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# **Serial Techniques in the Arts**

## **General Ambitions and Particular Manifestations**

Sandra KAJI-O'GRADY

Throughout the twentieth century, common techniques for conceiving and composing works of art were applied to different media and to disparate disciplines. Abstraction, narrative and anti-narrative techniques, indeterminacy and chance, and the reductiveness of minimalism, for example, can be found in music, literature, dance, the visual arts, and architecture. The disciplinary models of history and criticism through which works of art are apprehended, however, mean that the shared use of these techniques is rarely tracked across more than two disciplines. Any transference between disciplines is further obscured by these techniques frequently being made manifest under different names and with diverse formal outcomes. Sampled noise in a musical composition, for example, has conceptual parallels in found objects and collage. Stream-of-consciousness writing has a counterpart in improvised dance and music, and another in automatic drawing in art and architecture. Moreover, the uptake of a technique developed initially in one discipline may not occur in another for decades and, consequently, needs to be viewed against contexts that are not only disparate in their media and critical framework but also divergent in the historical and social conditions against which they are understood.

This essay is concerned with the transference of serial techniques across the arts, that is, with predetermined procedures of composition using series, often numeric and algebraic series. Serial techniques of composition were first explored in music by Schoenberg, Berg, and Webern in the 1920s and later by Stockhausen, Nancarrow, Wuorinen, and, most famously, Messiaen's pupil Pierre Boulez in the 1950s. Serial

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methods were subsequently adopted in the visual arts in the late 1960s and developed as a curatorial theme in exhibitions such as *Art in Series* (1967), *Serial Imagery* (1968), and *Systemic Painting* (1966). Serial methods appear in the architectural experiments of architects Peter Eisenman (from the late 1960s), Bernard Tschumi and Hiromi Fujii (in the 1970s and 1980s), and again in parametric and procedurally driven digital architectures in the 1990s. Serial techniques have been used to organise the length and timbre of notes; the temporal or physical spaces between aural or visual elements in performances; the distribution and selection of words, shapes, and numbers; the colour and size of marks on a page or wall; the spacing and size of architectural elements and openings.

Serial techniques have been selected as a vehicle for exploring interdisciplinary transference because of the precision, deliberation, and self-conscious character of their application and development. Artists and composers who used serial methods – from Boulez in music to Sol LeWitt in the visual arts – are reflective in writing about their ambitions and the perceived consequences of the approach. John Coplans (1967), Mel Bochner (1968), and Rosalind Krauss (1971) each make critical contributions to serial art in essays in *Artforum*, Krauss subsequently writing about Eisenman's Houses of Cards of the 1970s. More significantly for this study, serial practitioners and advocates frequently declare the serial approach to be outside of style and disciplinary history, and only arbitrarily connected to its material realisations; that is, serial techniques are posed as existing outside disciplinary boundaries.

Serialism is advocated by Bochner and other artists as a way of overcoming the privilege of appearance and the dominant discourse on iconology, style, and historical importance. Bochner declares that what matters is the methodology or "attitude" entailed in serialism, not what is produced through it.<sup>1</sup> He confidently announced, 'No stylistic or material qualities unite the artists using this approach because what form the work takes is unimportant.'<sup>2</sup> The stylistic uniformity of seri-

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1. Mel Bochner, "The Serial Attitude," *Artforum* 6, no. 4 (December 1967), 28.

2. Mel Bochner, "Serial Art, Systems, Solipsism," *Arts Magazine* 41, no. 8 (1967): 39-43.

3. Reginald Sm 1966), 157.

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alist art, however, suggests there is a gap between these aspirations to formal neutrality and specific instantiation. This gap raises a number of questions about disciplinarity that this paper will pursue.

