COMPUTER ART
as a
WAY OF LIFE

By Gene Youngblood

When I think of computer art I think of Chicago, and of four people there—Jane Veeder, Phil Morton, Dan Sandin and Tom De Fanti—who are pioneering a visual art form that ultimately is not visual at all, but rather the creation of language, and of conversational "environments" out of which will emerge our future images and the images of our future. Together with Steina and Woody Vasulka in Santa Fe, they inspired me, taught me, and changed me profoundly over the last ten years. With infinite patience and dedication, with the passion of visionary seekers, they guided me ever deeper into the digital domain and caused me at last to understand that computer graphics is something more than art, that it is a kind of practical philosophy, a way of life, a way of being in the world and a way of creating a world to be in.

No story reflects this more vividly than that of Jane Veeder, an artist-programmer whose life and work epitomize both the unique computer-art community in Chicago and a personal pathway of growth and discovery that will become representative of the life of the artist in our time. In my opinion, Veeder stands with Ed Emshwiller and Larry Cuba as one of the most gifted computer artists working in America today. Relatively unknown until recently, she is beginning to get the recognition she deserves. Her 1982 animation *Montana* is the only work of computer graphics in the Museum of Modern Art's video collection, and her interactive paint program/arcade game *Warpitout*—the sensation of the SIGGRAPH '82 Art Show in Boston—will later this year be installed at the Ontario Science Center in Toronto, one of the most prestigious science museums in the world.

