

# ART AND TECHNOLOGY

JACQUES ELLUL

JACQUES ELLUL is Professor of the History of Law and of Social History at the University of Bordeaux. He is the author of many books and essays. Among those available in English are *The Technological Society* (1964) and *Propoganda: The Formation of Men's Attitudes* (1966) both published by Alfred Knopf. A work in progress is *Art in the Technological Society*. This article, written for *THE STRUCTURIST*, was translated from the original French by Lois Wilson.

We shall try to avoid the standard questions in this area. Everyone reiterates that art and technology<sup>1</sup> are similar in nature; they are both interpretations of the world in which we live. The expressions themselves have a common origin, as we emphasize by recalling that *techne* in Greek means art (though this definition is not completely accurate). From its beginnings, art has been combined with, if not dependent on, technology. Prehistoric paintings and carvings mark a very clear technological advance, coinciding with the knowledge of color production, the manufacture of tools of every kind and the production of weapons, fire and so forth. There is, therefore, a common source. We see throughout the history of art a reciprocal relationship: art influences technology and vice versa. Obviously, we must refer to Leonardo da Vinci, but also to all the great architects of the Renaissance who are responsible for significant technological advances. Finally, one last remark in the name of curiosity: the word "technique" was used for the first time in France in the eighteenth century *Encyclopedia* to refer to the *technique du peintre*. How could their relationship be better expressed! But this succession of reflections is aimed, especially to-day, at stating implicitly: "In actual fact, nothing has changed. Technology has influenced art in every period, and it remains the same to-day." My thesis, however, is the complete reverse. I deny nothing of this influence, but I maintain that insofar as there is no possible comparison between our modern technology and the technology of the preceding millennia, its effect on art is totally different. Art becomes something other than what it has always been, and particularly now that it is embedded in a technological society, art no longer has the same function, the same role as when it was placed in a traditional, predominantly religious society. We must try then to determine what innovations have influenced art and, in particular, what it has become.

## COMMON BELIEFS ABOUT MODERN ART

We can begin by recalling a few "common beliefs" about the relationship of art and technology dating from the nineteenth century. We note the direct influence of technology; it upsets the sensitive universe in which we live; we can no longer relate either to the values of the past or to the general conception of the world, nature and man which existed before. Technology also forces us to transform our aesthetic appreciation of the world. Furthermore, technology brings new instruments (the computer for the musician), new materials (concrete for the architect, acrylics for the painter, polystyrene for the sculptor, for example). This gives the artist incredible freedom to deal with what used to be constraint and obstacle. Every day new methods are created for expressing the artist's objective, and this transformation of the means of expression obviously brings about a transformation of the concepts and goals. The power of the painter is totally changed by the nature of his paints. The synthesizer offers the possibility of "synthetic sounds," and so "paradoxical sounds" change the scope of the musician. Art becomes dynamic. It is impossible to remain within the limited scope of traditional aesthetics; as techniques are transformed, art must also undergo transformation, not only in form but also in theory. Modern techniques challenge traditional art; we realize that it was only the expression of a given "class" of society. The objet d'art must lend itself to change and not remain frozen by eternity. Eventually it must be designed to disappear, for in this art trend dominated by technology, the final object, the ultimate creation, is of little significance: the important aspect is implementing the means. The overriding technical law is that the means constitutes the essential factor. And modern art adapts itself perfectly to this requirement. It has become an art of means. A complete change has occurred then in the theories of art in relation to the traditional world. I am totally in agreement with the famous McLuhan phrase, "The medium is the message."<sup>2</sup> This holds true not only for television, but also where art is concerned.

