

Jack Burnham: The Systems Approach

Jack Burnham played a prominent role in the art scene at the end of the sixties. Burnham started out as an artist but established his reputation, above all, as a writer/theoretician and organizer of exhibitions. From 1968-1969 he was a fellow at the Center for Advanced Visual Studies. In an article, "The Aesthetics of Intelligent Systems," he described how his residency allowed him to use the time-sharing computer system at MIT's Lincoln Laboratories. His fellowship at the Center obviously also allowed him to touch on the different areas of scientific and technological research whenever possible, and to participate in the exchange of ideas with scientists. His interest in the possibilities of information systems, computer networks or artificial intelligence was certainly stimulated by the research done at MIT. Here Burnham met, among others, Marvin Minsky, one of the pioneers in research on artificial intelligence, whose chess programs and ball-catching robots had received much publicity. He also became acquainted with Nicolas Negroponte and his Architecture Machine Group, and invited them to participate in *Software* with the installation *SEEK*, mentioned above.¹³⁰

Writer/artist Jack Burnham belonged to those few who were in the vanguard to connect the twentieth-century developments in technology and science with the visual arts, in particular sculpture. He felt that the western world was changing from an object-oriented to a systems-oriented society.¹³¹ Sculpture's change from objet d'art to système d'art paralleled, as he defined it, the intellectual framework produced by the scientific community. The traditional tools of art-history and criticism - whether it is a stylistic and formal analysis, iconographic, or the linear development model - could not explain these changes sufficiently and in *Beyond Modern Sculpture* and his subsequent writing he set out to develop an approach which presupposed twentieth-century sculpture as a system, in which changes showed a continuous correlation with those in science and technology. He met with severe criticism of his methodology from art-historical sides, which was to be expected. Burnham's attempt showed weaknesses, indeed, when it came to explain not so much the relationships but rather the dissimilarities that occurred between art and science during the first part of the century.¹³² Most controversial, however, was his speculative prediction that the art object, being an inert artifact, would eventually disappear as a cultural

expression to be replaced by what he called a "systems consciousness."¹³³

His prophesy at the end of the book clarifies what he meant by that: "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."¹³⁴ It is significant that he could only have developed these theories right at that time, allowing him to synchronize the new directions in sculpture with the ideas appertaining to the general system theory and its practical applications in computer and communication networks. Jack Burnham's ideas of a systems art were in fact derived from Ludwig von Bertalanffy's general system theory, which he referred to as well. During the sixties and early seventies the number of publications on systems analysis quickly mushroomed, and Bertalanffy's approach found a modified but wide application from the seventies onwards. Its basic ideas were generally accepted by different disciplines, one of which was the visual arts.

To summarize the motives for the development of the general system theory: it reciprocated the growing demand for the introduction of a generalization of scientific concepts, due to the fact that similar concepts and models had appeared in different fields, making a conceptual model necessary which would make interdisciplinary understanding and collaboration possible. It facilitated the introduction of new categories in scientific thought and research, with concepts like organization, directiveness, teleology, using mathematics and statistics as descriptive methods. Most issues nowadays require a systems approach, being problems of interrelations with many variables. One of the most important features of the introduction of these conceptual models based on mathematical formulae was that they were interdisciplinary, and transcended the conventional departmentalization of science. By now, a vast realm of systems technologies, related to technological developments, has arisen, ranging from information theory, control technology, graph and network theory, to automation, computerization, software programs applying systems, etc.¹³⁵ In Burnham's interpretation, the art object as the subject of analysis itself was replaced by the notion of a system, whereby a system was defined as "a set of relationships in

action" (Ludwig von Bertalanffy). The elements of these relationships implied change(s) in time, that is process(es), which were interdependent and non-deterministic, however, since influences from the outside were not predetermined and could only be described scientifically in terms of possibilities.

Formal interpretation is based on the visible elements of a composition. In a systems context, equal attention is paid to invisible elements, to processes and changes in the work, as well as its relationship with the outside. These thoughts were the beginnings of what Burnham was to call a "systems esthetics." He proposed this term in opposition to Michael Fried's adjectives theatrical, literalist, and post-formalist esthetics, in his well-known article *Art and Objecthood*, in which Fried had comprised the materialist tendencies in modern sculpture into the one term "objecthood."¹³⁶ Fried thought that contemporary sculpture, being more and more a composition of different kinds of materials, was moving toward theatricality, a tendency he considered dangerous for the independence of art. For Burnham, the term 'systems esthetics' seemed to encompass the situation more fully, as it included the concept of the boundaries of art. For, when an art work crossed its boundaries, it became part of a context, or a system. Consequently, a systems esthetics was no longer solely limited to the specific concerns of the art world.¹³⁷ In Burnham's view, this meant that an analysis of these art works only made sense if one took into account "their assigned context." As context, he not only defined the immediate literal art space, but also the larger space of social, political, and technological contacts and collaborations with which the artist had to deal.