Gene Youngblood was a member of the jury for the SIG-GRAPH '83 Exhibition of Computer Art. He is working on a new book, *The New Renaissance: The Computer Revolution and the Arts.*
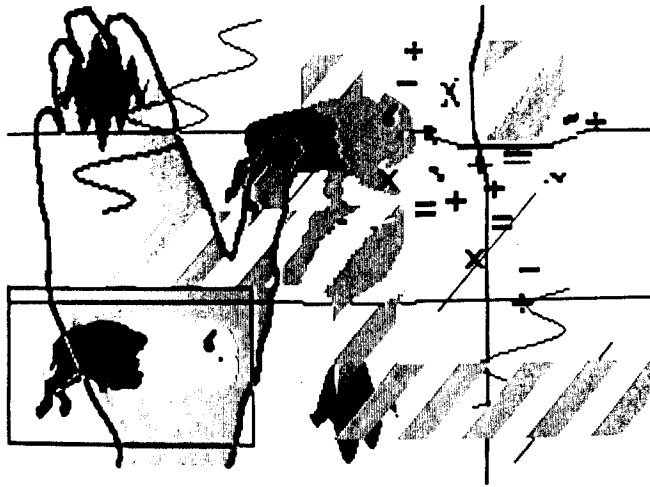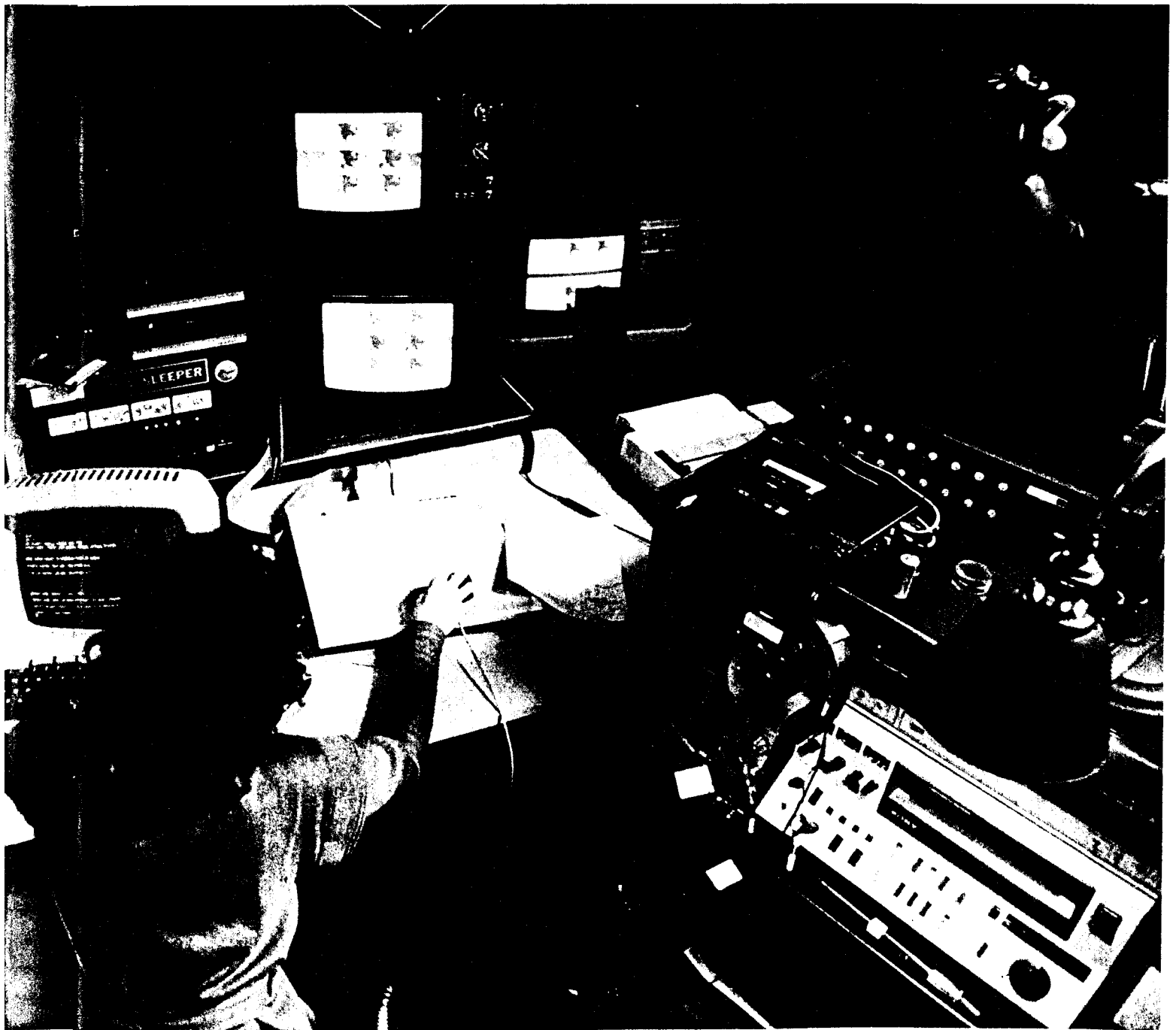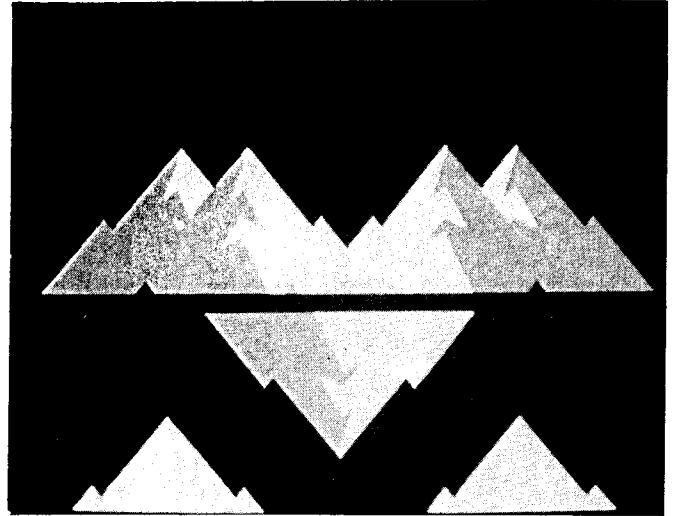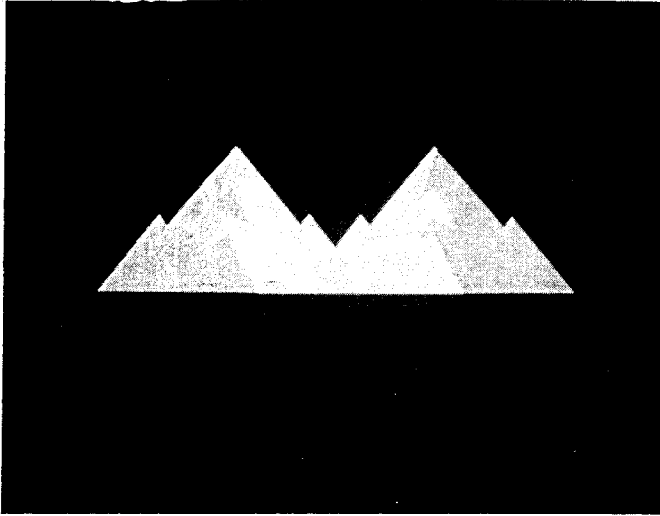
"The computer is the future . . . and remain autonomous and at the same connected with the future . . ."