Moreover, technology can in itself become a model for art. The machine can provide direct inspiration. Thus, the urban dweller may imagine the city as a "machine to be lived in." "The city must be full of noise and motion like the machine" (*Nuove Tendenze: Citta Nuova*, 1914). Painting can copy machines directly or portray man as a machine (for example, the painting of Léger); music can become directly imitative of machine noise (Honegger's "Pacific"). And Beaubourg's

"artistic building structure" in Paris has been spoken of as a culture machine. As early as the pre-First World War period, the Futurists were the first to place on a theoretical level the direct relation Machine/Technology/Art Nouveau. Finally, the last direct influence of technology on modern art is the possibility of creating an infinite number of original works of art, distributed directly by computer, with no difficulty, to a large public. Thus Moles shows that the combinations of form and color made possible by the computer are of infinite variety, so much so that anyone can acquire an original "painting." But this is another aspect of what I was saying before, the "final product" counts for little, has no "value." The piece of music will be neither written down nor preserved. And this is important; it is the denial of one of the most profound truths of traditional art: the quest for eternity. The "work" produced by technical means no longer sets its sights on the eternal. It no longer seeks to leave behind a speck of human eternity. It is subject to the obsolescence which strikes all technical things. And for this reason art is no longer what Malraux called the "Currency of the Absolute."

A second commonly held belief about art and modern technology comes precisely from André Malraux. It is the "Imaginary Museum." Thanks to reproductive means (photography, phonograph records, etc.), the work of art is within everyone's reach. *Every work of art from every culture in every period and of every art form can be known to everyone.* The artist is bombarded by such an immense proliferation. He lives in a world where everything has been invented. He is therefore compelled to innovate constantly; he must always create something new. And what is new is immediately distributed by the same methods, which means that it is immediately obsolete. And once again, something fresh and new is required. (This explains why there were twenty-five schools of painting between 1945 and 1975, every one of them distinctly different.) The artist lives then, on the one hand as if cut off from his own particular cultural traditions, and on the other assailed by a too diversified, too incoherent, aesthetic world, in which he no longer has any discriminating criterion: everything is equally available, equally acceptable, equally "interesting." The "Imaginary Museum" is not an inheritance; it is a kaleidoscope — and the artist has no cultural, religious, philosophical or aesthetic criterion to find his bearings. Consequently, art ceases to be what, until now, it has always been. If we examine modern thought, we see that it is no longer a matter of art expressing what is *beautiful*, or of

creating *pleasant* works, or of providing a *meaning*. The only dimension of art that is generally retained is the *game*. What was held until now to be the objective of art is now considered to be worthless, uninteresting, dead and done with. Everything resides in the Game, amusement or mathematical puzzle, etc.

In conclusion, a third commonly held belief about modern art is "mass art," tied to the existence of the mass media. The mass media projects into mass society cultural images that determine what is art and that administer such "art" in massive doses. Art and culture to-day are defined by the mass media. Unquestionably, they are only forms and directions without concern for the content. But isn't *everything* to-day just *form* (for example, in modern linguistics the triumph of word form over concept). Form is entirely overemphasized in modern art (for example, theatrical production in relation to the text). Of course we can say that the mass media offer exceptional potential: we can imagine endless possibilities! The "masses," abandoning their passivity and becoming actively involved, are themselves creators. The public "must participate." But as much in the theatre as in music, this is purely conceptual, an abstract idea, a *vision*. The major difficulty is clearly that the "masses" may be equipped with fantastic means (movie camera, video units, video-tape recorder, etc.), but they don't know what to do with them. The masses are not a medium for a new art form. There is a strict division between every new art form and the masses who invariably follow tradition. Artists and critics will both admit, if only half aloud, that art must *mold* public taste and thought. The public always remains, therefore, a malleable "object." It has to be taught and made to accept that Ingres is nothing and Picasso is wonderful. A modern composer (Duraillh) said, "modern music is *not properly heard*: we are listening in a traditional way to music which is no longer traditional." As a result "mass art" is a falsehood aimed at legitimizing modern technical means employed by artists and at giving clear conscience to producers of mediocrity.

### SCHISM IN ART

Is it really mediocrity? Isn't there an exact and rigid determining factor? I maintain that what directly or indirectly defines all modern art is the technology and the place of this art in our technological society.<sup>3,4</sup> I observe a schism, a splitting of modern art into two radically opposite trends: "art with a message" and "formalism." If the basic phenomenon of our times is technology, and the nature of society to be technologi-

cal, insofar as art consistently reflects the society in which it develops, then the splitting of art and even the two trends can be explained by technology. The question then is: what is the position of modern art (*only* the latter, for I am not concerned with art in general) in relation to present technology? Now, we find on one hand a basically and deliberately technological art, and on the other an art which is in direct conflict with technology (rejecting the latter, aspiring to raw material, raw art, spontaneity, the anti-objet d'art, the undeveloped). Similarly, there is an art which resorts to the past (the outmoded, primitivism, kitsch, black art) and is, at the same time, a futuristic, avant-garde form of art.

