Jürgen Claus

ART IN THE SOLAR AGE

A paper in three sections:

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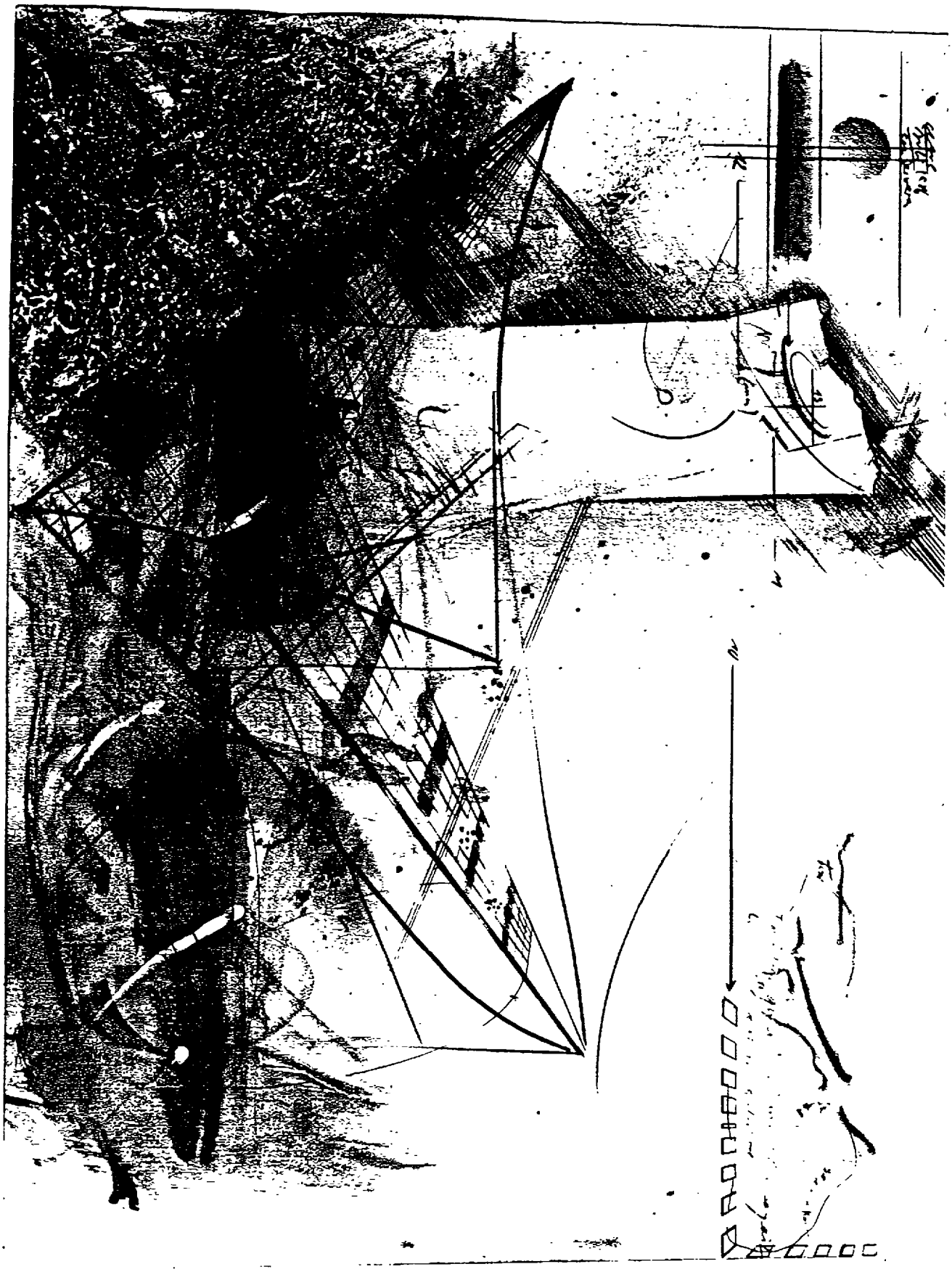

Jürgen Claus
Sun Sculpture project, 1986

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THE BIOSPHERE INTERFACE

Some regards on visual arts in the Solar Age

I

The quest for a **Solar Age** is defined by a general change in ecological consciousness, by declining resources of non-renewable energies, by the extreme increase in global and local pollution, by a strong demand for decentralization in political as well as energy decisions, by the rising demand of the underpriviledged three quarters of the world to participate in a higher quality of living.

