guests at the ceremony. All the elements of the composition appear as fragments that exist in a paradoxical net of denotative associations.

In order to "theorize" this non-systematic approach to the arrangement of space, Isozaki announces his interest in the notion of "darkness," where darkness is seen as an irrational and immersive connective tissue between spatial relationships. In a 1962 text titled "The Space of Darkness," Isozaki discusses two related and opposed spatial concepts of void and darkness. On the one hand, the void stands for spaces that are overcharged

with imagistic excess and flows of signs without any pressing meaning, as can be found in the swiftly growing Japanese cities. Spaces of darkness, on the other hand, remain unnamable in that they repress most of the information that would make them intelligible. The latter represents a kind of sublime silence that forces the subject's mind to constantly invest an effort of interpretation and intellectual "rearrangement." In darkness, objects in space appear as discrete fragments; as a consequence of this lack of spatial information, the subject's imagination has to actively create the associations between the objects in space:

> Darkness is physically stimulating because, by enveloping things, it has the power to stir up profound recollections and drag everyday perceptions into the world of illusion. When I come into contact with the deep-level recollections darkness arouses, I am recalled to the state [...] in which undifferentiated images flicker in my mind. My task is to give form to the spaces that arise from those images. This should make it possible to illuminate architecture in a wider field of vision. [...]
>
> The prototype of darkness serves as a connective on the levels of historical, anthropological, and ethnological thought. In other words, darkness acts as a working hypothesis for semiological operations.[18]

Subjective imagination is made the primordial ingredient of the organization of space and the arrangement of objects within it. What is more, this imaginary is always a temporary construction, and partly incomprehensible even to the interpreting subject. Schlegel already argues for the importance of "incomprehensibility" for any authentic act of theorizing, and maintains that certain aspects of cognition need to stay in the dark as the very precondition of a poetic approach to life:

> An incredible small portion (of non-understanding) suffices, provided it is preserved with unbreakable trust and purity, and no restless intelligence dares to come close to its holy borderline. Yes, even the most precious possession of mankind, inner satisfaction, is suspended, as we all know, on some such point; it would lose its stability at once if this power were to be dissolved by means of understanding. Truly, you would be quite horrified if your request were answered, and the world would all of a sudden become, in all seriousness, comprehensible. Is not the entire infinite world built out of nonunderstanding, out of chaos, by means of understanding?[19]

A series of exhibitions, including "Electric Labyrinth," serve Isozaki as a laboratory to test his inversions and subversions of modern architecture. His irony herein allows him to make use of traditional concepts of architecture while critiquing them at the same time. Importantly, the exhibition projects try to achieve the equivalence between the idea of destabilization and the bodily experience of imbalance, between the conceptual and affective dimensions of the project—a kind of Romantic synthesis between thinking and feeling.

Design a Being

In 1976, Hans Hollein curates the opening show of the Cooper-Hewitt Museum in New York, entitled "MAN transFORMS," and invites Isozaki to participate.[20] The overall concept for the exhibit is that man's creations are always a re-combination of pre-existing elements, and Hollein endorses Isozaki's aptitude to unite such heterogeneous fragments into new ensembles. In particular, Hollein points out the difficulty to invent a creature not seen before, e.g., a Martian, and illustrates how fantasies of such unprecedented beings are mostly derived from fragments of human or animal parts. Throughout human mythology, many of the fable creatures have been imagined as such heterogeneous composites, including the Sphinx, the Minotaur, the Centaur, the Unicorn, the Cyclops, and the Mermaid.[Fig. 7] What is more, Hollein exhibits a "Design-a-being" set that allows the visitors to assemble their own imaginary living creature from body parts of humans and animals.[Fig. 8]

Isozaki has always maneuvered within such a combinatory game, and Hollein therefore attributes to Isozaki the capacity to operate in between poles of clarity, and outside of the simple dialectics of positive and negative. Hollein explains with the metaphor of a chess game:

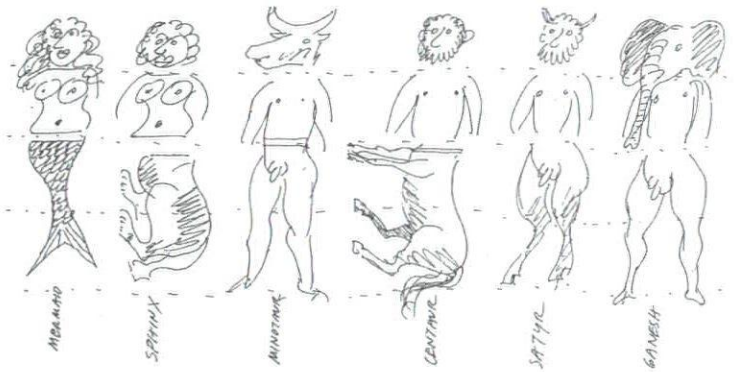
> Back to our chess game, and be it only because of the associative line Chess-Duchamp-Isozaki, what is Isozaki's color? Black or white? Of course black and white. But here I would add another dimension—mixture. [...] With a more poetic metaphor, Isozaki would call this 'twilight.' Twilight equalizes, and this equalizing of heterogeneous elements—[...] is one of the fundamental phenomena of Isozaki's architecture.[21]

In the context of the Cooper-Hewitt show, Hollein portrays Isozaki as an anatomical body, which is composed of a mixture of body parts stemming from different architects, both dead and alive at the time.[Fig. 9] He describes Isozaki's subject as an assemblage from heterogeneous parts. In this conceptual montage, the head is borrowed from Marcel Duchamp, the ears from Robert Venturi, the neck from Philip Johnson, the chest from James Stirling, the heart from Michelangelo or Giulio Romano, the left hand from Archigram, the right hand from Hans Hollein, the stomach from Carlo Scarpa, the buttocks from Marilyn Monroe, the genitals from Kenzo Tange, the left leg from Morris Lapidus, and the right leg from Adolfo Natalini.[22] Hollein's "improbable" anatomical combination of disparate parts is analogous to the re-arrangement of architectural fragments taken from different times, places, and authors in Isozaki's project for the Tsukuba Civic Center—which I argue is the building in which Isozaki's irony becomes most visible.

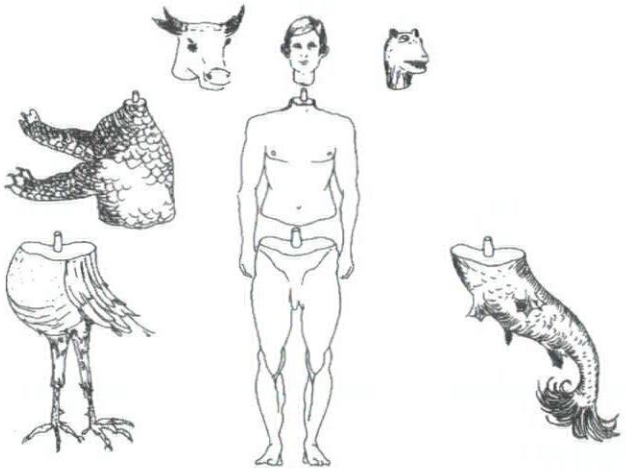
Tsukuba's Schizophrenic Eclecticism and Frankenstein

In 1979, Isozaki wins the competition for a Civic Center in Tsukuba New Town in Japan. Tsukuba had failed to attract the 120,000 inhabitants aimed for when the town was founded at the end of the 1960s. The creation of a Civic Center was to become a magnet to draw a larger number of residents—a number that does not even exceed 30,000 by the end of the '70s! From the very beginning of the competition, Isozaki conceptualizes his intervention as an attempt to reanimate a city that is lifeless, sterile and faceless as a consequence of abstract modernist planning, based on principles elaborated by the CIAM. The Civic Center was to become a new "heart" for the metropolitan body, able to invigorate its urban life.

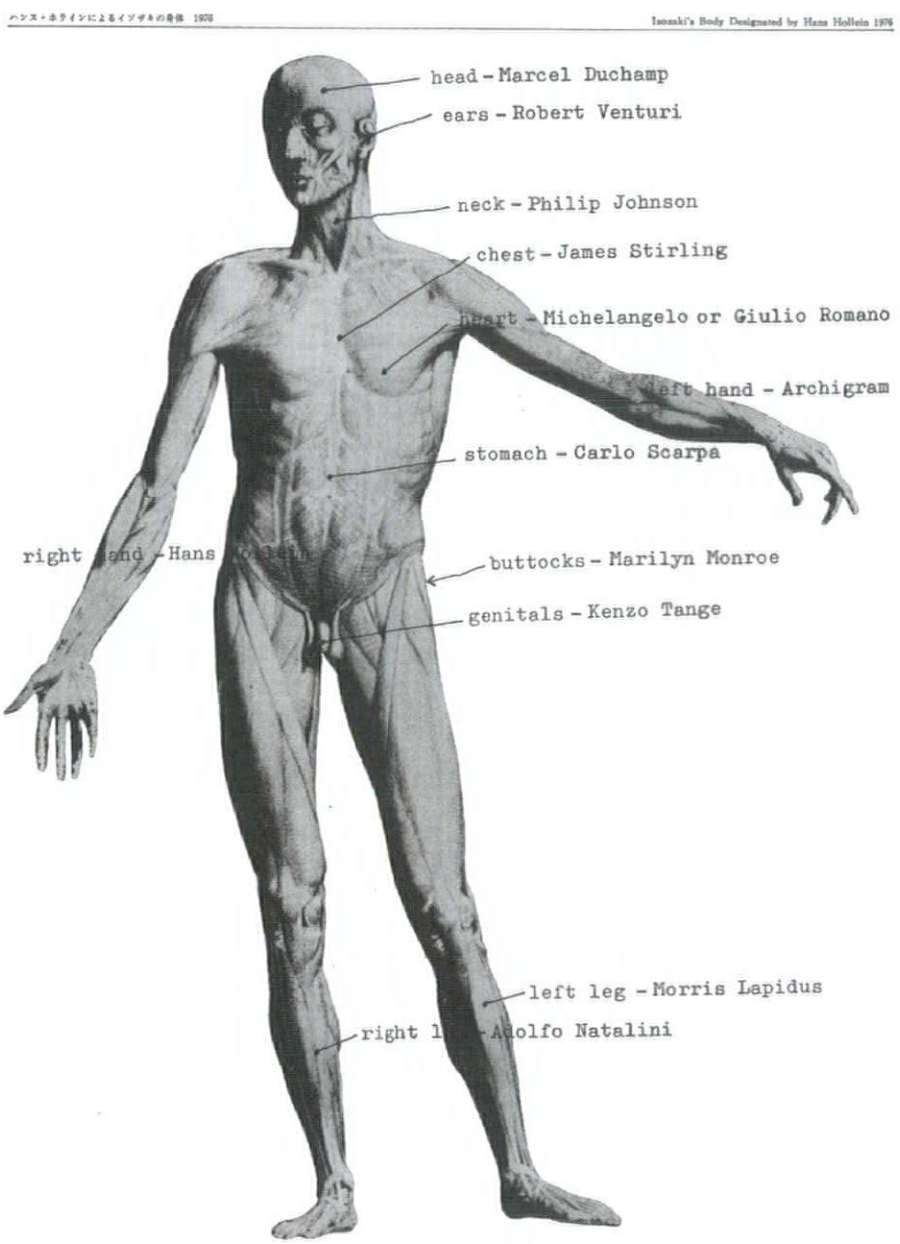
The architect decides to collect a multitude of diverse fragments from the history of architecture, hoping that the witty compilation of architectural déjà-vus can create new life out of past memories.[Fig. 10] Not unlike Hollein's portrayal of the composite nature of Isozaki's "biological body," the Tsukuba Center turns into an assemblage of pieces that are cut out from diverse historical contexts and stitched together at Tsukuba. Consequently, the building is thought of as a composite anatomy of recognizable architectural fragments—a "group portrait," in Isozaki's words—comprising materials taken from such diverse



7 Hans Hollein's sketch of Composite Fable Creatures for the show "MAN transFORMS".



8 Hans Hollein's Design-a-being set for the show "MAN transFORMS".



9 Hans Hollein's collage Isozaki's Body from 1976.

sources as Michelangelo, Ledoux, Giulio Romano, Otto Wagner, Michael Graves, Richard Meier, Charles Moore, Aldo Rossi, Hans Hollein, Peter Cook, Adalberto Libera, Philip Johnson, Leon Krier, Lawrence Halprin, Ettore Sottsass, among others.[23] Pushing the biological metaphor even further, Isozaki implies that the formal assortment of the building complex imparts on his architecture a troubled soul—a real monster, which he diagnoses as suffering from "schizophrenic eclecticism."[24] In fact, the architecture embodies its creator's state of mind: while his morale can no longer be synthesized in a coherent (modernist) narrative, its delusional schism vividly generates a sparkle of life in an otherwise dreary environment.

Akira Asada—curator, editor, and Isozaki's "house philosopher"—attributes to Isozaki's attitude the qualities of a "sophisticated ironist,"[25] who doesn't have "the slightest belief in any of the various styles" that he uses. What is more, Isozaki is portrayed as a mad doctor, "gazing at [these styles] from behind the glass with the cold enthusiasm of a dissector and, by skillful manipulation of the magic hand, can even come up with a collage which might, to borrow an expression from the Surrealists, be called un cadavre exquis."[26] The assemblage of disparate and heterogeneous materials in this architecture is meant to cover up the fatal lack of present urban life in Tsukuba. Says Isozaki: "If I were to say that this building is the expression of the absence of something, I might not be taken seriously."[27] The absence of life calls for the impossible ambition of Isozaki's to infuse life into the inanimate body of modernist town planning. The architect-creator herein defines himself as a life-giver.

With this project, Isozaki recasts the Romantic ambition to fuse the subject and his environment in a vital and "organic" whole. Not least Mary Shelley's Romantic novel Frankenstein narrates and ironicizes the grand ambition of a young scientist, the infamous Doctor Victor Frankenstein, to use his knowledge to get behind the mystery of nature, and become able to reproduce life out of dead material. Isozaki's concern for the cycle of life and death is analogous to Shelley's Romanticism, as is illustrated by the following quote from her novel, in which the young Frankenstein explains the motivations to undertake his experimentation on decayed corpses:

> To examine the causes of life, we must first have recourse to death. I became acquainted with the science of anatomy: but this was not sufficient; I must also observe the natural decay and corruption of the human body. [...] Now I was led to examine the cause and progress of this decay, and forced to spend days and nights in vaults and charnel-houses. My attention was fixed upon every object the most insupportable to the delicacy of the human feelings. I saw the fine form of man was degraded and wasted; I beheld the corruption of death succeeded to the blooming cheek of life; I saw how the worm inherited the wonders of the eye and brain. I paused, examining and analyzing all the minutiae of causation, as exemplified in the change from life to death, and death to life [...]. I became myself capable of bestowing animation upon lifeless matter. [...]
>
> Pursuing these reflections, I thought, that if I could bestow animation upon lifeless matter, I might in process of time (although I found it impossible) renew life where death had apparently devoted the body to corruption.[28]

Both Shelley's tragic hero and Isozaki use the trope of the recycling of lifeless material as a way to stress the importance of memory for cultural creation. To bring life back to a corpse composed of merely recycled material seems an equ desperate endeavor for Victor Frankenstein as it is for Isozaki both Shelley and Isozaki are, of course, ironic about the grand adventure that they are describing.

For Isozaki, no doubt, history has to be exhumed aft the avant-garde aspiration of architectural modernism had buried it. He considers the geometric figure of the cube to sta for the lifeless, abstract, and a-historical ambitions of Modern architecture. And because he sees the paradigm of the cube as inanimate and soulless, Isozaki states that "[t]he Cube is an enemy."[29] Nevertheless, unable to simply leave behind the geometric possibilities of the cube for his architecture, he inv techniques to simulate that the cube comes to "life": on the building plaza of his Civic Center, the free-standing, cubic ho ballroom appears as the only object in the building's plan, wh is rotated out of the overall orthogonal system, as if it attempt to escape the dictates of the grid.[Fig. 11] Only the buttock-like "Marilyn curve," which Isozaki affectionately names after Mar Monroe, seems to keep the cube from drifting further away fr the building, and acts as an umbilical connector to everyday l Furthermore, at the inside of the concert hall, the grid-pattern on the wall represents the collision of the outward projection of several cubes, which appear to be free-floating in space, and which break out of the orthogonal geometry of the buildi grid.[Fig. 12] Once these imaginary floating cubes have left the traces of their outward projection, they themselves are remov from the wall pattern. The resulting line ornament is a dynami cage-like lattice as the remnant of a former presence. This, to is to be understood as a critique of the lifeless grids of moder town planning, turned into interior decoration. Instead of avo the use of the geometric cube, he keeps it at the center of his architecture, only to crack it, distort it, rotate it, fragment it, s and show it in ruins. Rather than merely leaving what he sees closed order, he prefers to show his struggle with it.

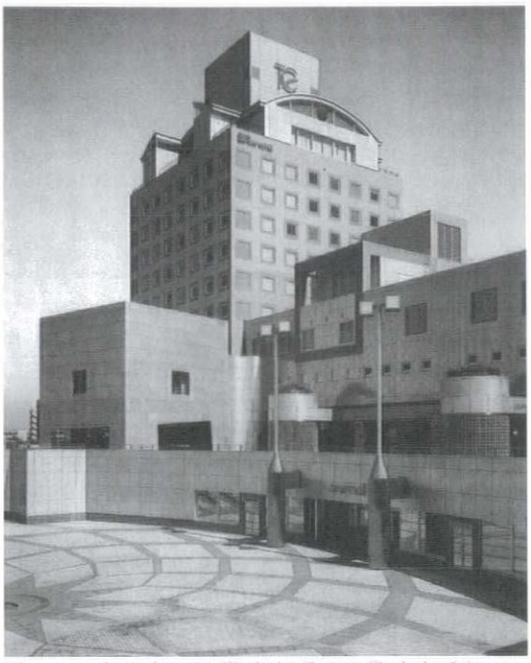
If the cube is the icon for Modern architecture's abst thought, Michelangelo's oval-shaped Campidoglio piazza pa is used as the symbol of historical references in the Tsukuba Center.[31] In reaction to the call to create the heart of a new to in need of resurrection, Isozaki transplants this icon of Roma civic life to the center of his complex. Yet, to symbolize his political protest against the centralized power of control that Roman Campidoglio stands for, he uses the pattern as "a rev quotation,"[32] by sinking it into the ground. Michelangelo's fig oval on top of the Roman hill is now inversely cut into the Civ Center plaza, defeating its original political symbolism. As on critic points out, "Isozaki has incorporated a large number of motifs in order that we may understand, but he has eliminate heart of the work, which was what the motifs were there to le to. The spectator is plunged into a perceptual motion of spac that have no value and no location."[33] The "absent presence the Campidoglio conveys the architect's conflicted view abo referentiality in architecture. Isozaki explains that "if one were give a metaphor for the void center, it might be that everythin line of vision, water, meaning, representation—is devoured b earth itself as a result of its own form."[34] Therefore, in his ser of competition drawings, he depicts the project in a state of ruin,[Fig. 13] as if to restate what he explained in "The Space o Darkness," that "the superficial mode of semiotic destructio real destruction make the former obsolete."

Isozaki's double operation of positing a form and reminding its relative validity at the same time, is what Schle calls "irony as permanent parabasis."[35] The "scar" in Isozaki Campidoglio is analogous to the rhetorical parabasis, which

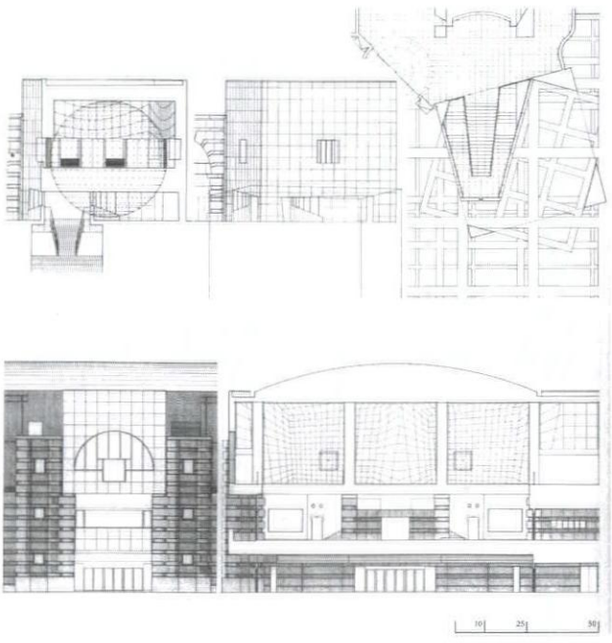
egel defines as "the interruption of a discourse by a shift in
netorical register."[36] In ancient Greek comedy, the parabasis
a choral ode delivered by the chorus at an intermission, and
ng the audience information that the hero of the story would
ave. At Tsukuba, the architect uses his art to reveal his full
eness of the relative and ephemeral nature of his creation:
rchitect embodies both creator and critic, and creates a
c artifice filled with contradictions.

This sort of crack is a common ironic device of both
antic art and also of the architecture at the time of the
uba Center. One finds it in one of Schinkel's lithographs
d A Gothic Church Behind Trees, Fig. 14 in which only
ses of the form of the church are being revealed, since
e, i.e., a huge tree, cuts through the image of the man-made
nature and the artifice of architecture appear in permanent
gle, yet in balance. A century-and-a-half later, among
ki's contemporaries, Stanley Tigerman's 1981 project for
nbolic Museum for a Painting that Will Never Go There for
nica, Spain, is based on five primary geometric forms
re cracked. The very title of Tigerman's project conveys
ustration and disillusionment with a museum project
vill never house Picasso's painting. Another example is
Hollein's Schullin jewelry shop in Vienna, from 1975,
ich Charles Jencks says that the "skin-like marble and
ning gold lips folding over each other, is explicitly ironic
exual."[37] Also, Charles Moore's Piazza d'Italia in New
ns from 1976–79 ambivalently cracks the radial pattern
community plaza to reveal the outline of "bootshaped"
as if commenting on the ambivalent identity of the Italian
nunity in America.

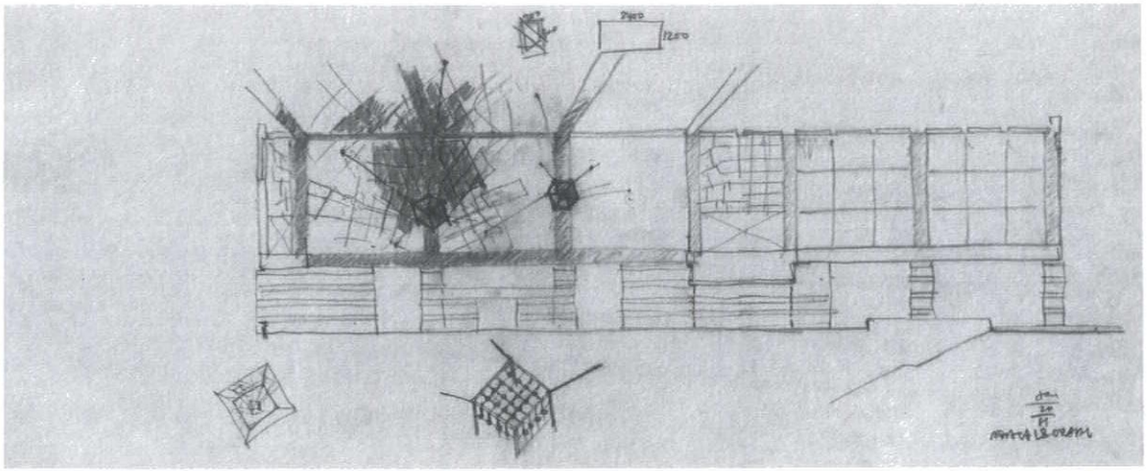
In each one of these projects, the crack reveals a crisis
he identity and significance of the forms that come to use
production of architecture; incapable of reproducing the
vist and instrumentalist approach of previous generations,
chitects here render visible their struggle with the alleged
ing of the forms they use. Their irony addresses their
eness of the insufficiency of available means of expression
to the sheer boundlessness of subjective imagination.
mits of reality meet the vast imagination of the creating
ct. In the dialogue with CIAM modernism and the
olists, Isozaki makes himself the reminder of the "other"
f architecture and city planning, bearing the traits of a very
nal poetics of space.



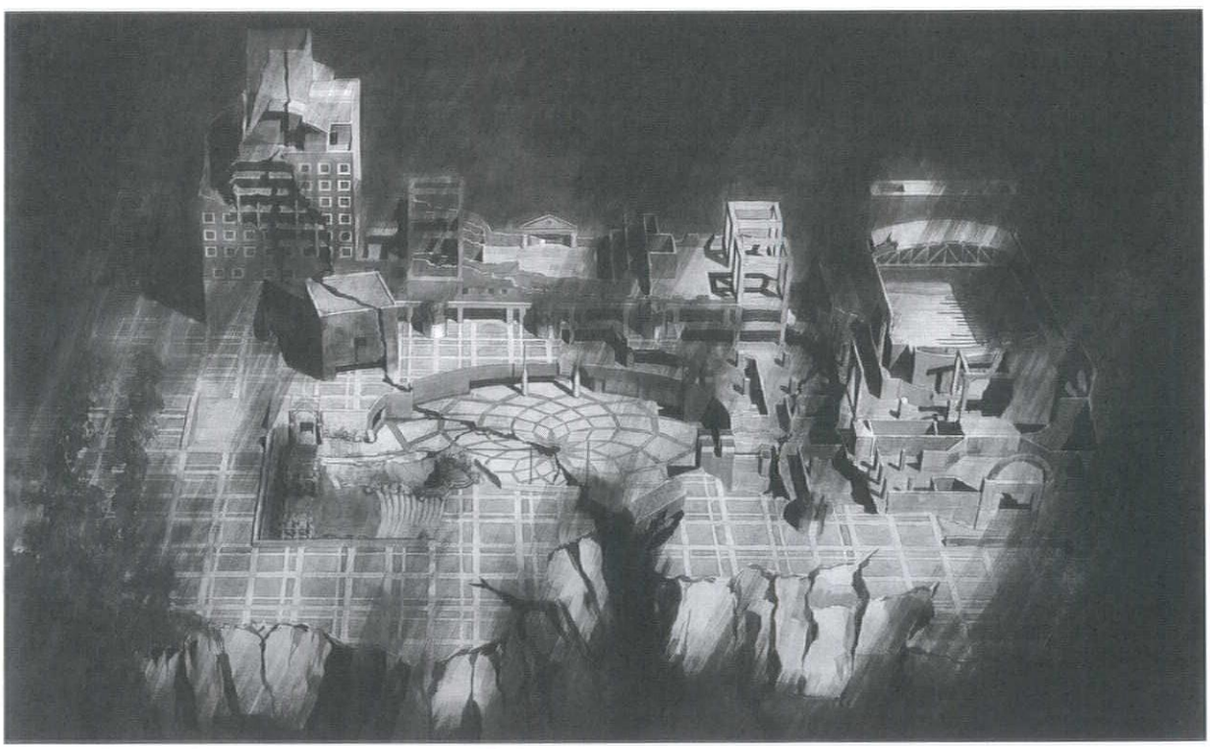
10 Arata Isozaki, Tsukuba Center, Tsukuba Science City, Ibaraki, Japan 1979-83.



