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ARTICULOS

FROM RELATIVITY TO THE FOLD: EMERGING ECOLOGICAL ETHICS IN ARCHITECTURE

RESUMEN

El ensayo trata la trayectoria en la arquitectura a partir de comienzo de siglo de éticas "centristas" que contrarrestan el relativismo inherente a la teoría de Einstein, publicada por primera vez en 1916.

Se argumenta que la gran parte de los "ismos" arquitectónicos, incluyendo el postmodernismo y el deconstructivismo, sólo han logrado un centrismo vacuo y pasajero, al menos en lo que respecta el vínculo de la arquitectura a la troica existencialista Construcción/Hogar/Pensamiento (Building/Dwelling/Thinking) de Heidegger.

No así el trabajo reciente de Peter Eisenman, el que sigue más bien el pensamiento "ecológico" de Leibniz y su interpretación moderna por el filósofo francés Gilles Deleuze. El ensayo mantiene que esta ética ecológica consigue la unificación verdadera de las condiciones fundamentales de "vivir en el mundo", según la filosofía de Heidegger.

DESCRIPTORES:
Ecología. Etica. Arquitectura. Extensión.

ABSTRACT

This paper traces the course of the "relative" ethical discourse in architecture from the early part of the century onward, and discusses the relationship between relativity and Eisenman's work through his decompositional investigations in House X. The essay examines the relationship between the emerging ecological picture of the world and Eisenman's post-decompositional work such as the Cannaregio (Venice) and Rebstockpark (Frankfurt) projects. It is argued that this work embraces an "ecological" ethic following the philosophy of Leibniz and its interpretation by Gilles Deleuze as The Fold, sources with which Eisenman is familiar. In conclusion, the author posits an ecological approach to design by which a "natural axiality" can once again return to architecture to signify a unified conception of the world.

PREAMBLE

This essay begun with a daydream during one of Clive Dilnot's lectures on architectural ethics at Harvard University. Ethics, Dilnot was explaining, dealt with the relationship to a "concrete other", or subject with specific wants, needs and motivations. It is not a pursuit of an ideal, or an a-priori picture of the world as dictated by moral law, but rather a way to confront, by action, the "other".[1] But is it possible, I wondered, to relate to a "concrete other" without dragging major views about the world such as provided by scientific theories? Did, for instance, Einstein's theory of relativity influence the rise of modern architecture in an over-arching way? In examining this question, I was struck first by the general absence of references to Einstein and his theories of space-time in the major historical accounts of the modern movement such as William Curtis' Modern Architecture Since 1900, Nikcolaus Pevsner's Pioneers of the Modern Movement, and Kenneth Frampton's Modern Architecture, a Critical History. These sources do reference Giedion's Space, Time and Architecture, but, as has been observed, Giedion's account of the "new conception of space" is rather confused and inconclusive. This led to the first objective of this essay: to broadly establish the connection between the theory of relativity and the modern movement.

The daydream had a trailer how was the emerging "ecological" view of the world affecting its "relative" counterpart, and how was this new picture being represented in architecture. In pursuing these questions the work of Peter Eisenman quickly shaped itself as a bridge between the relative and ecological world views. Relativity implies the absence of a single or "centered" universal authority by which the society should conduct its affairs. Arguably, this absence became manifest in early modern movement by the abandonment of axial symmetries in floor plans and elevations, which otherwise represented a whole or "centered" world-picture. However, much of what followed in the five or so decades after the first experimentations with space-time in architecture was not an affirmation of relativity, but an ethical reaction in direct opposition to it, i.e., the representation of "re-centered" views of the world embracing some kind of universal truth. The ethics of Le Corbusier, Louis Kahn, and Robert Venturi fall in this category, as does deconstructivist architecture, which seeks to represent humanity's de-facto decenteredness as the truth. Eisenman's early architecture went one step further: it pursued "pure objecthood", or the production of "decomposed" objects like House X, with no attachments susceptible to interpretation. It is in this sense that Eisenman's early work demonstrates a "relative" ethic.

An "ecological" ethic, by contrast, engages context as a ground for historical continuity and extension, permitting all possible points of views to act as a foundations for a traceable but contingent future. All aspects of the world, in effect, become connected and unified as "folds" in the same cosmic fabric. Ecology is conceived as an artifice –as a model of natural process which in turn is modeled in the production of architec-

1/ Quoted from Clive Dilnot's inaugural lecture on his «Architectural Ethics» course, Department of Visual and Environmental Studies, Harvard University, September 28, 1992. For Dilnot, «ethics» means the encounter between designer and subject, requiring the interpretation of the subject's context and history; ethics is about acting with respect to the lconcrete other» and should not be confused with morality, or one's standing to a moral code. Dilnot states: «...The ethical, in this sense becomes a way of gaining a perspective on the realities of the present situation and a means of working back from this understanding to potential strategies for design intervention» (See «The Ethical Structure of Architectural Form» GSD News, Summer l993, Cambridge, Ma: Harvard University Graduate. School of Design).

As this essay suggests much of this century's architectural production has followed the reverse course, that is, first establishing principles of action, based on some over-archig view of the world, and then working *forward* to the encounter with the design subject. I have not concluded that «ecological» ethics are any different, only that as an over-arching principle, ecological ethics espouse «a way to act» which recognizes the value of context as a unique «point-in-time situation». For purposes of this essay, «ethics» should be interpreted simply as the *attitude* toward the act of producing architecture.

ture. And it is in this sense that Eisenman's later work such as the Cannaregio project in Venice and Rebstockpark in Frankfurt reveals a preoccupation with ecology.

One key question is raised in the shift from one ethical track to the other: is the ecological world-picture a new over-arching paradigm, or is it merely one more ethical counterpoint to the paradigm of relativity? What would the tale-tale signs be one way or another? This essay offers no definitive answers. Nevertheless, it seems appropriate to look at the problem through a common prism: the variability in architecture of axial arrangements as an organizing device; and their linkage to vernacular "building" practices.

Of temples, domes, and cathedrals

In 1840, British architect George Wightwick published "The Palace of Architecture" an imagined architectural theme park conceived to "promote a just appreciation of Architecture, in the minds of all who are susceptible to the Beautiful, the Poetical, and the Romantic" (Wightwick, dedication). The plan shows Egyptian, Greek, Roman, and Gothic monuments of every ilk scattered amidst an idealized pastoral setting. Had he visited such a place, Oswald Spengler would have surely called it a sanctuary of the three souls of West, the Apollinian, the Maggian, and the Faustian. Spengler defined the Apollinian as the extrospective soul of the Classical Culture, a soul which seeks to grasp but ultimately stand against the "sensuous cult of the Olympian Gods". Symbolizing the male figure, the Apollinian soul is embodied in the classical column and the temple it stoutly supports, frames and guards. The Faustian, by contrast, inhabits the rising vaults and expanding luminescence of the Gothic Cathedral. This is a soul which searches through the spirit the inward and outward folds of "pure, limitless space". While the Apollinian "lacks all idea of an inner development and therefore all real history, inward and outward... the Faustian soul is an existence which is led with a deep consciousness and introspection of the ego, and a resolutely personal culture evidenced in memoirs, reflections, retrospects and prospects and conscience". The third soul, the Maggian, is at home under the sheltering space of domes. This is the soul of the "Arabian Culture...with its caliphates and mosques, and the sacraments and scriptures of the Persian, Jewish, Christian, 'post-Classical' and Manichean religions". It is a soul that seeks nurture, reinforcement and redemption, and the constant vigilance of the angels, saints, and persons of trinity which inhabit the "heavenly dome" (Spengler, 183-7).

While distinctive, Spengler's spirito-morphic paradigms share two fundamental architectural attributes: they have roots in vernacular building types, and they are built around axially arranged plans and elevations. The form and ornamentation of classical temples has long been attributed to their primitive origins in vernacular post and lintel constructions. The gothic arch is believed to have evolved from the bending of and tying of vertical branches to shape a roof.[2] The derivation of the dome is less certain, but its association with caves and other natural

2/ For a discussion on the vernacular origins of classical and gothic architecture see Joseph Rykwert, *On Adam's House in Paradise: The Idea of the Primitive Hut in Architectural History* (Cambridge, Mass: MIT Press, 1981).

domed structures is all too apparent. The labor involved in the erection and habitation of these early structures was pre-architectural, that is, it was a primitive act of building accomplished by common people with rudimentary tools. In these acts, as Heidegger argues in Building, Dwelling, Thinking, is contained the source of existential meaning —of "being" in the world: "...building is not merely a means and a way towards dwelling, to build is in itself already to dwell" (Heidegger, 146).[3] In time these primitive shelters became temples, domes, and cathedrals, symbols of the physical acts by which the common man and woman secured an existential foothold in the world.

