THE SECOND LINK:
VIEWPOINTS ON VIDEO IN THE EIGHTIES

In the summer of 1983, Lorne Falk, director of the Walter Phillips Gallery at the Banff Centre in Alberta, Canada, invited six curators from four countries to select videotapes by five artists, thus creating an exhibition of 30 works of contemporary video art from around the world. The curators were Peggy Gale (former director of A Space in Toronto), Kathy Huffman (Long Beach Museum of Art), Barbara London (Museum of Modern Art, New York), Brian MacNevin (former Curator, the Walter Phillips Gallery), Dorine Mignot (Curator, the Stedilijk Museum, Amsterdam) and Sandy Nairne (Director, the Institute of Contemporary Art, London). The exhibition premiered at the Banff Centre in July, 1983 and has since been traveling to these and other museums around the world.

A 150-page catalog of the exhibition will be published in February 1984. Each of the six curators has contributed an essay about their choices for the project. In addition, Gene Youngblood was invited to write about technological and artistic trends in video art during the coming decade; this essay is titled *A Medium Matures: Video and the Cinematic Enterprise*.

A Medium Matures: Video and the Cinematic Enterprise

Gene Youngblood

Let us begin by disabusing ourselves of myths. For instance, the idea of video art. I submit there is no such thing. In the first place, art is always independent of the medium through which it is practised. The domain in which something is deemed to be art has nothing to do with how it was produced. In the second place, the boundaries of video art are circumscribed by a much larger history — that of the cinematic enterprise in all its diversity — which contains video and defines its possibilities. Although video is usually identified with the fine arts tradition, its proper context is the tradition of personal cinema, outside of which its achievements cannot be assessed on any level more serious than that of artworld fashion or "sensibility". Video is a cinematic medium and the production of meaning through its unique properties is cinematic practice by definition, regardless of the artist's cultural allegiances. We can legitimately speak of cinematic art and visual art, although they are not the same. But the term "video", which we will certainly continue to use, refers only to craft, not to the object of cinematic desire that actually claims our attention. What we really mean by "video art" is personal cinema practised electronically.

Another myth is that video has anything to do with television as we know it today. It is apparent that video art is not television art. Yet the myth persists that video is somehow synonymous with television in either a partisan or adversary way — either that the mark of success in video is to be televised, or that its value lies in offering an alternative to, or critique of, television. Although we may find these arguments transparent, their purchase on video's public image is so complete that they deserve attention. In the first case, we need only remember that art and communication are fundamentally at cross purposes. Art is a process of exploration and inquiry. Its subject is human potential for aesthetic perception. It asks: How can we be different? What is other? In a basic sense, then, art is always non-communicative: it is about personal vision and autonomy; its aim is to produce non-standard observers.

Television in its present form represents exactly the opposite. Its goal is the production of standard observers through communication understood as a domain of stabilized dependency relations that maintain constant the cognitive domains of the population. Thus, the notion that video art "belongs on television" is both a contradiction of terms and a confusion of issues. Personal vision is not public vision; art is not the stuff of mass communication. The issue, of course, is specialized electronic publishing — that heroic promise of the Video Revolution implying an alternative form of television whose structures have yet to be realized. This begs the political question; but the critique of the mass media was already definitive and complete by the early seventies, and today there is really nothing new to be said. We know that mercenaries have invaded the language, that they occupy every image, every word. We know that the only alternative to their perceptual imperialism is continuous and pervasive access to counter-definitions of reality (the ultimate political meaning of video art) but those long dreamed-of channels still do not exist.

These reflections oblige us to acknowledge that video art remains, after eighteen years, both technologically and culturally immature. Technologically because as a cinematic medium it is still an industrial rather than personal tool; culturally because it is still primarily identified with a single special-interest group, the art world, whose academic and commercial venues constitute its only market. A tool may legitimately be described as mature only insofar as it is easy to use, accessible to everyone, offering high quality at low cost and characterized by a pluralistic rather than singular practice, serving a multitude of contradictory values. To paraphrase Susan Sontag, video, like photography, is not an art form the way painting and poetry are; and if photography lends itself most strongly to the notion of art which says that art is obsolete, then video surely stands as the paragon of that posture. It is truly a "medium" in the environmental sense, like language, like water, and it will have reached cultural maturity only when its ambient and pluralistic status is taken for granted. Only then will video art truly flourish.

