Art and Education in the Telematic Culture

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It was Simon Nora who coined the term *telematics* to describe the new electronic technology derived from the convergence of computers and telecommunications systems. His report to the President of France, *L'Informatisation de la Société,* published in 1978, is perhaps one of the most influential documents in this field to have been published in Europe—influential in that it led to the swift establishment by the French government of the *Programme Télématique,* which has resulted in the transformation of many aspects of French culture. This process of telematisation is most dramatically seen in the ubiquitous and rapid spread of Minitel, the public videotex system that enables widespread interaction between users and databases across an enormous range of services. Nowadays on the Paris Metro, for example, it is enough to see a poster of an island in the sun, a new household appliance, or racehorses pounding the turf, inscribed with a seven-figure sequence of numbers, to know that another Minitel service is being advertised. At home, at one's Minitel terminal (distributed by the PTT in place of volumes of telephone directories previously provided) one can interact in electronic space with friends, colleagues, institutions and organisations of all kinds. Artists, too, have not been slow to assimilate the medium.

Interactivity is the essence of the videotex system, as it is of all telematic systems, giving us the ability to interact in electronic space, via computer memory and beyond the normal constraints of time and space that apply to face-to-face communication. The concept of interactivity also has an important place in recent theories of communication, in contrast to the one-way linearity of older models. The new approach is found, for example, in the network analysis of Rogers and Kinkaid and in research into biology and cognition by Maturana and Varela. Neither of these studies is centrally concerned with electronic systems or telematic technologies. Both, however, deal with human interaction, language, meaning and memory, which is of value in our understanding of the potential of telematic systems to enrich visual culture.

Let me quote from both of these studies:

> Communication research in the past has almost always followed a linear 'components' model of the human communication act. Such research mainly investigated the effects of communication messages from a source to a receiver, in a one-way, persuasive type paradigm that is not consistent with our basic conception of the communication process as mutual information exchange, as sharing means, as convergence. [The new approach] is guided by a convergence model of communication based on a cybernetic explanation of human behaviour from a systems perspective [1].
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> According to the metaphor of the tube, communication is something generated at a certain point. It is carried by a conduit (or tube) and is delivered to the receiver at the other end. Hence there is *something* that is communicated, and what is communicated is an integral part of that which travels in the tube. Thus, we speak of the 'information' contained in a picture, an object, or, more evidently, the printed word. According to our analysis, this metaphor is basically false. It presupposes a unity that is not determined structurally, where interactions are instructive, as though what happens to a system in an interaction is determined by the perturbing agent and not by its structural dynamics. It is evident, however, even in daily life, that such is not the case with communication: each person says what he says or hears what he hears according to his own structural determination . . . communication depends on not what is transmitted, but what happens to the person who receives it. And this is a very different matter from 'transmitting information' [2].

In both cases we see that meaning is created out of interaction between people rather than being 'something' that is sent from one to another. If there is an author of this 'meaning' then it may be the system of interaction itself, in all its particulars, that should be described as the author, or, we might want to refer to a 'dispersed authorship' covering all those involved in negotiating for meaning in a given context. Where the context includes artificial memory in a telematic system, the potential for the creation of meaning is greatly enlarged. And when such systems are activated globally, in an art context, we can expect to see quite richly layered fields of 'meaning' being created.

We can see art as a whole, regardless of what media may be employed, as constituting such a system; and where, in any given practice, art objects are involved, for example paintings or sculptures, we can recognise them as parts of a system in which a flux of meanings can be generated dependent upon the variety of interactions that arise within it. Art does not reside in the object alone, nor is meaning fixed or stable within the physical limits of the artist's work. Art is all process, all system. If, in the past, we have thought otherwise—for example, that art is an object, or that the artwork 'carries' a definitive meaning 'created' by the artist and received by the viewer—this can perhaps be understood in the light of our Renaissance heritage. The ordering of space in Renaissance painting, with its absolute rules of representation and of viewing, a space subject to the authority of the vanishing point, which also positioned the viewer in relation to the 'world' and established control of a reality consisting in separate and discrete parts (everything in its place and a place for everything), can be seen as the perfect metaphor of the ordering of parts in the societies to which it gave expression. Renaissance space is authorised as 'real' space by many of those societies in which information flows one way, from the apex of the social pyramid to the base, where it informs the thinking, the orthodoxies, the rules of conduct of

