

THE FUTURE OF CULTURE

It is not as easy as one thinks to define the new dimension created by science in the life of modern societies; a considerable number of prejudices, resulting from conceptions which are often directly inspired by science itself, produce an unsuspected degree of resistance in this respect. Our only means of overcoming them seems to lie in isolating the real implications of the current scientific revolution, in breaking with the clichés which ensnare us, in becoming aware that research plays a very different part from the one that the preceding generation saw fit to attribute to it, so much so that one of the great barriers erected between art and science dissolves. Thus the hope placed by Gyorgy Kepes in "a new awareness of the interdependence of knowledge and feeling," in "the links between the intrinsic characteristics of natural and artistic forms" would be justified, together with the efforts of such men as Buckminster Fuller to erect "a bridge between our conception of the constitutive principles of nature and the application of this knowledge to the creation of man-

Translated by N. and M. Slater.

made forms,” and with the will to “renew the ancient marriage of art and science.”¹

It would be absurd to conclude that this is a step backwards towards irrationality by an unexpected twist; rather, we have here the first sketch of a completely different, as yet unexplored view. We also have the establishment of as yet unimagined connexions between rational activity and that which it permits to manifest itself and which, though created by it, nevertheless remains subject to its grasp. It is not only nowadays that the disinterested character of science, its desire for objectivity, the existence of fundamental research, are stressed; it is true that at the same time science has been by no means immune to accusations of complicity with the intransigent will of man and of holding everything at its mercy. However, a complete reversal has come about since it has been possible to see beyond the multiplicity of disciplines, specialities, tasks, research projects, to the emergence of a whole Universe from the mists, a focal point of convergence, a principle of unity for all these disparate labours. The “disinterested,” “objective,” “fundamental” character of research takes on an entirely new meaning. What, indeed, are the “foundations” of scientific knowledge, if they be not the very Universe to which it aspires? What should we understand by objective knowledge, other than that which is concerned with a Universe entirely *other* than we are, a Universe which, stripped bare of the faintest trace of humanity, exists in its own right, out of our grasp? As for the disinterested nature of research, does it not attest the existence of a never-ending, as yet imperfectly understood struggle between the internal civic preoccupations which constantly drive it to turn in on itself, and the will to maintain, against this temptation of self-sufficiency, a concern with the “inhuman” dimension of reality?

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From the moment that one recognizes the dominant part played by scientific research in the dynamics of industrial societies, one

¹ These quotations are taken from the collective work *Vision+Value*, edited by Gyorgy Kepes and written by doctors, psychologists, artists, architects, engineers etc. Here we have a real monument in eight volumes, highly representative of the trend we are concerned with.

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must concede that this struggle is written in their hearts; if we measure the considerable amount of innovation brought about by this struggle, we can convince ourselves that the struggle is violent and that this violence no longer corresponds with that of the social and political struggles we have known up to the present. The great struggles that have marked modern consciousness have revolved, up till now, round the establishment of a new society; the problem has been to destroy the institutions and the activities of the old society which obstructed this process. Now that this new society is in sight—giving free rein to dreams about a classless society, without conflicts, living in abundance and leisure—there arises a previously unsuspected source of conflicts, transformations, and of progress, between society considered as a whole and something other than itself, with which it has to do daily, if only to ensure the survival of its members, but which it still refuses to recognize, to look in the face or to call by name.

For the first time in modern times, the research worker and the poet are able to show the men of the industrial society the Universe to which they really belong, and to awaken them from their utter torpor and solitude by telling them, in the words of Le Clézio, “the never-ending and measureless history of materiality rediscovered,” (discovered how, if not by science?). By inviting them to witness “the admirable spectacle of a return to matter which gently draws us towards a sort of precise dream,” (who dreams in this way, if not scientists?). This “material ecstasy,” this tragic and violent joy at the sight of the world at last rediscovered, fulfil the persistent longings of all poets from the moment that those links of affection and familiarity, and those relationships, relationships of understanding and of courtesy, have been severed between industrial man and the world.

Everywhere, technology even more than science has been held responsible for the rupture of modern man with the world. Even a short while ago, Octavio Paz reiterated the criticisms normally levelled at it, albeit with more depth than is customary, because they refer to the former cultural system conceived in all its fullness. Technology has deprived men of every picture or vision, and prevents them from giving “the human response to the world,

