

### **The decline of the age of mechanisation**

The decline of the age of mechanics is now under way. It is the decline of modern technical thought and industrial practice that were most successful in the manufacture of mechanical objects within a cultural atmosphere dominated by the mechanical metaphor.

In 1948, Siegfried Giedion entitled his essay about the mechanisation of human activities "Mechanization takes command". He aimed at showing the means, times and consequences of the introduction of organisational forms and objects inspired by mechanistic principles, stressing the predominance mechanisation had achieved in the system of objects and in production and consumption modes.

It would be equally justified today to write an essay entitled "Mechanisation loses command", dealing with the tendency towards mechanisation's loss of predominance, the passing of classical mechanic thought in the scientific field, and the overall crisis of the interpretation and organisational metaphors it generated.

This change in my opinion may depend on two fundamental phenomena. The first phenomenon is represented by a change in technique's scale of dimensions and times:

- Its present capacity to very quickly manipulate extremely small things
- A change of scale pushing technique's way of operating outside the sphere of our direct sensitivity.
- A change causing designers to question the fundamentals of their own culture.
- A change leading to the production of an artificial environment losing the transparency and clearness that characterised its phase of mechanisation.

The second phenomenon is constituted by the onset of limits to the system in which we operate: the contemporary realisation that both the physical and semiological environment tend to saturation.

All this brings about a radical change in our production culture, which hitherto considered the environment as an unlimited system.

This compels us to face the unshakeable complexity of the system in which we operate. Any attempt to deal with products in the context of their environment involves the constitution of a system of double links, of mutual influences, which may not be reduced to a simplified model.

In the following speech I will particularly focus on the first of these two factors, and analyse its implications for design culture and practice.

### **New dimensional scales**

The radical novelty of the present context may not be observed starting from the analysis of individual technical innovations in isolation. Each solution comes from another; each innovative product represents a diversion from existing ones, and begins with their remake. From this point of view, continuity always prevails.

The main novelty should be examined from our point of view, starting from the space-time in which our mental and sensitive system is located, from the consideration that in principle the construction of a pyramid is not different from the construction of a macromolecule (in both

cases matter is given a shape in space). Yet it is a substantial difference which radically modifies our relationship with objects.

In the past any manipulation of wood or stone changed the materials, whilst reminding us of their original state. An engine could develop high power, a train could run at a high speed, but they could still be considered as multiples of something known because they belonged to our scale (the power of our "body machine", the speed of our run). The assembly line reorganised the factory's time and space on the ground of the machine's requirements, but that space-time and ours were still homogenous.

In short, man with his physical measures and neuronic and sensitive performances was still at the core of the universe of his instruments, at least because he still remained its term of comparison.

In the light of the products generated by the present technoscience, we realise that this is no longer the case.

"Constructing a material" by acting on molecules and atoms leads to a result our experience and senses may not even recognise: a superpolymer, for instance, does not show its properties in such a way as to be easily distinguished from one of the most common mass polymers. Communicating with somebody in the same city, or in another country or continent, does not allow to "feel" the distance. Interviewing a computer with a simple question or a very complex problem does not involve significantly different answering times and methods. Organising a production process with the newest technologies leads to forms of space and time organisation whose structure is no longer visible, as it disappears in the secret logic of communication networks.

In the past, all that man produced (that is all the transformations he brought to natural substrates) belonged to his order of magnitude and was within his sensorial sphere. This made it easy to understand the components and functioning of all artificial objects.

This is no longer the case. Man's activity has reached other dimensional levels, has penetrated into spaces and times that we might imagine, but not understand.

This may be the strongest reason for the diversity of the present artificial environment: what stands out and appears to our senses seems to come from far away.

Throughout its development, technoscience brought its manipulative capacity, the level of its controlling possibilities; to dimensional scales different from those of our direct experience. Thus the artificial products it produces do not show structures or "mechanisms" sensitively connected to effects. In current practice, at the dimensional scale of our senses, functions seem to emerge mysteriously from inexpressive and dumb materials and components.

This is true for those who experience this artificial environment as well as for those who are to design and manufacture it.

### **Technical hyperchoice and demand for cultural legitimisation**

Designers consider the present situation contradictory:

- The more the instruments of analysis of technical problems increase, the more the system in which we operate becomes complex.

