PSYCHIC AUTOMATISM AND NONLINEAR DYNAMICS: SURREALISM AND SCIENCE IN THE ARCHITECTURE OF COOP HIMMELBLAU::

MICHAEL J. OSTWALD and MICHAEL CHAPMAN

Professor Michael J. Ostwald is Dean of Architecture at the University of Newcastle (Australia), Visiting Professor at RMIT University in Melbourne and a Professorial Research Fellow at Victoria University Wellington (New Zealand). He is the author of more than 250 research publications including 16 books. He is on the editorial boards of the *Nexus Network Journal: Architecture and Mathematics* and *Architectural Theory Review* and he is co-editor of *ADR: Architectural Design Research*.

Michael Chapman is a lecturer at the University of Newcastle in Australia. He is currently completing his PhD in architecture concerned with the relationship between surrealism and architectural theory. Together with Michael Ostwald he is an author of *Tracings: Architectural and Urban Memories* (2003) and *Residue: Architecture as a Condition of Loss* (2007).

Abstract:
The Coop Himmelblau[i] partnership of Wolf Prix and Helmut Swiczinsky has, since the 1960s, been engaged in an attempt to break away from mainstream approaches to architectural design and production. Originally contemporaries of Archigram, Archizoom and Superstudio, Coop Himmelblau's manifestos for architecture have, since that time, portrayed a growing preoccupation with feed-back mechanisms, looping, folding, instantaneity and the attempt to recast architecture as metaphorically chaotic. While there have been extensive critical analyses of Coop Himmelblau's early post-Vitruvian, or anti-humanist propositions, their approach to design in the late 1980s and early 1990s has rarely been considered in such detail. Throughout this latter period, Coop Himmelblau merged surrealist concepts like "automatism" with the rhetoric of complexity scientific including "interference", "chaos", "indeterminacy", "iteration" and "open systems". The focus of this paper is Coop Himmelblau's celebration of the original design impulse, instance or event – what they call the psychogram – and its interpretation by Michael Sorkin as a reference to both surrealist automatism and scientific complexity.

The Dissolution of our Bodies in the City, Coop Himmelblau Architects.

The work of the Austrian firm Coop Himmelblau has emerged in the last two-and-a-half decades as a major force in world architecture and it is now celebrated through large commissions from prestigious clients and across multiple continents. However, despite the exponential growth of their practice, the focus of Coop Himmelblau's work has remained on the initial creative act; a feature which has shaped their distinctive style but is still poorly understood. Their architectural work is typically characterised by the unravelling of the design process; a method that allows their finished buildings to express the creative gestures which have shaped them. This process of dismantling the architectural object, while less evident in their works of the last five years, is at the heart of the firm's idiosyncratic approach to architecture and is indicative of a design process which is highly original yet often overlooked.

Michael Sorkin's introduction to *Blaubox* (the Architecture Association's Folio of Coop Himmelblau's work) commences with an argument that closely links the development of Coop Himmelblau's architecture with the dominant culture of its time. The essay, later published as "Post-Rock Propter Rock" in the collection of Sorkin's essays entitled *Exquisite Corpse* (1991a), argues for a correlation between the turbulent cultural upheavals of the 1960s and the anarchic spatial forms and design processes developed by the practice. Sorkin contextualises the firm's work amidst the tumultuous events of 1968, attributing to the year: "kids in the street, Paris shut down, Yellow Submarine, moon landing, the *White Album*—and Coop Himmelblau" (Sorkin 1991a, 339). Sorkin argues for a cultural connection between the exploratory early work of Coop Himmelblau and the anti-authoritarian message of the Rolling Stones. This conjecture was later confirmed by Wolf Prix who notes that "Coop Himmelblau was founded in 1968. That was the year in which not only architecture, but everything exploded: art, science, technology, education, philosophy and music" (Prix 1995, 399). This alignment is a primary theme in Sorkin's essay that he develops by positioning the wholesome appeal of the Beatles and the more discursive politics of the Rolling Stones in opposition to each other. As Coop Himmelblau's work developed over three decades Sorkin proposes that it paralleled other important changes that were occurring in the broader cultural sphere of science, literature, music and the arts throughout the same time periods. Although this proposition underlies much of Sorkin's text there is one point at which the critique changes in both style and content. After describing the development of different themes within the work of Coop Himmelblau, Sorkin produces a complex critique that simultaneously links their architecture to the anarchic games of the Surrealist movement and the science of nonlinear dynamics. Focussing on both the Surrealist game of the "exquisite corpse" and the nonlinear dictum of a "complex dependence on initial conditions" Sorkin argues that the design process embodied in the firm's work manages complexity and automatism by dismantling the certainties of more traditional architectural models.

These connections between complexity and surrealism, while often suggested in analyses of recent architecture, have never been adequately scrutinised in the work of Coop Himmelblau. The present paper focuses on Sorkin's two-fold critique of Coop Himmelblau's design method and the relationship it proposes between surrealism and the sciences of nonlinearity. The paper tests Sorkin's claims against both the artistic practices of Surrealism and the scientific concepts of chaos theory. At the heart of this analysis is the psychogram; a celebrated design armature that Coop Himmelblau employed in their work throughout the 1990s. The paper concludes that Sorkin's analysis is at its most insightful when it is concerned with the artistic, poetic or spatial qualities of Coop Himmelblau's architecture and less useful when it draws more detailed scientific parallels.

