

Art and Technology: The Panacea That Failed

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Today's science has spawned a wealth of technical gadgetry, while on the other hand, modern visual artists have been notoriously unsuccessful in utilizing much of it in the making of socially acceptable art. Why should it be so? Some forms of technology seem to lend themselves to art which has gained museum status, yet even with the aid of millions of dollars in grants and private donations (plus the assistance of some of the biggest names in contemporary American art, e.g., Rauschenberg, Oldenburg, Warhol, Kaprow, Lichtenstein, Morris, and Smith), the results have fared from mediocre to disastrous when artists have tried to use what has euphemistically been referred to as the electronic technology of "postindustrial culture."

Precisely what succeeds in the context of art and what fails? Simple mechanical devices based on balanced catenary links such as Alexander Calder's mobiles or George Rickey's weighted blades seem to be the only kinetic sculpture fully accepted by the art world. In terms of luminous sculpture (which saw a dazzling revival in the 1960s), only Dan Flavin's unexotic fluorescent fixtures have gained permanent status in museum collections. Certain hand-manipulated objects such as the water boxes of Hans Haacke, the optical reliefs of Jesus Soto, and the Signals of the Greek Takis have some artistic validity. Curiously enough, the only machine-driven or electrically powered art that has maintained its status through the 1970s are the fantastic robots and constructions of the Swiss

Jean Tinguely, which are programmed in many instances to break down or malfunction. It must be remembered that during the 1920s Francis Picabia, Max Ernst, Man Ray, Marcel Duchamp, and Tristan Tzara joined in the systematic subversion of the machine as an artistic force. Moreover, one wonders if the Constructivist-Dadaist Congress in Weimar in 1922, was really an accident of accommodation as some of the participants later insisted, or if there was subconscious and interior motivation to the juxtaposition of Dada's brand of chaotic destruction with the mechanistic ideology of Constructivism. Why should the only successful art in the realm of twentieth-century technology deal with the absurdity and fallibility of the machine? And why should electrical and electronic visual art prove to be such a dismal failure?

At its ideological core, advanced technology has always maintained some of the chimerical effect that the perpetual motion machine had before the twentieth century; we are led to believe in its eternal stability, omnipotence, and its ability to perpetuate human enlightenment. We have been seduced into not doubting technology's efficacy because of its palpable short-term advantages. Yet why have the majority of artists spurned advanced technology, and why have others so bungled its use in producing new art forms? Is it possible that the schism between art and sophisticated technology is far deeper than we suspect, that, in fact, these differences may lie embedded in the neural programs of artists' and scientists' minds? Or are there teleological reasons for this schism, perhaps based on the theological foundations of the Judaic-Christian tradition? If so, let us review some of the recent evidence before surmising the reasons for it.

In Paris the dealer Denise Renée opened an exhibition entitled "Le Mouvement" in 1953 with the help of K.G. Pontus Hultén and her partner Victor Vasarely. Included in "Le Mouvement" were Duchamp, Soto, Tinguely, Calder, Bury, and Agam. In March of 1961 the first "International Exhibition of Art and Motion" opened at the Stedelijk Museum in Amsterdam where it caused a *succès de scandale* for the organizers, in part because of the public response and the bitter tensions which prevailed between the Neo-Dadaists and the kinetic Constructivists. In April of that same year the Australian sculptor Len Lye mesmerized an audience at the Museum of Modern Art in New York City with an evening of "Revolving Harmonic" polished rods which created virtual forms at various speeds. Thus began a propensity for art in motion and light during the last decade which in 1967 *Time* magazine was to caption "The Kinetic Craze." The rationale behind much of this esthetic was a simple one; namely, if so much of twentieth-century art was concerned with the depicted effects of light and movement, then

why not produce art which literally relied on light and movement?

Until the early 1960s museums and galleries had tended to emphasize the historical aspects of light and movement. Technically this involved simple motor-driven devices, motorized light boxes, and various static light sources such as neon, incandescent and fluorescent fixtures. Following the Amsterdam Retrospective and an outstanding kinetic display at the 1964 Documenta III exhibition in Kassel, West Germany, the tendency moved towards an escalation of technical means, with a concurrent emphasis on collaborations between artists and research and engineering personnel. By the mid-1960s a division had developed between the earlier "machine art" and what could be defined as "systems and information technology." The latter includes artists' use of computer and online display systems, laser and plasma technology, light and audio-sensor controlled environments, all levels of video technology, color copy duplicating systems, programmed strobe and projected light environments using sophisticated consoles, and artificially controlled ecological sites. The definitive boundary line between the old and new technologies probably came with the New York Museum of Modern Art's 1968 exhibition "The Machine as Seen at the End of the Mechanical Age."

