

ELECTRONIC ART AND SOLAR ART

Hoenich, Prof. P.K.
Haifa, Israel

Abstract

-High technology opens phantastic possibilities for art and artists.
-With old techniques artists using simple means may create great new works of art.

My Solar Art -one of many possible uses of sunlight in art- intends to unite these two worlds: High tech art and painting and sculpture.

Sun Robots

I started this research years ago in the faculty of architecture of the Technion, the Israel Institute of Technology, and it is still going on. This paper is giving information about it, so that readers may consider "Solar Art" as an alternative, and experiment with it. If we look at the illustrations Fig. 1 and 2, even the expert might find it difficult to decide if they are Computer or Solar Art. Solar Art has some similarity to electronic art, but it is an apple from another tree.

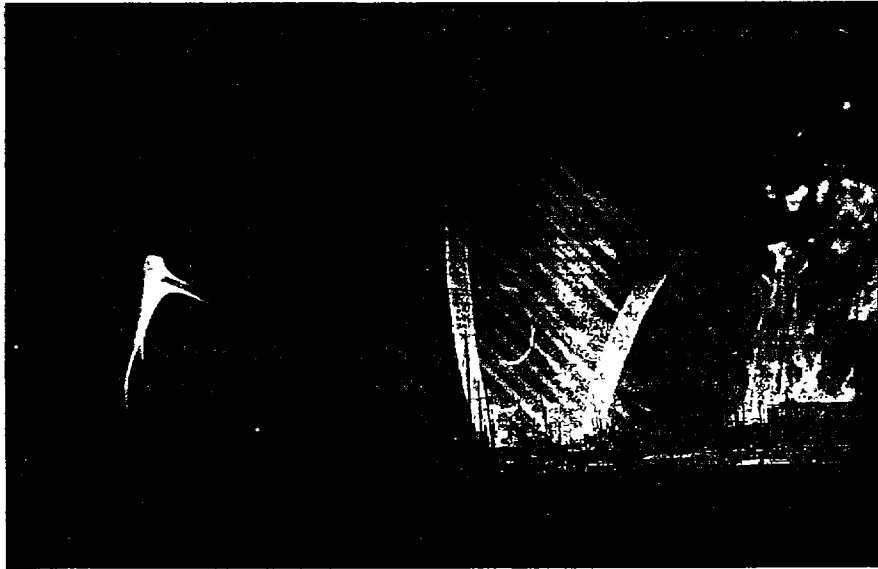
Solar Art is a complex of various possibilities, not discovered all at once. It has robot and manual techniques. All my solar techniques have the same basic principle, they use reflectors (reflecting sculptures, which give the form) and colour filters (transparent paintings, which give the colour).

There are 3 robot techniques (Robot Art). The first for constructing a cosmic projector, which is not really a robot, but only an automat; I called it the "Robot Picture". The sun is the lamp, the earth the motor of this projector. Rows of fixed sun reflectors are moved by our planet relative to the sun and project kinetic pictures on outside walls (Fig. 3). The colour filters cross the path of the incoming -not the reflected- light rays. Thus the changes of colour and form in the projection are independent of one another. This system is used in all my solar techniques. The constructor plans the projection of the cosmic projector for each hour and day. Running time is six months, from solstice to solstice.

