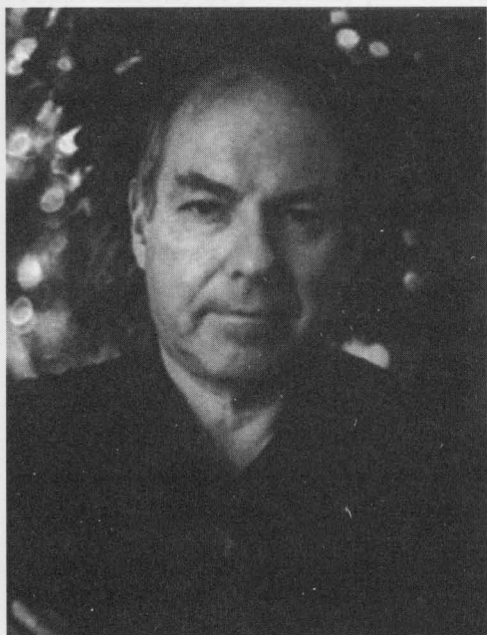Roy Ascott

"Behaviourist Art and the Cybernetic Vision" (1966–1967)

Roy Ascott. Photo by Josephine Coy.
Courtesy of Roy Ascott.

"If the cybernetic spirit constitutes the predominant attitude of the modern era, the computer is the supreme tool that its technology has produced. Used in conjunction with synthetic materials it can be expected to open up paths of radical change and invention in art. . . . The interaction of man and computer in some creative endeavor, involving the heightening of imaginative thought, is to be expected."

<< Since the 1960s, the British educator, artist, and theoretician Roy Ascott has been one of Europe's most active and outspoken practitioners of interactive computer art. Ten years before the personal computer came into existence, Ascott saw that interactivity in computer-based forms of expression would be an emerging issue in the arts. Intrigued by the possibilities, he built a theoretical framework for approaching interactive artworks, which brought together certain characteristics of the avant-garde (Dada, surrealism, Fluxus, Happenings, and pop art, in particular) with the science of cybernetics championed by Norbert Wiener.

Ascott's thesis on cybernetic vision in the arts begins with the premise that interactive art must free itself from the modernist ideal of the "perfect object." Like John Cage, he proposes that the artwork be responsive to the viewer, rather than fixed and static. But Ascott expands on Cage's premise in the realm of computer-based art, suggesting that the "spirit of cybernetics" offers the most effective means for achieving a two-way exchange between the artwork and its audience. Ascott challenges artists to acknowledge information technology as the most significant tool of the age, and insists that it is the artist's obligation to use this technology. Yet, unlike Nam June Paik's vision, Ascott's is not ironic; rather, it is utopian in its embrace of a new medium, excited by the potential of a thriving, dynamic exchange between technology and art to empower the spectator and deepen his or her experience. >>

THE BEHAVIOURAL TENDENCY IN MODERN ART

... By "Modern Art" we mean that cultural continuum of ideas, forms and human activity which differs radically from any previous era and is both expressive and formative of the attitudes and conditions of our time. To describe it as a continuum may seem contradictory to its accepted identity. It is seen popularly as an anarchic, highly diversified and chaotic situation which loses as much in coherence and continuity as it gains in novelty and imagination.

Now, undoubtedly it is anarchic, but in the good sense that interaction between artists is free and not constrained by aesthetic canons or political directives. The diversity of images, structures and ideas which it engenders is far greater than at any other period in history. And it may well seem chaotic; a common cultural consciousness is not readily apparent today. But it is our purpose to demon-

strate that Modern Art is fundamentally of a piece, that there is unity in its diversity, and that the quality which unifies it is in distinct contrast to the essential nature of the art which went before it. We shall describe this quality as "behavioural" and we shall show how it evidences our present transition from the old deterministic culture to a future shaped by a Cybernetic Vision.

The analysis of this behavioural tendency will be largely confined to one broad area, that of the visual/plastic arts, since there it seems to be most marked, but in a more general sense we shall discuss the arts as a whole, illustrating their convergence and interaction in this context. We shall demonstrate how this unity of approach may be potentially part of a larger unity, an integral culture, embracing modern science and technology. And we shall warn how this unity, and the incipient cybernetic vision in art, may be inhibited by artistic attitudes which, out of ignorance and fear, are opposed to radical creative change, and view a cybernated society with indifference or hostility.