- The more technical potentials spread and the possible alternatives increase the harder it is to understand "technical knowledge" as a whole and to its full extent. The more technical power increases, the less final choices seem to be suggested by technical requirements, and the more they depend on the cultural backgrounds of the operators involved. In short: designers are facing a double phenomenon.

On one hand technique's operative power gives rise to a situation we may define as "hyperchoice", that is the availability of an extremely wide range of possible alternatives. On the other hand, this sort of "freedom" technique offers designers involves a loss of importance of the role of technique itself as a legitimising factor in choices. In other words, technique itself in its previous archaic and rough phase constituted a fundamental legitimacy: "it is so because no other technical possibilities exists".

It is no longer so today. Indeed, technique is becoming more sophisticated and is providing various alternatives, thus making it harder for individuals to fully comprehend. It emphasises the subjective character of choices and sends the task back to other levels in order to legitimate its results.

It refers to social and cultural aspects, which acquire an increasing importance in the definition of projectual and productive processes.

This is evident for great and complex strategic choices, like those related to nuclear power or to the development of genetic engineering. When two equally "credited" technicians take on different points of view, the myth of technical rationality and of the "objective" character of its choices collapses, and the widely debated theme of "scientific uncertainty" emerges.

But the same phenomenon, even if on a smaller scale, also applies to small and medium everyday technical decisions.

In the face of the alternatives provided by technique a decision must more and more frequently involve non-technical reasoning. It must make its own cultural references plain. Hence a growing "demand for culture" in production activities.

### **New questions and new perspectives for the culture of design**

All this has no little consequence on the culture of design. In the recent past, the power of modern technical thought and the charm of the results it had achieved, were such that even the culture of design was compelled to produce a system of values based on the same logic:

- Materials had to appear in their genuineness and objects had to indicate their functioning clearly.
- The project had to achieve a final result, being inspired by a system of absolute values and rationality, with no relationship to subjectivity or taste fluctuations. And finally, the project itself found its legitimisation in the progressive value attributed to the diffusion of such certainties and transparencies in a world still sunk into the mist of previous mental attitudes and cultural models.

Today this basis for the culture of design is clearly in a critical position:

The idea of Progress, which determined choices in the past, is no longer clear and univocal. The concept of changing the world by redesigning it has pointed out its limits. The idea of the "final" object has collapsed in light of the evident subjectivity of choices (both related to projects and consumption).

Technique itself, by offering many possible alternatives, rather than enforcing its dictates, has lost its legitimising character. But its most immediate operative foundations are also in a critical position:

- What becomes of the "genuine image" of materials, when they may genuinely take on any image?
- What becomes of the relationship between form and function, when function is entrusted to shapeless components, whose miniaturisation almost makes them disappear from our perceptive field?

- What becomes of function, when the object, by articulating and complicating its performances, tends to escape from the field in which these may somehow be measured and quantified, and get into an area where usefulness, clearness, enticement mingle and merge?

Along with these questions, which at least constitute a possible point of reference, there are others that have no past reference point to turn to, owing to their new character:

- What does it mean to design a totally dematerialized object that is mere performance?

- What qualities may be attributed to an interactive object?

- How can we influence sensorial qualities that never had an independent history in design (such as touch, smell, and thermal sensitivity)?

An answer to these questions may only be provided by a deep change in the culture of design's consideration of itself and its tasks.

Its tradition was to trans-form, that is to give a shape to substrates provided with given cultural qualities and values, to operate on the geometry of materials so as to confer performance and expressive and semantic values to the result.

Today the new technological environment enlarges the field of what may be designed - from trans-formation to qualitative trans-mutation. It determines the sensorial and performative character of the material substrate constituting the substance of objects.

It more and more frequently compels us to force our attention on the form of the relationships the object defines with the environment in time, rather than on the physical shape of the object itself, on the fourth time dimension rather than on the three space dimensions.

However, at the same time, while drawing our attention to semantic and cultural values, to languages and to the immaterial character of the form of relationships in time, it increasingly happens that the material substrates provide such information, as they physically place themselves in the environment, and in how they influence and impact upon it.