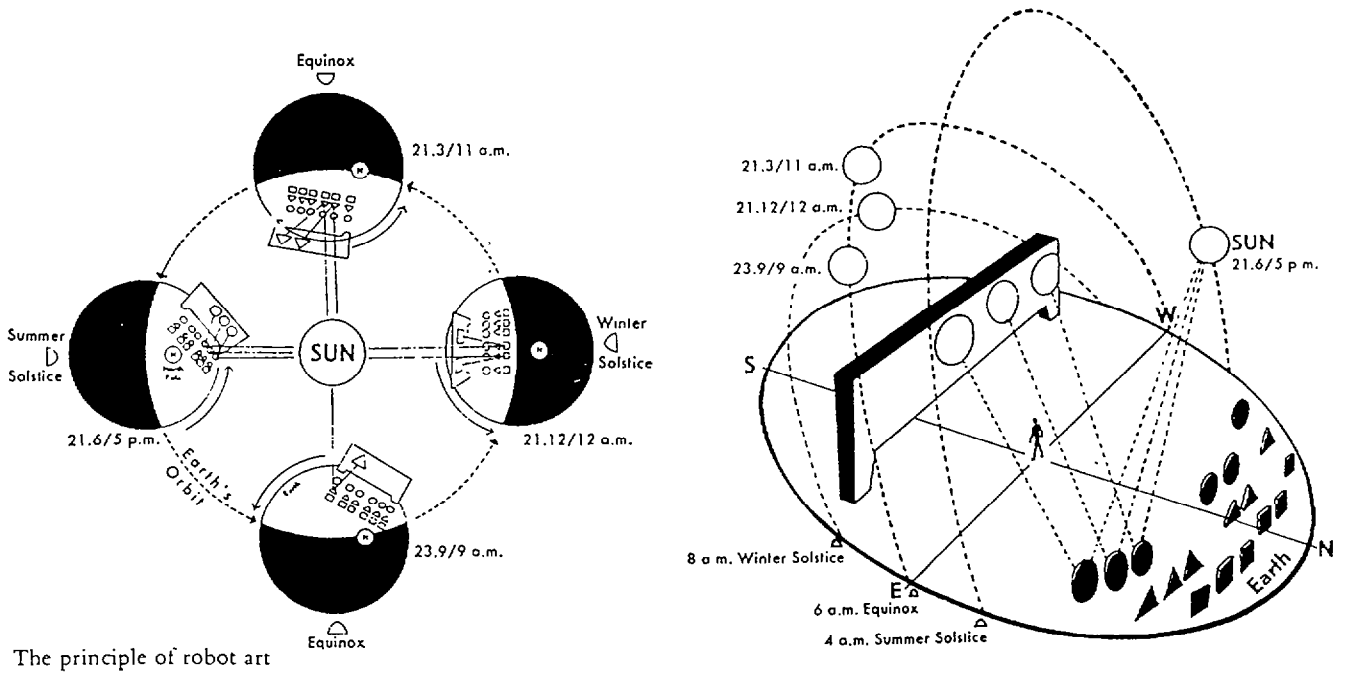
The second technique produces a real robot. I call it the Robot Painter. A robot painter not only projects, it also creates the pictures. It never repeats itself. It is an optical brain, which can distinguish between good and bad pictures. It projects only pictures according to the taste of its constructor.

This robot has movable reflectors and needs another source of energy in addition to earth rotation and revolution. I used wind energy. When three or more parts of a reflector system move independently from one another, they will forever produce new combinations, and their projections will never repeat themselves. It is the task of the constructor to stop movements and combinations of reflectors, which might produce bad pictures.

I experimented with these two techniques for years, but never made a permanent construction, a "Prototype". The third robot technique I called "Lightsymphony No. 1" after the name I gave to the prototype which I constructed. As far as I know, it is the only existing artificial non-electronic intelligence (Fig. 4-9).



P K Hoenich
fig 2



P K Hoenich
fig 3

The prototype is an apparatus, which functions as an automatic cosmic projector -using the same system as the Robot Picture-, but it is also a real robot, an optic brain, which creates countless kinetic or static pictures, using another system than the Robot Painter. It functions with sun light as well as artificial light.

But the prototype functions as a robot only, if it has a human visitor who plays with it. Man uses the robot as a tool to produce pictures, the robot uses man as a source of energy. The constructor uses both to activate his functional self portrait. I implanted my art into this optic brain, and some of my ideas, which the robot expresses with various visual symbols. It expresses the idea that our time is the space age.

The prototype looks like a framed picture (Fig. 4). The optic brain is in the frame (Fig. 5, 6). All parts of this optic brain are fixed. The visitor activates the brain by moving a mirror, which reflects sun light against the frame. Instead of a mirror he may move a lamp (artificial light) and produce kinetic pictures. A fixed lamp will produce various static pictures.