THE GENERAL CHARACTERISTICS OF MODERN ART

The dominant feature of art of the past was the wish to transmit a clearly defined message to the spectator as a more or less passive receptor, from the artist as a unique and highly individualised source. This deterministic aesthetic was centred upon the structuring, or "composition," of *facts*, of concepts of the *essence* of things, encapsulated in a factually correct visual field. Modern Art, by contrast, is concerned to initiate *events* and with the forming of concepts of *existence*. The vision of art has shifted from the field of objects to the field of behaviour and its function has become less descriptive and more purposive.

Although in Painting and Sculpture the channel of communication remains largely visual, other modalities are increasingly employed—tactile, postural, aural; so that a more inclusive term than "visual" art must be found, and the one we propose is "behavioural." This behavioural tendency dominates art now in all its aspects. The artist, the artifact and the spectator are all involved in a more behavioural context. We find an insistence on polemic, formal ambiguity and instability, uncertainty and room for change in the images and forms of Modern Art. And these factors predominate not for esoteric or obscurantist reasons but to draw the spectator into active participation in the act of creation; to extend him, via the artifact, the opportunity to become involved in creative behaviour on all

levels of experience—physical, emotional and conceptual. A feedback loop is established so that the evolution of the artwork/experience is governed by the intimate involvement of the spectator. As the process is open-ended the spectator now engages in decision-making play.

Creative Participation

We may say that the boundaries between making art, the artifact itself, and the experience of the work are no longer clearly defined. Or, more precisely, that the tendency for this to be so is evident. There are still in this transitional period many artists who contrive to force the new sensibility into old moulds, just as in technology there are many industrialists who attempt to squeeze cybernation into a nineteenth-century structure of operations.

The participational, inclusive form of art has as its basic principle "feedback," and it is this loop which makes of the triad artist/artwork/observer an integral whole. For art to switch its role from the private, exclusive arena of a rarefied elite to the public, open field of general consciousness, the artist has had to create more flexible structures and images offering a greater variety of readings than were needed in art formerly. This situation, in which the artwork exists in a perpetual state of transition where the effort to establish a final resolution must come from the observer, may be seen in the context of games. We can say that in the past the artist played to win, and so set the conditions that he always dominated the play. The spectator was positioned to lose, in the sense that his moves were predetermined and he could form no strategy of his own. Nowadays we are moving towards a situation in which the game is never won but remains perpetually in a state of play. While the general context of the art-experience is set by the artist, its evolution in any specific sense is unpredictable and dependent on the total involvement of the spectator.

Where once the function of art was to create an equilibrium, establish a harmony on the public level of relatively passive reception, we now find art as a more strident agent of change, effecting a jolt to the whole human organism, a catalyst which sets up patterns of behaviour, of thought and emotion, which are unpredictable in any fine sense. We observe in the painting of Poussin, for example, the wish to fix a set of relationships in the spectator's consciousness, to reinforce these absolutes by the stability of the formal composition; he communicates but by a one-way channel. The modern artist, on the other hand, is primarily motivated to initiate a *dialogue,* to set feelings and ideas in motion, to enrich the artistic experience with feedback from the spectator's response.

This cybernetic process of retraction generates a constant stream of new and unfamiliar relationships, associative links and concepts. Each artwork becomes a sort of behavioural Tarot pack, presenting coordinates which can be endlessly reshuffled by the spectator, always to produce meaning. This is achieved principally in one of two ways: either the artifact has a definitive form but contains only a small amount of low-definition information; or its physical structure is such that its individual constituent parts can change their relationships, either by the direct manipulation of the spectator, or by his shifting viewpoint, or by the agency of electrical or other natural power. The active involvement of the spectator can be thought of as removing uncertainty about a set of possibilities. Deep involvement and interplay produces information. The "set" of the artwork has variety only in so far as the observer participates. The variety of the set is a measure of the uncertainty involved. An important characteristic of Modern Art, then, is that it offers a high degree of uncertainty and permits a great intensity of participation.

As to the artist's role, it can be said to function on two levels simultaneously, the private and the social. In the first case, the primacy of a total behavioural involvement in the activity or *process* of making art is apparent. The artist is not goal-directed in the sense of working towards a predetermined art object. The artifact is essentially the result of his creative behaviour, rather than the reason for it. The growth of a painting or sculpture or environment is of more importance than the achievement of its final form. Indeed, unlike Classical Art, there is no point at which it can be said to have reached a final form. From the social point of view the artist's behaviour is a Ritual in which he acts out the role of the Free Man controlling his world by taking endless risks as he plunges into the unknown territories of Form and Idea. It is a paradigm of a condition to which the human being constantly aspires, where freedom and responsibility combine to reduce our anxiety of the unknown and unpredictable while enlarging our experience of the unfamiliar and irresistible.