This quest for change cannot be based on traditional, non-renewable energies. The **Solar Age** in this respect is defined by a new policy of installing and using technologies that harvest the sun's radiation in a more direct way.

But: All plans for reforming our energy situation must be put into practice now, to be fully effective in 2025. (I just focus on the first quarter of the next millenium.) The estimated 10 Billion people in 2025 cannot live a human life on our present Western standards of energy consumption. This is far more than a technical problem and this is why I am talking about a new definition of art in the and for the **Solar Age.** A loosly connected group of artists today are fully aware of the necessary changes in contributing to new solutions, new materials and new strategies for an Art in the **Solar Age.**

The aim of *The Solart Global Network* which I'm preparing for 1995, is to bring some of these artist together in working with outdoor solar artworks. These might be outdoor holograms, light work depending on direct use of solar power, reflection of Sun light etc. Highlights of this Solar Festival are positioned on different parts of the Planet in July and August 1995. Every artist works in her/his own autonomy, sharing a common catalogue and a common film & video documentation of the events. Exhibitions are planned to show the resulting art works and their documentation. Network, for me, means a value-oriented networking of people who share the same vision of the **Solar Age.** Technology is used at the most advanced level but only to strengthen the underlying values of a critical and creative redefinition of art in the Biosphere.

II

The second point which I want to make is that the change towards a Solar Age has to stabilize our civilizations. In doing so it must be a cultural one. Ecological stability, which is the aim towards the beginning of the new millenium, must rely

on cultural change to be seriously anchored within the different societies of our Planet. So we have to evaluate or re-evaluate the educational ground for advanced visual studies.

It was Jeremy Riffkin, author of *Biosphere Politics*, who, in his book *Entropy: A New World View*, 1980, postulated a new definition of education in the **Solar Age**. This includes a reduction of the flows of information and energy. Instead of an expanding storage of data, it is their interconnection, which counts, the flow of interrelated phenomena which the student has to evaluate. I strongly belief that the study of natural systems strengthen our creative understanding. It enables the student to create the most advanced biotechnological systems. And: It is within the very heart of art history that we can find supporting ideas of correlated systems.

Industrial ecology, which goes along with environmental stability, aims at an environmental design and environmentally sustainable technologies with nature - call it "biotechnique" design (Frederik Kiesler, 1938), "biomorphic" design (Victor Papanek, 1984), "biomimetic" design (Harden B.C.Tibbs, 1991) or, as I prefer to call it, Art in the **Solar Age**, Biospheric Art.

III

Art is part of the continous critical, as well as creative reflection of our life within the Biosphere. The *Biosphere concept* regards living matter in its entirety as the domain for the accumulation and transformation of the sun energy. Is art able to share this concept of all living matter? My answer is, that advanced visual studies should be directed towards these goals:

1. The study of the Biosphere, which is more than the study of ecology. Vladimir Vernadsky, one of the fathers of the concept, established "a gestalt view of the Biosphere as a solar, terraqueous being".[1] As art is deeply connected with the creation of *Gestalt*, we may talk about *"Gestalt technology"*, as I suggested for the 1984 exhibition *Art and Technology* in Bonn, Germany. *Gestalt* is, since Goethe, deeply connected with the idea and process of morphology. In constrast to the machine-oriented approach of information technology, *Gestalt technology* embraces human perception and creation.

2. The agenda for teaching and learning advanced visual studies should integrate the theoretical innovations which occured in the last two decades. Among those theories I would count the morphogenetic field (Rupert Sheldrake), the holistic-holographic universe (David Bohm, Stanislaf Grof) and others.

