

ART AND ITS NEW INTERFACE

by

Rene Berger
President
International Association for Video
in Arts and Culture
Lausanne, SWITZERLAND

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Introduction: How To Situate The Problem

The concept of "art", despite the unified semblance of its title, is dealt with uneasily today. The strength of science (and its limit as well?) is that it presents itself and presents an image of reality always in exactly the same way. Even if the theories differ, even clash at times, they have been established and, in fact, can only be established, on the foundation of a set of conditions accepted by the entire scientific community which judges these conditions only on the basis of proven experiments.

It is a completely different matter when it comes to art.¹ What is implied by and associated with the term (artists, works, esthetics, criteria, etc.) varies according to the location and historical, socio-cultural, economic or political conditions. There is no artistic community, in the strict sense of the word, which corresponds to the scientific community. Even the people and the institutions which make up the "world of art"--to speak more precisely but more vaguely at the same time--are characterized by the fact that they do not act in accordance with the same principles or the same conditions. In a certain sense, value judgments remain subjective ones; they can never, in any case, be reduced to factual assessments. Compared with scientific judgment which tends toward "monosemy",

esthetic judgment tends toward "polysemy".. The former wants to unify knowledge; the latter explains the diversity of peoples, cultures and values. This is not to conclude that they are fundamentally opposed; art and science will always be complementary activities.

A second preliminary remark. Our age is notable for a mobility unknown by any other age, at least not to such a degree. Scientific discoveries continue to abound; technological developments appear one after the other, affecting our lives in their most routine activities. Take, for example, the invasion of the video machine or, soon, of the personal computer; already electronic *MICRO-PROCESSORS* are colonizing our planet and proliferating in space.

Our classic instruments of knowledge--dictionaries, encyclopedias, manuals--have a limited life-span; all definitions are in a perpetual state of change. It is imperative to adopt a problematic perspective in which questions can remain open-ended.

A change of situation necessitates a change of method. In a stable situation, knowledge tends to have a restricted area of expertise, the prerogative of specialists and historians. On the contrary, our mobile situation calls for a systemic approach² whose underlying principle would be to consider every system as possessing a complexity greater than that of its parts. Instead of relying on partial analysis, as in the past, a sustained effort must be made to concentrate on the interaction between the parts

and the system as a whole.

It has become evident that the classic approach is no longer sufficient for matters dealing with art and, thus, for the theme of our meeting. The artistic phenomenon does not exist in itself; it proceeds from the interactions of a system in the process of evolution, the parts of which are here briefly and roughly outlined: artists, galleries, art dealers, collectors, critics, institutions (art schools, museums, foundations, institutes, cultural centers...); periodic, national and/or international exhibitions (biennials, triennials or festivals); selection committees, the media (press, radio, television, video, video-disks, infography); the art market (fairs, auctions), academia, art historians, experts, insurers, transporters, reproducers, cultural industries (editors: books, magazines, high-circulation weeklys, travel agencies), public agencies (government agencies, publicity groups, guilds, unions, etc); all sorts of associations (artistic, cultural), without forgetting about the international institutions (UNESCO, Council of Europe, private, non-governmental organizations, *NOG*), the public, or rather, the different publics, etc...

Also to be noted is that the systems analysis approach, as I conceive it in these circumstances, must be accompanied by the term "energetic". The parts which compose the system are endowed with different powers, be they the configurations they fit into or the configurations they produce. All phenomena (art is one of them, like expositions, collections, museums) thus

result from a multidimensional process which today's media everywhere amplify, accelerate and change.

In outline form, three principle dimensions comprise the interactions of the system:

1. The historico-esthetic dimension, which identifies the work in function of the prevailing idea of art in a society at a given time. Even if the term "beauty" is now hardly used, it obviously underlies the preceding affirmation. However, if it is relatively easy to list the different esthetic dimensions that have developed in the course of history and which have inspired known civilizations, it is a constant fact that contemporary art eludes norms and traditions. In so doing, contemporary art often causes, beside arguments, bitter conflicts such as the commotion arising from numerous biennials and other international exhibitions will attest; ³
2. The politico-economic and/or the economic-political dimension. Which means that in the countries promoting free trade, generally the Western economies, the economic aspect is emphasized. The art market, organized around and from inside the trade network dominates, if not absolutely, then at least by its priorities. The current asking-price serves as the standard; supply and demand, the mark of capitalist countries, are at the center of the dominant configuration which affects both artistic creation and artistic production as well as the distribution of the works and the subsequent opinions about them.

