31. [Introduction] Will There Be Condominiums in Data Space?

Video artists, and particularly interactive video artists, have developed approaches that can help us think about new media more broadly. For example, in the 1960s, when video seemed to be only lesser film for many people (less both in cost and value), artists began to explore the distinctive features of the video medium. They have continued their explorations as the technologies involved—cameras, editing systems, image synthesis equipment, screens and projectors—have evolved. Hans-Peter Schwarz notes, in his "MediaVisions" essay, that the early results began to call into question the sacrosanct status of montage, which had been central to film from the time of Eisenstein and Podovkin, in a manner even more fundamental than what experimental film had accomplished up to that time. Part of this was through exploration of immediacy—examples of which include Nam June Paik's immediately-screened video of the Pope's visit (◊15), Les Levine's self-surveillance installations at *Software* (◊16), and video environments in which artists presented images of the audience itself using different sorts of displacements in time and space: with a few second's delay, in a narrow corridor, while traversing a maze. Though television production had used the technologies of video for some time, artists' video reconfigured public and industrial conceptions of the video image—via means ranging from site-specific installations to the "music video" form.

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Bill Viola has been one of the highest-profile of video artists, allowing him to create, in recent years, what some have called "70 millimeter" video art—work in which video's lower cost is not a primary attraction for the artist, and the traditionally rough production values of video art are not present. However, what has remained consistent from Viola's grittier early work to his massive late-1990s retrospective at the Whitney Museum is a poetic approach to exploring the video medium. As Michael Rush wrote in his *New Media in Late 20th Century Art,* "Bill Viola's work, perhaps more than any other, represents the tendency toward the lyrical in art" (140).

This view of Viola's work is perhaps instructive when considering the essay reprinted here—for example, during his discussion of the MIT Media Lab's famous Aspen Movie-Map. The project was brilliant, but limited by the fact that it was structured around a video hardware hack (as discussed in Andrew Lippman's paper from SIGGRAPH 1980) which was mapped onto a navigation system meant to be as familiar as possible, so as to bring something already imagined to life. It remained for artists to seek, instead, surprise, and to create defamiliarizing forms of interaction that would allow the technology to be envisioned anew, instead of as a step toward making real what we already expected. The work of Lynn Hershman (◊44) and Grahame Weinbren are important artist-led explorations of interactive techniques and structures that, as Viola discusses, go beyond the basic branching flowchart, a structure that had been applied to narrative two decades before by Raymond Queneau (◊12)

Documentation of the Aspen Movie-Map project is included on the CD, as is documentation of Hershman and Weinbren's work.

Hershman and Weinbren's work, as well as Viola's own, relates to the Aspen project or commercial interactive video as poetry relates to an instruction manual or brochure. An instruction manual that makes us consider language anew is usually a failure—such a document must be transparent in order to be effective. Of course, the creation of effective structures for such manuals is a formidable challenge, and such documents are essential. But few would wish to live in a culture in which our ability to understand and use language was limited to what is evoked by such documents.
—NWF

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Yet there are certain works that blur the boundary between poetry and instruction manuals: Julio Cortázar's unusual "Instruction Manual" is one.

Further Reading

Lippman, Andrew. "Movie Maps: An Application of the Optical Video Disk to Computer Graphics." *Computer Graphics* 14, no. 3 (1980).

Rush, Michael. *New Media in Late 20th-Century Art*. New York: Thames and Hudson, 1999.

Schwarz, Hans-Peter, ed. *Media-Art-History: Media Museum: ZKM—Center for Art and Media Karlsruhe*. New York: Prestel Publishing, 1997.

Original Publication

Video 80(5): 36-41. 1982. This text from Bill Viola, *Reasons for Knocking at an Empty House,* 121–135. Ed. Robert Violette. Cambridge: MIT Press, 1995.

Will There Be Condominiums in Data Space?

Bill Viola

Possibly the most startling thing about our individual existence is that it is continuous. It is an unbroken thread—we have been living this same moment ever since we were conceived. It is memory, and to some extent sleep, that gives us the impression of a life of discrete parts, periods, or sections, of certain times or "highlights." Hollywood movies and the media, of course, reinforce this perception.

