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The Cybernetic Moment: Roy Ascott and the British cybernetic pioneers, 1955-1965

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The Cybernetic Moment: Roy Ascott and the British cybernetic pioneers, 1955-1965

Professor Roy Ascott developed the Ground Course at Ealing College of Art, drawing on his experience of Basic Design under Victor Pasmore and Richard Hamilton at Newcastle University. Through his reading of Ross Ashby and his friendship with Gordon Pask, Ascott introduced cybernetic theory into his art practice and pedagogy. This essay explores the degree to which Ascott embodied a distinctly British approach to cybernetics.

Keywords: cybernetics, art pedagogy, postwar art, new media, digital art, Independent Group, Victor Pasmore, Richard Hamilton, Roy Ascott, Nicholas Lambert

Roy Ascott is a significant interlocutor between cybernetics and the arts who introduced cybernetic theory into his Ground Course at Ealing College of Art in 1961. He has evolved concepts that continue to inform artists’ approaches to networks, communications media and the Internet; whilst also drawing deeply on shamanism and spiritual discourses. Ascott’s circle of influence is international and, through the graduates of his Planetary Collegium, works through a wide range of arts organisations and practices.

The word “cybernetics” developed rapidly from a specialist term denoting a field of scientific interest and became a household word that covered a whole gamut of expectations about the future in the 1950s. Later its usage faded in the 1970s as the computer became more established in business, and then in the home, and the concept of Artificial Intelligence took over its “futuristic” niche. By the mid-1990s, cybernetics was widely regarded as a quaint product of its times. However there is a resurgence of interest in the area, which is being reassessed in terms of contemporary approaches to ubiquitous computing and the rapid developments of new interfaces that bring the concept of “feedback” to a wide range of devices.

Ascott’s understanding of cybernetics was deeply influenced by two key British pioneers: Ross Ashby and Gordon Pask. Andrew Pickering points out that cybernetics in the UK manifested itself in a very different way, with a distinctly aesthetic and performative aspect that shifted “from epistemology to ontology, from representation to performativity, agency and emergence, not in the analysis of science but within the body of science itself.” (Pickering 2002)

This essay proposes that Ascott’s cybernetic theories concerning the arts emerged from this British school, combined with his formative aesthetic experiences under Victor Pasmore, Richard Hamilton and Lawrence Gowing on the BA Fine Art course at Newcastle University in the mid 1950s.

Though it is now overshadowed by the revolutions of the 1960s, the preceding decade laid the foundations for many of its radical changes. There was clearly a "cybernetic moment" in mid-1950s Britain that enabled the concept to spill over from the sciences into some of the artistic avant-garde. For instance, Jasia Reichardt was first introduced to the term on September 19th 1957, at a talk by Z Tarkowski at the Gaberbocchus Common Room, the salon run by her uncle and aunt, the Themersons. From then onwards, she followed the development of kinetic art in the UK and abroad, and went to the United States to observe the developments around Experiments in Art and Technology. (Reichardt 2014)

Ascott was seemingly predisposed to find cybernetics at the right moment and realise its application in art. As this discovery preceded his friendship with Gordon Pask, important though that was, the answer must lie in the confluence of British Constructivism, represented by Pasmore and Gowing, and Hamilton's approach to Duchamp, filtered through his connections with the Independent Group. It says much that Ascott was able to combine these very different strands. Pasmore, with his roots in Russian Constructivism, was “strikingly divergent” from the work of Hamilton, Paolozzi, Henderson and Smithsons, and these differences manifested themselves in the 1956 exhibition ‘This is Tomorrow’. (Grieve 1994, p225)

Ascott said that these two approaches to art “produced in me an extreme psychosis.” (Ascott 2011, p203) In terms of the Basic Design course at Newcastle, Hamilton brought the concepts of ‘Flow and Process’; whereas Pasmore provided ‘Point and Line to Plane’. (Ascott 2016) Indeed, Ascott averred that he responded not to Hamilton’s collages but to his precise way of working and also his longstanding interest in Duchamp.