On the other hand, non-capitalist countries are structured so that free-trade networks hardly exist. The State is

the center of the dominant configuration, and plays the role of inspiration, patron and "collector"; it is the State that usually deals with the artists in their guilds. In the politico-economic complex, the ideological aspect prevails (while the other is not completely ignored).⁴ Opposition or just different configurations? Does art remain ONE in its diversity?

3. The dimension of communication: even a short while ago, works of art were destined for and enjoyed by a relatively small and privileged group. The invention of engraving, then of photography, let these works be reproduced first at the artisan's level, then at the industrial level. Now, color photographs, slides, multi-media shows, audio-visual materials, posters multiply infinitely the iconography once removed that makes up our daily environment.⁵ Beside artistic expressions traditionally defined by the term "fine arts": architecture, painting and sculpture, literature, music, theater, etc., mass-appeal art has appeared: after movies and photography, cartoons, television, variety shows, records, etc...recently, "technological arts" such as video art, computer art, laser art, holography, mail art, copy art, etc...; moreover, the media themselves tend to reject their simple roles as "transporters or transmitters" in order to take on inventive or creative functions as the terms TV, video-clips, synthesized images etc... attest. In any case, it is becoming more and more difficult to separate certain artistic expressions from the medium conveying them.

Continuing this type of detailed analysis is not appropriate here. This overview of the three dimensions suggests the

system. It is now only a matter of discovering their purpose, in the cybernetic sense of the word, in order to understand their functioning.⁶ What are we dealing with? First, a work of art or a movement is only just a "something", as a struggling artist at the beginning of his career is just a "someone". Neither the "something" nor the "someone" can be assured of success. At the very most they have only a probability of success in their favor. The final purpose of the system thus consists in bestowing on them (or withholding from them) that status of works of art, the status of movement or the status of artist.⁷ From beginning to end, then, the "world of art" is involved in the process of Recognition. What a strange character for this institution! The scientific institution can recognize itself in the fact that it confers titles, functions and honors based on the principles and methods which constitute the basis of the scientific community. For its part, the judicial institution confers status and roles based on the codes that govern civil society stemming from recognized laws. A certain vagueness distinguishes the system of art from these other institutions: neither laws nor strict procedures nor codes nor even absolute criteria. Nevertheless, what I call the "institutional business" instead of my using the word "institution", does practice a comparable, although different, rigor. Even if its deliberations do not have the weight of judicial decisions, even if they are based neither on demonstrated or experimental proofs, nor on the authority of a code or a political power, it must be recognized that its rules, although unexpressed, are not for all that any the less strict. How many

"aspiring artists" never achieve public recognition, the supreme sanction, in spite of their determination, work, or profession of faith (often sincere or desperate)! On the contrary, the "scandal" caused by certain artists at the beginning of their careers, far from hurting them as public reprobation and the indignation of certain critics might lead one to suppose, actually confers on them often--but not always--a position whose importance and significance the historian, after the fact, attempts to elucidate. The classic example is that of the Impressionists; yesterday, that of Duchamp, today, in a certain sense, that of Beuys. The process of Recognition remains a complex social process which does not depend on contracts, examinations or degrees. It is thus never an accomplished fact. Only the interactions of the "world of art" can confer it, maintain it or even annul it.

The element of notoriety is thus a motivating factor. It comes about, in a broad sense, through the "talk" generated by these interactions, which progresses from simple rumor to hearsay, to the first news articles, to prizes, awards, and to international recognition.⁸ This is a far cry from the days when the Salon de Paris made or unmade reputations. The growing number of exhibitions and encouragements^{are} giving to the dimension of communication a heretofore unknown advantage. There are now rich opportunities for the mass media as well as for the few media.⁹

Launched, stimulated and fortified by notoriety, the process of recognition culminates in the valorization which crowns it. The word valorization lends itself at least to differences of interpretation which favor, as we have seen, the commercial or

the ideological aspects, although all claim to highlight its esthetic quality.

Alert To The Media

While not forgetting that the approach should continue to take a problematic view and remain faithful to a systemic method, since the emphasis is placed less on the elements considered in themselves than on the interactions they produce and whence they spring--let us look at the media, old and new, or, more precisely, at the phenomenon of the "medium" at its roots.

