Alea jacta est

> "…perfection is finally attained not when there is no longer anything to add, but when there is no longer anything to take away."
> Antoine de Saint-Exupéry

Band Structures (1969) was my first encounter with Manfred Mohr in 1975. He is an artist; I am a theoretician. We share an interest in semiotics and computers. And probably more: a love of Paris and New York, for example; respect for Max Bense's provocative activity; the desire to explore. This is why, I assume, that at about the same time as he gained access to the plotter of the Institut Météorologique in Paris, I was improvising my own plotter in order to finally see the images I generated on a computer. This is also why, after getting to know more of his work, I came to realize that the rather frivolous formula computer artist, embraced by so many who were neither computer scientists nor artists, does not apply to him.

Manfred Mohr owns an aesthetic space (to use Frieder Nake's concept) within which his talent unfolded in a very original way. It is exactly this original way that prompts my writing about him, as it prompted, in some of my articles and lectures, a public celebration of his remarkable art. The aspect of his work I will focus on in these lines is randomness. Omnipresent and yet so hard to understand, not to say integrate in our activity, randomness pervades even the most structured work we are aware of: mathematics, physics, genetic mutations. It also insinuates itself in the world of our thoughts and feelings. The more some people try to avoid it, the subtler its embrace. Think about those traces of randomness in endeavors of extreme precision – exploration of the cosmos, human genes, the mind – and how they open unexpected perspectives. The history of accidental discoveries, as they are labeled, is much more impressive than that of methodical invention.

But Mohr does not shy away from randomness; rather, he makes it work for him. As pervasive as randomness is, we still do not know too much about it. As a theoretic construct, it is quite slippery. As a reality of existence, it often makes life look like a vast lottery. The aleatoric, another name for randomness, is wedded to the Latin Alea jacta est (The dice are tossed). Well, Manfred Mohr knows a lot more about randomness than do those who wrote the Treatises on the topic. His first "study" of it resulted in a charming book, *Le Petit Livre de Nombres au Hasard* (Paris, 1971, Edition d'artiste), the output of a random number generator. This is concrete poetry at its best, no longer semantic games or word-image translations, but the embodiment, in elegant succeeding columns, of what randomness (also evoking the notion of hazard) is: the impossibility to infer from what was to what will be. In some ways, randomness is a reaction to determinism.

When computers first attracted attention through their potential use for art, the consensus was that while programs can describe the algorithmic component of art, intuition could only be modeled by randomness. Bense obviously made this point (in his *Aesthetica*), and so did his

entire "Stuttgart School." Across the Atlantic, A. Michael Noll, working in the Speech and Communications Department at Bell Laboratories, manipulated lines and shapes, allowing the random number generator to modulate the boring world of order. My own interest in randomness came via historically acknowledged examples of permutational art (Mozart remains my favorite example). They also came through Tristan Tzara, whose genius for provocation and innovation led to the Dada movement and its many consequences in the aesthetics of the modern and post-modern. Jackson Pollock was one of these consequences. But while I was trying to make cognitive aesthetics possible, Manfred Mohr made art that integrated the thought I was trying to express in theoretic terms. Needless to say, even in retrospect, his success makes my attempts so much more futile.

So what is Mohr's art in terms of converting randomness from a technique into an aesthetic component? Mohr himself comes from action painting (but not only). His good fortune was to have found an intellectual and artistic influence in K. R. H. Sonderborg, a painter capable of and intent upon extracting abstraction from natural forms, a source of conceptual inspiration. Sonderborg's strong aesthetic intuition must have left an impression upon Mohr's view of art at a time when to experiment meant to define himself. One of Mohr's friends, the composer Pierre Barbaud, used computers in music, fascinated by how subjectivity can be literally overwritten in the processing of programs.

Obviously, many more influences can be traced, but I am not writing biography. My interest is in the original appropriation of a mathematical notion in a large body of work in which, for the viewer and for the painter himself, all that counts is the art. Indeed, while looking at Manfred Mohr's compositions, the viewer will not see programs, computers, random number generators, or algorithms. Manfred Mohr does not illustrate the technology of computer graphics or even the functioning of random number generators. His work is not animated by the primitive thought of imitating with new technology what the masters, or the kitsch producers, generated with the pencil and the brush within the aesthetics of mimesis. He is not even interested in the thought animating constructivists, minimalists, or artists engaged in other tendencies in which some critics rushed to catalogue him.