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a culture. This one-way despatch fashions consciousness and enforces a dominant scientific paradigm just as the vanishing point and rules of representation determine, within the pyramid of space based at the picture plane, a coherent view of a world presented as 'reality'. Under these circumstances, the art object could well be understood as embodying not only unambiguous meaning and beauty but also absolute truth. This form of representation and this status of the object as art continues today, of course, in some quarters and has to some extent been automated by the photographic process. Its persistence is well understood given the seductive nature of the apparent certainty and coherence it claimed to depict.

But the art of our time is one of system, process, behaviour, interaction. As artists we deal in uncertainty and ambiguity, discontinuity, flux and flow. Our values are relativistic, our culture is pluralistic, and our images and forms are evanescent. If it is processes of interaction between human beings that create meaning and consequently cultures, then those systems and processes that facilitate and amplify interaction are the ones that we shall employ in order for more richly differentiated cultures and meanings to emerge. This is precisely the potential of telematic systems. Rather than limiting the individual to a narrow, parochial level of exchange, computer-mediated cable and satellite links spanning the whole planet open up a whole world community, in all its diversity, within which we can interact. Telematic networks are ubiquitous and can be accessed from virtually any location—the home, public institutions, libraries, hospitals, prisons, bars, beaches and mountain tops, as well as studios, museums, galleries, academies and colleges—anywhere in fact that is reached by telephone, including mobile telephones in cars, trains, ships and planes. The primary effect of creative interaction within such networks is to render obsolete the distinction in absolute terms between the artist and viewer as producer and consumer, respectively. The new composite role becomes that simply of *participant* in a system creating meaning seen as art. This contrasts forcibly with the Renaissance paradigm of the artist standing apart from the world and depicting it and the observer standing outside of the artwork and receiving this depiction. It was a paradigm which placed the scientist, also, outside the world looking in, and in turn led to all kinds of alienation and separateness in society.

Our assertion of *network* as the metaphor for the emerging culture appears to find support in fields beyond art. Quantum physicists, for example, speak of an 'undivided wholeness' at the quantum level of reality, of indeterminate behaviour, of non-local connectivity in the sub-atomic field, of the laboratory experiment being a part of the field of consciousness of the observer as participant. In literary theory and criticism, the status and identity of the 'author' is under scrutiny; the text is seen as a space within which the reader actively generates meanings, rather than as a container of messages and stable form. And in art it was not Duchamp alone who brought the power of context and new position of the observer as participant to our attention. The mobile viewpoint, montage and performance work all have contributed in various ways to breaking down the barriers, towards creating whole systems.

One effect of these holistic strategies in art and science, perhaps most evident in telematic systems, is to give credence to the idea of *mind at large.* In their various contributions to a science of wholeness, the new generalists—Gregory Bateson, with his idea of *an ecology of mind,* and Bertallanfy, with his *general system theory*—perhaps have done most in recent decades to reject the idea of the individual as an isolated entity, separate from his environment and other individuals. And it is the holistic view we must surely take when we consider art in relation to a telematic culture. Bateson argued that human plus computer system plus environment constitutes a thinking system. Just as he challenged the idea of separate, isolated mind that could be differentiated from body and from the individual's environment, so he showed that the lines between human, computer and environment are purely artificial and fictitious. They are the lines *across* the pathways along which information passes and within which meaning is created; they are not boundaries of the thinking system. With the convergence of computers and telecommunications the 'thinking system' becomes planetary.