Generally speaking, the medium is considered the way of transmitting a message from one or several persons to one or several receivers. Besides language, the first medium, it is the book, or more usually printing, that has been for centuries the dominant media. In scarcely the space of a century, the media have proliferated. After the press, radio, television, video, video-disk, satellite, computer, so many instruments of transmission, so many channels which, undoubtedly varied in their conception, materiel and actualization, all have as their function the passing on of messages. The neutrality of these "channels" seems to have been easily accepted; having been posited as an a priori by Shannon and Weaver who "canonized" it in their celebrated work Mathematical Theory of Communication¹⁰ to the extent that administrators, technicians, public officials, manufacturers and strategists accept it with their eyes closed. Thus, as soon as a new technique appears, the administration of the Post Office and Telecommunications think their responsibility is simply to accomodate it.

Its contents, they state, have nothing to do with its technical or administrative side. Thence, the cliché repeated unthinkingly: "The technique is neither good nor bad; it all depends on how it is used."

This naive point of view, which thinly disguises a good conscience from stupidity, was shattered by McLuhan's radical statement: "The medium is the message". This affirmation obviously went too far, but its meaning is more than a play on words. Clearly, if any medium is a process of mediating, irreducible to a simple transmission, it follows that there must be taken into account in every communication the very nature of the medium underlying it; that is, in the strictest sense, of the word, that each medium has a certain power of configuration which intervenes substantially from beginning to end of the transmission. In short, the emergence of a new paradigm is produced when the rules of a practice said to be "normal", that is, accepted by everyone, are changed."

The question that follows--and for me the answer is clear--is if the technological changes, which modify the conditions of our existence, are not the source of new forms which give us a new way of seeing and considering things.

Robert Stéphané, among others, has recently shown that, for him, the listing of programs on the television screen is nothing less than a metaprogram.¹² As the author observes, television has its own language whose syntax is formed by the screen and the camera; television has created an "art between the lines" by introducing "new forms" such as the logos; jingles, "studio design", "masters of ceremonies" (hosts), advertisements, video-

clips; these become part of the never-ending flow of televised news reports, sports and weekly shows.

In the light of this example, too briefly mentioned, it is difficult to contest the fact that each medium creates its own forms, on the level of communication as well as of expression, taking into consideration its possibilities and limits (the time factor, for example, dominates radio and television). In so doing, the media manifest a difference from one to the other which assures each one a distinct character if not an absolute uniqueness. For instance, it is obvious that radio does not consist of the news plus the sound of a voice, as television is not sound plus an image. The media do not proceed by a process of addition; they consist of configuring structures which, it has not been emphasized enough, permeate the public or publics with pre-formed structures of expectation, reception and demand.

In this way, each medium has its own esthetic; a way of feeling, which I call its topic to bring out the fact that the set of "characteristics" created by the functioning of a medium provides a cultural profile of those who use it. Printing itself creates an image of reality in which, whatever the varieties of approaches and the diversity of content, the concepts and their physical arrangement ~~are~~ used as the shaping and ~~already~~ shaped intermediaries. When I turn on my television, I ~~expect~~ and am greeted by another topic and another practice: images in motion, sound, music, words, these intermediaries function according to the conditions appropriate to the medium of television and which

have become part of us by a progressive internalization.¹³

A second observation touches on the particular character of the new media. Compared to writing or printing which have had a long existence and which have hardly changed over the centuries, the new media have been subjected to an evolution all the more accelerated that the pressure of technological innovation makes itself felt unceasingly. Even our language is short of breath. English, or rather, American terms are constantly infiltrating it. Significant excess: on the one hand, it reveals the weaknesses of established languages and their respective topics, on the other, it emphasizes the fact that those who control the technological power also shape our thought patterns.

That is only one aspect of the accelerated evolution of modern technology, however. There is another paradoxical, if not ambiguous, aspect. Actually, there is at one extreme the tendency toward globalization exemplified by Europe's macro-television with its semi-official stations run by the State; in the United States it is represented by the de facto monopoly of ABC, NBC and CBS. This tendency has culminated in the use of the satellite, whose first direct television broadcast was just launched by Japan. Thus are produced and distributed programs which try to reach the greatest number of receivers by vanquishing the obstacles of borders and languages. At the other extreme, there is the tendency toward privatization exemplified in different ways and degrees by cable, videotext, videotex, home video, in short, the entire home system of television and the personal computer. In this realm, the emphasis is on the individual use of

the media and the walkman is its symbol. To each his helmet or his headphones?