11 Arata Isozaki, Tsukuba Center, interior wall pattern and plaza pattern.



12 Arata Isozaki, Tsukuba Center, sketch of interior wall pattern.



13 Arata Isozaki, Tskukuba Center in Ruins, 1979-83.

Mary Shelley, Frankenstein (Penguin Classics, 1992, [1818]), 50.

Arata Isozaki, quoted in: Hajime Yatsuka, "Textual Strategy and Post-nism," SD Space Design, Arata Isozaki 1976-1984 (January 1984): 184.

Arata Isozaki's City in The Air project from 1960-61 was a erproposal to the skyscraper planning in Shinjuku, Tokyo, in which entive vertical buildings were to be replaced by a new type of the urban rise, composed by cylindrical shafts and long-span horizontal inhabited es. The same system was used in "Tokyo Project 1960" prepared by the Tange o, in the design of the central business district, which Isozaki headed.

The first Metabolist declaration was at the World Design Conference an in 1960, entitled Metabolism 1960 - a Proposal or a New Urbanism. The rs of the group included Kikutake, Maki, Otaka, Kurokawa, Kawazoe (critic), (industrial designer), later joined by Ekuan (President Industrial Design tute), Asada Secretary General of Tokyo World Design Conference 1960), (graphic designer), Manabe (painter), and Tomatsu (photographer).

Akira Asada and Arata Isozaki, "From Molar Metabolism to Molecular olism," Anyhow (Cambrigdge, MA: ANY Corporation and MIT Press, 1998), 66.

Arata Isozaki, Four Decades of Architecture (New York: Universe shing, Rizzoli), 39.

Ibid., 72.

Ibid., 35.

Martin Götze, Ironie und absolute Darstellung: Philosophie und Poetik Frühromantik (Paderborn: Schöningh Verlag, 2001), 218. "Was sich nicht annihiliert ist nichts wert." Translation by Emmanuel Petit.

Karl Wilhelm Friedrich von Schlegel, "The Limits of the Beautiful" , in The Aesthetic and Miscellaneous Works of Friedrich von Schlegel . E.J. Millington (London: George Bell and sons, 1875), 415.

Arata Isozaki, "Architecture With or Without Irony" (1985), in zo, Architecture & Design 7, (1992).

For texts on Isozaki's irony, refer for instance to David B.Stewart, and Its Fulfillment," Four Decades of Architecture (New York: Universe hing; Los Angeles: Museum of Contemporary Art, 1998); and David B.Stewart, and Men," in Arata Isozaki: Architecture, 1960-1990 (Los Angeles: Museum temporary Art; New York: Rizzoli, 1991), 9-17; and Asada Akira, "Beginning n Ending," and Ignasi de Solà-Morales, "Between Enigma and Irony: The Architecture of Arata Isozaki," in Arata Isozaki Works 30: Architectural . Prints, Drawings (Tokyo: Rikuyu-sha, c.1992).

Isozaki, Four Decades of Architecture, op. cit., 31.

See Plate 115 in Karl Friedrich Schinkel's "Collection of ectural Designs." About the connection between Schinkel's Bauakademie and i's Tegel project, refer to David B. Stewart, "Irony and Its Fulfillment," Decades of Architecture (New York: Universe Publishing; Los Angeles: of Contemporary Art, 1998).

James Stirling, "The Monumentally Informal," James Stirling: gs on Architecture, ed., Robert Maxwell (Milan: Skira, 1998), 156. The ition for the Stuttgart Staatsgalerie took place in 1974. A second run made ng come forth as the winner in 1978.

Arata Isozaki, "Absence-or in place of postscript" in Bijutsu nsha, Kenchiku no katai ("The Dismantling of Architecture"), (Tokyo: 397-98; and in: Iwona Blazwick, Century City: Art and Culture in the Metropolis (London: Tate Modern Exhibition, 2001), 205.

Karl Wilhelm Friedrich von Schlegel, "Athenäums-Fragment 41," che und theoretische Schriften (Stuttgart: Philip Reclam, 1978), 82. "Es eich tödlich für den Geist, ein System zu haben, und keins zu haben. Er ich also wohl entschliessen müssen, beides zu verbinden." Translation by el Petit.

Arata Isozaki, "A Rethinking of Spaces of Darkness," Japan Architect 287 (1981): 11.

Karl Wilhelm Friedrich von Schlegel, "Über die Unverständlichkeit," e der Romantik, 191. Translation taken from Paul de Man's "The Concept of " Aesthetic Ideology (Minneapolis: University of Minnesota Press, 1996).

20 Besides the curated exhibition by Hans Hollein, a few supplementary contributors were invited to do installations. This group of people included Peter M.Bode, Oswald M.Ungers, Richard Meier, Arata Isozaki, Ettore Sottsass, Nader Ardalan & Karl Schlamminger, and Richard Buckminster Fuller.

21 Hans Hollein, "Position and Move" (1976), in Isozaki Arata, (hensha SD Hensh¯ubu) (Tokyo: Kajima Shuppankai, Showa 52 (1977), Gendai no kenchikuka), 6.

22 see Hollein's drawing in: ibid., 10.

23 Arata Isozaki calls his project for the Tsukuba Center a "group portrait." See "Arata Isozaki 1976-1984," SD Space Design (1984): 99.

24 Isozaki, Four Decades of Architecture, op. cit., 114.

25 Akira Asada, "Beginning From an Ending," Arata Isozaki Works 30, 12.

26 Ibid., 12.

27 Isozaki, SD Space Design, Arata Isozaki 1976-1984, op. cit., 97.

28 Shelley, op. cit., 50-3.

29 Arata Isozaki, quoted in: Hajime Yatsuka, "Textual Strategy and Post-Modernism," SD Space Design, Arata Isozaki 1976-1984 (January 1984): 184.

30 Also compare Isozaki's use of the Marilyn Monroe curve with a similar curve in Stirling's Düsseldorf museum. In Stirling's museum too, the cubical "garden pavilion" is connected to the round courtyard by a curve, as if to show that the relationship between the main components is undetermined, or "in the dark."

31 To further understand the memory function of the Campidoglio, see Robert Venturi's study of the Campidoglio in: Venturi, "The Campidoglio: A Case Study," The Architectural Review (1953): 333-334; and Robert Venturi, A View From the Campidoglio: Selected Essays 1953-1984 (New York: Harper & Row, 1984), 11-2.

32 Isozaki, Four Decades of Architecture, op. cit., 116.

33 Hiroyuki Suzuki on Isozaki's Tsukuba Center: cf. Fumihiko Maki, An Aesthetic of Fragmentation (New York: Rizzoli, 1988), 21.

34 Isozaki, SD Space Design, Arata Isozaki 1976-1984, op. cit., 99.

35 Götze, op. cit., 228.

36 See de Man, "The Concept of Irony," Aesthetic Ideology, 178-9.

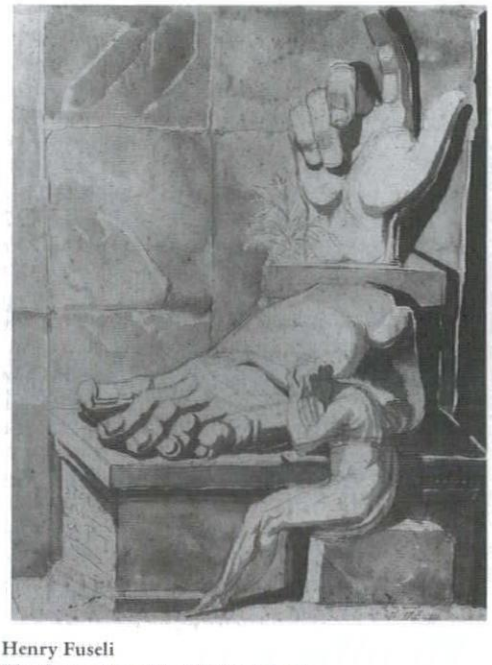
37 Charles Jencks, The New Paradigm in Architecture: Multiple Coding (New Haven & London: Yale University Press, 2002), 23.

14 **Karl Friedrich Schinkel, A Gothic Church Behind Trees, Lithograph, Nationalgalerie, Berlin.**

Undead

Ru(m)inations:
The Haunts of Contemporary Architecture

John McMorrough



Henry Fuseli
The Artist Moved by the Grandeur of Ancient Ruins, 1778–79.

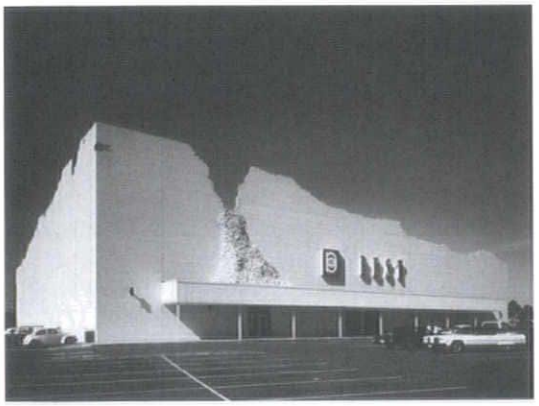
Think about architecture. As an activity that defines itself through its definitions (of spaces, of uses), the history of architecture is full of wholes—provisional totalities conceived to give coherence to an activity caught between the conflicting compulsions of necessity and frivolity. Whether in relation to capital, capacity, structure, or symbolism, architecture's history and legacy—maybe its very meaning—is to be found in the creation of reasonable explanations for its existence, its raison d'être made in the midst of a series of preservative justifications, in leaps of faith and defensive postures. This realm of shadow (formerly known as ideology), stories, fables, and superstitions is part of the logic of architecture itself. These manifestations of collective imagination are narrations that embody aspirations of society at large, and of architects themselves.

One instance of this phenomenon, in the tales of architecture's transmogrification over the last 40-odd years, is sublime: inspiring and, in a sense, terrifying. Regarding this period, which generally falls under the auspices of the Post-Modern (widely defined), the following is a sketch of a particular trajectory for how at a specific historical juncture architecture entered into a problematic relationship with the capacity to make proposals and instead focused on issues of signification. The ramifications of this are still felt, if not always fully acknowledged. It was (and is) a systematic avoidance through which architecture defined itself as a discipline. To give this phenomenon a name, we can consider the conceptual adjacency between two terms —ruination and rumination—that mark the period. While ruinations can be considered as both the causes and effects of demise (for this use, literally, ruins in appearance and ruinous in motivation), ruminations are lengthy considerations, negative cyclic thinking, persistent and recurrent worrying or brooding, obsessive-compulsive behavior—and in bovine usage, nonnutritious consumption. The oscillation between the modalities of ruination and rumination, between form and thought, in their multiple and paradoxically connected meanings, encapsulates the framework that spooks architecture to this day. Together these ru(m)inations define the twists and turns of architecture's epistemological machinations, and at this point are synonymous with the very idea of architectural disciplinarity, then and now.

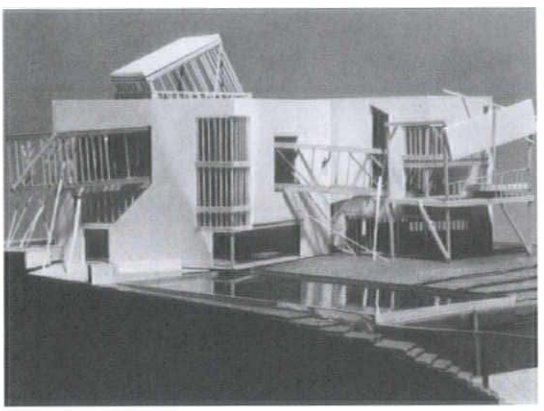
The Act of Ruining or the Condition of Being Ruined[1]

> The ruin strikes us so often as tragic—but not as sad—because destruction here is not something senselessly coming from the outside but rather the realization of a tendency inherent in the deepest layer of the existence of the destroyed.[2]
> —Georg Simmel

The ruin has been alternately inspiration, model, embarrassment, and legitimization; and its reenactment is an appeal both to the pictorial form of architecture's legacy and to its conceptual history. More than the simple pleasure of the ruin as pastoral fragmentation, it has continually been rethought as an end in itself, and even from its antiquarian origins has been a persistent figure of the architectural imagination, a source of material and inspiration.[3] Architects of the 1970s continued this trajectory by incorporating the image of ruin into their work. As embodied by the etymology of ruin, in the Latin root verb ruere ("to fail"), in versions ranging from collisions literal, denoted, and notational, architects inscribed the failure of architecture into its form.[4] The relation of this expression to forces both external and internal to architecture explains the occurrence.

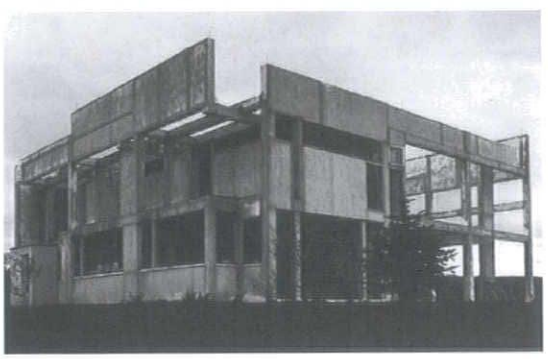


SITE
Indeterminate Facade Building, Houston, Texas, 1974.



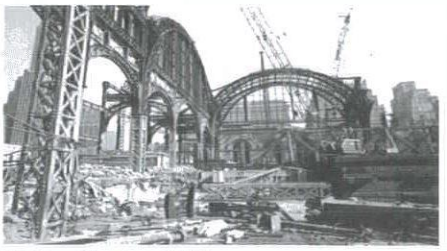
Frank Gehry
Famillian Residence, Santa Monica, California, 1978.

Venturi and Rauch
Franklin Court, Philadelphia, Pennsylvania, 1972.



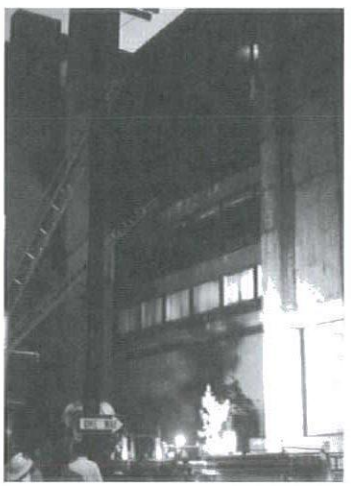
Peter Eisenman
House II, Hardwick, Vermont, 1969–70.

Minoru Yamasaki
Pruitt-Igoe Housing, St. Louis, Missouri, 1952–55
(Demolished, 1972).



McKim, Mead, and White
Pennsylvania Station, New York, New York, 1905–10
(Demolished, 1964).

Buckminster Fuller
United States Pavilion for the 1967
World Exhibition, Montreal, Canada, 1967
(Building Fire, 1976).



Paul Rudolph
Art & Architecture Building, New Haven, Connecticut, 1963
(Building Fire, 1969).

Failure that Results in a Loss of Position or Reputation[5]

Happily, we can date the death of modern architecture to a precise moment in time.[6]
—Charles Jencks

Like all Gothic tales, this one is borne of tragedy and accident. For the sake of narrative we can presuppose that the ideal of architecture (Modern architecture, more exactly) came to a full stop at some point in the 1970s. As an initial premise it is an inauspicious start, but even cursory examination of this period's cultural artifacts finds the idea in a variety of depictions in both its high and low forms. It is most notably embodied in the description of the city, which according to the prevalent options had suffered the ignominies of an urban renewal that meant a qualitative loss with not only demolition of the existent city fabric but also the legacy of failed renewals. Add to this other more spontaneous demolitions, both accidental and malicious, and the result was an image of the city literally and figuratively in ruins.

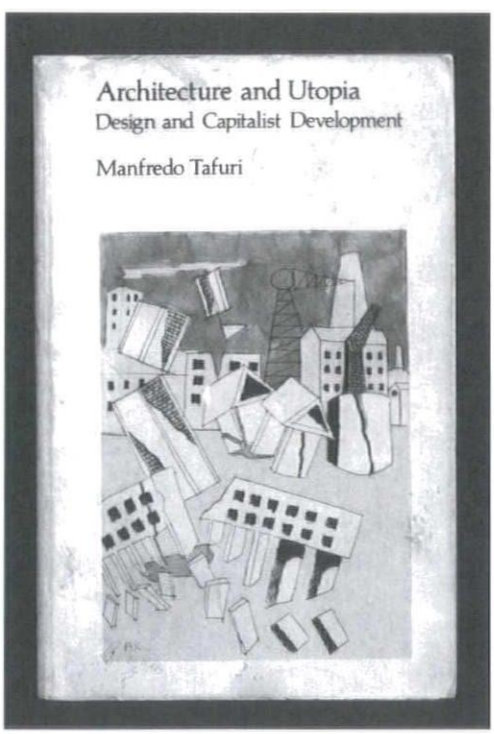
The reported causes for this (now) seemingly preemptive devaluation ranged from the failure of Modern housing and the perceived rise of criminality within its domain to the energy crisis and the slowdown of the building industry, to the abstraction of Modern architecture and the semantic opacity of transparent Modern buildings. These were more than a general suspicion of the authority of architecture per se; they were an indictment of the modernizing impulse of architecture to fix the whole of society's problems: an overestimation of efficacy in the first case, and an underestimation of potential in the second. What links these images of destruction, of buildings in decline or in a state of demolition, is a general malaise—an atrophy of architecture's constructive capacities.

It was thought that architecture might have promised too much. With the twin impulses of technical inevitability and social contract, architectural Modernism had come to represent a tangled web of motivations that were held simultaneously as style, politics, and zeitgeist. Once the limits of this were identified, architectural historians and critics commented prolifically with whole series of books and articles focusing on architecture's failure to deliver upon its social goals. Their diagnoses were quick to pronounce the deceased, with the death of "the street,"[7] "the city,"[8] and finally "Modern architecture" itself.[9] In such a ruinous state, the answer was found paradoxically in the potential of ruin itself.

To meditate or muse; ponder [10]

No longer enabled to present itself as utopia, ideology indulges in nostalgic contemplation of its own outmoded roles, or disputes with itself. [11]
—Manfredo Tafuri

The "death of" theses have yielded opposing reactions in the cases of painting and architecture. In painting it was a move to other media; in the case of architecture, an entrenchment into its own codes within the forms of autonomy. The significance of the ruin applies not only to its appearance (as an image) but also to the status of its continuation (as a thought). And its appeal lies in its simultaneous embodiment of demise and preservation of the idea of architecture, not only in appearance but as an implied system. The ruin represents strategies that denote a shared practice, the lingua franca of a common pursuit. Both deified and secularized, autonomy no longer argued for architecture's abilities; it articulated a definition of architecture in and of itself. As geometry was no longer spiritual, it was rendered as form; and structure was no longer efficient but was a signification of construction itself—as tectonics. No longer anything other than itself, architecture was now a representation of itself: a representation of representations no longer to be understood in relation to the exigencies of its own creation.



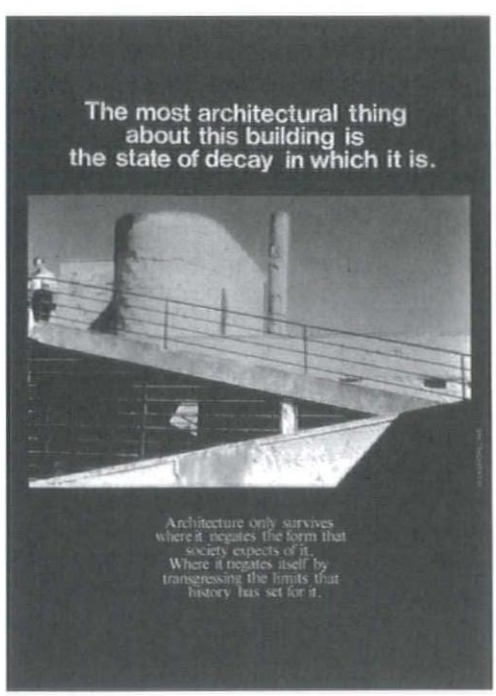
Cover, Manfredo Tafuri's Architecture and Utopia: Design and Capitalist Development, Cambridge: MIT Press, 1976 (Cover Image: Aldo Rossi L'Architecture Assassinée, drawing, 1975).

To chew again or over and over [12]

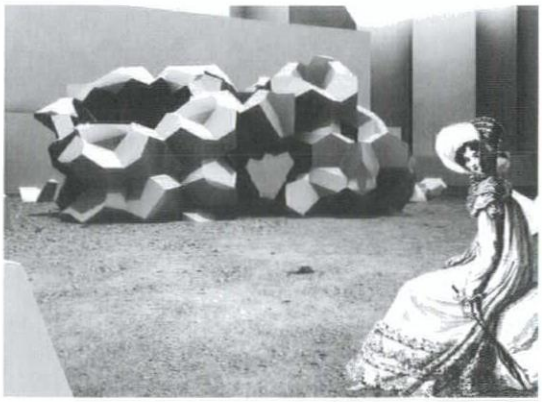
Repetition is the thought of the future. [13]
—Gilles Deleuze

This all seems to be of only anecdotal interest, and certainly not a concern of the moment, for in the current prevalence of architecture's ascension to the embodiment and ennoblement of global capital (think Dubai, China, Moscow, and Bilbao), the idea of (Modern) architecture's death must surely reside in the past. Yet improbably it is out of that previous malaise that the architecture of today, in its seemingly robust constitution, has grown.

The roots of this are generational. Architecture, caught in a period "after meaning," was (and perhaps is perpetually) in a quandary as to how to position its production both within the cultural field at large and within the logic of its own development. After the rejection of the semiotic enthusiasms of Post-Modernism, and its negation by deconstruction (after all, they are two versions of the same project to denote the possibility, or impossibility, of meaning), the aporias of indexicality and commentary seem to be equally exhausted. Contemporary architects have become educated in a context of hyperarticulated theoretical discourses (those that were at one level representational projects) but look in a different direction, rejecting the possibility of signification in the widest possible sense. These architectural Trummerkinder ("children of the ruins") are unified in their explicit rejections of semiotic models, only to find that replacement models offer a particular and tenuous relation to the real (both an under- and overestimation). As research replaces theory the idea of project is now replaced with that of scheme (both as design and as a plan of action that is especially crafty). A scheme makes itself valid, not as ideal but as particularity—as the frameworks, arguments, and illustrations that constitute the work—and there is no object. The scheme is not a residue, an index, a palimpsest, or a text at all; it is a description of actions, and it is in fact the diagram.



Bernard Tschumi
Advertisements for Architecture, 1976.



Aranda/Lasch
Grotto, submission for P.S.1 competition, 2005.

After the labors of architecture as code and the difficulties of such extended problematics, architecture—now in its postideological (post-Post-Modern) turn—seeks terra firma in all manner of the explicit: in technology with fabricators, with sensation for the neominimalist, and in information with the bureaucratic-pragmatists. Common to all this we see the interest in emergence and other forms of self-organization, a trial-and-error approach, an open-ended experimentation—it is architecture seemingly without motivation. The opacity of this postindexical work seeks to move past the legibility that comes from concerns with the text and takes pains not to reveal the process of its formation (deus ex machina indeed).[14] In spite of the recasting of the architectural project from one widely considered to be representational to one particularly focused on performance, architecture returns frequently to favored terms. Whether to form, to space, or construction (or tectonics, or in even more recent parlance, fabrication), each makes sense insofar as they are understood as elaborations of a disciplinary problematic. Project-based processes may define the work in its individuated substantiation, but it is the discipline-based justifications that define the work as architectural. Projects are presented in terms of their emergence, but understood in terms of the ideation of historical issues. As one can see in example after example of contemporary work, the logics of archaic construction underwrite the arguments for advanced computational geometry.[15] Such elaborations make the labors of the discipline simply laborious, making difficulty its own value—the images of fabrication (again both literally and figuratively) are nothing if not the quantification of the time and effort spent. No longer spoken as such, autonomy still regulates a variety of these developments through reasons that appear to be motivated by patterns occurring only within some reptilian unconsciousness of the practice; with arguments of architectural autonomy rendering the formulas of cellular automata, the autonomous has become the automatic.

Replacing the relatively decrepit repertories of the ruin is a more monstrous menagerie of the mutant, the viral, the alien, the blob (the list goes on). What unifies these appellations is their desire for an alternative to the reification of the inorganic with the vitality of animation. If the ruin is the inert figure adequate to the representation of architecture in decline, then perhaps the zombie is the mobile figure of architecture, disciplinary continuity in the form of nonorganic self-organization and emergent intelligence. Zombies, after all, are materialist images par excellence. As exemplified in the films of George A. Romero, zombies are slow, single-minded, and incapable of thought, their ominous status achieved by sheer multiplicity and single-mindedness, their effectiveness based on the uncontrolled yet driven mass. Singularly motivated—to eat brains, a motivation that is sufficient for them to operate—their actions are dictated by patterns of habit. In Romero's classic Dawn of the Dead, the zombies returned to the mall because of "some kind of instinct. Memory ... of what they used to do."[16] As the architectural zombies of today consume the intelligence of previous generations, they return to favored terms again and again—enacting and reenacting certain patterns of behavior. The recent interest in so-called "generative" models is not an overcoming of the mourning of architecture but its enactment; for in these various evocations of life, we find that the animations of the architectural body are in fact compensatory metaphors for its moribund status.

Afterthoughts

Are we not in a period in which a number of approaches that have "died" seem to have a surprisingly robust afterlife?[17]
—Rem Koolhaas

The necrotic condition of architectural possibility today is not only a function of one style or a subset of concerns; it is pervasive within a variety of means by which the defining terms of architectural coherence (its unspoken justifications) are formulated today.[18] Once a discipline is defined in relation to its preservative rather than its performative attributes, it is a constraint rather than an opportunity. While at one point such preservations were a necessity, they have now outlived their initial use. At this point the disciplinary conception of architecture concretizes the formats of practice as a rite: what was once the saving grace is now the problem itself. The impulse that originated as a mechanism of preservation has now been transposed into meaning—the defense mechanisms of architecture have become its content; the fort becomes a prison.

