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Art and Telematics: towards a network consciousness

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In Mill Valley, California in the Spring of 1978 I got high on networking. I had anticipated the condition some 17 years earlier in my rather wintery studio in London where I was visited with a cybernetic vision of art, after reading the works of Norbert Wiener(1) and Ross Ashby(2), formulating a prospectus for creative work which could, as I saw it, raise consciousness to a higher level.

My work, on gallery walls and in colleges of art both in England and abroad (especially at Ealing, London and at the OCA, Toronto) attempted to create analogues of the cybernetic vision which I had committed to publication (3), but one crucial element was missing. It was not simply that computer access was difficult to arrange, although that certainly was the case at that time, but that some link between the computer and the means of communication was (in my experience) lacking. I remember well how at the OCA in Toronto, the matrix: Information/Concept/Structure, (a curricular triangulation we introduced to replace the antique departmentalised and construing structure then and always to be found in orthodox art education), was thwarted by an overload of interactions, like those busy post offices which, while swamped with customers, insist in completing all the written transactions by hand. I knew that some crucial element in the available technology was missing.

More broadly, in my mind, the concept of a global creative network, a cybernetic art matrix, was clear but not until some fifteen years after I had first digested the significance of integrative systems did I come upon the technology which could effect these transformations of culture I had so eagerly anticipated.

If that sounds unduly personal and autobiographical for a paper on art and telecommunications, that's nevertheless how it was. Networking invites personal disclosure. But to know of a brand new technology is not necessarily to be able to get your hands on it.

It took me eighteen months to get funds and access to a network system. In 1980, thanks to an award from the N.E.A. in Washington D.C. and Jacques Vallee's Infomedia NOTEPAD computer conferencing system, I set up my first international networking project, mailing portable terminals to a group of artists in California, New York and Wales to participate in collectively generating ideas from their own studios. One of the group, Don Burgy, chose to take his terminal wherever he was visiting and log-in from there.

The possibilities of the medium began to unfold. Later that year I joined a group of scientists in SATURN ENCOUNTER, a global computer conference which, in

electronic space, accompanied NASA's Voyager II probe of Saturn. The high remained.

As my contribution to Bob Adrian's "World in 24 hours" event in Ars Electronica, I had players at their terminals around the world toss coins for the first planetary throw of I CHING. As I recall we got close to number 8, PI Holding Together/Union but the bottom line was -x-, which transformed the reading into number 3, CHU Difficulty at the Beginning, which was undoubtedly true. In fact looking at the emergence of networking for art, the offspring of this momentous convergence of computers and telecommunications, the commentary on CHU is particularly apt: "Times of growth are beset with difficulties. They resemble a first birth. But these difficulties arise from the very profusion of all that is struggling to attain form. Everything is in motion: therefore if one perseveres there is the prospect of great success" ...⁽⁴⁾.

Over the past three years I have been interacting through my terminal with artists in Australia, Europe and North America once or twice a week through I.P. Sharp's ARTBOX. I haven't come down from that high yet and frankly I don't expect to. Logging in to the network, sharing the exchange of ideas, propositions, visions and sheer gossip is exhilarating, in fact it becomes totally compelling and addictive. It was Don Burgy, in the first project whose 26th entry confided:

"Guess I'm hooked because I just got up and the first thing I did (after brushing my teeth) was to log in".

A new user coming on line even for the first time senses a connection and a close community, almost intimacy which is quite unlike initial face to face meetings. For anyone not involved in networking, it is probably hard to imagine how a computer based medium could possibly be convivial and friendly or how indeed working at a data terminal could lead to interconnections between human beings at any real level of meaning at all. The very term Information Technology sounds cold and rather alienating, like the outer offices of some Kafkaesque institution.

In fact the opposite is the case and computer-mediated networks, in my view, offer the possibility of a kind of planetary conviviality and creativity which no other means of communication has been able to achieve. One reason may be that networking puts you, in a sense, out of body, linking your mind into a kind of timeless sea. It is a more precise condition than that oceanic feeling that Jung describes in proposing a Collective Unconscious and that is because it deals with more than feeling - with particular ideas and associations. These ideas, being generated from a diversity of scattered locations, set in widely different cultural contexts and channelled of course through uniquely different individuals may become densely layered in meaning and implication. Networking produces an interweaving of imaginations which gives to the term "associative thinking" the most amplified interpretation.