This essay will track a single technique taken up at different times across the arts during the twentieth century, as well as the transfer of ideas about serial techniques. The aim of this tracking is to ascertain the degree of consistency of methods used and to assess this against stated ambitions and results. The supposition is that in studying a narrowly defined and prescribed method across different situations, disciplinary differences might be more clearly revealed – much as one might in a scientific experiment narrowly prescribe one set of variables in order to determine the impact of variation on another set. Some of these differences might be located in media and the perceptual mode in which works were apprehended; in the visual arts, for example, the use of algebraic procedures used to select and order elements is typically visible in the resulting formal organisation of the work and is explicitly presented as the subject of the work, as its formal order and process. In Sol LeWitt's wall drawings, the working out of the various combinations of elements is presented at two scales, as the working diagram and the wall drawing, with the two being identical in content. By contrast, the mathematical permutations that organise the notes of serial music are inaudible and, as Brindle notes, frequently the concern only of the composer.<sup>3</sup> In serial art, not only are the systems of permutation frequently those of specific mathematical series, such as the Fibonacci series, but the material subjected to its organising logic are those of epistemological systems such as dictionaries or the alphabet, which are also organised according to sequential conventions. This is not the case in architecture, where the organising geometries and material elements subjected to serial permutations – for example, the grids and planes in Eisenman's houses – are conceived by the architect as inherently neutral. Greg Lynn, who has identified his approach as digital serialism, argues that he applies procedural and rule-based techniques to 'schemata that precede the representational and linguistic

(December 1967), 28.  
*Arts Magazine* 41, no. 8

3. Reginald Smith Brindle, *Serial Composition* (London: Oxford University Press, 1966), 157.

effects they facilitate', these being vectors and blobs outside of Euclidean geometry.<sup>4</sup>

Yet there are other differences concerning the historic assumptions of disciplinary discourse. How serialism is critically understood and played out relates to the internal organisation of the discipline itself – that is, the location and porosity of its disciplinary boundaries and the sources that drive historical change. The boundaries between genres such as painting and sculpture, and between disciplines such as music and noise, have been seriously eroded in the past century of artistic experiment and technological change, yet serialism presents evidence that disciplines are not so readily dissolved. The institutional structures in which works are presented and received tends to return the generality of a technique to the specificity of the discipline.

An integral part of the picture of serialist practices involves exchanges among the visual arts, architecture, music, literature, and philosophy. Serial artists and critics such as Sol LeWitt, John Coplans, and Mel Bochner attest to the influence of the serial musical compositions of Boulez, Babbitt, and the Viennese school of the 1920s. Mel Bochner suggests that 'in procedure, if not in results', the work of Sol LeWitt 'very closely resembles some contemporary serialist music.'<sup>5</sup> Boulez's arguments for serial music were widely disseminated in publications such as *Tel Quel*, reaching audiences beyond music, including the structural anthropologist Claude Lévi-Strauss, who published a damning critique of serial music in the preface to *The Raw and The Cooked* (1964), and philosopher-historian Michel Foucault, who saw in Boulez's work the radical potential of a formalist approach.<sup>6</sup> More recently, architects using rule-based procedures coupled with softwares for "parametric" design have likened their work to the serial music of Schoenberg and Boulez. Sanford Kwinter, for example, describes Peter Eisenman's design process as 'Boulez-like total serialism' in its 'rigid positions or relations' and presents his own use of parameters and

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4. Greg Lynn, "Geometry in Time," *Anyhow*, ed. Cynthia Davidson (Cambridge & London: MIT Press, 1998), 170.

5. Bochner, "Serial Art, Systems, Solipsism," 42.

6. Michel Foucault, "Pierre Boulez: Passing through the Screen" (1982), in *Aesthetics, Method, and Epistemology: Essential Works of Foucault 1954-1984*, vol. 2, trans. Robert Hurley et al., ed. James D. Faubion (London: Penguin, 1998), 242.

7. Sanford Kwinter, *a Building: The Aronoff* Davidson (New York: 1998), 38.

8. Michael Sorkin, *38*.

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algebraic procedures as more flexible.<sup>7</sup> Eisenman's introduction to serial procedures was not through Boulez but LeWitt, about whose work he wrote in "Notes on Conceptual Architecture" (1971). The formal and methodological resemblance between Eisenman's houses and LeWitt's sculptures is so close that it prompted critic Michael Sorkin to snipe, 'Who, after all, *really* wants to live with or in a Sol LeWitt?'<sup>8</sup>