Hamilton’s exploration of D’Arcy Thompson’s *On Growth and Form*, to which he was introduced by Nigel Henderson during his studies at the Slade, (Massey 2013) was an important element in Ascott’s education that would later draw him to Henri Bergson’s vitalist philosophy. (Shanken 2003, p28) Indeed, Bergson assumed a place of central importance in Ascott’s early explorations of cybernetics, as demonstrated in his first essay for *Leonardo* magazine which appeared in 1968:

Henri Bergson, living in that period which served, so to speak, as the fulcrum of these two eras, revealed repeatedly in his *Philosophy of Change* the nature of the new situation. 'The role of life is to insert some indetermination in to matter' . . . 'The living are relatively stable, and counterfeit immobility so well that we treat each of them as thing rather than as progress, forgetting that the very permanence of their form is only the outline of a movement.' (Ascott 1968, p106)

Edward Shanken also follows Jack Burnham’s assertion that Bergson’s influence could be traced through Jean Arp, who was an important influence upon Victor Pasmore. (Shanken 2003, p29) Certainly there is something of Arp in Ascott’s earliest reliefs such as the *Video-Roget* (1962, now in the Tate Gallery Permanent Collection). Along with Arp, Klee also occupied an important place in Pasmore’s thinking and the *Pedagogical Sketchbook* in particular underpinned his work in the 1950s. These ideas too filtered down to his students at Newcastle. In 1953, at a symposium on Klee’s *Pedagogical Sketchbook* at the ICA, Pasmore described Klee in these terms:

'Klee aims to provide the student with a concrete and objective basis from which to develop. He seeks this basis in Nature: but it is not in Nature's finished results, as is traditional art, but in its processes.' (Grieve 1982, p548)

Pasmore’s approach at Newcastle, where he had been appointed Head of Painting in 1954, drew deeply on the Bauhaus tradition which had been inculcated in him during his time at Camberwell and the Central School by the painter William Johnstone. From his readings of Klee and Kandinsky he developed the famous Basic Design course:

I was interested in developing a new visual language which was independent of anything in front of you such as a still life, a language made up of basic visual sensations and basic visual forms. So at Newcastle I concentrated on experimenting with the students in creating this new language, which I called basic form, basic sensation. (Watkins 2001, p287)

Ascott later recalled Pasmore’s “very strange way of speaking” that made it more difficult to convey his ideas but Ascott declared that he “got it almost telepathically!” Certainly he was deeply imbued with Pasmore’s approach to relief paintings, which gave the idea of constructing things that later included movement. His constructivist principles were “hugely important”, as was the growing influence of Charles Biederman. (Walsh, Meeka 2013)

Biederman was another touchstone for both Pasmore and Ascott, because his textbook *Art as the Evolution of Visual Knowledge* provided much of the material for the Basic Design course. It was here, for instance, that Cézanne was accorded particular importance. The text proposed an evolutionary model of art that favoured the relief as a form appropriate to the industrial age:

For Biederman the next logical step in the search for a real art is the relief constructed of three dimensional planes under natural light. These reliefs, made from industrial materials by precision machines, are an 'art for a Science-Machine culture'. (Grieve 1982, p540)

Pasmore borrowed a copy of Biederman's book from Ceri Richards whilst teaching at Chelsea; Richards had been given it by the scientist William George, who had been sent it directly by Biederman himself due to the latter’s interest in his work. Although Pasmore had begun exploring reliefs due to his encounters with Ben Nicholson, it was Biederman who provided him with a particular justification for using this form. (Grieve 1982, p542) However he was no uncritical adopter of Biederman’s theories; on the contrary, Pasmore challenged the idea that one could create a scientifically-based objective artform that did not contain something subjective: “Your anatomy of processes, however, does not account for the subject. You have formed an anatomy, but no perspective; that is to say you have not identified processes within the artist which correspond to the processes of nature outside him.” In response, Biederman wrote:

