J. CLAVS

RELATION

RESUME

CURRICULUM

FOTO

Jürgen Claus

The cosmic and the digital code (résumé)

Contribution for the Round Table, Colloque Locarno 1989

"Newton would not take no for an answer" (Stephen W. Hawking).

Supported by Rupert Sheldrake's theory of the creative universe, Ilya Prigogine's theory of unstable fields, David Bohm's theory of an implicite order, we are actually more and more aware of the existence of codes or systems of information storage which are manifest in the individual or/and in the cosmos. When such a system is activated by a certain form of energy, the codes begin to generate recognizable phenomena (Allerd Stikker).

Such a form of energy is being crystallized in the artistic process. As far as we can experience this, the cosmic code shows concrete appearance in the work of some artists. They work with in-form-ation and per-form-ance, operating by a chain of conscious-unconscious actions which are relied to the permanent re-creation of the cosmos.

As the artist Lissitzky stated 1924 (in Locarno!): Art came on its own terms to the same results as modern science. Like science it has decomposed form into the basic elements to rebuild them within the universal framework of nature. Artistic work is a resting place of growing, not the goal.

"The cosmic and the digital code" as my contribution to this years Locarno Round Table will give some examples of artists, conscious of the continous cosmic creation, the most recent of whom are using the digital code as an artistic code for creation. Through visual metaphorms one can move beyond the constraints of verbal thought (Todd Siler).

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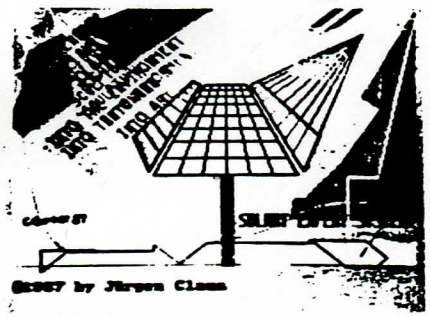

photo Jürgen Claus

Jürgen Claus est né en 1935 à Berlin. Depuis 1967, il s'intéresse à "l'Art de la Mer" : en 1969 il fonde le "Centre Subaquatique" et réalise en 1970 ses premiers jardins de sculptures dans la Mer Rouge.

Dans ses recherches, il se confronte aux matériaux de base que sont l'eau et la lumière, les images n'étant pour lui que des rampes de lancement pour des expéditions dans l'environnement réel. La mer, ou plus exactement l'espace sous-marin qui n'a jamais été saisi artistiquement, appartient à cet environnement. C'est là que Jürgen Claus a disposé plusieurs jardins de sculptures et éléments sonores.

Il se sert de la photographie comme moyen d'expression artistique ainsi que du cinéma et de la vidéo. Il s'intéresse tout particulièrement au travail avec la vidéo, sous sa forme digitale. L'expérience de la lumière élémentaire l'a mené à concevoir des sculptures solaires à base photo -voltaïque.

Son travail est essentiellement marqué par l'idée, voire la conviction d'une époque solaire à venir. Il nomme cette démarche "éco-technologique", pour marquer l'existence d'une relation signifiante entre des ressources naturelles et des médias électroniques.

Planète océan

Sa contribution se fonde sur une mise en scène de l'eau, de la lumière et du sable qui interviennent ici comme métaphores d'un espace élémentaire plus vaste.

Dans un espace formé de sable de quartz figurent quatre récipients, remplis d'eau de couleur différente où sont introduits des éléments de l'électronique (du monde du silicium). Cette installation comprend également des tubes de néon, métaphores de la lumière, et des "sculptures solaires" réalisées par Jürgen Claus avec la participation éventuelle du public.

Des images, tirées de "Planète mer" ou produites par ordinateur, sont retransmises sur des moniteurs intégrés au dispositif. L'électronique, judicieusement utilisée dans un sens écologique, révèle des images qui élargissent notre vision de mondes naturels.

C'est dans ce sens qu'il faut comprendre "Solart Expert System", la vidéo digitale achevée en 1988 par Jürgen Claus. Il s'agit d'une tentative pour introduire un système artistique spécialisé d'approche de l'environnement.

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The cosmic and the digital code

Juergen Claus

Author's Note
I would like to give special thanks to my personal text expert system, Constance McCutcheon.

ABSTRACT

The cosmic code has been made manifest in the work of certain artists. This paper begins with a brief quotation from the recently developed theory of continuous creation (Duana Elgin) and with remarks of Teilhard de Chardin on networks leading to a "syntonization of brains."