To be sure, video does seem posed on the brink of realizing its potential. It is becoming ever more flexible as a cinematic medium, and there are entire subcultures of enthusiasts for whom "video art" has nothing to do with the issues of the post-modernist fine arts tradition. These are encouraging signs, but the best is yet to come. Truly revolutionary developments loom large on the horizon of video's future. It has become apparent that two grand themes — one technological, the other cultural — will shape the medium in the 80's; and as we approach the millennium a third force, more political in nature, will propel video toward its historical destiny as the central instrument in the social construction of reality.

By far the most important development, on which the other two depend, is the imminent merging of video with computer technology. Among other things, this will abolish the distinction between professional and amateur insofar as that's determined by the tools to which we have access as autonomous individuals, and this in turn will precipitate a New Renaissance in the audio-visual arts. By the end of the decade, video will replace film as the universal medium of cinematic practice; as a result, the critical discourse presently struggling with issues of "video art" will merge with that of the cinematic enterprise, forcing a radical reconstruction of the theory of cinema.

The third great force to shape the future of video will be that long-heralded mythical transformation of culture and consciousness known as the Communications Revolution, which, for at least a generation, has seemed perpetually about to happen. It is not unreasonable to expect that by the mid-1990's we shall at last find ourselves on the threshold of a genuine revolution in communications, which will occur only after the computer-video revolution that is making it possible. A communications revolution is not about technology; it's about possible relations among people. It implies an inversion of existing social relations, whereby today's hierarchical mass culture would disperse into autonomous self-constituting "reality-communities" — social groups of politically significant magnitude, defined not by geography but by consciousness, ideology, and desire. It seems to me that wide-spread use of personal tools for simulation (computers) and conversation (two-way video) make the rise of such communities all but inevitable; and as their constituents we could produce models of possible realities (cinema) and also control the cultural contexts in which those models were published and perceived. I believe this is not only possible but essential for human dignity and survival. The continuous simulation of alternative realities within autonomous reality-communities would constitute a New Renaissance in which the artist-designer might address the profound social and political challenges of our time.

I shall return to this theme later; meanwhile let us consider the integration of video and computer technology. It will occur in at least four ways: through digital video, through computer controlled editing, through computer-controlled or "interactive" videodiscs, and through computer animation. Each may be regarded as the foundation of a new art form; each carries important aesthetic and philosophical implications; each offers unexplored possibilities for the elaboration of cinematic language. I do not mean to imply that creativity depends on, or is even related to, technology. Of course it is content, not technique, that matters: all one really needs is a portapak and inspiration. However I am suggesting that, all else being equal, the video artist who uses the computer will produce more interesting and complex work than those who do not. Here are some reasons why:

Digital Video

One of the fundamental utilities of the computer is its ability to translate the continuous phenomena of the analog world into the discrete units of the digital domain. This confers upon the processing of audiovisual information the singular advantages of transparency and control. Transparency means that the medium introduces no artifacts into the information being processed. The concept of a signal-to-noise ratio becomes meaningless because there is no noise. The source is reproduced with 100% fidelity, and the 50th generation is as clean as the first. Control means exactly what it says. Through the use of the framebuffer; a video frame, which is otherwise not an object but a dynamic time event, becomes a "virtual volume", an object in data space, whose every element (pixel) can be addressed and manipulated by the computer. Whereas the basic unit of creative construction in film is the fully-formed photographic image,

digital video gives us access in principle not only to the frame but to each of the 1000 scanlines that will constitute it in 1990, and not only that, but access to each of the 1000 pixels that will comprise each line. That's like being able to address individually each grain of emulsion in a film frame, assigning to it any one of, say, 250 grey-scale levels or colour hues. The smaller the basic unit the greater the variety of possible constructions — witness the brick house versus the prefab.

Philosophically, this suggests the possibility of understanding cinematic practice as the *collision of codes within the frame* as opposed to the classical language in which "codes" are constructed from the collision of frames. The aesthetic implications are no less profound. On a purely formalistic level, it means that an image-event can be submitted to nearly infinite spatiotemporal transformations, since the "image" is only a matrix of codes in a data space. It means that any element of any image can be inserted into any other image seamlessly, without the appearance of being an "effect". Indeed, the concept of special effects is rendered meaningless in digital video since all elements of the image exist in the same phenomenological domain. The ontological status of the cinematic image-event is altered through digital video — it becomes a hybrid reality standing somewhere between photography and a kind of painting. The ineluctable coupling of camera and world is reprieved: the image-event comes to represent both the imagination of the observer and the universe observed with equal inflection.