rhymes or verses of the poem which the cosmos tells to itself.”² Their solitude thus takes on a strange, unwonted, disturbing quality: “Nowadays, we are no longer alone in the world: there no longer is a world.” Faced with this situation, we absolutely agree that it is indispensable to remind us, as Octavio Paz does, of the architecture of the former cultural system, and to consider it in all its dimensions: “If the world evaporates as an image, a new reality covers the earth. Technology is so powerfully real—visible, palpable, audible, ubiquitous—that true reality has ceased to be natural or supernatural: industry is our landscape, our heaven and our hell. A Mayan temple, a mediaeval cathedral or a baroque palace were more than monuments: they were perceptible points in space and time, privileged observatories whence man could contemplate the world and the beyond as a whole. Their orientation corresponded to a symbolic vision of the universe; the form and the disposition of their component parts opened out a plural perspective, a true meeting-place of visual paths: downward and upward paths, paths to the four corners of the horizon. A total vision of totality. These works were not simply a vision of the world: they were created in its image; a representation of the face of the universe, a copy of it or a symbol. Technology comes between us and the world, shutting off every perspective from the eye. Behind its iron, glass and aluminium geometry there remains only the unknown, that formless region as yet untransformed by man.”

This analysis has the very great merit of carrying the discussion to the only plane on which the problem of culture should be discussed; it thus allows one to make a clear assessment of its evolution in modern times, but also to specify the respect in which the picture presented by Octavio Paz begins to be slightly out-of-date. There is no need to refer back to the destruction wrought by technology and industry on all the elements hitherto considered as forming a part of real culture; it is equally beyond dispute that the unknown region which fascinates modern science and which it explores has a brutal, inhuman, formless side to it: we have made a point of stressing this already. This region cannot therefore serve as a direct

² *L'arc et la Lyre*, p. 353.

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inspiration for works loaded with symbolic implications; on all these points we are in complete agreement. But in every discussion of this kind it is too easy to forget to ask oneself how the former system was set on its feet; do we not too frequently reason as if it had purely and simply fallen from the sky, associating ourselves with those who invoke a First Revelation? Would it not be more serious-minded to consider that it had emerged with difficulty from chaos and savagery, or rather from the millions of efforts made to impose a certain living and dynamic order on a certain chaos and a certain savagery? Today, we see it through the innumerable fruits it has borne; but it is only a dead tree now, we have no compunction about saying so, and we are barely interested in knowing how once the sap rose from the “formless” soil, and brought life to all these fruits in the days when they were ripening on branches in their prime. At the opposite pole, the cultural system for which we are responsible today has scarcely shown itself above ground, and we find it hard to imagine what evolution awaits it. It is unthinkable that “the dialogue” and “the inter-relationship” between the works of antiquity and “the landscape that sheltered them”—with which Paz credits the old system—can have been established from the start as if by magic. Nor was it from the start that our predecessors in ancient civilizations raised themselves to “a total view of totality”; this is something which we for our part are finding it hard to attain or even to imagine, and we cannot see why men who, several thousand years ago, undertook great enterprises well worthy of the name of civilization (which still stand as a challenge before our eyes today) should have achieved it at the first attempt, when we have not been able to construct it over several centuries (though we are never tired of remembering how far we are their superiors).

Before attaining totality, surely one must first identify, take stock of and select from among all the elements that are called to make up the relevant whole. “Totality” has nothing to do with the idea of stuffing *everything* in: it enjoys a certain unity which it can only impose on such parts as are chosen according to a common principle, even if at certain moments these seem to be as different from each other as they could possibly be.

This is the great task to which science has been devoted up till now; this is why its *analytical* tendency, its *critical* spirit, its incessant division into *specialities* have had the upper hand. The present revolution is bringing about a change, insofar as the data accumulated by thousands upon thousands through the past few centuries are beginning to gather into groups here and there, letting us glimpse the possibility of a certain ordering, most definitely not immovable, but mobile, dynamic, ever refashioned and refashionable for the benefit of ever vaster coordinations, of a living totality, of a real Universe that is living and intelligible.

Nevertheless, certain differences do exist with respect to the old cultural system: whereas “totality” is taking shape, the “total point of view” is far from being appreciated, either by the scientist, who must follow his path step by step, or by the poet, who persists in cursing all that takes its origin from science and who refuses to recognize as his own the Universe which science has given to the men of today. But on this point there is an imperceptible evolution taking place, from both sides: research does not only advance step by meticulous step—sometimes a spark flashes across the field of knowledge and illuminates whole regions which until that moment had been separate. As for the poets and the artists, their *avant-garde* is becoming aware of the fascination of the new Universe, even if it has to renounce the proud solitude of rejection. Gyorgy Kepes seems to us to give a reasonable account of this bilateral evolution in the following comment: “The world, as an ensemble of structured systems, is no longer divided between the two territories of scientific knowledge, and our artistic grasp of the physical world coexists within a common structure of motivation, communication and knowledge. All progress towards the mutual enrichment of art and science brings us closer to the full development of our own potentialities. In order to attain that which we all desire, in order to become worthy of an environment where life is worth living, we must do all in our power to unite our inner and outer worlds—to renew the ancient marriage of art and science, art and nature.”