At this point it might prove beneficial to touch upon five major art and technology projects with which I have been tangentially or directly concerned. In some instances financial support or approximate budgets have been supplied. These are given to provide some yardstick with which to compare costs relative to standard museum exhibitions. If final evaluations for most of these projects appear overly negative, it should be remembered that these also express the general consensus of the art community and not just my opinion.

I. Experiments in Art and Technology

Dr. Billy Kluver, a Bell Telephone Laboratories' scientist specializing in laser research, had worked with top-level artists all over the world since the late 1950s when he had been an adviser for K.G. Hultén's kinetic exhibition in Amsterdam. In 1965, along with John Cage and Robert Rauschenberg, Kluver began to organize an art and technology extravaganza which became the ill-fated "Nine Evenings: Theater and Engineering," presented at the 69th Regimental Armory in New York City in October of 1966. Kluver, with the aid of some of the most prestigious names in American art, gained the support of some thirty patrons and sponsors amounting to over \$100,000. The donated engineering aid was probably worth at least \$150,000.

Each evening of "Nine Evenings" presented one or two uniquely

designed “pieces,” including large scale inflatable structures, radio-controlled dance vehicles, audio-magnified tennis games, infra-red projected “work tasks” performed in the dark, and complex musical pieces synthesized from a number of live external sources. On October 15 the theater critic Clive Barnes reported on the first performance of “Nine Evenings”; his view was more or less typical of the general audience response, particularly that of other artist spectators:

If the Robert Rauschenberg work, “Open Score,” had been a big and glorious fiasco—the kind of thing people write about in years to come rather than the next morning—it could have been a kind of little triumph. But in fact it was such a sad failure, such a limp disaster, more like an indiscretion than an offense. The level of the technology was such that the performance started 40 minutes late, a 15-minute intermission lasted 35 minutes and even a loud speaker announcement was so indistinct on the apparently unsound sound equipment that it became unintelligible. God bless American art, but God help American science.¹

Barnes later pointed out that “Nine Evenings” was not so much an experiment in theater and engineering as it was an experiment in sociology, since it would take a particularly perverse audience to sit through and endure anything so feeble. Later defenders of “Nine Evenings,” such as the critic Douglas Davis, alluded to the overall complexity and uniqueness of each performer’s support system. “There was, to begin with,” Davis has written, “the patchboard system. Each artist’s performance was prewired; all of his equipment could be hooked up by inserting his particular patchboard. The system included amplifiers, relay decoders, tone-control units, transmitters and receivers; it also included a ‘proportional control’ network that made it possible to change the intensity and volume of both light and sound by moving a flashlight over sixteen photocells. . . .”² Kluver and his associates insisted that “Nine Evenings” had been a qualified success, based on the excellent rapport that developed between some artists and engineers working out problems on an intimate basis, and indeed, this has become the major rationale for claiming success for many subsequent art and technology mergers.

In January of 1967 Kluver and a group of associates published their first *E.A.T. News* bulletin as an outgrowth of “Nine Evenings.” The public function of Experiments in Art and Technology Inc. was to act as a service organization, to make materials, technology, and engineering advice available to contemporary artists. Because of its governmental and

¹ Clive Barnes, “Dance of Something at the Armory,” *New York Times*, 15 Oct. 1966, p. 88.

² Douglas Davis, *Art and the Future: A History/Prophecy of the Collaboration Between Science, Technology, and Art* (New York: Praeger, 1973), p. 69.

corporate ties, E.A.T. felt that it was in an ideal position to act as a liaison between artists and desired industries. Working from a Manhattan loft, E.A.T. held a number of seminars, lectures, and demonstrations for interested parties, and produced "Some More Beginnings" at the Brooklyn Museum in 1968. By 1970 Kluver and key members of E.A.T. had so proselytized on a nation-wide basis that according to their files they had upwards of 6,000 members, reportedly half artists and half engineers. No doubt, E.A.T.'s greatest success was its ability to extract relatively large sums of money from the National Endowment for the Arts, the New York Arts Council, large corporations, and various patrons of the arts. Technology seemed to be the key to loosening all sorts of purse strings. If business had been the business of the United States in the 1920s, surely in the 1960s the business of the United States was to acquiesce to the mystique of technology, as epitomized by the use of the "automated battlefield" and systems analysis during the Vietnam War.