MONTANA: A constellation of totem-like icons dancing on a dreamworld stage.

The road to success has been a long one for 39-year-old Veeder, whose personal journey as an artist—involving excursions into theatre, painting, ceramics, sculpture, filmmaking and video—reflects a widespread disenchantment with traditional art forms, a conviction that the leading edge of culture is no longer defined by what's exhibited in art galleries or purchased by museums. "The go-nowhereness of traditional art forms just kills me," she said. "First painting. The go-nowhereness of painting killed me off it. And then ceramics. I did ceramics for ten years and after a while you sort of know everything. You start reinventing the wheel. First there was abstract ceramics, then sculptural ceramics, then utilitarian, then Japanese, then you run out of things and you go around and around. But with electronic stuff, especially computers, there's always so much you don't know about. It's this incredible carrot that just keeps hanging out there in front of you. The computer is the future of everything and it's a tool for building tools: you can remain autonomous and at the same time literally create the tools that keep you connected with the future of the world."

Veeder's migration from the analog world of video synthesis into the digital domain of computer synthesis is a trailblazing journey that more and more electronic artists will follow as the advantages and satisfactions of computer life are recognized. "I like video but it's very expensive, so I couldn't afford personal tools. Also video skills don't get much in the way of rewards. Video's very easy to do. Many people have these skills. It's not very strategic. But having my own computer graphics system has made a huge difference. It's like doing video without the videotape recorder. Videotape recorders are horrible machines. They're complex, they're expensive, they don't last very long. That whole electromechanical combination is problematic.

"Also, being collaborative, video always involves hassles with other people. But with a computer, if the software is any good at all, the conversation is incredibly direct. It's encouraging to know that if you keep trying

you can make it work. You actually are encouraged to apply your energy. That's so satisfying. How many relationships have you had with humans where you knew that no matter how hard you tried it just wasn't going to get any better? So on one hand I just want to talk to the computer because we understand each other so well. And on the other hand it gives me a whole other level on which to communicate with people. With the computer I can get at my dreamlike images; I can visualize my made-up pictures with a lot of power and control and detail; there's this detail tweakability that enables me to get at this weird place; the computer offers more control in support of that space than video ever did."

ZGRASS: AN ENVIRONMENT FOR ARTISTS

Veeder works in ZGRASS, a language written by Tom De Fanti exclusively for real-time interactive motion graphics. Incorporating the best features of Pascal, Smalltalk, Lisp and BASIC, ZGRASS is by all accounts the best graphics language around. Among other things, it is self-teaching and user-extensible—the users can create their own commands and integrate these commands into the language, expanding and evolving it to fit their personal style of making images.

ZGRASS runs only on the Datamax UV-1 Graphics Computer which contains three custom chips designed for Bally Arcade games like *Wizards of War* and *Gorf*—one chip for processing instructions, one for controlling the display, and one for sound synthesis. This makes ZGRASS faster than anything around at its price (about $10,000), and speed is essential for real-time animation. There's also a 16-screen memory that allows you to create and store sixteen different full-screen images and then call them up in a real time animation cycle. Output is standard NTSC video. Veeder works with a single Sony 5850 videotape recorder and builds her editing commands into her graphics programs. "Every tape can be first-generation," she explained. "It's just as easy to run the computer and make a first-generation tape as it is to do a dub of the master. And with the 16-screen memory I