The disciplinary argument is no longer capable of sustaining the development of architecture and should no longer be continually propped up. It is not a matter of choice since the options for architecture to correct its course—to move to technology or economics (pragmatism), or perhaps retire further into its own dogma (utopia)—are all too familiar, each an individual manifestation of a collective amnesia regarding the impossibility of such facilities. It is not possible to simply forget or ignore these constructions. Instead architecture needs to creatively dismantle its own fortifications, to try yet again a new ru(m)ination.

Proposing the zombie as the figure of architecture today clearly has pejorative connotations; however, the zombie also has a certain kind of freedom. In the sheer multiplicity of its explorations of options, its systems have facilitated (by the parallels developed in their enabling technologies) new avenues of form generation. The promise of these conditions is the articulation of new possibilities, of ways of arranging circumstance. The opportunity and limit of this juncture is the lack of a critical apparatus to evaluate the demands of this new intelligence on its own terms rather than with the criteria of older models. Attention to date has been on the degree to which these efforts generate unexpected results, though its possibilities are perhaps less significant for the generation of novel form and much more useful for questioning inherited conceptual strictures. These are questions not about the limits of architectural styles but that of one discipline, and perhaps the beginning of another. What is necessary is a rearticulating of the capacities of architecture, in order to retest the historic legacies of the architectural and to reengage an understanding of these once again as means, not ends. In brief, it is something worth thinking about ... again.

1 "Ruination." Dictionary.com. The American Heritage® Dictionary of the English Language, Fourth Edition (New York: Houghton Mifflin Company, 2004). http://dictionary.reference.com/browse/ruination (accessed August 03, 2007).

2 Georg Simmel, "The Ruin" [1911], in Essays on Sociology, Philosophy, and Aesthetics, ed., Kurt H. Wolff (New York: Harper and Row, 1965) 263.

3 See Brian Dillon, "Fragments from a History of Ruin," Cabinet 20 (Winter 2005/6).

4 Sylvia Lavin has referred to this as "ritual suicide" committed by the architecture of this period, where it was "drowned (Superstudio), split (Gordon Matta-Clark), cut, burnt, etcetera." See Sylvia Lavin, "Practice Makes Perfect," Hunch 11: Re-Thinking Representation (February 2007): 106-115.

5 "Ruination." Dictionary.com. WordNet® 3.0, Princeton University. http://dictionary.reference.com/browse/ruination (accessed August 03, 2007).

6 Charles Jencks, "The Death of Modern Architecture," in The Language of Post-Modern Architecture (New York: Rizzoli, 1977) 9.

7 Vincent Scully, "Death of the Street," Perspecta 8 (1963): 91-96.

8 Jane Jacobs, The Death and Life of Great American Cities (New York: Random House, 1961).

9 Jencks, op. cit.

10 "Rumination." Dictionary.com Unabridged, Vol. 1.1 (New York: Random House). http://dictionary.reference.com/browse/rumination (accessed August 03, 2007).

11 Manfredo Tafuri, "Architecture and Its Double: Semiology and Formalism," in Architecture and Utopia: Design and Capitalist Development (Cambridge: MIT Press, 1976) 163.

12 "Rumination." Dictionary.com Unabridged, Vol. 1.1 (New York: Random House) http://dictionary.reference.com/browse/rumination (accessed: August 03, 2007).

13 Gilles Deleuze, Difference and Repetition (New York: Columbia University Press, 1995) 7.

14 On this postindexical work see Jeffrey Kipnis, "Performance Anxiety?" in 2G: Foreign Office Architects, no. 15 (2001): 5-9. In his discussion of the generation of effect, Kipnis indicates the general relation between informational contents (process) and result in this work, as in the description that "an affective response to form independent of the information that generated it is itself an emergent power of hyperindexing." The spectral evocation of signal felt yet not received is a specific embodiment of the general conception to which architecture has devoted its attention since the 1970s.

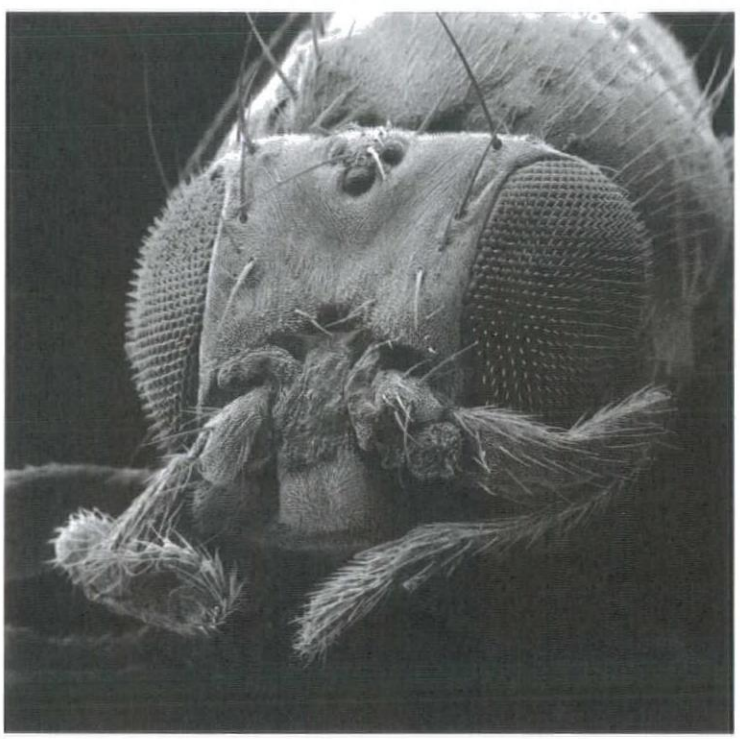
15 Here I would like to offer my double appreciation to Aranda and Lasch for allowing me to use an image of their work to enforce the rhetorical symmetries of this text's illustrations and for the high quality of their work, which is an exemplary embodiment of the current condition of architectural practice. In the example illustrated in the essay, their P.S.1 entry, the use of advanced geometry to regulate the joining of building "foam" according to stereotomic principles is an equation of the digital, the architectural, and the prosaic, which demonstrates the limits of disciplinarity on even the most advanced practices. See Benjamin Aranda and Chris Lasch, Pamphlet Architecture 27: Tooling (New York: Princeton Architectural Press, 2005).

16 George A. Romero's Dawn of the Dead (1977) Scene 167.

17 Rem Koolhaas and Hans Ulrich Obrist, "Relearning from Las Vegas: An Interview with Denise Scott Brown and Robert Venturi," in Harvard Design School Guide to Shopping (Cologne: Tashen, 2002) 595.

18 There are two essays to which the current effort is indebted: K. Michael Hays, "Critical Architecture: Between Culture and Form" in Perspecta 21 (1984): 15-29; and Robert Somol and Sarah Whiting, "Notes Around the Doppler Effect and Other Modes of Modernism" in Perspecta 33 "Mining Autonomy" (2002): 72-77. Though outside the confines of the current consideration of this essay, the "critical" is of looming importance to the topic. In the two aforementioned essays its explication has been formative to the argument. In the case of Hays it is the mediating potential of the critical to generate a possibility that both accommodated and resisted the totalization of either capital or aesthetics (in his terms, culture and form). In the case of Somol and Whiting, in the interest of articulating the architectural "projective," they offer a very instructive means of understanding the level of meanings that have accreted to the conception of the "critical" in architecture. At this point the "critical" represents a mélange of Kantian, Marxist, and reactionary positions in general that have collapsed into not only a presumptive mental disposition but also a recurrent formal and conceptual strategy of inversion. In this diagnosis of the critical, this essay supports the same points, with the possible addition to the discourse of how the critical is synonymous with the very idea of discipline itself. As such the question of the day is not only the identification of the potential and limitations of the critical, but the degree to which it is even possible to de-define architecture's relationship to it.

Mutations



Mutant fruit fly. Colored Scanning Electron Micrograph (SEM) of the head of a mutant fruit fly Drosophila melanogaster with leg antennae. Both of its multifaceted compound eyes are visible. Between the eyes are legs in the place of antennae, the product of a genetic mutation (known as leg-antennae). Normal antennae are fleshy pads much smaller than the legs seen here. Mutations such as this are produced by the artificial disruption of gene expression during the fly's early developmental stages. Drosophila melanogaster has been used for many years in genetic studies because it is easy to manipulate in a laboratory. Magnification × 70 at 6×6 cm size.

Monsters, Mutations and Morphology

Michael Weinstock

The mythical monsters of the classical world were imaginary creatures, composed of parts of known animal forms and the human body. The Sphinx, for example, had the head of a woman, the body of a lion and the wings of a bird. The Minotaur had the body of a man and the head of a bull, and the Centaur had the body of a horse and the head and torso of a man. These monsters were mutations of the human body, deviations from the ideal of harmonious proportion and beauty, beings that united mankind and animals. Other monsters, like the Chimera, a fire-breathing monster that had the head of a lion, the body of a goat and the tail of a serpent, were entirely composed of animal forms. Cerberus had three dogs' heads, a serpent tail, and many serpents' heads on his back.

There are common characteristics they share, of which the most striking is the fact that they were composed of different parts in order to do more than mortal humans could do. Stronger and more powerful than normal humans, they also were untamed and closer to the more "natural" animal, and terrible in their appetites and anger. The Sphinx devoured humans who could not answer its riddle[1]; Cerberus, the hound of Hell[2], tortured souls; the Minotaur was confined in the labyrinth built by Daedalus[3] to hide its monstrosity and fed on the flesh of virgin youth. The Centaurs killed men and ravished women and boys[4], but they were also knowledgeable of human culture—Chiron, the most righteous Centaur,[5] taught Achilles medicine and music, hunting and war. Classical monsters were not new or truly alien forms but rather deviations from known human or animal forms, parts of existing forms aggregated into systems of differences, and it was the union of differences that produced their excessively natural, superior yet deviant functionality.

Mutations to the forms of animal and human bodies occur naturally. Cyclops mutations, for example, are a frequent occurrence in many species. Fish may become cyclopic if their embryos are thermally or chemically traumatized, pregnant ewes grazing on corn lilies can produce cyclopic lambs, and in humans diabetes or the consumption of excessive amounts of alcohol during pregnancy dramatically increases the chances of the embryo mutating to the cyclopic form.[6] It is a very common mutation, a deviation at the very beginning of the normal development of the embryo.[7] The morphological characteristics of Cyclopia are similar in all species, including humans. The mutation produces an undivided brain, lacking the normal two hemispheres, and a single eye, usually with the nostrils located above the eye.

The construction of a systematic study of all "the monsters and prodigious products of nature, of every novelty, rarity or abnormality" is one of the earliest projects of science.[8] The study of the different, of the "Errors of Nature," of the monstrous and mutated, is an essential part of Bacon's proposition that Natural History should be split into three inter-related domains: the study 1) of ordinary or usual nature, 2) of deviant nature and 3) of nature manipulated by man. In the first instance, Nature produces the "history of generations," or species that develop in the ordinary course. In the second, Nature is forced from the ordinary course by the perversity of matter and produces monsters. In Bacon's third domain, Nature is constrained and molded by mankind to produce the artificial. Furthermore, the three regimes were not to be treated separately, but could be subjected to the same inductive methodology of enquiry. "For why should not the history of the monsters in the several species be joined with the history of the species themselves? And things artificial again may sometimes be rightly joined with the species, though sometimes they will be better kept separate."[9]

Biological monsters reveal the space of morphological variation or differentiation of any given species. In evolutionary terms, they are subject to strong negative selection, but are produced in every generation by the internal processes of the system of embryonic development. Morphological differentiation of the full adult form is produced by small variations that occur very early in development, and may be initiated by genetic errors, environmental changes or may be induced by experimental manipulation. The process of embryonic development determines the morphological variation or differentiation in the population of any species, the set of available forms. It might be thought that genetics and embryology take quite different approaches to differentiation, as they appear to have fundamentally different arguments. However, what is common to both systems of thought is differentiation.

Differentiation and the Body Plan

Genetics argues that all living things are the products of natural selection, operating on inherited small mutations or changes in the genome over many generations. It is these small changes (to the genome) that produce differentiation within populations, and drive evolution. Every reproductive cycle requires the organism to replicate its genetic material, and this process is susceptible to small copying errors, so that offspring are produced that are a little bit different from the parents. In the most extreme account, organisms are described as a kind of temporary host for the genes, a mechanism for their perpetuation.[10]

Differentiation during the development of an individual is controlled by the Homeobox genes (originally discovered in the fruit fly Drosophila) that turn other genes on or off during development, controlling the order of morphogenesis and the position of different parts in relation to the body plan. The Homeobox genes control differentiation in all species.[11] In the case of the fruit fly, the mutation of a single gene, called Antennapedia, produces changes to the morphology and function of the fly's antenna, so that it develops as a leg rather than an antenna. This is possible because all cells in the fly have all of the information necessary to become leg cells or antennae. Every cell in an organism carries a complete genome, all of the information necessary for the development of the complete organism. Antennapedia and its homologues control limb development in all vertebrates, so that the forelimbs of birds develop as wings, or the extremities of the forelimbs develop as hands in humans or flippers in seals. Homeobox DNA sequences have been conserved throughout evolution and are controlling factors in the development of even distantly related organisms.

Changes to the Homeobox genes have substantial effects on the morphology of individuals, and when these changed individuals survive the rigors of natural selection, new descendant species are formed. If individual mutations offer the advantage of superior functionality in some capacity, then the mutant organism will have an enhanced reproductive fitness. If its progeny inherit the changed genome, then evolutionary change will occur. Differentiation by speciation, new species arising from a common ancestor, is normally described in phylograms, or tree-like charts. The underlying logic is to plot the sequence of morphological differentiations that lead from the "form" of a common ancestor to the multiple differentiated forms of the whole group or taxa.[12] For example, the common ancestor of all arthropoda, including crustaceans, centipedes, spiders, scorpions, and insects, was a simple tube-like worm. The arthropoda group has over one million species alive today,

with a fossil record that starts in the early Cambrian era, and it accounts for over 80% of all known organisms. The sequence of morphological differentiation produced segmented bodies, exoskeletons, and jointed legs.

As opposed to genetics, embryology treats organisms as whole beings that evolve not only by the small incremental changes of genetic mutation and natural selection, but through transformations. D'Arcy Thompson argued that natural selection is efficient at removing the "unfit," but that the significant differentiations of new structures are a product of the mathematical and physical properties of living matter, just like the shape of nonliving things in the natural world.[13] Transformations between major groups do not happen in the completed adult, but may occur in embryos. The embryos of highly differentiated adults are strikingly similar. Genetic information does not need to fully specify the adult form, as the action of the natural forces in the environment and consequent mathematical principles determine the scales, bounding limits and informing geometries of the development of adult forms.

In more contemporary expressions, organisms are described as members of a class of complex dynamic system with distinctive properties of order and form, and it is these characteristics of organisms that are drivers of evolution.[14] The differentiated morphology of living organisms is determined not only by the genome, but also by the combination of the internal forces such as chemical activities and pressure in their cells, and of external environmental forces such as gravity. The effect of these natural forces is expressed in different ways, depending on the size of the organism.

Embryological development of an individual organism is a process of differentiation. In all animals and insects the sequence of differentiation commences when the fertilized egg divides to produce a cluster of cells, and as numbers increase, organizes itself into a hollow sphere. A thickened flat plate forms and on the surface of the sphere the edges curl up and meet at the dorsal midline to form a hollow tube. The next step in differentiation is when one end of the tube grows and becomes convoluted, and subsequently develops into the brain. The other parts of the tube follow a similar process and subsequently become the spine and lower limbs. A fully recognizable version of the final adult body plan is achieved very early in embryological differentiation. This process is identical in fish, birds, mice and men. The duration of the process of differentiation does depend on the final body size, so that a full body plan is evident in mice by day 14 of gestation, and a similar point is reached in the gestation period of humans by day 60; but it is clear that there is a commonality, a fundamental unity to the processes of morphogenetic differentiation across species and phyla.

Hopeful Monsters

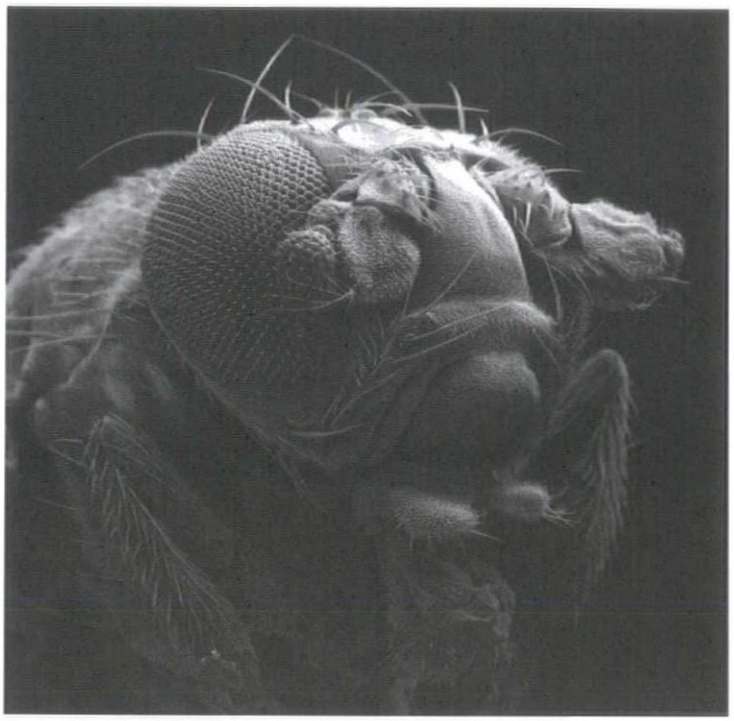
"Hopeful monsters" was a controversial term used by evolutionary biologists to describe an event of mutation that produces a new species, an idea that predates the sequencing of the "genome."[15] In 1942 the biologist Richard Goldschmidt proposed that mutations in genes that have a significant role in the development process of the embryo could produce large effects on the physical organism or "phenotype." In The Material Basis of Evolution, he argued that mutations that affected the whole organisms were "hopeful monsters" because they had the potential to succeed as a new species. The idea of developmentally significant mutations producing large effects is now widely accepted, but to extend from this to a theoretical proposition of speciation through systemic mutation has very little support, as it neglects the role of the dynamics of evolving populations. A single hopeful monster cannot constitute a new species, or found one. However, at least part of Goldschmidt's theory, universally rejected by the prevailing orthodoxy of the time, might get a more sympathetic hearing today—in particular, his finding of what he called "rate genes," genes that control the timing of local growth and differentiation processes. The earlier a mutation occurs in the process of embryonic development, the more extensively it will alter the organism, but such early mutations produce such profound changes that the fully developed organism is rarely viable. A small mutation at a very early stage of development, such as the mutation of the gene Antennapedia that changes the antenna to a leg, can bypass millions of years of the small incremental changes of Darwinian evolution. The more complex an organism is, the more extensive the changes will be, and more likely they are to be lethal to the organism.

Steven Jay Gould, writing some 60 years later in The Structure of Evolutionary Theory, gives an analysis of what might make a monster hopeful—for example a mutation that produces two eyes on one side of the head of a fish of the most common morphology (such as tuna) is a monster; a mutation to a flatfish that produces two eyes on the upper surface of the head, with better scanning of the surroundings as a lucky result, is a "hopeful monster."[16] To be hopeful, the monster must be well suited to a previously unexploited environment, it must be fully functional, and it must have the means and opportunity of reproducing and propagating itself.

Plant Bodies

Homeobox genes control the body plan of the adult plant, as in animals, but the body plan is not evident in the "embryo" or young shoot when the first growth begins from the seed. Plants differ from animals too in that the stem is capable of developing branches, leaves, and the cones or flowers of its reproductive system throughout the life of the plant. The body plan is adaptable to environmental conditions, developing morphologically and functionally according to sunlight, temperature and nutrients. There are only four basic body plans for plants; the unicellular, the colonial, the syphonous and the multicellular; and each have their own method of growth. Unicellular plants such as the green algae Chlamydomonas are the most ancient, and the significant differentiation between unicellular and colonial plants is that unicellulars remain independent and do not aggregate. Unicellular organisms are typically very small, which has the advantage of a large surface area relative to the contained volume, making the metabolic process very efficient. Because of this ratio of surface area to volume, smaller organisms rapidly absorb nutrients through passive diffusion, process them efficiently, and grow and reproduce speedily.[17] This makes them able to respond to favorable environmental conditions which may be brief or seasonal to complete their life cycle, remaining dormant in unfavorable conditions.

Most of those advantages are maintained when single cells are aggregated together. Siphonous plants typically have a cylindrical geometry as the module to be iterated in the construction of the body. A cylinder of any size always has the same ratio of surface area to volume. In aggregation each cell retains its individual capacity for rapid growth and reproduction, and in appropriate geometrical arrangements, metabolic activities can be coordinated. Syphonous and Colonial plant systems achieve greater overall size by aggregating cells that



Mutant fruit fly. Colored Scanning Electron Micrograph (SEM) of the head of a mutant fruit fly Drosophila melanogaster. This mutant has two small ectopic eyes in the place of antennae, seen here between the large compound eyes. Ectopic eyes are perfectly formed eye facets. This mutation is produced by inducing the expression of a gene called "eyeless"during the early developmental stages of the fly. "Eyeless" is thought to play an important role during larval development. Drosophila melanogaster is widely used in genetic experiments because it is easily manipulated in the laboratory. Magnification ×70 at 6×6 cm size.

are not strongly differentiated or specialized in themselves. An interesting colonial plant is the alga Water Net (Hydrodictyon), which has an ordered morphology like a hollow sack, made up of a "mesh" of cylindrical cells lying against each other. Each cell has to be morphologically similar, and to contribute to the global colonial morphology.

Large land-based multicellular plants require differentiated tissues that are specialized for the vertical movement of nutrients, as leaves and branches became increasingly elevated from supplies of nutrients and water at ground level. Vascular tissues are typically located in the central axis, where they experience the lowest tensile, compression and torsional shear stresses—but in this position they are less effective structurally. Other tissues surround the vascular bundles that are differentiated with higher structural capacity to respond and adapt to environmental stresses and dynamic loadings of gravity and wind pressure.[18] The differentiated distribution of cells, fibres and bundles, according to height and slenderness, produces variable stiffness and elasticity within multicellular plants. Variations in the section produce anisotropic properties, and a gradation of values between stiffness and elasticity along the length of the stem that is particularly useful for resisting dynamic and unpredictable loadings.[19] It is clear that body plans across very widely different plant lineages have converged on remarkably similar anatomies and morphologies (and similar structural solutions), even though they organize growth quite differently.

Adaptive Radiation

In periods of severe climate change extinction events occur. There have been five major mass extinction events, each of them featuring extensive glaciations and a retreat of living organisms to a narrow zone around the equator. The biota and the environment recovered after each event, but it took evolution tens of millions of years in each case for the full recovery of biologically diverse ecosystems.[20] Innumerable lesser events have occurred, either at local or global levels, and it is clear that climate and environment play a significant role in speciation. New species arise from a common ancestor species, acquiring new adaptations to a changed environment, expanding their geographical range and further differentiating into multiple descendant species. These in turn will fall from dominance when a new and different climatic change occurs, making way in time for the rise of a new, better adapted species. This process of differentiation, known as adaptive radiation, has been replayed in endless iterations, and some species may be stable for millions of years before disappearing rapidly when the ecosystem is disrupted. The new ecological niches will be rapidly filled by many new species.

Adaptive radiation also occurs within stable climatic periods. The clearest examples of the dynamics of adaptive radiation are in isolated habitats, such as islands and archipelagos. Isolation tends to make the movement of organisms into the habitat rare, but when such a migration event does occur, it is followed by rapid evolutionary divergence. In the original mainland habitat other species may have filled all the available ecological niches, so providing no opportunities for variant forms to diversify. On the island there may be vacant niches. The availability of unoccupied ecological niches, combined with the absence of competition and predators, presents maximum opportunities for colonization. The ancestor of the finches on the Galapagos Islands was a ground-dwelling, seed-eating bird, and must have migrated millions of years ago

the 800 miles from Ecuador. One original migrant species evolved into the 13 distinct species of finch that Darwin observed, some species living on cactuses or trees and eating seeds and other species living in trees and eating insects. Darwin noted the gradation of size and morphology in the differentiation of the beaks, some with slender beaks that they use to catch insects or drink nectar, some with shorter, stronger beaks that are used to crack open seeds.

As a lineage rapidly diversifies, the newly formed species evolve different morphologies and behavioral adaptations. The Galapagos is the site of extensive adaptive radiations of many kinds of plants and animals.[21] As on many other remote island sites, members of the plant family Compositae (including weeds, lettuce and herbaceous flowering plants) have successfully colonized the majority of the available ecological niches. Most trees of the tropical and temperate climates do not disperse seed very far from the parent, and these seeds do not survive immersion in salt water. Weeds, by contrast, have many wind-driven dispersal mechanisms for their hardy seeds. Once established on the oceanic islands which were devoid of trees and shrubs, Compositae rapidly speciated, and evolved from herbs to shrubs, and from shrubs to trees.

Adaptive radiations always involve a response to an ecological opportunity, including the evolution of a new functional adaptation that allows the organism to exploit previously unexploited resources. The geographical dimensions of the habitat are a constraint on adaptive radiation—an island will suffice for insects, birds and plants, but it takes a continent-sized habitat for mammalian speciation. All contemporary mammals are the product of three great radiations.[22] Amongst all species, it is the dominant (most numerous in comparison to other related groups) that are prone to experience adaptive radiation.

Coda

As mutations to the known forms of organisms occur naturally, so too have the small innovations, theoretical "errors" and design mutations of ancient architectures produced the "populations" or cities of buildings, and driven the historical evolution of architecture, with its limited morphologies and convergent set of available forms. The significant recent changes to culture, climate, and energy economies have destabilized the equilibrium of the cultural and physical ecology in which architecture lives.

Architecture is within the horizon of a systemic change, driven by the changes in culture, science, industry and commerce that are rapidly eroding the former boundaries between the natural and the artificial. The material practices of contemporary architecture cannot be separate from this paradigm shift, as the context in which architecture is conceived and made has changed. In the natural world change is normal, but its intricate choreography is now further accelerated and perturbed by human activities. Global climate change is upon us, and its effects will be local and regional—more energy trapped in weather systems produces emergent behavior and consequences that are not entirely predictable. So, too, the emergent behavior of local economies and cultures, now connected and interlinked globally, are substantially reconfigured.