It was therefore not possible to regard a fragment of a work of art and attach higher or symbolic meaning to it, all system components being interdependent. Among the artists who had acknowledged this approach according to Burnham's thesis were, among others, Hans Haacke, Les Levine, Dennis Oppenheim and Robert Smithson. The following sections are revealing in that Burnham used the array of systems terminology to describe and interpret the work. Burnham: "If Smithson's *Site-Selections* are didactic exercises, they show a desperate need for environmental sensibility on a larger than room scale...Smithson has transcended this by putting engineering works into their natural settings and treating the whole as a time-bound web of man-nature interactions." Dennis Oppenheim's *September Wheat Project* was characterized as "Oppenheim is using the untapped energy and

information networks of the day-to-day environment." In this and other sowing and harvest projects, searching the land, sowing the wheat or oat, "cutting, gathering, baling and trucking" were all part of the art process or art work, according to the artist and Burnham. *Levine's Restaurant* (1969), at 19th Street and Park Avenue, was described as "a self-organizing, data-gathering system," a "real time" process/system.¹³⁸ In terms of art, the move from object to system implied for Burnham that the new art forms were no longer defined by a fixed shape or boundary, but behaved like a system that alters in time and space according to both internal mechanisms and external conditions.¹³⁹ He arrived at the conclusion that sculptors were not simply adopting new materials and new standards of fabrication. There was also a new aesthetic evolving from the synchronization with the technological and scientific ideas, for, as he explained, "the artistic concerns with man-made systems, processes, ecological relationships, and philosophical-linguistic involvement of Conceptual Art ... deal with underlying structures of communication or energy exchange," whereby computer technology would be "instrumental in redefining the entire area of esthetic awareness."¹⁴⁰

As mentioned previously, in 1970 Burnham organized an exhibition with the title *Software*, in which he attempted to realize his utopian ideas about new interdisciplinary art forms in an environment governed by information and communication processing systems: technologies that would change the knowledge system of our society. The computer technologies would require new organizational structures for the exchange of information. These would no longer be based solely upon technology, but depend upon the knowledge necessary to have access to these tools; for those with knowledge and access would have the power. If artists wanted to participate in this environment, let alone exert some influence, they would have to learn about these technologies. Whether the result was called art or not was irrelevant at this point, according to Burnham. In fact, he thought that this realm would contribute to blurring the classical distinctions between art and non-art, between art and technology, or these distinctions might even become obsolete. Wrote Burnham: "As the computer environment further condenses the known world and as it increasingly becomes an elegant surrogate for global experience, a profound change will take place in the acquisition of knowledge and sensitivity."¹⁴¹ His involvement with cybernetic ideas and self-organizing intelligent systems and the current optimistic belief

of the researchers in artificial intelligence that it was possible to create systems with an artificial intelligence that could do the same things as human beings, that is have a life-like cognition, certainly influenced him to envision a situation where art and technology were advancing life, albeit from opposite directions, and that their meeting point would result in a resolution of art and technology: in the creation of life itself.

In a later article Jack Burnham set out to rectify this position, having come to the conclusion that it had "erred gravely in its tendency to anthropomorphize the goals of technology. ... 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."¹⁴² Of course, neither happened. Burnham's utopian idea about the future of art extrapolated too far from the existing situation. However, his connection of the changes in the visual arts with systems ideas still seems relevant, if restricted to those artists who sought a new context for art, and at that time. For it is certainly true that those artists who were involved with processes, events, time and space, and technical applications that involved interdisciplinary research, had a general knowledge of systems analysis. The use of cybernetic ideas, requiring scientific and technological knowledge, was found more among artists involved with computer-based art forms or sculptures, video, television, satellite and other communication media. The statements and writings of artists like Robert Smithson, Nam June Paik and Paul Ryan indicate that they were not only informed about these theories but could also incorporate the implications, artistically if not scientifically, into their art work. Robert Smithson systematically referred to the new thoughts on entropy in science and technology, and the application in his work.¹⁴³ In his contributions to *Radical Software* video artist Paul Ryan, in particular, described the utilization of the new artistic medium video in relation to the cybernetic and systems theories. He was active in the guerrilla TV scene for a while, then disappeared more or less from the art circle to purposively concern himself with social and, in particular, ecological issues. His writing is an example of an artist who was very knowledgeable about the cybernetic theories of Norbert Wiener, the media theories of Marshall McLuhan and so forth, interpreting the portable video system as an instrument to get access to information, to controlling the flow of information by means of "guerrilla warfare" systems.¹⁴⁴ What is significant here is not just the fact that Ryan was quite informed, but that he theoretically connected the development and function of a new

medium, a new technology in the visual arts - video in his case - with these theories to create a theoretical construct, using guerrilla warfare as a model.¹⁴⁵

Nam June Paik has also referred to the science of cybernetics, and in particular the new communication and information theories in relation to his own work in video, television and satellites in his writing. In a 1967 article, "Norbert Wiener and Marshall McLuhan," Paik set out to compare Norbert Wiener's theory of cybernetics with Marshall McLuhan's media theory.¹⁴⁶ A few artists perceived their work as cybernetic, such as sculptors James Seawright and Wen-Ying Tsai.