Examples of a painted cosmic code are cited in the work of Cezanne and van Gogh. As precursor of the digital code, Kandinsky's preoccupation with the proto-element of painting, the point, is discussed. The common strains between man, earth and cosmos, as revealed by Malevich and Lissitizky, gives rise to a new aspect of the cosmic code.

Toward the end of the twentieth century, we come to ask the basic questions concerning life, evolution, and the processes of brain and cosmos. The digital code, for instance in the multi-dimensionality of fractal geometry, yields the vision of "behavior" in universal scenarios. Examples from artistic as well as scientific research are given.

The theories of Rupert Sheldrake (the creative universe), Ilya Prigogine (unstable fields), and David Bohm (implicit order)--theories of a generation of what could be called spiritual physicists and chemists who have continued the cosmogenesis of Teilhard de Chardin--have made us more and more "aware of the existence of codes or systems of information storage which are manifest in the individual or in the cosmos. When such a system is activated by a certain form of energy, the codes begin to generate recognizable phenomena" [1].

It is this energy which is crystallized by the artistic process. And, as far as we are capable, we can recognize this energy as the cosmic code in the work of certain artists. Their tool is in*form*ation and per*form*ance. The process is characterized by a chain of conscious-unconscious actions which evoke the sense of the ever-repeating process of cosmic recreation. And now, contemporary artists are using digital code as the basis for today's hypermedia and telecommunication technologies [2].

Whereas the concept 'digital code' is widely understood today, it is far more difficult to define what is meant by 'cosmic code.' It depends on our personal understanding of cosmos and our personal understanding of universe (or, hyper-universe).

To begin, it might be enough to state that Teilhard de Chardin becomes the point of reference and to mention that a researcher like Duane Elgin with his theory of continuous creation gives us the perspective of an even more speculative--not to say more advanced--set of hypotheses. Elgin's theory sets the universe before our eyes as "a seven-dimensional, self-organizing system ... fully connected with itself... [which] has worked, moment by moment, since its birth, to maintain itself ... [with the result that] ... the entire fabric of the cosmos--matter-energy and space-time--is being 'woven together' as a single resonance pattern ... [and] observing or reflective potentials are present throughout the cosmos" [3].

Before we observe or participate in forms of digital productions that broaden artistic standards, activities like telecommunication, interactive multimedia, cybernetic sculptures, and computer-based environmental installations, we should acquire a basic understanding of our cosmic background. In 1947 Teilhard de Chardin already saw the machine as a possible "form of an ever more deeply penetrating organism," envisioned the machine being placed and used, for example, as an "extraordinary network of radio and television communications which, perhaps anticipating the direct syntonization of brains through the mysterious power of telepathy, already link us all in a sort of 'etherized' universal consciousness." To which he added, "the insidious growth of those astonishing electronic computers ... are also paving the way for a revolution in the sphere of research" [4].

A FLOW OF CONTINUOUS CREATION

About a hundred years ago, the cosmic code entered into the paintings of Cezanne and van Gogh. Although a painted code, it also embodies an awareness of the philosophical, religious, and existential "anchorage" of the code. Cosmic data have been dissolved into a field of painted energies. They are no longer to be seen as earthly things, no longer to be perceived as objects here, cosmic events, and objects there. They have been melted down together by a transfer of energies.

Color becomes "biological"--to quote Cezanne. At times he imagined colors to be "great nouomena, bodily ideas, entities of pure reason." He also stated, "Colors are the place where our brain and the universe meet" [5]. Color, as we know it from the paintings of van Gogh in Arles, Saint-Remy, and Auvers, no longer contains simple motifs, but puts man, landscape, firmament and the planets into a sort of cosmic whirlpool. Earth enlarges itself into an immaterial cosmos. This could well be connected to Duane Elgin's contemporary analysis: "We are living beings that exist within a living system--our cosmos--that exists within an unbound ocean of life-energy, the hyper-universe. Life is nested within life, which is nested within life. Infinite life energy achieves manifest expression by organizing itself into a living subsystem--our cosmos--that comes into existence in a flow of continuous creation" [6].

After the turn of the century, painter-philosophers like Franz Marc and Kandinsky, and artists from the Italian and Russian Futurist groups were working in this direction. Kandinsky serves as a good illustration. His search for a new science, "the science of art" as he called it, started with the "proto-element of painting: the Point." He reduced the time element to the point as its briefest form. When preparing his manuscript about "Point and Line to Plane" at the beginning of World War I (and not published until 10 years later), Kandinsky came astonishingly close to defining picture elements as the equivalents of pixels, as close as one could have come to it at that time.

