the materialization of mathematics

Bernar Venet and the Highest Degree of Abstraction

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Bernar Venet achieved global fame with his monumental and apparently non-objective, abstract public sculptures, whose enigmatic strangeness and "muteness" shatter the fabric of our familiar reality, whether in Versailles, Berlin or Florida. With their breathtaking mass and imposing height, Venet's steel arcs could have been brought here from another world, and although they conjure up countless possible meanings, depending on their modern or classical architectural and intellectual historical context, their own autonomous or a priori sense and significance are veiled in a shroud of mystery. This is compounded by the fact that the titles of his works are composed of mathematical terms, numbers and angles: *97.5° Arc x 8* in a scenic park in Florida, in an exhibition presented by Sotheby's, or *85.8° Arc x 16* in Versailles, framing the equestrian statue of the Sun King. In both settings, the sculptures generate a sublime effect, and in the proximity of these enormous arcs – fragmented though they may be – the biosphere shrinks into insignificance in the same way as the historic settings of the Palace of Versailles fade into the background. Moreover, this sublime effect is derived not from size alone, but rather from the fact that we cannot tell how these bizarre, colossal objects came into being, or what they want from us. The primary reason for the "capitulation" of common sense may be the way in which the artist, quite simply and provocatively, has "inserted" a different system of interpretation into everyday reality. This "different" system is none other than the abstract world of mathematics, which Venet ingeniously presents to us in its own purity and concreteness.

Venet thereby implements a unique and original programe of art, which assimilates and syn-thesises all the different traditions of concrete art, minimalism, conceptual art and land art, while apparently striving for only one thing: the materialization of mathematics.

The concepts of mathematics and the sublime were first brought together by Immanuel Kant within the philosophical framework of the theory of knowledge, when he discussed the mathematical and the dynamical sublime.

Kant, however, was inspired less by mathematics than he was by geography, for he used geographical examples when illustrating the mathematical sublime, referring to the infinity and immeasurability of oceans and mountain ranges.

Whereas Edmund Burke associated the experience of the sublime with the physiological senses, especially that of attraction mixed with fear, Kant appealed to the sense of reason, more precisely to the mind, which, in his view, is enthralled by the experience of the boundless and the infinite, and by the very fact that it is capable of formulating a concept of it at all. In the wake of Burke and Kant, artists from Caspar David Friedrich to Barnett Newman have focused keenly on the sublime, while in the world of philosophy it was perhaps Jean-François Lyotard who first came close to a definition of the kind of sublime that is based on powerful artistic inspiration: the presentation of the unpresentable.[1] This programe, regarded by Lyotard as avant-garde, has the capacity to bring together experiments in art that are aesthetically as widely divergent as the works of Kazimir Malevich, El Lissitzky, Mark Rothko and Robert Smithson. To date, however, the most powerful illustrations to emerge of an ideology of mathematics and the mathematical sublime that is simultaneously concrete yet totally abstract are perhaps those created by Venet, to whom Lyotard does not refer at all. Yet Venet's enormous monuments only truly reveal themselves from a historical perspective, and in order to interpret them, to unmask their mathematical philosophy, one must step back to the beginning. For behind the sculptural materialization of the various arcs, the pronounced straight lines and the chaotic profiles, there lies a past firmly grounded in painting and in conceptual art, which always derived its motivation from the dialectic tension between abstraction and visualization, that is, between presentation and non-representation.

Mathematics first appeared in Venet's work in 1966 in the "minimalist" intellectual environment of New York, when, in a sudden seismic shift, the artist abandoned his earlier gesture paintings in favour of mathematical diagrams painted as easel works. Compared with the motivations of institutional critique that imbued Fluxus, minimalist and conceptual art in those days, the most extraordinary aspect of Venet's practice was the almost complete absence of any political or socially critical considerations. Venet reinterpreted mathematics as an entirely abstract artist, and it was here that he discovered, in an artistic sense, the highest degree of abstraction. Interestingly, with regard to the theory of visualization and presentation, Venet's views bear comparison with the cartographic and semiotic works of the