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Sceptics will say that these are wishes, hopes and schemes, while the works inspired and executed according to this idea are far from opening out "a multiple view... to the four corners of the horizon." The gulf that still exists—and it is a wide one, we admit—should not in any way prevent us from grasping hold of a culture at the height of its gestation; and for this it is not enough, as Octavio Paz holds, to adopt a "total view of totality"; we must also rid ourselves of many bad habits of thought, and first of all of our inveterate historian's attitude which makes us very good at understanding, appreciating and judging all that has been achieved, but very clumsy, timorous and reticent before all that which—in confusion but also in hope—is in the process of seeking, forming and building itself. We are not sufficiently conscious of how much this defect falsifies all our understanding of cultural creation, how it leads us to prefer in all circumstances the completed masterpiece to ill-formed nascent efforts. This does not at all mean that we must love novelty for its own sake; on the contrary, novelty ceases to be a sufficient criterion from the moment that there is a serious system of reference to the new Universe; indeed, only those artistic or scientific efforts which contribute to the establishment and to the mastering of this new Universe will be considered as valid. Yet let us not appeal to a jury or to a judge, be he visible or invisible; when the cause to be served is the ordering of the whole Universe, the creative act itself is its own sole judge.

Discovery, invention, freedom, imagination, refusal to judge, that is to say to enclose in a definitive verdict, these are the characteristics which the combined evolution of art and science is in the process of conferring on the artistic tendencies of our time. It is these that Alain Robbe-Grillet singles out in his reply to a journalist's questions on the significance of his latest novel: "If you present imaginary, fantastic sequences within a perfectly constructed story, even if the construction only becomes apparent at the end, you empty them of movement and of life. Now, I want them to be like living matter, actually growing, pullulating, clinging to you. If traditional psychological analysis seems to me to fail in communicating passions, it is because it labels, codifies,

names, and orders. In doing so it congeals. From the moment that an author says of his character: 'This is a jealous man, this is a miser,' one can be sure of one thing, that it is a dead man."

If science today is opening the way to a new world which is almost entirely unknown to us, the honours are entirely due to science, which did not lightly embark on an exploration that had no tomorrow; the discovery of a whole universe is the fruit of its rigour and its obstinacy. This world strikes us by its dimensions, which are truly incommensurate with that which for the time being serves as our world. As a result, science is imbued with a feeling of indefinite expansion, which it communicates to the other members of the city, be they industrialists, economists, politicians or artists; Pierre Boulez defines modern music as an expanding music, opposed to classic music as "the music of concentration." The biological sciences which play a leading part in the current rise of research reinforce this orientation by forging, under the pressure of the living phenomena they study, notions, reasoning processes and perspectives apt to present life as the establishment of a dynamic and growing order, always new and unexpected. This expansion, this growing, frees us from all our old attachments to intangible categories, and from our desire to identify in every circumstance perfection with fixity; it liberates us from those of our judgments which could only be fixed because we were sure of living in a fixed, permanent, immutable world without a future, without a history.

It is towards a profoundly remodelled logical system that the movement of expansion and growth is leading us, that path on which, not without dizzy fear, we have been set by a science which no longer, like the oracle, dictates the full and entire truth of this invariable world, but which flings itself into the greatest adventure of modern times, that of setting out to meet a Universe so amazing that it makes all our boundaries, all our judgments, all our ideas of perfection explode into fragments. In contrast to the moribund world which surrounds us and which is no more than an inconsistent and conventional backcloth, the new Universe attracts us by the endless movement which animates it, by the exuberant life which inhabits it; all our former aspirations to embrace everything in a scholarly synthesis, the culmination of years of analysis, crumble before the perspective of an endless

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transformation, an eternally new world, whose prodigious organization defies all our conceptions. Everywhere we must change our approach. The novelist can no longer manipulate the strings of his hero, nor the scientist those of a world with whose secrets he should be almost completely acquainted. Both must feel their way, with no landmark, no map, no compass, in hesitation and uncertainty, but on the other hand, carried away by a creative imagination which is capable of breaking with the traditional forms of thought, capable of *inventing* at all costs,—for on unknown territory there is no other means of salvation.

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Thus one can easily explain the fact that nowadays science and art both take on the appearance of uninterrupted research. It is the encounter with a Universe which explains it; at the same time it justifies the growing distance between this latter half of the 20th century and the 150 years which preceded it, between the predominant orientations of one and the other period. The latter part of Robbe-Grillet's declaration brings out one of the great differences which separates them, and it is not by accident that imagination is once more awarded the patents of nobility which the science of the last century had confiscated and whose validity it is today obliged to recognize as regards its own work: "Imaginary life is the true life of man. What distinguishes man from other animals is that he is essentially in the process of imagining his own life... In the 19th century, perhaps, it was judgment (that was his distinguishing feature). But the world has evolved. Man has given up trying to fit the world into his systems. Scholars no longer believe that determinism will regulate the movement of particles. When young people are reproached with the fact that they have no ideals any longer, the fact is simply that they no longer see the world as a pre-established construction, a well-oiled machine." The example of science is clearly evoked by Robbe-Grillet; and indeed, in future, those who approach the subject discussed here will have to turn to science, even if the reasons invoked—in the event those of uncertainty in quantum physics, sometimes leave something to be desired.