The Psychogram in the Architecture of Coop Himmelblau:
Coop Himmelblau's design method has long revolved around the creation of an ideographic sketch that they call a psychogram. The rationale behind the psychogram is that it captures the perfect, or unsullied, subconscious desire of the architect. For Coop Himmelblau the act of drawing the psychogram is "the first capturing of the feeling on paper" (Coop Himmelblau 1991, 23). The themes expressed in the psychogram then become more legible as they are developed in increasing detail although the original psychogram remains sacrosanct. Between 1990 and 2000 Coop Himmelblau have described the formation of their theoretical position almost entirely in terms of the construction of the psychogram. "In the last five to ten

years we have begun to shorten the actual process of design, to condense it. [...] We try to define the feeling, the emotion that the space is later to radiate. And then suddenly we have a drawing, sometimes on a sheet of paper, sometimes on the table" (Coop Himmelblau 1991, 19). The psychogram, usually a drawing but sometimes a model, is the architect's expression of emotion liberated from the rationalising constraints that bind conventional architectural design processes. Coop Himmelblau's aim has been to reduce the design process to a single, volatile instant of creativity. They propose that the greater the degree of compression of time between the starting and finishing of a psychogram the greater the validity of the design. As the firm reveals, "in the last three to four years we have begun to shorten even further this very rapid design process, which can best be compared with coming close to the centre of an explosion" (Coop Himmelblau 1991, 21).

This intuitive design process culminates in their Groninger Museum project where an enlarged version of the initial sketch is physically etched onto the side of the building so that, as the steel rusts away, the only element left of the building is the sketch (protected from rust by the etching process). The process thus links poetically the building's destiny with its origin as well as materialising the sketch as a physical component of architecture. The tension between the "speed" of the sketch, and its eternal mummification in architecture is one that is left unresolved by the architects.

Anthony Vidler, suggesting a link with surrealism, describes the production of the psychogram as a kind of automatic writing "operating through blind gesture translated into line and three-dimensional form" (Vidler 1992, 70). The architect's act of creation, Vidler submits, is deliberately embodied within this process of automated production. According to Vidler, "Coop Himmelblau's projects attempt to recuperate an immediate connection between body language and space, the unconscious and its habitat" (1992, xii). In Vidler's reading of the significance of the psychogram, the act of drawing mediates between the body, space and mind. The production of the psychogram, it is argued, is *not* a method of recording the temporal, indeterminate or random emotion that precedes architecture. The psychogram is rather, for the specific purpose of rendering the building metaphorically organic and defined in terms of an amorphous but distinctly human condition.

Focussing on this impulsive design process, Vidler has authoritatively established Coop Himmelblau as one of a number of recent practices which, in unison, constitute a "third" paradigm in the historical relationship between the body and architecture: the first two being Vitruvian Classicism and, following that, physiognomy which dominates the theorising of the French Enlightenment (Vidler 1990). For Vidler the work of Coop Himmelblau can be aligned with an anti-humanist tendency that seeks to violently dismantle the relationship between the body and architecture and is a characteristic of avant-garde practices of the late Twentieth Century. The implications of stabbing, puncturing and piercing which are manifest in many early Himmelblau projects provide a clear correlation with this tendency to destabilise the body as the logocentric origin of architectural form (Ostwald and Moore 1995; 1998). Evidence is for this position includes Coop Himmelblau's widely quoted pursuit of "[a]rchitecture that bleeds, that exhausts, that whirls, and even breaks. Architecture that lights up, stings, rips and tears under stress" (Prix 1980, 46). In Vidler's reading of Coop Himmelblau the psychogram is an attempt to project a bodily metaphor into the building, rather than the endeavour to capture an aleatory moment of time (Ostwald 2000). The ambiguity in Coop Himmelblau's design methodology is evident in the twin translations of the psychogram as bodily vehicle or chaotic metaphor. Sorkin deliberately, and for reasons relating to his own design predilections, chooses the latter interpretation. However, Sorkin's reading of this "chaotic metaphor" draws heavily from the creative processes of the Surrealist movement and so chaos is connected with the automated processes of the exquisite corpse. This paper examines these two polarities in an attempt to illuminate the psychogram in architecture.

Coop Himmelblau and Psychic Automatism:
Recent research has established the importance of Surrealism and its influence over the political upheavals and protests of May 1968 in Paris as well as its ongoing importance in art production after the war (Mahon,

2005). The anarchic games of the early Dada experiments and the erotic polemics of early Surrealism were historically reconstituted at the heart of critical activities in Europe in the late 1960s, explicitly in the experiments of Fluxus, the broader evolution of conceptual art and the politically motivated activities of the Situationists. This cultural repositioning of Surrealism, like the evolution of rock and roll and the technological advances of the space age, is positioned by both Sorkin and Vidler as an enduring influence on the work of Coop Himmelblau.

Sorkin's *Blaubox* essay is replete with surrealist imagery. Paraphrasing Breton's famous conclusion to *L'Amour Fou*, Sorkin writes that Coop Himmelblau's "architecture will be convulsive or not at all" (1991a, 339). Later he evokes Dali's famous installation for the original Surrealism exhibition in Paris in 1937 as a metaphor for the firm's work; a process where "[t]he Rainy Taxi learns to fly" (1991a, 342). Sorkin links Coop Himmelblau's work with recognised members of the Surrealist movement such as Frederick Kiesler, the only official architect member of the group, comparing Coop Himmelblau's troubled Ronacher Theatre with Kiesler's earlier Raumbühne, or "Space Stage" (1991a, 349). Sorkin also demonstrates how the work of Coop Himmelblau contains resonances, both stylistically and theoretically, with the Dada/Surrealist artist Kurt Schwitters and specifically his famous "Merzbau" project. This is a connection that is made explicit in Himmelblau's own 1981 project for the Merz School in Stuttgart; a connection that Sorkin also draws critical attention to (Sorkin 1991a, 345; Prix 1981, 92). In contrast, Frank Werner (1995, 35) acknowledges the connection with Schwitters, but unlike Sorkin, he argues that this lineage should not be seen as especially significant.

