June Blues, mimicks watercolor with its horizontal "washes" of pastel colors; Monique Nahas's and Herve Huitric's Souvenir de Vacances looks much like a pointilist landscape; and a good number of people — Frank Dietrich, Eleanor Kent, Eudice Feder, Michael O'Rourke, and Alice Kaprow, to name a few — have produced works that rely on the same formal ideas as modern abstract painting. This fact has been a source of criticism: if it is merely mimicking other forms, why bother to use the computer? People forget, however, that whenever artists work in a new medium, they initially draw on their visual antecendents. Early photography was discussed in terms of 19th-century painting, and early abstract videotapes of the late 1960s and early '70s were compared disparagingly to modern formalist painting. What's most important is for artists to acknowledge this visual history as such, and use it as a point of departure.

Not all the work in the exhibition specifically reflect conventions of fine art. Probably the most common use of the computer is for commercial graphic design and illustration. There are a number of examples of fine graphic work, among them Collette Gaiter-Smith's Showers, and untitled works by Jean Tracy, Laurence Gartel, and Mike Newman. Contemporary illustration is represented by Marilyn Abers's untitled Cibachrome print, Joe Pasquale's Hello Plugs, and Ned Greene's Mondo Condo.

The 20 videotapes included represent a number of different approaches to the medium. Probably the most traditional — if that word can describe such a young art form — is the integration of electronically synthesized images and music. Guenther Tetz's V and Dots, Stan VanderBeek's Spectrum Six, Dean Winkler's and John Sanborn's Act III, and Calypso Cameo, a collaborative work by Winkler, Vibeke Sorenson, and Tom Dewitt, all explore variations on graphic and aural themes.

Other tapes are more akin to the "concept videos" of Music Television, in which a popular song is illustrated. These include JoAnn Gillerman's Clone Baby, and Big Electric Cat, by Sanborn, Winkler, and Kit Fitzgerald. Still another genre is the dance tape. Both Oua Oua and Digital Dancer by Ed Tannenbaum, and Moving Along with X, Y Axis, by Roberta Hayes and Robert Coggeshall provide fine examples of how digital effects can transform and accentuate — rather than merely record — a dancer's movements.

Some tapes don't fit neatly into any category. Jane Veeder's Floater addresses one aspect of the phenomenology of seeing — how our eyes perceive movement — by using real-time animated graphics as retinal stimuli. Barbara Buckner's Greece to Jupiter: It's a Matter of Energy is a series of graphic depictions of how energy changes in space and time. In Bob Snyder's Trim Subdivisions, images of tract houses are manipulated in such a way that the tape becomes a play between two-dimensional flatness and three dimensionality. In Yoichiro Kawaguchi's Three Pieces, geometric forms come to life as clay-like fantasy characters that perform a series of sophisticated movements.

Citing photography's recent mainstreaming, some artists who work with computers feel it is only a matter of time before their work is also accepted, and to some extent, this is true. However, it should be kept in mind that "acceptable" is usually synonymous with marketability. For example, all talk of whether photography was "art" or not subsided when that medium was assimilated into the art print market around 1978.[4] Similarly, it is the reality of the marketplace that will play a bigger role in the computer's acceptance — not rhetorical debates over its merits and deficiencies as an artist's tool.

Notes

1. In "The Salon of 1859: The Modern Public and Photography," reprinted in Modern Art and Modernism, edited by Francis Frascina and Charles Harrison (New York: Harper and Row, 1982), p. 20.
2. In "Of Cretans and Critics: In Search of Photographic Theory," Afterimage, Vol. 10, No. 7 (February 1983), p. 9.
3. In Ways of Seeing (New York: Penguin Books, 1972), p.11.
4. See Jacobs, ibid.

Lucinda Furlong is a critic, and a frequent contributor to Afterimage, a journal of photography, video, independent film, and artists' books. She is currently working on a history of the "image processing" genre of video art, through a grant from the New York State Council on the Arts.