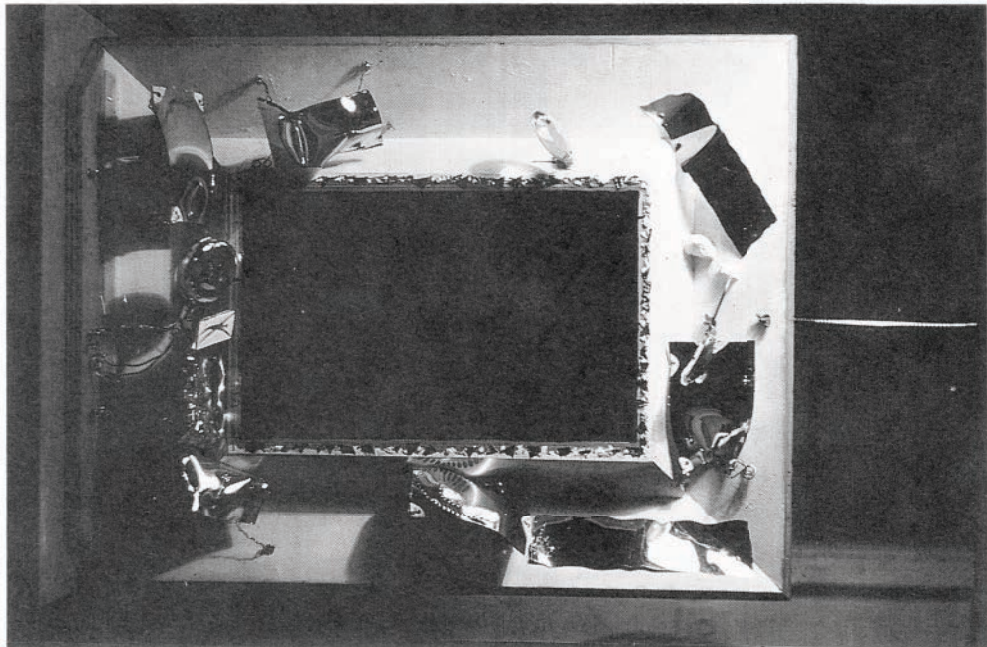
To construct this optic brain I had to try out predictable actions of man playing with the robot. It took me three years. To construct a functional self portrait is a fascinating task for an artist. It makes his creativity independent from his lifetime. This optic brain has three colour filters, two prisms and nine reflectors (Fig. 5). One of the reflectors is two-dimensional, it projects a concrete mirror drawing of a figure with raised arms. The three-dimensional reflectors, which project abstract forms, may suggest to the spectator something concrete. In Fig. 1 -a sun projection, made in manual technique for the picture concert "Time Travel"-, there is a yellow form, which may suggest the appearance of the Sun God in human shape with raised arms. I hope it will suggest this, but it might also be seen as a yellow flower etc.

For the optic brain it was very important to include a human form, so I made a mirror drawing. The brain has one two-dimensional reflector, intended to suggest a space ship. All other reflectors are three-dimensional, and project various abstract forms, suggesting cosmic space. Every three-dimensional reflector makes many different projections; Fig. 7 shows a projection of the robot uniting the space ship with man. Fig. 8, another projection of the robot, shows three figures coming out of an abstract form, which to me seems a symbol of the womb.

The prototype has only one mirror drawing of a figure, but when it functions as a robot it can produce multiple projections. I saw one, two, three and more figures arising from this form and thought: "The cosmos gives birth to man". Constructing the optic brain, I had not foreseen this happening. Years before I constructed Lightsymphony No. 1, I had written in my research report "Robot Art", that if an artist tries to construct a functional self portrait, the robot may in the end influence his constructor. It happened (Fig. 9). The projections of the robot inspired my oil painting "The Cosmos gives Birth to Man".



P K Hoenich
fig 4



P K Hoenich
fig 5

Manual Solar Techniques

I am fascinated by the robot techniques, but I seldom use them. I mainly apply the manual techniques of Solar Art. There are material and spiritual reasons for this development. In this short paper I report only the essential facts.

The material reasons: I found much interest for the robot techniques, but no commissions. On the other hand there were orders by cinema, television, publishers and print makers for solar art work. For cinema and television a robot would be of no use. It cannot see the actors or hear the requests of the stage director. Nor can it react to the various needs of book and print publishers. I needed manual solar techniques.

The spiritual reasons: Experimenting with manual techniques I think I have found two important new possibilities for the development of visual art. I am interested in using them. I know that artists and research workers may have illusions about the importance of their work. Anyway, I will report on these possibilities, and why I believe them to be important. Everybody may repeat my experiments. Let the reader then judge by himself their value and usefulness.