The reputation of E.A.T. was irreparably hurt by its rupture with the Pepsi-Cola Company when it planned to produce an art and technology pavillion for *Expo '70* at Osaka, Japan. As Calvin Tomkins elaborates in his brilliant article for *The New Yorker*, "Onward and Upward with the Arts," the E.A.T. people, after many delays and financial fiascos in Osaka, presented Pepsi in April, 1970 with a maintenance contract for \$405,000; the previously proposed sum had been \$185,000.³ Pepsi pulled out and E.A.T. gradually lost its image as a corporate mediator. Outside New York City, artist members of E.A.T. began to grumble that they were merely statistical fodder for E.A.T.'s grant proposals and that most of their serious requests to E.A.T. were simply ignored or bypassed with form letters. Once the word penetrated the art world that E.A.T. was an "elitist" organization, simply catering to the needs of its own staff and a few favored big-time artists in the New York area, its national demise was insured.

II. Cybernetic Serendipity

The first large-scale exhibition of "post-machine" art was held at the Institute of Contemporary Arts in London during the summer of 1968. Entitled "Cybernetic Serendipity," it was curated by Jasia Reichardt, an imaginative writer and vital force on the London art scene. Her catalogue-book contains a good layman's account of the historical development of digital computers, some relevant scientific projects, plus various experiments by artists that utilize feedback in machines. Other exhibits in "Cybernetic Serendipity" included computer printouts of musical

³Calvin Tomkins, "Onward and Upward with the Arts," *The New Yorker*, 3 Oct. 1970, pp. 83 ff.

analysis, computer-designed choreography, and computer generated texts and poems. But the I.C.A.'s exhibition was produced on a shoe-string budget: it did not use on-site computers or terminals and much of the available equipment was loaned. Moreover, when the exhibition was shipped to the Corcoran Gallery of Art in Washington D.C. the following year, a considerable portion of the contents was destroyed because of poor packing and handling. Several unpaid electrical engineers spent months salvaging parts of "Cybernetic Serendipity" for the opening, but Jasia Reichardt publicly disowned what was shown there.

III. Software

During the winter of 1969, Karl Katz, the director of the Jewish Museum in New York City, decided to mount a major exhibition based on computer technology and chose me to curate what was to become the first computerized art environment within a museum. "Software" did not open, however, until September of the following year. When I accepted, I hardly realized that the project would consume a year and a half of my life. Problems surfaced at every turn, ranging from dilemmas of conception and budgetary restrictions to malfunctioning of equipment and possibly even sabotage.

First, in planning the content of "Software," I was faced with an obvious quandary. At least two-thirds of extant "computer-art" consisted of computer programs designed to simulate existing art styles. Early on the use of the digital computer as a generative tool for creating art or music had been noted by Dr. John R. Pierce of Bell Labs. This was the case in the work of John Whitney, for example, who in the early 1960s began to program geometrical computer graphics using I.B.M. equipment. Similarly, Michael Noll had created a series of linear variations on known modernist masterpieces by using a line plotter. And there were many others: Kenneth Knowlton and Leon Harmon, Charles Csuri and Harold Cohen, to name only a few. But in spite of a wealth of official financial aid during the 1960s and early 1970s, most computer artists became profoundly disillusioned with the creative potential of tools. As Michael Noll admitted as early as 1970, "The computer has only been used to copy aesthetic effects easily obtained with the use of conventional media, although the computer does its work with phenomenal speed and eliminated considerable drudgery. The use of computers in the arts has yet to produce anything approaching entirely new aesthetic experience."⁴ And in fact, except for the magazine, *Leonardo*, edited by the aeronautics engineer Frank Malina, the art world has been consistently unanimous in its refusal to recognize or in any way support computer-

⁴Davis, p. 111.

based art. With all this in mind, I decided with "Software" to forget about "art" as such and to concentrate on producing an exhibition that was educational, viewer interactive, and open to showing information processing in all its forms.