At first glance, these two tendencies seem distinctly different if not contradictory. But the ambiguity, which assumes the guise of paradox, is that the techniques which both tendencies use are the fruits of the same industrial producers. This shows the importance of the economic factor in the evolution of the media, whether they tend toward globalization or privatization. In the techno-economic war which dominates industrial production, technological innovation has become, along with capital, the offensive arm which decides the outcome.¹⁴ It would be unwise to ignore the fact that technological innovation also makes up the dynamic factor in the evolution of our modern culture. A prophetic cover of Time Magazine proclaimed this fact, in its first issue of 1983, where the traditional "Man of the Year" was replaced by the Machine with the title "The Computer Moves In".

The Computer Moves In

Already it can assume all the roles. Soon it will be able to do everything. EVERYTHING. Not that it flaunts this fact; it does not need to. Hardly solicited, it adds, subtracts, multiplies, divides; there is no arithmetic or mathematical operation it can not do instantaneously. It directs, simulates, plays (alone or with partners); it can operate trains, planes, factories, machines, robots; it can transform the office, archives for scientific research; it assists the inventor, the editor, the engineer, the expert, the creative thinker; it is becoming

as Protagoras once said of man, the measure of all things. It can produce as well the amenities of life in all areas: it draws, paints, plays the piano, flute, organ, saxophone, all known instruments. Stupendous virtuosity, with the help of the fingers, it can create out of nothing images and sounds, without the slightest help from its surrounding reality. The fifth generation of computers, which will soon consign our current computers to a museum ¹⁵ is now on the horizon. The "omnimedia" is infiltrating everywhere.

Concretely, three paradoxes (or should we say *aporia*?) demand both our admiration and our distress:

1. The computer lends itself to both the most specialized as well as the most general tasks. In so doing, it extends the challenge flung by humankind at the other animal species dominated by their limited instincts. The flexibility of the brain is balanced by the flexibility of the micro-processor; both are capable of responding to stimuli and changes in the environment.
2. Our systems of communication all rely on symbols and specialized codes to function. This is true of language (spoken or written), computation (figures, numbers), modes of representation (fixed or moving images), our ways of reasoning. The essence of information processing lies in its being able to convert all symbols into a series of 0 and 1; inversely, of being able to transform such a series, assuming appropriate processing, into words, writing, arithmetic or mathematical operations, drawings, paintings, music, noise and sounds. Thus the system of binary numbers, clearly defined by Leibniz in the seventeenth century, has

become of universal symbolism.

3. Based on relatively simple operations, the computer can progressively simulate all procedures to the point that, refining and multiplying unceasingly the possibilities of inferences, it has contextual thought within its grasp. Thus, the more the computer excels as a machine, the less it seems like a machine; and the more it appears as a conscience. We must wonder if the thinking machine is still science fiction or whether it is fiction become science. ¹⁶

Already, documentary research based on information processing is being developed in all fields. The new media, especially the video-disk, allow not only for the storing of a vast amount of prodigious information ¹⁷, but also make research easier by multiplying the combinations of criteria for research. Going far beyond the capacity of traditional libraries and catalogues, they also have the advantage of being able to furnish information in an extremely short amount of time and at relatively reduced cost.

This type of research, however, reveals certain limits, on one hand those inherent in the choices made by the producers; on the other those inherent in the choices made by the indexers. (periodicals to read through, articles to keep, etc.); without counting the risks of missing information, of gaps, apparent or intentional, or even of disinformation that appears in all complex technology. In fact, the bases and/or banks of processed information will become more and more the very place of knowledge and will hold the power that derives from this fact, considering

too that the possible connections between the different data centers will further increase the power of these networks. A more subtle effect, although not widely perceived: the conception, language, symbols, in short, the procedures put into play by the functioning of these data bases will result in influencing the way information is stored, indexed, processed and accessed. This side, apparently a secondary one, will have a profound effect, whose possible influence is hard to imagine, but which will certainly have a great impact. Collective memory is not only made up of a content able to be catalogued (and processed); it is also made up by the type of media used, and thus by the processes peculiar to each medium. To the extent that artists and critics, at least in general, continue to insist on the nature (if not unique then at least peculiar) of works of art, would it not be appropriate for institutions and associations to join forces in confronting the processing of documentation (perhaps the documentation of society?) under conditions they feel are adequate?