Isolation and *convergence* are terms that encapsulate what could be seen as the problem and the remedy in our considerations of visual art in the electronic culture. The current problem is one of isolation through a rather crude differentiation between centres of operation in visual culture, inherited largely from the previous century. Despite some notable exceptions, we find for the most part a rather clear separation between atelier, museum, library, concert hall and academy. They are, by and large, autonomous entities, independent systems housed in distinctly separate physical structures. In many museums, as in academies, the flow of communication is usually one-way. Art is identified with objects; architecture is designed to support the consumption of culture rather than actively to participate in its creation. With electronic media, its flow of images and texts, and the ubiquitous connectivity of telematic systems, this isolation and separateness must eventually disappear, and new architectural structures and forms of cultural association will emerge. And in this emergence we can expect to see, as we are beginning to see, new orders of art practice, with new strategies and theories, new forms of public accessibility, new methods of presentation and display, new learning networks—in short whole new cultural configurations.

Within the planetary scope of these new configurations, however, we will want to do everything to avoid a homogenisation of culture. Telematic systems, through the massive memory of computers involved in their articulation, support great diversity and variety of input such that all the differences of individual experience, local culture and regional attributes can be preserved. The aim of a telematic culture cannot be to homogenise experience and unify ideas or conventionalise images but to generate *difference* in that multiplicity of viewpoints, preferences, dreams and concerns—spiritual, political, intellectual—that a whole planetary community can be expected to provide. At the same time, the richness of input that might be expected as creative collaboration around the world increases, and the profusion of images and meanings that could be generated to flow across the planet, will probably lead to a greater awareness of the world as a 'whole'.

It is as if the planet is at the 'stage du miroir', that point in its development when the infant sees in its newly reflected image its own unique identity and gains a sense of self (in this

case provided by astronauts and remote sensors in space beaming back to us images of the whole earth). Is it too fanciful to suppose that we are approaching the next stage of planetary awareness—global consciousness? As Peter Russell has pointed out, although it is far from equaling the trillions of synapses through which human nerve cells interact, our global interaction through telecommunication networks, mediated by the hugely increased capability of parallel processing in the next generation of computers, seemingly is reaching a level of complexity and interconnectedness in which we can no longer perceive ourselves as isolated individuals or cultures.

Given the accelerated telematisation of culture, not only can we expect institutions to converge, but we are probably in the position of having to revise all our assumptions about our field of enquiry—that is to say, a complete revision of art in all its roles, institutions, behaviours, codes, protocols, methods, funding and so on. Our inherited conventions of, for example, practice, display, conservation and education in art may soon come to be seen as progressively irrelevant and redundant.

Even a cursory examination of the art academy will show that, while here and there significant changes are taking place, the curricula for the most part contain curious anomalies. Let us take, for example, the case of Life Drawing. While computer systems and other electronic media are moved in, and new paradigms of design and analysis are presented to students, the Life Drawing class in many cases remains not as an historical curiosity but as central—sometimes the anchor—to the practical curriculum. And yet, this is not where the living processes of the body are examined; it is often merely where archaic codes of representation are rehearsed and, in fact, assimilated into the students' consciousness. There we find the body immobilised, without mind; is that not the ideal of all repressive cultures? The practice of life drawing, sometimes called 'objective drawing', is defended as offering a complex structure against which hand-to-eye coordination can be perfected. But is it not hand-to-mind coordination we should seek? Students are frequently misled into thinking that the Life Drawing class is where they will confront 'reality' and that they can acquire a skill to master its representation. The human eye is insufficient to reveal the whole complexity of the living person. The mind, not the eye alone, knows it to be a complex organism, made up of systems within systems, a subtle and continuous transformation of energy and matter. If visual observation in the Life Drawing class is to reach maturity, it requires technological extensions of the senses to give access to the microscopic processes and macroscopic environments by which the 'life model' is maintained. There are many other strategies, in science and in mysticism, for example, that offer us ways into a more holistic understanding of ourselves. It is no longer enough, one might think, to rely on a stub of charcoal and specious historical precedent. For, despite recent marketing of a nostalgic classicism, presented in the guise of a (misunderstood) post-modernism, the project of the art of our century has been essentially to make the invisible visible. Art has progressively sought to be in touch with unseen forces and fields, systems, relationships, connections, and transformations and to make them visible.