Manfred Mohr's art is, if we leave aside his early works, the result of a systematic, yet creative, exploration of the world of geometry, in particular the square and its many embodiments in the three-dimensional cube and hypercubes of varied spatial dimensions. In this exploration, the artist uses a very powerful instrument – the computer – able to perform an enormous number of operations and to generate huge amounts of visual representations. But all this is part of the aesthetic search, not the result. It amounts to a large-scale effort of identifying, in the universe of dimensional relations, entities that can finally coalesce in expressive units. At the end of the search, a relational entity results – a sign. But don't be fooled by the terminology. Mohr generates signs as an expression of intimate knowledge of the space he explores and of himself, the explorer who, instead of discovering continents, makes continents. Aesthetic continents, of course. Unless we understand what he is trying to achieve – the very expressive, synthetic condition of a sign – we will not fully understand his method and vision.

In order to free his explorations from the burdens of psychological patterns, Manfred Mohr literally harnesses randomness and makes it operate on the entities selected for exploration.

Value free choices, that is, choices that do not carry over prejudices and constraints inherited from culture or motivated by psychology, are almost impossible if the choice is left to so-called subjectively driven selection. This is a component of his very comprehensive philosophy. Paradoxically, randomness retrieves for Manfred Mohr what is usually eliminated in the vast space of aesthetic choices. For instance, Mohr wrote very clearly how he treats the very loaded notion and culture of symmetry. He also explained how, with the help of randomness, he explores the space of expressive possibilities usually discarded in art as being ugly or artistically unattractive. Directions are examined as they are revealed by the random search. At times, it seems that what drives the computer engine is not its CPU as much as the random number generator performing selections on the output. This generator whips the program, gives it unexpected directions, and avoids the boring and never aesthetically satisfying deterministic inertia. No surprise, since Manfred Mohr does not try to emulate art or produce similes of art objects. This is why he does not need all the bells and whistles of computer graphics utilities. The resolution he is after is not one of the display, or the printer, but of the search. Instead of pseudo-effects, he prefers powerful entries into the complexity of the space of his artistic investigation.

Chaos research shed new light on randomness. What at first examination seemed random proved to have, over wider cycles, an intrinsic structure in some cases. Bifurcations were made visible. Attractors, embodying a deep sense of order and a higher level of determinism, emerged in explanatory models effective in physics, biology, and genetics. Self-similarity emerged as a powerful concept, and fractal dimensions changed the way we look at the world. Does all this affect Manfred Mohr's perspective? Does it put his work in a different light? Most certainly. His art is strict in expression, but aesthetically it belongs to the open system of aesthetic values. We talked about all this, and about many other components of his method of aesthetic exploration. I think that neither he nor I can agree on more than the well-known fact that random number generators are, after all, pseudo random. If you run them long enough, they start displaying exactly the order one is trying to avoid. But having rehashed all this new terminology, I come to another level of Mohr's artistic foundation. Not only isn't he willing or prepared to ride with the fashionable, but he is also not prepared to pose as a scientist.

Mohr is really dedicated to aesthetic exploration as another form of gaining knowledge, definitely orthogonal if not always complementary to science. His art is precise and at the same time extremely expressive. After randomness is creatively used to open new avenues, through associations otherwise ignored, when it comes to the final piece of art, nothing is left to hazard. The work thus results as the unity of all its components: the formal, the cognitive, the semiotic, and craftsmanship. The significance of this particular condition of his work can be better understood if one follows its major cycles. Sure, every artist has what is called an early work phase. In the imaginary *catalogue raisonné* of Mohr's work, the early art testifies not so much to a time of discovery as of self-definition. The random component of intuitive searching, without even the thought that there is such a thing as a random number generator, applies to methods and themes. Afterwards, Subjective Geometry became a launching pad leading to early algorithmic work and the foundation of his aesthetics in the exceptional Cubic Limit series. The artist is in a sui generis state of revelation. His primary structure, the cube (which he calls a meta-structure), allows him to both explore a rich universe and to demythify the way of achieving effective aesthetic communication. Clarity of forms results from exploring the underlying structure of the

three-dimensional appearance. Nothing is arbitrary. The system integrates randomness in order to achieve aesthetic freedom from stereotype and prejudice.