We are not yet sufficiently aware that the birth of a new Universe erected by science overthrows completely the perspectives of artistic creation; a new ardour inspires artists to explore every field of sensation, because those which have never been experienced might perhaps help to tear the veil that still covers the as yet undiscovered world. It is certain that there is a general transformation taking place, for instance, in present-day music, over and above the desire to achieve a few new sounds; music, Pierre Schaeffer comments, "flung itself with a violence which long adherence to traditions explains, into a technical and aesthetic double revolution"; by this is meant that the two components, science and art, are linked together; "the discipline of a new mode of knowledge, as yet no doubt imperfectly perceived, is associated with the artistic process of creation," adds the advocate of *musique concrète*. But if art tends more and more to rub shoulders with science in their search for a world buzzing with new sensations, it is not content to trail behind it but insists on taking up such tasks as suit it in order to explore properly the Universe that is in gestation; this can be seen in the following lines of the young American composer Eric Salzman in answer to a question on recent evolution in music; "If, whichever way we turn, we seem to be approaching an extreme, that is because this is in the very nature of modern life, which, for the first time, offers us the whole gamut of possible experiences for the development of our art. But the important thing today is not so much the fact that any type of perceptive experience can be established, but rather that the exploration of an infinitely expanded experience can be communicated across the whole range of human capabilities; not the fact that it is now possible to reach and to pass the limits of perception, but the *artistic exploration of these limits*. All this shows that we are barely arriving at a level of perception and of communication, far removed from the thought, the meanings and the individual needs which dominated contemporary art up till a few years ago. The range of possible experience is itself the subject of the new art. The best works of new music (I am speaking of course of music that is now beginning to be born) are expressive, *in the sense that they are speaking anew of 'something'*: about the quality and the nature of an experience, a perception, a thought, a high understanding—all established

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through premises that are unique to each work, but which arise from a fund of knowledge and experience that has become universal.”³

The rediscovery of a Universe and the rapprochement between art and science that ensues are not the only manifestations of the current upheaval. Another aspect has to be stressed because of the unusual extent of its effect on the development of culture. The common characteristic of the science and the art of the new Universe goes far beyond these two branches of activity; the true partner which it is called to meet, the only one of its own stature, is industrial society as a whole.

The reason is a simple one, and rests on a fact well known to all: it is not research alone, nor theory, nor calculation, nor experiment alone, but the cooperation of science and industry that open our way to the universe. The reconciliation of art and science depends on a more fundamental rapprochement between science and industry. This proposition will be less offensive to the defenders of Culture if, instead of regarding both these reconciliations from the usual standpoint of the inner life of society, they will consent to consider it from the point of view of the relations that are beginning to form between industrial society and the new universe.

From this point of view, industry plays a part of the utmost importance; not only does it allow science to come to grips effectively with this Universe, by helping it to come out of its laboratories and its *in vitro* observations in order to enter living physical reality, but it also guarantees—standing as it does at close quarters—the diffusion of scientific imperatives through all divisions, all activities, all strata of society; let us not be afraid to say for example that every industrial product (and the list will soon cover everything including agricultural products) is, and will increasingly become the depository of some part of scientific knowledge. In other words, without industry, research would not be able to lead to the union that we spoke of in the beginning, between economic, social and political transformations on the one hand, and intellectual, mental and cultural transformations on the other; this coordination is impossible without the effective

³ Our italics.

intervention of industry. The old fears felt by the men of culture faced with industrial activity were due to the fact that they only saw industry in action left to its own devices; it goes without saying that by itself it is incapable of going beyond those limited aims that it can set itself. By itself, it cannot transcend the preoccupations and needs it meets in social life; nor can it have any relationship other than a practical and disparate one with the materials that it transforms according to its lights.

These well-known characteristics make industrial activity directly complementary to scientific activity, from the moment that their union takes place. One is internal to social life; it has a practical attitude to matter and avoids seeing in it anything but a series of disparate resources, delimited on the basis of the needs of society. The other stands outside—some would say above—social life; it has a “theoretical” attitude to matter, a coordinating one; it tries ceaselessly to find in it a “unitary field,” or at least a general plan.

So one must emphasize that without the help of industry, research would be wasting its time trying to put in place an entirely new universe; this universe would remain shut up in the icy, abstract, inhuman, extra-social, ahistorical solitude of mathematical formulae; it would accord neither with economic life, nor with the most massive aspirations, nor with the most exalted needs of the modern societies to come. On the other hand, its interpenetration is leading industrial society progressively towards the new Universe; industrial society, all-present in its essential activities, no less in its practical everyday life than in its most profound historical life.