The second shared characteristic in Wightwick's monuments is their axial geometry, both in the vertical and horizontal planes. Heidegger writes that the act of building occurs "on the earth" which also means "under the sky", which is how the divinities enter into union with mortals. Divinities in the sky, mortals on earth, such is the primal fourfold, of "belonging together in one" (Heidegger, 148-9). This "oneness", in the Apollinian, Maggian and Faustian souls, was captured –held in consciousness– by the axis. The axis was the abstract embodiment of a unified conception of the world, one in which a "supra-beingness", an omniscient deity with divine wisdom and power of creation exercised ultimate authority over its willing subjects and everything else in existence. It was a representation of a Him and His cosmic order, a line of infinite dimension reaching upwards and outward to His abode.

A prerequisite condition of the ancient fourfold was the acknowledgement of transcendent ideals that is, the existence of the world a priori. Under this ontology, philosophy was preeminent, science, including geometry, a willing partner. Ernst Cassirer explains:

> *In antiquity there had been and an indissoluble partnership between geometrical and philosophical ideas of truth; they developed with and within one another, and the Platonic concept of the theory of ideas was possible only because Plato had continually in mind the static shapes discovered by Greek mathematics...Its ideal of science was wholly determined by this, and Euclid's 'Elements' are the crown of its endeavor... The concepts and propositions that Euclid placed at the apex of his system were a prototype and pattern for what Plato called the process of synopsis in idea. What is grasped in such synopsis is not the peculiar, the fortuitous or unstable; it possesses universally necessary and eternal truth* (Cassirer, *Problem*, 22).

Euclidean postulates were in ancient times the manifestation of a cosmic "truth", ethereal and undisputed, and available, like light itself, to be "seen" as an ideal condition of everything that was. Little changed through roman antiquity and the Middle Ages. During the Renaissance, Descartes developed analytic geometry under the impetus of philosophical thinking, seeking, much like his relative contemporaries Brahe, Galileo, Pascal, and Newton, to reaffirm "the harmony that God imparted to the universe

3/ For a lucid explanation of Heidegger's conception of «being», see Chapter 3, «A Preliminary Sketch of Being-in-the-World» in Hubert L. Dreyfuss, *Being-in-the-World* (Cambridge, Massachusetts: The MIT Press, 1992).

through His mathematical design" (Klein, 219). Although regarded as an incipient modernist, Descartes sought, like Euclid, the representation of an ideal universal order. Euclid's axiom, "Through a given point can be drawn only one parallel line", draws a palpable inference to infinity. Hence the axis: it embodied a fundamental, single, unvarying Truth, emanating from and inhabiting, in architecture, a unified or "centered" conception of the world.

The modern ferment

Measured in geologic time, the advent of architectural modernism must be viewed as catastrophic event. In the early part of the twentieth century buildings materialized overnight without axial arrangements whatsoever, and bearing little resemblance to any vernacular building type. From the late seventeenth century onwards, humanity begun to shift from being in a world a priori, to subsuming the world to a picture of its own creation. New geometric conceptions of space in the nineteenth century played a decisive role in this shift, and a key play was Georg Riemann's derivation of n-dimensional geometries. At the core of Riemann's thinking was the concept that space, such as in a spherical surface, can be both finite and unbound: "Once space is finite an a line cannot be extended indefinitely (as Euclid's parallel postulate assumes it will be), it is possible to establish that no line can be drawn parallel to a given line. This principle is readily apparent in the geometry of the sphere where 'lines' are defined as great circles but will all intersect at the 'poles' of the sphere" (Henderson, 5). To Cassirer, Riemann's thinking was revolutionary:

> *Even the very title of his work ["On the Hypotheses Underlying Geometries"] suggests the revolution in thinking that had come about in mathematics, for Riemann speaks of 'hypotheses,' where his predecessors had spoken of 'axioms.' Where absolute and self-evident propositions had been envisioned he sees 'hypothetical' truths that are dependent upon the validity of certain assumptions, and no longer expects a decision on this validity from logic or mathematics but from physics... The whole character of mathematics appeared radically changed by this view, and axioms that had been regarded for centuries as the supreme example of eternal truth now seemed to belong to an entirely different kind of knowledge* (Cassirer, *Problem*, 21-2).

This "different" kind of knowledge was, of course, empirical. Empiricism acted like a wedge between philosophy and "reality" –and this was news, as Darwin so profoundly and disturbingly brought home in 1859 with "The Origin of the Species".

Along with new geometries emerged new systems for their organization. The world-picture, in effect, had to be structured, coded, and catalogued. and, due to the complexity of the scientific derivations, in increasingly abstract ways. A contemporary of Riemann, Felix Klein developed the "groups" theory (sets, subsets, etc.). To Klein this was a theory of pure forms, "forms with which are associated not quantities, or their symbols, numbers, but intellectual concepts, products of thought, to which actual objects or their relations may, but need not, correspond". In other words, a Euclidean triangle would be part of a conceptual group of triangles, where any one would be no less than any other. This was called "projective geometry", and it implied that the qualities of an object were dependent, or relative to, its abstract, not physical qualities. The relative notion of space was reinforced by Henry Poincaré from the mid 1880's onwards, but most particularly in 1902 with La Science et l'hypothese (English translation in 1905). In reference to the movement of two bodies in space he wrote:

> *The object of geometry is the study of a definite group, but the general idea of the group pre-exists, at least, potentially, in our mind, having forced itself in not as a form of sensibility but as a form of our understanding. All we have to do is to choose among all possible groups the one that will constitute a standard for us, as it were, to which natural phenomena are referred. Experience guides us in this choice but does not dictate it; nor does it permit us to know which geometry is truer but only which is more useful* (Quoted from Cassirer, *Problem*, 43).

And further:

> *...the state of the bodies and their mutual distances at any [given] moment will solely depend on the state of the same bodies and their mutual distances at the initial moment, but will in no way depend on the absolute initial position of the system and of its absolute initial orientation. This is what we shall call, for the sake of abbreviation, the law of relativity* (his italics, quoted from Cassirer, *Problem*, 76).

The latter statement cannot be more explicit in dismissing the notion of absolute space. In the first statement, Poincaré places the individual, through the act of "choosing", squarely at the center of world-conception. H. Hertz, a contemporary of Poincaré, furthers this point by proposing that the "inner logic" of the individual is as much responsible for the form of external objects as their own nature (See Cassirer, *Problem*, 110). Yet despite such clear thinking by noted mathematicians, it was Einstein, a physicist, who eventually gave relativity scientific and cultural prominence and permanence. First came the Special Theory of Relativity (1905), which essentially addressed the relative nature of uniform motion. Then came the General Theory of Relativity (1916), which addressed the effects of gravitation upon the field of space-time. To illustrate the principles of relativity Einstein used the now classic example of a passenger dropping a stone from a moving train. From the passenger's point of view, the stone drops in a straight line. But to a bystander on the side of the tracks, the stone arches towards the ground following a longer, parabolic trajectory. As the trajectories are different, the measure of time associated with the event is different depending on who is recording the event. Time, therefore, cannot be disassociated from space, nor from the relative position of an observer. In such a space-time continuum, Euclid's axioms are valid only insofar as they apply to the reference field of a uniformly moving body. As soon as a second body is introduced, space and time become variable, assuming multiple dimensions. Relativity, however, came to involve more than physics. Bertrand Russell raised the space-time concept to a social, cultural, and a metaphysical level:

> *The collapse of the notion of one all-embracing time, in which all events throughout the universe can be dated, must in the long run affect our views as to cause and effect, evolution, and many other matters. For instance, the question whether, on the whole, there is progress in the universe, may depend upon our choice of a measure of time. If we choose one out of a number of equally good clocks, we may find that the universe is progressing as fast as the most optimistic American thinks it is; if we chose another equally good clock, we may find that the universe is going from bad to worse as fast as the most melancholic Slav could imagine. Thus optimism and pessimism are neither true nor false, but depend upon the choice of clocks* (Russell, 225).[4]

As suggested by Russell, the conception of the world becomes dependent on the relative position, and arguably the state of

4/ Einstein himself acknowledged the cultural implications of his theories. In a 1919 article he wrote «Today I am described in Germany as a 'German Savant' and in England as a 'Swiss Jew'. Should it ever be my fate to be represented as a *bete noir*, I should, on the contrary, become a 'Swiss Jew' for the Germans and a 'German Savant' for the English» (quoted in Tauber, 64).

mind —and culture— of any given person. Under such relativism, the world-picture becomes "decentered", lacking a central reference to which all subjects can subscribe.

