Architecture as a craft

Architecture, drawing, model and position

Edited by Michiel Riedijk

Texts by Enrique Walker, Mark Linder, Emre Altürk, Gregg Pasquarelli, Jan de Vylder, Oswald Mathias Ungers, Joan Ockman, Alper Semih Alkan, Stefano Milani, Sou Fujimoto, Christoph Gantenbein, Giorgio Grassi, Michael Maltzan & Kersten Geers
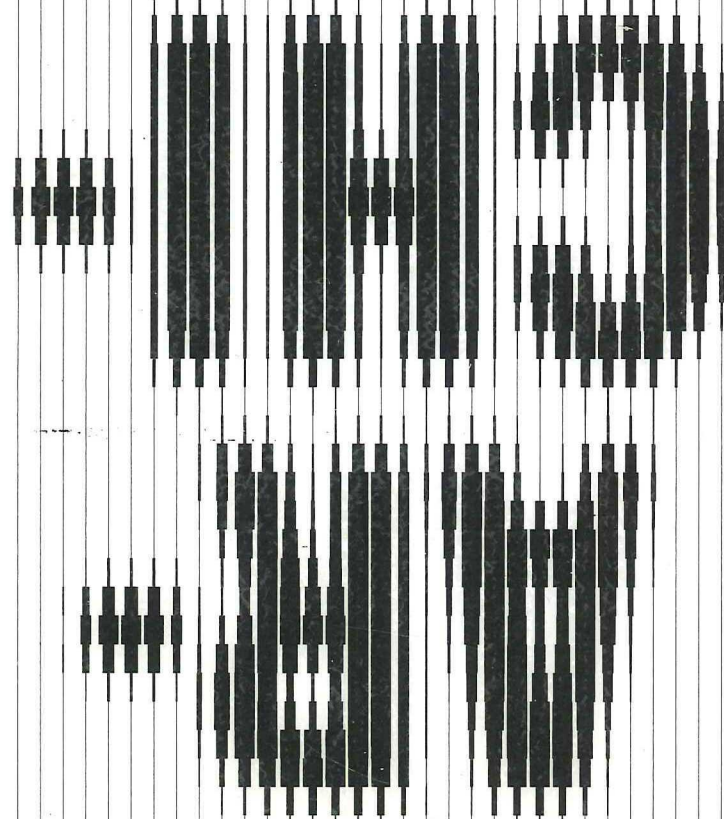
SUN

Architecture as a craft
Architecture, drawing, model and position
Edited by Michiel Riedijk

SUN

SUN

Architecture as a craft
Architecture, drawing, model and position
Edited by Michiel Riedijk
With the assistance of
Else Marijn Kruijswijk,
### Dražen Kričković & Jaimy Siebel

However, his negation of the physical edifice, and instead, focus on the prescriptive effort in the instance of Fun Palace reflects another problematic in itself that was highly criticized because of his oversimplification of architecture to functionalism. One of those critiques is boldly expressed by Peter Eisenman:

This shift in balance has produced a situation whereby, for the past fifty years, architects have understood design as the product of some oversimplified form-follows-function formula. . . . [A]s late as the end of the 1960s, it was still thought that the polemics and theories of the early Modern Movement could sustain architecture. The major thesis of this attitude was articulated in what could be called the English Revisionist Functionalism of Reyner Banham, Cedric Price, and Archigram. . . . However, the continued substitution of moral criteria for those of a more formal nature produced a situation which now can be seen to have created a functionalist predicament, precisely because the primary theoretical justification given to formal arrangements was a moral imperative that is no longer operative within contemporary experience. This sense of displaced positivism characterizes certain current perceptions of the failure of humanism within a broader cultural context. [14]

14   Peter Eisenman, 'Post-Functionalism', in: K. Michael Hays (ed.), *Architecture Theory since 1968*. Cambridge, MA (The MIT Press) 1998, p. 237.

The tone of the critique in Eisenman's reconsideration of the so-called Revisionists' approach in general reflects the anxiety for the domination of architecture with an outdated design agenda. However, Price and his fellows' approach should not be underpriced simply by just arguing that their effort was in a sense to overturn the practice of architecture into a ghost of self-organized functional relationships. The indispensible problem of formal complexity in architecture, where the classical Modernists left out, should also be questioned in this framework. The reconfiguration of our spatial dilemma should lead to a more serious reconsideration of the content rather than its formal aspects. In that sense, the cognitive path they followed in outlining the requirements of a architectural configuration with more prescriptive sensitivity should be aligned with the indigenous search for formal originality and complexity. More importantly, the visual categories they worked in, once heretic in their own context, also reflects the effort to resolve the latency between the spatial stimulus of architectural intervention and the social response to it.

Stefano Milani
The new 'ductus': A reflection on Manfred Mohr's drawing
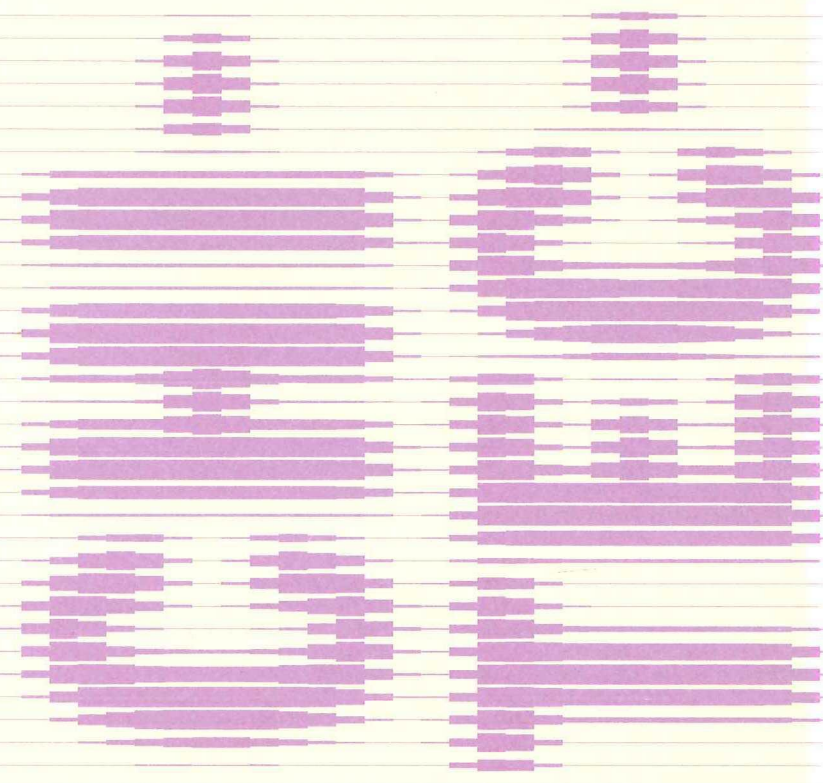
Stefano Milani graduated cum laude from the IUAV of Venice. Since 2004 he has been a principal architect at Ufo Architects in Delft. From 2001 to 2005 he worked as a project architect at Nio Architecten in Rotterdam. Besides his practical experience he has been carrying out research on the architectural drawing at the Faculty of Architecture at Delft University of Technology. At this faculty, he has also been teaching within the Territory in Transit Research Program. Since drawings are considered to represent the privileged field of architectural knowledge, his research attempts to enhance the role of architectural drawing within design research and theory. In 2006, he was invited to take part in the 10th Architecture Biennale of Venice. In 2008 he edited the publication *Franco Purini, Drawing Architectures*, 2008 and he curated, with Filip Geerts, the Symposium *Ideal / Real City*.