The question of access to digital video technology by autonomous individuals is therefore far from trivial. The trends are encouraging. On one hand, analog-to-digital conversion can now be performed by a single microchip that could eventually be built into every video camera and tape recorder manufactured; and the prodigious bandwidth required to store digital video information (presently the principal barrier to its commercial realization) will soon be provided by a revolutionary breakthrough called perpendicular recording, in which magnetic domains are generated vertically in the depth of the recording medium rather than horizontally along its surface, yielding up to forty times the capacity of present magnetic recording techniques. On the other hand, framebuffers are expected to cost about five dollars by mid-decade and will be built into every television set for videotex reception. In addition, advances in microcircuitry (digital image processors capable of performing all the post-production video "effects" today requiring $300,000 industrial tools like the Quantel Mirage or custom user-built devices like Dan Sandin's Digital Image Processor or Woody Vasulka's Digital Image Articulator) could, by the end of the decade, be incorporated on a single board occupying a single slot in one's personal computer.

Computer-Controlled Editing

The cinema is not a visual art, it is a time art. In the cinema we do not look at pictures, we witness events. In a purely technical sense, the history of video is the history of its becoming a cinematic medium by offering ever more control over "the time of the frame". In the beginning there was no video, only live television. Video recorders were not invented until ten years after television was commercially introduced, and they did not provide frame-accurate editing. It was not until 1974, with the introduction of the CMX computer-controlled editing system, that video acquired the electronic equivalent of sprocket holes and became a cinematic medium. But even then, so fundamental a cinematic technique as slow motion was impossible in video, and it was not until the introduction of the one-inch helical VTR in 1978 that both the order and duration of the image-event in video could be submitted to the controlling logic of the computer.

As we all know, styles in video art have reflected this evolution from real time down into the ability to store and manipulate time in a way that is completely different from film; for one advantage of approaching the cinematic enterprise from the electronic side lies in computer-addressable timecode, such that the organization of the cinematic space becomes pure abstract structuralism derived from mathematics. In other words, computer-controlled editing not only removes cinematic practice from the tedious requirements of manual skill, placing emphasis on the soul within the idea; it actually provides a context for conceptualizing strategies of temporal manipulation that do not arise if one is not using this tool. It suggests completely new approaches to the syntax of cinematic image-events.

In computer editing one works with something analogous to a musical score — the Edit Decision List as a graphic representation of audiovisual events that will unfold in time. It represents the cinematic composition as a whole, the way we think of music as a whole. Using this conceptual tool it is possible to approach the creation of

a cinematic work from the "opposite end", as it were, such that the edit list dictates shooting the way a musical score dictates its instrumental performance. In this way cinematic practice becomes a more holistic process and the cinematic text becomes an organic unity, since the entire composition may be entered into the computer before any part of it is edited.

This is unprecedented in the history of cinema. Among other things, it suggests a re-thinking of the idea of structuralism, which takes on new meaning as data structure or data space in the computer. No one has revealed the aesthetic potential of these concepts with greater vision and eloquence than Bill Viola, whose singular project constitutes a profound investigation of those specifically temporal manipulations of image and sound by which the attention of the witness is choreographed and meaning is produced in the cinematic space. He may well be the only artist in the world today who is not only systematically addressing this issue but actually beginning to specify new trajectories for the audiovisual time arts, whose evolution henceforth will depend on and be inseparable from the computer, that most intelligent of possible clocks.

Today computer-controlled editing is a complex industrial process accessible to most artists only through outside funding and the intermediary of a trained engineer-operator. There is every indication, however, that these resources will be available to autonomous individuals relatively soon. Already, personal computers interfaced with consumer video recorders are being used in place of high-tech one-inch facilities, and with read-write optical videodiscs and more "user-friendly" control structures now under development, access should be widespread by the end of the decade.

Computer-Controlled Videodiscs

The optical videodisc will also figure in a completely new art form which nevertheless can be regarded as an extension of the cinematic enterprise — the interactive movie, in which the viewer essentially creates his or her own personalized experience as they branch through a relatively open-ended cinematic space in ways made possible, but not directly determined, by the author of that space. It is the ultimate case of Duchamp's dictum that the artist begins the artwork and the witness completes it. For the more interactive a system is, the more it becomes what you want to be seeing, what you want to be doing, what you want to be experiencing.

The first rudimentary examples of so-called interactive discs (discs are not interactive, only computers are), primarily educational in nature, have appeared only recently. The most elaborate and best known is the Aspen Movie Map produced by the Architecture Machine Group at MIT. A more ambitious project, a movie map of Boston, is currently in production which will allow the viewer not only to travel down any street and into selected buildings to examine their contents, but also to switch between different seasons of the year and even times of day.