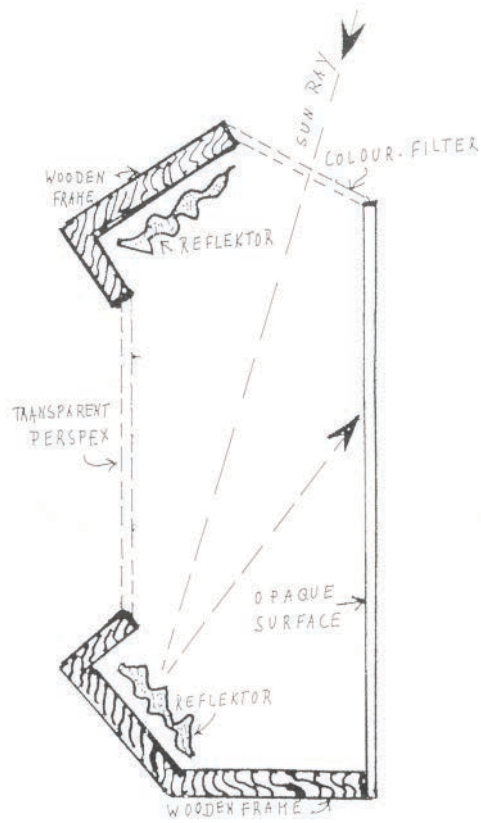
"Static Solar Art" is a paradoxical concept. A solar projection is kinetic. But we can reproduce solar projections by instantaneous photography and get static pictures to be used as slides or prints. My way of doing it:

I put colour filters in a window - a transparent painting or pieces of transparent plastic material in various colours. Sun light, traversing the filters comes into the studio in coloured stripes. I arrange a number of reflectors -usually 3 to 5- so that together they project a picture against a screen. The screen may be a wall of the studio, but for photography a translucent screen is preferable (back projection). The projection is photographed from the back of the screen. The reflectors are on the other side (not visible in the photo).

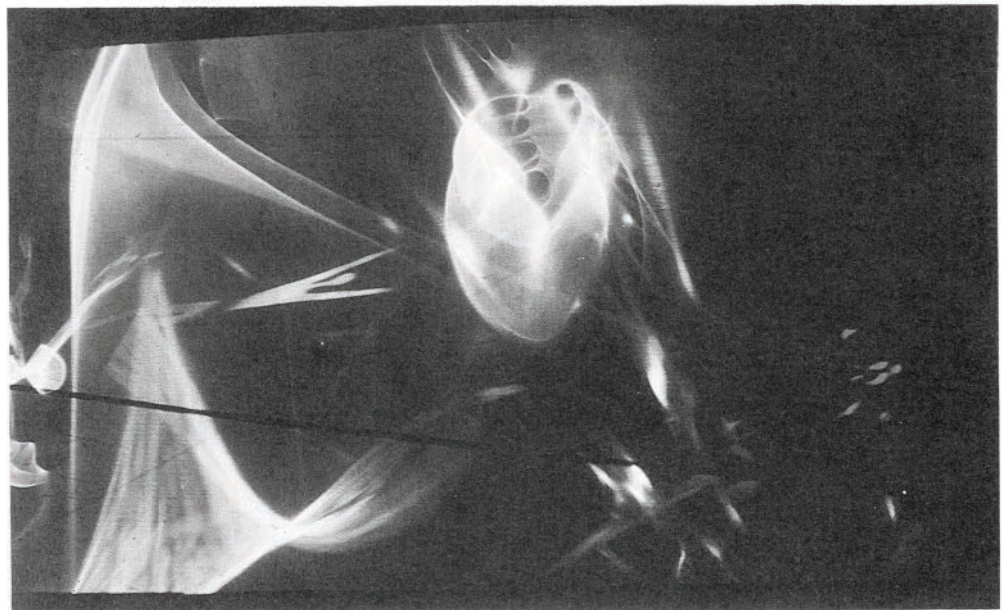
A new possibility for visual art, which I believe important. The velocity of light is of utmost importance for the quality of results achievable with this technique. When sun rays strike the reflectors, the complete picture with all its colours and forms emerges in "zero" time. Every change of position of one or more reflectors changes the picture. Generations of artists would have to draw and paint, in order to produce the countless variations of a picture, which can be created with sun rays in the shortest time. This use of the velocity of light I combine with the use of controlled indeterminability.