A New Challenge

And why not envision, if only for enjoyment (intellectual enjoyment?) the creation of an "expert system"¹⁸ which would act as a selection committee, like artistic juries, and exercise its functions? This selection committee (manmade) made up of humans, like a jury working in art exhibitions, seems to me to anticipate fairly well what we can expect from a system of processed information (computer-made). In its most manifest form,

it is in fact an institution which brings together a certain number of persons considered especially qualified, experts that is, who are asked to give their knowledgeable and competent opinions for the purpose of either granting prizes or awards (as is most often the case) or of choosing artists or works for such and such an exhibition, etc. In any case, and whatever the form of its activities, simple or complex, public or private, the important point is that the jury, even if it is contested, has the authority to make decisions; its decisions have the value if not of criteria, at least of rulings.

Consequently, by closely studying an ample number of cases and by analyzing the "functioning" of experts, it appears possible to derive the rules which, based on a set of structured, processed information, would allow the evaluation and classification of works of art according to previously tested perspectives and procedures. Expressed in this way, the hypothesis has a provocative air; it will also shock, I am sure, the tenants of humanism, for whom art will always defy the machine. Under the circumstances in which not only information, but also the whole of knowledge, is developing today, it would seem difficult for the esthetic perspective to remain an exception. The esthetic perspective has always, in fact, been constructed and validated based on a model. However, no model exists simply "in itself", nor exclusively in relation to the object under consideration; its implementation depends, by necessity, not only on the socio-cultural context, but also on the technical procedures appropriate to the

media it is using to elaborate it and communicate it. It would, then, be extremely surprising that in the age when information processing is imposing itself more and more, not only by its irrepressible expansion but especially by its increasingly sophisticated methods of refinement and penetration, it would be surprising, I should like to repeat, that artists and critics would not come up against certain changes as they begin to confront the media. Not really a challenge, but a gamble. Nor is my proposal of creating an "expert system" to assume the functions of an artistic jury either a provocation or a joke. Suppose it were taken seriously, as we take data processing seriously, we could find ourselves, in a reasonably short time, in the presence of studies which would allow us to measure the "processable" part, inherent in all collective procedures (even judgments), and the "non-processable" part, the part that defies processing. Artificial intelligence and (natural?) intelligence are not enemy sisters (or should we say brothers?). The deciding factor is that technology in general and the new media in particular now demand a redistribution of the territory, a reevaluation of techniques, a more rigorous examination of current phenomena, to which end other experiences, other procedures, other concepts should be applied.

In short, we can sum up the discussion in a question laden with consequences: is it possible in the field of art to turn to the computer as a partner? Not an exclusive partner, but one which can no longer be ignored.

Before coming to a computerized jury--whose usefulness I support not as an end in itself but as a possible avenue for

research--perhaps it would be good if the artists were informed about the technological evolution as it is proceeding in an ever-increasing number of salons, festivals, meetings and conferences. Impossible to be everywhere; impossible to read everything.

Thus it might be appropriate--and this is another suggestion on my part--to create a work group of critics interested in keeping up with the accelerated evolution of all technologies in relation to art. The changes are truly so numerous, so rapid, that it is foolish to think we can keep up to date simply by planning to discuss the following theme(s) at one of our next conferences: art, criticism, new media (or some such topic). Keeping abreast of these matters requires a determined effort which a regularly published research newsletter could promote.

We could thus learn to keep up with how technology, and especially the media, are simultaneously transforming society and, to a great degree, transforming art. The production, distribution, contents and meanings, notions and concepts, criticism--all are affected.

The preceding is so true that many artists have already begun, long before the critics, to draw inspiration from technology, video art, computer art, sky art ¹⁹ space art, holography, cineholography, etc...Without going back to the Pyramids, masterpieces of art, and striking technical accomplishments as well, we can recall that the last few decades have been characterized by an increased interest in technology, to which a vast number of artists, works, and exhibits will attest. ²⁰

Finally we can ask if the information processing revolution, following in the footsteps of the printing revolution ²¹ (revolution? evolution?) has not achieved what matters most, but which is usually noted too late, that is, a new esthetic dimension.