And it is the computer that is the matrix through which the abundance of data in all its modes can pass, from remote sensors, scanners, metering devices and difference machines of all kinds. Digitisation can be the 'lingua franca' of an enormous range of visual and notational systems reporting on, recording and analyzing the world, as well as a device through which our dreams, fantasies, speculations and assertions can find expression. The computer is simply a universal machine that can facilitate new modes of communication of desire and of anxiety.

As a matrix it is much more than a stand-alone generator of images, for it extends enormously the capability of the artist to integrate and work between diverse media—film, video, photography, graphics, paint, print and text as well as plotting performance in 'virtual' space and 'virtual' time. This universal machine similarly is spawning output media of considerable variety: electronic image and synthesised sound coexist with print media, cybernetic structures and complex interactive environments. Computer-aided manufacture (CAM) is also open to investigation by the artist.

On the screen we have the power to summon up colour, to draw, erase, recall, mix, split, overlay, reverse images and texts; we can digitise, juxtapose, enlarge, shrink, stack, cut, fuse, file and retrieve material of our own making or made by collaborators—or even made by others unknown to us whose work may be available in a variety of archival sources. The digital mode can lead to endless metamorphosis, realignments, new associations, conjunctions and assimilations of ideas and images.

And let us not forget that this is just the beginning of a technology, despite its exponential growth in the past few decades. Unless we are unusually privileged, we have yet as artists to play with touch-sensitive, high-definition, wall-size computer screens. We are for the most part still tapping keyboards, scratching with light pens and playing with mice. We are at the 'horseless carriage' stage in the development of the artist-friendly interface.

Apart from telematic networks and the computer as matrix of creative work, we also have to consider the environment. As artists, we inhabit, of course, physical as well as electronic space. In this regard, electronic architecture, the information city, is part of our concern. As the Japanese 'Fifth Generation' becomes our generation, it is conceivable that Technopolis City could become a town planning standard. While it is doubtful that 'the city' will become an export commodity on the Tokyo stock exchange, it is clear that many ideas currently being developed through the agency of MITI concerning the design of living environments to support innovation and creativity will find their way to the West. The design brief and supporting portfolio for the 1986 International Concept Design Competition for an Advanced Information City at Kawasaki were breathtaking in the scope of their concerns and the issues they raised. No less comprehensive and visionary is the national Technopolis strategy for the planning of a series of high technology research cities. In all of this the artist and the creative participant in telematic systems will find a place, but that place can be defined properly only with the active involvement of the artist at the outset of the planning process. And this seems to me to be the case whether we are discussing such advanced concepts as MITI is proposing or more discrete projects such as academies or museums. To start with, we probably need to find new terminology to avoid the cultural baggage that the old vocabulary carries. Our first questions should

probably be, in every case, what creativity and contact, what creative interaction, can the new institution *as system* be expected to generate and support? And then, as a sub-system of a larger whole, what other sub-systems must we plan to interact with? These are obvious questions to be sure, and yet how often today in our culture do we see new buildings put up ostensibly to serve art while actually they stand alone, physically alienated and alienating in their indifference to the larger processes and systems with which we expect them to integrate? The problem is even greater if we take the view that they are institutions that will increasingly need to serve an emerging culture radically unlike the culture from which they are derived.

The popular conception of high technology, we are told, is that of a sterile, inhuman and emotionless environment. And yet those of us who know of the sheer conviviality of communication in electronic networks, and have come to realise the sensitivity and receptivity towards the generating of images of which the computer is capable, will seek to change this perception. 'Garbage in, garbage out' is I suppose the phrase to invoke here. That is to say, the universal machine—which the computer is—can contain as much creative thought and express as much emotion as we put into it. There is no doubt though that telematic networks and computer systems, used merely as tools of production, will certainly and very effectively promote sterility and alienation in the culture. If we seek wisdom from the past, I imagine it should be to Socrates rather than to Cato we should turn, particularly insofar as the education of the artist is concerned. The principles of Socrates—critical reflection, personal development and sustained enquiry—must not be undermined in this new technological environment by the principles of Cato, which estimated everything by what it produced.