From this there follow a number of consequences of the greatest importance for the development of culture. The most visible one is the fatal blow to the cultural edifice bequeathed to the western world by the Renaissance and the Reformation, whose beams still support more aspects of our existence today than we might think. What we condemn today is the supremacy that used to be assumed by the book, its author and its reader, both these latter being conceived as “cultured” individuals. In *L'Age de l'humanisme*, André Chastel and Robert Klein define the Renaissance as the arrival of a third power alongside the State and the Church, a power resolved to impose its language and its ideas upon

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them: "the third cultural force." The arrival of the new Universe, the child of scientific research and industry, both strangers to the cult of the book, is bringing about the overthrow of a supremacy founded above all upon the man of knowledge and wisdom, the cultured man, the literate, educated, learned man, in a word—the humanist; it puts in question the promotion of the (cultured) individual to the highest ranks of cultural creation and enjoyment, a promotion which had been carried through at the expense of all collective organization, all established bodies. As a savant, the individual could embrace the totality of knowledge and speak all the languages worthy of him; as a genius, he was the creative source *par excellence*, the intermediary between man and that which is not of man; as the elect of God, he was the depositary of the moral conscience, the only approved interlocutor of the Eternal, the only authorized interpreter of the exemplary Book; as a citizen, he was the sovereign, the prince. Closer to our time, he has become the privileged home of the great impulses of the unconscious, and today he appears to be the sole candidate for happiness. For the great majority of our contemporaries, who are still impregnated, unknown to them, with the odours of a culture which is being steadily dismantled day by day, the individual appears to be the sole producer and the sole consumer of culture, while the true evolution of science and art leads us to proclaim society as a whole from now on as the only centre of creation and of welcome of a culture which has rediscovered all its components.

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There is no doubt that it is too early to draw up the complete list of artistic tendencies that have been trying for a decade or so to reach the light of day; in any case, the analysis we propose to make does not emanate from the usual perspective of the art historian; we are merely trying to discern, in the general evolution of industrial societies, that which may illuminate the break that everyone can vaguely feel developing between the newly-forming tendencies and the totality of artistic traditions that are familiar to us. The upheaval caused by scientific research allows one to draw attention to the new relationships beginning to be estab-

lished between art, industry and science, and to the new vision that the artist may develop for activities with which he has been on very poor terms up till now. In brief, let us say that the artist will cease, more and more, to spurn industry and to fear science, and that he will gain by liberating himself from the private life of individuals, where he had taken refuge, and entering into the public life of the societies to come. These are the three aspects which we will keep in mind in the following pages, restricting ourself to a few precise examples.

The ideas and intentions of a painter such as Vasarély are well suited to illustrate the evolution we are concerned with. In this "*plasticien*," as he likes to describe himself, using a term which itself shows his desire to break with the classical categories, the man of art makes for the first time a considered entry into the real life of the factory; he considers, not the shocking or anecdotal aspects, which generate reactions that are superficial, foreign and useless to artistic creation, but the very principles which govern the effective working of the industrial enterprise; it is not only the materials or the different shapes of machines or of products, but also the modes of organization, the processes of manufacture, in short the very spirit of industrial activity as a whole that hold the artist's attention. Mass-production, so much decried by the purists who accuse it of causing standardization, is also taken in an innovatory sense by Vasarély; against the concept of a unique work of art, created by an artist who is supposed to have a "genius" that has no equal, for a connoisseur who is theoretically worthy to receive it into his inner life and to appreciate it in his... inside, Vasarély sets up his intention of producing "multipliable" works, the fruit of more or less numerous combinations of elements chosen at the outset, together with the rules for assembling them, for a given "series." Nowadays, computers have no difficulty in listing vast numbers of combinations; the recourse to machines typical of the second industrial revolution, insofar as it is not the doing of fashion, is itself an early sign of a rapprochement between art and science and of the decisive break now appearing between the new tendency and the sum of the conceptions that have held sway till the present day.

One of the consequences that deserves to be noted is the

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disappearance of everything that still linked art with craftsmanship. "If," writes Vasarely, "the preservation of a work depended on the excellence of the materials, the perfection of technique and the hand's mastery, as it did even yesterday, today it resides in the awareness of the possibility of *re-creating*, *multiplying* and *expanding*. Thus both craftsmanship and the myth of the unique work will disappear, and the diffusible work will triumph, thanks to the machine and with its help." Vasarely does not hesitate to return to this theme; he declared one day to an art critic: "The myth of the unique piece must disappear. Let us reproduce our works to an infinite extent with the help of the machine. Let us not be afraid of the new tools technology has given us... In our day, a painter who sticks to the ancestral craftsmanlike techniques of the canvas and the easel cannot claim to belong to the avant-garde. That is why, when I work, I reduce the data of my technique to constants: precise colours, geometrically measurable curves, format, relation, scale: everything here can easily be reproduced. I produce a "small-scale" work, from which one can make a tapestry, a fresco, a block, or a film or television sequence. There is usually no point in applying myself to these secondary tasks. I have three assistants permanently with me. With their help, I work forty or fifty hours a day. Use other hands, use machines: that is the modern idea... If art once wanted to *feel* a thing and *make* it, from now on it will *conceive* it and *have it made*."