‘the artist does not abstract from particular objects, but from all his experience with the general behavior (or function) of process as revealed in nature'... 'We seek correspondence to the conditions of reality or nature (three-dimensional) in order that the structure of our art will be open to the possibilities evidenced in the functions of nature.' (Grieve 1982 p547)

Having made reliefs until the late 1950s, Pasmore eventually returned to painting due to his experience of designing the Peterlee new town in County Durham, following Berthold Lubetkin’s departure from the project. The housing designs emerged from Pasmore’s constructivist concepts, and he also brought in his students to work on the designs; Ascott recalls being asked to develop several buildings. (Ascott 2016) Following this, Pasmore said, “after the full experience of urban design at Peterlee, making reliefs seemed rather ridiculous, it was too limiting, so I thought I would go back to painting.” (Watkins 2001, p287)

It is notable that Biederman emphasized Cézanne in *Art as the Evolution of Visual Knowledge*, because Ascott regards his dissertation on Cézanne as a turning point. Here he discovered the sensibility for understanding an artwork as an organism: he could see that Cézanne’s later paintings are unresolved and the resolution comes from the viewer; in this sense they are interactive. Understood in the light of cybernetics, the work of art is a system, including painter and viewer. (Ascott 2016) Later, he recognized that sensors and other mechanisms could facilitate or enhance this interactivity but for some time he did not include mechanisms in his works. He also perceived some continuity between Cezanne and Jackson Pollock and arrived at the idea that Pollock’s paintings contain a visual metaphor for networks.

It was the Pollock retrospective in 1958 at the Whitechapel, curated by Betty Parsons, that made a considerable impression on Ascott. One can sense its impact in the contemporary review broadcast by David Sylvester on the BBC Third Programme:

I think it is their seductiveness that has been the big surprise for those of us who are seeing Pollock wholesale for the first time. Their *elegance* is the most striking thing about them. Probably it would be less striking [if] it didn't run counter to the great Pollock legend [of] the slapdash improviser […] Pollock's handling of paint and organisation of colour is in fact as sure, as subtle, as magisterial as Matisse's or Bonnard's. (Sylvester 2001, p61)

This caused Ascott to move away from reliefs and instead produce several huge painted canvases. He feared the results of such a radical break with Pasmore’s direction and thought this would be brought out in the next departmental crit, which included the head of the Art School, Lawrence Gowing. Instead of censuring him, Gowing wholeheartedly approved: ‘he said, “This is exactly what you’ve been doing previously. It’s still constructed; it is just the other side of the coin.” He got it.’ (Walsh 2013)

Indeed, Gowing was also influential in other ways; Ascott recalled being impressed by his early advice: “Gowing put up shelves with bottles on them and said: ‘Don’t draw the bottles, draw the space between them’”. Following the positive crit, this set up a kind of a chemistry between Ascott and Gowing, and when Ascott was doing his dissertation he was able to go into Gowing’s studio and study portfolios of facsimile watercolours of late Cezanne which informed the writing. Gowing was still doing his Euston Road paintings, and was of course responsible for bringing Hamilton and Pasmore to Newcastle. (Ascott 2016)

Moreover, it was Gowing who provided the scholarship that enabled Ascott to go to Paris and meet Victor Vasarely and Nicholas Schöffer. Both of these Hungarian artists had settled in France and were working along Constructivist lines with kinetic sculptures; Vasarely was also credited as the “father” of Op Art. Certainly his superimposed acrylic panes and *unités plastiques* were in a similar vein to Ascott’s later Change Paintings, and he too was deeply interested in theories of perception. He gave Ascott an etching that was later useful to him when he was able to sell it and help his financial situation. (Ascott 2016)