There have also been shared exhibitions and collaborations among serial artists of different disciplines. LeWitt collaborated with Lucinda Childs on *Dance* (1979), and Laurie Anderson set one of LeWitt's linear serial projects to music, as if it were a score. The exhibition *Working Drawings and Other Visible Things on Paper Not Necessarily Meant to Be Viewed As Art* (1966) includes pages of notations and calculations used in the planning and execution of art works by Bochner, Judd, Andre, and LeWitt. But it also includes building blueprints, plans for poems, musical scores by Cage and Stockhausen, chemical equations, diagrams of electrical circuitry, and record sheets of baseball games. Rainer Crone's *Numerals 1924-1977* (1978) includes a mix of work by visual artists such as Bochner, LeWitt, and Darboven; architects Peter Eisenman and Arata Isozaki; choreographer and dancer Trisha Brown; and pages of notations by composers Cage, Reich, Gibson, and Glass.

Evidence of collaboration and influence do not, however, explain the attractiveness of the influence or the ambitions motivating the borrowing of techniques and their application to a different discipline or medium. There are several intersecting ambitions common to serial practices across the arts. These need first to be understood in light of the abiding twentieth-century preoccupation with *how* to conceive and make art. This question of "how", in terms of process rather than craft, replaces the historic questions of what function the artwork performed or, post-Kant, what essence it possessed and what aesthetic experience it made possible. In investigations into process, serialism is one of a number of techniques used – indeterminacy and chance as

7. Sanford Kwinter, "Can one go beyond Piranesi?" in *Eleven Authors in Search of a Building: The Aronoff Center for Design and Art at the University of Cincinnati*, ed. Cynthia Davidson (New York: Monacelli Press, 1996), 158.

8. Michael Sorkin, *Exquisite Corpse: Writings on Buildings* (London: Verso, 1991), 38.

practised by John Cage is another – and although in some ways the opposite of serialism, both techniques have the effect of removing authorial intervention once the process is in train. Andrew Ford proposes that '[t]otal serialism aimed to give music a mathematical infallibility... Every sound would be subject to analytical avouchment, free from the moment to moment vagaries of human volition.'<sup>9</sup> Sol LeWitt, who identified predetermination in art more broadly with conceptual art, in 1967 proposes a similar removal of the author:

In conceptual art the idea or concept is the most important aspect of the work... In other forms of art the concept may be changed in the process of execution... When an artist uses a conceptual form of art, it means that all the planning and decisions are made beforehand and the execution is a perfunctory affair. The idea becomes the machine that makes the art.<sup>10</sup>

In architecture, Eisenman described how given constraints and parameters mean that 'the process is somewhat out of authorial control.'<sup>11</sup> The imposition of a "machinic" logic is directed not only towards removing the author as an originating ground of meaning, but simultaneously revealing the groundlessness of systems of signification and as a strategy for undermining representation. In architecture and music, authorship is always complicated by the constraints of realisation and performance necessitating the interpretation by others of notations and instructions – with the exception of serial composer Conlon Nan-  
carrow, who used a player piano to realise compositions so dense they are unplayable by traditional means. In the visual arts, authorial control is less frequently complicated by realisation, although Sol LeWitt coupled serial techniques with execution by others in many of his wall drawings, allowing others' input to vary the outcome of given instructions.

9. Andrew Ford, *Illegal Harmonies: Music in the 20th Century* (Sydney: Hale & Iremonger, 2002), 131.

10. Sol LeWitt, "Paragraphs on Conceptual Art" (1967), in *Sol LeWitt*, ed. Alicia Legg (New York: Museum of Modern Art, 1978), 166.

11. Peter Eisenman & Alejandro Zaero-Polo, "A Conversation with Peter Eisenman," *El Croquis* 83 (1997), 8.

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12. Nicholas Taw  
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13. Boulez, quote  
Da Capo, 1986), 14.