If things are perceived as discrete parts or elements, they can be rearranged. Gaps become most interesting as places of shadow, open to projection. Memory can be regarded as a filter (as are the five senses)—it is a device implanted for our survival. The curse of the mnemonist is the flood of images that are constantly replaying in his brain. He may be able to demonstrate extraordinary feats of recall, but the rest of the banal and the mundane is playing back in there too, endlessly. The result can be lack of sleep, psychosis, and even willful death, driving some to seek professional psychiatric help (and thus become history on the pages of medical journals and books).[1] This reincarnates one of the curses of early video art—"record everything," the saturation-bombing approach to life which made so many early video shows so boring and impossible to sit through. Life without editing, it seems, is just not that interesting.

It is only very recently that the ability to forget has become a prized skill. In the age of "information overload," we have reached a critical mass that has accelerated the perfection of recording technologies, an evolution that leads back to ancient times. Artificial memory systems have been around for centuries. The early Greeks had their walks through temple,[2] and successive cultures have refined and developed so-called "mnemo-technics"—Thomas Aquinas described an elaborate memory scheme of projecting images and ideas on places (fig. 31.2); in 1482 Jacobus Publicius wrote of using the spheres of the universe as a memory system (fig. 31.2); Giulio Camillo created a "Memory Theater" in Italy in the early 1500s; and Giordano Bruno diagrammed his system of artificial memory in his work *Shadows,* published in 1582. Frances Yates describes this entire remarkable area in her brilliant book *The Art of Memory* (University of Chicago Press, 1966).

When I was in Japan in 1981, I visited a festival of the dead at one of the most sacred places in the country, Osoresan Mountain. There I saw blind female shamen called *itako* calling back the spirits of the dead for inquiring relatives, a centuries-old practice. Until that time I had felt that the large Japanese electronics companies were way ahead in the development of communications technology. After witnessing the *itako,* however, I realized they were way behind. Right in their own backyard were people who, without the aid of wires or hardware of any sort, have been for ages regularly communicating through time and space with ancestors long gone. An interesting place at the temple site (which was

Figure 31.1. Tibetan Buddhist monks from Ladakh making a sand mandala.

perched in the surreal landscape of an extinct volcanic crater) was a special walk for the visiting pilgrims to take along a prescribed trail. The way led from the temple through a volcanic wasteland of rockpiles and smoking fissures to the shores of a crater lake. It was called "the walk through Hell." The path through the landscape and the points along it all had special significance. The *itako,* to call up the dead, took this "walk through Hell" in their minds, bringing the spirits in along the familiar path, and when they were through, sent them back the same way.

The interesting thing about idea spaces and memory systems is that they presuppose the existence of some sort of place, either real or graphic, which has its own structure and architecture. There is always a whole space, which already exists *in its entirety,* onto which ideas and images can be mapped, using only that portion of the space needed.

In addition to the familiar model of pre-recorded time unfolding along a linear path (as evidenced by many things from our writing system to the thread of magnetic tape playing in a videotape recorder), there is another parallel to be linked with modern technology. "Data space" is a term we hear in connection with computers. Information must be entered into a computer's memory to create a set of parameters, defining some sort of ground, or field, where future calculations and binary events will occur. In three-dimensional computer graphics, this field exists as an imaginary but real chunk of space, a conceptual geometry, theoretically infinite, within which various forms may be created, manipulated, extended, and destroyed. The graphics display screen becomes that mysterious third point of view looking in on this space (we often call it our "mind's eye"), which can be moved about and relocated from any angle at will. The catch is that the space must exist in the computer first, so that there is a reference system within which to locate the various coordinates of points and lines called into being by the operator. In our brain, constantly flickering pulses of neuron firings create a steady-state field onto which disturbances and perturbations are registered as percepts and thought forms. This is the notion that something is already "on" before you approach it, like the universe, or like a video camera which always needs to be "video-ing" even if there is only a blank raster ("nothing") to see. Turn it off, and it's not video anymore.

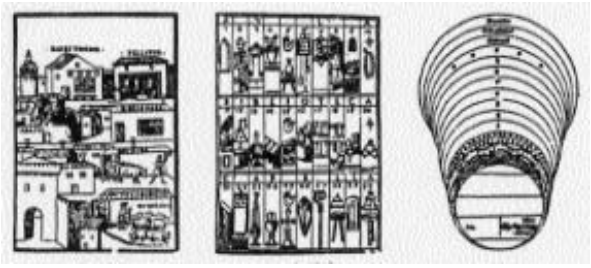

Figure 31.2. Left and middle: Abbey memory system, and images to be used in the Abbey memory system. From Jahannes Rombach, Congestorium Artificiose Memorie, Venice, 1533. Right: The Spheres of the Universe as a Memory System, from Jacobus Publicus, Oratoriae artis epitome, 1482.