*Art, backward motion in pursuit of surpassing itself in an historic society where history has yet to be lived, is at the same time the art of change and pure expression of impossible change: the more grandiose its scope, the more unattainable becomes its genuine fulfilment. This art form is inevitably avant-garde, and then again it isn't. Its ephemeral quality is what makes it avant-garde.*  
(Adorno)

This negation is not evidence of a disintegrated society. On the contrary, it is an art of protest against a unifying, centralizing society; for, in stating that art is invariably an expression of the society in which it is found, we can mean two things: either that this art reflects the society, or it is placed in contrast but, as a result serves to give confirmation to the existence of that society. By revealing through this contrast the contradictions of society, it reinforces them and, furthermore, it brings about their acceptance. By revealing the irrational, anti-art *produces* irrationalities and instigates further maladjusted behavior. Modern art demonstrates the inability to control the situation. In that, it is the opposite of the great forms of magic, religious, or classical art. The more difficult and intolerable society's structure is to live with, the more fundamental and unifying this structure becomes; and the more incoherent and diversified the ideological interpretations become, the more the aesthetic decor will tend to be decor (a game) and the more insignificant it will be. This is revealed in the variableness of schools and art works, with this compensatory art giving the illusion of meaning, of idea, of freedom in an unbending world.

This basic contradiction (compensatory art with a message versus esoteric formalism) leads to further inconsistencies. We will have on one hand an art which refuses to tell a story, to paint a "subject," to make comprehensible statements in drama, but on the other

hand an art which claims to convey a message, a conclusive piece of information, an imprecation or a sermon or an order. We will have an art which opposes aestheticism, art for art's sake, and which makes use of the means, but at the same time a neoformalism, an aestheticism based on self-justification (anti-art for the sake of anti-art!). We will have the requirement of raw spontaneity and the use of the most sophisticated techniques. We will have an art characterized by rejection of the object, and yet an art which, by opposing meaning, becomes a producer of nothing but objects (for example, ready-mades). Finally, we have an art which wants to be revolutionary, breaking with the past, and at the same time an art adopted immediately by capitalism (the works of the revolutionary artists commanding fabulous prices) or by State socialism (the same works also serving propaganda).

#### ART IN TECHNOLOGY

Art, therefore, is the reflection of a new reality. Our environment, the one in which we live, is no longer the natural environment, the environment of nature; it has become technological. We are living in a technological environment.<sup>5</sup> That being the case, nature, which used to be the artist's standard model, can no longer be inspirational since it is no longer a living environment. It becomes a pretext or theme, nothing more (pretext for light effects, for formal abstractions). No more does art reflect or represent anything of nature, because it is placed outside (as even we are situated outside). It seems that art becomes "abstract" or "non-representational," or informal. But this is wrong: it is merely placed in relation to, and within, a new environment which it reflects. It is perfectly concrete (like concrete music) in comparison to the artificial environment (i.e., technological) in which we live. It is clearly representational of what man sees, hears, experiences, but what he sees and hears is strictly the product of technology. The artist doesn't know it; he is content to translate without analyzing. He interprets a technical environment which is more and more theoretical (techniques become increasingly abstract: data processing, etc.). Yet, we realize this art is a tremendous producer of objects (never did the great masters produce like Dubuffet, etc. — with a picture completed every day). It is found in a world of objects (society of consumers made possible by the colossal output of objects resulting from the techniques of mass production). Now, this is a marked inconsistency. Modern art has claimed to have conquered the object, to have eliminated it; it has rejected the "work of art." It does not seek the finished

product, but draws attention to the method of producing the object. The object is eclipsed to benefit the means (for example, the *nouveau roman* and theatrical production). But in fact, it gives witness to the triumph of technology, for in the technological society, the means, the methods, are far more important than the actual product. Confronted, however, with the success of the technique employed (resin, computer, etc.), the object doesn't just disappear; on the contrary, there is duplication of the object (by the computer) and a return to the crude object, to pop art; in literature, the text of the novel or poetry must be taken as it stands, as an object nothing more.