The reflectors are mirroring sculptures, modelled so that their diverse reflections conform to the purposes of the artist, but there are chance results, too. The cosmos creates with chance results. Everyone of us is the chance result of the combination of the parental genes. By applying these two factors with the manual technique for static solar art, the artist may have chances for better pictures than with other techniques, including other solar techniques.

Fig. 1 and 2 were already mentioned. But Fig. 1 is also a very good sample for possible uses of controlled indeterminability in static solar art. The spectral form in the background was produced by a plane mirror in a tank of water. The mirror was placed at an angle to the surface of the water and functioned as a water prism, which projected the sun spectrum onto my screen. By blowing on the water I could produce a sun spectrum moving like fire, and select the form best suited to my picture.



P K Hoenich
fig 6 Diagram of the vertical cross section of the Robot Projector for 'Light Symphony, no 1'



P K Hoenich
fig 7

Rotterdam, Fig. 2, shows another way of applying solar techniques. We can unite reality and sun projection, and create with both a work of art. This we achieve with both solar manual techniques, static and kinetic. There are two methods - we can project the sun picture on the scene in nature and unite both in a single photo. Or we can make separate photos of reality and sun projection, and unite both in the laboratory. Both methods are easily applicable in the studio, in the open, often only the second is useful.

I have already told how I use my three-dimensional reflectors, and I want to add how I make them. Glass reflectors are formed in an electric oven, or by glass blowing, and then covered with mirror. Metal reflectors are made from mirror polished sheetmetal (cold hammer).

The reader, who wants to experiment with manual solar art techniques, should first try an experiment with primitive means. Instead of constructing reflectors, he should look for ready made reflecting objects. He may cover a window with pieces of cellophane in various colours, use a sheet of white paper as a screen, and on a sunny day he will project hundreds of pictures in a few minutes.

The difference between the static and kinetic technique is that in kinetic technique the artist and his assistants move the reflectors by hand, while movie or video cameras are running. Here the artist has no possibility to use the velocity of light for selecting the best design or wait for a useful chance result. Sometimes he even has to form the reflectors while the cameras are running. He takes a mirroring plastic sheet in both hands and presses it into various forms for different kinetic projections.

He plays with light like a musician with sound. He can make improvisations like a virtuoso with his instrument. And this seems to me the second important new possibility for visual art.

Conclusion

I believe artists should not be bound to a single way of creating. They should use whatever seems good for them and their work. For me solar art is an alternative to painting. I believe it could be a useful alternative for many artists, and especially for electronic artists. It has a similar philosophic background as electronic art.

Some Publications by P.K. Hoenich on Sun Art

-Robot Art. Technion, Israel Institute of Technology, 1962. Reprinted in "Cybernetica", Review of the International Association for Cybernetics, 1963 #4 and 1964 #1 (Namur, Belgium).

-The Art of the Future. Ariel #15, Israel Foreign Office, 1966.

-Design with Sunrays. Technion, Israel Institute of Technology, 1965.

-Kinetic Art with Sunlight, Reflections on developments in art needed today. Leonardo, Vol. 1, pp. 113-120. Pergamon Press, Oxford UK, 1968. Reprinted in Kinetic Art, Theory and Practice, pp. 23-29, Frank J. Malina (Ed.), Dover Publications, New York 1974.

-Design with Sunrays. Bauhaus Archiv, Darmstadt/Berlin 1971.

-Sun Painting. M. DuMont Schauberg Verlag, Koln 1974.