When I had my first experience with computer videotape editing in 1976, one demand this new way of working impressed upon me has remained significant. It is the idea of holism. I saw then that my piece was actually finished and in existence *before* it was executed on the VTRs. Digital computers and software technologies are holistic; they think in terms of whole structures. Wordprocessors allow one to write out, correct, and rearrange the *whole* letter before typing it. Data space is fluid and temporal, hardcopy is for real—an object is born and becomes fixed in time. Chiseling in stone may be the ultimate hard copy.

When I edited a tape with the computer, for the first time in my life I saw that my video piece had a "score," a structure, a pattern that could be written out on paper. We view video and film in the present tense—we "see" one frame at a time passing before us in this moment. We don't see what is before it and what is after it—we only see the narrow slit of "now." Later, when the lights come on, it's gone. The pattern does exist, of course, but only in our memory. Notation systems have been around since the beginning of history, since what we call history *is* notation of events in time, i.e., historical "records." With speech we have graphic writing systems; with music we have the score. They are both symbolic coded systems for the recording and later playback of information events in time. Poetry has always had a level that video or film cannot approach (at least not yet): the existence of the words on paper (how the poem looks, how the words are placed on the page, the gaps, the spacing, etc.). The whole poem is there before us, and, starting at the top of the page, we can see the end before we actually get there.

Our cultural concept of education and knowledge is based upon the idea of building something up from a

ground, from zero, and starting piece by piece to put things together, to construct edifices. It is additive. If we approach this process from the other direction, considering it to be backwards, or subtractive, all sorts of things start to happen. Scientists always marvel at nature, at how it seems to be some grand code, with a built-in sense of purpose. Discoveries are made which reveal that more and more things are related, connected. Everything appears to be aware of itself and everything else, all fitting into an interlocking whole. We quite literally carve out our own realities. If you want to make a jigsaw puzzle, you must first start with the whole image, and *then* cut it up. The observer, working backwards into the system, has the point of view that he or she is building things up, putting it together piece by piece. The prophet Mohamed has said, "All knowledge is but a single point—it is the ignorant who have multiplied it."

The Whole Is the Sum of Its Parts

> A friend of mine is an ethnomusicologist who spent several years studying the gamelan music of Central Java. He was trained in Western music in the States, and spent many years working on his own compositions and performing with other musicians. One of the most frustrating things about his studies in Java, he told me, was trying to work on specific parts of songs with the gamelan musicians. Once they were at a rehearsal, and after running through a piece, he asked them to play only a section from the middle so that he could make sure he got all the notes right. This proved to be an impossible request. After a lot of hemming and hawing, excuses, and several false starts, he realized that the group just could not do it. They insisted on playing the entire piece over again, from beginning to end. In Java, the music was learned by rote, from many years of observation and imitation, not from written notation. The idea of taking a small part out of context, or playing just a few bars, simply did not exist. The music was learned and conceived as a whole in the minds of the musicians.

Giulio Paolini, the contemporary Italian artist, made a little-known but far-reaching videotape in the mid-seventies. It was his first and only tape. Working at an experimental video studio in Florence in the cradle of Western art, he, like many other European artists who visited the art/tapes/22 studio, had his first encounter with video. Instead of simply re-translating into video what he had already been doing before, as most other artists had done, Paolini intuitively recognized the great power underlying the recording media. He took the slides of all his work, most of the pieces he had ever made, and recorded them one at a time on each frame of video. Playing back this tape, the viewer sees 15 years of Paolini's art, his life's work, go by in less than a minute. Poof! It's gone.

It is slowly becoming clear that structuralism, currently out of fashion in the fashion-conscious, ever shifting spotlight of the art world, must be reconsidered. It is vital. However, this new structuralism is not the same as the often over-intellectualized, didactic, structuralism-for-structuralism's-sake that took center stage in the art scene over a decade ago (most visibly through the work of experimental filmmakers). In retrospect, however, the core ideas being expressed then certainly remain important, and perhaps could only have emerged in the way they did given that particular place and moment in cultural time. Furthermore, the anti-content messages that have been espoused in various fields of art in the twentieth century also continue to merit attention. We have all been made aware that, since the Renaissance, Western eyes have been drawn to the visual, to the surface appearance of the world. "Realism" came to mean how something appeared to the eye alone. Looking at the Gothic art before it, along with Asian and so-called Primitive or Tribal Art, it is clear that something fundamental is missing. However, from our viewpoint today, it is also clear that pure structuralism alone is no answer either.