He envisioned a scientific bridge between a general natural code (point) and a specific precursor of the digital code (pixel). The analysis of a photo of the Hercules star cluster took him a step further toward seeing nature as a continuing accumulation of points: "It is invariably purposeful and organically necessary. These nature forms are in reality small space particles and carry the same relationship to the abstract point as to the pictorial."

Kandinsky's work is one of the most forceful intellectual prototypes of the interface between cosmic and digital codes: "However, the whole 'world' can, on the other hand, be looked upon as a self-contained cosmic composition which, in turn, is composed of an endless number of independent compositions ... In the final analysis, all of these ... large or small [compositions] have been originated from points, to which point--in its original geometric essence--everything returns" [7].

The writings, paintings, sculptures, films of certain artists of that time give an excellent and eloquent testimony to man's place in a cosmic biosphere. We must be aware of the fact that the beginning of the century induced a radical change of paradigm when, in a very real sense, the tellurian consciousness was substituted by a planetary consciousness: The time of the flying apparatuses gave birth to spacial art forms in a radically different way. Malevich transfers architecture into space as sort of an Icarian flying planet: "The new dwellings of man lie in space. The earth is becoming for him an intermediate stage" [8]. For him there is a common strain between man, earth, and cosmos. Man is an unlimited entity who endures and penetrates his

"atomization" into the totality of the cosmos.

Let's stop for a moment. Where are we within the context of a so-called art history? For decades a superficial view of an x-style in regard to the x-artist or vice versa has redirected our view, averting it from the by-far-deeper consideration of artistic production and artistic-scientific theory. However, at our present stage, we should be conscientiously noticing, elaborating, demonstrating the very unique and very close connections binding this century's art to its scientific research: natural, biological, technological, and cosmologic. Ten years remain in the century for the enterprise, and it involves a complete reorientation of art history towards a set of multi-layered perspectives: history of art as a theory of continuous creation.

The key postulate: to put art into the context of the new scientific vision of this century. And, to echo the assertion I made in my book The Electronic Bauhaus: we, the participants of the cultural community, must do it [9]. We would then have made our authentic contribution, both on a historic and on a practical level, to such questions as, for instance, those of Jim Lovelock's within his Gaia-hypotheses: "To what extent is our collective intelligence also part of Gaia? Do we as a species constitute a Gaian nervous system and a brain which can consciously anticipate environmental changes?" [10]. Only then will we be able to embrace a dialogue, only then will we participate in a dialectic such as that between the Gaia-hypothesis and an artist like Lissitzky, who, in the 1920's, was able as a result to draw near to that elusive bridge between the digital and the cosmic codes. In Lissitzky's terms the "image" is just a symbol of Gestaltung; the essential artistic act focuses on processes lying latent in nature and the universe, processes which the artistic creation can make manifest.

In 1924 in Locarno, Lissitzky wrote that art, left uncorrupt to operate on its own terms, will achieve the same results as modern science. "Like science, it has decomposed form into the basic elements to rebuild them within the universal laws of nature. Both came to the same formula: Each form is the solidified visual elementum of a process. Work is a resting place of growing, not the goal" [11]. The work introduces the concept of an "imaginary space." Lissitzky's examples include the transformation of acoustic into optical phenomena, the superimposition of colorful light beams by polarization, the stereoscopic operations generated by movement passing through color-media, all precursors of our present day artistic technologies.

SPACESHIP EARTH AND THE NEW ELECTRONIC BRAIN

The terror of Hitlerism and Stalinism brought the most advanced research in art to an end, at least in Europe. Refugees like Moholy-Nagy succeeded in sowing the seed of the new vision in the American context. In Europe about two decades elapsed after Malevich's death (in 1935) before the "electronic geste" made its appearance, a term coined by mathematician, architect, and composer Xenakis in 1958. He, Karlhein Stockhausen and some other composers used their music to introduce into the perception of the mathematical, later digital, code a deep sensitivity to the penetration of the cosmic. In architecture and environmental planning, Le Corbusier saw a new brain being born with the advent of electronics and was aware of the cosmic code with which man seeks to balance his/her personal bios: "... nature (the environment), that incredible vascular system, in which everything is embodied: sun, moon, the stars, the inconceivable unknown, waves, the earth with it inclined axis responsible for the seasons, body temperatures, blood-stream, nervous system, respiration system, digestion system, day and night, the solar day ..." [12]

Then came yet another vision: an exodus from the earth, the phenomenon of

rising up into the sky. From the second half of the 1950s on, machines were being prepared to leave the earth. This advent of rocket ships and satellites gave birth to a new philosophy, "Spaceship Earth." Towards the end of the 1960s, the "Leonardo-type" Buckminster Fuller, who coined the term, proposed twelve distinct periods of historical transformation in our physical and cosmological environments, our present period counting as number ten. Operating with a concept of universe as the "aggregate of all consciously apprehended and communicated (to self or relayed to others) experience of man" [13], Fuller sees mind as performing the "paramount function of conserving the scenario 'Universe.'" It is mind which apprehends, comprehends, and employs the "metaphysical, weightless, omni-intercooperative generalized principles of Universe--in strategically effective degree and within a critical time limit" [14].