The cultural and physical parameters of the ecology from within which a new architecture is emerging are clear. The ecological opportunity that has arisen is part of the growing cultural fascination with fluidity and dynamics, with networks and new topologies, and with soft boundaries between private and public domains, and between interior and exterior space. The experience of being in spaces that flow one into another, where differentiation between spaces is achieved less by rigid walls than by extended thresholds of graduated topographical and phenomenological character, and in which connectivity and integration are enhanced, is central to contemporary existence. Other parameters determining the evolutionary course of the new architecture are the changed parameters of climate and economy, of technologies and means of production.

The study of natural systems offers many models for architecture, and suggests the means of conceiving and producing an architecture that is more strongly correlated to material organizations and systems in the natural world. Architecture must make a positive contribution to the environment, construct a more symbiotic relationship with nature, and can do so by developing morphologies, material systems and metabolisms for buildings and cities that extend far beyond the minimizing environmental strategies of "sustainability." We learn from the systematic study of the "errors of nature" that singular macromutations, even when fully functional and well suited to a previously unexploited environment, do not have the potential to become new species. The "hopeful monster" will recur in every generation but is an evolutionary dead end. Sustainability is the "hopeful monster" of this generation, the Cyclops of the new ecology. The concept of sustainability, insofar as it can be said to have a concept, contains little more than a set of mitigating strategies to reduce the impact of human activities on the biosphere. It offers, at best, the continuity of things continuing as they are, albeit in a slightly cleaner physical environment; and it is by no means clear that reducing the impact of human activities will have such an effect. There is a fundamental, potentially fatal, misreading of the coupled processes of the natural complex systems of climate and ecologies.

The new emerging architecture that relates pattern and process, form and behavior, with spatial and cultural parameters, has a symbiotic relationship with the natural world. The design and construction of a symbiotic architecture must be the product of the mathematical and physical properties of living matter. This is part of the contemporary reconfiguration of the concept of "nature," a change from metaphor to model, from "nature" as a source of shapes to be copied to "nature" as a series of interrelated dynamic processes. As energy plays a critical role in differentiation at all biological scales, from the cell to the ecosystem, so energy flows and morphological differentiation, co-evolution, and speciation in ecological systems offer a metabolic strategy for buildings and cities that recognizes the dynamics of natural systems, and incorporates them. The conditions for the successful proliferation of a new symbiotic architecture into new ecological niches, the colonization of cities and towns by new morphologies and behavioral adaptations, are suggested by the study of Adaptive Radiation.

1 Jorge Luis Borges and Margarita Guerrero, The Book of Imaginary Beings, trans.Norman Thomas di Giovanni and Jorge Luis Borges (New York: Dutton 1969 and Jonathan Cape 1970). First published as Libro de los seres imaginaros (Buenos Aires: 1967). The riddle of the Sphinx – "which animal walks on four legs in the morning, two at noon, and three in the evening?" solved only by Oedipus, who answered that it was a man who crawled as a child, walked when grown, and in old age leans on a staff.

2 Durling and Martinez, trans., The Divine Comedy of Dante Alighieri (Oxford: Oxford University Press, 1996) volume 1, Inferno Canto VI.

3 Daedalus was the architect of the Labyrinth, and of the device that carried the unnatural desires of Persiphae, Queen of Crete, to gratification. Daedalus was later imprisoned in his own Labyrinth, and escaped by using artificial wings for himself and his son Icarus.

4 The carving on the Pantheon, known as the Centauromachy, is of the battle caused by the drunken Centaurs attempting to carry off the bride of the king of the Lapiths on the day of the wedding. See also Ovid, Metamorphoses XII, trans., M. Innes (Penguin Classics, 1955).

5 Homer, The Iliad, XI, trans. Fagles (Penguin Books, 1990) 832. See also Inferno, Canto XII

6 Armand Marie Leroi, Mutants: On the Form, Varieties and Errors of the Human Body (Harper Collins Publishers, 2003).

7 Ibid., Cyclopia in humans occurs in 1 in 200 aborted foetuses, and 1 in 16,000 live births.

8 Francis Bacon, "Preparative toward a Natural and Experimental History" in Novum Organum, 1620. The New Organum, ed. L. Jardine and M. Silverthorne (Cambridge: Cambridge University Press, 2000).

9 Ibid.

10 Richard Dawkins, The Selfish Gene, The Extended Phenotype, and The Blind Watchmaker (Oxford: Oxford University Press, 1976).

11 S.B. Carroll, "Homeotic Genes and the Evolution of Arthropods and Chordates," Nature 376 (1995): 479-485.

12 Known as Phylogenetic Systematics, first formalized in W. Hennig, Grundzeuge einer Theorie der Phylogentischen Systematik (Berlin: Aufbau Verlag, 1950) and W. Hennig, Phylogenetic Systematics (Urbana, IL: University of Illinois Press, 1966).

13 D'Arcy Wentworth Thompson, On Growth and Form (Cambridge: Cambridge University Press, 1917).

14 Stuart Kauffman, The Origins of Order – Self Organization and Selection in Evolution (Oxford: Oxford University Press, 1993).

15 Richard Goldschmidt, The Material Basis of Evolution (New Haven, CT: Yale University Press,1940).

16 Steven Jay Gould, The Structure of Evolutionary Theory (Cambridge, MA: Harvard University Press, 2002).

17 P.S. Nobel, Biophysical Plant Physiology and Ecology (New York: Freeman, 1983).

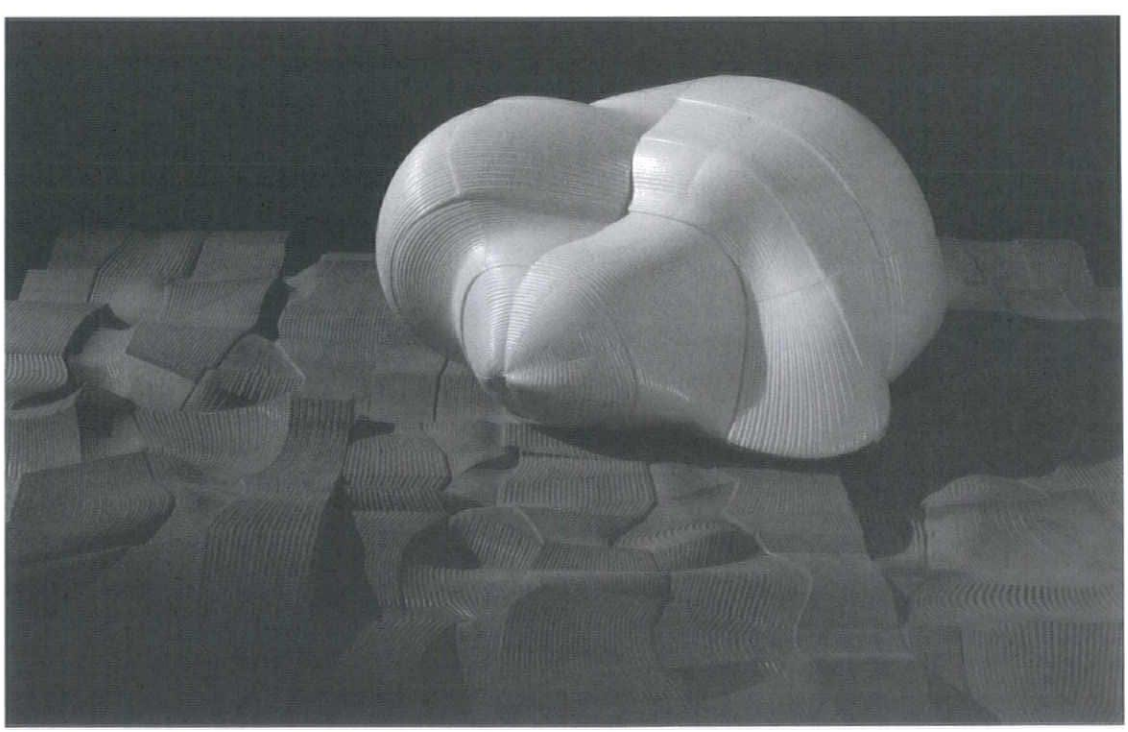
18 An introduction to some aspects of dynamics in biological systems is presented in George Jeronimidis, "Biodynamics", in AD Emergence: Morphogenetic Design Strategies, ed. Hensel, Menges and Weinstock (Wiley Academy, 2004).

19 Michael Weinstock, "Self Organization and the Structural Dynamics of Plants," in AD Morphogenetic Design: Techniques and Technologies, ed. Hensel, Menges and Weinstock (Wiley Academy, 2006). In this article Weinstock traces how evolutionary biology has utilized redundancy or excess capacities in order to adapt to environmental instability and how, with the assistance of George Jeronimidis and Nikolaos Stathopoulos, the Emtech Masters programm at the Architectural Association has explored the integrated morphologies of plants with a digital modeling and analysis of bamboos and palms.

20 Edward O. Wilson, The Diversity of Life (Norton/Harvard University Press, 1993).

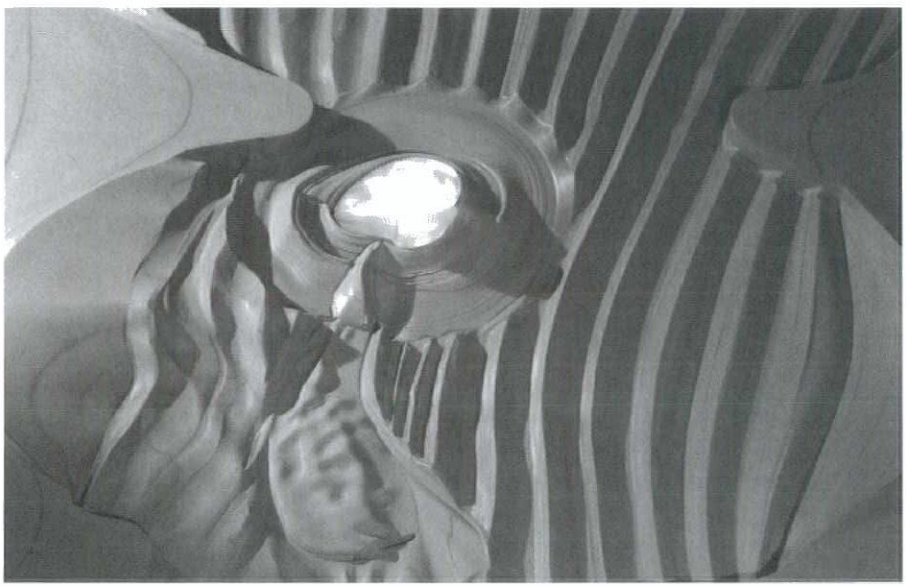
21 Ibid.

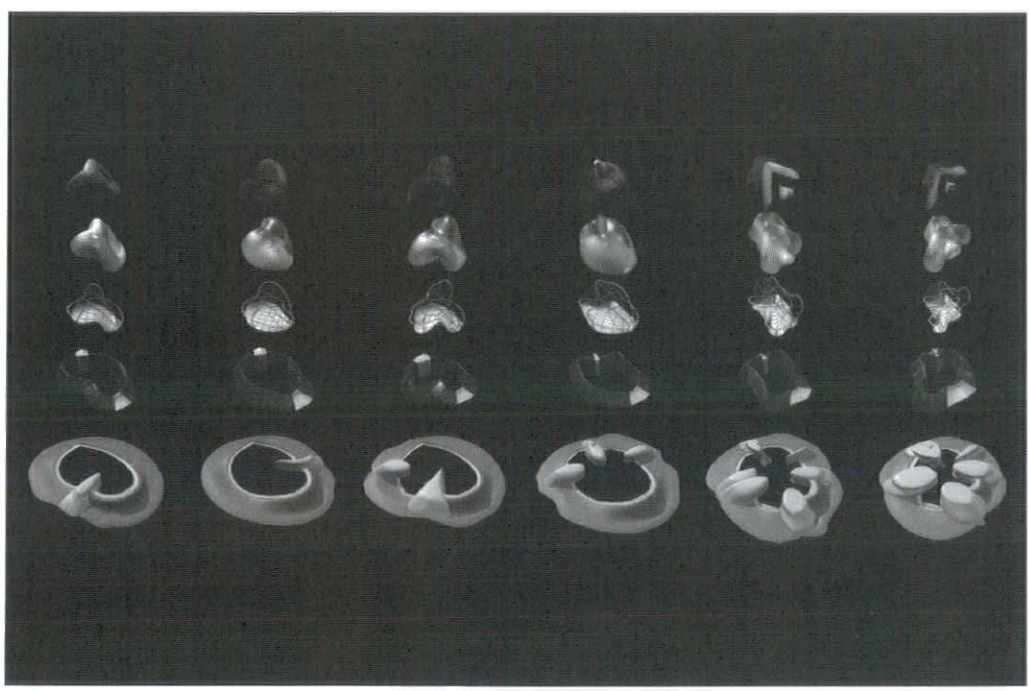
22 Ibid.



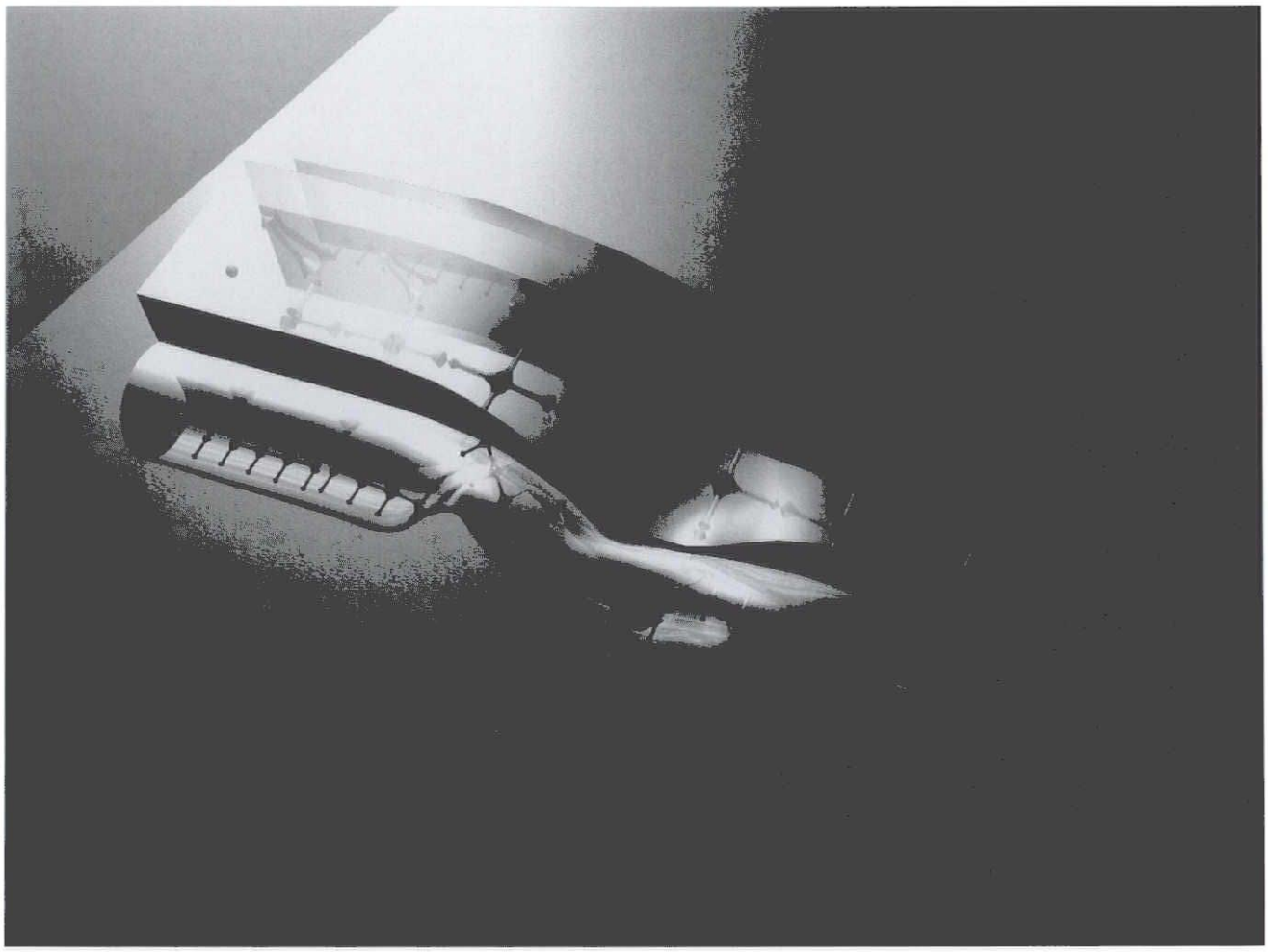
Greg Lynn FORM, Embryological House, 1999.

Unfamiliar

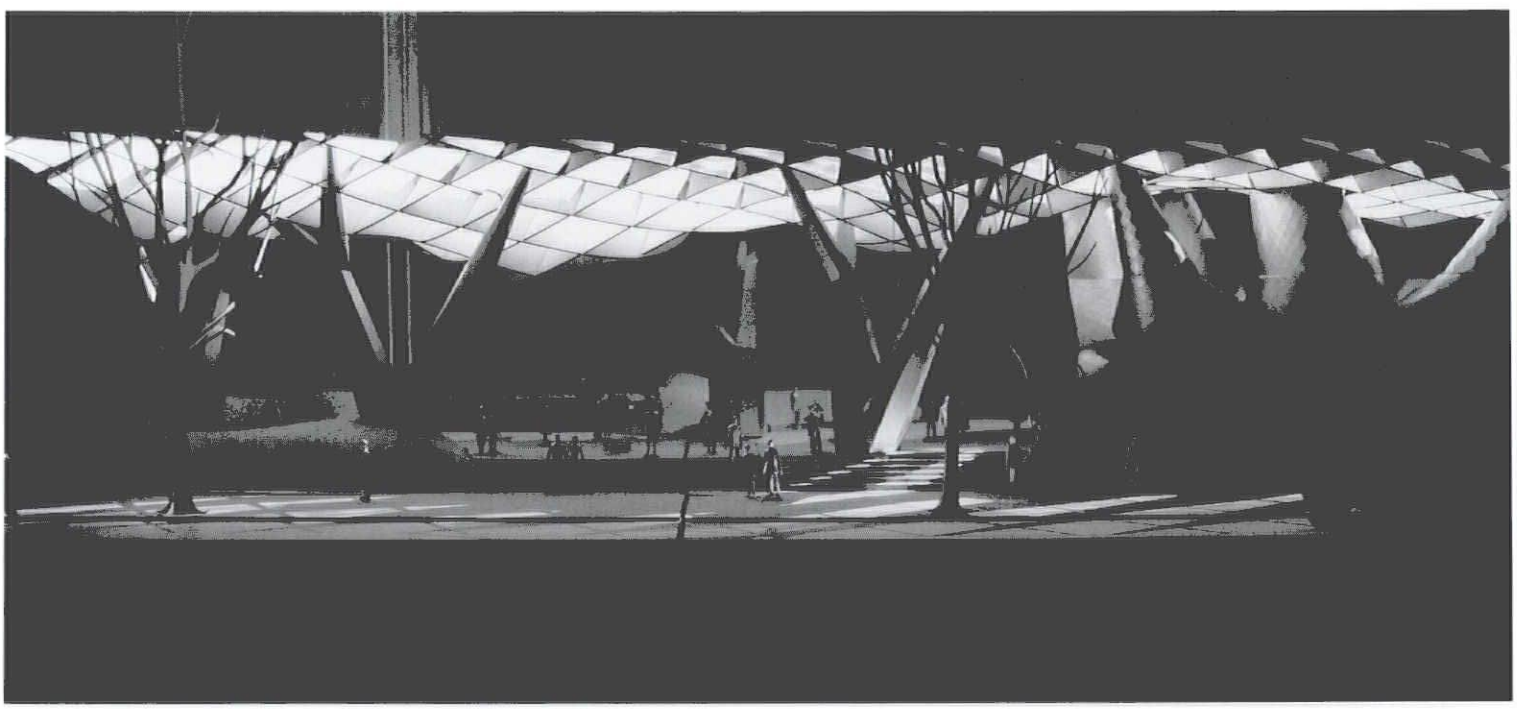




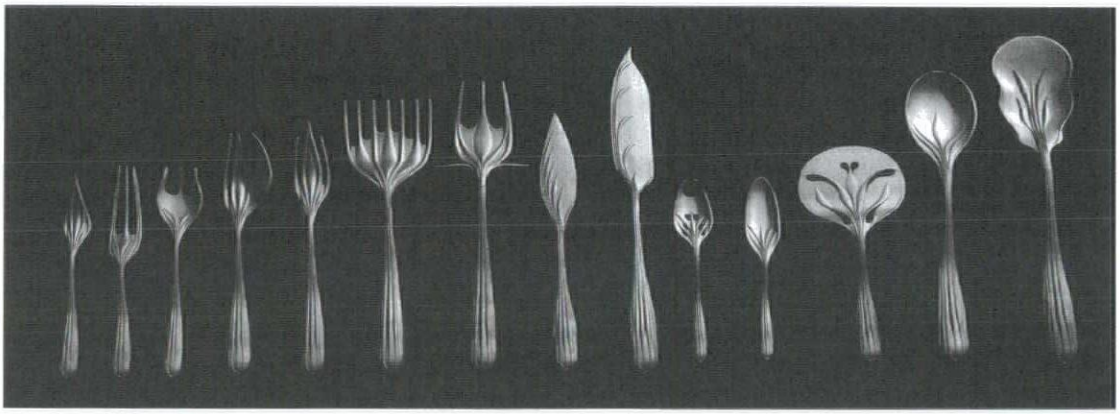
Greg Lynn FORM, Embryological House, 1999.



Greg Lynn FORM, Citron House
Amagansett, New York, 1994.



Greg Lynn FORM, 5900 Wilshire Blvd. Restaurant & Trellis Pavilion
Los Angeles, California, 2006.



Greg Lynn FORM, Flatware, 2007–present.

Beautiful Monsters

Greg Lynn

Due to the mapping of the human genome, the advances in genetic design in crops, livestock and medicine, and the general convergence of biology, life sciences, and information sciences, the popular imagination rightfully is fascinated with monsters. Instead of ideal form, we now are looking towards teratology or the study of individualism that does not emanate from a perfect type but is instead perfect in its uniqueness. This does not mean that we are free to willfully design a variety of fanciful custom objects. Rather, we must update the architectural disciplines' concepts of species, generic form, typology and uniqueness. Too often there is a naïve view of information science and computation leading to mindless variety rather than a thoughtful consideration of new concepts of individual and species as well as an engagement with architectural history.

When it comes to monsters, I think of William Bateson. His study—a whole school of thought which looked at biological form in terms of teratology rather than typology—was very interesting to me, especially around eight to ten years ago. All of my interest in variation and iteration, in fact, comes from a study of monsters in terms of typology and form. It was important for me that instead of finding a typological argument for form and design (where you try to find the perfect, ideal thing) I found a whole school of thought based on the study of monsters: the exceptions and variations rather than the norms or the rule. I'll also admit, there is something about monsters that connotes 1970s Japanese pop culture and Hollywood B-movies from the '70s and '80s—both things that I really do love. Right now, more than anything I have ever done, I am trying to engage Japanese popular culture and imagery. While not uninterested in high culture, I have always felt that popular culture is more relevant to architecture.

I am slightly ambivalent with regards to the 1990s experiments with the computer, which produced a lot of simply ugly, misshapen work. These were learning experiments, and the designs were often described by both their authors and critics as monsters. I must say I have no great affection for, or interest in, Frankenstein-style monsters (i.e., things that are inelegant, grotesque or abject). As opposed to ugliness, I'm far more interested in the new beauty. Today, there is a discourse surrounding the grotesque that I believe is calcifying the experimental processes of the '90s into a formal style, which I see as simply people's resistance to getting better with the technology and doing elegant, beautiful, resolved things.

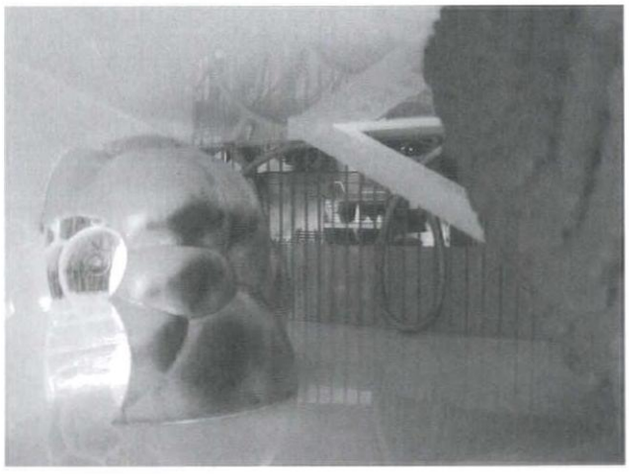
We must distinguish something unfamiliar or unprecedented from something that is badly designed. It may be that when we see it, we know it, but the most likely discerning characteristic would be the presence of rigor, proportion, harmony and composition, as even an unfamiliar monster can have these qualities. The new is always going to look strange simply because it is new. If it doesn't look strange there is a problem. If it looks familiar and perfect, it's not new.

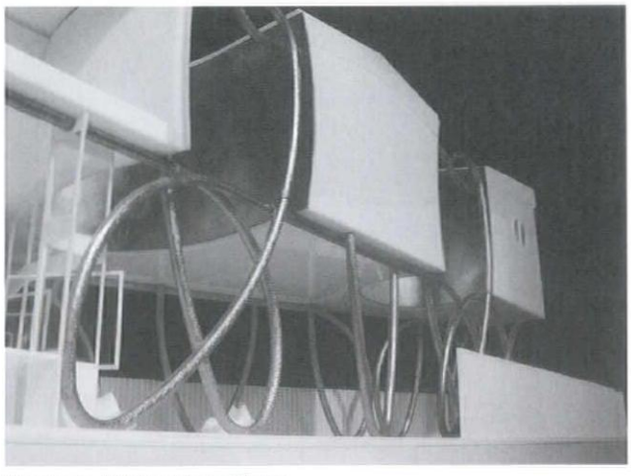
Speaking of things that are not new, a reaction to Post-Modernism rejuvenated an enthusiasm for mid-century Modernism in our discipline. The refinement and continued fascination with mid-century Modernism by young vibrant architects and designers astounds me. I prefer to refine unknown things rather than familiar things. There is a quality of strangeness that comes out of a new medium, but that shouldn't be confused with the amateurism that inevitably comes with a new medium. Of course, nobody can be expected to have facility in something that he or she is attempting for the first time. When it comes to architecture, we've had 10 years of learning to work with the computer. Now, everyone must start to discriminate qualitative differences such as aesthetic differences. It is important to figure out what is simply amateurism and what constitutes the new medium.