This declaration of war on craftsmanship should not surprise the sociologist who is used to seeing the new forms of organization of labour sound the knell of the craftsman's work and of its last representative within the factories, the old tradesman. The "scientific" organization of labour, mass-production, the setting of norms and quotas by business efficiency consultants, have deeply altered the old organization of the workshop, which was largely left to experience, tricks of the trade, or the professional conscience of one's companions. "The progress of mechanization," writes Alain Touraine in *Sociologie de l'action*, "places the worker more and more in a world of technical works, conceived, organized and controlled by social decision-systems. Ultimately, all work can be seen as communication, for the practical reason that the elements that are placed in relation to each other are stable and

predictable. The worker no longer creates 'events,' particular objects; he intervenes in a (collective) process of manufacture, definable in general terms of work-stations or shifts, not of persons."

For the sociologist, this evolution does not necessarily lead the worker's labour to a process of ineluctable degradation in an impersonal world; this is only true from a limited viewpoint, which can see nothing in mass-production but work of poor quality. This evolution, in fact, is in the long term the essential condition for the cointegration of workers with society; we are consciously avoiding the use of the term *integration*, which is bound up for some people with the idea of bourgeoisification and with their submission, pure and simple, to all that they had previously rejected. What we have is something of another order; we are dealing rather with a transformation both of workers and of society itself, with the convergence of two evolutions, allowing the workers to take their place and their responsibilities in the progress of a society that has been profoundly reshaped in its orientation and in its working in order to receive them. In the same way, we will no longer speak of an integration of art in society, an idea that is as shocking to the artist as the idea of his own bourgeoisification; but the upheavals that are under way in industrial societies are signs of an important remodelling of society, as well as prospects of cultural creation, so that there is no question, even for an instant, of envisaging the submission of the artist to principles established before him and without him, but only of taking note of his incorporation in the central decisions of society, transformed once again in order to accept the arrival of one whom it had rejected with fear and scorn ever since the beginnings of industrialization.

The presence of a real common Universe, the entry of the artist into the decision-making system of a society which makes a point of binding itself to this Universe, the appeal to collective creation, the passage of art from private life, to which the last century had relegated it, to public life, where it has today the possibility of finding the place that the great civilizations of the past accorded it, these are all different aspects of the same evolution. They explain one of the first, and ever more lively,

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obsessions of the artistic avant-garde, that of giving birth to a total art; attempts are being made on all sides to take over painting, sculpture, architecture and music, to construct and furnish a whole space. A new notion tends to be imposed: "The concept of environment," writes Frank Popper, "plays an ever more important part in the art of light and movement." Abraham Moles also has recourse to it in his introduction to an exhibition catalogue, and the commentary he undertakes attracts due attention to the deepest intentions of the artists of our time: that of constructing a proper environment for the industrial world; nonetheless Abraham Moles' explanation risks being over-brief, for the artist is not only concerned with building "a technological environment," integrating the various "machines" that multiply before our eyes, nor locking himself in social life in its presently established form; on the contrary, he wants to oblige it to come out of itself and to incite it to take part, at the researcher's side, in exploration, recognition, unification, adaptation, in a word—in the humanization of the common Universe. "Through works and exhibitions," writes Moles, "Vasarély follows, or leads, the clear integration of combinatorial geometry with the most varied aspects of our environment. The forms he presents to us pass into everyday life, to rediscover there the original function of art. If, he points out, we can endow the elements of our world with sensible *quality* at the outset, then the construction of our environment by our technological civilization will be the construction of beauty that is intrinsic and not superadded. Art will be integrated with the City: this is the architect's dream. Vasarély develops for us our awareness of possibilities: permutational art is written in filigree letters into the civilization of the machine." As one can see, the "quality" of work, "perfection," the "beauty" of the product are not sacrificed to the imperatives of mass production; but they are subordinated to the prior establishment of a whole horizon.