Schöffer, meanwhile, was constructing his first CYSP (CYbernetic-SPatiodynamic) piece, which used the homeostatic principle of Ross Ashby’s early cybernetic devices as its underlying concept: “The homeostat, as first described and modelled by Ashby, essentially seeks an equilibrium point when it gets out of balance.  CYSP-1 is a homeostat on wheels.” (Hoggett) CYSP was an early application of electronic sensors in a fully mobile piece of interactive and robotic art. Schöffer’s philosophical rationale for CYSP and his subsequent robotic pieces were summed up in a later article:

Every creator of sonic or visual art reveals and develops a framework. The harmonics of the framework in some sense mirror the complex structures which make us what we are and act upon our programs, regulating them according to each person's specific rhythms. […] Concretized in the domain of art, these structures constitute works coded and programmed in time and space. (Schöffer 1985)

Ascott certainly found this visit illuminating but did not engage with cybernetics until 1961, when he read F.H. George and Ross Ashby. He was not initially interested in cybernetics as an adjunct to robotics or mechanisms but as a social, political, spiritual and philosophical system. Indeed, he disagreed with Pasmore’s more disengaged approach, because he held that one had to involve the social in art and engage with it. Only later, when he established his course at Ipswich did he start working with electronics and wanted to take this forward with Stroud Cornock, but his exit from Ipswich precluded that. (Ascott 2016)

Around 1955 the concept of cybernetics was also introduced to the Independent Group. As Anne Massey recounts it:

Reyner Banham's interest in cybernetics [led] to E.W. Meyer being invited to talk about 'Probability and Information Theory and Their Application to the Visual Arts’ in March 1955, resulting in several diagrams and collages by John McHale on the theme of the transistor. (Massey 1995, p91)

This arose from the IG’s engagement with science and technology, driven in particular by Richard Hamilton’s longstanding interest in the area that went back to the exhibition ‘Growth and Form’ (1951), inspired by D’Arcy Thompson’s book of the same name; and also the group’s concern with popular culture, especially American culture, that animated Lawrence Alloway and John McHale.

The latter seems to be often overlooked in the histories of Pop Art, but McHale’s son claimed that his father had in fact produced a detailed mock-up design of *Just what is it that makes today's homes so different, so appealing?* (1956), as part of a collaboration for “This Is Tomorrow”, which was later credited to Hamilton alone. (McHale 2006) Though this was refuted by Hamilton in 2007, (Hamilton 2007) it is instructive to take a closer look at McHale’s contributions to the Independent Group and in particular his interests in contemporary communications technology.

McHale came to art following a wartime career as a medic and working for Admiralty Intelligence decrypting codes. During the late 1940s he travelled to Paris and met Ferdinand Leger and Tristan Tzara, then became interested in the Vorticists and Constructivism. Later he established a studio in Maida Vale and exhibited at the ICA, where he encountered Eduardo Paolozzi and attended his “Bunk” presentation in 1952, the first meeting of the Young Group that evolved into the Independent Group, led by Reyner Banham and Lawrence Alloway. McHale stayed until 1955, when he left to study with Josef Albers at Black Mountain College, North Carolina. At the same time he also had a commercial design and graphics business with clients in London including Shell and Air France. During this period he looked into optical perception and also studied symbolic content, signs and meaning. (McHale 2006)

From 1954 he developed a series of collages and influenced the concept of “Pop Art” as it evolved within the Independent Group. These contained the collaged elements of popular culture, in particular referencing the rise of electronics, that at the very least presaged the general form of Hamilton’s famous poster for ‘This Is Tomorrow.’ McHale was immersed in the world of American technology and culture earlier than many of his contemporaries and this underscored his decision to move to America later in the 1950s.