'The question is,' said Humpty Dumpty, 'which is to be master — that's all.'

Lewis Carroll, *Through the looking glass*, chapter VI

The analytical approach and the drawing

For nearly fifty years, different thematic aspects of computer sciences, such as shape grammars, evolutionary algorithms, parametric techniques, have influenced the architectural debate. In more recent years, we have witness an increasingly complexity of this relationship when many computational techniques and highly complex organizational model became available in all fields of the architectural production.
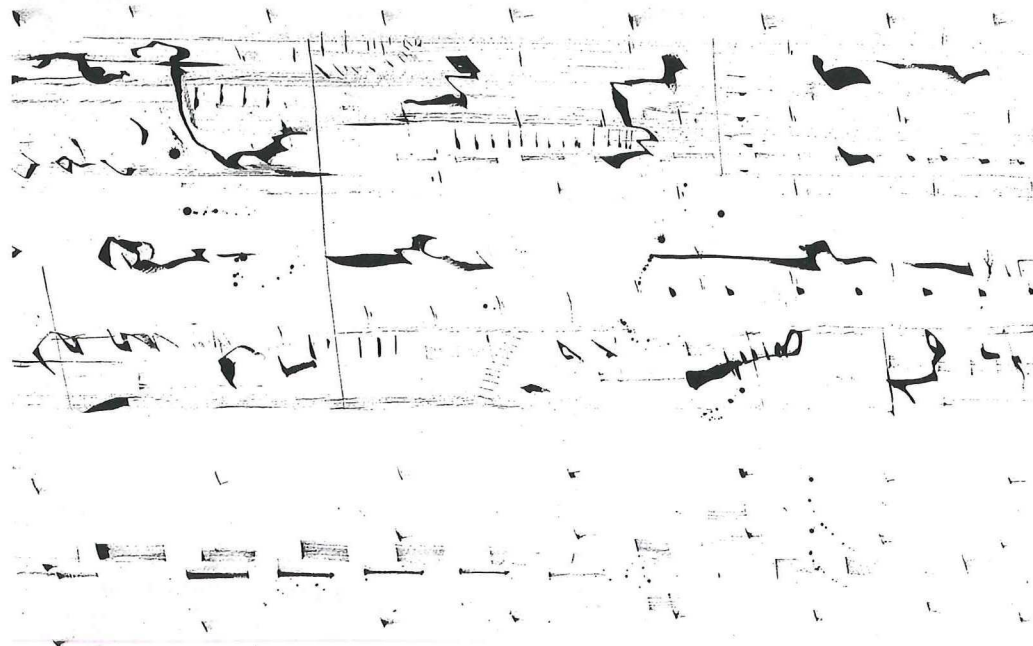
Reflecting on these topics of the contemporary condition of the architectural project Diana Agrest, has observed the existence of a paradoxical condition that sees a 'reunification of the process of representation in the production of a design and the process of construction',[1] a paradox which is also a sign of a conceptual problem that invest the specific identity and finality of architectural expression and the one of its 'construction'.

Undoubtedly, it must be acknowledged important transformations have occurred within the organization of the architectural work as a whole. This fact has lead to a redefinition of the visual repertoire of the architect but also a complete disarray of his cognitive maps. With extreme simplicity, the computer offers the possibility to organize in coherent classes an enormous amount of data that the architect have to 'connect' with imaginative paths, sometimes poetic, sometimes chaotic, but that are conceptually foreign to the rationality of a programmed trajectory, implied by a scientific method of computation.

In any case, there seem to be enough arguments for a comprehensive and rigorous research concerning the theoretical poignancy of the new modes of architectural expression and conception of architectural ideas, which, up until now, computer and complex software seem to have not yet determined.

An extended theoretical understanding of the Drawing, as a specific form of the elaboration of the architectural thought and, at the same time, as the very place of the architectural expression, could still be a privileged place for this epistemological research. Certainly, we will need an expanded

1   See Diana Agrest, *Representation as articulation between theory and practice*, in: Stan Allen, *Practice. Architecture, Technique and Representation.* Amsterdam (G+B) 2000, p. 176.

I   Manfred Mohr, Drawing, ink on paper, 1963

II   Manfred Mohr, Drawing, ink on paper, *Bild 12_366*, 1966

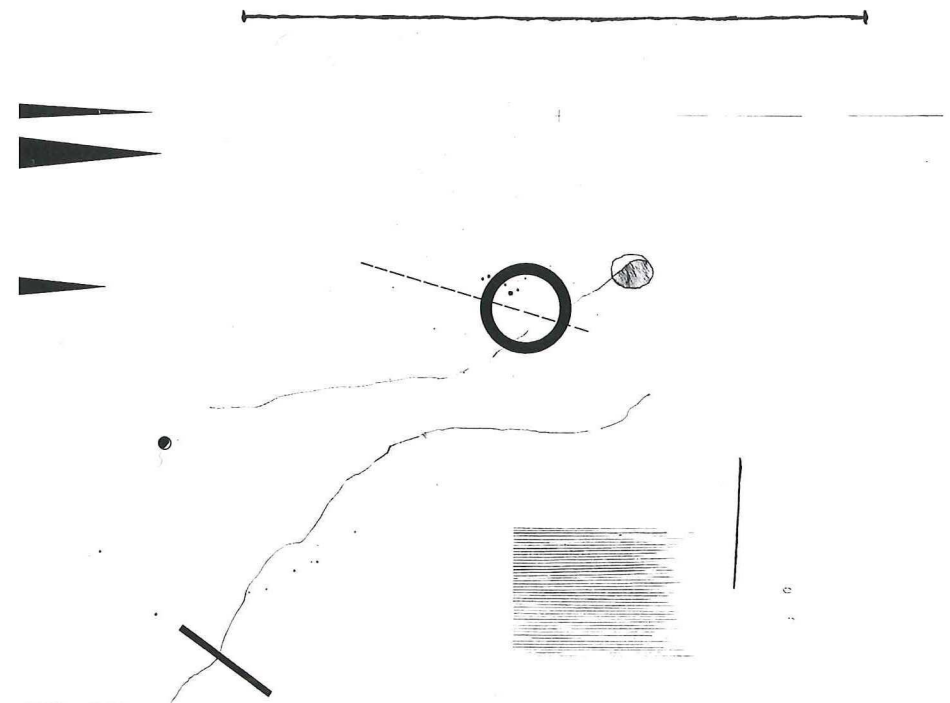Stefano Milani   The new 'ductus'. A reflection on Manfred Mohr's drawing

idea on what we traditionally refer to as the 'drawing'.