As impressive as they may be, such projects are fairly straight-forward compared to more abstract, poetic, conceptual, or perceptual experiments that artists might pursue. For example, Bill Viola, recently awarded a major grant to produce an interactive videodisc, compares the open-ended nature of the medium to the "infinite resolvability" of reality. He recalls a sequence of satellite photos showing first the east coast, then the New York metropolitan area, then just Manhattan, then just lower Manhattan, finally isolating individual buildings. "What fascinated me," he said, "was that the progression was not a zoom or a blow-up. It's not as though they used four different lenses and made four different pictures. All the buildings in the closeup existed already in the global view because it's actually a computer data base and they're in the information. So the image doesn't lose detail or become grainy when it's enlarged because it's computer enhanced. That's not like zooming. You determine the scale of what you're seeing by processing information that's already there. That's how eagles see. They see a field mouse from 500 feet. They're not zooming their eyes. It's like the World Trade Center being in the satellite photo from 200 miles out. That's where media's going in general — the idea that recording becomes mapping. Everything is recorded. Everything is encoded into the system and as a viewer or producer you just determine what part you're revealing."

Computer Graphics and Animation

I have reserved for last a discussion of the medium that will have the greatest impact not only on the future of cinema but on the theory of reality itself. Combining the apparent objectivity of the photograph, the interpretive subjectivity of the painting and the unrestricted motion of hand animation,

three-dimensional computer animation or "digital scene simulation" is by far the most awesome and profound development in the history of symbolic discourse. It is possible to view the entire career not only of the visual arts but of human communication itself as leading to this Promethean instrument of representation. Its aesthetic and philosophical implications are staggering, and they are ultimately of profound political consequence.

If photography is making marks with light, then computer simulation is a kind of photography, but one in which the "camera" is only a point in virtual space and the "lens" is not a physical object but a mathematical algorithm that describes the geometry of the image it creates. In a way that is haunting and prophetic, the most advanced form of photography now imaginable returns us to the Renaissance concept of perspective as a geometric rather than optical phenomenon and situates reality once again in a domain of mathematical constructs.

Although it is not itself video, computer imagery can be encoded as a video signal and integrated into the cinematic space (as graphics or animation or both) providing a richness of pictorial variety and texture otherwise unobtainable. As usual, the technology of simulation (both hardware and software) will filter down from high-tech industry to the individual user, but at a precipitous rate, such that the complexity and sophistication of computer imagery available to autonomous individuals will increase exponentially from now on. As a result, more and more aspects of the cinematic space will issue from the computer, not the camera.

Commercial cinema will provide the economic motivation for software development that might not otherwise occur. By 1990 most backgrounds and environments in Hollywood films, although indistinguishable from photographic reality, will be computer-generated and actors will be electronically keyed into them. Human imagery will take longer to perfect; crowd scenes will come first, then individual closeups. It is expected that the first all-simulated feature-length narrative movie will be produced before the end of the decade. Although its human characters will look like simulation they will have more the appearance of three-dimensional paintings than the flat cartoon figures of traditional animation.

Of course the full aesthetic potential of this medium will be realized only when computer artists come to the instrument from art rather than from computer science, which is generally the case today. This will require a new generation of ultra-powerful personal computers at prices affordable by artists, as well as a new generation of artists with the desire to afford them and the skills to use them. Today the kind of simulation envisioned above requires a $10 million Cray-1 supercomputer, the most powerful computer in the world, plus proprietary software that has been more than two decades in development. But the manufacturers of the Cray-1 believe that by the early 1990's computers with three-fourths of its power (quite sufficient for computing photographically realistic simulations in real time at video resolution) will sell for approximately $20,000 — less than the cost of a portapak and editing system today. Such a device would have an enormous market potential, and it is certain that the simulation software would be available with it. Finally accessible to autonomous individuals, the full aesthetic potential of computer simulation will be revealed, and the future of cinematic language — hence the social construction of reality — will be rescued from the tyranny of perceptual imperialists and placed in the hands of artists and amateurs.

Artistic Trends

Two artistic trends directly related to the merging of video and computer technology will characterize video art through the end of this century. The new techniques will be extremely instrumental in meeting the challenge of a post-structuralist cinema which seeks to integrate two traditions previously regarded as incompatible: first, the cinematic tradition (including surrealist and mythopoeic traditions of avant-garde personal cinema, whether actor/dialog-based or purely formalistic) with its emphasis on illusion, spectacle, and external reference through metaphoric or allegorical narrative; and secondly, the post-modernist tradition in the fine arts, characterized by minimalism, self-reference, and a rigorous, didactic investigation of the structures and materials of the medium, with particular emphasis on deconstruction of representational schemes.