Sponsored by the American Motors Corporation through the agency of Ruder & Finn Fine Arts, a public relations firm, "Software's" initial budget was \$60,000, not a princely sum, we were to learn, for an exhibition which expected to house four computers. The Jewish Museum expected substantial help from some of the smaller computer firms, companies specializing in software design, and various university departments that relied heavily on computer technology. I.B.M., we were told, was willing to pick up the tab for all of the exhibition's hardware and software. But the Museum and American Motors correctly perceived that "Software" would all too readily become a prime-time commercial for I.B.M. and thus the offer was rejected. However, two months before the opening of "Software"—with eight major computerized exhibits—we decided that an extra \$15,000 was an absolute necessity to sustain the show through a two-month exhibition period. American Motors generously added this money to our budget of \$60,000. And without the donated support of various corporations such as Digital Equipment Corporation, 3M Company, Interdata, Mohawk Data Systems, two members of the Smithsonian Institution design staff, and sundry individuals in the computer field, it is doubtful that "Software" could have been mounted for less than \$25,000. Yet even after our major computer, the PDP-8, had been reprogrammed a second time, it took several D.E.C. engineers six weeks to make both "Labyrinth" (the interactive catalogue) and related exhibits operational. The computer's failure to function was a mystery to everyone and a source of embarrassment to D.E.C.

This was not the only operational difficulty. The day before "Software" opened, the exhibit which one encountered upon entering the show's space—a darkened pentagon of five film loops which showed artists working or explaining their conception of "Software"—was destroyed by two of the filmmakers themselves. Involved in a dispute over titling and finances with the producer of the films, they cut the five films to pieces; it took three weeks to resolve these problems and make copies from the master prints. And the night before "Software" opened, a janitor sweeping the floors of the Museum short-circuited the entire program of the PDP-8 by breaking some wires in a terminal stand with a push broom—or at least that was the official story released by the Jewish Museum.

The fact that "Software" opened without its film and minus the use of its central computer gave gleeful satisfaction to some members of the

New York art press. The reasons for this animosity may stem from the ever-growing and disproportionate influence that technology exerts on our cultural values. As a result of training and personality, many art critics consider themselves "humanists" with strong feelings concerning the encroachments of technology on nature and cultural traditions. A few have successfully advocated what might be termed "Pop Technology," e.g., cybernetic light towers, video banks, and electronic sensoriums, but most critics instinctively realize that it would damage their art world credibility if they became serious advocates of hard technology as an esthetic life-style. With the rash of "Tek-Art" adventures during the 1960s, substantial numbers of artists and critics feared that electronics might soon overwhelm the prestige of the traditional art media as found in painting and sculpture. At the time, the spectre of an engineer-controlled art world seemed a bit too imminent for comfort. Hence, the reviews for "Software" were decidedly mixed, containing both strong praise and condemnation.

But on the whole, Talmudic scholars and rabbis situated on the top floor of the Jewish Museum were heard to mutter darkly as to the inappropriateness of exhibiting "Software" in a museum mainly devoted to Judaica and Jewish studies. The director of the museum, Karl Katz, lost his job a month after "Software" was disassembled. And the New York Trade Commission gave American Motors a special award in 1971 for sponsoring the most ambitious and interesting cultural failure of the year in New York City, an mixed blessing which American Motors, nevertheless accepted with gratitude.

IV. The Center for Advanced Visual Studies

One of the major attempts to wed art and technology in the United States during the last decade began formally in January 1968 with the opening of The Center for Advanced Visual Studies at Massachusetts Institute of Technology. Its founder was the head of the Visual Design Department at M.I.T., Professor Gyorgy Kepes, who in the early 1940s had headed the photography department at the Chicago Bauhaus under Laszlo Moholy-Nagy. Invited to M.I.T. in 1946 to organize the design program for student architects and engineers, Kepes created several important light murals during the 1950s and taught a seminar in 1957 on kinetic art, considerably before kineticism became fashionable in the United States. Possessing formidable connections within the scientific and academic world, he began plans for the Center in 1965. The Center for Advanced Visual Studies was to be the fulfillment of everything his mentor, Moholy-Nagy, had written about in his seminal *Vision in Motion* during the Dessau Bauhaus period. In 1967 M.I.T. renovated its old bookstore on

Massachusetts Avenue in Cambridge according to Kepes' plans. Essentially this consisted of five large, first floor studio areas, a large public work space in the basement, a small woodworking shop, plus a lavishly equipped photography darkroom.