it's a tool for building tools: you can time create the tools that keep you
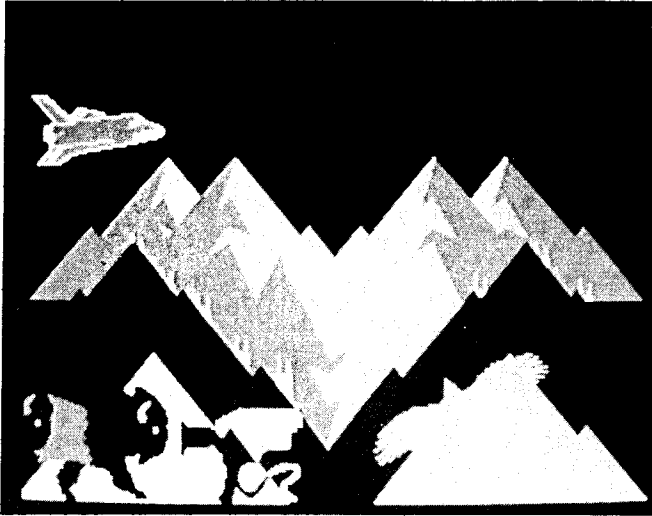
can work up the individual screens and then program them sequentially and the animation just happens."

The UV-1 offers less resolution and fewer colors than larger, more expensive systems—only 320 x 202 x 2 bits per pixel (256 colors with four colors per area). This represents a tradeoff in favor of real time operation while keeping the cost down; but if you're moving images you don't need that much resolution anyway; moreover, although Hi-Res has been elevated to a quasi-religion in the commercial graphics world, the fact is that for many artists real-time interaction is far more important. "Photographic realism is not my goal," Veeder explained. "I can see its utility but I don't think it would be a triumph, you know. I have no desire to use a super-high resolution system because I don't draw in super-high resolution. I just go so far and beyond that it's the integration and manipulation that I enjoy—movements and gestures."

In fact, animation *per se* is not the primary motivation for Veeder's involvement with ZGRASS. "I'm just interested in real time graphic interaction that results in a dynamic visual event," she explained. "What I want is to integrate my eye, hand and brain with the computer's ability to perform complex relationships very rapidly. The fact is I'm addicted to the high-speed personal evolution and perceptual education you get from continuous contact with a real-time interactive machine intelligence." Nevertheless, *Montana* and Veeder's most recent computer animation, *Floater*, rank with the best works of experimental hand-drawn animation. The quirky, totemic, dreamlike, cyclical image-events of *Montana* are reminiscent of Harry Smith's *Early Abstractions*, whereas *Floater* inspires comparison with Robert Breer, Paul Glabicki, and the optical-printing films of Pat O'Neill. Both works are essentially autobiographical.

MONTANA

For five years, Veeder and Phil Morton spent their summers camping out and making video in the mountains of the Western Badlands—Montana, Wyoming,

Utah. The trips were part of a unique lifestyle approach to video, a desire to live with and through the medium conversationally, incorporating computer graphics into semi-didactic "simulations" of imagined and desired video realities. They "processed their life" in the electronic domain, producing video "communiques" of the realities they created by living and processing them. The visual signature of these tapes is absolutely unique, whith Jane's poignant, ideosyncratic computer graphic complementing Phil's sublime image processing—all of this superimposed over, and integrated into elegant black-and-white tapes of animal life and geological splendors of the American wilderness. The tapes have a joyous, chatty, conversational, grass-roots flavor that resonates against the otherworldly strangers-in-a-strange-land consciousness that pervades them. They are pioneering works by two genuine pioneers of the Electronic Life.

Gradually Jane evolved away from video and deeper into computer graphics. She and Morton no longer work together, but her love of the wilderness, and much of the graphic material she evolved for the videotapes, continue to inform her work in computer animation. This imagery—soaring hawks, mountain peaks, stampeding buffalo, erosion patterns in the terrain—are combined in *Montana* with icons of the technological world: video cameras, the Sears Tower in Chicago, the Space Shuttle. Veeder organized the material into 16-screen sequences programmed as a loop that increases in speed over eight cycles, with each of the elements moving at different speeds. The effect is a constellation of totem-like icons dancing on a dreamworld stage—hence the similarity to Harry Smith. Equally remarkable is the stereo soundtrack, which consists of an audiotape of birdcalls from the Audobon Society combined with sound synthesis performed on the Sandin Image Processor. The effect of the narrator numbering and naming the birdcalls in a cascade of electronic echoes perfectly complements the imagery and gives the tape a poignant, haunting, otherworldly flavor.