As a protégé of Buckminster Fuller and the Eamses, and with his background in visual perception and the symbolic nature of media, McHale was well aware that the value of art was changing; hence the concept of the “Expendable Ikon” that he developed at some length. John McHale Jr summarises his father’s concept: “Images could be fixed, permanent, ephemeral, or they could be "expendable ikons" depending on one's choice, source or channel of information”. (McHale 2006)

McHale was thus open to informational theories and indeed, several of his collages included arrow-like diagrams, which also entered the commercial work he did for Air France in designing electronic information kiosks. (McHale 2006) By the time that E.W. Meyer lectured about cybernetics to the Independent Group, it is likely that McHale was already cognisant of this area, and it seems that Meyer’s talk inspired some of the *Transistors* series. Later in 1967, McHale formulated his understanding of the future of art:

As art and non-art become interchangeable, and the masterwork may only be a reel of punched or magnetized tape, the artist defines art less through any intrinsic value of the art object than by furnishing new conceptualities of life style and orientation. (McHale 1967)

This exploration is germane to the question of Roy Ascott’s influences because McHale did in fact come to talk at Newcastle in the mid-1950s. Ascott recalls that Hamilton invited both McHale and Alloway to speak to them, along with a surviving member of the Dadaists, the poet Richard Huelsenbeck. When this venerable figure entered the room, Ascott played “God Save The Queen” on an old record player, thus causing everyone to stand up! (Ascott 2016)

Certainly there was a sense that cybernetics was impacting the visual arts from the mid-1950s onwards, and it is noteworthy that the artists who began to investigate it came from a Constructivist or Bauhaus-influenced background. At the same time, at least one cyberneticist was taking another route into visual art from the areas of science and drama: Gordon Pask. His Musicolour machine, was positioned between the fields of art, music, performance and science. As an example of an early piece of interactive art, it was so far ahead of its time that the vocabulary to describe it did not really exist, though it influenced Pask's concept of an "aesthetically potent environment".

Musicolour was the outcome of Pask’s interest in synesthesia combined with his research in machine learning, and was first constructed in 1953 with Robin McKinnon-Wood, the co-founder of System Research Ltd whom he had met at Cambridge. Musicolour was designed to respond to sounds made by musicians; it altered visual patterns on a colour wheel according to filters that analysed the frequency, attack and rhythm; these then caused the performers to alter their music as they became familiar with the patterns, so the music did not become repetitive.

It is important to note that there [were] no fixed mappings between sounds and lights: these were developed through the interaction of the musicians with Musicolour. There is reciprocal feedback between Musicolour and the performers (Bird and Di Paolo 2008, p193)

The system was deployed at a number of theatres and clubs in Northern England and London between 1955 and 1957, most successfully at Churchill's Club in London where people "participated in the system by dancing, responding to the music and light show." [Bird and Di Paolo, p194] However Musicolour was only effective in smaller spaces where the interactions were obvious and it became little more than a novelty in large night clubs. Hence Pask moved on to learning systems such as SAKI, but Musicolour set the stage,as it were, for the *Colloquy of Mobiles* at Cybernetic Serendipity. Pickering reflects on the importance of the system to Pask’s evolving philosophy of cybernetics:

a Musicolour show was precisely a decentred joint performance of the human and the nonhuman. As Pask put it: 'He [the performer] trained the machine, and it played a game with him. In this sense, the system acted as an extension of the performer with which he could cooperate to achieve effects that he could not achieve on his own' (Pask 427 1971: 78). As nice an exemplification of the dance of agency as one might wish. (Pickering 2002, p427)

Thus by the late 1950s there was already one cybernetically-inspired performance system in the UK, albeit in the area of music. Although not directly influential on Ascott, it would be consequential for him when he finally met Pask a few years later. Having finished his course at Newcastle in 1959, he was employed as a demonstrator in the School of Art. Two years later, he was appointed to the post at Ealing College of Art where he would establish the Ground Course, which he initially conceived along the lines of Basic Design. Whilst looking through the book stacks in the University of Newcastle library, however, Ascott found: ‘this really weird book called *Cybernetics and Business* by F. H. George. At the time I didn’t know what cybernetics was, I just thought “what?” So I opened it up. It had inside special words such as “feedback,” “retro-action,” “black box,” all of which were magic to me. I thought, “Jesus, what is this stuff?”’ From this he went on to read Ross Ashby and this connected deeply with his concepts of change and the societal aspects of cybernetics that were to assume great importance later on. (Ascott 2011)