> Decadent art is simply an art which is no longer felt or energized, but merely denotes, in which there exists no longer any real correspondence between the formal and pictorial elements, its meaning, as it were, negated by the weakness or incongruity of the pictorial element; but it is often . . . *far less* conventional than are the primitive or classic stages of the same sequence. True art, pure art, never enters into competition with the unattainable perfection of the world.[3]
>
> —A.K. Coomaraswamy

Structure, or form, has always been the basis of the original pictorial art of both Europe and the East, but the Middle Ages were the last time when both Europe and Asia met on common artistic ground.

31. Condominiums in Data Space?

> In Western art, the picture is generally conceived as seen in a frame or through a window, and so brought towards the spectator; but the Oriental image really exists only in our mind and heart and thence is projected or reflected into space.
>
> The Indian, or Far Eastern icon, carved or painted, is neither a memory image nor an idealization, but a visual symbolism, ideal in the mathematical sense. . . . Where European art naturally depicts a moment of time, an arrested action, or an effect of light, Oriental art represents a continuous condition. In traditional European terms, we should express this by saying that modern European art endeavors to represent things as they are in themselves, Asiatic and Christian art to represent things more nearly as they are in God, or nearer their source.
>
> —A.K. Coomaraswamy

The idea of art as a kind of diagram has for the most part not made it down from the Middle Ages into modern European consciousness. The Renaissance was the turning point, and the subsequent history of Western art can be viewed as the progressive distancing of the arts away from the sacred and towards the profane. The original structural aspect of art, and the idea of a "data space" *was* preserved through the Renaissance, however, in the continued relation between the image and architecture. Painting became an architectural, spatial form, which the viewer experienced by physically walking through it. The older concept of an idea and an image architecture, a memory "place" like the mnemonic temples of the Greeks, is carried through in the great European cathedrals and palaces, as is the relation between memory, spatial movement, and the storage (recording) of ideas.

Something extraordinary is occurring today, in the 1980s, which ties together all these threads. The computer is merging with video. The potential offspring of this marriage is only beginning to be realized. Leaping directly into the farther future for a moment, we can see the seeds of what some have described as the ultimate recording technology: total spatial storage, with the viewer wandering through some three-dimensional, possibly life-sized field of prerecorded or simulated scenes and events evolving in time. At present, the interactive video discs currently on the market have already begun to address some of these possibilities. Making a program for interactive video disc involves the ordering and structuring (i.e., editing) of much more information than will actually be seen by an individual when he or she sits down to play the program. All possible pathways, or branches, that a viewer ("participant" is a better word) may take through the material must already exist at some place on the disc. Entire prerecorded sections of video may never be encountered by a given observer.

Soon, the way we approach making films and videotapes will drastically change. The notion of a "master" edit and "original" footage will disappear. Editing will become the writing of a software program that will tell the computer how to arrange (i.e., shot order, cuts, dissolves, wipes, etc.) the information on the disc, playing it back in the specified sequence in real time or allowing the viewer to intervene. Nothing needs to be physically "cut" or re-recorded at all. Playback speed, the cardinal 30 frames a second, will become intelligently variable and thus malleable, becoming, as in electronic music practice, merely one fundamental frequency among many which can be modulated, shifted up or down, superimposed, or interrupted according to the parameters of electronic wave theory. Different sections can be assigned to play back at specific speeds or reversed; and individual frames can be held still on the screen for predetermined durations. Other sections can be repeated over and over. Different priorities rule how and in what order one lays material down on the "master" (disc). New talents and skills are needed in making programs—this is not editing as we know it. It was Nikola Tesla, the original uncredited inventor of the radio, who called it "transmission of intelligence." He saw something there that others didn't. After all these years, video is finally getting "intelligence," the eye is being reattached to the brain. As with everything else, however, we will find that the limitations emerging lie more with the abilities and imaginations of the producers and users, rather than in the tools themselves.

As in the figure/ground shifts described in Gestalt psychology, we are in the process of a shift away from the temporal, piece-by-piece approach of *constructing* a program (symbolized by the camera and its monocular, narrow, tunnel-of-vision, single point of view), and towards a spatial, total-field approach of *carving out* potentially multiple programs (symbolized by the computer and its holistic software models, data spaces, and infinite points of view). We are proceeding from models of the eye and ear to models

of thought processes and conceptual structures in the brain. "Conceptual Art" will take on a new meaning.