Relativity in Art and Architecture

In The Fourth Dimension and Non-Euclidean Geometry in Art, Linda Dalrymple Henderson describes at exhaustive length the influence of the "fourth dimension" in the plastic arts during the early part of the century. Partly derived from Riemann's n-dimensional geometries, and true to the spirit of relativity, the fourth dimension meant different things to different individuals. To some the visualization of the fourth dimension was a physical thing akin to translating a cube in space, much like a square can be translated perpendicular to itself to generate a cube, or a line to generate a plane, and a point to generate a line. In this four-dimensional "hyperspace", a cube became a "hypercube" (Henderson, 7). (What no one seemed to be asking is what translation generated a point; in other words, are there any negative dimensions?). To others, such as Malevich and Kandinsky, the fourth dimension was a spiritual thing, more in tune with cosmic intuition as a primary source to the creative impulse. (Note) To the Cubists, the fourth dimension meant the representation of simultaneity, or the capturing of multiple spatial events in a single, two-dimensional view. And to the Futurists, such as Boccione, the fourth dimension was visualized as the movement, speed, and dynamism inherent in the emerging technologies (See Henderson, 89-110).

The diverse and often conflicting interpretations of the fourth dimension point to the infancy of the space-time concept during the century's first decade. By the late teens, however, both Einstein's special theory of relativity and Minkowski's discourse on space-time had put to rest the speculative, mystical, and more occult inferences of the fourth dimension. The concept became strictly associated with physical properties, including time. In 1917 the cubist painter Severini stated emphatically: "the fourth-dimension is, finally, only *the identification of object subject, of time and space, of matter and energy*" (Henderson, 307). This was also the year in which Mondrian's first produced a truly non-axial, non-directional, "Composition in Line" (prior to this date, Mondrian's line compositions always exhibited axial tendencies, however subtle, such as his Composition n. 10 of 1915). Significantly, Mondrian declared in The new Plastic Painting that the "new art" was a "direct expression of the universal through [the] subjective transformations of the universal" (his italics) and that the "subjectivization of the universal is relative" (Mondrian, 30-41).

The most consequential artist to pursue the fourth dimension as a time-space phenomenon in art was El Lissitzky. In 1920 Lissitzky begun producing "Prouns", or "Project for the Affirmation of the New". Prouns aimed to represent a new kind of space, which "by dividing it into the elements of its first, second, and third dimensions passing through time, [would construct] a many-sided but unified image of nature" (Henderson, 295). Prouns are characterized by the seemingly random arrangement of objects in a non-referential space. The objects project a certain independence, and seem to coalesce in space almost by accident. No indication whatever is implied of an organizing, central "force". To further reinforce the point, Lissitzky rendered three-dimensional forms using non-perspectival, axonometric techniques. Vanishing points to a Euclidean infinity are absent. Lissitzky was among the first artists to turn to architecture as the only possible medium in which to formally explore the time-space continuum. Accordingly, Prouns should be considered emblematic of early twentieth century thinking about "building", used here in Heideggerian terms.

Lissitzky was a frequent contributor to Van Doesburg's De Stijl publication. He was also an acquaintance of Laszlo Moholy-Nagy, whom Gropius brought to the Bauhaus in 1923. And Mondrian, a founding member of De Stijl, was well published in the Bauhaus Book series. These relationships point to the awareness of relativity and its translation into art and architecture within both design schools. Einstein

himself was a member of the Circle of Friends of the Bauhaus, a relationship that extended to the United States in the late 30's when Gropius assumed the direction of the architecture program at Harvard University while Einstein taught and conducted research at Princeton.[5] In the first two decades of the century, Gropius' architecture was modern in some respects, but traditional in others. For example, the 1914 Model Factory for the Werkbund Exhibition exhibited an "open" facade and a full compliment of modern materials, but remained traditional in its symmetry and the rhythmic columns flanking the main entrance. However, soon after the dissemination of Einstein's theories in the early 20's, Gropius' architecture changed radically.[6] In the 1922 Kappe Brothers Storage building, all traces of geometric symmetry had vanished. Instead, the building exhibits the spatial aspects of a Proun: independent and autonomous planes and solids lacking any reference to an organizing "authority". About this shift, Gropius stated:

> *...the symmetrical relationships of the parts of the building and their orientation towards a central axis is being replaced by a new conception of equilibrium which transmutes this dead symmetry of similar parts into an asymmetrical but rhythmic balance* (quoted from Curtis, 126-7).

The Kappe Brothers Warehouse is perhaps a paradigm of early modern architecture: its forms organize space according to an internal structure of sets and subsets; they are non-hierarchical; and the measure of buildings is gained not from one point of view, but from a time-space experience through it. Nowhere on earth can the modern and pre-modern conceptions of space stand in sharper contrast than in Barcelona's site of the 1929 World's Fair. Perched over Montjuic, on axis with the grand boulevard, stands the Neo-Baroque Exhibition Hall. It is solid, symmetrical, overbearing. At its feet and off to the side, dwarfed in scale but resplendent, stands the reconstruction of Mies van der Rohe's pavilion. To historian William Curtis, Mies' early architecture seems like a "fusion of stripped Classical values, of the pin-wheel qualities of Wright, and of the abstract paintings of Mondrian, van Doesburg, or perhaps Lissitzky" (Curtis, 124). Mies' later works certainly points to influences other than Russian Constructivism, but at least in the Barcelona Pavilion the spirit of Lissitzky's Prouns is all too clear.

Despite the influence of the theory of relativity on architecture, it took two decades from the completion of the Kappe Brothers warehouse before anyone attempted to shed any light on the evidence. The attempt, of course, was Sigfried Giedion's Space, Time and Architecture: The Growth of a New Tradition. Giedion stated:

> *Space in modern physics is conceived of as relative to a moving point of reference, not as an absolute and static entity. And in modern art, for the first time since the Renaissance, a new conception of space leads to a self-conscious enlargement of our ways of perceiving space* [436].

5/ Reginald Isaaks documents comnunication between Gropius and Einstein regarding the latter's interest in securing admittance into the United States of a German architect residing at the time in France. See Reginald Isaaks, *Gropius, an Illustrated Biography of the Creator of the Bauhaus* (Boston; Bulfinch Press, 1983), p. 243.

6/ I have not run across references indicating conclusively that Gropius and Einstein held conversations or exchanged correspondence on the subject of relativity. Gropius' production of «relative» special arrangements may have been serendipitous, although it is difficult to believe that discussions about relativity did not place at tte Bauhaus. Further research is necessary on this question.

Yet for all the theoretical presaging implied in this statement, Giedion's actual documentation and interpretation of the space-time conception and its influence upon early modern architecture is both partial and confusing. For example, no reference is made to Lissitzky. Giedion does associate architecture with cubism's preoccupation with the simultaneous presentation of objects from several points of view. Yet six paragraphs later it is explained that "more and more clearly it appears that this new conception of space was nourished by the elements of bygone periods", meaning primitive cultures (Giedion, 436-439). Overall, Giedion focuses on "openness", or the blending of exterior and interior spaces, as the signature of the modern movement.[7]

Ethical attitudes in a "relative" world-picture

Regardless of how Giedion interpreted space-time, he clearly made the point that modern architecture was engaged in the representation of an entirely new "modern" conception of the world. The disposal of axial symmetries signified a radical break from the past, the abandonment of a "centered", universal cosmogony and its replacement with mere "reference systems" with which the autonomy of individual could reign supreme. It seemed at first that modern architecture would ride humanity's emerging de-centeredness towards a multiplicity of "relative" representations. Lissitzky's Prouns certainly pointed in this direction. Yet most of the dominant ethical attitudes that followed point to a condemnation rather than an affirmation of a "relative" world picture. It's as if the modern ethic sanctioned subject-based representations of the world on the one hand, but dismissed them in favor of re-centered, universal truths on the other. This ethical dilemma has been central to architecture for over six decades, and it has produced a number of distinctive aesthetic responses, or architectural "harmonies".

Spiritual harmonies

One way to re-center the human subject was to grant primacy and transcendence to the human spirit. Individual differences could well be tolerated so long as there was a common, "higher" ground: the universality of human emotions. To Malevich, Kandinsky and Mondrian, the means to such emotional grounding was abstract art. Malevich's "Suprematism" was exactly this, a "representation of the world of feeling" (Malevich, 612). Kandinsky, for his part, professed the primacy of the spirit as a means to rectify the emerging de-centered, non-referential modernist world-picture, a world which he believed was "infected with the despair of unbelief, of lack of purpose and ideal" (Kandinsky, 2). In Concerning the Spiritual in Art, he wrote:

> *The spiritual life, to which art belongs and of which she is one of the mightiest elements, is a complicated but definite and easily definable movement forward and upward. This movement is the movement of experience. It may take different forms, but it holds at bottom to the same inner thought and purpose* (Kandinsky, 4).

7/ Giedion's confusion with space-time is also addressed by Peter Collins. In reference to Time, Space and Architecture he writes: «In some passages...[space-time] evidently means 'related to Einstein's theory of relativity', whilst in others it seems to mean only 'related to avant-garde paintings of the 1910s and 1920s'. Sometimes it is used as a synonym for 'four dimensional', sometimes as the equivalent to non-Euclidean geometry', and at least on one occasion it is used to explain the architectural significance of Zen Buddhism» (Collins, 288).