3. Another topic and goal of art education is the re-valuation of what art history means for the *Biosphere Interface*. Probably we have to go back into the 'deep

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[1] Dorion Sagan, *Biospheres* (New York:McGraw-Hill, 1990), p.42.

time' of art, leaving aside the narrowing views of 'modern' art, but not towards a random 'post-modern' everything goes, but towards values. Values in the visual arts are maybe less superficially detected than in medical education or in direct ecological activities. But indeed they relate every work of art with human perception of the world.

Jürgen Claus

MIRRORS OF THE SUN

Towards Solar Art - Some Examples - More to follow

PAUL HOENICH

This artist, born 1907, is a true pioneer in *Sun Painting* through the use of different reflecting materials. He emigrated to Palestine in 1935. In 1950 he became Professor for experimental art at the Faculty of Architecture at the *Technion* - Israel Institute of Technology in Haifa. He developed a type of kinetic art with direct use of sunlight from the end of the fifties on.

I suppose he was the first or at least one of the very first to coin the term *Robot Art* at the beginning of the sixties. The *Robot Picture*, which he developed from 1956 on, is a moving and changing sunlight projection system which repeats itself in a yearly circle. The robot projection, as he says, "makes use of the sun as a fixed lamp and of the planet Earth as a motor moving not a strip of film but rows of reflectors"[1]. The composition depends on the shapes and colours of the reflectors. Colour filters are added to the reflectors to change and determine the projected colours. The artist can predetermine a year's programme in setting up a whole row of reflectors, which will be effective differently during the year.

Besides the *Robot Picture* Hoenich has created the *Robot Painter*. Here the individual pictures cannot be foreseen. Besides using sun rays and the Earth's rotation and revolution around the sun, an additional energy source is needed to produce irregural moving pictures. Before turning to more recent solar art works, I may recall Walter Gropius' statement from 1963, in a letter to Hoenich: "I am convinced", wrote the founder of the Bauhaus, "that this is a field of research for the future and will become a true instrument of a new art".

DALE ELDRED

Other artists working with the *Mirrors of the Sun* followed. Since the late seventies Kansas City based Dale Eldred, born 1934, did numerous sunlight sculptures throughout the United States and Europe. He regards the human life cycle as being intimately related to sunlight. In his work he uses very large reflectors for the sunlight and projects the light rays partly onto walls and buildings. He deals with the relationship between man, the earth and the sun.

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[1] P.K.Hoenich, Kinetic Art with Sunlight, *Leonardo*, Vol. I, Spring 1968, p. 115.

In September 1981 he installed a 24 x 16 feet reflective unit on the south bank of the Charles River in Boston, opposite a mirror battery three-quarters of a mile away. When the mirrors are activated by the sun, the five-colour panel glows up as a brilliant temporary picture. As Dale Eldred sees ist: "There is complete non-particularity in the viewing of such a work, and there is no one 'correct' orientation"[2]. The changes, which photographs show, correspond to a decentralized view of the Planet. There is no 'static' picture of the sun and the solar reflections, as there is no 'static' viewer in the Biosphere.

Eldred: "What I'm involved in relates to a time incident and to a light incident. You'll se on the back of the mirror boards all the time is set and the far side is the moureceiver. That's a retro-reflective field" [3]. The artwork becomes a timefield, an energy field, related to the primary life energy source of our Biosphere. Art approaches a visualization of the cosmic data. What is impressive is the large scale of his outdoor sun structures, as in the case of his reflecting sculpture outside the Nelson-Atkins Museum in Kansas City, 1979.

The use of solar time as a determinant of space becomes evident in many solar art works. We have to add time to our definition of the urban space too. That is where the solar mirror work of Dale Eldred comes into regard and becomes important beyond the aesthetic values of his performances.

SHAWN BRIXEY

With him we are entering into a transition of cosmological and technological sources. He represents a third generation of artists working with mirroring sun light and cosmical light. Born 1961 in Springfield, Missouri, he was a student with Dale Eldred before he came to the Center for Advanced Visual Studies at the MIT, where he graduated as Master of Science in Visual Arts in 1987. The universe, for him, is a boundless stage and elusive map of our human knowledge. Here are some of the projects, through which he is mapping his vision of the universe.