The Italian architect and theorist Franco Purini notes that the progressive scientific-*ization* of the design, especially in recent years, seems to have overshadowed the unpredictable aesthetic sphere the drawing, its artistic dimension: 'as a consequence of the digital revolution, the drawing becomes a "scientific text", an applied theorem or an algorithm that protects its content through an accelerated and mysterious figuration'.[2]

The question of the artistic dimension of the architectural drawing is a very generic one, especially in a moment where languages of art and architecture have undergone irreducible hybridisation that renders impossible to disclose the criteria of this relationship. Nevertheless we can observe that whenever art and architecture concern themselves with theoretical and constructivist problem a mutual attraction occurs; an attraction which is measured by the drawing, by an idea of drawing. This has notoriously taken place during the Renaissance where the drawing squired the status of 'synthesis of all the arts,' during the historical Avant-gardes, especially with the experience of De Stijl, in particular the work of Theo van

2   See Franco Purini, 'Drawing Architectures', in: Stefano Milani (ed.), *Franco Purini. Drawing Architectures*. Bologna (Compositori) 2008, p. 41.

Doesburg, and again during the sixties, when the experience of the avant-garde attempted to resurface. With the analytical experiences of sixties, art and architectural work acquired a qualified professional dimension. The creative and constructive work became a means for other finalities while the object of art became a 'project', an investigation into the realm of the series, into the process.

This critical operation implied a meta-linguistic character seen the double operation of making art and, at the same time, a discourse on art. The shift from the expression to the critical reflection on the work, the attempt of a formalization of a specific artistic language, implies the definition of logical operations and a scientific use of the 'vocabulary' of the artist. Through attempting to find the deep analogies that bind the two forms of materialization of thought, the 'rational' one and the 'artistic' one, the artist's expressions are transformed into logical-mathematical propositions, being thought as being true or false, and, consequently, they become analyzable as a whole. The drawing became the conceptual place for this analysis and formalization. The renowned closeness between art and architecture revealed an increasing interest
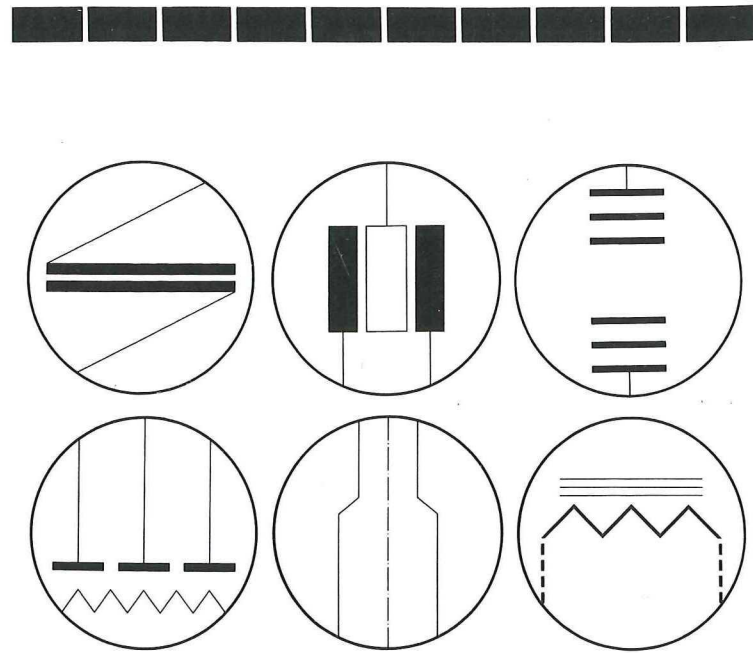
III Manfred Mohr, *Hard Edge, Work Phase (1966-1969), Subjective Geometries, 777 MHz, 1967.*

IV Manfred Mohr, *Bild 16_469, Work Phase (1966-1969), 1969*

Stefano Milani The new 'ductus'. A reflection on Manfred Mohr's drawing

for the drawing considered not only as a design act but also as an 'intransitive experience that allows for the systematization of a self-verified approach'.[3]
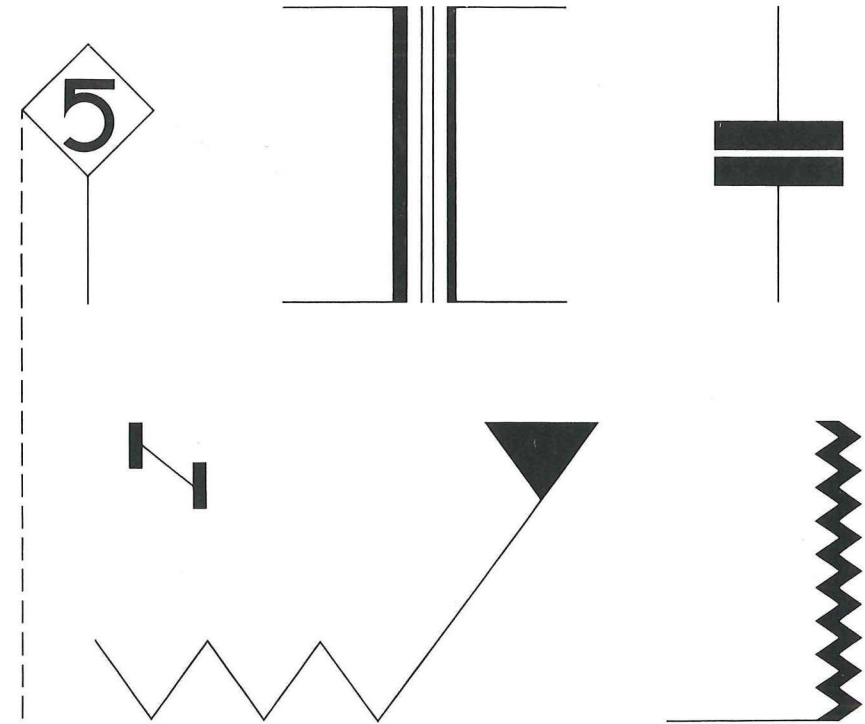
Manfred Mohr's 'drawings'

The drawing of the German artist Manfred Mohr can offer a very singular, and on the same time very consistent and precise account on some of the theoretical themes emerging between mathematical logic and aesthetic research found and developed through his work. The radical questioning of the subjectivity of the artist, the rigorous and radical definition of a constructivist attitude towards art, and on the same time the difficulties to bind it within a traditional critical framework, are all aspects that Manfred Mohr's work appears to be stressing to the point of their logical conclusion.