The way we, as architects, relate to the computer is extremely important. Much of the work using the computer as a design tool originated in the late 1970s with intellectuals from UCLA like William Mitchell, George Hersey, George Stiny and Richard Freedman, who combined a design methodology of shape grammar with their very early experiments with and exposure to the most primitive computer modeling and rendering programs. This eventually led them to train computer software to design "Possible Palladian Villas" as well as other design logics using the computer as an algorithmic tool. All of this was an extrapolation on the work of Rudolf Wittkower and Colin Rowe in a digital design medium. The first attempts to harness the new dimensional tools were therefore, in this regard, to first assemble variables, define their interaction, and then to pray, wait, invisibly guide and/or filter the results, hoping for a happy accident that might resemble a design solution. This approach assumes a model set of variables that is correct at the outset; so the quality of the information being input for random mutation and recombination was seen as the important design decision. This explains why Palladio was selected as the model. The very first attempts at finding multiple solutions took this form and in many ways this unguided anti-design methodology is still adhered to by some designers. Mere variations or versions based on randomization, external or internal constraints still has a place in the academy and in some offices but the resulting work can only be described as ugly, grotesque, monstrous or, most accurately, amateurish. In any design field, the only way to efficiently, artistically and predictably realize the design of a collection of individuals within a coherent species or family is by defining the design task as the design of a family of variations. The Embryological House was my first attempt to define the design task as neither an ideal villa with variations, nor a random variety of accidental houses, but a coherent family of houses none of which was more commodious, functional or delightful than any other, as all were individually perfect: like my children, different but equally loveable. In order to begin such a design agenda, the first task is neither the design of an origin (Wittkower and Rowe) nor the design of random constraints and mutations (Darwin), but the design of a generic primitive.

Unfortunately, there are many offices that do a form and then just vivisection it, or try to expediently break it down, and who don't really understand the medium of the computer. 99.9% of practicing architects use it as a tool. There are even younger offices around that really use the computer as a tool and celebrate their role as tool handlers without really focusing on design, expression, and their audience. Ironically, most of the architects that do use the computer as a medium also are interested in the grotesque, the ugly, and the abject. So the question of Monsterism is a good one at getting at the status of aesthetics today. It should be noted that aesthetics is not style or shape, but the way in which we communicate with our audience culturally through space, form and material. If monstrous aesthetics is tool- or technology-driven, then let's pass on this aesthetic and settle for something we have some facility with, like groovy mid-century Modernism. If popular culture, related design fields, high art and a media-saturated audience are looking for architecture to rethink itself through a language of contemporary surfaces and forms though, then count me in with the new medium. When dealing with the public audience for the built environment—let alone a client or an occupant of design—I don't want to be a tool. I would rather be an artist with something new and beautiful to contribute to the world, even if it is a monster.

Greg Lynn FORM, Ark of the World Museum
San Jose, Costa Rica, 1999.





Greg Lynn FORM, Slavin House
Venice, California, 2007.

Scope

Scaling Practice: The Increasing Footprint of Architecture in the Digital Age

Phillip G. Bernstein

A steady increase in the size and potency of design firms has paralleled an increase in the scale and complexity of architectural practice. Spurred by the enhanced productivity provided by digital technologies, firms achieve larger, more complex projects at greater distances than ever before, stretching the span of the architect's influence over the built environment—but currently those advantages are going disproportionately to firms with 50 or more staff members. This essay examines the future of practice in a globalized market, where projects of increasing complexity are executed by such firms, and suggests that the enhanced capabilities of digital tools will continue these trends, but to greatest advantage to larger practices. As similar improvements move through the building supply chain to constructors, fabricators, and building owners, the resulting reconciliation of process and influence will define the role and practice context of architects.

1 Practice Scale

According to the American Institute of Architects' Firm Survey 2006,[1] the practice of architecture continued to grow in size, revenue, and influence during the first decade of the twenty-first century. By almost every measure (including one of the most important, net revenue) the overall size of design practice expanded with the burgeoning construction economy, pausing only slightly during the downturn of 2000–03. That survey included the following illuminating statistics.

Overall industry growth: Total billings by U.S. architects grew 11% from 2002 to 2005. Those architects designed $360 billion in buildings for gross fees of approximately 8% on average in 2005, or almost $30 billion (up from $26 billion in 2002). Fig. 1

Earning power: Large firms continue to dominate the practice in the U.S: firms with more than 50 people comprise 4% of total firms, 42% of total staff but 52% of total billings. The average net billing per employee of firms with 100+ staff was $143,000, compared to $84,000 for all firms, and a range of $70,000 to $92,000 for firms with between 2 and 19 persons. Figs. 2,3,4

Broadening services: 80% of firms with more than 50 people are providing multidisciplinary work beyond traditional architectural "basic services", including urban design, engineering of all sorts, interiors, urban planning and even construction management. Smaller firms have simultaneously reduced the scope of their services, returning to more classic architectural design. Fig. 5

Global practice: 54% of large firms with more than 100 employees are working internationally, compared to an average of only 6% for all firms. Fig. 6

Multiple locations: While 90% of all U.S. practices have but a single office, 54% of firms with 100+ staff have five or more work locations. Several large U.S. based practices have twenty or more offices worldwide. Fig. 7

Advanced technologies: While 10% of all firms in late 2005 were using advanced representational technology like Building Information Modeling for billable work (versus simply evaluating it), half of large firms with 50 or more persons had done so, versus only 8% of firms with between 1 and 19 staff. Larger firms spent $5,500 per employee on technology, compared with less than $3,000 per employee by smaller firms. Figs. 8, 9

The majority of work performed by American architects—be it project size, construction cost, or number of architects working—is performed by firms with 50 or more staff. These facts are at odds with the general perception that architecture is practiced in the main at a small scale, but only if measured by the number of firms working, not the amount of work those small firms are producing. It is increasingly likely that a young graduate architect will find herself hired by one of these large juggernauts that are in many ways defining the landscape of design practice.

The opportunities afforded by technological infrastructure are more available to larger firms that can capitalize on the necessary investment in hardware, software, and training, and amortize the required investment across a broader range of projects. That same technology significantly increases productivity, meaning that larger firms can capture and execute greater numbers of increasingly complicated projects, furthering their advantage. Small practices may enjoy those same incremental advantages in productivity, or even the ability to handle jobs of greater complexity, but in the near term the advantages will continue to accrue to the larger, better capitalized firms.

2 Practice Context

At the same time large firms are increasing their influence in the profession, the environment in which design occurs is becoming increasingly complex. Successful practices must respond to an increasingly globalized workplace, dependence on ever more sophisticated digital tools and methodologies, the need to create more accommodating and sustainable workplaces, and clients who demand more predictable results in projects that are extensively constrained by new codes, project schedules, tight budgets competing for capital, and a litigious public.

The marketplace for clients and staff is globalizing rapidly as owners worldwide seek the best expertise independent of firm location and young architects from schools around the world seek to gain that same expertise. The competitive marketplace is now defined as the entire globe, and a firm must be able to work in distant time zones, frequently with local staff or architects hired on the ground near the project location. Where once the competition for work was among firms of similar size in the same region, as modern construction economies evolve in places like China and India, a new generation of larger firms (operating at significantly lower cost) will join the global design marketplace, competing with firms of all sizes in the "flat world" of twenty-first-century practice. Examples include Chinese "design institutes," large multidisciplinary AEC offices once under the aegis of the government's Ministry of Construction, which are rapidly privatizing and competing for work globally. In India, one "outsourcing" firm currently employs 400 registered architects whose salaries are one-fifth of their American counterparts and comprise one of the largest practices in a country of more than a billion people. Each of these "new practices" is perfectly positioned to take advantage of the modernization in their respective home countries as powerful players in the global design services market.

While still behind most other industries, construction is systematically incorporating digital tools and methodologies to improve its processes. Previously limited to the relatively cheap processes of drafting and printing, digital tools now support behaviorally correct prototyping, analysis, computer-controlled fabrication, building operations controls, and facilities management. Each trend requires an investment in software, hardware, training, and, most important, diverse expertise. For example, a recent McGraw Hill study ("Interoperability Smart Market Report 2007") projects that full implementation of building information modeling technology by architects and engineers will grow from 7% of firms in 2005 to 49% in 2009, a seven-fold increase in just five years. Can smaller firms afford to move this quickly and compete effectively without these improvements, or find the necessary talent, for which they can pay less?

Finally there is increasing acknowledgment that an architectural workplace comprised primarily of men, with few minorities and decreasing numbers of women in senior positions, does not serve the mission of the profession well and demands change. For example, the Firm Survey reports that while women have made some gains in seniority (principals have increased from 4% to 16% between 1999 and 2005), the percentage of women who study architecture in the United States has remained relatively constant—approximately 35% of all students—for many years.[2] Thus many women are choosing to leave the profession, particularly during childbearing years. Flexible work arrangements (like job sharing), better compensation and benefits, and more family-friendly policies would address this problem directly and keep these valuable intellectual assets in the workforce but will require flexibility, innovation, and more profitable business results, all of which are more challenging to smaller practices.

3 Project Characteristics

At the same time the context of practice is becoming more complex, individual projects are demanding increased sophistication and capabilities by designers. Programmatic and formal complexity, decreasing construction capability in the field coupled with computer-based fabrication of building components, sustainable-design requirements, and extensive experimentation with project-delivery methodologies combine into a heady stew of issues for the architect to manage the completion of a project. As a result projects have become more complex on three axes: scope, depth, and integration.

The traditional scope of services, known in American practice as "basic services"—comprised of schematic design, design development, construction documents, procurement, and construction contract administration—are being redefined as the relationship between design and construction is remediated and integrated. Typical services may now begin with extensive predesign and feasibility testing, and extend through construction to include commissioning, performance measurement, and postoccupancy evaluation. Even the basic phases of design are being reconsidered as integrated approaches bring technical and construction expertise to the table earlier in the design process.[3] Project schedules frequently require these phases to be overlapped, performed simultaneously, or accelerated dramatically, placing intense demands on the project staff.

Simultaneously the degree of insight and expertise necessary to move the project through design and construction is becoming deeper, best typified by the emerging requirements of sustainability. Design today must meet the typical requirements of aesthetic prowess, life safety, technical competency, budget compliance, and schedule constraints overlaid with the performance outcomes of green architecture, which demands that architects keep up with an ever-growing body of knowledge about materials, techniques of construction, analytical algorithms, competent contractors and suppliers, and changing green standards. Emerging trends toward digital fabrication and mass customization in support of sustainability add additional layers of complication.

The number of players at the construction table is increasing with these project demands. More technical consultants involved earlier in the process increase demands on architects to coordinate project work. Integrated delivery approaches, which will be increasingly common in the future, will bring in the contractor and his expertise early in the design process. Building information models will serve as platforms for intensive collaboration and require intensive management, adding the role of "digital information integrator" to the long list of tasks required of the architect.

4 Implications for Practice

What are the core competencies of firms that can accommodate the demands of twenty-first-century practice as outlined above, and which firms are better positioned to meet these challenges? Will the increased demands of more complex practice squeeze out smaller practices? Will the trend toward larger and more potent design practices continue? Have the combined forces of technology, globalization, and complexity resulted in an industry "monster" that will consume smaller, less potent players in its path?

These questions are really proxies for a larger issue: What is the role of the architect in making the buildings of the future? In a recent paper Paolo Tombesi posits that architects could participate in both process integration and what he calls "flexible specialization," the ability to focus on particular skills in the larger network that delivers buildings.[4] Under Tombesi's construct, it may be possible for firms of various sizes to fit into the delivery network at "nodes" that match their particular competencies without regard to their overall responsibility for delivery of the project itself.

That delivery network will get wider and more nuanced as the building industry becomes more connected in the globalized digital marketplace, and the resulting opportunities created for smaller firms will likely create new roles for them. However, to the extent that successful design is the product of a broad integrative view of design, and the ability to deploy and coordinate the various intellectual resources at hand to that end, one could anticipate two possible scenarios: large, highly competent firms extending their dominance and influence, taking a larger piece of the globalized building pie and pushing smaller firms to the margins of less complicated, localized projects; or smaller firms rapidly innovating and capitalizing on the productivity advantages of technology and their inherent light-footedness to grapple with more demanding projects.

In the former scenario, project complexity and client demands combined with the increasing competency and organizational strength of contractors push larger firms to continue to scale in size, services, and potency, creating in essence a design counterweight to construction in an integrated delivery environment. The sheer strength of their talents, multiple offices, ability to work in various locations and acquire talent where needed, and access to capital combine to continue the trend toward monster practices. Their small-firm counterparts will still service smaller, less complex and more local projects where local contacts and relationships are more important than sheer competency, or snap into a larger firm's delivery network, where they have a special talent.

In the latter case, small to midsize firms that can be strategically more agile build competence in process integration and strengthen their skills in broad project management in order to be able to control the "horizontal" process of design to construction, fitting other "flexibly specialized" firms into the delivery network where they lack a particular competency. These skills complement core design capabilities. This approach is likely completely dependent on the ability of smaller firms to take maximum advantage of digital technologies that are easily accessible and cheap, and allow them to consolidate and coordinate design information, leveraging ubiquitous connectivity and the ever-increasing processing power of inexpensive computers. Combining careful cultivation of these competencies might find smaller firms outmaneuvering their larger but less maneuverable competitors. Clayton Christensen, in his recent book The Innovator's Solution, explains exactly how such smaller competitors can exploit market opportunities too small to interest these bigger firms and extend the resulting capabilities to their advantage—a niche strategy where David slays Goliath.

Irrespective of practice scale, opportunities for innovative architects to maintain the primacy of our role—and with it the importance of design—are manifold. The success of that effort will lie in our ability to demonstrate that our core capabilities to see and understand problems, and present synthetic solutions, are critical to taming the monster of architecture.

1 Kermit Baker, The Business of Architecture AIA Firm Survey 2006 (American Institute of Architects, 2006).

2 From statistics provided to the author by the National Architectural Accreditation Board in 2007.

3 See "Integrated Project Delivery," a working paper prepared by the California Council of the American Institute of Architects, 2007.

4 "On the Cultural Separation of Design and Labor," given at the "Building (in) The Future: Recasting Labor in Architecture" symposium, at the Yale School of Architecture, October 2006.

5 Unexamined here is the formation of larger firms by merger or acquisition. As this paper was being written, Scottish firm RMJM (750 staff members) announced its merger with U.S.-based Hillier (300 employees) in an effort to reach the American market. See http://archrecord.construction.com/news/daily/archives/070619rmjm.asp.

FIG. 1 Billings Grow by 11 Percent Between 2002 and 2005

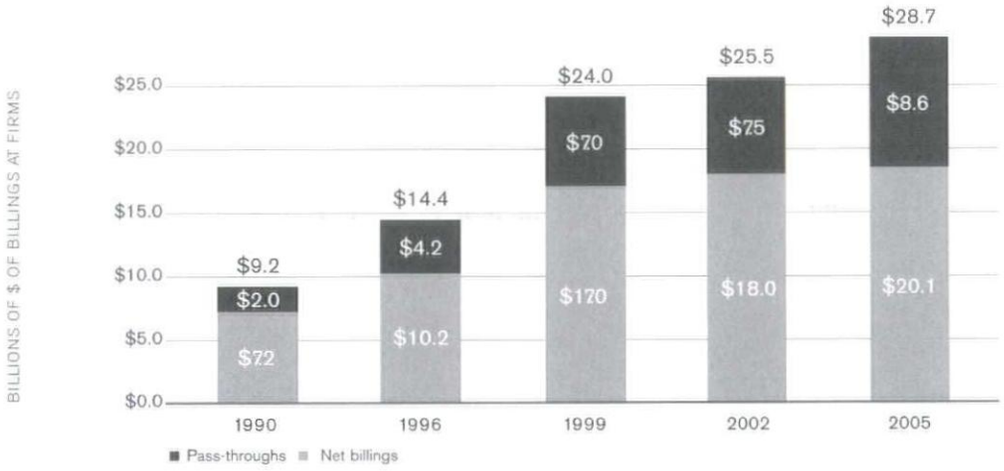


FIG. 2 Sole Practitioners Lose Share and Two- to Four-person Firms Gain as Economy Rebounds

% of firms

	NUMBER OF EMPLOYEES						
	1	2–4	5–9	10–19	20–49	50–99	100+
2005	23	38	19	11	6	2	2
2002	31	29	18	11	7	2	2
1999	23	30	23	11	8	3	2
1996	34	26	21	10	6	3*	n/a
1993	31	35	20	8	6**	n/a	n/a

* includes all firms with 50 or more employees

** includes all firms with 20 or more employees

FIG. 3

Larger Firms Account for Large Share of Activity and Growth in Profession

share of total staff and billings in the profession in 2005 and growth in 2004–2005, at all firms by firm size; % of firms

NUMBER OF EMPLOYEES	SHARE OF STAFF	SHARE OF GROWTH IN STAFF	SHARE OF BILLINGS	SHARE OF GROWTH IN BILLINGS
1	2.3	0.0	1.8	1.4
2–4	11.3	9.2	6.4	6.9
5–9	12.1	10.5	8.3	9.1
10–19	14.1	17.4	12.3	13.6
20–49	18.5	22.2	19.4	17.0
50–99	14.5	14.8	18.1	18.8
100+	27.3	25.8	33.8	33.2

Source: The American Institute of Architects

FIG. 4

Net Billings Average $84,000 per Employee

billings per employee, average

FIG. 5

Smaller Firms Generally Concentrate on Architecture

% of firms

		NUMBER OF EMPLOYEES						
FIRM TYPE	ALL FIRMS	1	2–4	5–9	10–19	20–49	50–99	100+
Architecture–single discipline	65	80	73	62	48	31	14	9
Architecture–multidiscipline	29	15	22	34	45	62	78	80
Other	6	5	5	4	6	7	8	11

FIG. 6

Larger Firms More Likely to Be Involved with International Work

% of firms with international billings

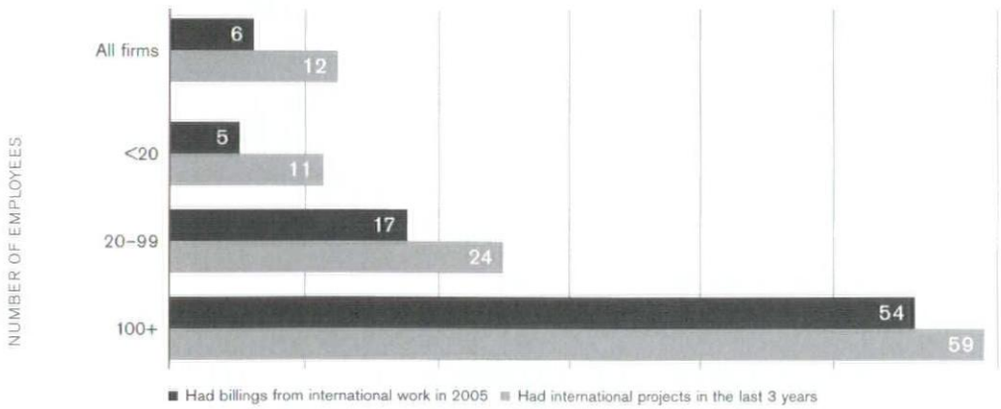


FIG. 7

Most Firms Have a Single Office

% of multiple-office firms

		NUMBER OF EMPLOYEES						
NUMBER OF U.S. OFFICES	ALL FIRMS	1	2–4	5–9	10–19	20–49	50–99	100+
5+	3	-	-	1	3	10	22	54
4	1	-	-	1	1	2	-	15
3	1	-	-	1	2	5	19	11
2	5	-	4	5	9	18	17	11
1	90	100	96	92	85	64	41	9

FIG. 8

Building Information Modeling/Virtual Design Makes Inroads at Design

% of firms with BIM software

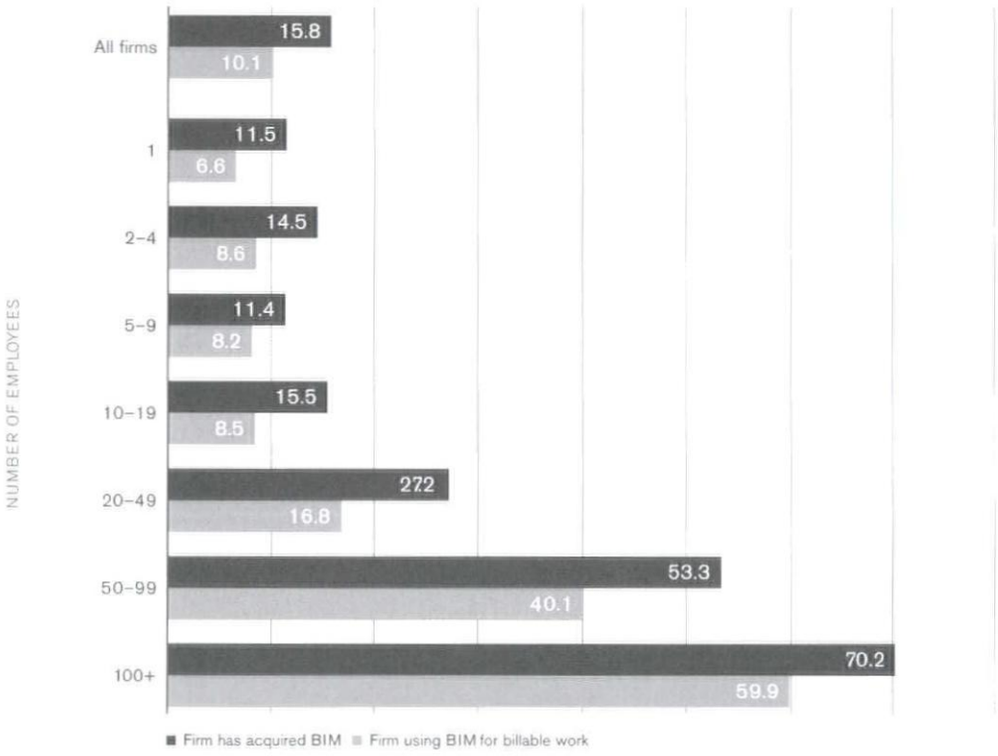


FIG. 9

Firms Spent an Average of $2,700 per Employee on IT Expenses

spending per employee, average across all firms

Size

Engineering News-Record, July 23, 2007, pp. 40-41.

Interview with Gensler

Conducted by Perspecta 40

Reading through a rankings list such as Engineering News-Record's annual "Top 150 Global Design Firms," it is perhaps no surprise that architecture firms are few and far between. Indeed, when it comes to who actually designs and builds the vast majority of the world (and who consequently earns the most total revenue), names such as SNC-Lavalin International Inc., URS, AECOM Technology Corp., Bechtel—among a host of others, some familiar to architects, most probably not—dominate. In the 2007 ENR rankings, only fourteen architect-led firms were present amongst a crowd of E (Engineer), EA (Engineer-Architect), EC (Engineer-Contractor) and EAC (Engineer-Architect-Contractor) firms. Of those fourteen, only four were classified as A (Architect), and the rest were AE (Architect-Engineer).

One (A) firm—Gensler—has maintained a rather lonely position either among or near the top fifty firms in ENR's 150. With $500.2 million in total revenue for 2006, Gensler was ranked globally at #53 in 2007 (and #50 the year before), followed by HOK (AE) at #57, HKS (AE) at #79, and Skidmore, Owings, & Merrill (AE) at #93. As far as the three other (A) firms are concerned, the nearest to Gensler was NBBJ at a distant #133.

At issue here is more than simply revenue. The relative lack of architecture firms in a list such as this bespeaks a more general irrelevance of "architecture" when it comes to the built environment. That said, as noted above there are architecture firms acting in this arena—pushing the envelope of architectural influence through sheer volume—and one characteristic these firms share is size. Does size yield strength, influence, and hence the potential for true agency? Perspecta 40 met with the biggest of the (A) firms—Gensler—to discuss, among other things, how they got to be so big, the advantages of size, and if there is anything that could possibly stop their growth ...

P40 Our first question is directed to Art. When you started Gensler in 1965 did you anticipate becoming a global firm with more than 3,100 employees and 1,500 active clients?

Art Gensler I certainly had not planned it in terms of my own architectural career. The idea of global firms didn't exist in those days. None of us in the business even thought about having a branch office, let alone a global practice. We collected a group of very talented people. I don't know why, but they joined our firm. I knew one person from previous work, but the rest of the people I hired through the AIA hiring board. We got some nice interiors work through the ALCOA building. A year-and-a-half later, one developer came along with a bare piece of property. We had done some interiors for him, and he said, "Can you do a proposed building?" We said "sure" and did a schematic for him. Then, through the brokerage community I was able to get the project for MasterCard's first facility. So we built about a 60,000 square-foot office building, and it got us started in terms of architecture.

P40 How did you expand the scope of the company?

AG My next major project was the interiors for the Bank of America headquarters building. We designed the interiors for the tenants, not the bank itself, which was being designed by Skidmore Owings & Merrill. Cushman & Wakefield was the real estate broker, and through the process of the project, they liked what I did, and they put me on the list to do the First National Bank of Denver and the Houston headquarters for Pennzoil. The client saw my name in one of their brochures and then they got me into Los Angeles to do what was the Bank of America and Arco Plaza, the twin towers in downtown LA. They put me on lists—I designed Valley Bank in Phoenix, which led to opening offices in Phoenix, Denver, and Houston.

These were project offices. The idea was to take a lease for the term of the project, and if we hit it off with the community, we would extend the lease and build a local staff. In each case except for Phoenix, where work was very slow in the early '70s, we maintained those offices and built them into very successful operations.

It all kind of grew from that. Mobil Oil Company saw what we did for Pennzoil in Houston and asked us to come to New York. Then Goldman Sachs heard about us when we were in New York. We designed their headquarters, and in 1988 they asked us to help in London. We would take advantage of the project opportunity to get to know the community. In each case we transferred people to the project instead of going into the community and buying an organization, which on principle we don't believe in. We took our own people and relocated them, so our new offices were really just an extension of the family—never a separate, competing organization. We worked as one big team and shared work back and forth between offices. I was very lucky to find some terrific young people who were willing to move and travel much more than today. In those days if I said, "Let's go," you would jump on the plane and do it. There were no contracts. Maybe we were young and naïve, but we were all trying to build something and have fun. All we did was respond to client demand rather than push into a community. By and large that has been the basis for every office that we have.

All of our success, I suppose, has really come from clients whom we got to know and who helped us grow our practice. We started doing the interiors, then consulting, and then actually doing architecture. We developed an inside-out design philosophy that has really been the basis for everything that we do. It isn't just what looks pretty, but it is a philosophy that says we must do responsible design for both the user and for the community. That isn't to say that we don't have a very strong commitment to something that has good curb appeal, but it really has to work from the inside out.