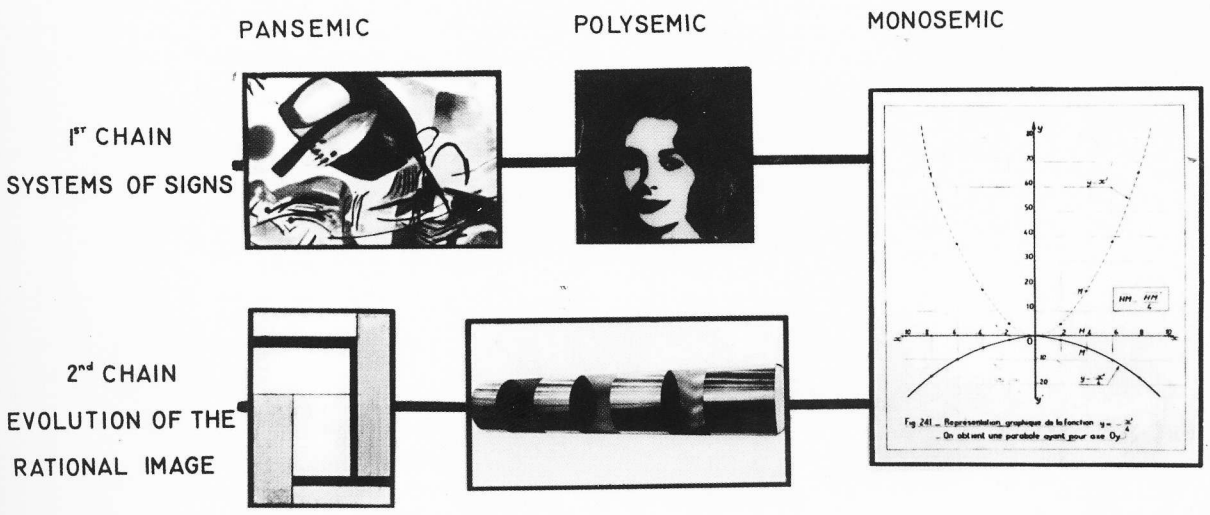
1 *Jean-François Lyotard*, Presenting the Unpresentable: The Sublime, Artforum, *1982/4, 62-69. Further: Donald Kuspit*, Bernar Venet, Art and Mathematics: In Search of the Sublime, *Yeuse, Paris, 2003.*

Az absztrakció szintjei
acques Bertin után, *1971,*
tinta, kollázs papíron,
Gyűjtemény:
Enrico Pedrini,
Olaszország, Genova

egrees of Abstraction After
Jacques Bertin, *1971,*
Ink, collage on paper,
Collection:
Enrico Pedrini, Genoa, Italy

DEGREES OF ABSTRACTION AFTER JACQUES BERTIN

		SYSTEMS OF PERCEPTION	
		AUDITORY	VISUAL
SIGNIFICATION ATTRIBUTED TO SIGNS	PANSEMIC	MUSIC	NON FIGURATIVE IMAGE
	POLYSEMIC	VERB	FIGURATIVE IMAGE
	MONOSEMIC	MATHEMATICS	GRAPHIC IMAGE