This statement succinctly describes the modern dilemma: it reveals the desire for wholeness and unity ("...but it holds at bottom to the same inner thought and purpose".) while at the same time supporting the relative nature of existence ("This...is the movement of experience [and] it may take different forms..."). Mondrian, too, was driven by the desire to "get beyond the everyday world of time and space to the realm of the absolute". (Henderson, 334). In The New Plastic he stated:

> *The truth that is manifested subjectively in art is universal, It is therefore true for everyone in opposition to that truth which, in every pure search forms the true way for each individual. The new plastic can exist as style, as universality, since it clearly expresses universal truth* (his italics, Mondrian, 51).

To Kandinsky and Mondrian, the power of the spirit represented a universal frame of reference. Abstract art was the medium of deliverance, the mediating threshold between subjective "anarchy" and an objective "authority". Both men were followers of Theosophy, a society —some called it a cult— engaged in the spiritual and mystical dimensions of life. And both were central figures, respectively, in The Bauhaus and De Stijl, arguably the two most influential design schools of this century. To be sure, both schools sought a true expression of the modern, including industry and technology. Nevertheless, as Rykwert argues in The Dark side of the Bauhaus, a preoccupation for the spiritual and mystical was part and parcel of their search for a modernist ethic (Rykwert, *Necessity*, 47).

Machine-like harmonies

An alternate way to re-center the human subject was to inveigh industrial technology, as symbolized by the machine, with a universal, authoritative power. Industrial production was, after all, the monument of the age —an age "to be revealed in a naked and universal language of geometry infused with the utopian sentiment of salvation via mechanization" (Curtis, Corbusier, 50). Among the avatars of the new age were Tatlin and the Russian Constructivists. They sought a new spatial and material order centered on the physical nature of things: the inherent quality of materials, their engineered potential, and the social benefit accruing from their practical application. Van Doesburg and Rietveld in De Stijl shared these ideals, as did Gropius and Moholy-Nagi at the Bauhaus. Le Corbusier, of course, embraced the spirit of mechanization with unmatched fervor and militancy:

> *The house is a machine for living in... Machinery, a new factor in human affairs, has aroused a new spirit... Nobody to-day can deny the aesthetic which is disengaging itself from the creations of modern industry... The engineers of to-day... provoke in us architectural emotions and thus make the work of man ring unison with universal order* (Le Corbusier, *Towards*, 31-90).

Placing modern automobiles below classical temples in Vers un Architecture, as Curtis has noted, is emblematic of Le Corbusier's mechanistic vision. But instead of following the "relativistic" formal attributes of a Prouns, he embraced instead the Phlebean, "pure" geometry of industry: cones, cylinders, spherical sections, and other primary solids like those in automobiles, steamships and airplanes. In this he shared Malevich's Cubo-Futurist aesthetics in painting. But, unlike Lissitzky, Le Corbusier did not embrace the Fourth Dimension as a reflection of material relativity. Rather, he thought of it as a metaphysical thing, "...the moment of boundless freedom brought about by an exceptionally happy consonance of the plastic means employed in a work of art" (Le Corbusier, *Modulor*, 33). By dismissing the physical dimension of space-time, Le Corbusier helped suppress relativism in architecture for well over half a century. What Lenin banned in the name of a social utopia, Le Corbusier did in the name of an architectural utopia.[8] Nevertheless, by linking architectural production with industrial production, Le Corbusier brought "home", or grounded modern architecture.

At the beginning of this commentary I referred to the vernacular rootedness of pre-modern buildings. On the surface, early

modern buildings appear to have no vernacular origin, no link to the primitive acts of building. To be sure, there is no model in the vernacular for the Villa Savoye, or Mies' Barcelona Pavilion. In the early part of the century the common person was engaged in the making of industrial objects and the operation of machines.Therefore, in making buildings "like" machines, Le Corbusier was translating unto architecture a true vernacular act, generating in the process the fundamental condition for dwelling, of "being-in-the-world". To this end, his architecture fused form and function as an expression of machine-age efficiency. Buildings derived their formal identity from a purely rational response to the program: "The plan is the generator... The exterior is the result of an interior" (Le Corbusier, *Towards*, 45). In this process, invention was truth. But this was not to dominate the age. Soon enough buildings ceased to be conceived "like-machines" and instead became "machined", monuments not to the ethic of invention but to the logic of production.

Primal harmonies

As the pan-cultural, mass-produced dissemination of the modernist aesthetic, the International Style of the 30's and 40's (and the 50's and 60's in the third world) utterly suffocated the machine-age spirit of inventive efficiency. In recoil, "post-modernist" ethics emerged with sights trained in the lessons of history as an alternate grounding source. While not usually viewed as a post-modernist, Louis Kahn's sifting through the formal records of antiquity should be considered, at a minimum, as a post-modern impulse. Kahn sought in architecture the expression of meaning above function, that is, a transcendental, uncontested, universal meaning such as could be drawn from the Euclidean or "primal" geometric harmonies. Through his Beaux Arts training at the University of Pennsylvania Kahn and subsequent tenure at the American Academy in Rome, Khan acquired a solid exposure to the ancient geometries of architecture. To Kahn, Euclid's elemental shapes, the square, the circle, and the triangle, were proof positive of humanity's overriding intuitive wisdom:

> *Man's agreement with architecture is an example of something that stems from intuition, and what else is intuition but a record of the psychical and physical decisions we have made, particularly at our most dramatic moments. Intuition is the sum of the whole universe; when the universe is in question, what happens to the laws of the universe is of little importance —I utilize them all without isolating any of them, because, basically we know by intuition everything that is to be known* (Latour, 335).

This statement, which reverberates with Kantian idealism, is an affront to empiricism, a turn back to a world a priori. Kahn held that things possessed an ideal nature, a transcendent condition of truth that preceded human experience. And, it was up to intuition to discover, to make present, the true nature of the thing, of what the thing "wants to be": "A microbe wants to be a

8/ Lenin viewed the non-absolute nature of relativity as a threat to a rational —and authoritative political order (See Kern, 134-136). This eventually led to a revamping of Constructivism and abstract art in favor of social realism, i.e., the expression of a «centered» ideology.

microbe... a rose wants to be a rose... a man wants to be a man" (Latour, 163). In his architecture, this condition of truth became manifest through the use of primary or ideal geometries. Accordingly, his buildings are primarily about composition —ideal compositions derived out of axially arranged elementary solids and voids such as are exhibited in the Assembly Building at Dacca or at the Exeter Library. For Dacca's building Kahn was inspired by the baths of Caracalla, a Maggian edifice elbowing for supremacy in a city built out of primal harmonies. Kahn's great work, the Salk Institute, is revered for its central, axial court. The court functions like a die of sorts that re-cast the modern mind and allows it wander out, re-centered, into the infinite ocean horizon. Still, Kahn had to heed the vagaries of function, which forced him to do battle with the "machine" ethic. The diagrammatic set of primal geometries for the Unitarian Church, for example, eventually evolved into a looser arrangement of forms in deference to programmatic requirements. Kahn's ethic perhaps can be defined as a dialectic between "order" as an ideal condition of form, and "function" as the adapted condition of form.

Another primal-harmonist is Aldo Rossi. Rossi's architecture is eminently Euclidean and axial in character, as represented by the Cemetery of San Cataldo —a compendium of ideal forms that trace humanity's common and symbolic past. Moneo elaborates:

> *Rossi's ambition is to offer to architecture... the image of type, something that architecture has anxiously searched for without success. Mimesis for him is not mere repetition, but rather the effort to represent the common, the generic, that which implicitly carries an abstraction... It is my understanding that Rossi's wish has always been to be able to represent architecture in its primary and original condition* (Arnell/Bickford, 314).

This "primary and original condition", parallels Kahn's search for transcendent meaning. In working with "the image of type" Rossi certainly has achieved the transcendence of circumstance, the representation of universal possibilities of meaning, or, as Moneo puts it, the "materialization of memory" (Arnell/Bickford, 313). Rossi, too, embraces a supplemental ethic, but it is not the mechanistic like Kahn's. Rossi yields not an inch to the circumstance of place and program. To his primal harmonies, he rather juxtaposes the material force of the vernacular. The Teatro del Mondo is a symmetrical enclosure of classically proportioned planes that recalls the "ephemeral festival structures" of the middle ages (Arnell/Bickford, 220). In floating about from place to place in the Venetian waters, the building rises above the circumstance of site to stand against the cityscape in proud and primal independence. In purveying the primacy of type Rossi achieves the idealization of the vernacular, something the common person can readily identify with and feel reassured about.