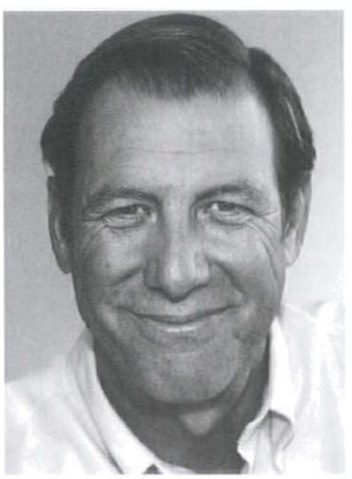
What we try to do is build relationships with clients, follow them, and respond to their needs. With Apple, for example, first we designed a workplace, now we are involved in implementing the stores. Each one of our relationships has blossomed from one kind of service into another. I have found that most clients would prefer to deal with one firm. They don't want to have to educate each firm about their philosophy, their standards, how they budget and schedule and think. So, we have been an organization that builds relationships—a sort of trusted advisor role. We are not a firm that is predicated on our style of architecture, our look, or even our projects. It is the client's project. Yet we want to do quality work, and we only work with clients who want to do quality work. We do both tiny jobs and large jobs. That is what this firm is about, servicing companies as a design firm, not just architecture but all aspects of design—managing it, packaging it and delivering it in a professional way where we are concerned about budget and quality.

P40 With a firm of your size, how are you able to manage quality and maintain control?

Art Gensler

Walter Hunt

Diane Hoskins



David Gensler

AG The biggest thing that people are mystified about is how you control design with 30 offices and 4,000 current projects. You hire very good people, you support them, you believe in them, but nobody is looking over everything saying, "That is the way to do it." It is always a group of people working together.

Walter Hunt It seems to me there are three types of architects. There are the star architects who are pursued by clients for a specific reason. They hate to get into competitions or beauty contests among themselves, but they will do it. They have a very definitive style and way they present what they do, which is great and important, but that is a small part of the profession. Then you have the few large firms that have the resources to do high-quality work, yet don't necessarily have well-known designers within their firm. Then you have all the others, which tend to be mid-size firms in smaller cities that often dominate their market.

At Gensler, our philosophy is based on a different idea. We can become very small when we need to be. We often do presentations where we say, "Look, there is a whole big Gensler back there and resources if we need them, but this is the team that is going to do the job. If these guys don't cut it, don't hire us. We have looked at your project requirements. We understand your needs. This is the team." As a client, it's not like you're going to have hundreds of people working on your project, but when you need us to be big, we can be big.

The danger of a big firm is if you can't get small enough. We lose some work to two-person partnerships and we understand that. But it is the huge group between—the mid-size firms—that will ultimately struggle, because their marketplace is so tightly defined, and they can't easily step out of it unless they have a unique specialty.

P40 We've all heard talk about outsourcing of architectural services to places like India and the impact this will have on the profession in the United States. What is Gensler's position on this?

Diane Hoskins For us, it is about how to put the right team together for a given project from the standpoint of design disciplines, practice-area knowledge, location, and obviously the fee that we are trying to meet. So the first challenge is: who is the right team, where are the right people, and how do we do this? There are other organizations that can bring components to our project teams. For instance, with rendering, we have tapped into resources around the globe as well as in the U.S. for the last ten years. There is a great rendering firm in Russia, another one in China, along with an organization in L.A. that does incredible models. We will look for those top resources wherever they are.

Regarding the outsourcing that you see a lot of firms doing—where they are really just trying to figure out how to deliver services cheaper—that is not part of our strategy, and it isn't part of our business model. We believe that when you have a team abroad working with you, there may be some cost savings on their billable rates. But it takes a lot more effort from other team members to coordinate that work and to provide oversight. It ends up not being that much of a savings. More than anything, I think right now it is a race for talent. There just is so much work because we are seeing India, China, Brazil, Russia all looking to raise the standard of living in their countries, all developing middle class standards very quickly. That demands the kinds of skills that we have as architects. We are now an important global resource. It is not about outsourcing taking away anyone else's opportunity. There is much more need for architects than there are architects.

The Top 150 Global Design Firms

RANK 2007	RANK 2006	FIRM	TYPE OF FIRM	2006 GLOBAL REVENUE TOTAL ($ MIL.)	2006 GLOBAL REVENUE INT'L ($ MIL.)	GEN. BLDG.	M
51	41	**ERM HOLDINGS LTD.**, Exton, Pa., U.S.A.†	ENV	502.7	262.2	0	(
52	**	**COLT WORLEYPARSONS**, Calgary, AB, Canada†	EC	502.0	39.0	0	(
53	50	**GENSLER**, San Francisco, Calif., U.S.A.	A	500.2	55.8	93	(
54	49	**COWI A/S**, Kongens Lyngby, Denmark†	E	496.2	302.0	22	(
55	51	**CHINA RAILWAY ENGINEERING CORP.**, Beijing, China†	EAC	484.2	6.3	1	(
56	53	**MACTEC INC.**, Alpharetta, Ga., U.S.A.†	EAC	476.4	0.0	21	2
57	52	**HOK**, St. Louis, Mo., U.S.A.†	AE	475.8	163.8	95	(
58	54	**CHINA POWER ENGINEERING CONSLTG. GROUP CO.**, Beijing, China†	EC	466.4	21.3	0	(
59	61	**DHV GROUP**, Amersfoort, The Netherlands†	E	463.5	220.3	11	2
60	75	**GHD**, Sydney, NSW, Australia	E	462.0	101.0	14	(

Engineering News-Record, July 23, 2007, p. 42.

P40 Returning to firm size and volume of work, in the ENR rankings, Gensler (ranked at #53 by 2006 Global Revenue) is one of the only "A" (Architect) practices in a crowd of EA and AE firms. Do you see yourselves competing against these practices?

David Gensler Well, the really large EA's are doing a lot of infrastructure work. They are not really competing against us. With commercial design operations ... well, EA's are not really playing in that market, and there is increasing consolidation in that sector. Most "A" firms are fairly small, and when they get big there is a trend to grow through consolidation with other firms. Gensler, on the other hand, is focused on organic growth. We make sure we have the capacity for sustainable growth—targeting a 15-25% annual growth rate—without stressing our culture.

P40 Would you consider taking Gensler in the direction of AE?

WH I don't believe that you get fresh thinking from in-house engineering. For us, it's about collaboration. We try to select consultants who are going to be as creative and forward thinking as our design team. I came from a firm years ago that had in-house engineering, and it was a terrible experience. There were rote ways of doing things, and it tended to stifle the discussion of new ideas.

DH If you look at some of the writings of Walter Gropius, he talks about an interdisciplinary model in which architects and engineers work together in an integrated practice. This was a groundbreaking concept in the first half of the 20th century. Many firms have their origin in that model. Unfortunately, the implementation of that model has been difficult. The typical failing in that model has to do with the culture of those disciplines—architecture and engineering—coming together.

At Gensler, we have integrated across design disciplines, from architecture to interior design, product design, graphic design, planning and consultancy. Not vertical integration like Gropius' model, but horizontal integration that creates synergies among design disciplines. It is about really going deep into the "why" behind the design, and being able to engage the client on a level that is more than "I need a building and it needs to be this big." We are going after integrating the consultancy and the evaluation sides of our business along with that design continuum. I believe that is the future of all firms. We talk about Gensler redefining what is possible through the power of design, and at the heart of this is the intersection of consultancy and strategy with design.

P40 Where are you looking for models of practice? We are struck at times by the rhetoric we've encountered at Gensler. It seems rather atypical of architecture firms.

DG One organization that has been a benchmark for us in terms of professional organizations is McKinsey. We hired them—a team of internal operations people—and worked with them as well as examined how they run their firm.

In the early '90s they helped us continue to develop. Some aspects of Gensler that emerged from their analysis include the "one-firm firm" structure, individual studios as building blocks, employee promotions at the firmwide level and not the office level, looking at how professional firms are matrixed with global accounts, and market-oriented divisions such as hospitality. Also, we hire professionals with different backgrounds. Of the three executive directors at Gensler, I represent the pure business side. Andy Cohen represents pure design. Diane, with an MBA and an architecture degree, is the hybrid. It's a very powerful combination. For an organization of our scale and complexity, we need both experts in business and design. In the second generation of the firm—after Art—we realized that we needed three people to cover the scope and complexity faced by the senior leadership.

Andy Cohen

P40 Art's name keeps coming up, and it is clear that he has had a strong role in shaping the company. It also seems to us that Gensler operates as a collective in many ways. Going into the next generation, do you need to have someone out front as the single face of the firm, or can you really have a pool of talent that operates collectively?

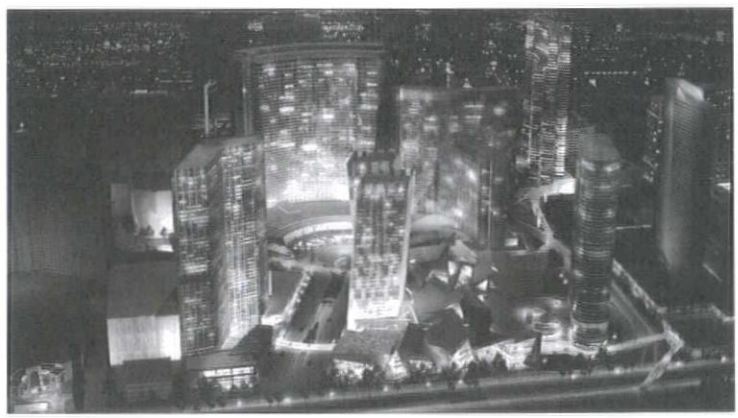
WH When we changed the legal name to "Gensler" from "M. Arthur Gensler Jr. Associates" people would always ask if Mr. Gensler died. This was over 10 years ago mind you, and Art was extremely active at the time. Gradually we developed the concept of the three executive directors—Diane Hoskins, Andy Cohen and David Gensler.

DH You bring up a challenge in our profession, which is this idea of the single name behind an architecture firm. Our profession tends to want to gravitate towards that as the model of practice. Something that Art did, that I believe is essential, is that from day one his values, his beliefs, became the firm's values and beliefs. They became institutionalized, and they live on past all of us. We talk about the "one-firm firm" all the time. We talk about being client-focused all the time. We talk about taking care of our people and growing them all the time. We talk about excellent design all the time. Those are the things that Art came to the table with, and his gift is being a great communicator. That is how you create an organization. It doesn't matter if there are 30 or 3,000 of us, or if we are sitting in one room or spread over the globe. We are one entity. Yes, we love Art. We all have had the opportunity to know him. But it is beyond Art. It has been beyond him for a long time, but it is due to the fact that he believed in the unity around these core issues.

P40 Do you see Gensler redefining architectural practice?

AG I think that the practice of architecture and design can take many forms. I have absolutely no reason to believe that many people should not practice as single practitioners, or as boutique design firms that do brilliant work in a specific area in a specific community. There is nothing wrong with firms that are mid-size and do a variety of project types. The world needs some very large firms that can respond to what our clients are looking for. I am very proud to be an architect—it's one of the things I am most proud of. We took the name "architects" out of our firm title however, because people came to me and said, "We don't want to hire branding services from an architecture firm, and we don't want to hire a consultant from an architecture firm."

DG We're redefining the practice indirectly. We're not focused on changing the industry. Rather, we're more focused on creating the best platform for our design professionals and clients. So, how do we create a community that works best for our designers, and what is the best platform for our clients? How that impacts the industry is less a driver for us. Look at the interior design industry of the '60s, we did change that, but it was more as a response to client need.



MGM MIRAGE's CityCenter, Executive Architect, Gensler, 2006–

WH Gensler has always responded to new opportunities, and historically that's opened up our design practice. A recent example of this is the CityCenter project in Las Vegas, where we're Executive Architect but essentially playing a role that is new to the industry. We were hired to oversee design in addition to schedule, Tishman was hired for budget control and construction schedule. It is an amazing concept. We have Rafael Viñoly, Lord Norman Foster, KPF, Studio Libeskind, Helmut Jahn, Cesar Pelli, David Rockwell, Adam Tihany, among others. In the sector that I oversee there are 30 restaurants, involving 25 designers. It will be 18 million square feet. Pelli is doing the bulk of the work—a 4,000-room hotel, a casino, the core and shell of the retail, theatre and convention center. We've conducted four work sessions where the designers have really collaborated.

P40 In general, do clients appreciate the value architects bring to the table?

DG In short, no. The profession isn't effectively communicating the value it brings. Too many architects are bad business professionals. They simply don't know how to manage their businesses. On the other hand, the large firms are getting better at it. In the past, architects were a critical profession. We've allowed other players in related industries to erode our position and turn it into a commodity. Real estate firms and brokerage agencies have expanded into consulting and strategic planning, displacing the architect as a strategic advisor. These consultants tell the clients "You can't trust an architect. They're irresponsible, can't stick to the budget and the schedule. You need us to manage them." That position is particularly damaging to the smaller design firms, though somewhat less so to large firms.

WH I was on a panel at Columbia University recently and the question was interesting: "Will new workplace strategies affect the consumption of office space in New York?" Lauren Eckhardt and I were the only architects on it. There was Ken Hubbard from Hines, John Livingston from Tishman, and the New York developer Harry Macklowe. I realized that it was one of the few instances where architects were at the same table with the developers and the constructors. It was a rare occurrence. Michael Buckley at Columbia put it together, but you wouldn't ordinarily see such a panel. Architects need to be at the table more often where we can have the kind of dialogue that successfully impacts all aspects of a project or environmental issue. Our master-planning group, which has developed exponentially over the last few years, is in play now in this way, but it is tough because we as architects don't bring equity to the table.

P40 Are there ways architects can start to bring that equity?

WH We bring intellectual equity. When you come to the table, it is not just about doing a project. It is about the process and the consultancy. We just did a confidential analytical study for a very difficult property in an awkward slice of land in midtown Manhattan. Our work brought significant value to the client. Architects need to be better acknowledged for that capability.

P40 Do you think it's possible for architects to reclaim the role of the master builder and trusted advisor mentioned earlier?

DG Frankly, I don't think it's possible to reclaim the role of the master builder any longer. Our culture is too litigious. Our profession has tried to position ourselves as responsible, but in our contracts we still refuse to take risks.

P40 Has Gensler taken on increased risk?

DG We are interested in exploring what we can take on. We are one of the best firms in managing risk, and as a result, our insurance rates are low. But we have more assets to risk than most firms.

P40 If you feel the architectural profession needs to manage risk to take on a more proactive role, do you think this could or should encompass architects taking on a financial stake in building? Some smaller firms such as SHoP have said that the only way to manage risk is for architects to put up their own dollars.

DG Do lawyers and doctors put skin in their own game? Architects are fooling themselves. We are experts at solving problems and managing risk. Gensler doesn't like to take an equity role in this manner. We are not in the business of financing projects. That's not our expertise. Developers like to build assets with other people's money. We don't have that competency. We have a fiduciary responsibility for 3,000 employees.

P40 Do you think architects need to do a better job of educating the public so that more people can understand the value proposition we do bring?

WH Absolutely, but in general our profession needs to more strongly communicate that value proposition. Every Gensler proposal and new client discussion is based upon our defining the value proposition.

DG We need to focus on the clients' design problems, as opposed to focusing on problems that are of interest only to the profession. This is a controversial issue in the industry. As an architect, are you going after AIA Awards, or enhancing your client's business? Of course, this doesn't mean you can't do great work, but it is a question of priorities.

DH Clients are still looking to pay a commodity fee to the architect as if all we do is create a set of drawings and a physical space. I think that is the paradigm shift that we are on the edge of. It is not going to be a small two-person firm that is really going to affect the broader perception of the contribution of the architecture profession.

I was thinking about what Walter was saying about being at the table with the developers. Most developers get their money from capital funds and investors. On the other side of this are the tenant leases. We design the buildings and the interior space for businesses. We are literally at that place between developer and tenant. Our ability to create a building that "performs" at a higher level for the tenants and makes the building a superior product is beyond just meeting a schedule and budget, and we need to better understand that value and get compensated for it .

There is, as Walter is explaining, a huge value that we are bringing to a project that makes sense for the developer, and for the tenant, but we are still in that box of being seen as bricks and mortar designers only. We are going to continue looking at that evidence-based, results-based value proposition afforded by architects. We are going to spend research dollars to help make that more visible to young people coming into the profession, to our clients, and to the community outside, because, frankly, if Gensler doesn't do it, no other firm is going to. That is the power of the big firm. We have resources to devote towards research, towards convening workshops, towards convening roundtable discussions. That is something I feel very passionate about, because I do believe the paradigm shift is going to happen.

P40 You mention research, Diane. What role—if any—does pure research play in Gensler's practice?

DH When I was an intern in our L.A. office in the mid-'80s I did a summer internship where the challenge was to design a monorail for Orange County, outside of Los Angeles. That study ended up being the impetus and the seed from which our entire transportation practice has been born. The firm took a chance and invested in the two students doing this study.

Today we now have a director of research, and we have been upping the ante on research issues and saying, "Look, where do we really need to put our focus to help ourselves

and our clients understand the value of design?" Last year we launched the first U.S. survey of office workers to understand the impact of design on their workplace and their productivity. We are following up this year with our second U.S. workplace survey as well as our second one for the U.K.

We are also launching a materials research consortium. Now that we have a person directing research, we have several different initiatives happening simultaneously. We feel that—as leaders and not just as the biggest firm—it is about bringing thought leadership, educating ourselves, our clients, and our profession. Knowledge doesn't just come out of project work. We learn by doing projects, but also by stepping back and focusing on a particular issue.

P40 Where have you looked for models of pure research in the context of an architectural practice? Rem Koolhaas' AMO comes to mind, for example.

DH We've not necessarily been looking within the field of architecture. Koolhaas—I love his message—obviously he is in a whole different area and spectrum than us in many ways, but I think we are similar. When I read some of the things that they [AMO] published, I think, "This sounds really Gensler," because they believe in the intersection of design and strategy and the "why" behind projects.

These things have been happening at Gensler as well, and we call them skunk works, initiatives, and task forces. As far as models for this, we've again looked to corporations. 3M has a terrific program that they are very well known for where everyone in the company is encouraged to come up with new ideas. That is how the Post-it Note got invented. Some companies give internal grants to staff to pursue concepts. We've explored this. Our "Gensler University" program is, in a way, internal research as well. Through that program, we have a group going to Costa Rica to look at and develop what it means to do eco-resorts. We are looking at what other companies do, but we also invent it ourselves.

dialogue, a bi-annual Gensler publication that discusses new trends and issues of direct concern to clients.

P40 You talk about "educating the profession" and providing "thought leadership." Do you see other ways for Gensler to give back some of the lessons it's learned to the architectural profession in general?

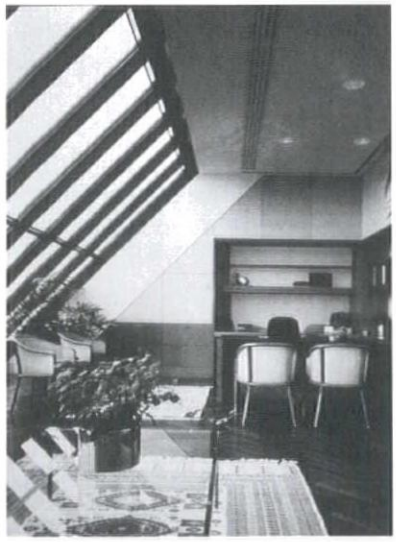
DG There is a fine line between "giving back" and giving away competitive advantage. We believe we should participate in the industry in a way that moves us forward. For example, internship programs benefit the industry broadly. Also, we collaborate with other firms often. We have given back via participation with the AIA and the USGBC. We have contributed speeches, articles, seminars, etc. What we are doing today is impossible to patent or protect. The only way we can maintain our competitive advantage is to innovate as fast as we can.

P40 Speaking about the need to innovate, given Gensler's size relative to the rest of the profession, do you ever attempt to drive the development of software and/or technology specifically tailored to your needs?

WH As for the role of technology in our practice, we want to be just behind the leading edge. I certainly agree that technology has elevated our ability to maintain connectivity and enhance productivity, but we prefer to have our internal technology team implement the latest proven aspects of technology to support our practice.

P40 Do you see a difference today though in terms of client expectations compared to the past? If so, has this made projects more complex?

AG First, the answer to both is yes. The thing that is intriguing is, when I first started I was always working with the chairman of the board of a company. Whether it was Mobil Oil Facilities, or Pennzoil, or banks, you would sit down with the chairman of the board, you would work things out, you would present to them. They were very involved.



Pennzoil Corporate Headquarters, Houston, 1972, interior design by Gensler.

Then a group of people, usually in the finance department—they didn't really have real estate departments in those days—started realizing that real estate was fairly important. You started to see in-house facilities managers, and in the beginning they didn't know much. They used to want to keep you away from the client, saying you didn't need to talk to the chairman. Over time we had a chance to balance it out, and we got the chance to work with the senior management as well as the facilities and real estate people.

Then program managers came along because the architecture industry, very unfortunately, stepped away from what I would say is taking responsibility for the project, saying "our job is just to design it." The profession was getting very worried about lawsuits, and so we walked away from responsibility. We

turned it over to program managers, who got between us and the client in many cases. In some cases they intermediated very successfully, and in others not so successfully. But basically the whole philosophy was that we, as professionals, unfortunately gave up a lot of our authority to limit our responsibility.

Today we are seeing clients who are much more sophisticated, facility managers who are much more sophisticated, program managers that are much more team players and projects that are becoming incredibly complicated. Where before you never had a budget for technology, now the budget for technology is almost the budget we had for the whole project. Everything is much more rapid, it is much more of a team game with the consultants and the contractors and the architects and the program managers all working together. One of the roles that we at Gensler prefer to play is to lead that team. Some clients want us to, others don't, and what we as an organization try to do is fill in the voids where clients need support.

Now there are so many large organizations that have multiple locations. Before, organizations would build one-million-square-foot buildings and put everyone in the same location. Today—often because of security concerns—they don't want to concentrate everything all in one place, and they don't want to be stuck hiring in just one market. So people are distributing their organizations in different locations. They prefer to work with one firm that can deliver, in multiple locations, a consistent product. This is something that we have been able to do with our system of working as a "one-firm firm" rather than as a series of silo offices with one name.

DG I agree. Today, clients are struggling with the complexity of our industry, so clients are going with integrators such as Gensler and design-build / construction management firms. Many clients want the process simplified and less risky. In short, they want one-stop shopping.

P40 Are the projects themselves Gensler sees today getting bigger?

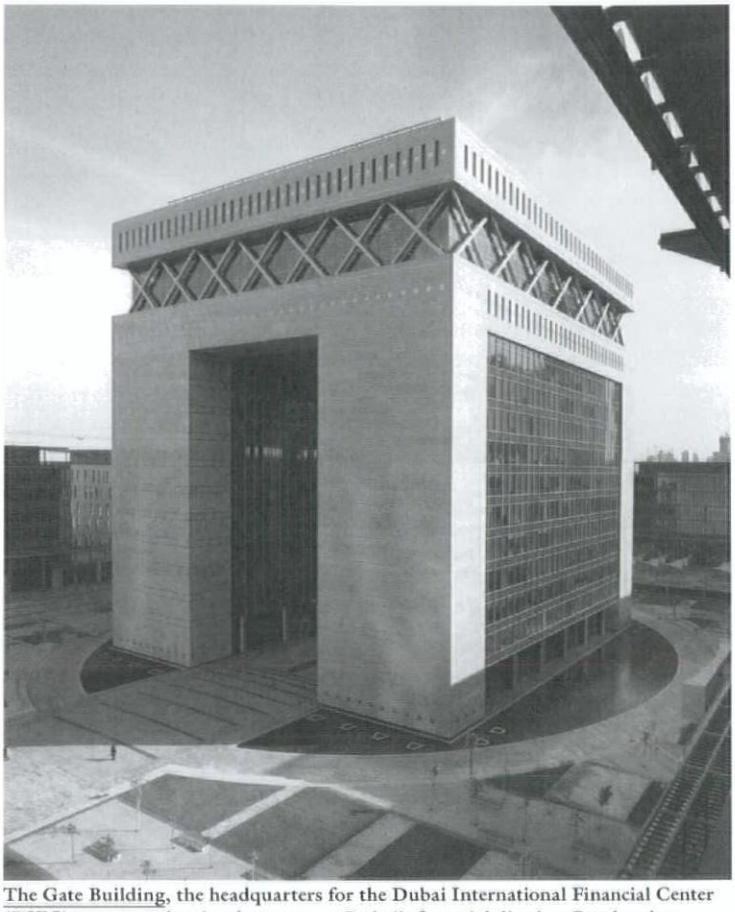
DH I think it is the number of these projects that is different today. It is the number of them in the time frame. You add to that the China and Middle East factor of "let's build the tallest building in the world." How many clients five to ten years ago wanted to build the tallest building in the world? It is almost a joke now.

P40 If there is an attitude today that anything is possible—that anyone can build the next tallest building in the world if they have the resources, for example—do you ever have moments when you recognize that something is possible, but, well, maybe it shouldn't be done?

DH I think our role as architects is to be a trusted advisor. We have to bring our values to every project we are involved with. If it is something that we do not believe in, it is our responsibility to speak to that.

WH With our consulting practice and our master-planning practice we have developed a relationship to the point where we are not afraid to tell a client not to do something. I was in Dubai with my wife in March [2007] and I was appalled at the lack of planning. It is a "build anywhere" mentality in Dubai, and if this doesn't change it is going to end up being a very disappointing environment in the end.

The way I look at it, if SOM wants to do a 180-story building there in the middle of the desert, not on the water, then good for them. Our firm would look at that, say it isn't appropriate, and not touch it. Our London office has done very responsible buildings in Dubai's core—the ministry of finance, for example—and I think we are trying to be selective and not just take anything that walks in.



The Gate Building, the headquarters for the Dubai International Financial Center (DIFC), serves as the visual gateway to Dubai's financial district. Gensler also designed the master plan for the district.

P40 You bring up a place like Dubai. Gensler has taken a very clear position on sustainability; I think the goal is 50% of the staff to be LEED certified in the future. Can Gensler capitalize on its size and resources to push this issue in architecture further?

WH I think LEED is important, but the real driver is making certain we all understand, as designers and planners, that sustainability is a vital aspect of the program. That said, we try to lead by example. Gensler has a history of pushing new categories of sustainable design. We try not to be the "big gorilla" in the room yet still play an important role in these issues.

P40 Speaking about being the "big gorilla" in the room, we wanted to follow up on the growing complexity of projects and the sophistication of clients that you spoke about before. Do you see Gensler's size allowing you to deal with these complex problems more effectively?