In 1968 the German artist Otto Piene, the Greek sculptor Takis, Harold Tovish, Ted Kraynik, Wen-Ying Tsai, and I were invited to join the Center as its first fellows. Kepes' master plan for the Center was to produce a sophisticated environment where artists with a technological bent could do their own art and collaborate on large-scale group projects. In *Art and the Future*, Douglas Davis draws a fairly sympathetic portrait of Kepes' hopes and the early progress of the Center. Davis comments that the "Center's early years were lean ones financially, and that Kepes was kept from fulfilling his hopes in detail."⁵ After a year at the Center my perception was at considerable variance with what Douglas Davis saw or believed.

Given the state of the American art world, Kepes initially had generous financial support, with M.I.T. and a half a dozen foundations backing him. But during the past few years support for the Center has dwindled as it has failed to produce writings, art works, or urban projects of any significance. Much of this is not the fault of the present director, Otto Piene, who has struggled to keep the Center alive. I would lay the blame in two directions: the rapid decline of technological art as one of the pet ideals of the avant garde, and the Center's lack of any concrete philosophy beyond the exploitation of available technologies. All too often artists expect their rather feeble art ideas to be rescued with the aid of exotic electronics.

Actually, except for those areas of scientific research that produced stunning photographs, such as holography, electron microscopy, and aspects of optical physics, Kepes had a strange aversion to direct involvement with sophisticated technology, particularly anything to do with the computer sciences. Due to the fact that the Center had been publicized, by virtue of its relation to M.I.T., as a technological nirvana for the artist, I found the situation mystifying. Slowly it began to dawn on me that the Center's underlying purpose was not primarily to do visual research or to make art, but to produce lavishly illustrated catalogues and anthologies that would impress foundations.

One should remember that in 1969 the Vietnam War and student-faculty protests were at their height. Speculation abounded that the Center was M.I.T.'s gesture towards the humanities, perhaps a means of focusing attention away from the presence of so many Navy and Air Force contracts. Certainly the Center never really had any concrete program,

⁵Davis, p. 115.

outside of fulfilling the director's vague dreams of creating urban spectacles. During my first month and a half we met twice weekly to discuss Kepes' ambitions for erecting a colossal light tower in the middle of Boston Harbor. Somehow the conversations and exchange of ideas remained maddeningly vague. I began to ask specific questions:

Did the Center have funds for such a project or any idea of costs? *No.*

Given that the Boston Harbor was directly in the flight patterns of Logan Airport, had the Center checked on the feasibility of the project with the local Civil Aeronautics Board, or with the Boston Harbor Authority? *No.*

Did they understand the problems of laying underwater electrical conduit or the costs? *No.*

What was the civic purpose of the light monument? *No one really knew.*

V. Art and Technology

Of all the art and technology projects instigated during the 1960s, Maurice Tuchman's five-year symbiosis at the Los Angeles County Museum (1967–71) was the most ambitious and perhaps the most revealing. In 1968 I visited the Los Angeles County Museum at the invitation of Tuchman, the Museum's Curator of Modern Art, in the capacity of consultant. From the start there was something grossly immodest about "Art & Technology" or "A & T" as the Museum called it. Tuchman managed to induce thirty-seven corporations in the Southern California area to contribute financial and technical support to resident artists. After three years of selection and various labyrinthine transactions which are documented in the "A & T" catalogue, the Museum came up with twenty-two artists who were paired to work with specific corporations. Out of these twenty-two artists, sixteen finally produced usable pieces or environments of the exhibition. Originally Tuchman proposed that the Museum contribute \$70,000 towards supporting "A & T," while corporations, he felt, would contribute \$140,000 in cash donations. By the Museum's own reckoning, its final budget was \$140,000 for the expenses of "A & T," including three months of operating expenses. In terms of nonmonetary contributions by corporations, including materials, technical assistance, and the use of working facilities, I suspect the total outlay for "A & T" was between \$500,000 and \$1,000,000. If "Art & Technology" had been a critical success, or if its extravagance had not been so attacked by critics, quite likely the published budget would have been considerably higher.

By drawing up contracts for artists and supporting corporations,

Tuchman made certain that there would be no abrupt pull-outs, inadequate technical assistance, or failures to furnish length of exhibition maintenance for artists' projects. In retrospect, the technical support for Los Angeles' "A & T" exhibition was probably the most thorough and proficient ever supplied for an exhibition of its kind. And yet the length and legal binding character of "A & T's" contract was a facet of the project which critics attacked with vigor. Critics saw it as a covenant between two capitalist organizations (e.g., the museum and each of its corporate benefactors), in collusion with or against all the artists involved. Even Tuchman in the catalogue intimated that most of the artists in the show would not have participated by 1971, the year "A & T" finally opened, primarily because much of the art world believed by then that there was or is a nefarious connection between advanced technology and the architects of late capitalism. In the press "Art & Technology" was decimated, and not altogether for unsound reasons.