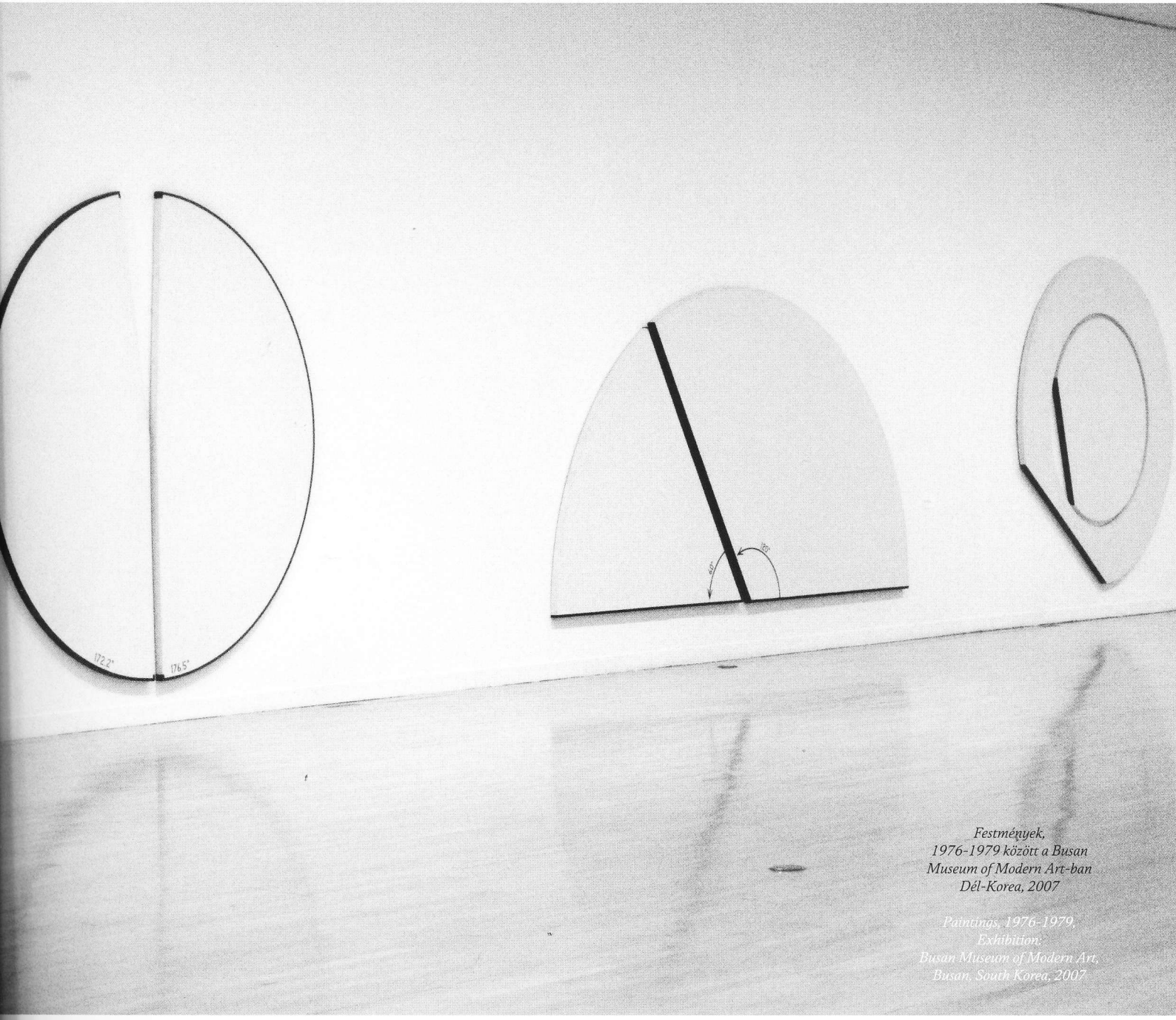


map-maker, Jacques Bertin.[2] Bertin attempted to formulate a system, inspired by linguistics and structuralism, of different types of graphic representation, which he classified into three groups, depending on the relationship between the signified and the signifier: pansemy, polysemy and monosemy. Intriguingly, according to Bertin, non-figurative art, regarded by many as being meaningless, is characterized by pansemy, so the signifiers and signifieds en masse are equally undecidable, implying that almost anything may signify almost anything. By contrast, figurative art is polysemic, since a single signifier, that is, a formally defined single figure or motif, may be associated with more than one signified. Surprisingly, in accordance with this logic of linguistics and communication theory, the highest degree of abstraction is attained by the most unambiguous and most concrete of presentations, the scientific graph, in which a single signifier is associated with a single signified, in other words, where the presentation is monosemic. Most interesting of all, however, is the way in which, similarly to but independently from Bertin, Venet came to a similar conclusion in the mid-1960s.

Whereas Bertin presumably sought the path to the most accurate form of imaging from the perspective of scientific objectivity and cartography, Venet was in search of the maximum of art and abstraction, that is the minimum – the "degree zero" – of presentation, which, paradoxically, may also represent the highest degree of pure or concrete art.[3] Via this programe, the aesthetic imperative of purism in art, Venet joined in with a characteristically European tradition, which, after Max Bill, is called concrete art. It is important to stress, however, that Venet set about implementing a marked revolution in this tradition, because he invented pure abstraction not in painting itself, in its materiality, its geometry and its opticality, but in its mathematical language and philosophy. In this way, mathematical and scientific abstraction became the subject matter of his painting, which he presented virtually „as is", in a hyper-realist manner: he painted equations, graphs and diagrams ranging from algebra to the realm of astrophysics – in acrylics, on canvas, with pinpoint precision. Moreover, this path correlated thrillingly with the developments taking place at the time on the New York art scene, which, to paraphrase Lucy Lippard, was creating in the thrall of dematerialization.[4]