As we take the first steps into data space, we discover that there have been many previous occupants. Artists have been there before. Giulio Camillo's Memory Theater (which he actually constructed in wood, calling it a "constructed body and soul") is one example. Dante's *Divine Comedy* is another. Fascinating relationships between ancient and modern technologies become evident. A simple example can be found in the Indian Tantric doctrine of the three traditional expressions of the deity: the anthropomorphic, or visual, image; the yantra, or geometric "energy" diagram (fig. 31.3); and the mantra, or sonic representation through chanting and music. It is interesting to note that these are all considered to be equal—simply outward expressions of the same underlying thing. In form, this is not unlike the nature of electronic systems: the same electronic signal can be an image if fed into a video monitor, an energy diagram if fed into an oscilloscope, and a sequence of sounds if fed into an audio system.

Today, there are visual diagrams of data structures already being used to describe the patterns of information on the computer video disc. The most common one is called "branching," a term borrowed from computer science (fig. 31.4). In this system, the viewer proceeds from top to bottom in time, and may either play the disc uninterrrupted (arrow), or stop at predetermined branching points along the way and go off into related material at other areas on the disc for further study (like a form of "visual footnoting.") Examples of this system go something like—in a program on the desert, the viewer can stop at a point where plants are mentioned, and branch off to more detailed material on the various flora of the valley floor, etc. Although it is clear how this can enhance our current educational system, freeing students from boring and incompetent teachers so they can proceed at their own pace through information which now contains movement, dynamic action, and sound in addition to written words, artists know that there must be more out there than this. Even though the technology is interactive, this is still the same old linear logic system in a new bottle.

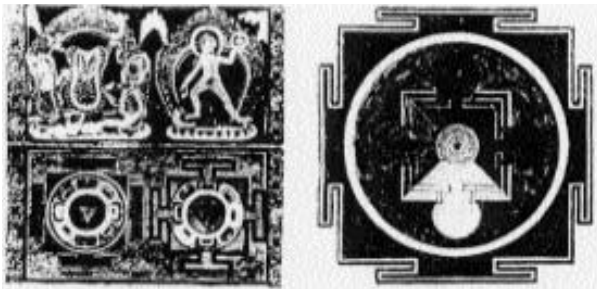

Figure 31.3. Left: Two deities and yantra diagrams of the same two deities. From a Nepalese illustrated manuscript, c.1760. Right: Ground plan of a temple.

As a start, we can propose new diagrams, such as the "matrix" structure (fig. 31.4). This would be a non-linear array of information. The viewer could enter at any point, move in any direction, at any speed, pop in and out at any place. All directions are equal. Viewing becomes exploring a territory, traveling through a data space. Of course, it would not be the obviously literal one like the Aspen project.[4] We are moving into *idea* space here, into the world of thoughts and images as they exist in the brain, not on some city planner's drawing board. With the integration of images and video into the domain of computer logic, we are beginning the task of mapping the conceptual structures of our brain onto the technology. After the first TV camera with VTR gave us an eye connected to a gross form of non-selective memory, we are now at the next evolutionary step—the area of intelligent perception and thought structures, albeit artificial.

Finally, we can envision other diagrams/models emerging as artists go deeper into the psychological and neurological depths in search of expressions for various thought processes and manifestations of consciousness. Eventually, certain forms of neurosis, so long the creative fuel of the tormented artist in the West, may be mapped into the computer disc. We may end up with the "schizo" or "spaghetti" model, in which not only are all directions equal, but all are not equal (fig. 31.4). Everything is irrelevant and significant at the same time. Viewers may become lost in this structure and never find their way out.

Worlds are waiting to be explored. It is to be hoped that artists will be given their share of access to experiment with this exciting new technology. I recently had a glimpse of some of the possibilities for art when I met a designer who had first encountered computers while working at a large French fashion design firm in New York. There, the graphics artist worked at computer terminals. With a light-pen, he could draw various designs, working with functions of computer memory and data manipulation. Furthermore, his

terminal was linked to a large databank of fabric designs and images from around the world and throughout history. After completing a sketch, for example, he could call up a seventeenth-century Japanese kimono design, look at it or superimpose it with his own idea. Then he could call up a turn-of-the-century European dress pattern, combine that with his design or integrate it with the kimono, all the while storing the various stages in memory. When all of this was completed and the final design chosen, he could then tie into other offices in Europe and the Orient right on the same screen. Designers could compare notes, get availability data on his fabric from the mills (i.e., where is the best silk, who has stock, what is the order time, etc.). All phases of his work could occur on the same screen as digital information. He could travel in space (Europe, the Far East), as well as in time (art history), all in an instant and available either as written text or visual images.