The metaphor of weaving is especially potent in current thought. The physicists Fritjof Capra and David Bohm attest to the seamless web of interconnected events which may detect at the quantum level of reality. Bohm writes of the unravelling of an implicate order in the universe(5) and Capra finds it entirely fitting to interlink his exposition of contemporary physics with the Taoist Metaphysic (6) (Tantra", meaning weaving, is the Buddhist denotation of cosmic interconnectedness). Earlier McLuhan alerted us to the cultural transfusion in which "Electric circuitry is Orientalizing the West. The constrained, the distinct, the separate - our Western legacy - are being replaced by the following, the unified, the fused" (7).

Significant too, especially at this stage of technological development when the telematic dissemination of text is more advance and a good deal cheaper than interactive networking of images, are the observations of Roland Barthes:

"Text means tissue; but whereas hitherto we have always taken this tissue as a product, a ready made veil, behind which lies, more or less hidden, meaning (truth) we are now emphasising, in the tissue, the generative idea that the text is made, is worked out in a perpetual interweaving; lost in this tissue - this texture - the subject unmakes himself, like a spider dissolving in the constructive secretions of its web" (8).

In more practical terms, Jacques Vallee, a pioneer with Robert Johnsen of the FORUM computer confrencing system developed at the Institute of Future, and foremost in the field of technological application of networking to commercial, industrial and educational needs has pointed out the uniqueness of the medium:

"Computer confrencing is the first medium of human interaction that uses the computer as its base of support. The telephone was based on simple knowledge of electric currents. Radio and television use electromagnetic waves. (Networking is) a medium that fully utilises the logical and memory abilities of the modern computer ... The long term consequences are incalculable" (9).

In the context of weaving and linking minds, during the Saturn Encounter Project he made the following point:

"In any other medium (and even in the marvellous television pictures (of Saturn) we are seeing from Voyager) the sense of time and space is always present. Not so in computer confrencing since we truly link minds wherever they are, and the sense of time is lost rapidly in the group interaction that transcends it.(10)

There seem to me to be two seminal essays on the significance of computerised telecommunications for society as a whole. One is by Daniel Bell of Harvard (22) who has coined the phrase "The Information Society", the other is a report to the President of France on the Computerisation of Society, by Simon Nora, who introduces the term "Telematics".

“Telematics is springing to life born of the marriage between computers and communications networks, which will culminate in the arrival of universal satellites, transmitting images, data and sounds”. (11)

Around this new medium a wealth of terms and neologisms have been generated, none of which have yet achieved universal acceptance. In “Network Nation: Human Communication via Computer”

Hiltz and Turoff (12) cite the terms “computerised conferencing” (USA) , “Computer - mediated interaction” (Canada) as well as teleconferencing. Anthony Oettinger has advanced the neologism “communications”. I prefer to use the term “networking” for the activity and “telematics” for the medium as a whole.

This is no place to trace the history of telematics, even though it is an exceedingly brief history compared even to the relatively recent emergence of its two component parts - telecommunications and computers. But what I do want to show, or propose - is that the convergence of these two, in themselves vastly powerful media, constitutes a paradigm change in our culture and, without being foolishly optimistic, I hope, what may amount to a quantum leap in human consciousness. I am certainly not alone in this and propose to cite a variety of writers from a variety of disciplines who collectively contribute to a vision of the future of the human condition which is rather hopeful. At the same time, I shall try to make it clear that for art, telematics, while being the product of considerable technological innovation, equally can be seen to carry forward an aesthetic of participation and interconnectedness implicit in the developing strands of art practice during this century. Indeed, it constitutes in many ways a return to values expressed in the culture of the very distant past.

Initially, however, I want to refer to the telematic networking of text. Currently, to apply telematic processes of distributed authorship to the generating of images is extremely expensive and virtually inaccessible for any sustained creative enterprise. The text is both cheaper and easier to process. When I first used it, I saw it very much as a secondary medium and not capable of serving as the central component of my art practice. However, my experience of the past three years has led me to feel that the text can, in its own right, seen as it emerges, hot off the roll of a thermal printer, so to speak or, especially, inhabiting the electronic space of a VDU (“console de visualisation” is more poetic), can have primary significance in my work. Not, as I had previously used it, as a vehicle for analysis or explication or (as usually is the case, I’m afraid with artists like myself) for rhetoric, but distinctly a thing in itself, a concrete entity with its own space - a space that was new to me and which remains enigmatic, mysterious and wondrous. To extend the video output by data projector to a large screen format only further enhances the palpable presence of the text in this non-localised, timeless space.