It was, however, completely independently from Lippard, and from the artists regarded so highly by her – Lawrence Weiner, Robert Barry, Sol LeWitt and Joseph Kosuth – that Venet reached the point where his art became fully immaterial, following his own path, with his "ready-made" scientific presentations. In synchronicity with the logic of a conceptual art that paradoxically fetishised ideas, Venet abandoned painting, and at his exhibitions in the late 1960s, he communicated only photographic reproductions of the texts and diagrams he used when giving presentations on a variety of different mathematical and physical topics. After 1971, he no longer produced anything at all that could be interpreted as an art object, restricting his activities to writing theoretical texts

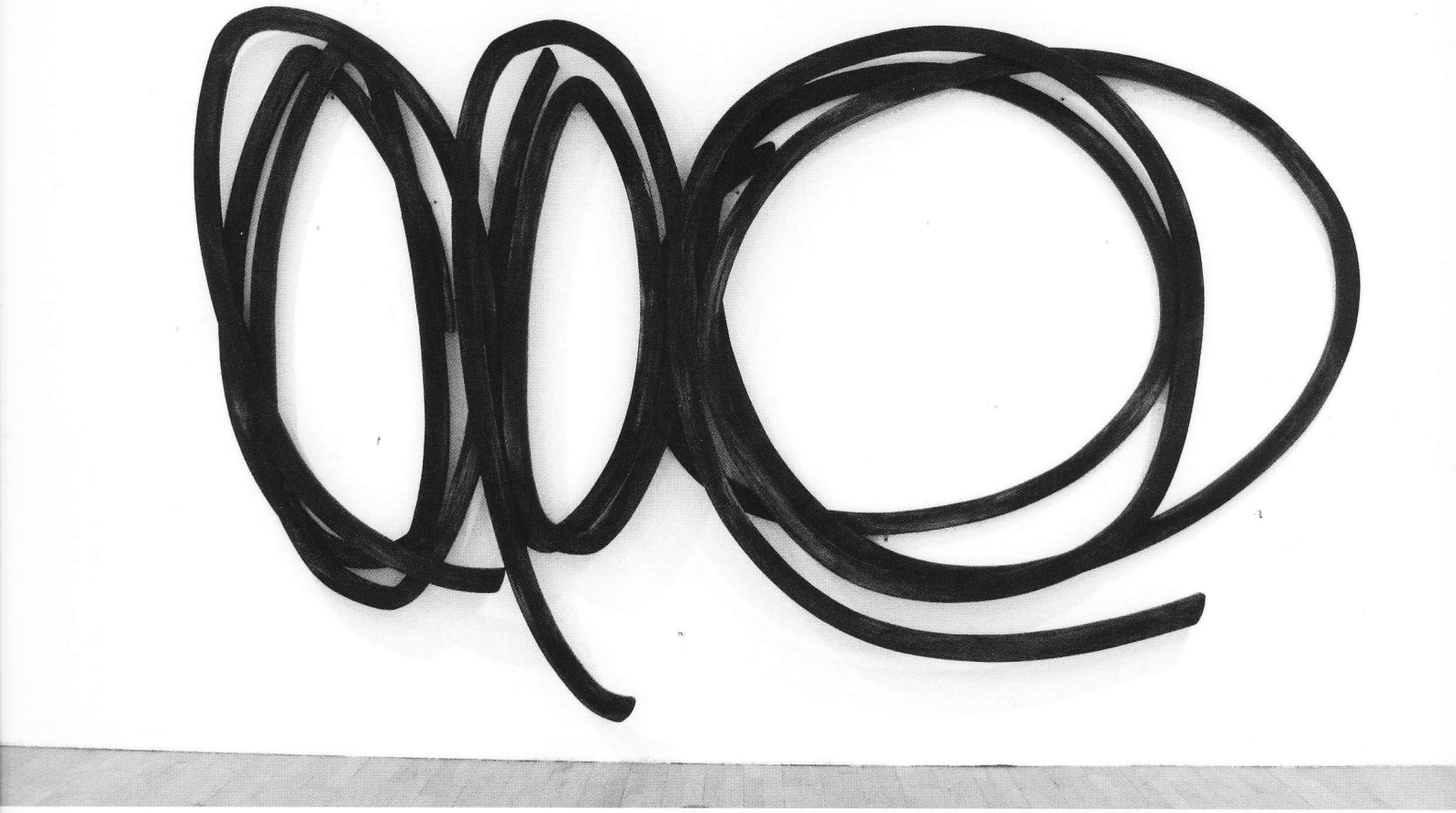
2 *Jacques Bertin,* Sémiologie graphique, *Mouton, Paris, 1967.*
3 *Roland Barthes,* Le degré zéro de l'écriture, *Seuil, Paris, 1953.*
4 *Lucy R. Lippard,* Six Years: The Dematerialization of the Art Object from 1966 to 1972, *University of California Press, Berkeley, 1973.*