For several years now the post-structuralist movements in all the arts have sought to reconcile these two histories, and a powerful synthesis seems to have emerged: rich in poetic resonance, romantic, even spectacular in form, it nevertheless retains a poignant awareness of its own construction. In painting today it is represented by the New Image movement — Clementi, Salle, Fischl, Longo and the rest; in music it is Bowie and Byrne and the New Wave; in theatre, Robert Wilson, Meredith Monk and Laurie Anderson; in contemporary cinema it is Godard (still) and Straub-Huillet, Hans-Jurgen Syberberg and Manoel de Oliveira and, in quite a different way, Fassbinder. As yet, video art can claim no personality of this stature except perhaps Bill Viola; but it is video nevertheless that will ultimately articulate a post-structuralist cinema far more radical and robust than that which theatrical cinema has given us so far — precisely due to the plasticity and interactivity of cinematic image-events made possible by the computer.

The second trend, which could be regarded as a subcategory of the first, is what is currently being called "visual music" or "music image". I prefer the term "opera" or operatic cinema. In any case let me quickly distinguish it from movie musicals on the one hand and rock video on the other. Whereas these are trivial illustrations of popular music, the practice I have in mind would constitute an organic fusion of image and sound into a single unity, created by a single artist who writes and performs the music as well as conceiving and executing the images that are inseparable from it. Considering the awesome cultural forces represented by the cinema on the one hand and music on the other, a fusion of the two would seem to possess unparalleled potential for emotional and intellectual discourse and poetic expression. To my knowledge the only North American artist who even comes close to satisfying these criteria is Ernest Gusella in New York, whose surrealistic, operatic songs and poems are beginning to define a new trajectory for the dialog of image and sound. In any case, I am convinced that the "electronic opera" will develop into a lasting cultural tradition through the integration of video and computer technology.

Communication versus Conversation

As video merges with the computer, and thus with user-controlled telecommunication networks, a communications revolution would seem all but inevitable, bringing with it the rise of those autonomous reality-communities I mentioned earlier — communities defined not by geography but by consciousness, ideology, and desire. Paradoxically, the migration to autonomous reality-communities will not be achieved through communication. Communication (from the Latin "a shared space") is interaction in a common context ("to weave together") which makes communication possible and determines the meaning of all that is said. The control of context is the control of language is the control of reality. To create new realities, therefore, we must create new contexts, new domains of consensus. That cannot be done through communication. You cannot step out of the context that defines communication by communicating: it will lead only to trivial permutations within the same consensus, repeatedly validating the same reality. Rather, we need a *creative conversation* (from the Latin "to turn around together") that might lead to new consensus and hence to new realities, but which is not itself a process of communication. "Do you mean this or this?" "No, I mean thus and such . . ." During this nontrivial process we gradually approximate the possibility of communication, which will follow as a necessary trivial consequence once we have constructed a new consensus and woven together a new context. Communication, as a domain of stabilized non-creative relations, can occur only after the creative (but non-communicative) conversation that makes it possible — communication is always non-creative and creativity is always non-communicative. Conversation, the prerequisite for all creativity, requires a two-way channel of interaction. That does not guarantee creativity, but without it there will be no conversation and no creativity at all. That is why the worst thing we can say about the mass media is that they can only communicate — at a time when creative conversations on a massive scale are essential for human dignity and survival.

Simulation and Desire

What is important to realize is that in our conversations we create the realities we will talk about by talking about them, thus we become an autonomous reality-community. To be conscious observers we need language (verbal or visual). To have language we need each other. The individual observer, standing alone, is an impossibility. There is only the observer-community or reality-community whose constituents can talk about things (like art, science, religion) because they create the things they talk about by talking about them. As constituents of autonomous reality-communities we shall hold continuously before ourselves alternative models of possible realities. We shall learn to desire the realities we simulate by simulating the realities we desire, specifying, through our control of both medium and message, context and content — what is real and what is not, what is right and wrong, good and bad, what is related to what, and how. This is the profound significance of the computer-video revolution and the cinema, understood as simulation, not fiction. The purpose of fiction is to mirror the world and amuse the observer; the purpose of simulation is to create a world and transform the observer. As video art merges with the computer, transforming cinema into simulation, we shall gather in autonomous reality-communities and conspire to abolish once and for all the ancient dichotomies between art and life, destiny and desire.