First of all, what is called "progress" appears as a "greater facility" or a "greater accessibility" or a "cost reduction", etc. which are all partially or totally accumulated values. But what happens in the long run, most often without our knowing it, is that the new technique turns out to be not only more effective in a given situation, but also that its widespread adoption entails progressive changes in our environment as well as in our ways of thinking and in the products it creates, as well as in our behavior; in short, each technique offers the possibility of a new esthetic dimension. This is precisely the case today of the information processing revolution which affects both our sensibilities and our imagination.

Will we be reduced to nothing more than the agents of this revolution, or can we learn to be partners with it? The alternative is more than just a matter of speaking. It is at work in the very heart of social transformation, in each one of us. The agent is he who, from inside a system, carries out certain functions whose objectives are those of the system itself. This is true for all agents, whatever name they go by, whatever they produce. On the contrary, a partner implies a type of associate relationship which, in an enterprise, is characterized by a participation which all the partners can appreciate. The agent exists within the functions he exercises; the partner exists when his

position as subject is recognized. An open system versus a closed system.

If the marketplace tends to make agents of the system out of members of the world of art, then the agents will have no rest if they can not keep or retrieve something of their original state as partners. To speak concretely, there is no art dealer worthy of the name, no critic, no museum director, no expert who, whatever his allegiance to the art market, will not decide to break away from the system in order to defend an unknown or misunderstood artist against indifference, oftentimes at the risk of his own livelihood. Similarly, if the computer tends to make us agents of information-processing, there is not one among us who could not forfeit his allegiance in order to affirm himself as an individual, to proclaim his attachment to a certain artist, to certain values, to a certain faith. The world of art has the virtue of ambiguity, when ambiguity means that the dispensable part to which the agent gives his allegiance does not deny that inalienable part which makes of him a person associated with others through the respecting of each one's personhood. But since there is no affirmation except a "published" one, made public by some medium, it follows that we can no longer ignore the medium of the media that the Computer has become; the computer which, to recall its etymology, established order. The Computer Moves In. If it does move in, it must be up to the humans to control it, assisted by the critics (not only art critics), on the condition that the critics know what they are dealing with, and how to collaborate. The interface with the machine has now become part of the human condition.

NOTES

1. This paper synthesizes a certain number of studies that have been or are in the process of being published. Please refer to, in particular, Art(s) and power(s) as well as to Art and the Media, on the Road to Abdère, both of which appeared in Diogène (UNESCO) (nos. 120 and 128).

2. It is important to recall what Ludwig von Bertalanffy already stated in 1968:

"A system can be defined as a complex of elements in interaction. By interaction I mean element "p" linked to its relationship to "R", so that the behavior of an element "p" in "R" differs from its behavior in another relationship such as "R' ". If it were to act in the same way in "R" and "R'" then there is no real interaction and the elements behave independently from their relationships with either "R" or "R' ". (p.53) Closed systems tend in general asymptotically toward states of equilibrium. On the contrary, in the case of open systems there can arise phenomena stemming from a false start of from a new leap forward. (p.164)

Cf. Ludwig von Bertalanffy, General Theory of Systems. Ed. Dunod, Paris, 1973.

- .. This notion is further developed by Joël de Rosnay, who sums it up thus: "A system is a set of elements in dynamic interaction, organized in function of a goal". (p.93). Cf. Joël de Rosnay, The Macroscope. Towards a Global Vision, Ed. Seuil, Paris, 1973.

- 3.) A recent study of the problems posed by international artistic exhibitions entitled The Role of Information and Encouragement in the Major Biennials of Contemporary Art (Venice, June 24-26, 1985), has just been made by a consulting committee organized by UNESCO with the help of the IACA and the AIAP. Organizers of biennials from the five continents were present at that meeting.

- 4.) These observations should be discussed and clarified at this meeting.
- 5.) Newspapers, magazines, manuals, everything is now profusely illustrated and in color, not to mention the millions of post cards needed to send cultural or tourist messages, not to mention the artistic merchandising which has become an important if not vital resource for certain institutions (several million dollars to the MET in New York).
- 6.) Cybernetics processes regulatory systems in people and machines. Its goal in general is to control actions and operations in function of data processing centered particularly on feedback. Cybernetics is thus at the crossroads of several disciplines: mathematics, logic, electronics, physiology, psychology, sociology. It is understandable why it has a key place today and why it dominates information processing and systems theory.
- 7.) Thus, Duchamp's urinal ceases being a utilitarian object the moment that, presented in 1913 at the Armory Show, it was endowed with artistic qualities by the critics. This extreme example shows that the status of a work of art does not only stem from, as people may still think, any intrinsic quality, which can be isolated as such, but by the set of interactions of the institutional business in the world of art.