Popular harmonies

As "true" post-modernists, Robert Venturi and Dennis Scott Brown responded to the search for a centered existential foothold in direct opposition to both Le Corbusier and Kahn. Venturi's and Scott Brown's ethics focused rather on the common, the ordinary —the cultural circumstances of the quotidian along with its complement of bourgeois tastes and biases. This is not an ethic inspired by what the common person "builds", but rather about what s/he consumes: the products, icons and messages of popular culture. As such, it is not an ethic based on a cultural ideal, but about the culturally real: the "richness and ambiguity of the modern experience", in which a "messy vitality" prevails over obvious unity (Venturi, *Complexity*, 16). In *Complexity and Contradiction in Architecture*, Venturi critically tracks the minutia of formal "complexities", "contradictions", "ambiguities", and "juxtapositions" manifest in historical precedent. Its underlying premise is that popular culture unavoidably generates a countercurrent of chaos, however much it is predisposed to conceive the world in ideal terms:

> *Some of the vivid lessons of Pop Art, involving contradictions of scale and context, should have awakened architects from prim dreams of pure order, which, unfortunately, are imposed in the easy Gestalt unities of the urban renewal projects of establishment Modern Architecture... And it is perhaps from the everyday landscape, vulgar and disdained,*

> *that we can draw the complex and contradictory order that is valid and vital for our architecture as an urbanistic whole* (Venturi, *Complexity*, 104).

In *Learning from Las Vegas*, Venturi and Scott Brown turn decisively towards populism, enshrining the urban harmonies of "pop" as the formal essence of the "age of communication" (Colquhoun, 141). Umberto Eco calls Las Vegas "Message City...a city which functions in order to communicate" (Eco, 40). Space is no longer defined principally by geometric attributes, but by its symbolic content —the message. And no message is as rich with popular crackle than The Strip, perhaps America's foremost urban invention. In structuralist terms, the strip represents an environment of pure signifieds, where the application of popular icons, as ornamentation, to the "sub-stance" of buildings, suffices to ground the common person to his/her world. This ethic is all too clear in Venturi's and Scott Brown's student project "Precedents of Suburban Symbols", where typical middle class tract housing facade and yard improvements are depicted as aspired symbols of status and wealth (Scott Brown, 29). The project implies that meaning in architecture is dependent on cultural bias and convention, as mediated by a select and particular historical context. "Historicism" or "Contextualism" were thus born, message-isms that advertised the grounding of society through the shared values of former ethical representations. In borrowing from history, a consequent return to axial symmetries took place. Of all the formal qualities of Venturi's Guild House or his mother's house, for example, their grand symmetry is their most salient feature. In these instances, however, axiallity does not represent an ideal unity, as with Kahn, but a nostalgia for one. Such nostalgia is also in evidence, in varying degrees, in the work of Charles Moore. Projects like Kresge College evoke the scale and form of old-world townscapes more so than any specific historical style. Piazza d'Italia, on the other hand, was chock-full of classical quotes, although their playful application gave the place an extra-ordinary allegorical content. Less allegorical but equally as historical is Moore's Beverly Hills City Hall addition. In scale and ornamentation the project clearly evokes the original Deco-styled administration buildings of the former city hall, and a grand axis traverses the complex through which are skewered various formal, baroque-like courtyards. In the end, such architecture relies for meaning on the surficial application of popularly understood and desired aesthetic conventions. It is architecture as a semiotic veneer, an advertisement of a culture that isn't making history as much as it is consuming it.

Dis-harmonies

Borrowing Ezio's Manzini's idea of a "semiosphere", the 70's and 80's over-production of cultural signifieds left the planet littered with semiotic refuse, which, in pursuit of "contextualism", more often than not became manifest as a pile of banal historical imitations (Manzini, 7). Such imitations are far from the ethical intentions of the "post-modern" project, yet in the end it buried it, allowing a seemingly old ethic to gain new ground: the ethics of "dis" —dis-junction, dis-structuring, dis-location, dis-*harmonies*, all better know as "deconstructivist" architecture. Prodded by post-structuralist philosophies, this new ethic sought to re-center the human subject through a *critique* of its own de-centeredness: that is, by breaking the traditional bonds between signifiers and signifieds that otherwise convey the work of culture. As stated by Barbara Johnson:

> *[This] critique reads backwards from what seems natural, obvious, self evident, or universal in order to show that these things have their history, their reason for being the way they are, their effects on what follows from them, and that the starting point is not a [natural] given but a [cultural] construct, usually blind to itself* (quoted in Rapaport, 22-23; brackets added by Rapaport).

And Mark Wigley:

> *[Deconstructivist architecture] exploits the weakness in the tradition in order to disturb it... But not from the retreat of the avant-garde, not from the margins. Rather its occupies, it subverts, the center. This work is not fundamentally different from the ancient tradition it subverts. It does not abandon tradition. Rather it inhabits the center of the*

> *tradition in order to demonstrate that architecture is always infected, that pure form has always been contaminated* (Johnson and Wigley, 18).

Frank Gehry's early work appears to be of this critical kind. The Gehry residence in Santa Monica, for example, exhibits very common and traditional elements and materials, but in un-common and un-traditional arrangements that defy the traditional relationships between form and meaning. Objects are taken out-of context, assuming a self-referential autonomy. A similar intention is evident in OMA's Villa dall'Ava in Paris. Many of the features of the Villa Savoye are present in this project: the piloti, the horizontal fenestration, the rooftop garden (a swimming pool), yet each element coalesces in space with seeming material and formal independence. The piloti, for example, are bundled to one side of the street facade rather than spaced along it, and are tilted and made slender to appear more like part of an adjacent grove of trees than an integral part of the Villa's structure. A traditional "machine-age" phraseology is thus deconstructed. As with Gehry's house, a confrontational dis-harmony emerges, but a fresh new call for re-interpretation as well.

As explained by Madan Sarup, the aim of such a confrontation in deconstruction is to "locate the promising marginal text, to disclose the undecidable moment, to pry it loose with the positive lever of the signifier, to reverse the resident hierarchy, only to displace it; to dismantle in order to reconstitute what is always already inscribed" (Sarup, 56). Gehry's house and OMA's Villa dall'Ava are about dismantling and reconstitution, about re-assembling tradition to cause a reassessment of it, allowing history to be re-introduced as a field of possible, "observer" based interpretations. The aim is to "kill the author... and celebrate the reader" (Sarup, 59). In this sense Gehry's architecture, as does much of the deconstructivist project, approaches a "relativistic" condition that exists as a topical offering to the subject's world-making autonomy (See Burns). Predictably, and as has been documented by Mark Wigley, Catherine Cooke, and others, deconstructivist architecture shares with Constructivism many formal and ideological traits. In Gehry's Vitra Museum, various cube-like solids seem to float about space, turned or rotated according to their own "motor" authority in perfectly good deconstructivist form. But the objects are then translated or rotated in space to produce intersecting "hypersolids". This is exactly what Lissitzky was after when he imagined solids in space "passing through time". The result is a "fourth dimensional" tour de force, a monument to the conceptualization and representation of Minkowski's time-space continuum. We can only dream about what the Russian Avant-Guarde might have accomplished had they had similar access to current computer-assisted design and manufacturing technology.

Tschumi and Eisenman (early phase) have also been labeled as deconstructivists. However, like the Russian Constructivists, their work is concerned with setting up new formal structures more so than disrupting old ones. At the Parc de la Vilette Tschumi set out to prove that "it was possible to construct a complex architectural organization without resorting to traditional rules of composition hierarchy and order". He also sought to "subvert context", i.e. tradition, by imposing on the site an entirely arbitrary physical and rhetorical structure with "no relation to its surrounding" (Tschumi, 38). The result is a purer brand of architectural relativity:

> *The Park's three autonomous and superimposed systems and the endless combinatory possibilities of the* Folies *gives way to a multiplicity of impressions. Each observer will project his own interpretation, resulting in an account that will again be interpreted (according to psychoanalytic, sociological or other methodologies) and so on. In consequence, there is no absolute 'truth' to the architectural project, for whatever 'meaning' it may have is a function of interpretation...* (Tschumi, 39).

The absence of "truth", the dependence on the "point of view of the observer", the "multiplicity of impressions", are cognitive derivatives of a relative, de-centered world picture. What Tschumi demonstrates at la Vilette is that there is a method to madness, a specific way in which a de-centered

world picture can be represented. His method relies basically on 1) the juxtaposition of independent layers of information (the functional and/or metaphorical "program", which at La Vilette were represented as fields of points, lines, and planes), and 2) on the manipulation of the resulting field of "combinatory possibilities" to produce disassociated and self-referential formal events or "incongruities" (Jenks, 23). In other words, A+B+C equals a number of ABC's: ABC', ABC", ABC"', and so on. Such "incongruous" commonality is made manifest by the bright, unremitting red hue shared by the park's follies. The follies, as Charles Jenks has noted, are meant to "signify at once the British 'folly' in the eighteenth century and the French notion of 'madness'..." (Jenks, 23). The follies, in effect, fulfill deconstructivism's critical agenda, "deferring" the production of objects that "mean nothing", as Tschumi aimed to do (Tschumi, 39) . In this sense, La Vilette fails to achieve a pure relative condition. Any object bearing a recognizable cultural imprint is in opposition to relativity i.e. that which otherwise bears no cultural meaning.

