

Chapter 1

Interdisciplinary Collaborations: Ideas

Art and Technology Movement

The twentieth century is characterized by several waves of dialogues between art and science and art and technology.²² In general, the scientific and technical interests of the artists followed those in the sciences and technological application with a time-lag of twenty years. The sculptors of the 1920s, for example, were influenced by scientific models precisely at the time when models (for example the atomic model) were beginning to lose their importance for the mathematician and physicist, who were by then working with the field model and pure mathematics. In the 1950s and 1960s those kinetic art forms, focusing on the perception of movement in light and color images, still relied on mechanical instead of electronic technologies, with the exception of light programming. Also the repetitive field structure of many optical works was in fact based on an already obsolete scientific field concept.²³

Marshall McLuhan has stated that a particular technology becomes a subject for the artist only when it is already superseded by the next one. Pontus Hultén exemplified this somewhat in his catalogue essay for *The Machine as Seen at the End of the Mechanical Age*, an exhibition about the use of the machine in the visual arts, organized for the Museum of Modern Art in New York in 1968. Be that as it may, these discussions still made a distinction between the relationship between art and science and that between art and technology. It was not until the sixties that this discrepancy in time between scientific discovery and technological application began to disappear. Science and technology have become closely interconnected since then, for both economic as well as political reasons. As a consequence, relationships of art to science and technology were predominantly discussed in one context, that of technology. Simultaneously, there was the introduction of the electronic media and the computer technologies, making their first impact; media that have infiltrated our daily existence. With it came theoretical and philosophical publications about the possible social, political and economic effects of the new technologies, some of which were widely read in art circles.

Literary and philosophical discussions since modern industrialization, i.e. the Industrial Revolution, have often stressed the growing chasm between a scientific culture, founded on specialization of external knowledge, and a literary-artistic culture aiming at intellectual internalization of cultural achievements. Writers, like C.P. Snow, have often perceived of the two as "two cultures," whereby anxious thoughts about a forthcoming alienation were voiced as a consequence of the growing importance of the scientific and technological culture in the society of the Machine Age. For what could be the function of the arts in an automated society? Discussions about possible congruences and differences between the two worlds also predominated in the sixties. Virtually only Susan Sontag put forth a different point of view in her article "One Culture and the New Sensibility" (1966), criticizing Snow's "false assumption that science and technology are in motion, while the arts are static." She perceived an overall new kind of sensibility, which will affect the "transformation of the function of art." Sontag argued that science and technology, all forms of social life, all cultural forms, including works of art, reflect each other, therefore change with each other. For Sontag it followed logically that today "its spirit of exactness, its sense of 'research' and 'problems,' is closer to the spirit of science than of art in the old-fashioned sense."²⁴ The experimentation with new materials, techniques and forms was its first expression and in a sense this book extended these thoughts.

The wave went into the history books as the Art and Technology Movement. The museum and gallery world reacted with a number of large exhibitions. To mention just the most important ones: Pontus Hultén's *The Machine as Seen at the End of the Mechanical Age*, at the Museum of Modern Art in New York, 1968, presented a diverse survey of machine-related art forms. Hultén had invited Experiments in Art and Technology to participate in the contemporary section. Jasia Reichardt organized a show of computer-based art forms, titled *Cybernetic Serendipity*, which took place at the Institute of Contemporary Art in London in 1970, and traveled to Washington D.C. Then there was Jack Burnham's notorious *Software* exhibition at the Jewish Museum, also in New York, in 1970. Maurice Tuchman initiated a collaborative project to connect artists with industry for the Los Angeles County Museum of Art, the *Art and Technology Program* (1969-1971), and György Kepes organized *Explorations* at the Smithsonian Institution of the National Gallery of Art in Washington D.C., in

1970. There were numerous activities by small interdisciplinary groups like Pulsa and USCO, which discontinued their activities long ago. Pulsa was a group of seven artists and architects teaching at Yale University, who did a series of outdoor temporal light environments between 1968 and 1971, revolving around the concept of the city as artwork, using what they called its "soft information systems," such as water supply, electricity, telephone, heating, as working parameters. USCO was a group of artists and engineers pioneering with multimedia and kinesthetic performances in the United States as well as Europe. In the late sixties they also worked with behavioral scientists "to explore multi-channel techniques and design of facilities, hardware and software." Their ultimate focus was more toward entertainment and as education.²⁵

Before discussing interdisciplinary collaborations as the most important characteristic of the art and technology movement, it needs to be emphasized that it was never really a movement in the formal or stylistic sense, nor was it a movement with a uniform set of ideas or concepts. Rather it was the umbrella for a change in attitude toward technology and science among a group of artists. This 'group' of artists was part of a larger 'group' that wanted to extend the boundaries of art. The interest in technology was from the start related to the desire for something new outside the realm of art; a desire to participate in the possibilities for radical changes in our environment which technology was to bring about. Around 1965/66 there existed a situation in which artists interested in technology were looking for knowledge and access. For in discussing the relationship between art and technology, one major problem was the access to this technology. At first, a characteristic of technological progress was the widening of the gap between the sophisticated technologies used in scientific laboratories and those available to the general public. Artists were not able to use these technologies until the personal computer and its accompanying software programs became gradually accessible, and not until the introduction of equipment like the portable video camera and recorder by Sony Corporation, Japan. In addition, sufficient knowledge was wanted. Art academies, colleges and universities were at first not at all equipped to deal with these rapid changes. In reviewing publications, newspapers and magazines, it becomes apparent that the atmosphere was one of an incredibly optimistic belief in the advancement of technology. It stood for progress. The same optimism was voiced in art

criticism. John Perrault, critic for the *Village Voice*, wrote: "Certain similarities between art and technology indicate the possibility of a fruitful marriage. These similarities also clarify differences. Art and technology are both systems of translation. Technology translates pure science from the realm of abstract ideas into useful techniques and devices. Art translates experience and emotions into form. ... We are in a period of transition. With one foot in the Mechanical Age and the other in the Electronic, there is always the possibility to slip back into the dark. The Electronic Age, not yet completely assimilated, already seems to be branching off into the Bio-Chemical. Where are we going? ... Our relationships with machines and electronic systems are mirror images of our relationships with ourselves. If we learn how to relate to technology, we may yet learn how to relate harmoniously to ourselves."²⁶ His writing is an example of the extent to which this advancement was personalized as a utopian possibility for total personal harmony, far beyond what Marshall McLuhan advocated as being a reflection of society's so-called harmonious progress.

Catalysts: György Kepes, Billy Klüver and Jack Burnham

On the one hand, artists sought to find a new function for their work by going outdoors and using the natural environment itself as material; on the other hand, artists sought a new role by exploring the new electronic technologies that were rapidly introduced. In retrospect, two important figures who functioned as catalysts in proclaiming a new relationship between artists and scientists and technologists were György Kepes and Billy Klüver. György Kepes worked since 1946 as Professor of Visual Design at the Massachusetts Institute of Technology, Cambridge.²⁷ Billy Klüver was an electrical engineer who worked at Bell Telephone Laboratories in Murray Hill, NJ, since 1959. The role of theorist was taken up by Jack Burnham, who promoted his ideas in writings and exhibitions. Kepes and Klüver set out to promote and facilitate collaborative and interdisciplinary projects between artist, scientists, engineers and technicians: Klüver by creating Experiments in Art and Technology in New York, Kepes by founding the Center for Advanced Visual Studies at the Massachusetts Institute of Technology, Cambridge.

Hungarian-born György Kepes had become acquainted with the theories of the Bauhaus and Constructivist movements as well as