In my view, we might anticipate the dematerialisation of academies, galleries and museums or at least their fusion into pervasive and wide-reaching networks. While the physical presence of material artworks will always be valued in experience, electronic storage and distribution of these works, apart from the purposes of archival research, will come to be enjoyed also as electronic 'traces'. In addition, the ability for students, quite apart from artists themselves, to communicate through telematic networks with skill banks, data banks, artists, experts and professionals in all fields, to participate in world-wide electronic seminars, and to so engage from any location at any time of night or day would add considerably to their current face-to-face contact with a meager handful of professors (however well informed and dedicated as teachers), not to mention technicians, with depleted resources and an inadequate physical plant, housed in buildings designed to support a Beaux Arts culture scarcely attended to since their construction.

In conclusion, I am sure we all recognise that our cultural participation in intelligent telematic networks has long-term implications that we can scarcely imagine. The symbiosis of computers and human beings and the integration of natural and artificial intelligence will be realised in forms and behaviours the understanding of which is beyond our present conceptual horizon.

I would like to affirm what I hope may be confirmed as an outcome of this conference—that there is a need for artists, designers, architects, museum directors, educators, philosophers, scientists, technologists and politicians throughout the world to work together to create telematic networks and nodes of digital hardware and cybernetic systems that will support new forms of art practice, new means of public access and the involvement of a wider range of participants in the emerging global culture and to develop new strategies for creative learning and visual research.

APPENDIX

My professional activities are in two fields: art practice and art education. Below I describe briefly a number of projects in both these fields to illustrate a variety of strategies employing telematic media and interactive behaviour.

In the domain of art practice there are three projects in which I have been closely involved either as instigator, collaborator or participant. First, I was invited by Frank Popper to create a project for his exhibition ELECTRA at the Musée d'Art Moderne de la Ville de Paris in 1983. For this I conceived the idea of *La Plissure du Texte: A Planetary Fairy Tale* (in homage to Roland Barthes' "Le Plaisir du Texte"). This was to involve the creation of a text by 'dispersed authorship' by groups of artists located in 11 cities around the world: Honolulu, Vancouver, San Francisco, Pittsburgh, Toronto, Alma Quebec, Bristol, Paris, Amsterdam, Vienna and Sydney. Each group represented an archetypal fairy tale role or character: trickster, wicked witch, Princess, Wise Old Man, etc. From computer terminals at each location (usually in a public museum, art centre or artist studio) each group participated through an electronic network in the production of a text from the point of view of their assigned role. Thus the story developed and unfolded as each day a piece of text was logged in from each terminal, taking up the theme as it had developed from previous entries. Most terminals were linked to data projectors, enabling the generated text to become a publicly accessible feature of the museum or public place occupied by each group. Many layers of meaning from such diverse sources became embedded in the text; a feast of cultural allusions, puns, flights of imagination and political criticism in an unpredictably meandering and branching story line were pleated together for this 'plissure du texte'. Often the text was ingeniously manipulated to create simple visual images as well. The public too was able to contribute to the fairy tale, interacting within the worldwide dispersal of authorship through keyboards made available to them at most locations.

Second, at the Biennale de Venezia in 1985 I was involved in a planetary network of more ambitious dimensions, which combined electronic text exchange, slow scan TV and telefacsimile with an Apple Macintosh network. This was part of a larger digital laboratory, UBIQUA, which included interactive video disc works, personal computers, paint systems and cybernetically controlled interactive electronic structures and environments of various kinds. This *Art, Technology and Informatics* section of the Biennale was curated by Don Foresta, Tom Sherman, Tomaso Trini and myself as International Commissioners appointed by Maurizio Calvesi. Over 100 artists were involved from three continents. Planet Gaia had begun to beat the digital pulse. I should also explain that the entire exhibition, involving much coordination and planning of both equipment and artists—some to be present in Venice, others dispersed

around the planet—was organised by the four commissioners *remotely,* that is, through an electronic mail network that connected our various working locations in Paris, Ottawa, Milan, Venice, Wales, Bristol and Vienna. Since I was regularly commuting at that time between Gwent, Bristol, Lille, Paris and Vienna, I carried a portable terminal with me at all times, a practice that now is habitual.