Mohr's work seems to offer the possibility to envision aspects such as a new aesthetic dimension of the sign, for a redefinition of 'drawing' both as a significant moment of knowledge and as datum, a concrete expression of artistic dignity. In essence, Mohr's drawings are theoretical landscapes in a world of two-dimensional mathematical forms.

3 See Filiberto Menna, *La linea analitica dell'Arte Moderna.* Turin (Einaudi) 1975 (reprint 2001).

Manfred Mohr has been one of the first artists together with Frieder Nake, Michael Noll, Georg Nees, to acknowledge the potential of the computer for the exploration of the domain of the intelligence proper. As an artist, Mohr 'draws' algorithms that are processed by a computer and printed by a plotter. The algorithms function as aesthetic filters to represent the human behavior in a given aesthetic situation. Mathematics, thus, is used as vehicle (and only as a vehicle) of the artist's expression. Mohr describes his work and the role of the computer with a bewildering terseness: 'the computer became a physical and intellectual extension in the process of creating my art. I write computer algorithms i.e. rules that calculate and then generate the work which could not be realized in any other way. My artistic goal is reached when a finished work can dissociate itself from its logical content and stand convincingly as an independent abstract entity.'[4]

In the mid-sixties, influenced by Max Bense's ideas on 'aesthetics',[5] Manfred Mohr started a radical questioning of his informal approach to art, and he began a rigorous formal analysis of his painting. He started to enquire the possibility to rationalize the 'emotive cloud' and the free nature of the signs

4 Manfred Mohr, quoted from the exhibition catalogue: *Manfred Mohr Computer Graphics. Une esthétique programmée.* A-R-C Musée d'Art Moderne de la ville de Paris, Paris, 1971, p. 38.

5 Max Bense's aesthetics represent the conclusive moment of a long tradition of thought that sees the theory of the Avant-garde as fertile ground for a synthesis of all technological ideology. Bense have been able to reach a complete synthesis of aesthetic, ethic and cybernetic, oriented to a configuration of a rigorous model of the behavior of a man fully involved within the universe of the capitalism.
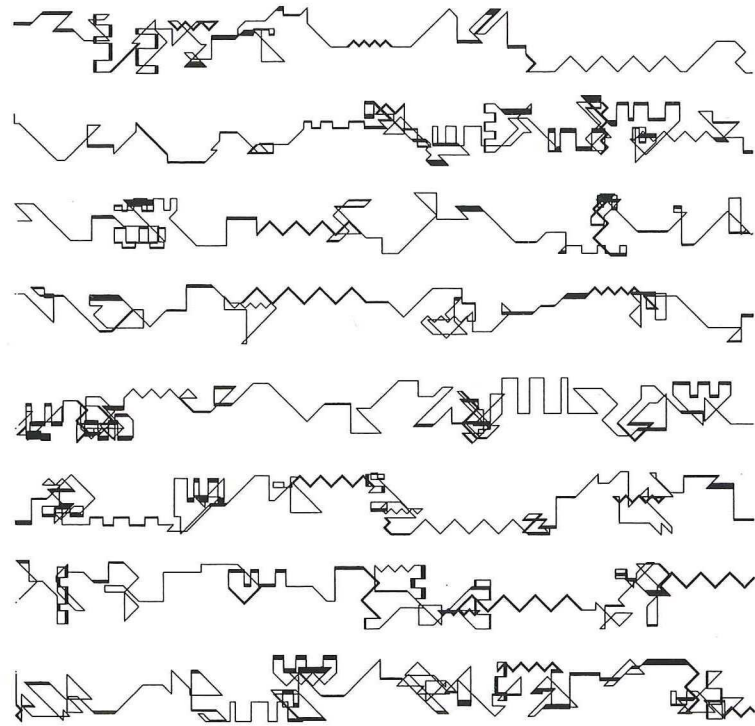
V Manfred Mohr, *Early Algorithms, Work Phase (1969-1972), Band Structures, Program P-21, 1969*

VI Manfred Mohr, *Continuous Lines P-10_I and P-10_II, Study (first level) for Program 21, Early Algorithms, Work Phase (1969-1972)*

Stefano Milani   The new 'ductus'. A reflection on Manfred Mohr's drawing

and their organization within the white background, thus discovering a large amount of regularities, determined of course by his individual aesthetic sense expressed in his early work. I Consequently, this led to a definition of a rough syntax of basic elements and recurrences that would determine the criteria of the next phase. In this intermediate moment of analysis, the work *Subjective Geometry* represented a first attempt to rationalize his imagination through the realization of a catalogue of black geometric signs accurately arranged on a white background. The pictograms, conceived according to 'a subjective selection process' and visually informed technical symbols as well as mathematical formulas and electronic circuits, constituted the premise for the elaboration of a formal language of self-referential signs. II

In the next work phase between 1969 and 1972, Mohr introduces logic and mathematics to study and represent his production of signs. Algorithms were for the first time introduced to calculate the images that will be unified under a computer program to allow for all possible combinatorial representation of that algorithm.