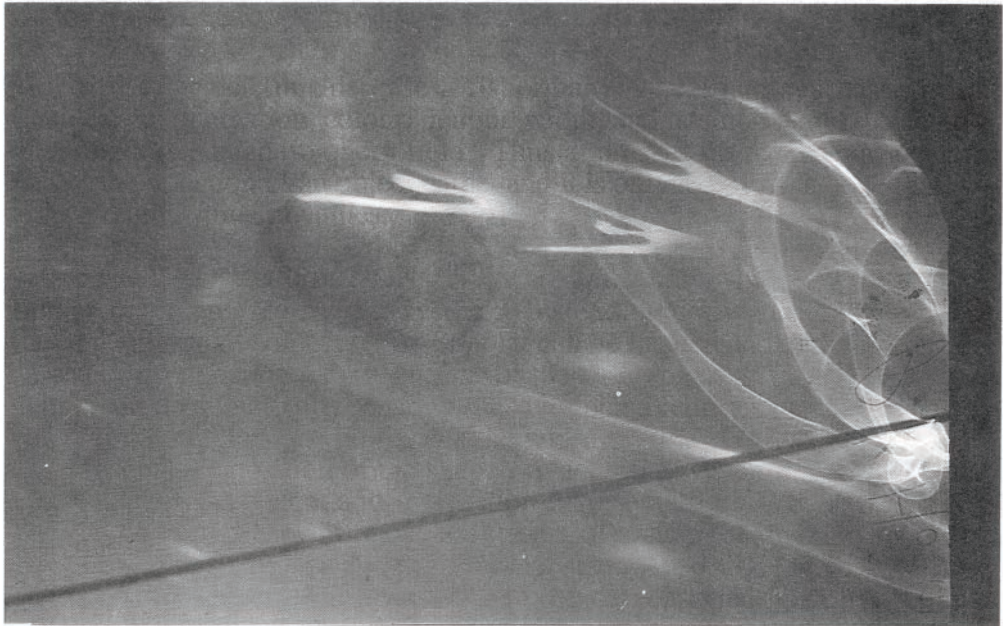
-Light Symphony No. 1. Technion, Israel Institute of Technology, 1979.

-Light Symphony No. 1. Leonardo, Vol. 14 pp. 38-40 Pergamon Press, Oxford UK, 1981.

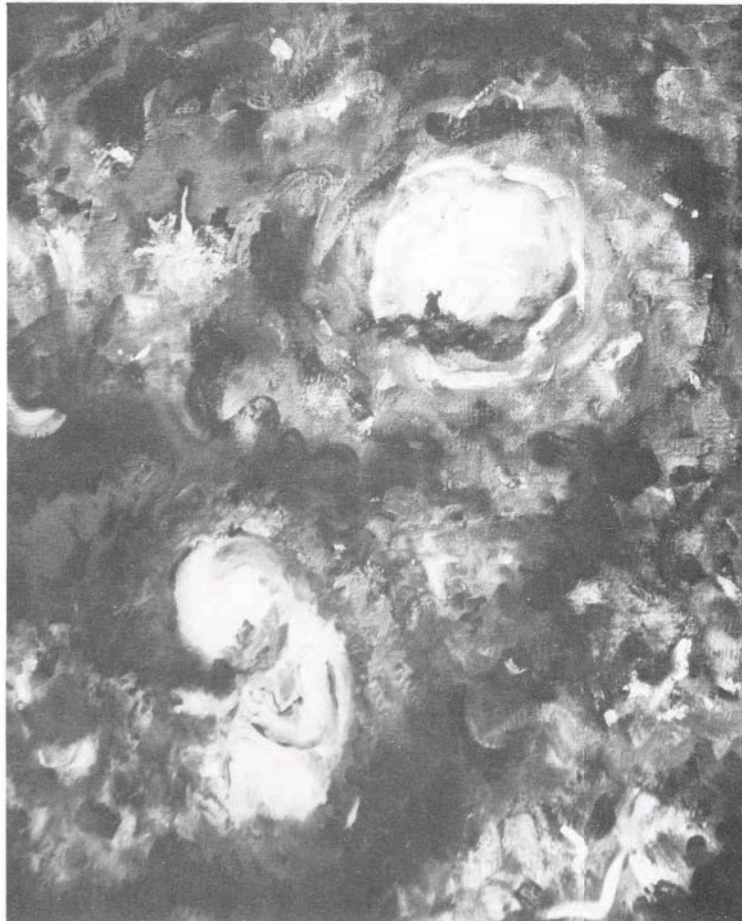
-Sun Art; Kinetic and Static Pictures created with Sunrays. Leonardo, Vol. 19 pp. 123-126 Pergamon Press, Oxford UK, 1986.

-Sonnenkunst - Ein Weg zur Freude. Polyaisthesis, Vol. 3 pp. 110-119.

Verband der wissenschaftlichen Gesellschaften Osterreichs, Wien 1988.



P K Hoenich
fig 8



P K Hoenich
fig 9 The cosmic birth of man .