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Talk of machines and the apparently rational pursuit of logical procedures meant that many critics of serialism, even those who supported it, viewed it as academic and mathematical. Contemporary critics of serial music attacked it for being cerebral, mechanical, artificial, overly sombre, non-melodic, static, and self-defeating. Serial composers were accused of being preoccupied with technical and theoretical concerns, prey to sterile mannerisms, uncompromising, and indifferent to the public.<sup>12</sup> Boulez himself conceded to an 'uncomfortable period' for new listeners and subsequently admitted that serial music was a 'theoretical exaggeration' that overlooked instrumental practicalities.<sup>13</sup> In art, Donald Kuspit regarded LeWitt's work as 'the deification of the human mind by reason of its mathematical prowess' wherein 'there is no optical induction: there is only deduction by rules.'<sup>14</sup>

One or two critics noted the tension between the visual and the organising logic at work. Rosenblum observed that LeWitt's work appears 'as if the computer systems... had been freed from their utilitarian duties and had gone beserk in new two- and three-dimensional, cellular or labyrinthine structures.'<sup>15</sup> LeWitt's intentions are unambiguous: 'Irrational thoughts should be followed absolutely and logically.'<sup>16</sup> His friend and fellow artist Robert Smithson thought LeWitt's work was concerned with enervating paradox: 'His concepts are prisons devoid of reason.'<sup>17</sup> Constraints and predetermined rules were intended to generate unexpected outcomes that appeared logical, but in fact pointed to the arbitrariness of systems of meaning and representation.

12. Nicholas Tawa, *American Composers and Their Public: A Critical Look* (Metuchen, NJ: The Scarecrow Press, 1995), 172-203.

13. Boulez, quoted in *Pierre Boulez: A Symposium*, ed. William Clock (New York: Da Capo, 1986), 14.

14. Donald Kuspit, "Sol LeWitt: The Look of Thought," *Art in America* LXIII (September-October 1975), 48.

15. Robert Rosenblum, "Notes on Sol LeWitt" (1978), *On Modern American Art* (New York: Harry N. Abrams, 1999), 253.

16. Sol LeWitt, "Sentences on Conceptual Art," *Art-Language* 1 (May 1969), 80.

17. Robert Smithson, "A Museum of Language in the Vicinity of Art," *Art International* (March 1968), 21.

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Krauss, writing in 1978, confirmed that 'the babble of a LeWitt serial expansion has nothing of the economy of the mathematician's language.'<sup>18</sup> By this date, she had changed her position on serial art significantly from her 1971 criticism of Frank Stella's practices. Krauss had then argued that the internalisation of relationships in the serial work eroded the relationship with the audience, which was no longer needed for its completion. She claimed the serial calculations that support the work were no longer present as part of the viewer's experience, thus substituting vision as the mode in which a work was understood for conditions outside the material factum of the work. Krauss had concluded that serialisation had become the medium and that Stella's paintings, in tending towards the diagram, had entered 'the condition of the mathematical formula'.<sup>19</sup>

In *The Architectural Uncanny* (1992), Anthony Vidler suggests two ways of understanding Peter Eisenman's serialist houses undertaken between 1969-83. One is to see the series of projects as 'an exercise in the rational exploration of certain pre-established formal constructs: a self-conscious logical sequence with a beginning and an end.'<sup>20</sup> Alternatively, it is plausible to see them as 'posed self-consciously against anthropomorphic analogies, closed formal systems and functionalist derivations', in such a way that these designs 'overturn the classical system of representation'.<sup>21</sup> As Lévi-Strauss discerns, serial music is 'a system adrift... like a sailless ship' in which the crew is subjected to elaborate protocols intended to distract them from thinking about their origins or destination.<sup>22</sup> Whereas Lévi-Strauss believed that meaning arises from the location of a work within a field of differences amongst other bounded works, the serialist work, however, makes of

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Non-signification is the serial method. It is that the special is non-referential'.<sup>24</sup> C produced by a structure of a work to Representation in essence to an exterior work as creation the series posits of simulacra. Rel and multiplicity

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18. Rosalind Krauss, "LeWitt in Progress," *October* 6, (1978), 55.

19. Rosalind Krauss, "Stella's New Work and the Problem of Series," *Artforum* 10, no. 4 (December 1971), 44.

20. Anthony Vidler, *The Architectural Uncanny: Essays in the Modern Unhomely* (Cambridge & London: MIT Press, 1992), 118.