A Medium Matures: The Myth Of Computer Art

Gene Youngblood

We embark upon SIGGRAPH's second decade with a growing conviction that the leading edge of culture is no longer defined by the fine arts community — by what's being shown in galleries, purchased by museums, published in art magazines or talked about in SoHo lofts. The excitement and power and significance today seems to lie in electronic technology, especially the computer, which we are convinced will reveal the way to unlimited new aesthetic horizons and produce wholly new art forms. And yet the idea of computer art — of an art unique to the computer — remains after twenty years an unrealized myth, its horizons barely in view, its forms still to be manifest. For, ironically, most of what is understood as computer art today represents the computer in the service of those very same visual art traditions which the rhetoric of new technology holds to be obsolete.

For this reason, one might well take the view — only partially as Devil's Advocate — that there is in fact no such thing as computer art. In the first place, art is always independent of the medium through which it is practiced: the domain in which something is deemed to be art has nothing to do with how it was produced. 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? It is a mode of consciousness, a way of being in the world. This requires a medium, of course, but the properties of that medium, the techniques that define it, do not constitute the exploration they facilitate. It is not paint that makes a painting art — even if the subject of the painting is painting itself.

In the second place, the boundaries of computer art as we know it today are circumscribed by a much larger history — that of the fine arts tradition — which contains all visual art and defines its possibilities. The use of the computer in the production of drawings, prints, textiles, ceramics and sculptures does not suddenly transform these ancient traditions into "computer art" — they remain painting, drawing and sculpture and their status as art will always be determined by art-historical concerns, not by any consideration of the computer's role in producing them. The myth of computer art is that it is visual art.

This is not to imply that computers do not give us new visual experiences. Three-dimensional animation, for example, is not only unprecedented in a visual sense but may well qualify as a truly new art form. Combining the objectivity of the photograph, the interpretive subjectivity of the painting and the gravity-free motion of hand-drawn animation, "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. But the question whether a particular work of 3-D animation is Art will be addressed in a historical context that need not — and should not — take into account the medium through which it was produced, no matter how dependent on that medium it may be.

Art and Ontology

This seems sufficient cause to question the whole premise of Art and Technology. On one level this movement has simply been the art world's way of acknowledging that new technologies have a lot of cultural significance, and Art is a status-conferring label that means "this is culturally significant." But this validation is frequently bestowed on technologies whose actual significance may have nothing to do with what has traditionally been understood as art. Perhaps the "and" in Art and Technology should be changed to "or," for so many of our entrenched assumptions about art are inappropriate to new technologies and actually prevent us from realizing their unique potential.

The true aesthetic significance of the computer will be revealed only when we begin to explore that which is unique to it regardless of whether the results are art-like or not, or whether the art world acknowledges it. Whatever the case, I suspect it will not have much to do with producing anything at all — for what is most unique about the computer is precisely its intelligence, that is, its interactivity. In other words, the great value of the computer is ontological rather than phenomenological — it has more to do with processes of being in the world (ontology) than with the consequences of our being here (aesthetics, phenomenology). This is repeatedly confirmed by computer artists themselves, whose testimonies are almost always ontological, seldom phenomenological — always about the processes of producing the art through in-

teraction with the intelligent machine rather than about the art itself. This is what Dan Sandin means when he says that one cannot understand computer art by looking at it. And it is why Jane Veeder's interactive paint program/arcade game Warpitout was the outstanding work of computer art at SIGGRAPH '82.