Eisenman's relative non-harmonies

Where Tschumi falls short, however, Eisenman succeeds. With House X, Eisenman sets out not merely to critique but to sever the impulse to re-center the human subject in some unified conception of the world. This he pursues by side-stepping the trap of conception. He rejects the presupposition that there can be a purposive end to an object beyond its pure "objective" nature. He writes: "Like some astronomical artifact dropped on earth, it is less important how [an object] arrived or what meanings society might decide to ascribe to it...than that it is there" (Eisenman, *House X*, 42). To have and object simply "be there", Eisenman follows a sequential, non-iterative process of "decomposition" in which 1) two or more objects are selected as "pre-compositional" raw material (four squares, and four "els" in *House X*); 2) through their superimposition, transformational possibilities are inhered for each object, yielding a unique composite form (the squares become off-set and the "els" are transformed into narrow and wide pairs depending on which two square sets they fall); and 3) the "data" from each such operation, or "move", is carried into progressive transformations, from the largest to the smallest scale, until no further moves are possible. The aim is to "...produce something which cannot be known or predicted from the beginning or by merely knowing a series of moves" (Eisenman, *House X*, 38). By stopping to explore the formal possibilities of the object at each stage, that is, by literally inventing each "move", causal relationships are eliminated form the process of form-making. In other words, A+B do not produce AB, but possibly M. Eisenman argues:

> *It is not immediately understandable how the object has been derived, nor can there be any projection into the future as to what its ultimate destiny might be. Rather the process...sets in motion its own historical judgement, this time as a fiction as opposed to a real history, because in an irretrievable past and a futureless present, the object has no past or future history, only a present condition as a suspension of past and future... In a futureless present —an immanent immanence — there is a removal of the extrinsic, conventional identity and significance from the object* (Eisenman, *Harvard Review*, 78-9).

Through the process of "decomposition" the history of the object becomes untraceable, which is to say that the object carries no interpretive harmonies; it becomes, as some critics contend, "hermetic", like a black hole out of which not even meaning can escape.[9] Eisenman's ethic, in effect, approaches

9/ «Decomposition» is not the antithesis of composition, in the pictorial sense, but of «compossibility,» a term which Leibniz used to infer the ability of a substance to affect its world, or, more precisely, of its *possible* composition with it. The term is aligned with «composite», which is to say the combining of substances. Decomposition, therefore, is the separation or isolation of objects previously composed (by cultural convention). In this sense, Eisenman's early work follows a deconstructivist impulse. However, the decomposed objects are re-assembled with complete formal autonomy, responding to no context or convention. In this sense, the work goes beyond the deconstructivist critique to become meaning-neutral.

the theory of relativity's logical rhetorical end: why bother with meaning when we exist in a world where any and all possible meanings are, well, possible? This conclusion has earned Eisenman the label of "positive nihilist" (Jenks, *A+D*, 26). Such criticism is based on the assumption that traceable histories and, therefore, cultural representation in architecture —even critiques of culture such as promoted by deconstructivist architecture— are desirable, perhaps even unavoidable. Through House X, Eisenman argues exactly the opposite, that the search for meaning is meaningless, an exercise in futility. And history bears him out: since the advent of relativity, many ethical course have been plotted in search of Heidegger's unified fourfold, yet each has faded, proving that the fourfold is a mirage, a temporary apparition destined to shift along with the ever shifting "point of view of the observer".

A more interesting counter-force to relativity's nihilistic gravitational pull is Cassirer's argument that whereas there are any number of possible reference systems in the universe, it is a universal principle of some kind —a "synthetic unity"— that binds them all. Cassirer, a neo-Kantian, argue this point at length:

> *But these 'relativizations' are not in contradiction with the doctrine of the constancy and unity of nature; they are rather demanded and worked out in the name of this very unity* (Cassirer, *Substance*, 374).

And further:

> *To wish to know the laws of natural process independently of all relation to any system of reference, is an impossible and self-contradictory desire; all that can be demanded is that the content of these laws not be dependent on the individuality of the system of reference... Measurements in one system, or even in an unlimited number of 'justified' systems would in the end give only particularities, but not the true 'synthetic unity' of the object". The theory of relativity teaches [us]... how we may go from each of these particularities to a definite whole, to a totality of invariant determinations* (Cassirer, *Substance*, 381).

The "invariance" Cassirer refers to is that in as much as the theory of relativity allows for measurements of physical reality to yield different results according to which referent system one chooses, the measurements will be different only according to definitive and knowable rules. What we are left with is, then, a relative truth about *natural form* (we can never be sure about what the thing looks like except from a referent system), but with absolute truth about *natural process*, i.e., the rules by which we can take the measure of nature. In this sense Eisenman's architecture is clearly relativistic: he gives us not what the form of the object means, but the rules by which it is made. As a relativistic architecture, Eisenman's early work deals with the "here and now", or, as Libeskind has described it, "the suspension of judgement" (Libeskind, 62). Without future and without past, no judgement of his objects is possible, only the pure sensation of its presence, of its being as a mere *particularity*.

Modern skepticism, Cassirer writes, rests "on the assumption of absolute sensations", i.e., on the primacy of the "here and now". By this definition, as Jenks' has already implied, Eisenman's early ethics are those of a modern skeptic (Jenks, *Harvard Review*, 26). Cassirer goes on to argue that relativity is modern skepticism's "immanent force", and also its "immanent limit", meaning that a relative world picture is, ultimately, a phenomenological construct devoid of meaning (See Cassirer, *Substance*, 389-91). It would appear, then, that in House X Eisenman reached relativity's presentational limit, which is to say that in terms of architectural representation, nothing can surpass "nothing". To accept this conclusions means resigning to the unattainability of Heidegger's "fourfold" —dwelling on earth, under the sky, before the divinities. Under such skepticism, "building" becomes an autonomous, non-associative act that grounds no one. Being is supplanted by being. Noun becomes verb. In the interest of universal truth, relativity has forced upon architecture the presentation of process, of the rules by which objects are made, nothing more. No truth is therefore derived out of the forms produced by such

process, for they respond to internal "laws of production", which lie outside human re-presentation. But, as Eisenman himself has questioned, it may well be beyond the capabilities of architecture to escape representation:

> *To the extent that all architecture must provide for space that can be entered and moved in, and to the extent that all of these spaces must withstand the force of gravity...architecture will tend to contain elements and relationships which will appear more similar from one building to another than will the respective spatial elements in, say, sculpture or painting. That is to say architecture will always look like architecture* (Eisenman, *House X*, 42).

Libeskind strikes a similar cautionary note in his aptly entitled critique, "Peter Eisenman and the Myth of Futility":

> *One would have to ask Eisenman about the kind of world that would allow itself, as if by Hegelian "ruse of reason", the prerogative of coming-into-being-through-process-without-ends as an end* (Libeskind, *Harvard Review*, 63).

It would appear, then, that architecture has reached an ethical impasse: it cannot escape the void in meaning that results in the presentation of a relative world, nor it can escape being non-re-presentational. What then?

Eisenman's non-relative harmonies

Barring the continuance of skeptical hermeticism as exemplified by House X, two alternate ethical courses seem plausible: retreating to a previous ethic, say pre-modern classicism; or shifting towards a new conception of the world from which new harmonies can be drawn. With the Cannaregio District project in Venice (1978), Eisenman appears to engage the latter course. In this project, Eisenman appropriates the architectural grid proposed by le Corbusier for a nearby (and never realized) hospital, and extends it into the Cannaregio site. As critics have noted, this move reflects on Eisenman's part a concern for context (See Hays). The Corbusian grid is used in the Cannaregio as compositional foundation, much like the initial squares in House X were pre-compositional raw material. The critical difference is that in the Cannaregio this foundations is an extrinsic asset —a formal precedent rather than a geometric abstraction intrinsic to the object-to-be. A second contextual borrowing then occurs: the scale, massing and orientation of the surrounding city fabric is projected over the new grid, acting as a *cause* by which the grid points —actual squares— are transformed into potential architectural *effects*. Because the source-points are selected arbitrarily (why not chose instead the sinuous geometry of the nearby rail terminal tracks?), and because the rules by which they were juxtaposed are also arbitrarily determined, the "reading" of context remains elusive —*except by retracing the steps by which the object was developed*. In other words, source "A", coupled with source "B", produce *traceable* object "C". Through this process Eisenman achieves historical continuity, not to evoke the past, but rather to weave the past into a "possible" future. Later projects like the Wexner Art Center at Ohio State and the Columbus, Ohio, Convention Center are still clearer about these intentions. At the Art Center, Olmsted's campus grid as well as a former ROTC armory function as source-points; in Columbus, Eisenman appropriates the facade modulation of adjacent buildings to articulate the massing of the new convention center. In an interview Eisenman was asked whether such an appropriation of context meant the adoption of post-modernism's thoughts on place:

> *I do not think it's as simple as that. For instance, at the time we did the Wexner, my own psychoanalysis was all about grounding. As Tafuri had pointed out, I was too much like Icarus; I was flying too close to the sun. The houses did not belong to the ground; my own body had no sense of ground. My analysis was about trying to get back to the ground and then into the ground, into my own unconscious. To me, being in a place, in the ground, was in part my search for myself and never had anything to do postmodernism* (Jeff Kippis, *A+U*, 177).