Chance had it that my professional life brought me close to an artist, David Brisson, seduced by the geometry of the cube and its "incarnations" in spaces beyond three dimensions. It also brought me close to a mathematician, Thomas Benchoff, who was trying to visualize the cube in four, five, and six dimensions. Exciting individuals, exciting themes, exciting times for knowledge that was becoming increasingly computational. Where we, living and working in a three-dimensional space, have problems visualizing a cube in four or more dimensions, the computer, with no time and space culture to affect its behavior, accepts coordinates and displays whatever is inputted. What results are strange images, always more interesting when animated. In the late sixties, the same A. Michael Noll I already mentioned also looked at the hypercube and even came up with computer techniques for displaying n-dimensional hyper-objects. His inspiration came from *Flatland*, Edwin Abbott's beautiful little story of two worlds of different dimensions.

But after all is said and done, all this is science, hard-core attempts to discover new things. Manfred Mohr is fundamentally interested in something else. And this something else is comprised of dimensions in their generality, dimensions as possibilities, such as a three-dimensional cube affords, or a four-, five-, or even six-dimensional cube makes possible. Somebody speculated that the fifth dimension might be seen as "the ultimate spiritual essence." Who knows? We know, however, that in order to deal with Einstein's theory of relativity, geometries of spaces with six (and more) dimensions are necessary. In the dimensions Mohr explores, the focus is not on mathematics, although a relativistic thought is definitely present. His ultimate goal is to generate those synthetic, very dense carriers of aesthetic meaning that are his unconfoundable signs. From whichever space he explores, he returns to his "êtres-graphiques," in two dimensions, semiotic entities that emerge as a result of generative processes. Complexities of the spaces he explores are not erased, rather translated into the signs he generates.

Each dimension is explored to exhaustion. But the travail is of creative search, not confined by pre-defined biases or subjective inclinations. A window is always opened; the cube, no matter in which dimensional space, is looked at as a space of possibilities. Sectioning, rotations, shifts, an entire repertory of procedures (additive, subtractive, juxtapositional, etc.) for reducing the image to essential elements are applied. What governs the entire process is the stubborn determination to extract art where almost all others would see only debris or meaningless forms. If the metaphors of gold mining were not so tired, one would be inclined to use them in describing what Mohr does. The cycles of *Divisibility* (3-dimensional cube), *Dimensions* (4-dimensional), *Laserglyphs*, and *Contrapunct* (6-D hypercubes) follow naturally, but each reveals hidden aesthetic possibilities. Definitely, in order to cope with the complexity of such higher dimension spaces, Mohr refined the strategy of exploring them by using randomness. As a result, the exploration returns a sculptural dimension even to the final obstinate painting on canvas. I dare to say that this dimension results from the intrinsic search, not from some decorative choice. Yes, where all those who tried the path of geometry ended up with the decorative, Manfred Mohr avoids it exactly because his exploration is freed, through randomness (or is it chaos?), from the subjectivity that usually crystallizes in decorative art. Nevertheless, randomness is not a

constructive principle, a way of introducing some of the lost spontaneity and improvisational quality of making art. It is constitutive in the deep sense of supporting discovery. As a method of exploration, Mohr's randomness no longer simulates intuition and spontaneity, the dominant trend in the so-called art generated with computers, but literally guides intuition. Randomness guides intuition beyond the boundaries that the artist accepts, consciously or unaware of them, unaware as we all are of being captive to prejudices, even when rejoicing in our creative intuitions.

We have come to a closure. Methods and subject fuse into the work. They confer necessity upon the work, as in a sign the unity of its elements converges. It should be clear why the actual paintings, China ink drawings, installations, and everything else Mohr produces, project a sense of unity. The semiotic focus on signs confers to his works not only expressive, but also communicative functions. Although randomness helped open new avenues, its contribution to the aesthetic process is in the artifact, not in competition with it. In some ways, the process itself – search, evaluation, critical inquiry – becomes the final work of art. The realm which Manfred Mohr explores, the method, and the unifying vision set a new borderline to this ever changing and ever challenging human projection we call art.