My belief in this new order of the text, actually a new order of discourse, and my wish to exercise and celebrate the participatory mode of dispersed authorship which networking affords, led me to devise a project wholly concerned with the interweaving of textual inputs from a global distribution of artists. This became

“La Plissure du Texte” in the exhibition ELECTRA 1983 in the Musee D’art Moderne de la Ville de Paris.

The title of the project alludes, of course, to Roland Barthes’ book “Le Plaisir du Texte” but pleating (plissure) is not intended to replace pleasure (plaisir) only to amplify and enhance it.(8)

Barthes’ book is rich in insights into what we do when we enjoy a text. it is a wonderful book and along with writing Degree Zero, S/Z and Mythologies, pumps blood into the otherwise colourless body of semiological thought and is prodigiously fertile in ideas for the artist. But the text he writes about is not “telematic text” as I experience it, and the authorship he analyses is not the “distributed authorship” of networking. So that when he celebrates the “jouissance” that text stimulates (which Richard Howard suggests is best understood as “coming” or “knowing” (biblical) or “spending” (Victorian), it seems to be very much a solitary act that he describes. Telematic text by contrast, rather than affording a “jouissance solitaire”, offers the means of a “coming together”. It is a distributed but not dissipated “jouissance”; metaphysically strange (at first) since the act is indifferent to the geographical location of its contributors, as it is one of the time or sequence of their interventions. It constitutes a “bliss” which is visited on every point of the system which generated it. The processes of coming and going of information is wave like, and without wishing to stretch the metaphor beyond credibility, at the full intensity of interaction in a creative networking project, these waves can extend to the most prolonged stage of “jouissance”.

Some people would feel that the text is most satisfying when it is the most precise; that the certainty of the message, an underlying determinism of the unfolding discourse is what is most sought in its production and consumption. But to be involved with creative work in the telematic mode is to search for and to play with uncertainty and ambiguity rather than to strive for semantic outcomes of the finite kind. To “understand” what is going on in the transactional process of network art is to merge into the waves of planetary inputs, the modulation of ideas passed around the multiplicity of terminals, and to identify with the patterns of change which surge through the lines of communication. It can feel, not just as an extension of mind but an extension of the body. There can be this sense of out-of-body experience, joining up with others in the aetheric, electronic, and totally timeless space. There are high tides and low tides of these wave motions, these ripples of meaning; greater or lesser densities of textual loadings. I do not mean to imply that the medium is the message but that the interwoven texture of the messages in the telematic medium, certainly informs and contextualises the artist’s engagement with it.

But whether with the text or the visual image, telematic networking generates discourse, discourse of an order unlike speech or writing, but discourse none the less, which exists in relation to desire and power just as the other orders do. In examining this, we can be guided by Michael Foucault’s “L’ordre du discours”, (13) Not that he refers in any way to the telematic process or indeed to distributed authorship.

I have mentioned already the addictive itch to log-in to the network that users quickly acquire. The conviviality of the medium (Terry Winograd has written usefully on this (14) - if only Ivan Illich would welcome electronic systems of at least this kind into his inventory of social tools) invites frequent returns to the keyboard, to reach out to others in the "field" who are at once to be weaved into a text. compared to the towering achievements of the art of previous eras, networking must appear puny and insignificant. foucault points out that speech, similarly, in appearance may be of little account but that the prohibitions surrounding it soon reveal its links with desire and power. "this should not be very surprising for psychoanalysis has already shown us that speech is not merely the medium which manifests - or dissembles - desires; it is also the object of desire".(13)

Interwoven and shared text of telematics is a form of discourse for which we have no name. It is not speech, nor is it writing as we know it in the book. Authorship is distributed, meaning is negotiated - but it too can be the object of desire. To continue in Foucault's vein, networking can be seen as an issue of the will to truth since its form, spreading over the whole plane, invisible in sense, promises to evade those systems set up for the control and delimitation of discourse.