Towards the end of the twentieth century, along with the terrifying question of our survival on Spaceship Earth and intimately connected with it, we begin posing the basic questions of life, evolution, the processes of brain and cosmos. Apparently digital visual pattern in the advanced research of chaos and cosmos go far beyond "traditional" mathematics and on towards the use of the computer not only as means for calculation but as a research laboratory in and of itself. The multi-dimensionality of fractal geometry, for example, gives us a window onto the "behavior" of universal scenarios. And inside these self-referential systems, scientist/artists discover the image-ideograms, regarded as the "hieroglyphics" of the electronic age. It is here that the digital code can be seen to be the carrier of the continuing complexity, in the sense of Teilhard's tradition: consciousness. Except for the computer graphics and animation produced by the founders of the Bremen school of dynamic systems [H. O. Peitgen, P. H. Richter, 15], artists have not yet, or only rarely, developed to the point of a Gestalt-interface between the self-organizing, self-referring system and the resonance of their own art.

But we have developed some fascinating approaches. Machine vision, as it had been called, becomes transformed into multi-media/hyper-media-supported vision or into the Gestalt machine which is interwoven with human activity (for example, dance or performance). Shawn Brixey from the Center for Advanced Visual Studies at MIT (directed by sky-artist Otto Piene) has initiated "Performance Phenomena," a project which is trying to see human performance as the focus of fundamental processes of the universe. For his piece "Aqua Echo," he uses as central art apparatuses an audible laser interferometer and ice recording mechanisms. The interferometer creates collisions of microscopic wavefronts of light and turns them into sound; ultra-pure water is introduced to freeze the resulting attracting nucleating materials. Brixey: "The memory-laden ice crystals are then introduced into large bodies of ultra-pure, super-cooled water where they spontaneously 'teach' that water their memory (and finally) evaporate into the atmosphere and into the air we breathe" [16]. Cosmic code is captured in a holographic code.

Science and art actually share the search for interactive computerized systems and apparatuses to process and visualize information from the nearest point to the most distant sky, universe, hyper-universe. The "Digital Orrery," to cite an example, was designed to investigate the long-term stability of the solar system. Designed and constructed by six people in one year, the Digital Orrery uses a specialized parallel computer architecture, making it 60 times faster than a VAX 11/780. The digital code follows the past and future cosmic code to determine the orbits of the five outer planets of the solar system for the past 100 and the future 100 millions years [17].

Both for cosmological science as well as for artistic research, the interface of the cosmic code with the digital code is a productive challenge. If we experience space, we have points of orientation for our cosmic existence. And we are children of space. By understanding space, we understand something essential about ourselves. If art turns

to space, it does so by using different codes. One of the most intriguing of these codes, first detected as a painted code, then emerging as a comprehensive philosophical code, and finally as a code of the digital alphabet, reveals itself in the last analysis to be the cosmic code.

By way of conclusion, consider a comparison of today's telematic nomad with the ocean nomad of the unbound wide "cultural realm of the sea" [18]. The ocean nomad of the Pacific lived, and partly still lives, the antithesis of the earth-bound, terrestrial culture. He experienced the ocean in the real sense. Navigation, the essence of the life of the ocean nomad, the means of survival, the source of life-style, was only possible through exact knowledge of the "cosmic conditions." His culture was dominated by space and fluidity. "Polynesia is the most remote subversion of the cultural symptoms of land" [19]. The cosmology culminated in solarism: the central positioning of the sun; a solar culture.

For the telematic nomad, "navigation" becomes a question of survival as well. The cosmic code may serve as a "proto-element" of a new language to navigate ourselves and our Spaceship Earth. The very strong belief in a coming solar culture will serve us in two ways: to understand the complexity of light and to help us use it intelligently, practically, as a source of energy. Not only helpful, this result is inevitable. The telematic nomad is also dominated by space and fluidity: the permanent flux of thoughts and images which may lead to new, different kinds of life-energy.

References and Notes

1. Allerd Stikker, Tao, Teilhard und das westliche Denken (Bern, München, Wien: Scherz, 1988) p. 64. Original Dutch edition as Tao, Teilhard en Westers Denken, 1986.