"Being able to earn my living by sitting at home with my intelligent machine . . . the sense of power and control over my life is immense."

WARPITOUT an installation in the form of an arcade game whose target is everyone's favorite image—their own, sensation at SIGGRAPH '82.

FLOATER

As impressive as *Montana* certainly is, the six-minute *Floater* (1983) is an even more sophisticated work, a tour-de-force of subtle animation, a masterpiece of simplicity, nuance and economy of gesture. The complex canvas of *Montana* is here reduced to a minimal set of emblematic objects which serve, in Veeder's words, "either as foils for dynamic graphic processes or manifest a particular motion behavior intimate to their identity." All that is left of the Badlands are two buffalo that gallop in place and two simple gestures that suggest mountains, water and reflections: squiggly lines and a diamond shape that transforms into a ripple and floats offscreen. (The ripple, which Veeder refers to as a "frequency being," also represents a sinewave, a natural phenomenon found not only in the electronic domain but in water and erosion patterns as well.)

In place of the video camera are two simple icons that represent Veeder's evolution into computer graphics: a rotating constellation of mathematical signs floating cloudlike in a black void, and two white lines, one vertical, one horizontal, manifesting the x-y coordinates of the two-dimensional graphic space. A few diagonal grid patterns constitute the only other imagery, except for the outline of the artist's hand that periodically "wipes" the screen as a transitional device. *Floater* ends with a remarkable figure-ground reversal as a grid of black squares emerges from the black background, obliterating the image: the ground becomes a figure that is indistinguishable from the ground, and nothing is left.

The lyrical economy of gesture in *Floater* is strongly reminiscent of Robert Breer's *Gulls and Buoys*, while the rhythmic clustering of iconographic objects in a black void is as effective as Paul Glabicki's *Five Improvisations*; and the cyclical orchestration of the whole dance calls to mind Pat O'Neill's earlier films like *Downwind* and *Runs Good*. The sound for *Floater* was created simultaneously with the animation using the audio-synthesis chip (originally used for sound effects in those Bally arcade games) that is resident in the UV-1 system; in other words, the audio was built into the animation programs, sharing variables with them. The result is a beautiful composition of small, sensitively-chosen sonic events (Veeder calls them "skeletal figure-sounds"), punctuated with intervals of silence, that have a droning/ringing quality like musical Morse Code. It is a reminder that she is as talented a sound composer as she is a gifted visual artist.

Ultimately, of course, the images and sounds are all that matter: they are the whole point, the reason why Veeder is simply a good artist, computer or no computer. Indeed, 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. The use of the computer in the creation of animated graphics does not suddenly transform this noble tradition into "computer art"—it remains animation, whose status as art will ultimately be determined by art-historical concerns relevant to animation, not by any consideration of the computer as a creative instrument.

WARPITOUT

If there is an art unique to the computer, I suspect it will not have much to do with producing a drawing or sculpture or videotape; indeed it might not involve 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 commentaries and judgements we make as a consequence of being here (aesthetics, phenomenology). This is repeatedly confirmed by computer artists themselves, whose testimonies are almost always ontological, seldom aesthetic—always about the processes of producing art through conversation 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 *Warpitout* is such a brilliant approach to the idea of computer graphics.