Consequently, a reaction sets in: confronted with an influx of objects into the world of art, the artist escapes — whether through mockery of the object (unnatural, ridiculed objects, for example moustaches painted on a reproduction of the Mona Lisa, mockery in protest, expressing a certain despair), whether in the happening (aesthetic event with no possibility of reproduction), whether in “decomposition” (for example, the well-known 4'33” by Cage, or the “sculpture object” designed to disintegrate by itself). But these three attempts are inadequate compared to the success of technology, producer of objects by efficient methods, which elevates the means at the expense of the objects. The artist will refuse, therefore, to go beyond the object. A painting is a piece of canvas covered with color, a painted object: “there is nothing to look for behind it” (Manet). Music is composed of sonorous objects (from “packages” of sounds), the literary text is a set of black symbols on white. Consequently, nothing in all that can make any sense.

#### MESSAGE AND COMPENSATION

This, I believe, is the most startling side of modern art, which in itself has two facets. On one hand this art wants to be a means of action, an ideological art, a tool of propaganda (bearer of a message), on the other it is a sort of compensation with respect to emptiness, to the utilitarian, to the mechanical, to our technical environment. It can be just as much a means of escape. Thus technology generates an ideological art; otherwise how does it happen, for example, that Soviet art from 1925 to 1965 was identical to official western art of the nineteenth century, and how could it be that western art since 1950 seeks to be revolutionary and anti-establishment? We see clearly the development of the ideological in art. An intentional, ideological content is introduced into art (which intensifies the unintentional, spontaneous ideological content), giving

an *external* meaning to art. There is, therefore, an intentional ideology (for example, a revolutionary declaration) and an unintentional, ideological role in art (for example, to mask the reality of technological society and to compensate for it). The two are in no way inconsistent. Thanks to modern art, man is fully satisfied with an imaginary anti-establishment protest. By escaping into this art, man rejects the real world in which he lives, or else he attacks ideologically the intolerable system in which we live, but only in *one of its aspects* (generally political). I will say that the ideology injected into this art actually justifies the world as it is, precisely insofar as it declares itself to be anti-establishment. It exhausts man's aggressive powers, his impulse to revolt, which is aroused through and toward false objectives. It attributes man's misfortune to everything, except the actual reality of his life, which is submission to technology, submission that man generally views very positively (automobile, computer, domestic comfort, television, etc.).

But this art claims to overcome technical character by conveying a message; it suggests to man an escape from his prison by offering him fellowship and revolutionary commitment. The message, first of all, can only be revolutionary. It is an extremely pessimistic and political art (the model for it was the Living Theater, but there are thousands which are similar). There is, for example, an illustration through painting of a political speech (the Paris exhibition of painting in 1972: “The Art of Painting: The Last Twelve Years”). There are also examples in the theatre or cinema. In fact, these works do not tackle any basic problems, but remain at the most superficial level, on the surface (therefore, if the pollution tragedy happens to be portrayed, it is immediately rendered in terms of an accusation against “capitalism”). That is not the only “revolutionary” form. In modern art there is a distinct will to transgress, a will to deny everything. It is often said: we live in a society of Nonsense, therefore art must mirror Nonsense (Beckett). This art seeks to avoid being adopted by the ruling capitalist power, and we wind up, therefore, with the “creation” of an anti-art (for example, drama without text).

But if the work becomes totally abstruse and incomprehensible, then the public obviously ceases to see its revolutionary aspect. It therefore becomes necessary to append an explanation, to give the significance of the symbols used (Tapiès), to clarify, for example, that it involves a message about Nonsense or the absurd. But when we come to read the treatises of painters, musicians and theatrical producers, aimed at clarifying

the meaning of their work, we notice immediately the deficiency of their thinking, the mediocrity of their understanding of the world, and the thorough banality of their message. Finally, *excess* also finds a place in this revolutionary purpose; thought is replaced by a thrust toward extremes, giving birth to the drama of horror, to heights of violence in musical sound, staggering movements of the body, and violent colors hurled in one's face. Such are the superficial reminders of the forms of this revolutionary message.