During a recent interview, Ascott was asked whether the Ground Course at Ealing was conceived as a cybernetic experiment. He replied as follows:

It was initially an attempt to set up a Basic Design Course, but changed considerably thanks to finding the cybernetic book in Newcastle. In the ‘Construction of Change’ there’s a short manifesto about it. Bernard Cohen and Anthony Benjamin were particularly supportive of my concept. From the start it was intended to be a cybernetic organism with rules of reciprocity; if given info you must find a way to pass it on. I brought in Gordon Pask and Johnny Nerikov, a militant Marxist who gave classes in small arms training; also Gustav Metzger, Cohen and many others to expose the students to as wide a range of thought as possible. It was all tied together by the idea of systems and process. (Ascott 2016)

“The Construction of Change” (1964) was Ascott’s first substantial reflection on the importance of cybernetics to his own creative process and by extension, as the basis for the Groundcourse itself. By providing a multiplicity of experiences to his students, and forcing them to confront new modes of thought and the fluidity of their own personae as well, Ascott could then make them comprehend the dynamic and unfixed nature of things they had previously assumed to be unchanging. In so doing he better equipped them for a cybernetic world which was becoming, to a large degree, automated and where human perception was mediated through a range of mechanisms. As Ascott declared:

Cybernetic method may be characterised by a tendency to exteriorise its concepts in some solid form; to produce models in hardware of the natural or artificial system it is discussing. It is concerned with what things do and how they do them, and with the process within which they behave. It takes a dynamic view of life, not unlike that of the artist. […] Cybernetics is concerned with the behaviour of the environment, its regulation, and the structure that reveals the organisation of its parts. “Control and communication in animal and machine” is a proper study for the artist. (Ascott 1964)

Behaviour and identity flowed from this interchange and by the second of the course, much of the learning was given over to mind maps and calibrators to change the students’ behaviour. Therefore the Ealing course departed significantly from previous art courses and produced little assessable material in terms of portfolios, but strong results in the students themselves. Ascott reported that there was good support within Ealing art school for this, but when the students’ work was sent out for assessment to Laurence Gowing (now professor there) he “couldn’t understand a jot”, as Ascott put it. (Ascott 2016) This was despite his earlier support for Ascott at Ealing. At that point, Ascott decided to leave for a more senior position at Ipswich College of Art, where he also implemented further cybernetic concepts. (Mason 2008, pp66-67)

It was at a 1961 show by the Artists’ International Association in Frith St that Ascott met Gordon Pask, who was intrigued by the *Change Paintings* that Ascott was exhibiting. On the strength of their conversation, Pask came back to his studio in Highgate. They spent the night looking at a book on computer programming which was a Russian book in translation; quite possibly by Kamynin, Lyubimskii and Shura-Bura, whom Ascott later celebrated in an eponymous work in 1964. (Shanken 2003, p32) Ascott could understand the more general analogies in the text but Pask had the necessary mathematical knowledge to help interpretation. The results of this were a milestone for Ascott. (Ascott 2016) He later explained how cybernetic art connected with his earlier Constructivist-influenced training and developed it further:

Just as Constructivist art mirrored in its structures those kinds of spatial

organizations thought to be excellent at the large architectural levels, so my studio work mirrors in its processes the behavioural possibilities I am in- tending when I plan, at the larger social level, the requirements of a Cybernetic Art Matrix. (Ascott 1968, p108)