In a review of "Art and Technology" for *Artforum*, I tried to place the exhibition in an historical perspective that would make the responses of the art world more discernible:

No doubt "humanist" art critics are going to pan A & T as another marriage of convenience with industry that fails to measure up to Henry Geldzahler's exalted view of the last 30 years. However, like Dr. Johnson's remarks on the virtues of singing dogs, defending A & T as the "best exhibition of its kind" is also questionable. In any case, due to the particular sociopolitical malaise that has gradually engulfed the United States, this show probably will be the last technological attempt for a while. If presented five years ago, A & T would have been difficult to refute as an important event, posing some hard questions about the future of art. Given the effects of a Republican recession, the role of large industry as an intransigent beneficiary of an even more intractable federal government, and the fatal environmental effects of most of our technologies, few people are going to be seduced by three months of industry-sponsored art—no matter how laudable the initial motivation. Certainly painting and sculpture do nothing to alleviate these conditions, but at least they are less exasperating since they avoid unpleasant juxtapositions.⁶

⁶Jack Burnham, "Corporate Art," *Artforum*, Oct. 1971, p. 67. This review appeared in *Artforum* along with a piece by Max Kozloff under the general heading: "The 'Art and Technology' Exhibition at the Los Angeles County Museum (Two Views)." What was interesting about this review was that both the Los Angeles County Museum and *Artforum* had asked me to write it—the former, I thought, because they trusted my objectivity, and certainly there was much of a critical nature in the 5,000 words that I wrote. But unknown to me, John Coplans, then Managing Editor of *Artforum*, sent out his most trusted critic. Max Kozloff's piece, "The Multimillion Dollar Art Boondoggle," *Artforum*, Oct. 1971, p. 72, was probably the most vicious, inflammatory, and irrational attack ever written on the art and technology phenomenon. It posed the Museum, Tuchman, and most of the artists connected with "A & T" as lackeys of a killer government, insane for new capitalist

One might look again at the large corporations supporting technological art and the artists receiving their sponsorship and conclude that both were guilty of some degree of naiveté, but hardly collusion for political purposes. While E.A.T. and other art groups held out the boon of "new discoveries" to corporations funding them, most companies were cynical and wise enough to realize that the research abilities of nearly all artists are nil. What companies could expect is a limited amount of good press for appearing "forward looking." To be sure, sociologists and several conceptual artists such as Victor Burgin and Hans Haacke have shown that pervasive philanthropy and museum-controlled "taste-making" do exert long term political control over the artistic tastes of the public. But given the costs and popular failure of technological art, it would appear an enormously inefficient means of swaying the masses, much less a means of promoting Technocracy as a successor to Capitalism.

In retrospect one could divide the artists participating into three categories: the techno-artists such as Robert Whitman, Rockne Krebs, Newton Harrison, and Boyd Mefferd who were esthetically allied with the light and kinetic movement; New York "name" artists such as Claes Oldenburg, Roy Lichtenstein, Richard Serra, Tony Smith, Andy Warhol, and Robert Rauschenberg who were only tangentially connected with art and technology; and finally the oddballs such as James Lee Byars, Ron Kitaj, and Oyvind Falstrom who provided the show's element of serendipity. The "name" artists tended to do enlarged or elaborate variations of their standard work or to cynically build into their projects hints about the utter futility of technology as a humanistic endeavor. Yet, as I stated in my review, by its nature art depends upon social compliance and cooperation; every successful artist places his or herself in the hands of the financial establishment: "Whether out of political conviction or paranoia, elements of the Art World tend to see latent fascist esthetics in any liaison with giant industries; it is permissible to have your fabrication done by a local sheet-metal shop, but not by Hewlett-Packard."⁷

The examples given so far—"Experiments in Art and Technology," "Cybernetic Serendipity," "Software," The Center for Advanced Visual Studies, and "Art and Technology"—are a representative cross-section of major art projects concerned with advanced "postindustrial" technology during the past ten years. Have they failed as art because of technical or esthetic incompetency, or because they represent some fundamental

conquests in South East Asia. Kozloff depicted half of the artists involved as "fledgling technocrats, acting out mad science fiction fantasies"; the more sophisticated artists he envisioned as cynical opportunists.