Despite all of the connections that can be established between Coop Himmelblau and the various exponents of Surrealism, it is the fascination with automation that provides the most enduring thematic connection and it rightly dominates Sorkin's analysis. Sorkin sees Surrealist automation as the bridge between Coop Himmelblau and chaos theory—connecting the bodily/psychic creative processes of art with the predicated indeterminacy of mathematics. Sorkin sees in Coop Himmelblau's psychogram

> the hoary surrealist aim of the "dictation of thought without the control of the mind," an abiding youth culture trope, an angelic pursuit, the beginning of innocence. But the privileging of the sketch is more than just a strategy for clearing the decks: it's a brave signal of intent, a vow of no compromise, a pledge of truth and consequences. Breton (the ur-rocker) analogizes automatism to a melody, a structure imposer, "the only structure that responds to the non-distinction… between sentient and formal qualities, and to the non-distinction … between sentient and intellectual functions". (Sorkin, 1991a, 346.)

At this point, Sorkin's analysis overlaps with the theoretical assertions of Vidler who sees the psychogram as a kind of "automatic writing" which aligns with the psychoanalytical themes that preoccupy his broader architectural research. Prix, confirming the arguments of both critics, wrote in 1990, that "one could compare this process of design with 'transautomatism' in art" (1990, 63). Coop Himmelblau, in further support of this influence, openly acknowledge their debt to the Surrealist and Viennese prophet Sigmund Freud and have been frequently connected with psychoanalytical processes as well as the automatism experiments of the movements leader André Breton.

Automatism was originally a by-product of Dada, which used spontaneity and chance to dramatic effect as a way of reacting against bourgeois taste. As part of this push towards instantaneous composition, the Dada movement invented the use of photomontage. They were attracted to photomontage for its direct political iconography as well as its ability to capture the dynamic and random energy of the city. They also used this technique in their graphic experiments with typography where texts were reduced to individual letters and arranged according to visual and spatial principles. Coop Himmelblau also used photomontage in the 1980s when they exhibited images that were violently torn, ripped and shredded and then reassembled as footprints for architectural form. An image of Prix's and Swiczinsky's faces positioned against a plan of the city and then slashed open and violently penetrated with shards and nails, demonstrates this tendency to

arbitrarily decode the image; to strip it of it inherent meaning and then use it as a platform for indeterminate and violent acts of architecture (Coop Himmelblau 1992, 12).

Similar artistic methods including collage and Max Ernst's process of "frottage" all emerged at this time in an attempt to allow the Surrealist artist to communicate a kind of instantaneity. Central to the evolution of these processes was the notion of indeterminacy, as artists increasingly sought to distance themselves from the work of art and the accumulated bourgeoisie values embedded in it. Foremost in this process were the collages of Hans Arp. Arp tore up pieces of coloured paper and scattered them on the ground, later gluing them in place to make abstract compositions of colour which, he argued, where more meaningful than compositions he had deliberately arranged. Arp wrote of this procedure that,

> often I shut my eyes and chose words and sentences in newspapers by underlining them with a pencil. I called these poems "Arpaden"… We thought to penetrate through things to the essence of life, and so a sentence from a newspaper gripped us as much as one from a prince of poets. (Arp, quoted in Gale 1997, 87).

Arp's process of collage, also undertaken with closed eyes, has a relationship, at least in terms of process, to Coop Himmelblau's psychogram where the creative event and the act of making are accelerated into a singular, uncontrollable moment. The Surrealists associated the act of closing their eyes with automatism, somehow enabling a direct connection to the unconscious. A famous image by Rene Magritte entitled "Je ne vois pas la … cachée dans la foret" [I do not see the … hidden in the forest] shows the leading members of the movement photographed with their eyes closed further reinforcing this connection with a non-visual model of artistic production (Caws 2004, 76).

A common image that is used to promote Coop Himmelblau's work shows the hands of Prix and Swiscinsky each poised above a blank page and communicating, in a single image, the creative identity of the practice. The picture, implying the moment connecting the sketch with the body, is replicated in a number of images of surrealism including Herbert Bayer's 1937 *Self Portrait*, which shows an identical hand poised above a page. Kiesler also used a famous image of a hand tying a knot to promote many of his exhibitions. The relationship between the hand and the artwork is a theme in Rosalind Krauss's "When Words Failed". In this text she uses the Bayer image of the cropped hand to unravel a discursive history of art – a history where, in the work of certain artists, action replaces content and language as the primary means of communication (Krauss, 1982). The resonance between this surrealist history, and the work of Coop Himmelblau begins to suggest a relationship between the graphic practices of the two groups as well as the theoretical constructs that underpin them.

Mary Ann Caws, discussing the work of the lesser-known surrealist painter Dorethea Tanning, reinforces the alienating qualities of some of this imagery when she writes:

> [t]he hand, as presented in these works of 1988, is never attached to an arm or anything else. These are studies of detachment, of isolation—if you like of the creative act as it knows itself to be detached, even as it is most significant. Tanning never falls into the trap of painting herself isolated; it is enough to paint, to paste, to draw a hand in isolation from the rest of the body and the rest of life. (Caws, 1997. 93).