"In any society the production of discourse is at once controlled, selected organised and redistributed according to a number of procedures whose role is to avert its powers and its changes, to cope with chance events, to evade its ponderous, awesome materiality". (13)

We can expect a growing and close interest in telematics on the part of the controlling institutions in our society. At present most timesharing systems are in the hands of the multi-national corporation and the military, in any case, but there is general agreement that over the next ten years telematic networks will spread over the whole earth, the growth of data banks will be exponential and information processing will acquire priority status in most countries. Japan's total national commitment to acquire by the 1990's world leadership in Knowledge Information Processing Systems (KIPS), and the intensity of effort sustain ICOT, The Institute of New Generation Computer Technology, gives further significance to the notion of a "telematic imperative" in culture.(15)

In 1978 report to the French President, Simon Nora draws attention to the inevitable spread of networks:

Today any consumer of electricity can instantly obtain the electrical power he needs without worrying where it comes from or how much it costs. There is every reason to assume that the same will be true in future of telematics. Once the initial connections are made, the network will spread by osmosis ... thus, within a relatively short time, the debate will focus on interconnectability ... In the past, the stakes in the computer game were limited - they were commercial, industrial or military. Now, with data processing dispersing into a limitless

variety of small machines and disappearing behind a network with infinite branches, it is drawing society as a whole into its net".(11)

I considered identifying some of the ambitious experiments in interactive videotex which are currently being pursued for example in Canada, where SaskTel has been running its PATHFINDER trials, using Telidon to link up a small but scattered community in Saskatchewan, or the wiring of Velisie, an urban community outside Paris for a complete range of interactive systems. But I need reach no further than this morning's mail to give an example of the proliferation of commercial telematics.

Here on my desk is a postal solicitation from a savings and loan company, to do business with them through a home terminal which they will be happy to provide me with, at virtually no cost. I can invest, borrow or transfer funds, pay bills, do my teleshopping and access 250,000 pages of PRESTEL information. More importantly, I can interact with anyone else in the system and initiate messages which will be stored until they are ready to be accessed. If I wish to display as "artwork" some visual/textual mosaic for public viewing, I can rent a page in the Prestel files. It may lack the subtlety and flexibility of the more advanced computer-mediated networks but it is here now on the domestic doorstep.

However, even the most rudimentary overview of experiments in computerised telecommunications in the broad social context would be lacking if it failed to mention the enormous imaginative effort which has gone into the proposals for a "carrefour" or crossroads of telecommunications - the International Centre for Communications at Tete Defense in Paris. This is planned to be a test bed for new information technology, a public access point for the newest developments in interactive media, a museum, an artspace, a language research centre and a kind of creative, technological and intellectual switching unit for the whole telecommunications field. The background papers for this initiative along with Elaine Kerr and Roxanne Hiltz's study, "Computer-Mediated Communication Systems" for the Computerised Conferencing and Communications Centre at the New Jersey Institute of Technology at Newark, together provide essential reading for anyone, and particularly artists, wishing to fully understand the scope of the medium.(23)

Though we can expect in consort with network expansion both regional and international regulatory bodies to proliferate, the particular nature of telematic discourse make it less amenable to control. For the artist, its out-of-body, asynchronous, dispersed, interactive and semantically layered qualities, makes the medium less vulnerable to cultural constrain than earlier modes of expression.

Foucault speaks of those "fellowships of discourse" which have operated to preserve orders of discourse and their secrets, within a closed community, in which "roles of speaking and listening were not interchangeable". But he warns us not to be deceived into thinking that (widely) published discourse is free from secret appropriation and non-interchangeability.

“The separateness of the writer, continually opposed to the activity of all other writing and speaking subjects, the intransitive character he lends to discourse, the fundamental singularity he has long accorded to “writing” ... all this manifests in its formulation ... the existence of a certain “fellowship of discourse”.(13)

I want to propose, perhaps naively and without caution in the light of society’s relentless determination always to institutionalise and contain creativity by any means, that telematic discourse can exist outside such closed systems, or that a much more inclusive, indeed planetary “fellowship of discourse” as it now exists in book production, conventional telecommunications and entertainment media structures.