Despite the anti-technology attitudes which still persist (some, it should be added, for very good reasons), the present generation of artists, filmmakers, and video-makers currently in school, and their instructors, who continue to ignore computer and video technology, will in the near future find that they have bypassed *the* primary medium, not only of their own fields, but of the entire culture as well. It is imperative that creative artists have a hand in the developments currently underway. Computer video discs are being marketed as a great new tool in training and education. At this moment, there are creative people experimenting with the technology, ensuring that innovative and unique applications will emerge; but for now, many of the examples return to the boring domain of linear logic in the school classroom. The Aspen city map project is perhaps one of the more interesting examples of new program formats. We are at the beginning, but even so, for the artist, standard educational logic structures are just not that interesting. Artists have been to different parts of the brain, and know quite well that things don't always work like they told you in school.

It is of paramount importance now, as we watch the same education system that brought us through school (and the same communications system that gave us the wonderful world of commercial TV and AM radio) being mapped onto these new technologies, that we go back and take a deeper look at some of the older systems described in these pages. Artists not shackled to the fad and fashion treadmill of the art world, especially the art world of the past few years, will begin to see the new meaning that art history is taking on. As I have begun to outline in this article, the relation between the image and architecture (as in Renaissance art), the structuralism of sacred art (Oriental, Early Christian, and Tribal art, with their mandalas, diagrams, icons, and other symbolic representations, including song, dance, poetry), and artificial memory systems (the first recording technologies from the time of the Greeks through the Middle Ages), are all areas that require further investigation.

As we continue to do our dance with technology, some of us more willingly than others, the importance of turning back towards ourselves, the prime mover of this technology, grows greater than the importance of any LSI circuit. The sacred art of the past has unified form, function, and aesthetics around this single ultimate aim. Today, development of self must precede development of the technology or we will go nowhere—there *will* be condominiums in data space (it has already begun with cable TV). Applications of tools are only reflections of the users—chopsticks may be a simple eating utensil or a weapon, depending on who uses them.

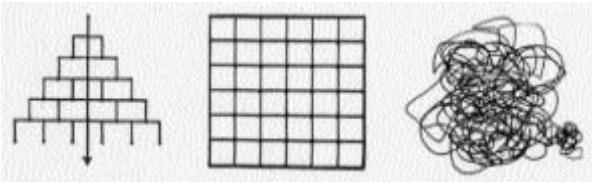

Figure 31.4. Branching Structure, Matrix Structure, Schizo Structure.

The Porcupine and the Car

Late one night while driving down a narrow mountain highway, I came across a large porcupine crossing the road up ahead. Fortunately, I spotted him in time to bring the car to a stop a short distance from where he was standing. I watched him in the bright headlights, standing motionless, petrified at this "close encounter of the third kind." Then, after a few silent moments, he started to do a strange thing. Staying in his place, he began to move around in a circle, emitting a raspy hissing sound, with the quills rising up off his body. He didn't run away. I realized that this dance was actually a move of self-defence. I cut the car headlights to normal beams, but he still

> continued to move around, even more furiously, casting weird shadows on the trees behind. Finally, to avoid giving him a heart attack, and to get home, I cut the lights completely and turned off the engine. I watched him in the dim moonlight as he stopped his dance and moved off the road. Later, while driving off, I realized that he was probably walking proudly away, gloating over how he really gave it to that big blinding noisy thing that rushed toward him out of the night. I'm sure he was filled with confidence, so pleased with himself that he had won, his porcupine world-view grossly inflated as he headed home in the darkness.

Notes

1. A.R. Luria, *The Mind of the Mnemonist* (New York: Basic Books, 1968).

2. The Greeks perfected a system of memory that used the mental imprinting of any objects or key points to be remembered onto specific locations along a pathway previously memorized from an actual temple. To recall the points in their proper order, one simply had to take the walk through the temple in one's mind, observing the contents left at each location along the way.

3. A.K. Coomaraswamy, *The Transformation of Nature in Art* (New York: Dover Publications, 1956). (Reprint of the original Harvard University Press edition, Boston, 1934.)

4. A landmark interactive laserdisc project by MIT Media Lab, in the late 1970s, that mapped the city of Aspen, street by street, with moving cameras so that the viewer could take a "ride" through the city, going anywhere at will—one of the first visual-mapping database moving-image projects related to data space ideas and today's virtual reality technology.