Photon Voice was an outdoor event for the CAVS/MIT "Desert Sun/Desert Moon" events in the California desert near the small village of Lone Pine, 1986. Light waves were converted into sound waves and back into light waves. The

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[2] Dale Eldred, Sun Structures, *Sky Art Conference '81* catalogue, CAVS/MIT, Cambridge, Massachusetts 1981, p. 30.

[3] Statement in *ars electronica* catalogue, Linz 1982, p. 131.

mouvement of dancer and choreographer Laura Knott became visible in a glass terminal where her mouvements parallel the mouvements of graphite particles.

The central instrumentarium which he developed for *Photon Voice* had been used again for his project *Instruments of Material Poetry*. The title stems from the idea that his work can be described as poetry, made of expressive interaction of discrete forms of matter and energy. The project design orbits around the radical use of radiation pressure (the kinetic momentum of photons) to construct and animate microscopic events in a vacuum chamber.

From here Brixey went to the *Vista Genesis Device*. As he told me (in a letter from July 25, 1991): "It is a small noninvasive input-output device, that broadcasts an electromagnetic signal to override the electro-chemical response of the eyes into the optical cortex. By using data from optical and radio telescopes I was able to find astronomical sources (stars) whose signals mimic precisely these modulations. These stars produce a signature that creates a kind of internal aurora borealis of pastel colors and graphic pulsing patterns in the 'mind's eye'. The poetic reality that our brain can have a type of concrete communion with events (light) that occured billions of years before we were born, punctuates the basic core of my investigations". Even if this goes far beyond the use of solar light in an artwork, it might outline the actual research investigation which is done today by some artists.

JANET SAAD-COOK

She is the first woman who I'm including into this presentation of solar artists. The reflectors which she is using to beam the sunlight onto walls are made of steel, bronze and optically coated glass. Spreading the sunlight throughout an environment, she wants "to take the cycle of the sun and make it a human experience through art. The cycle", as she says, "is constant, and all of us who have ever lived on the earth have shared that cycle in some way. I believe that connecting with this cycle connects us on some level with each other, beyond any barriers of time"4.

Janet Saad-Cook made numerous trips to the American Southwest to study the way in which prehistoric native Americans marked the sun's passage. These experiences became an integral part of her artistic orientation. Even modern astronomical observatories seemes to her to have an almost sacred fascination. So

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4 Janet Saad-Cook, Sun Drawing, *Leonardo*, Vol.22, No.2, 1989, p.158.

she choose the National Radio Astronomy Observatory in Socorro, New Mexico, as the site of her permanent *Sun Drawing Project*. The model shows a nearly hemispherical shape, 49 ft diameter, 25.5 ft high, with a glass-covered opening through which sunlight enters. The reflectors, about 200 one-foot-square pieces of reflective glass, dielectrically-coated with a thin film of iridescent material, will be standing on an elevated platform located inside.

Janet Saad-Cook's sunlight 'sculptures' are as immaterial as it is said of all the electronically produced screen 'sculptures', but are related intimately to the Earth-Sun dialogue, which is in the very center of the Biosphere understanding.

PIERRE COMTE

Pierre Comte, who works in Paris, is one of the pioneers of Space Art, for which he developed an aesthetic dialogue both from Earth to space, and to Earth from space. Among his projects seen from space the biggest one is *Horus*, a circle of 24 prismatique structures each of 14 meters lenght. His proposal was to put them together on water, the diameter of the circle being 500 meters. The large structure would be seen from space ships as well as from satellites.

In 1981 he designed first drawings of an art satellite, called *Arsat*. Together with scientists and technicians he presented *Arsat 1* by the end of 1983. The second step led to the creation of *Arsat Helios* which took the shape of a rhomb. In all these experiments, which had not been realized, Pierre Comte could anyhow rely on his experience with pneumatic structures, he did in the seventies. The design covered a space of 800 meters diameter and 300 000 square meters. This enormous solar sail was thought to work with what is called photon propulsion. *Arsat Symbiose* finally, the City of Art in Space, as Comte named it, was designed as a satellite of the third generation.