The visual discourse of art, embodied in painting, sculpture, film and photography, has its own closed fellowship. For all the apparent freedom from constraint cherished in the mythology of the “avant-garde”, the ways of addressing art work (either as “sender” or “receiver”) constitute a set of rules, the learning of which permit entry into the permitted discourse. the control, selection, in society, where art is the subset of a wider discourse subject to the institutional management of desire and power.

Telematics does not generate a new order of art discourse but demands a new form of criticism and analysis. The theory of this mode of art will have its technical, philosophical and communications aspect bound up within a larger cybernetic framework, which Gregory Bateson has called “ecology of mind”.(16) This in turn will produce a reevaluation and fresh interpretation of older art forms since it can be argued that meaning has never in reality been created by a one-way dispatch, nor do new ideas of images originate in the solitary mind. Individual genius was the invention of an era which chose to delimit and contain the subversive power of art within fixed, identifiable boundaries. The field of communications network analysis is especially relevant here and the major shift of emphasis within this field of research, in recent years, points up the dialectic between the telematic model and the older paradigm of art discourse.

“Communications 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 meanings, 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” Rogers and Kincaid.(17)

This may sound a far cry from the poetics of telematique but we should remind ourselves that the ordering of ideas supporting the cardinal concept of perspective in the formative period of Renaissance Art called equally for rigours of thought and measurement which were at least as demanding. “La bella perspectiva” after all kept Uccello from his lady’s bed, night after night.

Perspective underwrote a mode of visual discourse which separated out both the individual artist and the solitary viewer; a one way view of the world calling for a one way reading of the visual field. It called for a head to toe consistency with human viewing which was at once isolating and alienating.

“The view of renaissance art is systematically placed outside the frame of experience. A piazza for everything and everything in its piazza. the instantaneous world of electric information media involves all of us, all at once. No detachment of frame is possible” McLuhan.(18) In telematic discourse, meanings are not asserted and consumed in one way linearity, but negotiated, distributed, transformed and layered in multiple exchanges where the authorial role is decentralised and scattered in space and time.

But “vertical field viewing” in visual art began to give way at the beginning of this century to a more inclusive “bird’s eye view” of the world which sought a more composite, holistic patterning of events. Some would nominate Marcel Duchamp as the most vital force at that time in this radical shift in art which finds its expression in the tilt of the picture plane from the vertical to the horizontal. As Leo Steinberg has pointed out, Duchamp’s “Large Glass”, or his “Tu m”. is no longer the analogue of a world perceived from an upright position, but a matrix of information conveniently placed in a vertical situation. He goes on to show how

“something happened in painting around 1950 - most conspicuously (at least in my experience) in the work of Rauschenberg and Dubuffet. We can still hang their pictures - just as we tack up maps and architectural plans ... yet these pictures no longer simulate vertical fields, but opaque, flatbed horizontals. They no more rely on a head to toe correspondence with human posture than an a newspaper does. The flatbed picture plane makes its symbolic allusion to hard surfaces such as table tops, studio floors, charts, bulletin boards - any receptor surface on which objects are scattered, on which data is entered, on which information may be received, printed, impressed - whether coherently or in confusion. The pictures of the last fifteen to twenty years insist on a radically new orientation, in which the painted surface is no longer the analogue of a visual experience of nature but of operational processes.”(19)

Perhaps the most powerful visual metaphor of telematic interconnectedness that painting of that transitional period could offer is to be found in Jackson Pollock’s work. Here the horizontal arena is both celebrated and actually employed employed in the production of the painting. he creates “fields” of intertwining, interweaving, branching, joining, crossing, linking lines of energy, creating an alloverness and allatonceness which is the very epitomy of telematic networking. His space is inclusive and inviting, in a sense providing for a kind of anonymity of authorship which embraces the viewer in the creation of meanings. The metaphysical promise of Pollock’s work is made technologically explicit in telematic systems, where the dichotomy of artist/viewer or sender/receiver of the earlier era is resolved into a unitary “user” of the creative system. Pollock’s painting surface was an “arena” a meeting place, of behaviour, myth and idea.

The computerised network is another kind of meeting place, an electronic arena for creative work.

I see this shift to the horizontal as a renewal as much as “the new”, a return to very ancient values which belonged to a more holistic world view.