It is in this period that Mohr discovers the potential of

Regarding more specifically the work of art Max Bense investigated the possibilities to formalize the aesthetic content of an artwork on the basis of 'aesthetic signs' aiming for a rational approach for the understanding and production of art. Reflecting on the influence of technology on society, and on people's awareness of it, he believed that the judgment and the production of art should leave the emotive subjective sphere to a more logic-mathematical approach.
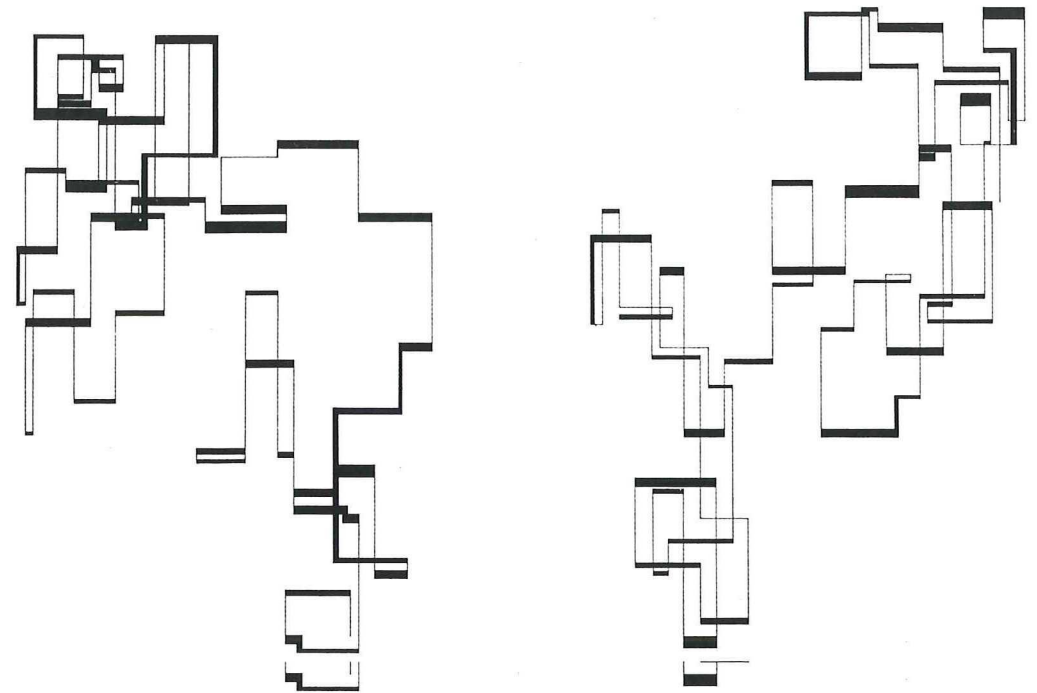
the use the computer to develop his research. In 1968, thanks to the influence of the composer Pierre Barbaud, one of the pioneers of the computer music, he had the opportunity to be guest at the *Institut Météorologique* in Paris where he could use a *CDC 6400* computer and plotter for his experiments on man-machine relationship, by testing his visual ideas and at the same time to develop the knowledge in order to write himself the algorithms and the software he to be used in the process.

This would turn out to be a crucial moment on the development of his research, because from that moment on the series of abstract forms (signs) produced have no visual reference with their constructive logic expressed by the algorithm. This fact implies that the algorithmically produced signs accurately defined as autonomous 'carriers of aesthetic information'. In fact, according to Mohr, 'the sign must be able to free itself visually from the logical content so as to appear as an abstract form. But at the very least an equilibrium between logical content (origin) and aesthetic information (goal) should be reached.'

The work series 'Continuous Lines', 'Discontinuous
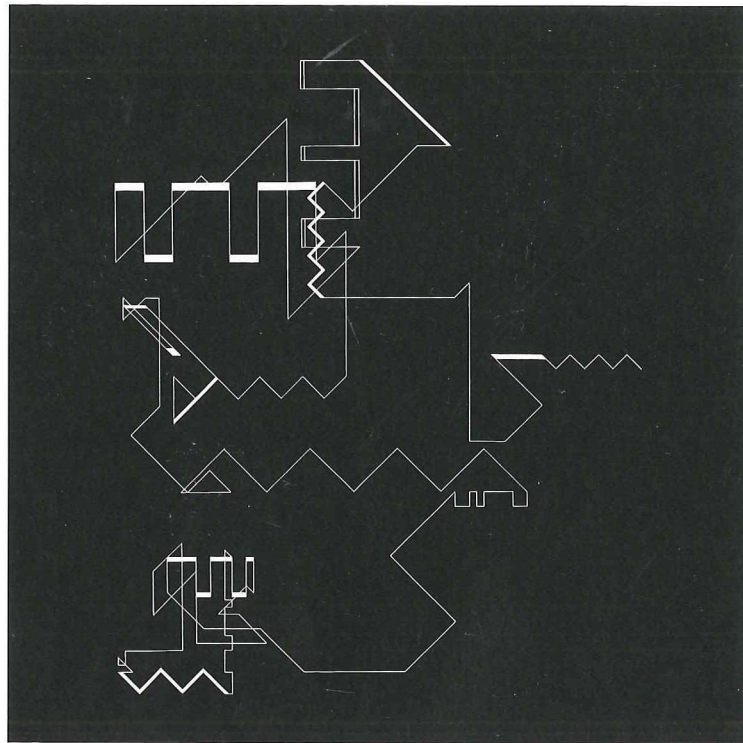
Stefano Milani The new 'ductus'. A reflection on Manfred Mohr's drawing

Lines', 'Band Structure', 'Formal Language', 'White Noise' are examples of this his early algorithmic phase. Accompanying the title there was always the reference of the version of the program that generated the work. In 'Band Structure', a series of continuous script-like lines are generated according to the 'Program 21' that contains a number of aleatory instruction in order establishing the criterion of appearance and behaviour of elementary lines according to parameters such as: intervals and thickness, zigzags and directions; while a sub-program parameterizes the relationship between lines according to similar instructions. III IV

III
IV

Even when seen at a general level, without entering the complexity and controversial meanders of a semantic analysis to attempt to reveal the potential meaning of this operation conduced by Mohr, this work allows for the singling out with clarity a series of essential aspects. First, the artistic signs become truly self-referential; second, the precision of their systematic production offers the possibility for interpretation. The gap, between their constructive logic and their visual equivalent defines the boundaries of an aesthetical territory that can be, measured, improved, developed and redefined.
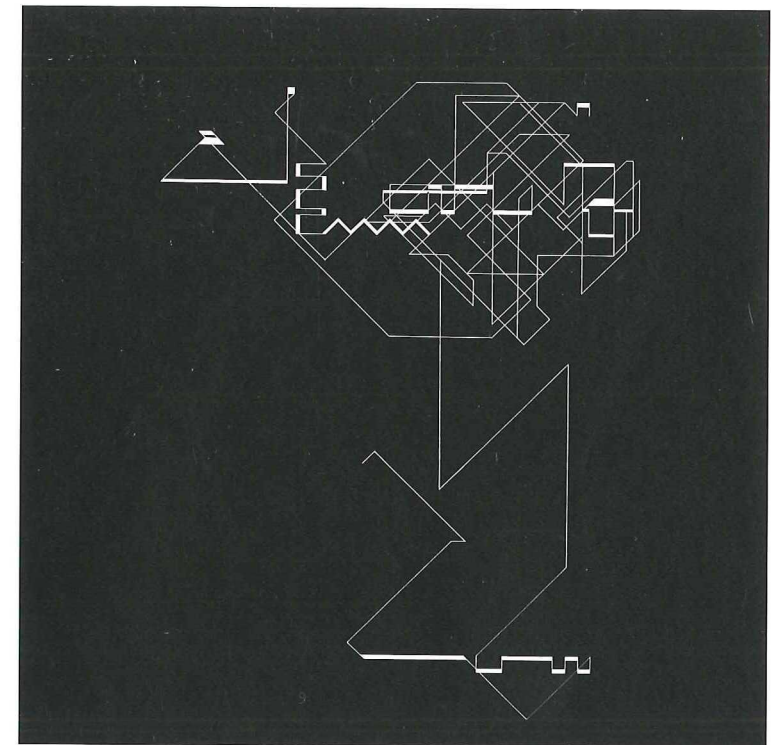
The basis of Manfred Mohr's working process is the creation of rules and systems. In a second stage, with the visual realization of the work, it is determined whether the system is adequate and if it can function as foundation for further development. This approach based on a rigorous system of binary decisions is associated with the complete freedom and curiosity towards the contradictory chaotic visual output of the series. The diversity of the results is stimulated by random choices along the execution of the program, which according to Max Bense's theory represent the 'guarantee of the singularity of the mechanically generated aesthetic object'. [6]