This cropping of the body, its implication in the creative act and its separation from any notion of continuity or totality within the world, as well as resonating with the iconic Himmelblau photo, overlaps with the most pervasive themes of recent surrealist discourse, including alienation, the crisis of the body and broader psychoanalytical themes such as castration anxiety (Krauss 1994; Fer 1995; Foster 1997; Caws 1997; Foster 2004).

However, as much as the ideographic sketch shaped and recorded the insistent speed of surrealist creativity, it was the camera rather than the pencil that became the vehicle that the surrealists used most consistently to document the violent impulse of the creative act. Man Ray's "rayograms" are only one of a number of iconic examples of this; where objects are placed, thrown or dropped onto photographic paper, documenting the creative act in the finished exposure. Experiments with solarisation, multiple exposures and decalcomania were all techniques developed by the leading Surrealists to document this obsession with speed. These techniques overlap, both stylistically and methodologically with the broader project of Coop Himmelblau's psychogram.

As these processes emerged in Dada and Surrealism respectively, they also became, like the psychogram, increasingly violent, as instantaneity became the datum against which works were measured. Often involving dropping sharp objects from a height, throwing darts at a wall, tearing, ripping and slicing, the bodily act of violence becomes the art object, as the artist tears, rips, slices and shreds at the material fragments that compose it. Caws, echoing the words of Prix himself, wrote that "for a while, Surrealism seemed to me to be all about speed. [...] Such an obsessive speed, desperate to get things down, verged at times upon hysteria in its wish to close the gap between perception and the subsequent representation" (1997, 29). Nowhere was this creative obsession with speed and indeterminacy more clearly articulated than in the surrealist game of the Exquisite Corpse; a process wherein speed, blindness and indeterminacy are formulated within a controlled system of artistic production. This game, as described by Breton, consists of a folded paper exercise whereby participants add their own words to a piece of paper without knowledge of those preceding (Sorkin 1991b). By then folding these phrases into the paper, and out of sight, another participant in the game may add their words to the paper. As the game develops over time, the words became drawings, blindly drawn on folded segments of paper so that the lines of each image are connected, but the content is not. The outcome of this exercise, as well as delighting the Surrealists, was thought to provide an exemplar for liberating the mind from its traditionally rational thought processes. The combination of random and yet still confined elements (each word is random but all are still words) created a simple machine to produce unfettered works. The game, a form of automatism, was named after one of the first sentences revealed; "the exquisite corpse will drink new wine." The inference is therefore that, a series of iterative rules while not restricting the creative process had assisted in the creation of a collective image (or design) whose final complex and preternatural imagery was beyond the predictable outcomes of any single component (Ostwald, 1992).

Coop Himmelblau and Chaos Theory:
In his essay for the *Blaubox* edition of Coop Himmelblau's works, Sorkin argues that the psychogram acts in much the same way as the surrealist game the Exquisite Corpse. The production of the psychogram is, apparently at least, an event wherein the mind and the pencil interact directly and spontaneously. In this event the mind's impulse (or emotion) is processed into an image without passing through an interface or filter. Although the resultant image is not strictly stochastic its aim is to liberate the design from constraints that have become ingrained in the architects' acculturated or educated design practice. Thus, in this sense the psychogram could be described as random at least insofar as it resists the architectural proper (Ingraham 1988).

Although this technique is neither original nor necessarily worthy of consideration in isolation, the manner in which Coop Himmelblau privilege the sketch above all other factors has drawn many critics to connect their work to nonlinearity. Sorkin identifies this rigid adherence to the original psychogram as analogous to automatism; the process of composition or design through random or nonlinear processes. Having identified this technique and highlighted its importance for understanding the work of Coop Himmelblau Sorkin then argues that the "true consequence of this journey [of automatism] can be chaos. Chaos may be a little overfamiliar nowadays, especially in its studied inscription in architecture. However, the idea behind this latest upheaval in physics does have real implications for us" (1991a, 346-7). This statement is noteworthy as Sorkin, almost alone amongst architectural theorists to enter into comparisons with nonlinear dynamics,

prefaces his argument with a *caveat emptor* that, despite its misuse, nonlinear dynamics is still an important theory with implications for architecture (Ostwald 2001). This preface also signifies one additional dimension, ironically at odds with the obvious connotations of his paragraph: that Sorkin has a greater understanding of the topic than many of his contemporaries. Few of the architects or theorists who have made tentative or misguided forays into the field of nonlinear dynamics have recognised the superficiality of their acts. As popular culture is subsumed into architecture, so too is popular theory regardless of whether it originates in either philosophy or science (Ostwald 1999).

Sorkin proceeds, after his caveat, to provide one of the more lucid and accurate descriptions of the significance of nonlinear dynamics written in architectural theory.

> Chaos calls into question the idea of linearity, Newtonian classicism, the reductive notion that physical problems can be solved definitively, that simple rules or equations ultimately rule or equate simply. This radical deterministic optimism is summed up by that Pangloss of Newtonianism, Pierre Simon Laplace, who postulated a celestial intelligence which could "embrace in the same formula the movements of the greatest bodies in the universe and those of the lightest atom; for it, nothing would be uncertain and the future, as the past, would be present to its eyes." (1991a, 347)

In this description Sorkin has captured two crucial notions at the core of Chaos Theory; that it is nonlinear and that it negates the Laplacian conceit of certainty. Whilst other descriptions of Chaos Theory in architecture have dwelt on the implications of anarchy in society or natural catastrophes Sorkin avoids this line of reasoning. Similarly Sorkin deftly avoids the next most common analogical connection to complexity, usually by way of urban chaos and heterotopia (Papadakis 1992; Mayne 1992). Instead Sorkin relates Coop Himmelblau's insistence on the retention of complexity to the Butterfly Effect.