During the sixties systems theory and cybernetics rapidly spread among other disciplines, and its jargon was popularized, and also found its way into the visual arts. Many of Burnham's ideas (and use of language) about the consequences of the continuing infiltration of computer technologies into our daily lives can also be found in contemporary publications with a concern for the social, political, and foremost, human consequences of the computer technologies. Compare economist Peter Drucker's analysis, much read at the time: "The systematic and purposeful acquisition of information and its systematic application, rather than 'science' or 'technology', are emerging as the new foundation for work, productivity and effort throughout the world," when he discussed some economic and political consequences of the new computer technologies.¹⁴⁷ Or the economic theories of Alvin Toffler's *Future Shock*, and the ecological concerns of Charles Reich in *The Greening of America*, both published in 1970, as well as the media theories of Marshall McLuhan, already mentioned.

Marshall McLuhan's notion of the computer as an extension of the senses is met frequently, as well as the idea that we have become a society based on knowledge rather than experience. This led to the introduction of a whole terminology that came from these disciplines. It had given words like structure, pattern, organization, indeterminacy, interrelatedness, a new and specific meaning. Cybernetics introduced yet another new lexicon which was reflected by words like feedback, information, parameter, software, hardware, entropy. As said, an important aspect of both sciences was their interdisciplinary approach, and one can see that exactly this aspect would attract the artists who wanted to reach beyond art's known boundaries. That an infiltration of the ideas of cybernetics and systems thinking was facilitated by the experiments with new communication media, which were accompanied

by artists' collaborations with scientists and engineers, should be seen as a logical accompaniment.

As I have said, artists were thus brought into direct contact with new technologies and scientific developments and theories. Thus, it was not only the systems terminology that was used as a way to describe the new directions in art. A group of artists truly related their work to the developments that were taking place in the sciences, even if the extent of their understanding remains difficult to measure. A main problem was constituted by the fact that the systems analysts and cyberneticians themselves applied different definitions. The terminology itself had varied meanings too, and was often used wrongly. Some artists emphasized the continuing abstraction of the sciences, as denoted by the growing importance of mathematical concepts or formulae as a conceptual framework and that of twentieth-century art as expressions of a similar development. Others perceived the new concepts of time-space, the changed subject-object relationship, indeterminacy and uncertainty as similar to those in the visual arts, although there was in my view no specific correlation between the developments in the visual arts and the sciences. Although a systems analysis in the narrow scientific sense proved difficult - Hans Haacke was the only artist who adhered to this definition for his art for a longer period of time - the multiple internal and external relationships of Haacke and other artists in search of another context and territory for art do require an interpretation that accounts for this 'organized complexity,' in particular since these works came to involve the knowledge and expertise of other disciplines, creating a complex layering in the content of the work of art.

The systems sciences and cybernetics have become accepted as valid methods in many disciplines, including the social sciences. Why this approach has been neglected by the scholarly art world is a question I feel incapable to answer. One possible answer is that the direction of the official art world moved toward the object again, while the artists who worked on and with the land moved in the opposite direction, showing little inclination to participate actively in exhibitions or other art activities. Another possibility is the fact that technologically-based art forms, with the exception of video art (which also remained marginal) disappeared from the main stream of attention around 1974, and computer art forms were systematically neglected by the art world. Also, other philosophical approaches, such as structuralism, followed by the post-modernist French philosophy advocated by Jean Baudril-

lard, Jacques Lacan, or Jean-François Lyotard, became en vogue. Interestingly, artists currently working in the field of interactive computer networks show a renewed interest in the systems theories and cybernetics of the late sixties and early seventies, now related to yet another wave of concern about the dynamics of ecological systems. This probably also explains current interest in the philosophy of Gregory Bateson.

The theories about a civic art form as proposed by György Kepes never materialized in the ways envisioned. Neither did the ideas of Billy Klüver, nor Jack Burnham's notion of the disappearance of the art object to assimilate with an overall 'systems' orientation as the dominant view of the world's organization, whether man-made or natural in origin. Yet one cannot do away with these ideas simply as idealistic concepts guided by an overall but vague call for social and political change of the times. Although the experimental, non-object, non-precious art forms, which were perceived as necessary indeed to break with the traditional concepts in the first place, still fitted the avant-garde idea of art as the expression of revolt and protest, a genuine belief that the traditional concept of art no longer had a function in a changing society - and the necessity for new forms made them search for possibilities outside the realm of the art system into what one might define as the environment at large.

Radical Software

"Electronic media have become looped-in to our neural networks. We need a minimum of information flow not only for physical survival, but also for psychological balance, because electronic media are as omnipresent as light" stated Michael Shamberg in 1971.¹⁴⁸

Radical Software was published from 1970 to 1974 by Raindance Corporation, and founded by Michael Shamberg. The first edition was printed in July 1970 and reprinted as *Radical Software/Number One* in September 1970. *Radical Software* began as a "service to alternate television people," but with the advent of video technologies the magazine immediately followed "the trend towards alternate uses of technology and media. ... In fact, we think the combination of hardware and software trends (e.g. in addition to high access television, the availabil-