After this programmatic phase, where we can still find a analogical relationship between algorithmic scripting and their output as in 'Band-Structures', Mohr introduced the cube as 'fixed system with which signs are generated'. [7] The intelligibility of the cube, the fundamental three-dimensional Cartesian object, enables a further systematization of the algorithmic work. From this basic structure, Mohr elaborate a syntax of constructive and deconstructive algorithms that enable an endless proliferation of the cognition of the aesthetic processes. Once again, the development of

6 Max Bense quoted in: Lida von Mengden, 'Manfred Mohr. Research in the Aesthetic Universe of the Cube', in: Lida von Mengden, *Manfred Mohr. Broken symmetry.* Exhibition catalogue Kunsthalle, Bremen 2007.

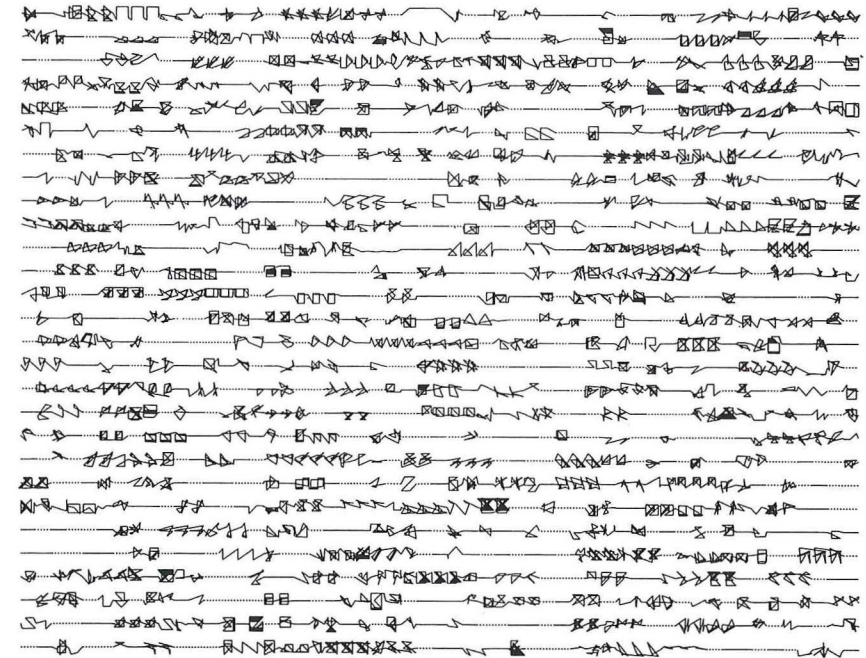7 Manfred Mohr, *Cubic Limit*, Galerie Weiller, Paris, May 1975.
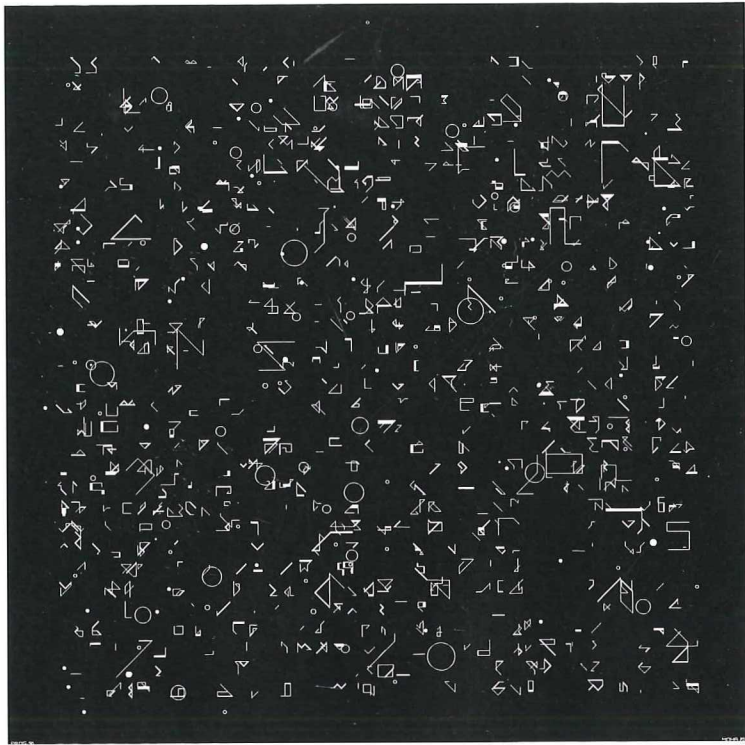
IX   Manfred Mohr, *A Formal Language P-50, Early Algorithms, Work Phase (1969-1972)*

X   Manfred Mohr, *Early Algorithms, Work Phase (1969-1972), White Noise, Program P3-6*

Stefano Milani   The new 'ductus'. A reflection on Manfred Mohr's drawing

the work, its complexity and expansion into unforeseen territories, was achieved through the rationalization and precision of the systematization of the work phase. 'The cube' will represent the leitmotif in which Mohr would develop the repertoire of signs of the later stages of his work.