A third project was a small interactive videotex piece I created at the invitation of the group Art Access for Jean-François Lyotard's exhibition *Les Immatériaux* at the Centre Pompidou in 1985. My contribution was a treatment of two interwoven texts, one from Henri Bue's translation of *Alice in Wonderland* and the other a treatise, *Organe et Fonction,* by two scientists in Montreal. The pleating of the texts created new meanings, as did the selection of pages by users of the system. The piece was dispersed through the Minitel system to thousands of subscribers throughout France. Thus it broke through the physical barrier of the museum just as the exhibition itself sought to break through the barriers of art and science to a new immateriality.

In the domain of art education, I would like to cite three quite different but related projects in which I am or have been centrally involved.

In Austria, where I hold the Chair of Kommunikationstheorie in the Hochschule für angewante Kunst in Wien, on the instigation of Rektor Oswald Oberhuber I have developed, in close cooperation with my assistant Zelko Wiener, a Lehrkanzel devoted to the development of theory and practice of telematic systems and interactivity in the digital mode. This involves students in a electronic space that is planetary in its dimensions, linking them in interaction with students in other countries. Students can come to the Lehrkanzel from all departments of the university, though at present they come principally from the areas of media, graphics and painting. Initially we used a commercial electronic mailbox system accessing artists and art schools in a user group of 26 locations in North America, Europe and Australia. This was purely text exchange, although additionally at the time digital work on disc was exchanged through the postal system. We now use the European Academic Research Network (EARN) with free access and free computer time-sharing. Through EARN we now routinely exchange and collaborate on the production of digital images with students at the Carnegie-Mellon University in Pittsburgh (Pennsylvania), Gwent College in Wales and the City Art Institute in Sydney. Other colleges are set to join the network in the near future. These electronic seminars and collaborations bring my students in Vienna into regular contact with my students at Gwent College, where I am head of the Fine Art course.

The Fine Art course is housed in a new building, designed specifically to support its philosophy. It is wired for complete interactivity: data, video and audio lines link all the spaces, enabling all activities to interact. Monitors throughout the building allow for the flow of electronic images, videotex and digital/video work in progress. A comprehensive switching system allows for a flexible distribution of material and a varied interconnection of media. Just as there is no separation or alienation of diverse media in student practice, electronic media are integrated with the more traditional forms of art practice. The curriculum supports the relativism proper to a post-structuralist, post-modernist endeavour. Much emphasis is placed on the integration of theory and practice. The course is relatively small (120 students) and the provision in terms of personal computers, paint systems, digitising pads, video effects machines, sound synthesisers, video equipment and post production facilities, modems and printers is fairly comprehensive but modest. There is as yet no satellite tracking dish and no large-screen data projection. Essentially the course and its building are a small model of what could be, a testing ground circumscribed economically and by the constraints of a more conventional academic accreditation system. But it is a living model and it shows that an academy can be planned as a network and can network regularly in the wider context of an international electronic space. Well-advanced plans will integrate into a larger interactive network embracing three-dimensional design studies, graphic design and fashion. In my involvement with the development of this strategy at Gwent I have had the close collaboration of Michael Punt, and with recent forays into the extended EARN network, the assistance of Robert Pepperell.

The third, and quite different, telematic project with which I have been involved has been with the French Ministry of Culture as Chargé de Mission of a project for the creation of a centre for teaching and visual research in the Nord Pas-de-Calais region. This was to consider the possible transformation of an existing École des Beaux Arts and a College of Design in two adjacent cities into a telematic, networked entity that could assist in new ways in the release and development of creativity amongst both young people and the newly unemployed in that region. My colleague in the design of this project was Pierre Guislaine. Our basic approach in acquiring resources was to identify and solicit 'partners' in the network who could provide capital equipment, a plant and expertise from amongst the many industrial, scientific, commercial and university institutions in the area. All student learning would be through practical projects located in the real world. Project teams would include teachers drawn from a mixture of disciplines and professions. The entire structure would be decentralised, dispersed and highly interactive and would also constitute an arena in which visual research both in art and in science and technology would combine. The project has been designed but awaits implementation.

References

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