Another preoccupation of the artistic avant-garde, sensitive as it is to the transformations caused by scientific research, applies to the building of cities. This preoccupation completes and amplifies the concern for a total art; it implants such an art better into the living tissues of society. We have already stated that the need for collective creation brings in its train the need

for coherent collective, that is public, consumption. With the new tendencies, the spectator is above all "freed from the obsession of possession," as Popper writes. The end of the myth of the unique work is as valid for its creator as for the recipient. The latter is invited in his turn to play a creative part, as much by a novelist and scriptwriter like Robbe-Grillet as by certain artistic trends: "The spectator, and his active participation in the aesthetic propositions in a given environment, which are frequently programmed, are at the centre of the kinetic and luminous tendencies of most of the artistic groups and associations formed in the last ten years," Popper also writes.

But in all these cases, the spectator involved is someone who attends a film or a concert, who views an exhibition or leafs through a novel, who, in short, indulges in an activity nominally acknowledged to be a cultural one. To build whole towns artistically corresponds to a deeper desire to appeal to all men in each of their activities; it means turning the main square (and Boussac requires that art should go out into the streets, into the underground) into an "exhibition," a "concert," a "reading," all of them permanent. Do we not thus once more fulfil what has always been the great vocation of art: to confer to *all* the objects we use their own "intrinsic" beauty? Are we not slowly overcoming the great cultural disaster of the last century, the dislocation of the world of objects into two groups: objects of art, beautiful through express design, and, when all is said, created simply in order to be beautiful, artistic and consequently useless and luxurious, pointless even, and all the others, common objects, flooding into society, without form or significance, produced with a view only to their immediate use and their economic profit-earning capacity in the eyes of their maker; and let us not omit to include amongst these objects blocks of flats, factories and whatever other buildings one wishes.

It is difficult to understand the efforts being made today without referring back to the preceding period. "The 19th century," writes Raymond Ledrut in his *Sociologie urbaine*, "is above all a sterile age for urbanization. On the one hand, towns were abandoned to non-interference; on the other they were sacrificed to urgent technical preoccupations which are but distantly related to complete town-planning. Town-planning was poor because the

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town neither spontaneously nor deliberately affirmed its aggregate existence. During the reign of individual interests, which sought to make profits and pile up wealth, technical and material aspects were alone considered. Unity, grandeur, collective force were beyond the ken both of the collective and of the individual consciousness. The propertied classes cared only for the comfort of their homes and their safety. The 'dangerous classes' had to become too dangerous, the poverty of the hovels had to become too shameful for plans for urban renovation, or for the renovation of certain urban sectors, to be considered. If they were, it was only to a limited extent. Social atomisation weakened and almost destroyed town planning. There were no more princes, there was no community to view a town as a whole, as an aggregate setting for a way of life."

It is easy to explain the fact that this rift in environment is responsible for the exile of art from the main square and for the decline of architecture and town-planning; and indeed, far from uniting men by producing both useful and beautiful objects, art was condemned to a process of isolation and of division. It will surprise some to learn that one of the writers of the last century who was the most tormented by this dismantling process was the poet who one is too apt to imagine as lost in the no-man's land of the most abstract poetry; but what other meaning can one give to Mallarmé's desire to give a purer sense to the words of the tribe? "And the people," he writes, in a passage which towards the end directly echoes the previous quotation, "dwelt amid the marvels of Art—and ate and drank from masterpieces—for there was nothing else from which they could eat and drink, and no ugly building in which to dwell; not a single article in daily use, whether necessary or a luxury, but was designed by a master and made by his craftsmen..."

"Thus it was with Greece in its glory, and Art reigned supreme... And Art Lovers were unknown—and Dilettantes undreamed-of!

"...And the centuries passed in these customs, and the world was filled with that which was beautiful, until there arose a new class which discovered cheap goods and foresaw their fortune in the manufacture of counterfeits.

“Then there sprang into existence the tawdry, the shoddy, the *trumpery*.

“Tradespeople’s tastes supplanted artist’s skills, and that which was born in its thousands came back to them and delighted them, for it was fashioned after their own hearts; and great and small, statesman and slave, took to themselves the proffered abomination, and preferred it—and have lived with it, always, from that time forth!

“And the artist’s work disappeared, and the manufacturer and the retailer took his place.

“And from pitchers heroes poured and drank to chalices—knowing full well what they did—noting the dazzle of the new object of ceremony and taking pride in its value.

“And now the people had a say in these matters, and all were satisfied. And Birmingham and Manchester rose up in their might—and Art was relegated to the junk shop.”

The present evolution of art, and more generally of culture, stimulated, consolidated, guided by that of scientific research, henceforward gives us a glimpse of art reinstated in its central function within the city, or rather at the junction of the city and the universe. Thus is justified the ambition of such people as Vasarély—an ambition which in any other circumstance would have seemed sheer madness—to cover all the external and internal walls of a whole town with paintings which, moreover, would be renewable as and when the need was felt; that is another perspective of multipliable art. “Then thousand, twenty thousand works of art, with their eloquent presence, in the rooms of children, amongst the young: this can and will be done. It is a question of taking over both the physical plane (the city) and the psychic (the collective consciousness).”