In *Cubic Limits I* (1972-1975) an algorithm generates a catalogue of signs where the twelve edges of the cube underwent a gradual combinatorial subtraction to the point of loosing visual referent with the basic structure of the cube. In this work the constructive logic of the algorithm generates autonomous two-dimensional signs from a three-dimensional form. The signs produce a progressive break-up of the solidity of the cube and in particular the spatial illusion of its three-dimensionality on the picture plane. In this microcosm, aesthetical complexity is achieved through reduction, by the elimination of the spatial ambiguity of the solid representation on the picture. Mohr excludes the concept of spatiality from his research, as he is interested only in the relation between signs and a two-dimensional field. The idea of dimension is not understood in its physical and philosophical aspects, but solely in a mathematical sense.[8] There are

8   As a mathematical entity the cube can be conceived with an infinite number of dimensions. In *Divisibility I* (1978-1980), for instance, the cube is expanded to the fourth dimension (hyper-cube).

no representations of an external reality, nor his process is a fiction. Rather, here reality is conceived anew within a world of sign.

Mohr's early work phase on the cube offers enough elements to formulate a series of conclusive considerations aiming to address the question of drawing underlying this text.

There are many evident characteristics (formal and visual) that enable us to use the term 'drawing' for this work: the elementariness of the information, the technical precision, the exclusive use of black and white, the linearity as the only determining element of form. But drawing herein must be understood in a wider sense, as amplitude that exceeds the criteria of a formal analysis.

We need to recall the concepts of *Disegno Interno* and *Disegno Esterno* (Inner Drawing and External Drawing) elaborated by Francesco Zuccari at the beginning of the seventeenth century, in order to broaden the spectrum of analysis. Zuccari, in fact, was able to theorize a unifying concept of drawing that connects the concept of Idea to the one of Representation.[9] For Zuccari, the precision of the analytical approach and the theoretical interpretation of the drawing lies

9   See Federico Zuccari, *L'idea de pittori, scultori et architetti*. Turin 1607; reprinted in: Detlef Heikamp (ed.), *Scritti d'arte di Federico Zuccaro*. Florence (L.S. Olschki) 1961.
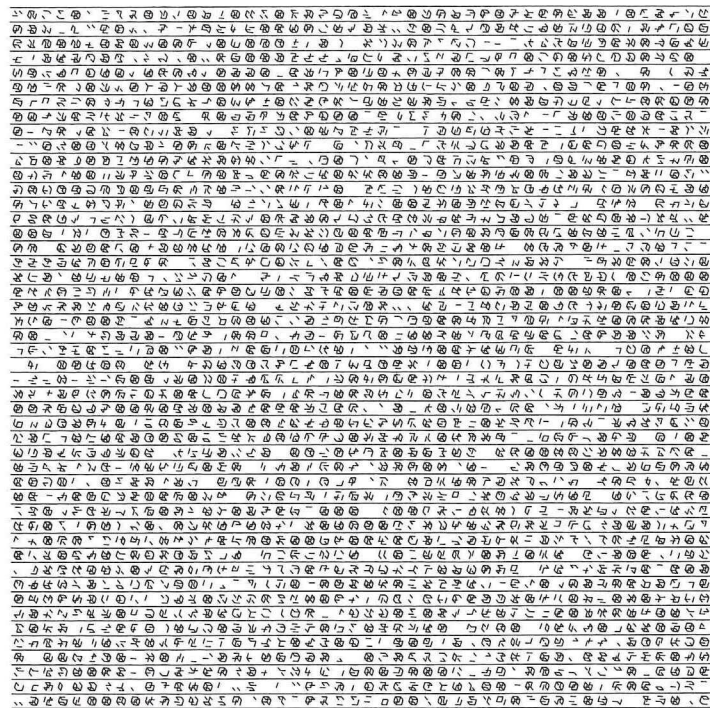
XI Manfred Mohr, *Cubic Limits I, Work Phase (1973-1975), Program P-155-C, 1974*

XII Manfred Mohr, *Cubic Limits I, Work Phase (1973-1975), Program P-159-A, 1974*

Stefano Milani   The new 'ductus'. A reflection on Manfred Mohr's drawing

in the very moment of general consciousness of the world, a general disposition (or faculty) of the human being to give *meaning and form* to the external world. The central assumption of Zuccari is the attribution to the Inner Drawing, both imaginary and spiritual, the quality of concept and object known, that means to give to the drawing the epistemological status, a device able to generate knowledge and 'even' truth. Consequently the drawing should be a subject matter for our comprehension of the world.

But, while in Zuccari the meaning of the supremacy of drawing originates from the Idea that lightens the mind of the artist and that finds its external concretization in the drawing itself, in Mohr the concept of origin becomes relative: idea and result are just sections of a process. The relationship between the functional role of the artist's individuality towards the conception of the object does not subsist from the moment in which Mohr Mohr delegates the 'work of art' to an on-going exploration, oscillating between the two poles of the Inner Drawing and the one of the External Drawing.

All here seem to be equally consistent and necessary to grasp anew an understanding of the work of art: the con-

ception of the algorithms, the precision of the machine, the plotted results. It is not a case that Mohr uses to published the result of his experiment along with the algorithms and programs. According to Lauren Sedofsky, 'Mohr's strictly heuristic use of the digital image occupies a territory midway between established artistic practice and the paradigm of computer simulation, understood as the visualization of theoretical systems, or even simply forms, evolving over time. Based on a priori rules (the transcription of relations, continuous variations and multi-dimensional structures), simulation creates the conditions of production for a microcosm, an autonomous formalized universe whose inherent possibilities become accessible to exhaustive exploration.' And again: 'Where the particularity of the work of art was once a function of the artist's individuality, here form begets form.'[10]

If the death of the aura is the necessary condition of the universe of art within the technological society, then, for the artist, the inner contradiction disclosed within the elaboration of the work of art becomes a necessary element to accelerate this death. To do so the artist must now become 'an operator, entering hypothetical laws of composition in an