Festmények,
1976-1979 között a Busan
Museum of Modern Art-ban
Dél-Korea, 2007

Paintings, 1976-1979,
Exhibition:
Busan Museum of Modern Art,
Busan, South Korea, 2007

and teaching at the Sorbonne. In 1976, however, when he started to produce images again, he started out once more from mathematics, this time specifically from geometry: he painted angles. Furthermore, he did so in the strictest sense of the word – as though he were making illustrations for a book, only his medium was not the printed page, but the canvas. His painted angles very quickly escaped into spatiality, becoming formed canvases, then cut-out reliefs, and finally three-dimensional sculptures, enormous arcs. At some point during the period of his reliefs, his walls began to feature irregular lines derived from scribbles, which soon developed into his sculptures of mysterious and monumental *Indeterminate Lines* making their presence felt in ordinary, everyday spaces. Not for the first time, Venet had broken free from the confines of easel painting, but now it was not along the path of "conventional" abstraction, following ideas and conceptualism, but in the very opposite direction, towards the physical realm of tangibility, of matter and materiality.



By breaking with the traditions of abstract art, Venet did not arrive at the line through attempts to tackle the problem of how to present the infinite, but, quite the contrary, through the materialization of the line, he stumbled upon a solution to the conundrum of the impossibility of presenting the infinite. With his public sculptures, his models and his drawings, Venet gave form to the line itself – in its mathematical sense – more unambiguously and monosemically than anybody before him. The key to this was the fact that the line, through sculpture, had emerged from the abstract space of an easel into the three-dimensional space of ordinary life. Whereas, in the mathematical and physical diagrams of his conceptual period, the line had existed only as an illustration, in his models and sculptures it assumed its own independent, autonomous existence. In parallel with this, the theory of monosemy was also enriched with new meaning, for the very act of placing different arcs and irregular curves into real architectural and natural contexts emphasises the fact that the line has no meaning of its own, and is merely the materialization of an abstract mathematical idea. In its own concreteness, this programe of sculpture provides a valid solution to the Lyotardian problem of how to present the infinite and the unpresentable.

Három meghatározatlan vonal, *1983, grafit, fa, 240 × 400 × 12 cm*

Three Indeterminate Lines, *1983, Graphite on wood, 240 × 400 × 12 cm*

With this solution, however, Venet was inspired not so much by Lyotard as by the work of Kurt Gödel, when he began to explore the phenomenon of the indefinable with his own irregular, apparently finite, but infinitely extendable lines, which erect an eternally relevant monument, as it were, to an arbitrarily selected segment of a universe that functions as a chaotic system. Gödel's incompleteness theorems, that is, the refutation of the completeness of formal logic, has been regarded by many – Lyotard among them – as evidence of the impossibility of rationalism or of a consistent grand narrative.[5] Interestingly, however, Gödel himself did not set out with this objective in mind, and for him, the rejection of the universality of formal logic represented just the first step on the path towards mathematical Platonism, where he conducted his own experiments to make a non-contradictory, consistent description of the mathematical functioning of the world. This type of Gödellian consistency, which seems elusive, yet rests on algebraic foundations (Gödel numbering), also occurs indirectly in Venet's steel sculptures, which constitute a coherent system, and which are just as capable of producing a lasting materialization of the simple and the regular as they are of the indefinable and the random. The strength and complexity of Venet's art lies not only in the multifaceted way in which the works reflect upon the different traditions of abstract, concrete and minimalist art, but also in the fact that they pertain to discourses which are concerned less with the interpretation of art than they are with attempts to describe the universe.

5 *Kurt Gödel,* On Formally Undecidable Propositions of Principia Mathematica and Related Systems I, *(1931), Basic Books, New York, 1962.*