> A commonplace of the study of chaos is the so-called "Butterfly Effect" or, more properly, the idea of "sensitive dependence on initial conditions." The image comes from meteorology, a science which has long laboured after the Newtonian grail of predictability. In the pre-chaotic model, faith had it that small events were without real consequences, that the system would simply slough them off. The post-chaotic view celebrates these slight contributions: the fluttering of the butterfly's wings over the Ringtrasse redounds above Bedford Square. Systems tend to complexity, not simplicity, or, in Benoit Mandelbrot's phrase, "clouds are not spheres." And this, this voyage from sphere to cloud, is precisely Himmelblau's. (1991a, 347)

Although all of Sorkin's quotations come from a single source[ii] the manner of their use, and the clever association with Mandelbrot's famous description of natural geometry (Gleick 1987; Mandelbrot 1977), serves as an evocative link to Coop Himmelblau's early passion for both clouds and spheres (Coop Himmelblau 1984). The Butterfly Effect has strong implications for Coop Himmelblau's work as it proposes a system that is inherently unpredictable (within certain limits). Coop Himmelblau have used the concept of an "open architecture" to describe their efforts to produce an architecture that is "not for a specific purpose". These are "self-sufficient structures that form differentiated spaces, spaces that do not pin down the future user" but promote the idea that the exact use of any space is indeterminate at any given moment in time (Coop Himmelblau 1991, 18). This indeterminacy is related by Sorkin directly to the creation of psychograms and, by inference, to the Exquisite Corpse.

Although Sorkin never makes the connection, the Exquisite Corpse machine appears to mirror the creation of fractal geometric form; the geometry of nonlinear dynamics. Both processes rely upon a seemingly linear sequence of iterations, each stage repeating the last, but the complexity of the outcome of each stage, in either words of numbers, is ultimately highly detailed. However, despite such broad similarities, the relationship can not be extended any further. While the words chosen for the Exquisite Corpse are random (within predetermined limits), the fractal geometry produced through the iterative process is not random, rather it is just complex and self-similar (Barnsley 1988). It could be argued though that the output of the

Exquisite Corpse game was a string of words and therefore that commonality of signs was a form of order. This argument would rely upon an understanding that language may only be analysed though systems of language. Attempts in mathematics to derive first-order axiomatic languages have resulted in the realisation that such attempts are self-referential and consequently instable (Hofstadter 1979). Thus both the iteration of language and the iteration of geometry are, in this sense, linked to scaling; although this relationship is both complex and outside the bounds of this paper. Despite this, the superficial similarity between Sorkin's Exquisite Corpse, Coop Himmelblau's psychogrammatic indeterminacy and nonlinear dynamic's Butterfly Effect is notable. The final outcome of each of these automated acts is seemingly unpredictable because at each iteration the sequence is randomised, or at least undergoes complex elaboration. Thus the final stage or outcome is sensitively dependent on the first stage. To return to Coop Himmelblau and predictability Sorkin states the their Open House project:

> […] is a shrine to the sensitive dependence on initial conditions. The impetus to retain—with utter fidelity—the character of the first sketch is exactly this. Instead of trying to smooth things out, rationalize an impulse without ready quantification, Himmelblau trusts the evidence of their sensibility, and then struggles to retain it—whatever the consequences. […] Instead of retreating into the tactic of the impossibility of building, they attempt to build the impossible. (1991a, 347)

It is here that the first flaws appear in Sorkin's argument. Although the random, surrealist psychogram is the initial condition it is also, as far as Coop Himmelblau can make it, the final condition. Coop Himmelblau's aim is to match the building as closely as possible to the psychogram. This is contrary to the implications of the Butterfly Effect as this law suggests that the final condition of the system, both architectural and meteorological, is unpredictable owing to the immeasurability, or perpetually unknown nature, of the starting condition. Rather like the perpetual failure of any search for mythical origins (Pfau and Jones 1987), the search for origins in Coop Himmelblau's work should be shrouded in mystery, not recorded statically as identical from first to last stage. In Coop Himmelblau's work the iterations, which start out with a random operation, then strive to remain static, stable and faithful to this initial cast of the die. In nonlinear dynamics, each iteration results in the creation of a new related psychogram; each iteration builds upon the last, or more correctly, looks more closely at the last and reinscribes itself within the old psychogram. Thus although, initially at least, Coop Himmelblau's architecture is concerned with chaos and unpredictability after the production of the ideogram the process returns to the predictable and to the Newtonian or Laplacian fixation on certainty. Ultimately Coop Himmelblau's adherence to the initial condition of the system reduces any tendency towards sensitive dependence. Despite this, Sorkin's reasons still possess a degree of descriptive accuracy. Even though the two systems, one natural, the other architectural have similarities and differences a sufficient number of additional cues exist for Sorkin to draw his parallels even if the production of a psychogram does not support claims of sensitive dependence.