21. Anthony Vidler, *The Architectural Uncanny: Essays in the Modern Unhomely*, 118.

22. Claude Lévi-Strauss, "Overture," in *The Raw and the Cooked* (London: Jonathan Cape, 1970), 25.

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*itself* a field of differences and internal relations and is thus found to be 'floundering in non-significance'.<sup>23</sup>

Non-significance was, however, exactly what was sought in the serial method. Bochner referred to this quality as solipsism, explaining that the special kind of order that is the serial, is 'self-contained and non-referential'. The serial art work presents itself as 'autonomous and indifferent'.<sup>24</sup> Or as John Coplans elaborates, 'Serial structures are produced by a single indivisible process that links the internal structure of a work to that of other works within a differentiated whole.'<sup>25</sup> Representation is challenged because these works eliminate any reference to an exterior world outside the work and insist instead upon the work as creation in its own right. In place of models and their copies, the series posits an undifferentiated throng of copies without models, of simulacra. Relativity replaces causality, banality usurps auratic value, and multiplicity is valued over uniqueness.

The paradox of the serialist work is that it uses abstract and mathematical universals and makes generalised claims about these, yet each actualisation of serial techniques takes place in particular historical and disciplinary contexts. Serial methods require a medium of some sort to be made evident, and is thus impelled to deal with the relationship between conceptual and procedural order and visual, auditory, or spatial perception. Rather than this gap signalling some kind of failure, serialists were interested in the ungovernable residue in any communication of a concept and the inflection of the idea through the shifts offered by different media. Or as LeWitt explains, 'Some ideas are logical in conception and illogical perceptually.'<sup>26</sup> This is apparent in his wall drawings, where it is impossible to perceive the whole simultaneously in order to comprehend its underlying order. The apprehension of the work is dependent on the gaze of the viewer. Serial art demonstrates that concept and percept are not coincident or transparent.

The impact of the gap between concept and percept, and of the challenge made to representation by the solipsism of serially produced works, differs in each discipline. This is most evident when one com-

23. Lévi-Strauss, "Overture," 23.

24. Bochner, "Serial Art, Systems, Solipsism," 40.

25. John Coplans, *Serial Imagery* (Pasadena: Art Museum, 1968), 11.

26. LeWitt, "Paragraphs on Conceptual Art," 166.

compares the violence of the response to serial architecture with the critical response to serial music and art. Critical disappointment with serial art and music focuses on the lack of visual or auditory pleasure to be derived from the outcomes and on its perceived lack of meaning. In art, there was also some dismay expressed at the formal similarity of work. On the occasion of a major retrospective at MoMA in 1978, the critic Robert Pincus-Witten notes for the first time the formal homogeneity of the work, writing, 'For all its joy, the occasion was muted – since the imposition of an epistemic system as an authentic style in the history of art seems over and done to me... that there should be the possibility of a "Tenth Street Touch" with regard to epistemological abstraction staggers me, hurts a bit.'<sup>27</sup>

In the new millennium, serial art has attracted a great deal of historical revision and retrospective exhibition along with other art of the period, beginning with Anne Rorimer's inclusion of a chapter on "Systems, Seriality, Sequence" in her *New Art in the 60s and 70s: Redefining Reality* (2001). Serial music has continued to influence composition, particularly electronic and digital music – for example, the work of Brian Eno. In architecture, however, the experiments of a previous generation in serial techniques were vehemently attacked by their contemporaries and are now overlooked or dismissed by younger generations who cite the influence of Boulez before the relevant architectural precedents.

Critics of Peter Eisenman's serial architectural proposals deride them as non-architectural, because these projects do not derive their purpose from the function or meaning of inhabitation or the logical processes of building. Michael Sorkin finds House El Even Odd to be far 'from any reasonable standard of legibility as habitable architecture'.<sup>28</sup> Serial techniques applied to architecture are an ethical affront. Their form does not respond to social expectations, function, assumptions about professionalism, budgets, or regulatory mechanisms pertaining to planning, safety, and amenity, and they are thus dismissed as socially

irresponsible, or true?

Bernard Tschumi attempts to make elements subjected to formal sequences intuition but or discrete architectural fragments and manipulations of 'pure formalism' and program to dependent relations. 'As sequences of (or versa), both can be schemes or part methods, not discrete; every element of performance and Hanne Darboven's terms with biographies.