AG There are many different types of clients. Some clients may have organizations in multiple locations, but they work fairly independently. And then there are others that are totally controlled from one location. Because we operate with so many clients, I believe it is more healthy and fun to work on big

and little projects—and lots of them—because nothing goes in a straight line. There are planning delays, time for EIR reports, decisions of boards of directors ... very seldom do you get a project today where you walk in, you get the project, do the work, and it ends. It starts and stops and goes in different directions, so to be productive and efficient you need to have places to fill the gaps. If you have a lot of work and you are large enough, you can move people in and out, back and forth and around and be efficient and effective. So size offers you flexibility, and that is, we think, a healthy thing.

P40 Would you ever speculate that there is a maximum size to which Gensler could grow?

AG The answer is no. We have passed that point. If we were going to stop, we would have stopped long ago. Our infrastructure allows us to grow, but I think there are some limitations, which are the number of people at a given location. We find that 200 is a really nice size for an office. In New York, the downtown office is 100, the midtown office is 300. From my perspective, what will happen is we would probably create another office in a new community before going to 500. Each office is broken into studios of about 30 people. We think of ourselves first as a studio and then as an office and then region and firm. Technology has allowed us to do a lot of communicating about what is going on so the people in Tokyo are looking at the same information that we are looking at in San Francisco.

DG Today, we are a global design firm. This is a big challenge, and we're facing scale issues and culture issues, different time zones, markets, languages ... We have a vision, but we haven't solved all the problems. Is there a limiting factor to our growth? It's unknowable. We're committed to solving the problem each time we face it.

P40 Are there any other barriers to expansion that you have encountered?

AG Registration. One of the things that is interesting to me is the fact that in the profession, architectural registration is nonsense. In the State of New York for example, only registered architects can be owners of an architecture firm. At Gensler, we employ top people in technology, HR, Finance, and they are owners too. Because we are an employee stock ownership, we all own this place. The idea that only architects can be owners of a business is an insult. It's a naïve view of how the world works today.

Unfortunately, the organizations and the laws of various states and communities are predicated on protecting the single practitioner and on being exclusionary rather than inclusionary. Take licensing rules for example. I carry 48 licenses including in England. Sadly, the licensing boards and the state registration groups have a long way to catch up to reality. But we comply with the way they work now, and we work around it because we need to.

P40 Do you think a firm of Gensler's size could have a role in driving change within the professional organizations such as the AIA?

DH The AIA, to its credit, has gotten on board with sustainability as a core issue. The AIA and R.K. Stewart, a former Gensler partner who just retired as AIA president, deserve a huge amount of credit for not waffling at all, but really stepping out strongly and setting up some goals and metrics around buildings in the future.

Regarding how much we can influence the AIA ... well, again, we don't want to be the big firm telling everyone what to do. That is not how we feel our positioning and power is best served. We bring that to bear for our clients, and it's not appropriate for us to take on more than what is any firm's responsibility to push the associations of our profession forward.

WH It is difficult. You have to walk on eggs as a large firm dealing with the AIA because of the breadth of their constituency, which is understandable. The large firms—chief information officers as well as CEOs—do meet, and they are making progress. We also acknowledge that when you go to one of the AIA conventions, 80% of the people there are mom-and-pop firms where the founder of the firm is bringing his wife, and it might be their annual vacation. You have to respect that. Ultimately, it is about getting the AIA to elevate all of the firms—and our profession—to a level where we are taken seriously in a much broader context with lawyers, real estate developers, and constructors. We lost a good deal of that respect a long time ago, and today we are swimming upstream.

Gensler's first office at 555 Clay Street.

Agility

Interview with Christopher Sharples
of SHoP Architects

Conducted by Perspecta 40

P40 **SHoP has actively pushed the profession to take a more proactive role in the building process. What must we, as architects, do to actually achieve this?**

CS **We need to be more proactively engaged with the building industry as a whole. We need to stop accepting the existing process where we abdicate our role in evolving a better construction model. Architects need to work directly with manufacturers and fabricators to foster the integration of new technologies on existing construction systems and develop a collaborative relationship which would promote innovation. SHoP is currently building these relationships with precast and façade manufacturers, and we're also looking to do this with next generation sustainable technologies. Utilizing and embracing IPD [Integrated Project Delivery] processes will also have a large impact on how we evolve a virtual prototype that fully integrates all aspects of the design from systems coordination to "collision testing" to scheduling costing analysis and construction coordination. This will not only lead to a larger role for the architect, but allow the architect more control of the design process and at the same time allow both architect and builder a much better means to manage risk by catching mistakes and conflicts before they happen in the field. Again, this can only happen by committing more time and effort to building close relations with both the consultants and subcontractors charged with building the project.**

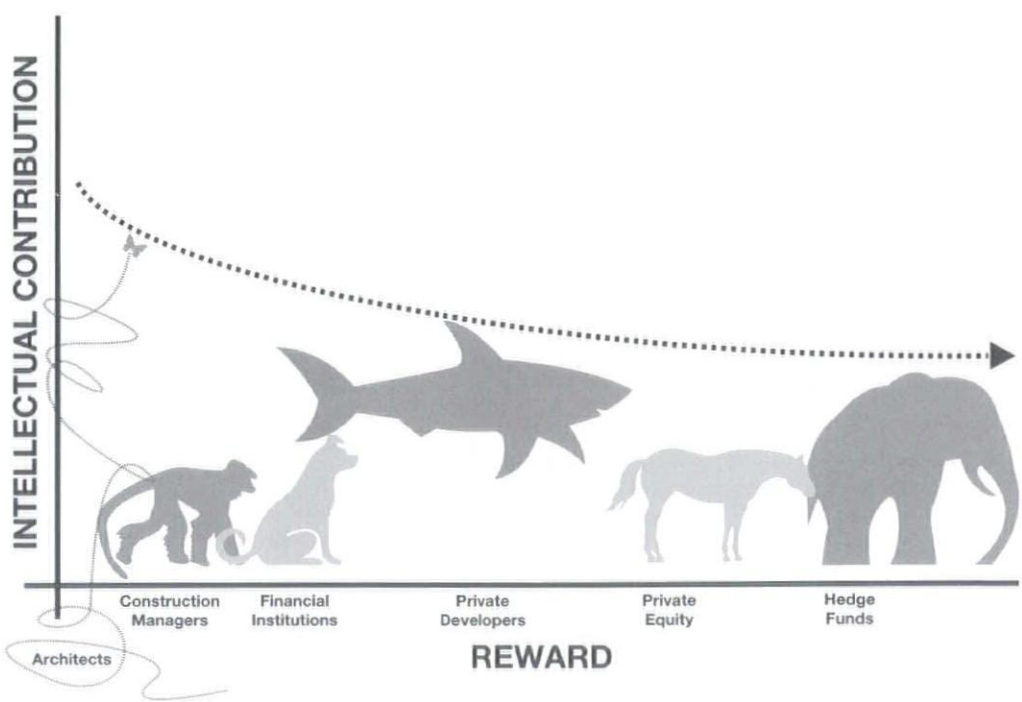
P40 What about investment and development? Should architects take a greater financial stake in their built work via ownership, intellectual property, patents, etc.?

CS A year ago Ken Frampton implied that "SHoP had sold out to developers." It's not about that. It's about understanding what the developer's operating model is. Unless we understand that, we can't affect it. How can architects bring more value to architecture by engaging the industry? Really, it's about understanding the financial models and how they're tied to construction costs and means and methods. As we start to build more transparency into the process, developers will begin to appreciate the knowledge-based contribution that architects can provide and see that value utilized throughout the whole design and construction process. When we start doing that, there's an opportunity to get additional dividends and a better design that isn't value engineered during the latter phases of the design process. Alternatively, we are setting up other companies in our office: SHoP Construction, SHoP Real Estate & Development and SHoP Applications.

P40 What about directly taking on development though?

CS We've done it. When clients have asked us if we wanted to take an equity stake, we've said "yes," but only when it looks good. It really depends on the problem or project. I see no reason why an architecture office can't be involved in development. The key is creating the track record with developers. The people who benefit the most are the people who take the most risk, and those who can manage and reduce risk should get a dividend as well.

The building industry has become so specialized. The challenge is to see how we can take it back to a period prior to WWII when architects were general practitioners, when they worked with builders directly and really understood the balance between design and construction. Today it seems that architects are concerned only with aesthetics. For example, in the film Towering Inferno Paul Newman, playing the architect, goes into the electrical closet and immediately realizes that substandard wiring had been installed to save on construction cost. I'm not sure many architects practicing today, me included, would know the difference.



P40 With regards to the size of architecture firms today, some have talked about a "squeezing of the middle." Do you agree that mid-size firms are at risk today?

CS One should ask the question, "what kind of work do you want to do and how many people do I need to do it?" The offices of 50–100 might be better equipped to handle a variety of different project types utilizing a variety of different technologies. And smaller offices may be able to form temporary collaborations or alliances to work on larger projects. The large offices with the top-heavy bureaucracy may be in trouble, especially as we move away from less standardized practices of operation. Kelly Johnson, founder of Lockheed Martin's experimental wing Skunk Works, believed in keeping project teams small and assigning a lot of responsibility to the individual team members. He also mixed his engineer designers with the actual fabricators to not only streamline the design process but inspire more feedback. By bringing a variety of different skill sets together in an office one is better able to accept a variety of different project types.

If you look at traditional nineteenth century models of practices, you had in-house engineering and consultants under one roof with architects. Architects owned quarries. They were interested in knowing where their materials came from. This is something we're interested in. In twenty years will SHoP be building just buildings? I don't think so.

I would not frown on bringing it all under one roof, but this isn't our goal right now. We believe working proactively in the early stages of a project allows us to understand more issues. We're finding with evolving analysis software we are able to educate ourselves enough to understand basic issues of environmental design and structure, and with this new technology we can run preliminary analyses to study and measure the environmental effects and match the ideal form of the building to take advantage of system performance. It's a very pre-schematic process, but by the time we sit down with engineers like Buro Happold and Arup, we're already having a conversation about principles. It is all about creating an environment with feedback, and these software technologies are allowing us to achieve this. Of course, we wouldn't mind having Happold or Arup in the same office, but realistically in order to maintain a level of close collaboration we need interactive tools that allow us to better share and manage information in real time. The i-Room, for example, is a key component in facilitating better management and coordination of the BIM [Building Information Model] in real time. The architect should play a key role in convincing the consultants and later on the general contractor and their subcontractors to utilize this virtual job trailer to manage the design and construction process. It's all about how you use these new tools to improve and coordinate the relationships between the different parties. The master builder has an important role in evolving this model of practice. We need to be the conductor of this orchestra. It's about understanding the big picture. If the architect can organize this process with a single big model, then we are coming closer to what the master builders had when they were building the cathedrals. It's about getting the spirit of the building back into the process.

P40 Do you feel pressured to grow bigger as a firm in order to compete?

CS Work smarter, not harder. Don't just add more people. This is where the technology can help a lot.

P40 Ok then, does this mean you work less?

CS NO. It means less busy-work. It means doing what a firm like REX does. Look for first principles, and spend your time on that. At the end of the day, you might not have an image, but everyone at the table knows what the goals are, and that's a powerful idea. It's not about busy-work. A lot of people make a lot of images trying to figure out what the design should be. You see students producing all these models and all these drawings ... they're trying to find the concept. That's not antithetical to the profession, of course. The idea doesn't just pop out, and we're used to getting it through a visual, graphic process. We have a site, we have a program, we start to mass it out, but then—teaching our students, we see this happen—you have your first review and you're asked how you got to that point, and there's no clear set of diagrams constructing the argument.

You need to be with a rule-based system. It's not necessarily fixed. It can evolve and change. But you have a baseline. It's not derived first by form-generation. That's why it's important to have non-architects involved in the design process. It becomes anthropological. It doesn't have to start with form generation.

Also, I feel I should add that the experience model in the profession is changing. The recession in the late '80s to early '90s forced many students to look for work in other fields, and in turn produced a gap in experience. There simply isn't a large talent pool of architects today in their late 30s and early 40s with building experience. This group, which was in architecture school in the late '80s and early '90s, was part of the transition from traditional drafting and modeling processes to the "paperless" studio environments promoted at Columbia University by Bernard Tschumi in the early '90s.

Today, what has been exciting to see is how high the level of technology-savvy students has come. As Steve Sanderson, head of technology at SHoP, once remarked, there is a clear generation gap between the experienced project architects and these tech-savvy graduates. This is really exciting. Where once it required years of apprenticeship and training, these young graduates, from day one, can play a critical role in moving the design process forward in direct collaboration with experienced practitioners who have a strong feel for the role of these new technologies in the practice.

Getting back to the question of what this means in terms of the size of the practice and whether or not we feel the need to grow, if you run a large office with a set structure, it can be quite bureaucratic. How are decisions made, and how long does it take for a decision to get implemented? In a smaller office change can occur more quickly with less overhead; however, they aren't necessarily able to manage large projects like the big offices. This takes us to the mid-size office. If they can keep the agility of the small offices and match it with the idea that you can do large projects, then you're talking about a very interesting and powerful model.

This is why I think it's the big office that's in trouble. The mid-sized office can innovate, and sustainability in this industry is about whether or not you can innovate. If you can't do that in a reasonable amount of time, you won't be able to maintain a position at the table. This is tied to the need to draw a more diverse skill set in the office as opposed to hiring only architects. People with diverse backgrounds and other skills can bring a variety of different realities to the table.

P40 What is SHoP's growth strategy?

CS Keep diversifying, look for new opportunities, and innovate the industry. We are hiring from a diverse pool of different talent, so we may grow to 100, but maybe only 60 of the SHoPpers will be coming from an architecture background. We are looking outside the profession to develop the practice.

P40 Where do you look for models of best practices?

CS We look at the air and space industry, the naval industry, the financial sector as well as development and real estate models. We have started to work with inventors and manufacturers as well as people involved in new materials research. With aerospace, modeling technology has allowed products that typically took decades to come on-line to do so in much shorter times. The Boeing model is a great story. They invite people who do maintenance on their aircraft, and interview them to make sure that the initial base constraints are reflected and addressed in the digital model. This is done before the physical mock-up.

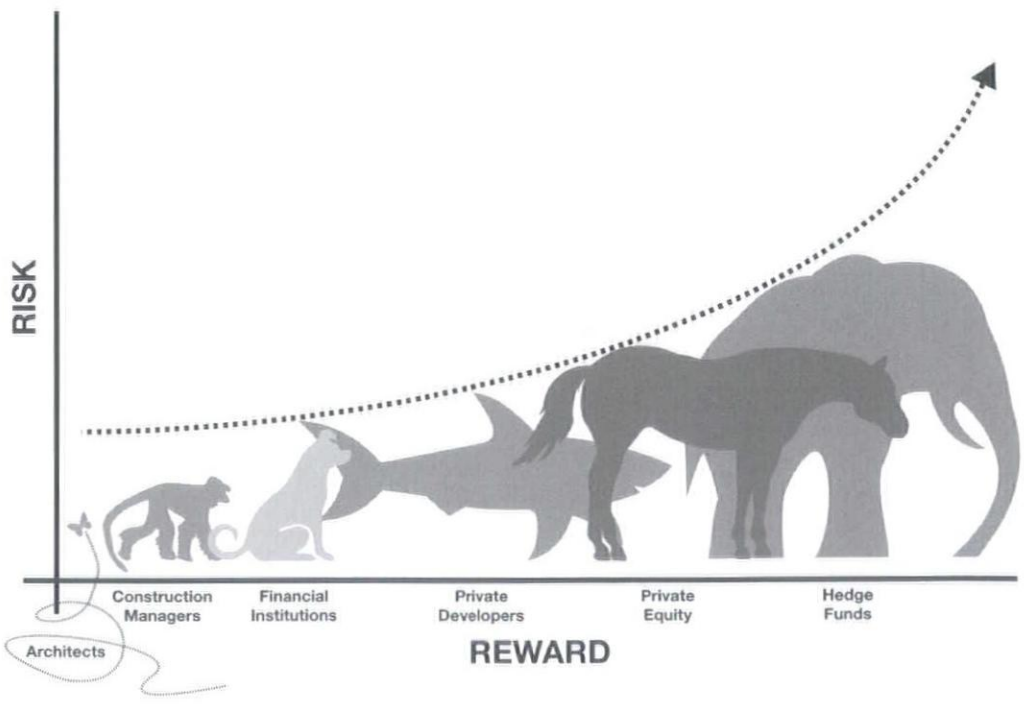
When it comes to the naval industry, they really understand how to combine new materials and digital modeling to create high-performance craft. For architects the question is "How do we manage that with cost?" It is not a compartmentalized process. We need to manage complexity holistically. Architects need to return to the time when they were generalists.

Looking at the financial sector has a lot to do with different types of organizations. With some like McKinsey and IDEO, it is how they attack problems and sit down with companies to determine their strengths and weaknesses and in turn find ways to improve and evolve them. We are also developing a working relationship with software creators, currently evolving a strong relationship with Phil Bernstein at AutoDesk, for example ...

P40 So when it comes to software, you're putting all your money on AutoDesk?

CS It's not about achieving singularity with software. It's about using as many different types of software as possible. Why? Because all projects are different and the way you go about solving them requires a variety of different tools and techniques.

We want to develop an open dialogue with software designers because we want to have more of a collaborative say in the evolution of these tools. We want to say, "This is what we're doing and this is the kind of tool we need fashioned to do it." What we're trying to do with Phil at AutoDesk is to take a very proactive role in setting the firm's direction with regards to applications. In a similar way to how we are dealing with fabricators and contractors, the first step is about working more collaboratively. Outreach is vital; architects need to be going to software companies saying, "I've got an idea. Tell me about your product and how we can push this."



Action

Gojira, Dir. Ishirō Honda, 1954.

The editors asked structural engineer Guy Nordenson if he would be interested in contributing to Perspecta 40. Nordenson's response was as follows:

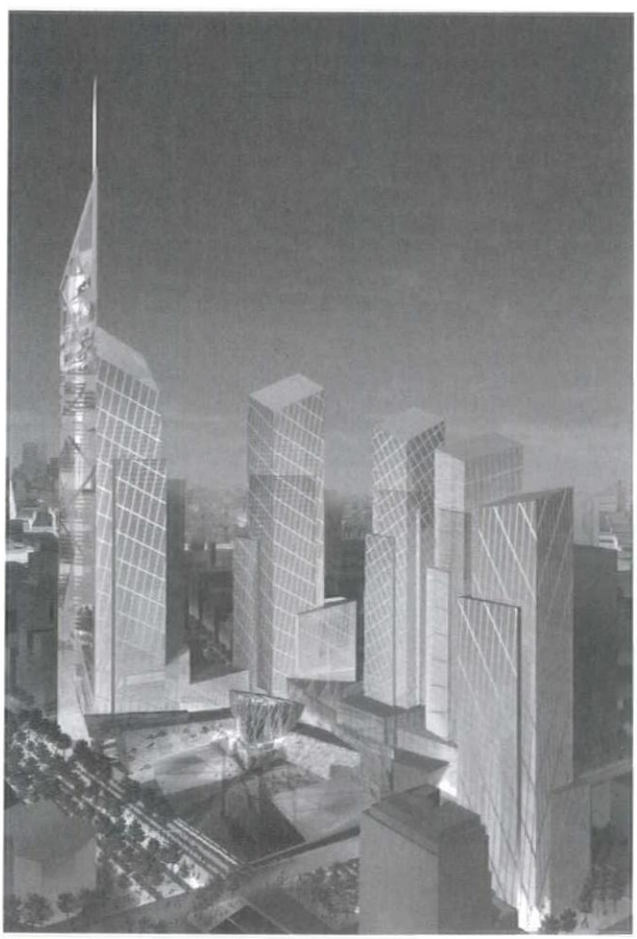
Thank you for the request but I think I will have to pass on this one.

As much as I like Perspecta and would want to be able to contribute, I find your theme of "monster" unconvincing. It is rather narcissistic in fact. Do you really believe it is architecture that is monstrous? Perhaps there are other forces out there that better deserve the description. And the allusion to the permissiveness of engineering is rather short sighted—isn't the Sydney Opera House or the World Trade Center for that matter a good example of engineering making outscale and willful building possible? Once again it is this fashion of making today the great crisis of architecture (now there's a theme).

That said I am happy to talk to you about your project—but as it is I don't think I would be a good contributor.

All the Best,
Guy

& Prac tice



Memory Foundations, World Trade Center Design Competition Winning Entry, Studio Daniel Libeskind, 2003.

Perspecta 40 followed up with an interview on September 26, 2006.

GN Automatically, this discussion about monsters leads me to think of the movie Godzilla, which I recently watched in Japanese on a flight between Tokyo and Seoul. I think the classic interpretation is that Godzilla represents the Atom Bomb and the terror it caused. Today there seems to be a kind of slippage which has happened. A film like Godzilla expressed the absolute horror of Hiroshima and Nagasaki and the possibility of nuclear annihilation. There used to be widespread motivation to actually talk about eliminating nuclear weapons. I remember the great June 12th, 1982, nuclear freeze demonstration in New York. I think there were one million people at the New York City demonstration on the Great Lawn in Central Park. There were so many people marching towards Central Park that half of the people had to march down Fifth and the other half had to march down Eighth Avenue.

There is quite a difference between a million people walking into the park protesting the possibility of the use of tactical nuclear weapons, and what we are used to today. At that time it was just a matter of basing Pershing missiles in Germany. Today, if you read Seymour M. Hersh, you know that there are actually plans in the Pentagon for using weapons in Iran.[1] Nevertheless, there is not a peep from the public, and I don't see rivers of people walking into the park worrying about it.

So, while watching Godzilla, I thought it was striking, the distance that we have traveled domesticating our terror of nuclear annihilation. Maybe climate change has frightened people more—I don't know—but I think part of my reaction was

that those realities are getting so much worse than thirty or forty years ago. Consequently, I find it a little bit disconcerting that architects are preoccupied with the idea of "the monster," as in Daniel Libeskind's building in Denver. It's almost a sublimation of the other issues—such as the potential use of nuclear weapons against Iran—into the aesthetic realm for the sake of distraction.

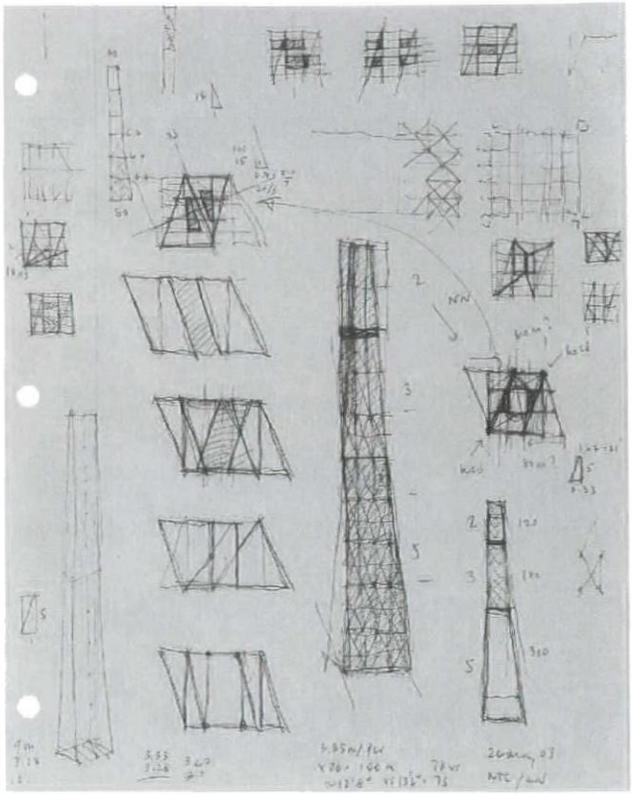
P40 Actually, this is an issue we'd like to explore. One (possibly unfortunate) role for architecture today is to attempt to create a safe bubble, a new take on Oscar Newman's "defensible space" perhaps. Just look at the new Seven World Trade Center around the corner from here, or the revised design for the Freedom Tower with a 20-story windowless, fortified concrete base. With the Freedom Tower especially, we are actually seeing an architectural attempt to defend against terrorist attack.

GN I think the issues at stake here are very similar to the debates that were going on with deterrent theory in the 1970s, which at that time argued for tactical nuclear weapons in Europe. What we are seeing with the Bush administration is a return of the repressive and reactionary attitudes that were in play during the Vietnam War and then during the Nixon and Ford administrations. For a lot of the people involved, particularly Cheney and Rumsfeld, there were missed opportunities and missed understandings about what the ideological issues were and what should have been done to achieve a different outcome. So now there is a chance to replay the scenario, this time with the substitution of "Islamo-Fascism." The status today is fueled by the classic "man-needs-to-replay-the-trials-of-his-youth-and-win-this-time" situation. This is why, I think, there is such a strong fantasy component in our foreign policy today.

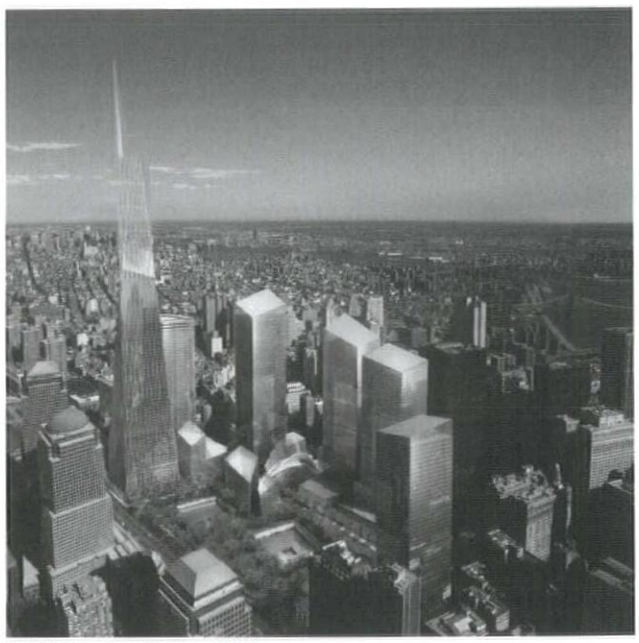
The deterrent theory in the '70s argued for using tactical nuclear weapons in Europe. It was necessary to put nuclear weapons in the front line because doing so would trigger a sequence of events, which the other side would realize and then be forced to act in a certain way. It is like playing a game of chess.

In the case of the World Trade Center buildings, the question is: Who decides what the threat is? Whoever decides what the threat is basically decides what the architecture is. Early on we had a design for the World Trade Center site which was this twisting parallelogram. After some time in the schematic design process the client came to a point where they realized it couldn't be built, in part due to the adjustments Pataki had made to the design. Conveniently the police came along and said, "Well, you can't build it anyway because it is not according to what we want." Essentially, getting the "right" design was about adjusting it to the level of threat. "You've designed it for X threat, but we've decided now that it is not good enough. You will have to design it for 3X or 6X. So, please come back to me and tell me what your architecture is, now that the threat has changed." If the client is really, truly sophisticated, perhaps he can even get you to design it in Gothic rather than Modern simply by changing the threat and tweaking the parameters just right. This situation is all based on the construction of a monster, i.e. the Terrorist.