⁷Burnham, "Corporate Art," pp. 66-67.

dissimilarity as systems of human semiosis? Although it is clear that technical incompetency is partially to blame, I would suspect the latter is a more fundamental explanation. My experiences with semiology and iconography lead me to believe that the enormous vitality and will-to-change behind Western art is in a sense an illusion, just as technology harbors its own illusionary impulses. Only within the past ten years have we begun to accept the possibility that technological solutions are not universal panaceas. Gradually but surely, much of it in unspoken terms, we are beginning to accept evidences that scientific research and technological invention have their boundaries. Such a speculation would have been nearly unthinkable fifteen years ago when scientific grants were plentiful and the avant garde was the key to artistic success. Perhaps technology is only a matter of man-made or artificial negentropy which, because of its enormous productive capacity and ability to aggrandize perception into convenient and coherent packages of "information," we perceive as invincible, life-stabilizing, all-meaningful, and omnipotent.

Since the scientific revolution, art has become a protected cultural sanctuary; as empiricism has gradually dominated everyday cultural values and academic standards, art has been transformed into a sort of necessary way-station for the expression of anti-social sentiments. It liberates the human spirit by its inability or reluctance to become acutely self-analytical, while at the same time art remains implicitly critical of everything around itself. One might conjecture that art remains a knife-edge or balancing fulcrum for the human psyche. By that I mean it encompasses all aspects of the psyche equally; mythic fantasy, technological skill, esthetic idealism, manual craftsmanship, a variety of contents, but most importantly an internal semiotic consistency which prevents it from becoming absorbed by other disciplines, no matter how powerful or persuasive. If there is a teleological function to art, quite likely it is to lead us back to our psychological origins, to exhaust our material illusions by forcing us to understand the reality of mythic experience, for myths are merely the mental constructs we devise for our perception of the world, having particular properties isomorphic with the physical world. Yet increasingly we sense the fragility of art, the fact that modern rationalism tends to denude it of its most precious characteristic, its "believability."

In 1968, my book *Beyond Modern Sculpture* was published. What made the book controversial was the prediction that inert art objects would eventually exhaust themselves as a means of cultural expression (that is, lose their powers of contemplative evocation for human beings). I suggested that the art world was rapidly moving from "object" orientation towards a "systems" orientation in its perception of mundane reality. The book ended with a prophecy:

The stabilized dynamic system will become not only a symbol of life but literally life in the artist's hands and the dominant medium of further aesthetic ventures. . . . As the Cybernetic Art of this generation grows more intelligent and sensitive, the Greek obsession with "living" sculpture will take on an undreamed reality.

The physical beauty which separates the sculptor from the results of his endeavors may well disappear altogether.⁸

In a sense *Beyond Modern Sculpture* validated itself in terms of some subsequent art; where it erred gravely is in its tendency to anthropomorphize the goals of technology. As with Norbert Wiener's comparison of the ancient Jewish myth of the man-made Golem with cybernetic technology, I envisioned the resolution of art and technology in the creation of *life* itself. Yet, in a most ironic fashion, something other than that has taken place. Presently and for the near future the science of artificial intelligence has produced nothing approaching life-like cognition, but merely pale imitations of it. The cybernetic art of the 1960s and 1970s is considered today little more than a trivial fiasco. Nevertheless, avant garde art during the past ten years has, in part, rejected inert objects for the "living" presence of artists, and by that I am referring to Conceptual Art, Performance Art, and Video Art. In the case of such artists as Chris Burden, Joseph Beuys, Christian Boltanski, James Lee Byars, and Ben Vautier, art and life activities have become deliberately fused, so that the artist's output is, in the largest sense, *life-style*. During his last years, Marcel Duchamp often insisted that art, after all, was only the process of "making." Thus, in a literal way, art objects are merely materials, the semiotic residue of the artist's activities. What we are seeing when we view art is a fusion of cognition and gesture; as the historical semiotic of art evolves, this becomes increasingly apparent. Gradually the art object destabilizes, imploding upon itself. What is left is a series of partitioned fragments of the entire art-making process.