Conclusion: Rethinking the Open House:
In 1937 the founder of Surrealism Andre Breton wrote, in his novel *L'Amour Fou*,

> I myself shall continue living in my glass house where you can always see who comes to call; where everything hanging from the ceiling and on the walls stays where it is as if by magic, where I sleep nights in a glass bed, under glass sheets, where *who I am* will sooner or later appear etched by a diamond. (1937, 18)

The passage, in a novel replete with architectural imagery, could be an introduction to the crystalline architectural objects that Coop Himmelblau imagined throughout the late 1980s. Breton, imagining a fantasy domestic life of floating psychic independence, had already predicted the struggles with transparency and gravity that would shape the architectural objects of Coop Himmelblau and reiterate the connections backwards towards surrealism and forwards, towards an architectural culture obsessed with fractal geometry. Nowhere is this more clearly articulated than in the "etched diamond" of the Open House.
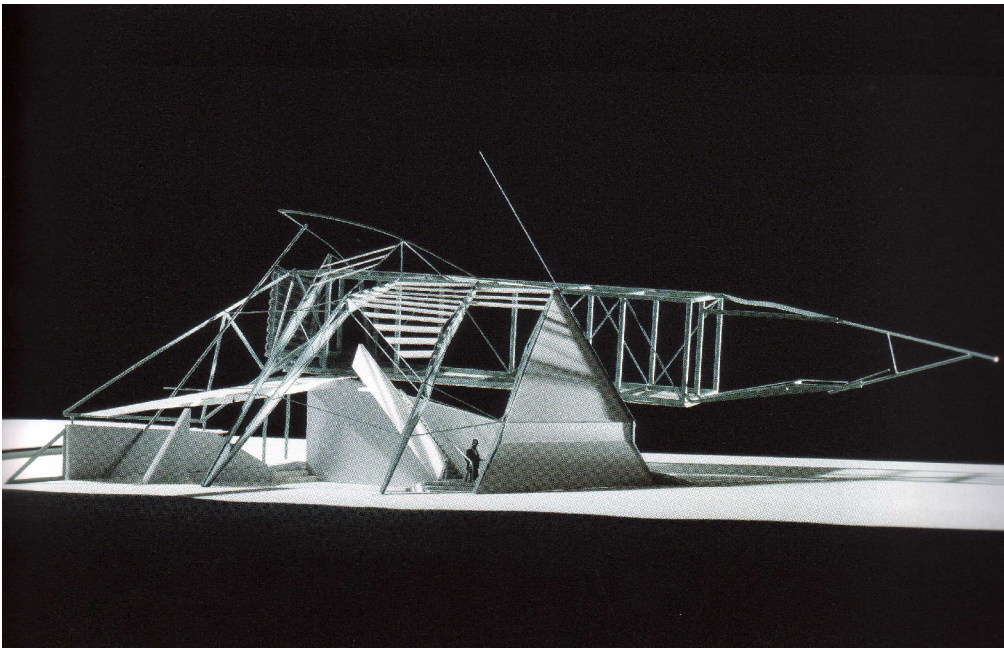
The Open House, California, 1983. Coop Himmelblau Architects.

Coop Himmelblau's claim that "[s]paces are indeterminate, as are enclosures" (Betsky 1990, 114) is the central axiom of the Open House. At no other time do Coop Himmelblau provide a more lucid description of the relationship between their work and nonlinear dynamics; yet even here the terminology and the sentiment suggests the very relationship Sorkin has proposed but never confirms it. The Open House is the built manifestation of the original psychogram with a deliberate lack of regard for controls, either natural or artificial. In this sense, as previously demonstrated, the design process is undoubtedly linear. A design process based on Chaos Theory would exhibit both its sensitive dependence on starting conditions as well as other properties of fractal geometry including scaling (Eisenman 1986). In the Open House Sorkin describes the construction and detailing of the wing in such a way as to recall images of the Butterfly Effect and field theory (Hayles 1985; Capra 1977). As Betsky notes:

> [t]he construction of the wing is made possible by a truss in tension, a stretched fabrication of steel anchored at the highest point. The myriad thin members of this truss, and of most of Coop Himmelblau's structures, diffuse loads to the point where they become competing poles of attraction instead of fixed points of reference. These thin members also make the underlying order of architecture transparent, leaving a series of overlapping planes, shimmering and sheer coverings that may be either ceiling or wall. (1990, 114-115)

The construction of the wing is not immediately expressive of the forces involved, or the resolution of these forces. The visual imagery of overlapping fine members may recall events within the quantum field, in the sense that they are linked but unpredictably so, however this could equally well be said of many other architect's works. Charles Jencks offers a similar description of Coop Himmelblau's wing devices as constructed. Jencks, although familiar with the concept of nonlinear dynamics, does not make any direct comparison between architectural and scientific theories although his terminology might suggest it. Jencks states that,

[n]onetheless the thin steel lines, which slightly bow and stretch, have a taut beauty. Their counterpoint is so tense that it seems the architecture would explode into life if one tendon were cut. Perhaps it would. In any case this is the image of dynamic, moving, balancing forces frozen into architecture. (1990, 277)

Jencks suggests that the final state of the architecture represents a snapshot of a system of dynamic or chaotic forms. In support of this view Coop Himmelblau's 1983 work *Architecture is Now*, an installation and text roughly contemporaneous to the Open House, reveals their theoretical predisposition.