This art with a message looks at the same time for fellowship. We have a deep need, in a cold and impersonal technological society, to rediscover human warmth, a communication which is not a Shannon-like abstraction. And a certain art form claims to provide just that. On one hand, we believe ourselves reunited with the theatre of antiquity through the fellowship of theatrical participation. On the other, we seek to motivate the public. A large number of underground movements claimed to fulfill this role. And we find very different trends. The reader himself must become the poet (for example, Queneau's hundred thousand poems, or "Epsilon" de Roubaud). The spectator must join in the performance (for example, the play "1789," at the cartridge factory in Vincennes, when the audience had to take part in the processions, along with the players, to represent the processions of people in the French Revolution). Even creative architecture is derived from community bonds (certain attempts by Yona Friedmann). Now, all this corresponds to a compensatory reaction to a world of upset and regulation; the art mirrors the product of a technological system (which automatically creates collectivity and multiplicity), and provides what is indispensable in order for this situation to be tolerable.

#### FORMALISM AND THEORY

This represents the other major trend in contemporary art; it is an art without content, without any expressible significance, without any reference point; it is, in fact, the exact replica, conforming exactly to technology, but more and more difficult, obscure and scholarly.

Firstly we observe the prominence of theory in each form or each attempt: it is an art based on awareness of the potential of machines and of diverse techniques, wherein lies the origin of the theory. The artist is guided by individual, systematic development, according to a rule of construction, with forever more refined improvements in the technical methods of execution. This implies a rejection of statement and feeling, of sensitivity — and of the subject and its being. The same is

true for music composed strictly mathematically. We have diverse theories, but the dominant characteristic is chance: accident, statistics, the theory of infinite combination. There is an attempt to form a science of motion *independent* of the nature of the objects to which the motion applies (structural dissociation of motion and the object in motion). We could cite dozens of examples of these purely abstract theories.

But the theory will be expressed in the utilization of the most sophisticated technical methods. The artist, for example, will become a computer programmer. Even in literature, there are only "writing<sup>6</sup> processes" to be applied. Now, the work produced under these conditions remains entirely foreign as long as there is no explanation. "The way to make use of it" must be supplied, a disclosure of the theory! We will therefore have a treatise on the work and the theory, or else we accept this work as an enigma to be unravelled.

In all this we notice a loss of meaning. Art no longer refers either to a sign or a source. It is purely objective and external. "One must agree that a sound is a sound. . . . One must give up all illusions concerning aesthetics or the expression of feelings. . . . the goal is to have no goal" (J. Cage). And this corresponds precisely to technology, itself, which has no finality.<sup>7</sup> The purpose is no longer to convey or to give a meaning; the form is in itself the meaning (being linked to structuralism). It is therefore necessary to become exclusively tied to the concrete act of painting or writing; value doesn't exist, only the sound, the material, the word, the movie-theatre, etc. And from there we come back to the theory: there is really nothing to be said. There is no possible purpose or expression. Communication is no longer communication of something, but a simple process (here again, identification with technology). Language is challenged inasmuch as it could still be a carrier of meaning. Puns are constantly produced to show the ambiguity of verbal sounds. And every exercise becomes possible: incorporation of two plays into one (for example: "*King la crème Lear Napolitaine*"), systematic corruption of a classical play by a technical process ("*A. comme Andromaque*"), a collage of photographic films grouped in disorderly fashion, the theory of destruction as an artistic process, etc.

#### THE ART OF GAME PLAYING

Remarkably, these two trends are united in game playing, confirming from both sides that art is nothing more than a game. But on one hand there is compensatory game playing, and on the other theoretical game playing.