In the long run, technology may, like art, be a form of cognitive bootstrapping, an illusionary form of conquest over the forces of Nature. Both are vaguely deceptive in that they hold out the possibility of human transcendence, yet they only lead us back to a point where we can understand how we are dominated by our own perceptual illusions. In technology the sense of mastery, manipulation, and "otherness" is a more implicit assumption than it is in art. The ritual-making aspects of art do not sever man so effectively from his natural origins. Ultimately, perhaps, the very weakness of art as a cultural force—its conceptual confusion and lack of utilitarian value—gives it its strength.

⁸Jack Burnham, *Beyond Modern Sculpture: The Effects of Science and Technology on The Sculpture of This Century* (New York: George Braziller, Inc., 1968), p. 376.

Any attempt to explain why art and the electronic technologies are mutually exclusive can only be conjecture. Possibly, though, the reasons for this schism are metaphysical and not technical. At its foundations art may be a cognitive discipline or exercise, one that steers us towards the most primitive regions of the human brain. Physically, the brain is a jelly-like gray mass composed of billions of neurons sending and receiving billions of weak electrical signals per second. Providing that art is primarily a form of self-understanding (*re-cognition*), it would seem likely that the principles behind the historical evolution of art contain an exclusion principle. By that I mean a principle which does not allow the esthetic-cognitive functions of the brain to accept an electronic technology as an extension of inanimate objects. In a sense a certain rapport or similarity exists between the brain and electronic technology, although analogies between the two at this time are very gross. Traditionally the esthetic aura or charisma of art has existed within a Pygmalion-like paradox: art "lives" although it remains consecrated in dead, inanimate materials. To challenge that paradoxical state may very well jeopardize the mythic consistency of Western art.

When one speaks of the "mythic consistency of Western art" many alternate possibilities come to mind. What I mean by that is Western art's semiological consistency, that fabric of "believability" in contemporary thought which has possibly been best defined in Roland Barthes' illuminating essay, "Myth Today." Barthes suggests, and I feel correctly so, that virtually everything is subject to mythic interpretation, hence the limits of myth are essentially formal, not substantial.⁹ Does such a broad generalization define myth out of existence? Or does it suggest that the efficacy of mythic thought is far more culturally pervasive than our intellectual conventions allow? Barthes, of course, has been a strong advocate of the second position. For him myth becomes in a sense "background," the naturalization and depoliticization of everyday speech. This suffices, as with Barthes' examples, to explain the subtleties of patriotic posters, dress codes, or bourgeois rhetoric, yet it allows us insufficient insight into the dynamic vicissitudes of equally if not more complex phenomena such as art history.

Here one might suspect that the level of historical discourse (that carried on in works of art by artists and not scholarly analysis) is essentially anagogic, having to do with the unresolved purpose of Judaic-Christian culture at the highest levels. In such a case, the linguistic conventions of signified, signifier, sign, and referent revert back to their theological forms of Father, Son, Holy Ghost, and last but not least, Man himself. The mythic consistency of the Judaic-Christian tradition is

⁹Roland Barthes, *Mythologies*, trans. Annette Lavers (New York: Hill and Wang, 1972).

premised on a somewhat multiple assumption: namely, man cognizes by virtue of perceiving dichotomies, he acts triadically through the agency of signs, but he only comes to know himself by dissolving thought and action in the recognition of unity. The theological term "anagogic" also refers to the transformation of drives from the unconscious into constructive ideation, which is just about as succinct a definition of Western art as one could hope for.

As such, Western art leads a double existence. It operates as an unveiled and exoteric activity, taught pervasively in schools (usually badly) and subject to the most commercial exploitation. Yet it contradicts Barthes' everyday mythic invisibility because art by its very paradoxical nature (its near perfect resistance to economic, psychological, or sociological interpretation), openly signifies an apparent mystery concerning the fusion of spirit and matter. So at the highest level, secrecy and a code of concealment are imperative for its cultural survival.

Dialectically art moves in Western culture towards the disclosure of the human psyche, which I would interpret as the life force unhindered by ego and self-consciousness. Even this is accomplished paradoxically in that art appears to be constantly moving away from clarity and resolution, and towards chaos and materialism. Technology's mythic consistency is no less subtle, because it springs from the accrued conviction of the intellect's invincibility. In a sense it resembles the other side of the human personality: lacking the psychic acceptance of the artist, it places its *raison d'être* in empiricism, which tends to lead it towards its worst enemies, paradox and meaninglessness. Nevertheless, while art and technology show signs of mutual exclusiveness, at the level of anagogic significance they may actually be completely tautological.