10 In: Lauren Sedofsky, *Linebreeder, Manfred Mohr*. Exhibition catalogue Josef Albers Museum, Bottrop 1998.
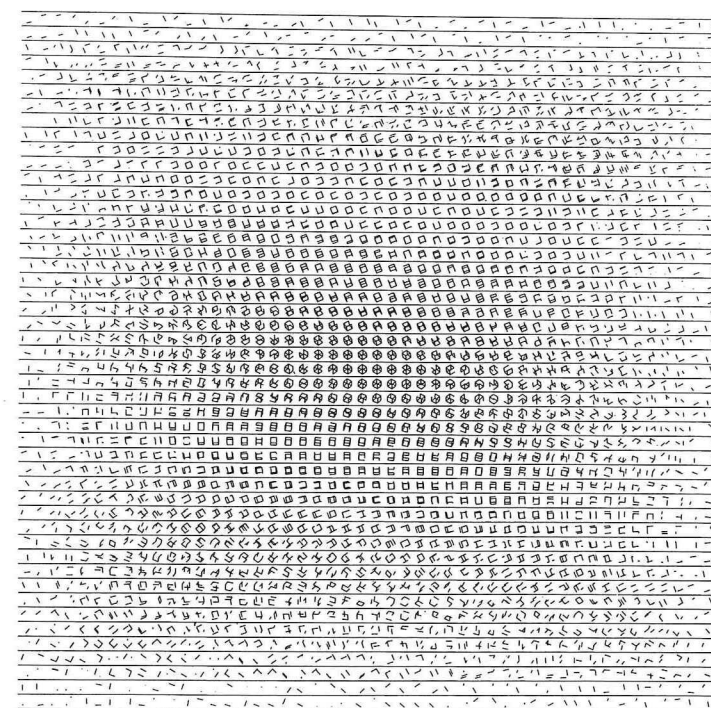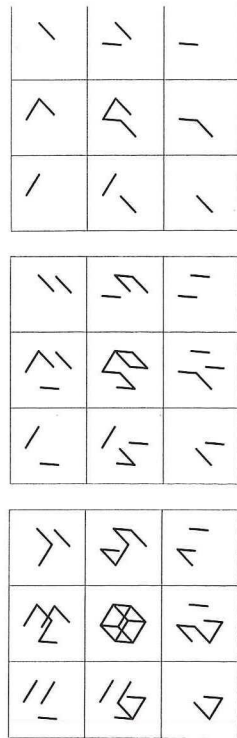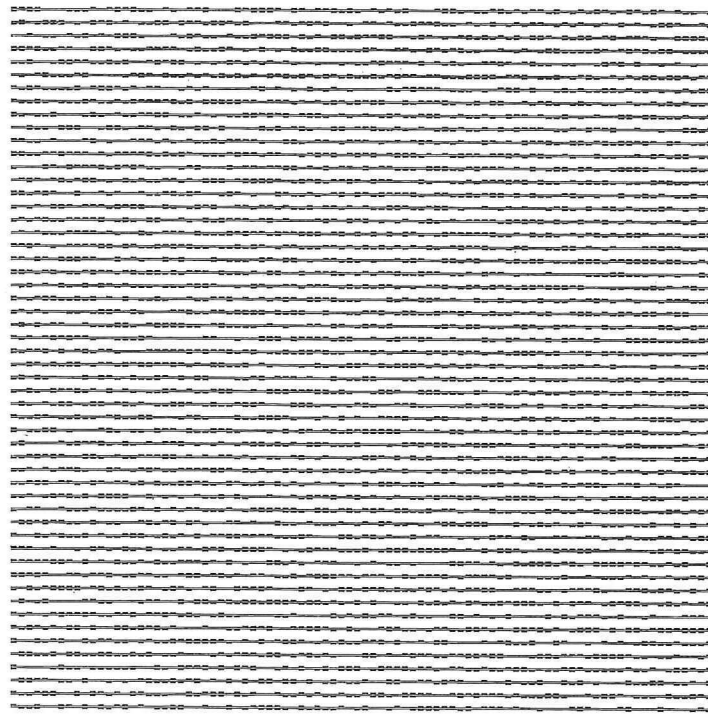
XIII Manfred Mohr, Cubic Limits II, Work Phase (1975-1977), Program P-185-D, 1976

XIV Manfred Mohr, In Schrift, 1973

XV Manfred Mohr, P-196-EE, 1977-1979

Stefano Milani   The new 'ductus'. A reflection on Manfred Mohr's drawing

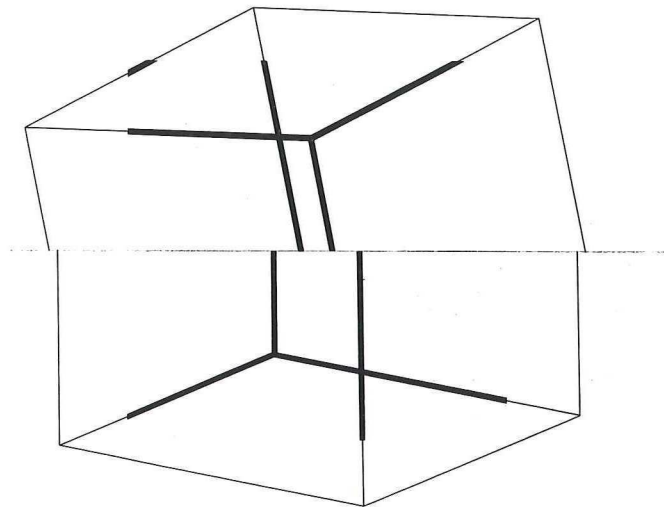abstract notation, while passing alternately through moments of blindness and moments of insight'. [11]

11   Ibid.

A new ductus

Manfred Mohr's radical approach to art prompts a series of arguments that legitimize a reflection on the field of architectural drawing. In addition to the evident similarities between Mohr's investigations and the architectural drawing, such as the constructivist approach and the necessity for its visual output, one theme in particular can be singled out as potentially reinvigorating of the theoretical relevance of drawing in architecture.

The implications produced by the conceptual shifts operated by Manfred Mohr is the theoretical possibility to conceive a reformulation of the most basic structural character of drawing, namely the *ductus*. The concept of singularity and individual qualities of a sign, should be redefined through the formalization of new *modi operandi* that enable the integration of the *causa mentale* of human thinking with the of the precision of the mechanical production. According to Mohr, 'Since the most important point in applying a computer to solve

aesthetical problems is the MATERIALGERECHTE [12] use of this instrument, the research therefore should assume that old techniques of drawing and imagination are not to be imposed on the machine (although this would be possible), but should develop a priori a vocabulary which integrates the computer into the aesthetic system.' [13]

Within the apparatus elaborated by Mohr, the drawing can rediscovers its necessity and universality also within architecture, enabling the possibilities to re-conceive its epistemological status, and the aesthetical experience. But this new finality of drawing cannot be prescribed a priori, nor can it be a-critically remitted to an instrument or to a technique, as the rational research of Manfred Mohr has shown, rather it can only be found within the freedom accorded by its own modus operandi. Through the norm, drawing can become a form of writing, investigating the inner legalities of its praxis, and perpetuating its inscription inside the domain of form.

12   MATERIALGERECHT, German for: working or using a material only in the way that is basic to the material.

13   Manfred Mohr, quoted in: *Manfred Mohr Computer Graphics. Une esthétique programmée.* Exhibition catalogue A-R-C Musée d'Art Moderne de la ville de Paris, Paris, 1971, p. 36.