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27. Robert Pincus-Witten, "Bochner, Shapiro, LeWitt," in *Postminimalism into Maximalism: American Art, 1966-1986* (Ann Arbor: UMI Research Press, 1987), 127-128.

28. Sorkin, *Exquisite Corpse*, 38.

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Bernard Tschumi in the design of the Parc de la Villette (1986) attempts to make programme, which he calls event, one of the elements subjected to serial ordering devices. He proposes that the transformational sequence entailed by the design process is based not on intuition but on 'a precise, rational set of transformational rules and discrete architectural elements'.<sup>29</sup> He likens this process of recombining fragments through a 'series of permutations' to the Oulipian manipulations of the writers Queneau and Perec.<sup>30</sup> Claiming to avoid 'pure formalism', Tschumi subjects space, movement, event, symbol, and program to these mechanical operations. He conceives an independent relation between object, movement and action, proposing, 'As sequences of events do not depend on spatial sequences (and vice versa), both can form independent systems, with their own implicit schemes or parts.' Tschumi is suggesting a broader scope for serial methods, not dissimilar to Boulez's recognition that serial order could be applied not only to notes and their timbre and spacing, but also to elements of performance, or the work of artists such as Karen Shaw and Hanne Darboven, who sought to intersect the use of abstract systems with biographical events and details.

Tschumi did not continue with the serial methods he developed in the Parc de la Villette. Nor have we seen, in any of the disciplines, a more complex approach to mathematics that takes on multiple, intersecting series, open-ended or infinite series, or the irrational series proposed by Cantor and Dedekind in 1917. The series used are mostly discrete; every element has only one predecessor or successor. In a sense, the serial techniques described here are limited and the project of representational critique incomplete. By no means have serial techniques been exhausted in their application. Nevertheless, it has been possible to discern differences in their realisation in different media and disciplines – in critical response, in the clarity with which audiences perceive the serial structures at work, in the motivations of those that used them.

<sup>27</sup> in *Postminimalism into*  
arch Press, 1987), 127-

29. Bernard Tschumi, "Sequences," *Princeton Journal* 1 (1983), 30.

30. Bernard Tschumi, "Madness and the Combinative," *Precis* 5 (Fall 1984), 153

In conclusion, it is worth returning to Mel Bochner's definition of serialism:

A procedural work of art is initiated without a set product in mind. In a piece of this kind the interest is only in knowing that the procedures, step by step, have been carefully and thoroughly carried through. The specific nature of any result is contingent on the time and place of implementation and is interesting as such. It is the 'proceeding' that establishes it as such.<sup>31</sup>

Curiously, however, this implementation led to works bearing distinct formal resemblance. In the visual arts this was characterised by planes of flat primary and secondary colours; epistemological elements such as numbers and the alphabet; taut horizontal or vertical lines; grids; Euclidean geometries and platonic forms, particularly cubes; a single and uniform medium for each work; even distribution of pattern or parts; and the use of diagrams and tabulated lists.

In the serially devised architecture of John Hejduk, Eisenman, Hiroshi Fuji, and Tschumi we see the same use of grids, platonic solids, cubes, flat and uniform colour, and diagrams that set out the iterations of the process in matrices. Such a convergence of formal outcomes is not determined by the serial methods used, but arises out of the circulation of forms that crosses disciplines and includes sources such as Russian Constructivism, mathematics, and a broad representation field on which serialism builds its critique. The critique of representation that serialism carries out is undertaken through the subjection of elements adopted from systems of signification to predetermined rules and procedures of permutation that operate independently of and in contradiction to those systems. In effect, serialism does not escape representation or discipline, but merely suspends and demonstrates their underside in contingency and nonsense.

31. Mel Bochner, "Excerpts from Speculation (1967-1970)," *ArtForum* 8-9 (1970), 70-73, reprinted in Ursula Meyer, *Conceptual Art* (New York: Plume, 1972), 52.

## Build On M

In scholarly discourse Bernd and Hilla Becher are included. There are buildings as such of architecture as impersonal and critics have said objects, that '[The concerned with: are engineered r of architecture v tions of discipli that represent it, case.

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1. Ulf Erdmann 2 no. 6 (June 2002), 93