In looking back to these earlier attempts of Space Art, the artist drew an account of all the problems he met. "When the invention is not a response to an existing need, it can meet with hostility from people in charge of the conventional process or, more generally, with mere apathy. If I introduce a new product, it might also mean that I am hoping to take over part of the market, even if it is a tiny part." Another severe difficulty is, the more one becomes involved in technical problems, one looses credit in the art world. Comte: "For them, at best, I am a kind of mutant without conncection to any artistic family"5.

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5 Pierre Comte, The Arsat Saga, *Leonardo*, Vol. 26, No. 1, 1993, p. 33.

Finally, in October 1989, Pierre Comte got the chance to establish *Earth Signature,* made up of 16 large square sheets made from black polyurethane material, forming a unit of cross and circle - symbols already used in ancient times and codified in the Middle Ages. The total field covered 390 000 square meters on an old airfield in Southern France, next to Plaine de la Crau. Photographs had been taken by a Spot satellite orbiting 830 km above Earth.

In recent years Comte developed his research into two directions: The first one is the project for an entirely artistic satellite, the other one is a technical and scientific program for a Solar Power Station in space that can be launched by existing launch vehicles. It would be a kind of experiment on a smaller scale to eventually launch large solar space power plants. It would unfold in space automatically with its 50-m-diameter parabolic mirror and would transfer about 0.5 Megawatt. As there is controversy about solar power plants in space this model would give some practical advice. Roger Malina, astronomer and art editor, comments on these kinds of space adventures by artists: "Space Art is an essential part of extending human civilization into cosmos. Scientists who dismiss artists' proposals as frivolous forget that one of the roles of artists has always been to create markers of human presence"6.

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6 Roger F. Malina, Art in Space, *Technology Review*, MIT, Cambridge, 3/4,1990, p. 61.

Jürgen Claus

FROM PLANET OCEAN TO SOL*ART* SCULPTURES

A short overview of some of my environmental art works from 1967 on

My own **Sol*art* Sculptures** developed from the ***Planet Ocean Project.*** The crucial year for this development was 1983. In March 1983 I started my visual notebook, *The Ocean Dimension*, but soon the study of plankton and photosynthesis led me to cybernetic objects which show alterations when exposed to natural light. As a central grid for my artistic creation I saw the biological, the energetic and the technological dimension. My first project of transforming solar light into energy for art works was born.

In 1983 I participated with my new Sol*art* concept at several international exhibition among them *Electra,* organized by Frank Popper at the City Museum of Modern Art in Paris. I quote from my contribution to the *Electra* catalogue:

"In the second half of the sixties I began developing multimedia spaces using electricity and/or electronics. It felt like installing a 'fluid space' where images from film and slide projections appeared simultaneously. It defied one-dimensionality. When I began to work underwater my experiences affected my artistic concepts. By definition, the open space underwater is a 'natural' multidimensional area. Electricity and/or electronics were used as extensions of human sensory organs. Light was as important as was underwater acoustics, both related to the physiological reactions of man.
In my new project, Sun Sculptures, I am using sun energy to produce electricity underwater... Electricity brings light into the 24-hour-circle of light blue - dark blue - darkness of the natural Planet Ocean." (1983)

Different Forms of light had been used before in my underwater art events. When we made the film *Planet Ocean* in 1979 at Long Island, Bahamas, one of the key elements of the film, which had been commissioned by the biggest European Television Station, WDR Cologne, was a bright, glowing ball of fire sinking to the ocean bed. Like a star falling into the sea or a message from outer space. The film turns next to a large cocoon held by six female divers. A diver in the centre of the cocoon frees himself with a burning flare and moves up to the surface of the ocean.