Architecture is not accommodating. Because accommodation and classification are—in architecture as well as in social living—an expression of a reactionary and rigid attitude. An attitude that turns life to ice. Just as propriety and remaining in the past petrify everything that lives. However, architecture lives for seconds at the moment of conception. It can never be Past, because at conception it becomes Future. The instant of conception differentiates and decides. Is this instant free from pressure, cliché, ideology and formalism, then architecture becomes free. Then the circumstantial pressures crumble. Causality is overturned. (Coop Himmelblau 1984, 11)

The metaphorical images record frozen moments in time and petrified seconds; each narrows the time span to that distinct ossified moment. As Coop Himmelblau strive to capture the instantaneous "architecture of now"; they forfeit the ability of their architecture to exhibit nonlinearity. The final refrain, "[c]ausality is overturned", is both a strategy to accept indeterminacy and at the same time deny its ultimate dominance of any man-made artefact. In this sense Coop Himmelblau's work has come full circle; the Open House is a frozen image generated from an (un)predictable psychogram. The house is thus the chaotic image "frozen into architecture". In contrast the early works of Coop Himmelblau do not exist as an end state. The wing project in Graz was made to blaze and then to decay. It was not meant as a lifeless, static monument to the aspirations of the designer. The proposal for another wing over Munich, a wing that "rises and falls —flaps or flickers" in response to the changing state of nature, is the most powerful evocation of nonlinearity in Himmelblau's work; to use an analogy from quantum mechanics, the end state of the system (architecture) is unpredictable owing to the interrelatedness of natural systems. Ultimately this means that the early projects of Coop Himmelblau captured the totality of nonlinear dynamics far more effectively than the more recent.

Coop Himmelblau's Open House sought to place itself outside the systems of nature and to record its exact starting conditions. This is a patently utopian act as the architect strives to ignore the complexity of reality in favour of the idealised vision. This process ignores the tendencies of natural systems and the inevitability of the failure of this dream. From this analysis of Coop Himmelblau's theoretical position, and its development, it is ironic that Sorkin should choose the Open House as his exemplar of nonlinear dynamics in the work of Coop Himmelblau. In contrast, Jencks argues that the work of Coop Himmelblau is well suited to be described as "violated perfection" because it relies upon the perversion of pure and predictable geometric forms;

the perfect white cube suddenly smashed, skewed and skewered into a frenzy of oppositional forms. Another such crescendo occurs in the adjacent power house where the chimneys suddenly tilt off the right angle. In both cases a rational predictable solution is partly violated by an expressive outburst and the balance of one and the other is mutually heightening. (Jencks 1990, 277)

Like Sorkin, Betsky and Cook, Jencks insistently describes Coop Himmelblau's geometry as unpredictable, irrational and random. However, unlike these other critics Jencks avoids the temptation to relate this to nonlinearity. Jencks, somewhat simplistically, classifies Coop Himmelblau's architecture as consisting of a "frenzied cacophony"; the building forms "jump about and cross in contradiction" but they are not related to the science of nonlinear dynamics (Jencks 1990, 277).

Coop Himmelblau have asked; "how should we think, plan and build in a world that is becoming daily more and more fragmented? Should we turn a blind eye to this fragmentation and take refuge in an 'ideal' world of architecture?" (1991, 18) Their response is to become part of the fragmentation they perceive in urban life and certain natural systems including fire and decay. Their strategies, though possessing the imagery of nonlinear dynamics are intricately linked not to science but to phenomenology and anthropomorphism. Their conceptual aims are perceptive in that they have captured the essence of nonlinearity and sensitive dependence; their methodology nevertheless is distinctly linear.

Those areas of Coop Himmelblau's work which most closely recall, and are related to, the processes of surrealism and the science of nonlinear dynamics are often those ideas which they have explored in an attempt to redefine the building as body, a common strategy of de-anthropomorphism. Coop Himmelblau's efforts to create an architecture which is aleatory, through its immersion in fire, destruction by heart-beat, changes in temperature, urban space and wind, are those which most clearly link architecture and chaotic, natural systems. However, in the work of Coop Himmelblau there is a network of possible connections between nonlinear dynamics and architecture that they never fully acknowledge. Their tacit acceptance of the claims made by Sorkin does not imply any agreement; rather Coop Himmelblau's work itself changes and develops constantly in an attempt to resist simple interpretation. Sorkin's opening note in the *Blaubox* essay contains a clear note of caution that suggests that he too understands the tenuous nature of his claims.

References:

Barnsley, M. (1988). *Fractals Everywhere*. New York: Academic Press.
Betsky, A. (1990). *Violated Perfection: Architecture and the Fragmentation of the Modern.* New York: Rizzoli.
Breton, A. (1928). *Nadja*. Trans. Richard Howard [1960]. New York: Grove Press.
Capra, F. (1977). *The Tao of Physics: An Exploration of the Parallels between Modern Physics and Eastern Mysticism*. New York: Bantam Books.
Caws, M. A. (2004). *Surrealism*. London: Phaidon.
Coop Himmelblau (1991). "On The Edge." P. Noever, (ed.) *Deconstruction In Transition: Between Deconstruction And New Modernism.* Munich : Prestel: pp 17 – 31.
Coop Himmelblau (1992). "The Dissipation of Our Bodies in the City." Coop Himmelblau, *Die Faszination der Stadt/The Power of the City*, Darmstadt: Verlag Jürgen Häusser: pp 12-19.
Coop Himmelblau, (1980). "Architecture Must Blaze." Reprinted in W. D. Prix, *Get Off My Cloud: Coop Himmelb(l)au Texts 1968-2005*, Martina Kandeler-Fritsch and Thomas Kramer (eds), Ostfildern-Ruit: Hatje Cantz, 2005: p. 46.
Coop Himmelblau, (1984). *Architecture Is Now: Projects, (Un)Buildings, Actions, Statements, Sketches, Commentaries, 1968 - 1983.* London: Thames and Hudson.
Eisenman, P. (1986). *Moving Arrows, Eros and Other Errors: An Architecture of Absence.* London: Architectural Association.
Fer, B. (1995). "Fault-Lines: Surrealism and the Death Drive." *Oxford Art Journal* 18, no. 1: 158-60.
Foster, H. (1995). *Compulsive Beauty*. Cambridge, Massachusetts: The MIT Press.
Foster, H. (2004). *Prosthetic Gods*. Cambridge, Massachusetts: The MIT Press.
Gale, M. (1997). *Dada and Surrealism*. London: Phaidon.
Gleick, J. (1987). *Chaos: Making a New Science*, London: Macdonald and Co.
Hayles, K. N. (1985) *The Cosmic Web. Scientific Field models and literary strategies in the 20th century.* Ithaca: Cornell University Press.
Hofstadter, D. R. (1979). *Gödel, Escher, Bach: An Eternal Golden Braid.* New York: Basic Books.
Ingraham, C. T. (1988). 'The Faults of Architecture: Troping the Proper.' *Assemblage*, 7 (October), pp. 6–13.