- 8.) There is a Nobel prize for literature but none for the plastic arts. Moreover, a great many international institutions purposely do not award prizes, but their reputation is such that artists invited to them enjoy, ipso facto, an enviable reputation.
- 9.) By definition, mass media have as their objective the masses; the few media, a newly-created term I propose, designates products which can be obtained not massively but through programs of selection (like pre-recorded cassettes that can be rented whenever one likes). The evolution of all technologies has permitted, alongside the "wide public" which was the initial target, the creation of select publics who are themselves select targets.
- 10.) Claude Shannon and Warren Weaver, Mathematical Theory of Communication, The University of Illinois Press, Urbana, 1949.
- 11.) It is the same for the paradigms studied by Kuhn, who clearly demonstrated that "each scientific revolution modifies the historical perspective of the group living it." Cf. Thomas Kuhn, The Structure of Scientific Revolutions, Ed. Flammarion, Paris, 1970.
- 12.) Robert Stéphané, Television and Art--Television as Art, International Conference on the Unity of the Sciences, Chicago, November 1983 (unpublished). The author is the director of the Belgian Radio Television (RTB).
- 13.) I have developed this notion of topic in my book The Effect of Technological Changes--In Mutation, Art, the City, the

Image, Culture, US! Ed. Pierre-Marcel Favre, Lausanne, 1983
(pp 131-137).

- 14.) As proof there is the invasion of IBM which, having scarcely entered the micro-processing market, has captured the major part of that market in a short two years, relegating the pioneers to the second place, or forcing them to declare bankruptcy. Pitiless fight, to be won by whoever can eliminate the competition in order to seize their trade outlets; the winners will be those who can establish the most effective avenues of distribution. In 1975, SONY dominated the entire market of video machines; today, Betamax only has a quarter of that market which belongs now to Matsushita whose VHS, which appeared two years later, handles three-fourths of the world-wide market.
- 15.) Edward A. Feigenbaum/Pamela McCorduck, The Fifth Generation, New American Library, New York, 1983-84.
The idea of a museum is not a casual one: San Jose in California is planning on creating one "for computer age applied sciences, the Technology Center of Silicon Valley, which directors of the project hope will attract a million visitors a year." Its budget is a staggering \$95 million . (Cf. Herald Tribune, December 27, 1984).
- 16.) Turing's test, which dates from 1950, will decide. See Calculators and Intelligence in Tify 1, ALP and Co., Paris, 1984 (p.9) as well as Artificial Intelligence--Myths and Limits by Hubert L. Dreyfus, Ed. Flammarion, Paris, 1984.

The bibliography regarding information processing is too vast to be cited. A brief glimpse at this phenomenon is the subject of a book, For a Consciously-Done Information Processing, Presses Polytechniques Romandes, Lausanne, 1985, on which I collaborated with my article entitled From the Sphinx-Computer to Conscious Information Processing (pp 189-196).

- 17.) 54,000 images on a side, plus 100,000 on a single disk.
- 18.) Edward A. Feigenbaum/Pamela McCorduck, The Fifth Generation, New American Library, New York, 1983-84, (pp 63-103).
- 19.) Sky art was the subject of an excellent elucidation by Jürgen Claus which appeared in the journal Coloquio No. 58 in September, 1983.
20. The same is true for the famous exposition Art and Technology which took place in Los Angeles in 1971. Cf. Maurice Tuchman, Art and Technology, The Viking Press, New York, 1971. The same for the journal Leonardo to which the artist and inventor Frank J. Malina dedicated himself for many years. Cf. Frank J. Malina, Leonardo, Journal of the International Society for the Arts, Sciences, and Technology, Pergamon Press.
- 21.) Lucien Febvre/Henri-Jean Martin, The Appearance of the Book, Ed. Albin Michel, Paris, 1958 and 1971, coll. "The Evolution of Humanity".