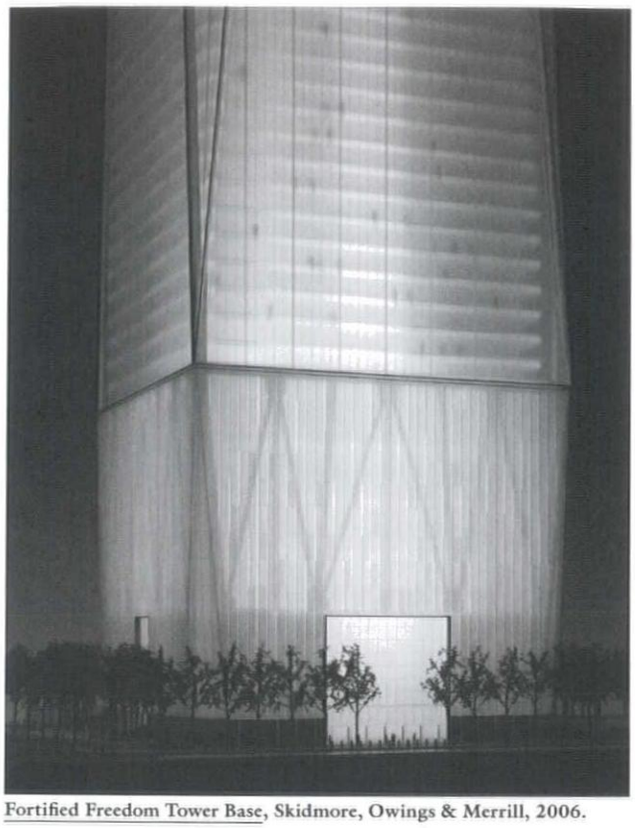
One bureaucratic entity takes the issue to another bureaucratic entity, they arrive at some compromise where they all agree to believe in the same fiction regarding what the threat is, and that is what we design according to. Thus, when something bad happens at least we can all say, "Governor Pataki told me what to do." This is where the Monster is constructed, and I think this is the area where I find it hard to articulate what is going on in terms of architecture and engineering.



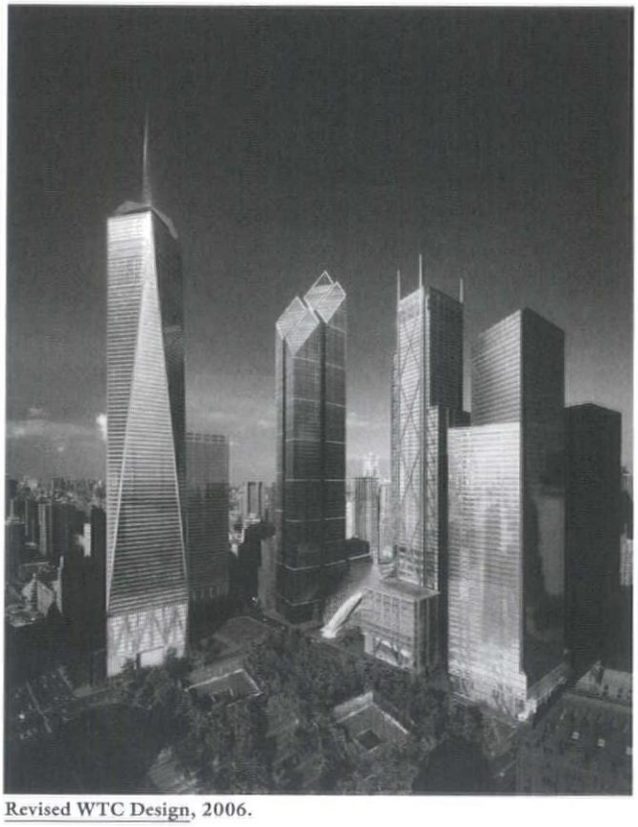
Revised WTC Tower Concept, Guy Nordenson and Associates, 2003.



WTC Site Plan Design, 2004.



Fortified Freedom Tower Base, Skidmore, Owings & Merrill, 2006.



Revised WTC Design, 2006.

P40 Is there any way that the architect and the engineer can engage in the discussion proactively as the supposed expert, as the one who should be able to step in and say, "This isn't solving the problem"?

GN Noam Chomsky would say that it is a question of the intelligentsia's role. We got away with what we did on the World Trade Center Tower One, because we had no contract, we weren't getting paid—we were free. We could have just as easily stood up in the middle of Central Park and made a speech, but as it was, Hyde Park Corner happened to be in the conference room at Skidmore Owings & Merrill. However, the role wasn't any more official than if we had been in the middle of Central Park. There were already other engineers involved, there were architects involved, there was a political process involved. So the only thing we had was the ability to influence the process through our argument. We got involved in the World Trade Center, partly because we didn't agree with the ideological connotations of Libeskind's design. I felt that it was demagogic, so there was an opportunity to oppose a kind of romantic, neo-expressionist reaction with a rational, classical response. It was a truly ideological exercise, which we took all the way to Governor Pataki and through his intermediaries, explaining "If you build that way people will die, and if you build this way they will not die. Therefore let's build this way." The problem is, once you are acting as an expert—the role that Chomsky is trying to play as a social critic—you become an outsider. You are not going to be asked to design the building.

The generation of architects who were born in the 1930's all made the same decision at the end of the 60's, be they "whites" or "grays": no more "blue jean architecture." Arthur Drexler argued against political engagement because that muddied the waters. Architects should, by his argument, work in an autonomous practice where somebody else carves out our domain so the work can proceed. What the World Trade Center has shown is that for a lot of people who have grown up in a form of practice from the late 1960s—Libeskind is a good example—it is very hard to reconcile politics and architecture. I think it is very hard for everybody nowadays to reconcile politics and architecture. It's hard for them to deal with the monstrous side.

P40 Do you try to do that in your own work?

GN To some extent, but only because we are given opportunities to do things where expectations are different. Again, for the World Trade Center Tower One nobody asked us to design the building; we were asked to come in there and react to ideas. Personally, I have found that in the last few years there have been more and more occasions where it has been possible to combine political action and practice. Ground Zero is a case in point. There we have seen a number of occasions where it was possible to resist certain ideological thrusts through certain design approaches, like the different work we did on Tower One or, the work we are doing on the slurry wall right now ... we are trying to preserve good ideas within the difficult environment, as are a lot of other people.

1 "One of the military's initial option plans, as presented to the White House by the Pentagon this winter, calls for the use of a bunker-buster tactical nuclear weapon, such as the B61-11, against underground nuclear sites. One target is Iran's main centrifuge plant, at Natanz, nearly two hundred miles south of Tehran." From Seymour M. Hersh, "The Iran Plans: Would President Bush go to war to stop Tehran from getting the bomb?" The New Yorker (2006).

Nothing will come of nothing

Catherine Ingraham

I do not think monstrosity is, at this moment, possible in architecture. This is not to say that there are no buildings and projects that are gruesome. I mean monstrosity in a clinical sense—the inability to trace a line of descent or the lack of a rationale for why something looks the way it looks, or the failure of every idea of underlying order. The interesting thing about the monstrous as a category of the imagination and, at times, an all-too-real reality, is that everything monstrous is made up of a mis-assembly of familiar parts. As Francois Jacob describes it in The Logic of Life, the monstrous being was an incoherent conjoining of parts from familiar beings—humans, oxen, goats, snakes, devils and so forth. Historically, this kind of being was only possible before modernity, which is to say before an accurate theory of biological reproduction made it impossible to genuinely entertain certain mutations upon which the monstrous depended. Currently, in biology and genetics there are new forms of the monstrous emerging—"Dolly" the sheep clone, for example—and architecture may or may not benefit from these developments. This issue of Perspecta (by re-posing the issue of the monstrous) may force us to think, in architectural terms, about monstrosity not as a description of what we now call "aberrant form" (although monstrosity always expresses itself in formal terms) but instead in terms of the potent animate forces through which architecture is constantly moving and from which architecture is constantly surfacing.

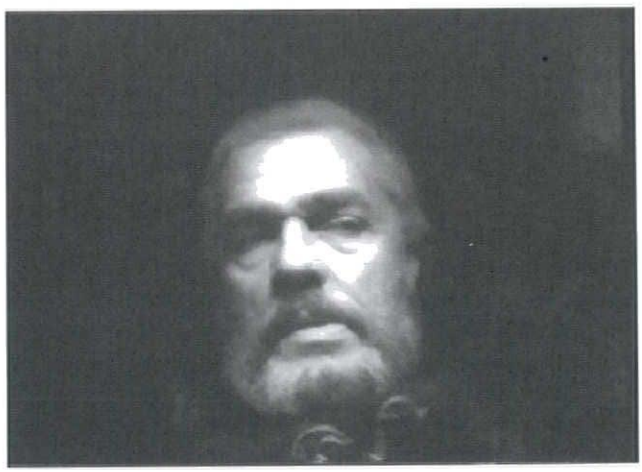
Architecture, of course, is not strictly a biological discipline or form of life. And if we speak of monstrous architectures from time to time—as some might when they see certain digital creations and others might when they see certain mega-corporate architectures—we typically use the word "monstrous" as a euphemism (the substitution of a mild or vague description for a harsh one) or as a way of characterizing buildings that we nevertheless fully comprehend from structural and generative points of view. These architectures do not have the power of the monstrous, which is a power that terrorizes the very heart of our claim to humanness, life, and logics. Since architecture—neither biological nor a form of life—is nevertheless made up of humanness, life, and logics in a general sense, there was perhaps a time when the presence of monsters in the world might have meant that architecture had to be more fortified, less likely to risk confusion with natural forms. Or, the reverse. But was there ever really a time when architecture would have appreciated mis-parented beasts in an unmapped landscape in this way? Or has architecture always specialized in forming places into which various forms of monstrosity are never allowed to enter—holding some crucial line, so to speak, on life's drift and tendency towards mutation, which only results in monstrosity (sterility) when this drift becomes a biological dead end? Evolution registers monstrosity as a wrong turn or missed opportunity, not as a threat.

For a kind of answer—because this is a short piece, any answer will be, at best, a stab in the dark—I want to turn (for the hundredth time) to the play King Lear. It must be admitted that turning any literary production toward architectural ideas strains our credibility. The usual poetics aside, literature and architecture have very little to say to each other. Literature is about what goes on in the spaces from which architecture, and architectural elaborations, necessarily stand aloof. In addition, Shakespeare's writing in King Lear increasingly seems to me excessive and histrionic; the character Lear laboriously teeters for hours on a thin ledge between sanity and insanity, compassion and insult, power and powerlessness. And yet the play continues to compel virtuoso performances and seemingly inexhaustible commentary.

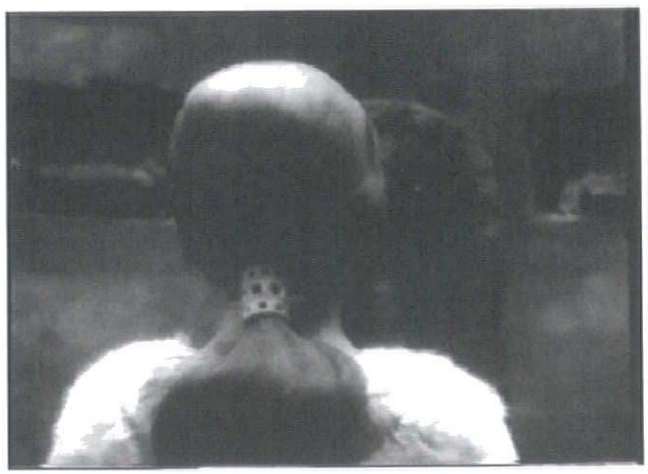
For architectural purposes, the play has always been for me about nothing, or, rather, the "problem" of nothing. The sitcom Seinfeld claimed to be about nothing; events were random but linked through the antics of an ensemble of characters. This is not quite the problem of nothing in King Lear. The characters in this play are radically dis-ensembled and Lear himself specifically disassembled. The problem of nothing that we find in the play is related to a drastic loss of orientation to what we might call some presumed human right to dwelling and space. Lear founders in a pre-modern, pre-biological, landscape. As a result, monstrosity is very real in Lear's world. Among the multitude of things that formed architecture inside modernity was the inability for form to be taken by surprise in the way, for instance, that biological mutations take morphological development by surprise, or monsters take the normative by surprise. A number of contemporary projects in computational architecture are searching precisely for ways of releasing architecture from the hyper-intentionality inherited from Modernism into a stream of unpredictable adaptations. Most of these experiments, however, are front-loaded with information that guards against a too-rude set of surprises, such as forms that no longer look or act like architecture.

The geopolitical and family themes of King Lear are well-known: the play is about a general "abatement of kindness" among family members, Lear's perverse desire to test his three daughters, long-standing medieval rivalries between France and Britain, failures of loyalty and old age. There is a general descent, by Lear, from his kingly seat of authority into chaos and wildness. It has often been said that this is a difficult play to stage and act. Modern Shakespearean actors are taught, in various ways, to learn the rhythms of Elizabethan poetry and prose in order to make contemporary sense of the complex and heightened language of Shakespeare's plays. These actors are faced, among other things, with the paradox of what the noted Shakespearean director John Barton theorized as "two acting traditions." The first tradition has been forwarded from Shakespeare's world, which Barton imagines is a world where language had more primacy in life and theater than it does now and in which stage drama was presented, with a few props, in the form of long expository narratives that actors dramatized by playing the surface or mood of the narrative. This could be called flat acting. If Shakespeare wrote of sadness, an actor played sad. The second tradition is our own theater tradition, which is dominated by Stanislavsky's theorization of acting according to Freud's theory of the unconscious. Actors in this tradition look for psychological motivation and intentions in order to provide a subliminal structure for what appears on the surface. They do not simply act the mood of the play but attempt to reveal deeper structures and currents of the human psyche. These two types of acting parallel, in some sense, our ideas about Elizabethan versus modern life. Elizabethan life looked to its exterior for meanings. Modern psychological life looks to interiors—its world a construction of desire and mind. In the first, a world of surfaces, monstrosity would classically be found outside our own, properly human, enclave. In the second, a world of structures, monstrosity no longer exists as a species of object or being in the world, but

Nothing



King Lear, first scene.



Cordelia.

as a dysfunction of interior life. The psychotic killer is mentally deranged, not morphologically malformed. Monstrosity has become, in our world, a wholly human potential, even when it is brought about in another species by genetic manipulation.

The difficult aspects of acting Lear in contemporary theater are, quite pointedly, the need to act both the exterior and interior of life. The actor must negotiate, in the case of Lear, a belief in a monstrous exterior (the storm, malevolent forces from earth and sky, the reduction of shelter to a leaky hut) with a belief in a monstrous interior (madness). Lear is buffeted from without by a powerful storm of space and the actions of monstrous daughters and simultaneously wrung from within by mental phantasms and failures.

Nothingness, which is one metaphysical description of what happens to Lear (homelessness, speechlessness, voids), behaves differently in a flat world of exteriority and surfaces than in a dimensioned world of interiority and structure. The points I want to make about this "nothingness"—which, as intimated earlier, are not ultimately aimed at an interpretation of King Lear but at another target, architecture—come from both a historical interlock between mathematical space and biology, and from philosophy. These points rest on the following exchange between Lear and his favorite daughter at the beginning of the play:

LEAR: ... Now our joy,
Although our last and least; to whose young love
The vines of France and milk of Burgundy
Strive to be interest; what can you say to draw
A third more opulent than your sisters? Speak.

CORDELIA: Nothing, father.

LEAR: Nothing?

CORDELIA: Nothing.

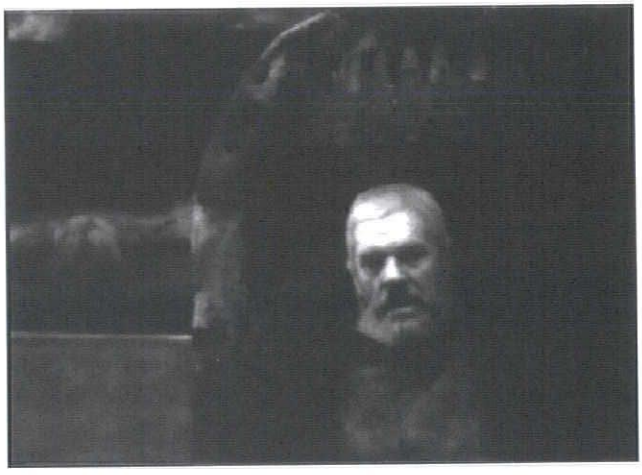
LEAR: Who speaks? Nothing will come of nothing.
Speak again. [1]

Rosalind Krauss, in her remarks on the invention of mathematically correct perspective in The Optical Unconscious, pointedly reverses Lear's words "nothing will come of nothing": "Far from nothing coming from nothing," she writes, "the truth that arises from this Euclidean meeting of parallel lines at that point beyond the limit of imagining [during the construction of a perspective] is the solidity of the construction's basis in geometrical law." [2] The vanishing point, which is an "infinite rapidity," is the "nothing" that solidifies, in Krauss' formulation, the geometric construction of modern space. I have argued in other places [3] (as have many others), in a kind of perpetual homage to Erwin Panofsky, that Brunelleschi's invention of perspective in the Renaissance began to redefine and fill a terrifying and powerful nothingness with something called "space" that was specific, measurable, inhabitable, neutral, even friendly. Lear's utterance to Cordelia—quite vicious—that she speak again because "nothing will come from nothing" is not simply a remark made by an angry father to a recalcitrant daughter. It is a statement about the world—not even yet a "world" in any modern sense, not a coordinated place, but a temporary occupation defined by some specifically human ability to be temporarily enclosed by walls—that Lear lives and eventually dies in. This utterance is also Lear literally enunciating a medieval theory of reproduction by which life is understood as generational (fathers, daughters) but the precise manner of inheritance is confused and chaotic. Something is owed by Lear and Cordelia to this inheritance—which is why Cordelia's response is considered ungrateful, among other things—but it is an inarticulate debt. It is not coincidental that Lear literally cuts into his own kinship with his family in order to exorcize the "nothing will come from nothing."

It is interesting, as an aside, that Krauss's and Panofsky's view of perspective as a structural, and constructing, machine is now undergoing revision in the hands of a new generation of art and architectural historians who may be taking their cue from revisionist theories of art and sociology, as well as contemporary architectural work. Chris Heuer, for example, who is studying the Dutch architect Vredeman de Vries's use of perspective, argues that perspective was used for its efficiency and effectiveness in describing surfaces, rather than symbolic or proto-psychological form. [4] This is the "Northern Renaissance" that Svetlana Alpers first framed. The nothingness of the vanishing point out of which a perspectival construction is made might be, then, comparable to the "glance" of everyday outer life rather than the gaze of the unconscious; the return of the retinal and the demise of an optical unconscious. Such a glance brings little insight; indeed, it signals a kind of end to the Enlightenment project and a return to empirical descriptions of a world of objects. But this new generation of historians has also been instructed in the heterogeneity of the world; its temporal and spatial folded aspects. [5] Flat cultural analysis, such as that advanced by Bruno Latour, reads landscapes that are aggressive in their materiality but also temporally creased. Latour's "actor-network theory"—which distills Deleuze and Gauttari and Foucault into sociological theory—offers the following steps toward the practice of flat analysis: Solutions explored by actor-network theory have nothing to do with offering still another compromise between the macro and the micro; political assemblage of the social is only one of many possible assemblages; the social is assembled ahead of us, not behind us; solutions have to take seriously the impossibility of staying in one of the two sites (macro/micro) for a long period; we feed off uncertainties instead of cutting through them; and so forth. [6] These relatively new, non-depth-structure practices—led most profoundly, I think, by experimental work in architecture over the past fifteen years—suggest a different kind of interiority.

I have several times (elsewhere) suggested that Lear, inside the play, enters a kind of spatial storm when he leaves the protection of his castle, because once he leaves he can't get back. The castle has no stable spatial coordinates; it exists only in the space of individual memory and is defined by the vicissitudes of memory, a medieval, non-psychological memory impaired by old age and rage in the case of Lear. For one thing, according to any interpretation that takes maps seriously (that is, any interpretation after the eighteenth century), the division of land in the famous opening scene of the play cited above—in which Lear consults a map of his kingdom in order to split the land between his three daughters—must be very crude. The map in this scene can only be a rough diagram, a sketch, or a list because cartography has not yet been enlightened by mathematics in Lear's world. One could say that Lear's dilemma, architecturally speaking, is that he is moving horizontally, like a four-legged animal, with his eyes facing downwards. There is no horizon line and therefore only a mobility driven by what lies underfoot; no constructing eye, minimal historical context, no organizing infinity. Or, in a flat world description, Lear is thrown into a medieval territory that lacks sufficient coordination or

Animal skin.



Crowned.

Wildness.

House.

resources. No theory of reproduction controls—philosophically or scientifically—what comes from what, and this makes "nothing will come from nothing" a very dangerous remark. Many have said (again referring to the two traditions) that Shakespeare is a weirdly psychological playwright. But Lear clearly lacks all our contemporary resources of the psychological. In modernity, psychological life requires both a geometric understanding of space and an accurate theory of reproduction. As mentioned earlier, the difference between a world that is psychological and a world that is not is also the difference between a world where monsters live outside the house and a world where monsters live inside people, who are inside houses. It is the difference between a world where the outside had teeth and a world where the inside has teeth.

Accordingly, one might imagine that contemporary architecture would thus, at the very least, be capable of a psychological monstrosity (which is, above all, an index of human psychological complexity). John Hejduk certainly believed this, as did Richard Neutra.[7] But the peculiar adaptation that Modern architecture made, over the centuries it took human life to switch from exterior to interior descriptions of itself and for architecture to achieve its modern potential, was to strive for detachment and transparency. Unlike Freud's prying open of the unconscious and libidinal mind, architectural Modernism attempted to formulate an autonomous domain for itself that set it apart from both literal and psychological life. Contemporary advances in theories of human psyche, biological reproduction, and theories of matter, have been, for the most part, incompatible with the evolution of this autonomous practice, which maintained that the presence of life in space was a matter of order and the maintenance of an aesthetic of order. No teeth outside, no teeth inside.

It would only be, perhaps, in the evolution of the architectural interior from Filarete to Greg Lynn (with some fascinating developments along the way, the Baroque for example) that we might begin to read traces of a psychological architecture. Perhaps there are various refractions through ironical and slippery modernisms (Koolhaas), or a post-modern grotesque (Venturi's mannerism), or a digital practice specializing in artificial intelligence. But insofar as contemporary monstrosity depends on the psychological, I think it has very little traction in architecture.

I understand how tricky my position is; how it might impinge on a certain hermeneutical happiness in which we have founded our modern disciplines—of architecture, history, and biology. It may also impinge on the enormous range of thought and culture that we have hypothesized as the very definition of humanness itself. The Enlightenment project was to make something of everything, even nothingness. Heidegger (the early Heidegger) argued in "What is Metaphysics?" that because our "scientific existence" gives matter "the first and last word," being (Dasein) finds a new relation to itself.[8] Science, he writes, "wishes to know nothing of the nothing" and yet must call on the nothing "for help." I have been equating nothingness with certain conditions—spatial voids, an obtuse conception of biological life and generation, monstrousness of kings and daughters—all of which rely on nothingness as a nullity or active negation. The ex nihilo nihil fit (from nothing nothing comes to be)of antiquity is non-being, unformed matter. Lear's loss of architecture (matter) and of himself (being) and of his daughters (generational power) is also a world in which monstrosity thrived because form was capable of being unformed by strange and unpredictable forces. In modernity, Heidegger writes, Dasein means "being held out into the nothing." "Without the original revelation of nothing," he writes, there is "no selfhood and no freedom." This is a new nothingness.

We have thus more or less paved over, in our metaphysics of being and our scientific world of matter, the breeding ground from which monsters used to emanate. And we have presumably gained "selfhood and freedom" in return, which have grounded and formed our understanding of generative processes. And, as I suggested above, in architecture we are also still well within the accommodations modernism made to forestall any inner monstrosity from finding a format in modern space. So we are safe from monsters and monstrosity. For now.

1 William Shakespeare, William Shakespeare: The Complete Works, ed. Alfred Harbage (New York: Viking Press, 1969) 1066.

2 Rosalind Krauss, The Optical Unconscious, (Cambridge, MA: MIT Press, 1993) 213.

3 See Catherine Ingraham, Architecture, Animal, Human: The Asymmetrical Condition (Oxford: Routledge, 2006), esp. Chapter Eight.

4 See Chris Heuer, The City Rehearsed: Hans Vredeman de Vries and the Architectural Imaginary (London: Routledge, 2008).

5 See John Rajchman's introduction to Pure Immanence: Essays on a Life (Cambridge, MA: MIT Press, Zone books, 2005).

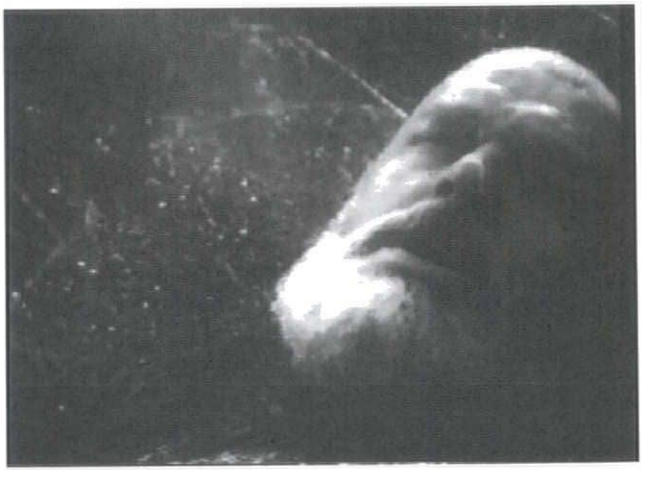
6 Bruno Latour, Reassembling the Social: An Introduction to Actor-Network Theory (Oxford: Oxford University Press, 2005) 247-262.

7 See Sylvia Lavin, Form Follows Libido: Architecture and Richard Neutra in a Psychoanalytic Culture (Cambridge, MA: MIT Press, 2005).

8 Martin Heidegger, "What is Metaphysics?" in Martin Heidegger Basic Writings: Second Edition, Revised and Expanded (1964), ed. David Krell (San Francisco: Harper, 1993) 89.

Mixed heredity.

Storm.



Madness.

Map.

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