The most important point to be noted is the way in which the imperious will of artists who feel themselves responsible for beauty in the industrial society and ready to fight against “manufacturers and retailers” who supplanted them in the last century, rises up. The determination of the artists is measured in terms of their consciousness of the social force which they represent and of the significance of their intervention: “I reaffirm,” says Vasarély again, “the convergence of all creative forms towards a civilization-culture on a terrestrial scale. The future city erected

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by a thousand engineers, architects, plasticists, will answer all the physical and psychic needs of humanity.”

While it is now certain that one of the great enterprises of science in the coming century, more and more distinct from and inversely more and more closely coordinated with the image of the object of its research, will be the study of the human brain, which according to science is the central unifying principle of the human being and of his exchanges with his environment, one of the great projects of societies to come will equally certainly be the construction of new Towns, as central principles of unification, brains of human society, and of its exchanges with the Universe that surrounds it. Every category of artist will contribute to a task of this magnitude, and in conjunction with them research workers and engineers will deal with calculations, forms, procedures, new materials, and above all with the ensemble of the new approach; but over and above the artistic, scientific and technical milieux, it is plain that nothing can emerge without the assembling of enormous capital resources and hence without the assistance of financiers who have been won over to the new perspectives, and less still without the aid of politicians and administrators resolved to break through the innumerable obstacles and to take the necessary risks and decisions; above all nothing can emerge without the adherence, the participation, the conviction of the mass of humanity.

“Cooperation between scholars, technicians and engineers, industrialists, architects and plasticists is the first prerequisite for the task. Extra-pictural contacts serve more and more to put research projects in concrete form.” Need one stress the exceptional significance of an affirmation of this type? For not only does artistic creation cease to be the work of an isolated artist, but—and this is even more surprising—it ceases to be the work of artists alone; it is no longer the exclusive task of a specific category of specialists; but to a certain extent it extends throughout society; the dream of surrealism, that inspiration be shared by all, would be fulfilled here. It is normal that the desire of artists to impose their productions on the rest of society, free from any arbitration or constraint, should imply the effective commitment, in one way or another, of the various social groups; this is the prerequisite for an intelligent acceptance by all of

society of art's imperatives governing all its activities and the mass of its objects.

During the course of all these reflections, one should never lose sight of the relationship, essential from the point of view of culture, between the industrial society and the scientific universe, if one does not want to get bogged down in the errors which menace sociological analyses that are confined to social activity alone. After what we have said on the birth of the Universe, on the resulting repercussion upon the entry of art into public life, it is inconceivable that towns which are real meeting-places for the energies and the activities of the industrial age, should be built without the least care for this Universe which alone is capable of communicating to them the deep rhythm of time and of space, and of ceaselessly destroying the desire for self-sufficiency which never ceases to threaten them; the Universe alone can remind them that they belong to an infinitely vaster, more majestic whole, the source of their grandeur and inspirer of their sense of beauty, and can thereby prevent them from being swallowed up in an infernal round. Let us for one last time witness the proof that this superior preoccupation even today does not escape the artist who is carried along by the present movement, in the words of Vasarely; although they do not directly refer to the insertion of the future city into its appropriate Universe, they can nevertheless be applied to this context without difficulty: "At a time when man has widened his knowledge of both the macro- and the micro-cosm, how can one be fascinated by the daily world of the old artist, his narrow setting, within immediate reach of his senses: his house, his immediate circle, his garden, his landscape, his town? The modern artist will no longer paint a leaf hanging from a tree; he will ask himself where Nature's chlorophyll comes from."

And what will he learn, if not that the mechanisms of photosynthesis are unexpectedly complex? And what will he notice, if not the vertiginous breadth of forces brought into play in order that Nature may live? In *Bioenergetics*, Albert L. Lehninger brilliantly brings to light "the immensity of the cycle of biological energy," by comparing the tide of this energy with our assessment of the energy expended in one year by the machines made by man on the surface of the earth. There is a gigantic

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difference in favour of the former: "We can see straight away," adds Lehniger, "...that the annual flux of biological energy which draws its source from the sun is far greater than the flux of energy contained in all the machines on earth. Moreover, most of the machines consume products which are formed biologically, such as coal, petrol and natural gas, which come from the substance of fossil plants from prehistoric times."

The vision that research gives us of the green leaf on the tree, then, has nothing pastoral about it any longer; here we are confirming that a thing that seems so fragile in the wind depends on an immense force and a cycle, one of whose elements is none other than the sun with its nuclear energy. Such is the environment to which modern man, be he man of action or of thought, poet or architect, no longer fears to belong; such is the exceptional environment which will provide for future towns the scenes of the public life of societies to come, the cosmic coordinates which are lacking in them and the necessary power to rise up through the centuries as the Sites, above all, on which the industrial society and the scientific universe are to meet.