We must agree that historicism plays no part in Eisenman's ethical shift. What his response reveals, rather, is a desire to

enter, as an active participant, the flow of history —or, as he puts it, the "ground" in which history unfolds. Moneo has described Eisenman's ground as "a metaphor of times past" (Moneo, *Coincidences*, 40). This "ground", however, also implies continuity into the future: it is the medium of change in which the myriad cause-effect relationships that occupy space and time unfold into an unpredictable, but traceable continuum. To be sure, Eisenman's ground is artificial —a second nature. Yet the impulse to be "grounded", I will argue, has everything to do with nature and the manner in which we apprehend it as an entity: the science of ecology. To argue this point, it is necessary to define what is meant by "ecology", and how it fundamentally differs from relativity.

The fold as a monadic continuum

In as much as the theory of relativity overcame the limitations of classical mechanics as a universal law that could explain all physical phenomena, it still remains largely within the bounds of mechanics, i.e., the behavior of matter and energy in space-time. Relativity frames reality within specific reference systems, and accounts for how "it" can be transferred from one system to another. In this sense relativity stresses the difference between relative systems of perception, ascribing to any one a certain unitary distinction —a point of view. Ecology, on the other hand, focuses on the connection or relationships between unitary distinctions, emphasizing the processes by which matter unfolds into forms of energy constituting a *whole and indivisible* unity. It does so by tracing the layers of causal interaction, or the interconnection between energy systems, organic and inorganic alike.

In the nineteenth century, the transcendentalist philosophy of Emerson and Thoreau introduced to the American mind the ethics of wholeness and interconnectedness. Transcendentalism promoted what has been called a "theological ecology", a sort of organic unity among all creatures, including humans (Nash, 61). In this century, the pioneering writings of Aldo Leopold, Rachel Carson, Barry Commoner, Fritz Schumaker, and Ian McHarg, among others, have given moral and practical force to the ecological picture of the world. As a result, "environmentalism" is now solidly entrenched in our culture, both in the popular and institutional domains. But it is not principally the conservation/preservation/"small-is-beautiful" side of the environmental movement that is molding current architectural ethics. It is, rather, the ontological root of the whole thing: the conception of a flowing, indivisible, minutely connected world encompassing universes of living folds and manifolds, all part of a single web of existence. To this world picture, the philosophy of W.G. Leibniz, whom Gilles Deleuze has characterized as "a philosopher of habitat and ecology", appears to be emerging as a deep tap (Deleuze, *The Fold*, xiii). In opposition to Descartes' separability of "thinking things" (rational spirits) and "extended things" (matter), Leibniz fused both entities into primary substances called monads which continually and in continuity bind all of life:

> *In every possible world everything is linked together* (tout est lié). *The universe —however it might be constituted— is a unified whole, like an ocean; even the smallest motion extends its influence to any distance, however large* (Quoted from Rescher, 49).[10]

Written in the late seventeenth century, this statement intuits chaotic behavior as has been scientifically defined and modeled in recent years. Chaos theory admits the possibility that a single butterfly flapping its wings can affect, in some infinitesimal measure, the weather pattern in another distant part of the globe.[11] Accordingly, all substances, by their continuity and

10/ Cassirer defines a monad as «a living center of energy, and it is the infinite abundance and diversity of monads which constitute the unity of de world. The monad 'is' only in so far as it is active, and its activity consists in a continuous transition from one new state to another as it produces these states out of itself in unceasing succession. 'The nanlre of the monad consists in being fruitful, and in giving birth to an ever new variety'. Thus every simple element of the monad contains its own past and is pregnant with its future. Never is one of these elements just like any other; never can it be resolved into the same sum of purely static qualities. Anything we may find in the monad is to be understood rather as in transition. Its recognizability, its rational determinability is not owing to the fact that we can grasp it by a single characteristic criterion, but that we can grasp the rule of this transition and understand the laws according to which it takes place» (Cassirer, *Enlightenment*, 29-30). Monads are, in effect, individual «energies», or *essences*, capable of composition. Benson Mates further clarifies the «activity of monads»: «The states of a monad are called 'perceptions', and the tendency to go from state to state is called 'appetition'. In its perceptions every monad

extension in time and space, contribute to the dynamic processes of the universe, which Leibniz calls a "pond of matter in which there exist different flows and waves" (Deleuze, *The Fold*, 5). Such a metaphor implies, as Leibniz pointed out, that space is in-and-of-itself a substance "full of an ultimately fluid matter, susceptible of all divisions, and even subjected actually to divisions and subdivisions *ad infinitum*..." (Russell, 235). Monads, therefore, *are* the space-time continuum, with each one constantly affecting, and being affected by, every other. Deleuze elaborates:

> *...[a] body still has cohering parts that form a fold, such that they are not separated into parts of parts but are rather divided to infinity in smaller and smaller folds that always retain a certain cohesion. Thus a continuous labyrinth is not a line dissolving into independent points, as flowing sand might dissolve into grains, but resembles a sheet of paper divided into infinite folds or separated into bending movements, each one determined by the consistent or conspiring surroundings... A fold is always folded within a fold, like a cavern within a cavern... Folds of winds, of waters, of fire and earth, and subterranean folds of veins of ore in a mine. In a system of complex interactions, the solid pleats of "natural geography" refer to the effect first of fire, and then of waters and winds on the earth...* (Deleuze, *The Fold*, 6).

Cohering parts, cohesion, division into folds, complex interaction, conspiring surroundings: These are the metaphors that appear to be at work in Eisenman's later work. The appropriation of context, as was done in the Cannaregio, the Wexner Art Center, or the Columbus Convention Center, means the engagement of a "conspiring surrounding". The term engagement must be stressed. At the Cannaregio, it is not the copy of Le Corbusier's grid nor its extension into the project site that's of importance but its engagement with the projected geometry of the existing city fabric. Eisenman, in effect, acts like a catalyst that promotes and regulates the "complex interaction", between two substances. The process is one of direct and traceable causality, resembling natural process in its transformative strategy. Few words express this strategy more succinctly than these by Mexican poet José Gorostiza:

> *No es agua ni arena / la orilla del mar.*
> (Not water nor sand / is the edge of the sea).[12]

In other words, two dissimilar substances when composed will always produce a third substance of unique characteristics. One may question the linkage to natural process on the basis that Eisenman's borrowing of context (the water...the sand...) is entirely arbitrary, leading to what is essentially an unpredictable result. Nevertheless, the borrowing is arbitrary *within a range of available possibilities*. The issue is not whether Le Corbusier's grid was appropriated arbitrarily, but whether it was possible for it to be appropriated at all. Had Eisenman taken instead the train station as a "conspiring surrounding", the result would have been different, but it too would have been possible. This point is

'mirrors' every other monad; that is, the state of each monad at any given time 'expresses' the state of all the others at that time –each monad is a 'universe in miniature '« (Mates, 37). It is through the understanding of monads as «energies» in action, comprising the totality of the universe, that the fusion between matter and spirit becomes tenable. Conscious or unconscious, each monad contributes to a single continuum of energy . Leibniz elaborates on this point: «...[S]since each of these substances [monads] accurately represents the whole universe in its own way and from a certain point of view, and the perceptions or expressions of external things come into the soul at their appropriate time, in virtue of its own laws, as in a world by itself...there will be a perfect agreement between all these substances, which will have the same result as if they had communication with one another by a transmission of species or qualities. . .» (quoted from Russell, *Leibniz*, 261).

11/ See the Introduction and the «Butterfly Effect» Chapter in James Gleick, *Chaos, Making a New Science* (New York: Penguin Books, 1988).