Compensatory game playing: art is a kind of invitation to a celebration, for example, the happening. Everything that has gone before must be rejected in order to proceed into the unknown of spontaneous creation. Everything that can be anticipated, organized, planned, and thought and all techniques are rejected! "When machines come into play, man gets out of the way" (Bauhaus). The goal is to invent the counter-culture of freedom. Art must be produced simply by playing, as young animals play. But at the same time the revolutionary, disruptive value of the celebration is affirmed. The celebration *is* itself revolutionary. In every celebration, society is called into question; for this society is conceived with a view to production according to its efficiency; it is a serious business. To introduce then into these mechanisms the celebration of art is to question the fundamental concept (just as at the Avignon Festival). But under these conditions, fellowship quickly becomes tragic; those who launch the celebration do not tolerate the passive spectator. We are summoned, sometimes violently, to participate in this game. Outside the celebration, the game may resemble the creation of a stage set in the streets: paintings and decoration on walls, board fences, construction sites. They have gone so far as to print designs of old car parts on walls. Now, this whole movement of the revolutionary art game introduces a basic defect, for art as a game is precisely the bourgeois conception of art! Art for the bourgeoisie was an "extra," an "appendix." There was serious business (science, money, etc....) and then art as entertainment. Now, this is not by chance: it is, in fact, technological development that reduces art precisely to that, as much for the bourgeoisie as for the so-called revolutionary artists. At this point art becomes a simple, psychological compensation, the picture of freedom without any consequence (the artist may do as he likes, it will change nothing of the make-up of society, and especially of technology). And this art is completely cut off from reality: up against the machine (material or social), it goes totally beyond social and concrete reality to rediscover "life." It claims to be revolutionary, but it is a purely verbal revolt, which completely bypasses the real structures and questions of our time (even — and particularly — when it wants to be "political"). Moreover, this revolutionary art, this game, is entirely accepted by the bourgeoisie, and these artists receive fabulous sums.

The other major trend in art (the theoretical) also leads to game playing, and to full agreement that art has no purpose. But instead of formulating revolu-

tionary ideologies, theories are developed to prove that art can be nothing more than a game, such as chess, etc. It is a matter of playing with the instruments which technology has placed at the artist's disposal. It is a game with strict rules; they are what describe the art that exists only when a carefully designed procedure is observed. For Moles, art has become "the game of permutation and combination." We could list here a great variety of these fixed rules of the game, always according to the technical apparatus. The literary text becomes a rebus (for example, Ricardou, explaining a Roussel novel, proves that one must *first* understand that for Roussel the white paper represents the "Whites" and printed symbols (black) represent the "Blacks"); even the picture or poem is a puzzle whose user must piece together the content. It is an exceedingly scholarly art. Explainable only if one has the code, the form becomes totally pure, having systems of stable equivalences. Thus Kandinsky will tell us "vertical=white=activity=birth...."

#### FINAL OUTCOMES

From this duality of modern art found in the game, we need to analyze again the artist's position and function, and the complementary role of the critic. We cannot delve into these questions here. I will only give a few comments: in the end the artist integrates human specificity into technical neutrality. His role is clearly defined by technology. And from this very fact, whether through the inadequacy of the message, or through the reflection of technology, he destroys everything in man which could be a reaction against technology. He turns man away from the real problems; he distracts and castrates him. Far from being a contradiction to technical development, the artist is an unwitting agent of its advancement. In other respects, insofar as the work of art no longer has any meaning by itself, we are witnessing the phenomenal development of the critic's role; he is compelled to act as mediator, responsible for explaining to the public either the embodied message, or the applied theory.

I would like to make one last clarification to avoid any misunderstanding: I am not in any way putting modern art on trial; I am not making an appraisal of it. I limit myself to noting that modern art totally removes everything which in every culture has been the substance of art from the time of its origin (recognizing that generally a so-called artistic activity was not separated from other activities — as is now a result of technological specialization). We can take all possible art forms — they are always reduced either to the expression of