At this early stage of a radically new culture the artist is doing little more than exploring his new relationship to the spectator. He is searching for new ways of handling ideas, for more flexible and adaptive structures to contain them; he is attempting to generate new carrier waves for the modulations of contemporary experience; and he is searching the resources of technology to expand his repertoire of skills. His concern is to affirm that dialogue is possible—that is the content and the message of art now; and that is why, seen from the deterministic point of view, art may seem devoid of content and the artist to have nothing to say. The modern means of communication, of feedback and viable interplay—these are the

content of art. The artist's message is that the extension of creative behaviour into everyday experience is possible.

The message is timely and apposite at a period in which we can anticipate the reduction of labour to a minimum and expect the creative use of leisure time to be the main preoccupation of our lives. And even if the artist were to have fully explored the new channels of communication and thoroughly exploited the media and techniques of modern technology, it is unlikely that his attitude would change. He would continue to avoid the limitations of an aesthetic geared to the transmission of finite messages or the formulation of fixed attitudes and absolute values. He will continue, instead, to provide a *matrix* for ideas and feelings from which the participants in his work may construct for themselves new experiences and unfamiliar patterns of behaviour. . . .

THE CYBERNETIC VISION IN ART

By this term we do not mean "the Art of Cybernetics" nor do we refer to an art concerned to illustrate Cybernetics, nor yet an art embodying cybernetic machines or Robot Art—although any one of these things might be involved at some point, and again, they might not.

We are referring to the spirit of Cybernetics which may inform art and in turn be enriched by it. We contrast the Cybernetic Vision in Art to the Deterministic Vision of the past which has already been outlined. We say of Cybernetics that, before it is a method or an applied science, it is a field of knowledge which shapes our philosophy, influences our behaviour and extends our thought.

We are moving towards a fully cybernated society[1] where processes of retraction, instant communication, autonomic flexibility will inform every aspect of our environment. In that forming society, of which we are a part, the cybernetic spirit finds its expression in the Human Science[2] and in Environmental Technology; the two poles between which we act out our existence. It is the spirit of our understanding of life at its simplest and most complex levels, and a large measure of our ability to control it.

The economic and social effects of automation in the cybernated society will be profound.[3] The effects of our transition of that future state are already felt, particularly in the United States. Matters of leisure, class formation, political and economic power have already called for revision and new thinking. Cybernetics already dominates our more advanced concepts of transport, shelters, storage and other day to day matters of control and communication and has caused the rad-

ical transformation of many industrial and commercial procedures. The effect of the computer on human thought is currently the subject of vigorous discussion in academic circles; the man/computer relationship is seen to be as much a question of identity as of methodology.

Fundamentally Cybernetics concerns the idea of the perfectibility of systems; it is concerned in practice with the procurement of effective action by means of self-organising systems. It recognises the idea of the perfectibility of Man, of the possibility of further evolution in the biological and social sphere. In this it shares its optimism with Molecular Biology. Bio-cybernetics, the simulation of living processes, genetic manipulation, the behavioural sciences, automatic environments, together constitute an understanding of the human being which calls for and will in time produce new human values and a new morality.

How does the artist stand in relation to these radical changes? On the level of opinions or concepts he is and will be free to accept or reject them. But on the level of deep human experience they will "alter sense ratios or patterns of perception steadily and without resistance."[4] The artist is faced with two possibilities; either to be carried along in the stream of events, mindlessly, half aware and perhaps bitter and hostile as a result; or he can come to terms with his world, shape it and develop it by understanding its underlying cybernetic characteristics. Awareness of these underlying forces will sharpen his perception; the utilisation of new techniques will enlarge his powers of thought and creative action; he will be empowered to construct a vision in art which will enhance the cybernated society as much as it will be enriched by it. Understanding and awareness, in short, are the conditions for optimism in art.

There is reason to suppose that a unity of art, science and human values is possible; there is no doubt that it is desirable.[5] More specifically we propose that an essentially *cybernetic* vision could unify and feed such culture. The grounds for supposing that Art has anticipated this integral situation and is prepared for it can be found in the emphatically *behavioural* tendency which it displays. Cybernetics is consistent with Behaviourist Art; it can assist in its evolution just as, in turn, a behavioural synthesis can embody a Cybernetic Vision.

CYBERNETICS AND BEHAVIOURIST ART

It is necessary to differentiate between *"l'esprit cybernétique"*[6] as we have tried to describe it above, and Cybernetics as a descriptive method. Now, art like any process or system can be examined from the cybernetic point of view; it can also

derive technical and theoretical support from this science—as in the past it has done from Optics or Geometry. This is not unimportant since the artist's range can be extended considerably, as we briefly indicate below. But it is important to remember that the Cybernetic Vision in Art, which will unify art with a cybernated society, is a matter of "stance," a fundamental attitude to events and human relationships, before it is in any sense a technical or procedural matter.