Pask’s development of Conversation Theory was a key part of his discussions with Ascott and he acknowledged importance to his later thought. He found Pask to be a great friend and mentor, who introduced him to many people in the cybernetics and art scenes both in UK and abroad. Through him, Ascott was inducted into the International Institute of Cybernetics. He was once asked to give a keynote to this august organization at a suitably grand theatre in Vienna. No sooner had Ascott walked to the podium, there was a sudden crash as Pask strode through the door, wearing a green cloak and rustling a bag of medicines, and sat down at the very front! “Do you mind if I start now Gordon?” asked Ascott. (Ascott 2016)

Later, it was Pask who brought Ascott into the Fun Palace project set up by Cedric Price and Joan Littlewood in 1964. Amongst the various committees working different aspects of the Fun Palace, Ascott was to chair the Amenities Committee, where his central contribution was the Pillar of Information:

Based on patterns of user interaction, the Pillar of Information would gradually develop an increasingly complex network of cognitive associations and slippages as a kind of nonhierarchical information matrix, both allowing and provoking further inquiry beyond the user’s initial query.(Matthews 2006, p40)

This was a prescient concept for a type of publically-accessible database that would enable various searches to be made and also track the paths taken by various users, to enhance the directions taken by later questioners. Pask’s ideas around performativity were key to the Fun Palace; indeed, the concept of “fun” was reinterpreted towards something more like societal conditioning through experience. Arguably, the range and dynamic of the activities, and committees established to serve them, made the Fun Palace ever more unlikely to reach fruition and Ascott reflected that it was “scuppered by the ‘mafia’ of the Arts Council” because of its myriad approaches. (Ascott 2016)

One positive outcome of the project, however was that Ascott was introduced to the architect Will Alsop; and participating in discussions with Cedric Price and his colleagues also ensured a wider circulation for Ascott’s cybernetic concepts. (Ascott 2016)

Although Ascott’s work at Ealing and Ipswich came to an untimely end due to its inherent radicalism, he inspired other art educators to approach fine art courses in more radical ways. Peter Kardia, for instance, saw the potential of the behaviourist aspects of the Ground Course and engaged with them in his Objective Studies course at St Martin’s:

"Frequently progress in study involves the questioning of institutional definitions of the boundaries of a subject. Behavioural studies are concerned with the procedures of redefinition." (Staff handout by Kardia in 1965, quoted in Westley 2010, p45)

Following the cessation of the programme at Ealing, Kardia went on to recruit many of the tutors for his own course. (Westley 2010, p43)

In conclusion, then, it is clear that Ascott discovered cybernetics at an early moment in its evolution; about a decade after the term entered circulation following Norbert Wiener’s book of 1948. He had already been prepared to some degree by the innovative Basic Design course at Newcastle, which was itself the result of a confluence of resurgent Constructivist ideas combined with an appreciation for the mediated (and Americanised) postwar cultural landscape, together with the potentials of science and technology in the arts. Through Cybernetics, he was able to synthesise the contrasting influences of Pasmore and Hamilton, and also benefit from the guidance of Gordon Pask at a crucial time for his work.

Ascott put all these ideas to use at Ealing and also in the evolution of his own artworks; and they provided him with a dynamic set of artistic principles that would later make him one of the key figures in communications art, and his own area of telematics art.

The question then comes back to the extent to which cybernetics was used as a tool for control or for activating the creative responses of both makers and participants. Here we come back to McHale who thought that in the era of technological production, artists and audience participated in the creation of whole creative environments rather than individual works and the "work" as such was destined to disappear. Clearly this underscored the rise of Conceptual Art, of which Ascott was seen as a key exponent.

At the same time, of course, Jack Burnham, Sol LeWitt and many others were formulating ideas around the use of process and systems in art; and in Germany the ideas of Max Bense were also proving influential. But Ascott’s ideas remain a very distinctive expression, in both a British and international context, and evolved in their own way through the 1970s, surviving the gradual fading of “cybernetics” as a buzzword for the future. Currently, cybernetics informs the development of Roy Ascott’s undergraduate and postgraduate programmes provided by his studio at the DeTao Masters Academy in Shanghai.[[1]](#endnote-1)

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