Interactivity

We have identified two domains in which the computer offers truly unique contributions to the theory of art — three-dimensional simulation and interactivity. Many people believe the ultimate computer art form will be a synthesis of the two. Let us first consider interactivity. In interactive art the concepts "artist" and "audience" become the roles of "author" and "participant." The author creates not a particular image, object, event or space but rather specifies the laws of an environment that contains many possible images, objects, events or spaces that can be realized by the participant as he or she interacts with that environment according to its laws. But a truly interactive environment becomes conversational — its laws change as a result of its interactions. The computer "senses" the participant's state of being (for example, through a menu of questions, or through kinetic or physiological sensors) and changes some aspect of the environment (such as images or sounds) accordingly. This is the ultimate case of Marcel Duchamp's dictum that the artist begins the artwork and the witness completes it — for the more interactive a system is the more transparent it becomes: its own systematic characteristics are less evident as it becomes what you want to be seeing, what you want to be doing, what you want to be experiencing.

The first interactive art form likely to be addressed by artists is the interactive movie, based on computer-controlled optical videodisc systems. The user essentially creates his or her own personalized movie as they branch through a relatively open-ended cinematic space in ways made possible, but not directly determined, by the author of that space. The first so-called interactive discs (discs aren't interactive; only computers are), primarily educational in nature, have appeared only in the last few years. The most elaborate have been produced by the Architecture Machine Group at MIT, whose best known is the Aspen Movie Map which allows the viewer, among other things, to travel down any street and into buildings to examine their contents.

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, the video artist 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. As a metaphor, 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 blowup. 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."

Simulation

The fundamental premise of the interactive movie — the global recording of a scene or event from, as it were, a "spherical" point of view which allows the user to select a particular pathway through the material — is an idea ahead of its time, one which will be served only partially by conventional photography and the videodisc. It begs for three-dimensional scene simulation. For whereas the photographic disc is limited in the number of decision-nodes or branching points its method of production can accommodate, simulation can offer a decision thirty times a second: every frame becomes a branching point, every shot can pose the question what to do next? This is well understood by designers of video and arcade games who see these rudimentary toys as forerunners of the cinema of the future. And it is understood by pioneers of digital scene simulation like John Whitney, Jr. and Gary Demos at Digital Productions in Los Angeles, who are developing the "algorithmic database" software which they believe will make remote interactive scene simulation over cable TV channels a commercial possibility within this decade.

"The real-time simulation channel would be a direct feed from a supercomputer like the Cray-1," Demos explained, "running 24 hours a day and available on a subscription basis. So you just tune in and connect your home computer to the central computer by phone modem and you become a part of the movie. The Image Utility presents the generic possibilities and you make variations based on your own personality and abilities. You control things, create a custom movie that will never be seen by anyone else. The entertainment value of interactive characters more beautiful than those in Disney animation, all customed to your commands, would be incredible! There would be some restrictions on scene complexity if you wanted real-time interaction; but the ability of the viewer to introduce flies and birds and wind and weather into the simulated environment would be overwhelming. Look at the popularity of video games today with their low level of visual sophistication and interactivity. It seems to me that the applications for real-time custom simulation are infinite and the demand will be enormous. Custom news, for example, or just your general interests. Maybe a doctor needs a readout on a patient so we simulate his heart from the doctor's input. Geologists, architects, they all need images — not just line graphics but three-dimensional shaded motion images. It seems to me that everyone could easily consume a couple of hours of television today. The AT&T of the future is the company that sells custom visual simulation. I am certain it will be common in ten to fifteen years."

In Search of Computer Art

The full aesthetic potential of these forms will be realized only when computer artists come to the instrument from art rather than computer science. 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. Computer art will not mature overnight. The kind of interactive simulation envisioned here requires today a $10 million Cray-1 supercomputer and software that does not yet exist; but the manufacturers of the Cray-1 believe that by the early 1990s computers with three-fourths of its power — quite sufficient for computing real-time interactive simulations at video resolution — will sell for approximately $20,000. Such a device would have an enormous market potential, and it is certain that the simulation software would be available with it. Thus finally accessible to autonomous individuals, the full aesthetic potential of interactive visual simulation will be revealed, and the future of cinematic language — hence the social construction of reality — will be rescued from the tyranny of perpetual imperialists and placed in the hands of the artists and amateurs who shall inherit the world.

Morris, David
"River Crystal"
1983