Other parts of my *Planet Ocean* art events included divers with silvery shining 'stars' mirroring sunlight as it penetrates to a depth of about 12 meters. The late afternoon we added, to the sunlight, a set of artificial underwater lights. Quoting from my script: "Stars found beneath the glass plane of the ocean. A garden of stars planted in the water. We have placed them in the artificial solar system of our floodlights. Now they reflect." (1979)

My artistic and environmental investigations of the **Planet Ocean Project** started around 1967 and lasted for about 15 years. The shearing force which I experienced from diving in many parts of the world inspired my paintings, drawings, visions and several publications, among them my book *Planet Ocean - Art & Environmental Research Underwater*, 1972. Solar Energy was already in the very heart of my *Ocean Architectures* drawings from the early seventies on. In addition to this, decentralized energy supply came to my attention by practical use. The need of energy for recharging batteries on remote diving places like tropical islands, without traditional resources of energy, lead us to the application of small solar power stations. Later on I began to propose larger photovoltaic panels on top of the water to give electricity and light to underwater structures. The *Sun Pyramid,* for which I developed several versions, was an outcome of these structures. Other forms included light tubes and light spheres in the water.

When I devoted more time to the creation of **Sol*art* Sculptures** from 1983 on, I included the *Sun Pyramid* in exhibitions like *Art and Technology*, which I organized in the German Ministry for Research and Technology in Bonn, 1984. The separation of an outdoor solar supply station (from Siemens Company) and an indoor light sculpture was a transitional form, leading towards sculptures which integrate the aesthetics and the solar technology. Several of these tree-like sculptures had been constructed as models, exhibited and included in videotapes which I made with Vin Grabill (University of Maryland) and others.

Sol*art* Sculptures are vertical constructions with a height of approximately 30 meters in their final stage. Their wings would be furnished with solar cells and ideally follow the position of the sun. (But this includes a loss of energy for the tracking, as we know.) Just to give a very general idea of the technical side of these sculptures, let's focus on four big wings, each 3 x 5 meters, i.e. 15 square meters each. The total amount of solar resources would be 60 square meters. Given the reference system of 1 kW per square meter as the nominal power we could count on 60 kW available, provided that we have full sunshine and a surface perpendicular to the sun.

What I have called a *Solart Expert System* is part of the preparatory work and will serve as 'brain' for **Sol*art* Sculptures**. The sculptures are designed to receive natural light and transform it into energy - the principle of photosynthesis. So this bioapparatus follows the path of the "solid-state quantum-molecular miracle which involes dropping a photon of sunlight into a molecular device that will kick out an electron capable of energetically participating in the life of a cell," as Terence McKenna wrote. [1]

The **Sol*art* Sculptures** are energy banks as well as being part of an energy network. They are based on ecological systems, putting art back into the environment: Solar Art. These sculptures are, in a true and real sense, responsive, environmental, enhanced-dimensional, energy-transforming systems. They require

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[1] Terence McKenna, "Plan Plant Planet", Whole Earth Review, No.64, Fall 1989, p.5.

a sort of a sensorium, an environmental steering system which might for the time being be best called an expert system. It works as a graphic interaction system through which images, data, and graphics can be called up in real-time. The knowledge base contains technical expert and environmental information, for instance about light, metabolism, landscaping.

As art is part of the search for a new holistic, ecologically based, responsive paradigm, every effort that goes into artistic research goes into a more general human definition of our planetary societies. The artistic phenomenon provides us with realities and metaphors of significance within social, cultural, electronic and biospheric changes.

As an artistic metaphor for the Solar Age my wife Nora and I created the installation *Carrousel of the Suns* for the exhibition *Artists and Light* in Rheims, 1991. Commissioned by the French National Centre of Art and Technology (*CNAT*) the installation occupied the entire upper space of the exhibition hall and covered a surface area of 530 square meters, bathed in blueish light. The argon gaz writing, about five meters long, is a metaphor reminiscent of the Solar Age of the Future. Two circles made up of nine 'suns' rotated slowly, intersecting with each other in a beam of yellow light. Two laser beams travelled across the space at different points. One may regard the complete form, or Gestalt, as a demonstration of the dynamic relationship between natural and man-made environments.

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