Many of the behaviours, of transaction, negotiation even interconnectedness can be understood in terms of the table top. It is a compact meeting place, a microcosm of larger fields of interaction. Claude Levi-Strauss has taken particular note of the structure of table manners in the mythical texts of the native people of America. The table top and its required forms of exchange constitute an ethical process to unify the inner life of man and the external world of nature. In our own culture he points out, we have simply been concerned with control of the external world where the events of nature and of other people are seen as a continual threat to be mastered. Is there some connection between the insistent verticality of viewing in art and the aggressive, alienating stance of a society? The reemergence in our culture, in recent decades, of interest in the psyche, in cooperative human action, in a more holistic approach to the planet, seems to be all of a piece with the impulse towards “flatbed” inclusiveness in contemporary cultural forms. Telematic networks can provide for culture an extensive electronic meeting place, a non-localised table top for the most intimate and inclusive dialogue and exchange. One of the earliest experiments in electronic remote conferencing was called the “electronic round table”, I seem to recall, although at that time the idea of computer-mediation was no more than a dream. The dream has become realised now, with vast dimensions and implication in the telematic domain. Two of the principal components, machine memory and artificial intelligence (AI) have hardly begun to be investigated by the artist. On our agenda must be the inquiry into the extent to which, through its internal “semantic network” calling upon memory and intelligence, the computer can itself contribute to our artistic strategies. Can the information matrix, this electronic meeting place itself contribute to our artistic strategies. Can the information matrix, this electronic meeting place of minds, itself generate ideas from its experience of the ideas it mediates? The extent to which a telematic network can learn itself is a question only a fifth generation system will be able to begin to answer. But in human learning, and I have in mind especially, the education of artists, telematics offers enormous scope. Unlike the orthodox media, telematic systems are unlike any other technological applications to learning.

“They involve group interaction through the technology. And this interactive capability means they do not have to be impersonal, authoritarian or boring. Learning via teleconferencing does not require packaged instruction programmes as does television or programmed learning. The electronic seminar is as possible as the electronic lecture. Further more with computer based conferencing, it is possible for students to put together their own learning networks and call upon people who, because of geographical location, might otherwise be inaccessible. Education might become student centred rather than institution centred “Jacques Vallee.(9)

Telematics has arisen from an ethos of cross-disciplinary science and is set within a cybernetic perspective of the world. Numerous writers have attempted to describe the enormous changes they see occurring in human awareness, which some see as a kind of planetary consciousness. Teilhard de Chardin imagined a noosphere, a thinking layer, enveloping the biosphere of the earth. Peter Russell has more recently advanced the hypothesis of the emergence of a planetary brain which may put us onto

“The threshold of a completely new level of evolution, as different from consciousness as consciousness is from life and life is from matter”. “A global brain which will result in a shift shift in human ego-centred awareness to a unified field of shared awareness”.(20)

He sees this occurring due to the exponential rate of information processing and global telecommunications. In comparing planetary networking to the emergence of multi cellular organisms one billion years ago, he takes his theory to the point where

“as communications networks increase, we will eventually reach a point where the billions of information exchanges shuttling through the networks at any one time can create patterns of coherence in the global brain, similar to those found in the human brain ... Advances in each of the technologies involved accelerate progress in all the others. The cross-catalysing effect of these technologies suggest we are in the midst of a phase that has no evolutionary precedent”.(20)

However inflated his expectations may seem to be, there can be little doubt that the engagement of creative minds in telematic systems will effect human consciousness and transform our culture.

To the unconvinced, the artist who commits himself or herself to networking as a primary medium is playing with dreams. But it was, after all, the most grounded of men who said “it is pricing life exactly at its worth, to abandon it for a dream”. Montaigne would have been in tune also, I suspect, with Hazel Henderson’s description of networking in the real world:

“Out of all our current social ferment, organisations are slowly learning that if they and our society are to survive, they will need to reformulate their goals and restructure themselves along less pyramidal, hierarchical lines. Such participatory, flexible, organic, and cybernetic design is now pyramidal, hierarchical lines. Such participatory, flexible, organic, and cybernetic design is now mandatory in the face of cataclysmic changes ... In fact the ultimate organisations already exist although they are metaphysical. They are most often referred to as networks ... Few theorists have yet studied networks because they are evanescent, ebbing and flowing around issues, ideas and knowledge. Luckily, networks are linked by the mimeograph machine, the postal system and the telephone - all decentralised technologies accessible to individual users ... Networking cross hatches all existing structured institutions and links diverse participants who are in metaphysical harmony ... networking is the most vital, intelligent, integrative organisational mode on our turbulent social scene ... it

may even augur the next revolutionary step in developing human consciousness".(21)

I have concentrated here on the nature of telematic networking in its structure, scope and possible cultural consequences, rather than citing examples of the specific content of specific art projects in the medium. This is because, whether interacting in the textual or visual mode, the specific data generated can only be understood in the totality of the transactional experience.

Work at the interface of the network, at a console with keyboard, VDU , printer or plotter is, in itself sensuously satisfying: the rhythm of the printer, the unrolling of the paper, the glow of the CRT, the secret stillness and precision of the software, the immaculately delicate responsiveness of the keyboard, the whirring and bleeping of control signals can induce moods which can excite enthusiastic expectancy or a meditative tranquillity. The electronic space of the video output which the text and image inhabit is a new kind of space, not at all that of the projected space of film or the illusionary space of photography. It is more ethereal and metaphysical than paint, though no less palpable. It coalesces on a two dimensional screen, but its depth is infinite. With appropriate software the text can be deconstructed, disassembled, redeployed, inverted, withdrawn, squashed, stretched, removed, recalled, cut , chopped, twisted. The field of the text is mosaic, but, if scrolled, it can be set rolling for eternity. There need be no beginning and no end to the text. It can be generated by a multiplicity of participants, or transferred privately to a targeted interlocutor. The space is negotiable space, it invites interrogation.

It is that rare medium in which errors of input, whether clumsy typing or mistaken insertion of extraneous material, are somehow instantly acceptable and accommodated by your collaborators in the network; rather like, when you are working entirely alone, you not only accept mistakes but find so often within them the seeds of new, totally unexpected ideas for development. There is always this sense of community, the presence of your collaborators is all about you, albeit in another space, telematic space, present but silent unless summoned up through the matrix you all share.

Networking is a shared activity of mind and a form of behaviour which is both a dance and an embrace. It brings about a convergence of ideas from scattered sources with then, amplified, platted or stacked, diverge out into branching pathways of meaning. This darting to and fro of ideas and images (let's call it creative data), colliding, emitting new combinations, absorbing each other, virtual, real, in a state of continual transformation puts me in mind of Gary Xukav's description of the dance of sub-atomic particles "which never ends and is never the same".(24)

That I would see as the grand aspiration of networking in art, where the art work, the transformations of "creative data", are in perpetual motion, an unending process. In this sense art itself becomes not a discrete set of entities, but rather a web of relationships between ideas and images in constant flux, to which no single authorship is attributable and whose meanings depend on the

active participation of whoever enters the network. In a sense there is one wholeness, the flow of the network in which every idea is a part of every other idea, in which every participant reflects every other participant in the whole. This grand reciprocity, this symmetry of sender and receiver is such that a mirror image is exchanged in which sender is receiver and receiver sender. The observer of the "artwork" is a participator who in accessing the system, transforms it. The physicists who attempt to explain the quantum view that all particles exist potentially as different combinations of other particles often cite the Buddhist parallel view of the world, expressed in the metaphor of Indra's net: "In the heaven of Indra, there is said to be a network of pearls, so arranged that if you look at one you see all the others reflected in it. In the same way each object in the world is not merely itself but involves every other object and in fact is everything else.(25)

The creative use of networks makes them organisms. The work is never in a state of completion, how could it be so? Telematique is a decentralising medium; its metaphor is that of a web or net in which there is no centre, or hierarchy, no top nor bottom. It breaks the boundaries not only of the insular individual but of institutions, territories and time zones. To engage in telematic communication is to be at once everywhere and nowhere. In this it is subversive. It subverts the idea of authorship bound up within the solitary individual. It subverts the idea of individual ownership of the works of imagination. It replaces the bricks and mortar of institutions of culture and learning with an invisible college and a floating museum the reach of which is always expanding to include new possibilities of mind and new intimations of reality.

ROY ASCOTT Bristol , 1983

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