2. Ted Nelson, who used the term "hypertext" back in the early 1960s, described "hypermedia" this way: "Hypermedia are branching or performing presentations which respond to user actions, systems of prearranged words and pictures (for example) which may be explored freely or queried in stylized ways. They will not be 'programmed' but rather designed, written, drawn and edited, by authors, artists, designers and editors. Like ordinary prose and pictures, they will be media and because they are in some sense 'multi-dimensional', we may call them hyper-media, following the mathematical use of the term 'hyper-'" (Ted Nelson, Computer Lib - Dream Machines(Redmond: Tempus Books of Microsoft Press, revised edition 1987) DM p. 133. First published 1974.

3. Duane Elgin, "The Living Cosmos: A Theory of Continuous Creation", in ReVISION, Vol.11, No.1, p.3. The author was staff member of the National Commission on Population Growth and the American Future and senior researcher at SRI Inter= national. He is author of the book "Voluntary Simplicity."

4. Teilhard de Chardin, "The Formation of the Noosphere," first published in "Revue des Questions Scientifiques," January, 1947, and in: The Future of Man (London: Collins, 1964), p. 173-174.

5. First published in Joachim Gasquet, Cézanne (talks) (Paris: 1921); quoted from: Walter Hess, Dokumente zum Verständnis der modernen Malerei (Hamburg: Rowohlts Deutsche Enzyklopädie, 1956), p.20.

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7. Wassily Kandinsky, Point and Line to Plane (New York: Dover, 1979), pp. 31-39. This book was first published in the German original as Vol.9 of "Bauhaus-Bücher" (München: Albert Langen, 1926).

8. Kasimir Malevich, "Suprematist manifesto Unovis (excerpt), in Ulrich Conrad, ed., Programs and manifestoes on 20th-century architecture (Cambridge,MA: MIT Press, 1970), p. 87.

9. Cf. Jürgen Claus,"The Electronic Bauhaus: Gestalt Technologies and the Electronic Challenge to Visual Art," Leonardo, Supple= ment Issue "Electronic Art", 1988, pp. 13-18; and Jürgen Claus, The Electronic Bauhaus (Zürich: Edition Interfrom,1987).

10. J.E.Lovelock, Gaia - A new look at life on earth (Oxford: Oxford University Press, 1987), p. 147. The book was first published 1979.

11. Kasimir Malewitsch, Suprematismus - Die gegenstandslose Welt (Köln: DuMont Dokumente, 1962), p. 167.

12. Le Corbusier, 1929 - Feststellungen zu Architektur und Städte= bau, preface 1960 (Frankfurt/M, Berlin: Ullstein, 1964), p. 7. At the time the preface was written, Corbusier had already

had experience with the electronics of the 1950s from the Philips Pavillon at the Bruxelles world fair in 1958, which he designed with Xenakis.

13. R. Buckminster Fuller, No More Second Hand God (Carbondale: Southern Illinois Press, 1962); reprinted in parts in John McHale, R. Buckminster Fuller (New York: George Braziller, 1962), p. 105.

14. R. Buckminster Fuller, Earth, Inc. (Garden City, New York: Anchor/Doubleday, 1973), p. 32. "The Leonardo Type" was originally published by the Jawaharlal Nehru Memorial Fund, 1969, as part II of Planetary Planning.

15. Cf. H.O. Peitgen, P.H. Richter, The Beauty of Fractals (Berlin, Heidelberg, New York, Paris, Tokyo: Springer, 1985).

16. Shawn A. Brixey, Laura Knott, Aqua Echo (Cambridge, MA: press release, 1987). Concerning the art apparatus and the artistic use of phenomena he wrote: "A quest for the phenomena themselves...How do we make art for gravity? How do you make art for hydrogen conversion at the center of a star? How do you make art to celerate not just man alone, but the universe as well? How do you communicate with the wild abyss? The greatest sensual evidence of this interdisciplinary nature of my work manifests itself in what I build, the art apparatus, instrumentarium and the phenomena they create. The art apparatus serves physically as an aperture, a life support system for the phenomena" (unpublished manuscript).

17. Piet Hut, Gerald J. Sussman, "Advanced Computing for Science", in Scientific American, October 1987, p. 151.

18. The term "telematic nomad" is used by Claudia Nonà, "Invisible design" in John Thackara (ed.), Design After Modernism (London: Thames and Hudson, 1988), p. 158.

19. Kurt von Boeckmann, Vom Kulturreich des Meeres (Berlin: Wegweiser, 1924), p. 181.