Behaviourist Art constitutes a retroactive process of human involvement, in which the artifact functions as both matrix and catalyst. As matrix, it is the substance between two sets of behaviours; it neither exists for itself nor by itself. As a catalyst, it triggers changes in the spectator's total behaviour. Its structure must be adaptive implicitly or physically, to accommodate the spectator's responses, in order that the creative evolution of form and idea may take place. The basic principle is *feedback*. The system Artifact/Observer furnishes its own controlling energy; a function of an output variable (observer response) is to act as an input variable, which introduces more variety into the system and leads to more variety in the output (observer's experience). This rich interplay derives from what is a self-organising system in which there are two controlling factors; one, the spectator is a self-organising sub-system; the other, the artwork is not usually at present homeostatic.

There is no a priori reason why the artifact should not be a self-organising system; an organism, as it were, which derives its initial programme or code from the artist's creative activity, and then evolves its specific artistic identity and function in response to the environments which it encounters. The artist's creative activity is also dependent on feedback; the changes which he effects in his immediate environment (or "arena") by means of tools and media set up configurations which feed back to affect his subsequent decisions and actions. Thus Modern Art, with its fundamental behavioural quality, is the art of *the organisation of effects*. And when all the control factors, including the artwork itself, are effectively homeostatic, art will be concerned with the automatic control of effects. Cybernetics, of course, is the science of the organisation of effects, and of the automatic control of effects.[7]

Equally, there is no a priori reason why the artwork *should* become a self-organising system; the basic feedback process of behaviourist art operates within the conventions of painting and sculpture, provided that they display low definition, multiple associations and indeterminate content, within parameters which are, at least implicitly, flexible. And, as we have suggested already, this is nowadays the case—even to the extent of providing a more or less empty receptacle (the canvas) into which the spectator can project his own imaginative world, e.g., Yves Klein, Ad Reinhard.

THE COMPUTER AND GROWTH SYSTEMS

However, historically it has been a characteristic of the artist to reach out to the tools and materials which the technology of his time produces, just as his perception and patterns of thought have tended to identify with scientific and philosophical attitudes of the period. If the cybernetics spirit constitutes the predominant *attitude* of the modern era, the computer is the supreme *tool* that its technology has produced. Used in conjunction with synthetic materials it can be expected to open up paths of radical change and invention in art. For it is not simply a physical tool in the sense that an aluminium casting plant or CO_2 welding gear are tools, i.e., extensions of physical power. It is a tool for the mind, an instrument for the magnification of thought, potentially an intelligence amplifier.[8] The interaction of man and computer in some creative endeavour, involving the heightening of imaginative thought, is to be expected. Moreover the interaction of Artifact and computer, in the context of the behavioural structure, is equally foreseeable.

Experiments are already taking place. We have cited Schoffer's use of a computer in some of his structures. In music Iannis Xenakis has made extensive use of an IBM 7090—a process in which he "specifies the duration and density of sound events, leaving the parameters of pitch, velocity and dynamics to the computer." The "Light-Harp" project of Haukeland and Nordheim, an environmental sculpture emitting sound in relation to the quality of local light, with sound sources changing position within the structure, calls for a highly sophisticated control and communications system within it.

The computer may be linked to an artwork and the artwork may in some sense *be* a computer. The necessary conditions of behaviourist art are that the spectator is involved and that the artwork in some way *behaves*. Now, it seems likely that in the artist's attempt to create structures which are probabilistic, the artifact may result from biological modelling. In short, it may be developed with the properties of growth. Cybernetics already furnishes models which could assist in this development, e.g., Beer's Fungoid Systems and research into chemical and chemical-colloidal computers.[9] The potential for the future is enormous.[10]

The cybernetic vision not only shapes modern science and technology, integrating and bridging disparate fields of knowledge and improving artificial control and communication systems by the understanding of complex natural processes, but it can be expected to find expression and enlargement in Art. It can assist in the evolution of art, serving to increase its variety and vigour. . . .

multiMEDIA
FROM WAGNER TO VIRTUAL REALITY

Edited by
**RANDALL PACKER
KEN JORDAN**

Foreword by
WILLIAM GIBSON

Coda by
LAURIE ANDERSON

"For anyone who wants to know where multimedia
technology is going, or where it has been."
—BOSTON GLOBE