Jencks, C. (1990). *The New Moderns: From Late to Neo-Modernism*. New York: Rizzoli.

Krauss, R. (1982). "When Words Fail." *October* 22: 91-103.

Krauss, R. (1994). *The Optical Unconscious*. Cambridge, Massachusetts: The MIT Press.

Mahon, A. (2005). *Surrealism and the Politics of Eros: 1938-1968*. London: Thames and Hudson, 2005.

Mandelbrot, B. B. (1977). *The Fractal Geometry of Nature.* New York: W. H. Freeman and Company.

Mayne, T. (1992). *Morphosis. Connected Isolation.* London: Academy Additions.

Ostwald, M. J. (1992) 'The Architectural Writing of Michael Sorkin.' *Architecture Bulletin.* (May), p. 15.

Ostwald, M. J. and R. J. Moore (1995) "The Disappearing Body: Three Strategies for De-Anthropomorphism in Architecture." *Exedra*, Volume 5, Number 2: pp 19–27.

Ostwald, M. J. and R. J. Moore (1998) *Disjecta Membra: Architecture and the Loss of the Body*. Sydney: Archadia.

Ostwald, M. J. (1999) 'Architectural Theory Formation Through Appropriation.' *Architectural Theory Review*, 4, 2, pp. 52–70

Ostwald, M. J. (2000) 'Architecture and the Evil Eye: Coop Himmelblau and the Apotropaic Oculus Invidious.' *Interstices* Vol. 5, pp 56–67.

Ostwald, M. J. (2001). 'Fractal Architecture: Late Twentieth Century Connections Between Architecture and Fractal Geometry.' *Nexus Network Journal, Architecture and Mathematics*, 3, 1 (Winter/Spring): pp. 73-84.

Papadakis, A. C. ed. (1992), *Andreas Papadakis Presents Theory + Experimentation: An Intellectual Extravaganza.* London: Academy Editions.

Pfau, P and W. Jones (1987). 'Origin Versus Existence and Language'. R. McCarter, (ed.) *Building Machines. Pamphlet Architecture. No 12.* New York: Princeton Architectural Press.

Prix, W. D. (1980). "And This Is How It Works." Reprinted in W. D. Prix, *Get Off My Cloud: Coop Himmelb(l)au Texts 1968-2005*, M. Kandeler-Fritsch and T. Kramer eds. Ostfildern-Ruit: Hatje Cantz, 2005: 92.

Prix, W. D. (1980). "Merz School." Reprinted in W. D. Prix, *Get Off My Cloud: Coop Himmelb(l)au Texts 1968-2005*, M. Kandeler-Fritsch and T. Kramer eds. Ostfildern-Ruit: Hatje Cantz, 2005: 46.

Prix, W. D. (1990). "Our Architecture has Four Cities and Seven Lives." Reprinted in W. D. Prix, *Get Off My Cloud: Coop Himmelb(l)au Texts 1968-2005*, M. Kandeler-Fritsch and T. Kramer eds. Ostfildern-Ruit: Hatje Cantz, 2005: 60-64.

Prix, W. D. (1995). "Rolling the Sky: On the Rolling Stones and the Connection of Architecture and Rock and Roll." Reprinted in W. D. Prix, *Get Off My Cloud: Coop Himmelb(l)au Texts 1968-2005*, M. Kandeler-Fritsch and T. Kramer eds. Ostfildern-Ruit: Hatje Cantz, 2005: 399-404.

Sorkin, M. (1991a). *Exquisite Corpse: Writings On Buildings.* New York: Verso.

Sorkin, M. (1991b) 'Nineteen Millennial Mantras.' P. Noever, ed. *Architecture in Transition, Between Deconstruction and New Modernism*, Munich: Prestel, pp. 107-123.

Vidler, A. (1990) "The Building in Pain: The Body and Architecture in Post-Modern Culture", *AA Files*, 19 (Spring): 3-10

Vidler, A. (1992) *The Architectural Uncanny: Essays In The Modern Unhomely.* Cambridge: MIT press.

Werner, F. (2000). *Covering + Exposing: The Architecture of Coop Himmelb(L)au*. Bäsel: Birkhäuser.

Notes:

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[i] In the mid 1990s, after almost thirty years in practice under the name Coop Himmelblau to firm began to use a variation on that name, Coop Himmelb(l)au. Within this paper, the firm is consistently referred to under the original name.

[ii] The journalist James Gleick's 1987 account of the rise of Chaos Theory.