The Tetracone

The tetracone is an object produced on a small scale for the purposes of programmed art. It consists of a cube with sides eight inches long, within which four cones revolve slowly at different speeds. The cube is open on two (opposite) sides, so that the cones inside it may be seen from front and back. They are arranged so as to fill the entire areas of the spaces thus presented to the view. From the front one sees one combination of colours, from the back the same combination but with the opposite colours.

Each cone contains a small motor and is fixed to the inside of one of the walls of the cube. The cones are cast in aluminium with an internal cavity that contains the motor. All the wires pass through grooves cut into the inside of the box, which is then covered with black plastic. On the base there is nothing but a plug for electric current and a switch.

The dimensions of the box are the basis of all the other forms. Each element is related to every other one and to the whole, not according to the old rules of the Golden Section, which do not apply in this case, but by simple geometrical relationships. The diagonals of the sides of the box determine the size of the cones. The diameter of the base of each cone is equal to the internal length of the sides of the box,

while its height from base to apex is equal to half that amount. The surface of each cone, if projected on to a flat surface, is equal to three quarters of the circle which has a radius of half the diagonal of the side of the box. Each cone is painted in two complementary colours, half one colour and half the other. In this case the colours are red and green. Complementary colours produce an optical vibration at the dividing line between them, and this gets rid of the material. I had better explain this: if you look at complementary colours in the right lighting conditions you will lose all awareness of the material they are painted on. You will therefore be looking purely at the colour and not at the material.

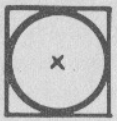
The programming part of the operation consists in deciding the speeds at which the four cones will turn, and the combination of the number of seconds that each cone takes to make a complete turn. In this way one can establish not only the three spatial dimensions but also an effective (as opposed to poetical or metaphysical) dimension of time, which in the tetracone I am describing here is 1,080 seconds. This means that theoretically the combinations of colour repeat themselves every eighteen minutes.

The tetracone therefore offers the viewer a changing combination of two complementary colours. Looking at the object, with its shifting chromatic effect, is supposed to lead the viewer to meditate on the mutability of nature (which in traditional art is presented as static). Because of the slowness with which the change occurs, the colour combinations are at first perceived one by one, like the single frames in a film, but if one watches for longer the effect becomes that of a continuous transformation, from all green to all red, in the course of eighteen minutes.

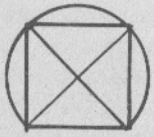
The art of the past (painting and sculpture) has accustomed

general plan

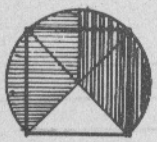
setting a position for cones in a cubic space



base of cone = side of the square



the flat surface of each cone takes up $\frac{3}{4}$ of a circle



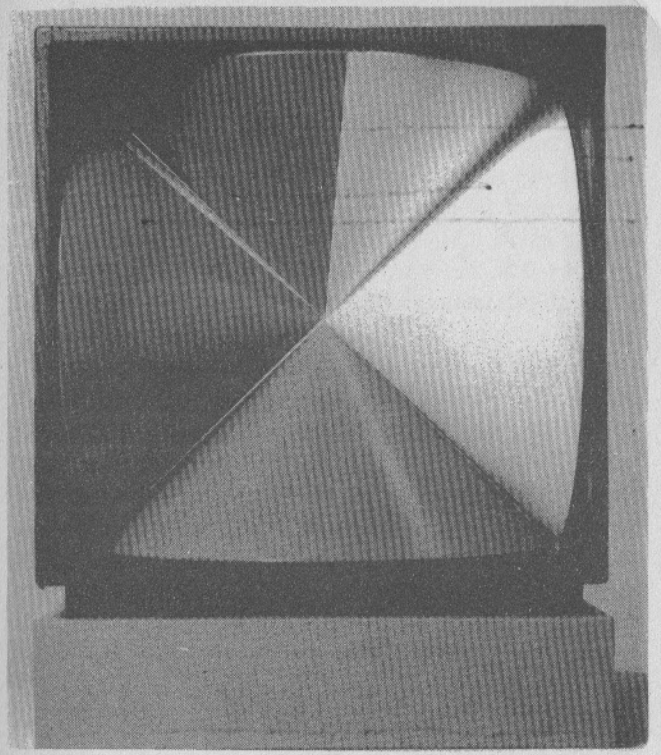
the surface of each cone is divided in two equal parts of complementary colours

programming

kinetic distribution of the speeds

time, in seconds, for each full turn

kinetic direction of four motors built into the cones



'As long as we try to slow up and limit spontaneous change by means of a static symbol we will never be able to understand or to act in a really effective way.' (*Alexander Dormer*)

'The greatest freedom comes from the greatest strictness.' (*Paul Valéry*)

us to seeing nature as static: a sunset, a face, an apple, all static. People go to nature looking for images such as these static things, whereas an apple is in fact a moment in the process from apple-seed to tree, blossom, fruit. In nature nothing is still. The idea of nature fixed at 1 June 1969 or a face fixed at thirty-two years and eight days old is completely unreal; quite apart from the fact that if we stop nature we shall never be able to understand her.

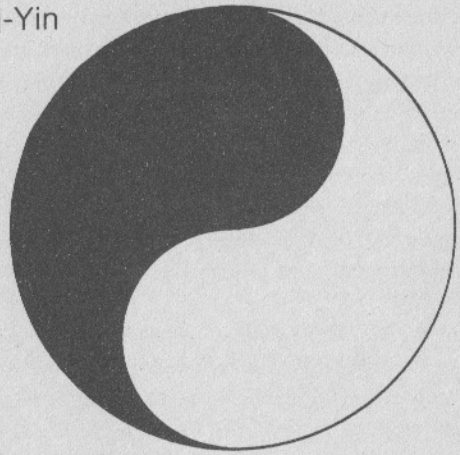
When we fly over the Pole we see a sunset that lasts for hours, and then slowly changes into dawn. Sunset and dawn are the same thing; day and night are both continuous in the world. They never stop. What kind of art can tell us about these facts of nature? What have we learnt from the art of the past about the cyclic movements of nature? Or about the transformations of forms and colours? Think of a tree when it is a seed, and then imagine it tall and green and flowering, laden with fruit. Think of it in autumn, and in winter. All this is nature and nature is all of this, not just one moment of it.

The programmed art of today aims to show forms while they are in the process of becoming, and for this reason it cannot use forms such as painting and sculpture use. On the contrary, its means must be dynamic, and it must be prepared to make full use of motors and other industrial materials.

What really counts is the information which a work of art can convey, and to get down to this we have to abandon all our preconceived notions and make a new object that will get its message across by using the tools of our own time.

'The principle of a form is not *it is* but *one does*.' (*Bauhaus*)

Yang-Yin



This Yang-Yin symbol is of Chinese origin, and is more than three thousand years old. It represents the unity created by a balance between two opposing forces that are equal and contrary.

This unity is visibly represented by a disc made up of two equal parts, one black and one white. These parts seem to be in constant movement in a clockwise direction.

The two opposing forces are interpreted as natural forces, and from their balance comes life itself. Yang is the positive, active, masculine force, and subsists in dryness, heat, hardness, the sky, light, the sun, fire. It is firmness and brightness. Yin is the negative feminine principle present in everything passive, such as cold, damp, softness, mystery. It is in all mysterious, secret, evanescent, cloudy things, and in everything inactive. The shadow on the north side of a hill, the estuary of a river, earth and water: these are Yin.