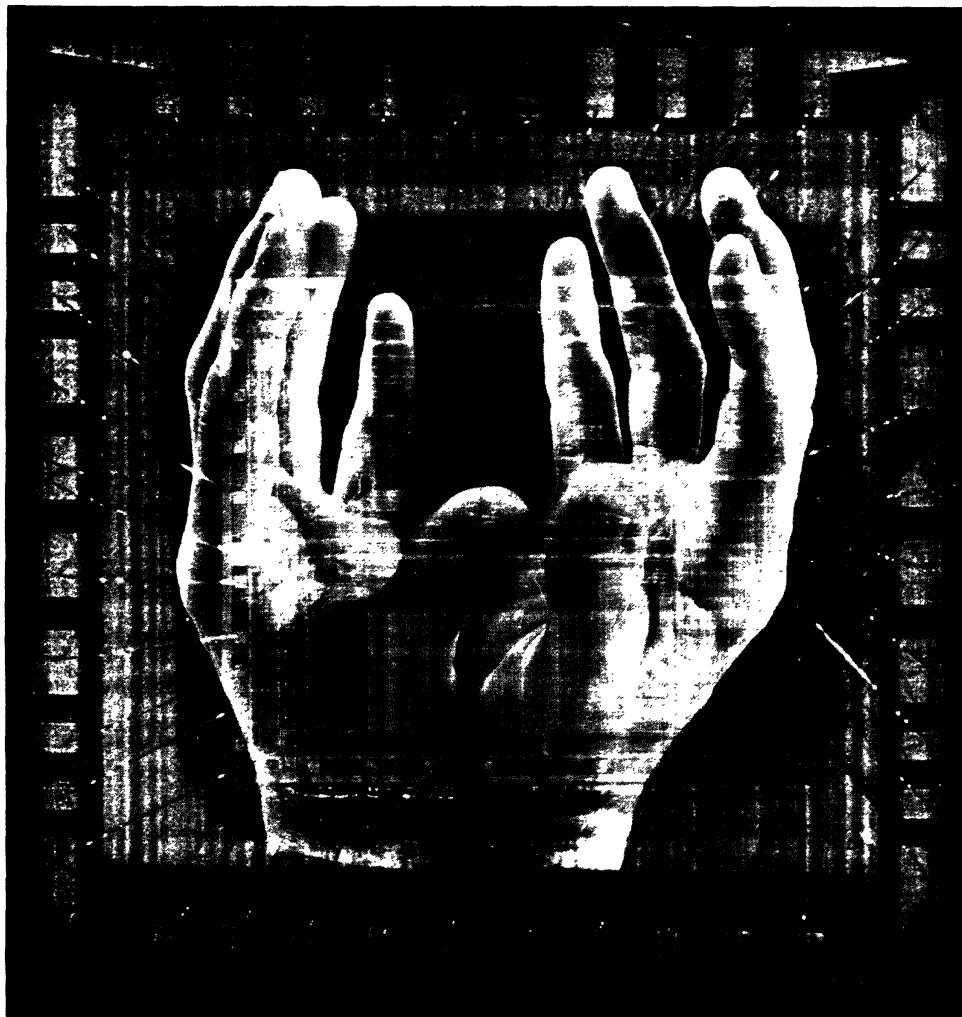
meaning, to an influence on reality (through connection with magic or religion, for example), to a symbolization of reality, or to communication. It is through the exercise of one of these four functions that art could come to produce works considered to be "beautiful." Insofar as modern art has left these spheres, that means simply that it no longer corresponds to what, in humanity, we have been able to imagine as art. It expresses a radically new position. And this transformation is explained by the radical change in our society, in relation to all earlier societies, due to the effect of technological development. □

NOTES

1. For the purpose of this article, the word "technology" has been adopted for the French substantive "technique," as used by R. Clark, translator of "The Artist in the Technological Society," J.

Ellul, *The Structurist*, No. 6, 1966, pp 35-41: "Although the English word "technique" is used in *The Technological Society* (Knopf, 1964), a translation of Jacques Ellul's *La Technique* (1954), we are taking the liberty of using the term "technology" with the meaning originally given it by the author: "the search for methods which are both rational and coordinated in their total effectiveness in all spheres of human activity." — L.W.

2. I shall simply emphasize that in 1962, when unacquainted with any of McLuhan's work, I wrote in *Propagandes* that the influence of television is totally independent of the message communicated by this means.
3. With regard to the following pages, the interested reader will find numerous examples and analyses of contemporary works in my book, *L'empire du Non Sens*, (PUF, 1979).
4. For an explanation of the difference between technology and technological society, see my book, *Le Système technicien*, (Calmann, 1977)
5. Cf. *Le Système technicien*.
6. As in handwriting, i.e., refers to the technical processes associated with production of written symbols. — L.W.
7. The question of the non-finalist growth of technology is extremely complex. I refer the reader to the study of it in *Le Système technicien*.



PHOTOMONTAGE BY HELMAR HEIMANN, SASKATOON