12/ These are the first two lines of a Poem entitled «La Orilla del Mar». See José Gorostiza, Poesía y Poética, Edelmira Ramírez, Coordinadora (España: Colección Archivos, 1988).

key, for natural process is opportunistic and unpredictable. As paleontologist Stephen J. Gould argues, "if you re-wound the tape of life and started again with the same initial conditions, you would get a different result —every time".[13] Nature unfolds in an unpredictable manner, but within certain boundaries. This, in essence, is the point of Chaos Theory. But how can God conceive of a system without a predictable end? This was no small question for Leibniz, who, after all, submitted to the existence of God as the author of all things. He resolved the issue by defining substances as being the sum total of all *possible* compositions (states) as could arise by their *potential* interaction with all other substances within their range i.e., their own universe (boundary). God, in effect, is the author of all *possible* universes. Accordingly, the interaction between two substances is as much about the possibility of their composition, a concept which Leibniz brilliantly called *compossibility*, as is about their actual composition. Nicholas Rescher summarizes this idea as follows:

> *Every possible world has its own population of possible substances. And not just* possible *ones, but substances that are also* compossible, *i.e., capable of being realized together and conjointly. Every possible world is a* maximal *manifold of such compossible substances. There is never any addable possible substance —one that is not already a member of a given possible world and yet is compossible with the substances of this world... Every substance of every possible world has its characterizing complete individual notion that links it to all other substances of its world. In consequence there is a (conceptual) linkage between the things of each world that render them indissolubly interconnected* (Rescher, 49).

The Cannaregio is about the linkage of compossibles, about extending a site condition into the flow of history —and it is in this way that Eisenman "gets back to the ground and into the ground". As if to underscore the point, the squares that extend Le Corbusier's grid into the project site are configured as actual depressions out of which rise, like a rebirth, the new buildings. Le Corbusier's hospital never got built. Nor will Eisenman's proposal. But both are now compossibles for further explorations into the continually evolving identity of the Cannaregio, and, by extension, of the whole of Venice, Italy, the world, the universe. The Cannaregio is, in effect, a "fold" in what Leibniz calls the "labyrinth of the continuum" (Rescher, 100).

In the Rebstockpark project in Frankfurt, Eisenman exercises a formal translation of the Deleuzian fold, *while using The Fold itself as a conspiring surrounding.*[14] Context in this instance is an abstract condition —the "folds" of the German soul as characterized by Nietzsche.[15] This borrowing sanctioned the use of literal folds, without further contextual indexing, as a grounding device structuring the entire site. To my mind, however, the result is poorer than at the Wexner Center for the Arts, as an example, because it is unlayered: only a single, abstract borrowing has taken place, which negates the possibil-

13/ Quoted from a Steven J. Gould lecture in his «History of Life» course, Harvard University, February 9, 1993.

14/ Eisenman collaborated with Hana/Olin, landscape architects on this project.

15/ Eisenman introduces his thinking on te Rebstockpark project by quoting Nietzsche on the German spirit: «The German soul is above all manifolds... The German is acquainted with the hidden path of chaos...» (See Eisenman, *Viel*, 16).

ity of interaction between "compossibles". The derivation of form, then, rested exclusively on the manipulation of folding planes and their causal potential; that is, their ability to "affect" whatever building program needed to be placed on the site. Specific rules were applied as to how pre-sited building and landscape typologies should be activated by the site's fold lines, which intersect them at random. Where the crease of a fold runs through a building, for example, the roof planes angle upward as if lifted by an invisible force. Building facades likewise shift in orientation as they are engaged by fold lines, as do landscape features such as water canals, tree allees, and meadow patches. The application of pre-determined rules achieved an unanticipated urban landscape laden with formal accidents, situations and encounters. This method, to Robert Somol "compels a rethinking of architecture and urbanism [and landscape architecture, I might add] from a theory of the accident rather than the object" (Somol, 4). He further comments:

> *In contrast to the interpretive deep logics and strong forms of the last century, the chance Eisenman takes at Frankfurt is for an urbanism and architecture that exhibits characteristics more like those of gambling and photography, that preserve the accident, that displays a 'weak intentionality,' and allows a weakening of architecture's meaning system... As the ruins (and windfalls) of catastrophe theory, the structural faults of Rebstockpark preserve the possibility of the accident, the undecidable, through a spatial and temporal dilation, the moment of being here and there, now and then* (Somol, 7).

Eisenman puts it in another way:

The fold is like the site of all the repressed immanent conditions of existing urbanism which, at a certain point like the drop of sand which causes a landslide, has the potential to reframe existing urbanism, not to destroy it but to set it off in a new direction (Eisenman, *Viel*, 16).[16]

The distinction of the Rebstockpark project is that forms were derived from a set of rules, much like algorithms can be deployed to generate fractals in a computer screen. Algorithmic operations will always, true to chaotic behavior, "set things off in new directions". This is how nature works. Nature is accidental, contingent, opportunistic, *but within certain boundaries*, as set by its own rules. The Rebstockpark exercise is strictly about the use of pre-determines rules, or principles, by which architectural forms come into being. This approach, as Deleuze points out, is the "true character of the Leibnizian game... that of principles themselves, of inventing principles" (Deleuze, *Fold*, 67-8).

As a process, the unfolding of principles leads to the complexity we call nature. The use of "conspiring surroundings", or layers of information, coupled with the use of predetermined rules of combination yields the artificial equiva-

16/ The fold is a technical term used to describe singularities, bifurcations and catastrophes associated with the emergence of discrete structures from smooth and continuous ones (Poston and Stewart, ix, 174). The point at which water begins to boil is an example of such a bifurcation, or catastrophic fold. Catastrophe theory was developed by French mathematician René Thom in the sixties, and it is considered a close relative if not a stepping stone to the theory of chaos. Eisenman directly references Thom's mathematics in forwarding an application for the use of the Leibnizian fold in architecture «In one sense catastrophe theory can also explain abrupt changes in the state or form of such controls as figure to ground, urban to rural, commercial to housing, be means of a complex fold that remains unseen» (See Eisenman, *Unfolding*, 14-16). The Rebstockpark project does in fact contain «abrupt changes», but these have little to do with contextual continuity, which is a catastrophe theory prerequisite.

lent, in architecture, to natural process. But why bother? Why should it at all be important to use natural process as a design artifice?

Conclusion

According to Heidegger, the condition of dwelling is in itself conditioned by the act of building. When Le Corbusier translated the act of building machines to the process of building buildings, he tapped into the life-force of the vernacular, to what the common person built, grounding the human subject in the process. Today, through resource conservation, wilderness preservation, habitat reconstruction and rehabilitation, product recycling, organic growing and consuming, and the focused vigilance against environmental degradation, the common person is increasingly engaged in the "building" of the planet. All of these practices, not to add the "folds" of laws, regulations, and administrative procedures that frame them, are generating a new condition of dwelling, of being-in-the-world. Vernacular construction can thus be viewed as the act of building the planet —our collective *house*, which, after all, is the Greek root for ecology (oikos). The breath and significance of this undertaking cannot be overstated. Nothing since the industrial revolution has had as great an impact upon the welfare of humanity as the current and ongoing "green" revolution.

To the practice of architecture the ethical implications are all too clear: if during the machine age buildings were designed "like" machines, in the environmental age buildings should be designed "like" nature. Not natural (as in Biosphere II in Arizona), nor natured (as in organic, or metabolic architecture) but rather like the process by which nature makes itself.

In building artificial environments like nature, we place upon the designer three fundamental burdens: first, the selection of contextual features (physical or abstract, such as the German soul); second, of interpreting their "conspiratorial" potential as an extension of history; and third, the derivation of rules by which the various contextual layers can be composed (in the Leibnizian sense). Nothing in this approach requires an a-priori conception of the object; just the opposite, the object —a building, a landscape, an urban precinct— can only me made by a process of algorithmic approximation once the layers of information and the rules of interaction are devised. Its final form cannot be known except by "running the program".

Such a nature-like process of object-making is axial in character. Layers of information, particularly after they have been translated into some graphic or plastic equivalent, can only interact along an axis, along a prescribed direction. In Rebstockpark, the folds emerged out of the ground, in a vertical direction perpendicular to it. In nature everything composes itself strictly along the axes of gravity and light, which are perpendicular to the ground. These axes rigidly fix the processes of natural composition along their shafts . While the "logic" of natural production works in layers that stack themselves vertically, the experience of nature occurs along a horizontal plane. Nature's complexity accrues from the cross-axial distinction between process and phenomenal prehension. To understand a landscape we must make a map of it, which is essentially a synthesis of vertically stacked layers of information. To "feel" the landscape, on the other hand, we must walk along the ground, across the grain of natural process. It is in this sense that "nature-like" environments are more like nature: meaning is obtained from the rules of composition and the trace of the interaction by which layers of information generate complex forms. Rebstockpark's formal complexity, and its meaning, are derived from an analogous process.

The preceding arguments point to the emergence of an ethic inspired, albeit at an abstract level, by an ecological view of the world. The question remains, however, whether this ethic represents a true paradigmatic shift, or merely one more soon-to-be-superseded attempt to re-center the human subject around some over-arching "truth". It is tempting to dismiss "ecological ethics" as just another ontological flair-up. It is notable, however, that this ethic reinstates the two conditions that regulated the production of architecture for millennia: a vernacular life-line to the constitution of "being", and an axial disposition to the composition of form. Perhaps there is yet hope to regain a foothold in the fourfold. Or just the fold.

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