Warpitout is an interactive installation in the form of an arcade game whose target is everyone's favorite image—their own. A menu-driven environment of programs written by Veeder in ZGRASS allows the "player"
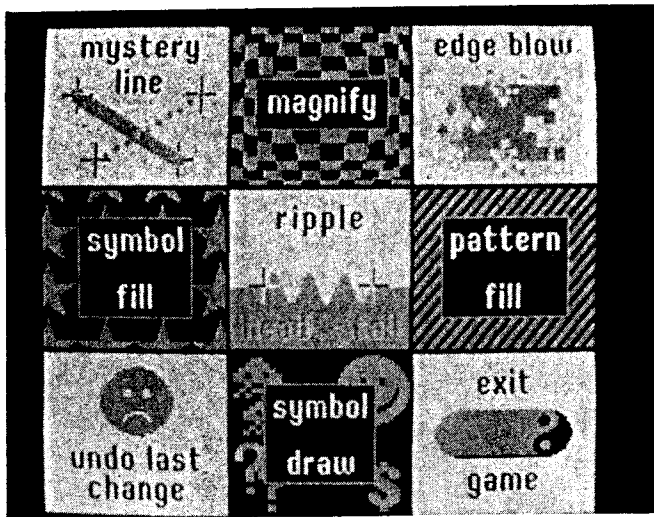
of *Warpitout* to make computer art with an image of their own face, experiencing interactive graphics much more directly than is possible in the restricted, essentially one-way environment of video games. The system is housed in a *Wizards of War* cabinet that contains a 21-inch TV screen with a black-and-white video camera mounted above it, aimed at the player. There's a joystick and two buttons; push one and your face is digitized. ("It's one of the few things I've ever done that only makes a still picture.") Next you select a color map and the image is colorized. Then you are presented with a main menu consisting of nine options for visually processing the image. The joystick is used to select a particular option. Some of them, such as *Symbol Draw, Symbol Fill* and *Pattern Fill,* cause secondary menus to be displayed; from these you either select objects to be drawn as foreground figures, or fill in areas of the image with symbols or patterns which thus become a background field. Still other options, like *Magnify, Ripple* and *Edge Blow* modify the image geometrically. For example, the *Ripple* option redraws a swatch between two points designated by the player using the joystick; the redrawing process is modulated by a sine wave, rippling the image.

Unfortunately, the arcade game metaphor of *Warpitout* will remain only a metaphor: it's too expensive to manufacture and too slow for commercial environments. "One-way stuff like arcade games have to be fast and snappy because one-way is boring," Veeder pointed out. "Also, arcades want to kill the kids off quickly so they can get the next quarter. But *Warpitout* doesn't destroy you—*you* get to destroy you, and you get to sit there and watch the computer do it. That's the joy of the whole thing. It's fascinating to watch it all unfold before you. It gives you this tremendous sense of power."

AUTONOMY: THE COMPUTER LIFESTYLE

Power is a word used frequently in reference to computers, and for good reason, since a computer is a universal machine that can contain and become all media, conferring autonomy upon the user and erasing the distinction between professional and amateur insofar as that is determined by the tools to which we have access as autonomous individuals. Jane Veeder is among a rap-idly-growing population of computer programmers who, by working at home with powerful personal tools, exemplify the emerging 'electronic cottage' lifestyle.

"I never visualized my future in career terms," she said, "you know, jobs. My images were always of pure lifestyle with no visible means of support. Pure lifestyle issues. I've never been able to get into the Professional world for more than a year at a time. I get dissatisfied. I can't possibly integrate those junk jobs into my life. But I *can* integrate the computer into my life. I can respect its power. There's something to deal with there. Who wouldn't want to integrate that kind of power with their life? I've always been into control, you know, and what better instrument than a computer? By teaming up with a computer and the ZGRASS language I have finally found a way to make being Jane Veeder a prime career slot."

She earns her living as a freelance graphics designer doing animated sequences for ads and spots, and as a programmer, writing programs for ZGRASS graphics packages. In computer jargon, a package is an environment, a collection of small programs that mediates between a user and the software language, in this case, ZGRASS. "My graphics packages stand between the user and ZGRASS the way ZGRASS stands between me and assembler code," she explained. "So I create environments for the ZGRASS user. I turn the computer and its controls into different things. You have menus and you choose stuff." The software modules for *Warpitout,* for example, were originally written as graphics packages for commercial applications.

"Being able to earn my living by sitting at home with my intelligent machine has made a huge difference," she said. "The sense of power and control over my life is immense . . . I want to evolve so far out there that I don't even know where I was before. I was reading recently some MIT pundit who was warning of the 'dangers' of using powerful interactive computer languages. One of the dangers he sees is that you get these feelings of powr. You start thinking that you're evolving into this sort of far-out electronic person. Well, the fact is that you *are!* And I mean what else do you want to do with your life?