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THE PHILOSOPHICAL IMPLICATIONS
OF THE USE OF NEW INFORMATION TECHNOLOGIES:
INTRODUCTORY REFLECTIONS

"Granting these new instruments, this new environment, these new perceptions and sensations and standards, this new daily routine, these new esthetic responses — what sort of man comes out of modern technics?" This question was posed in around 1930 and the book which contains it (on p. 359) was published in 1934 when computers were still a thing of the future. Its author, Lewis Mumford, is perhaps the most perceptive scholar dealing with the cultural and epistemological effects of the application of new technologies. Although recognized as an outstanding author, he was at times charged with employing a style close to an unjustified grandiloquence and hyperbole. His observations, which often referred to the technical inventions of the past centuries, became strikingly topical and increasingly meaningful at the end of the twentieth century when the tempo of technological transformations exceeded the possibility of their full comprehension by man. This is why Mumford's thesis that man's capacity to go beyond the machine rests upon his power to assimilate the machine, sounds like a threat. Are we, therefore, threatened by the "rule" of the machine of our times — the computer? What could that rule consist in? The effects of the application of modern information technologies are omnipresent regardless of the civilizational level of a given country or the degree of its economic development. Of course, the dimensions of that presence and the degree of the awareness of the existence of such effects are different. Certainly, some of those effects are almost unnoticeable, regardless of the degree of universal presence of those technologies. Indubitably, the possibility of "adopting" new information technologies are limited by various barriers: the barrier of expert knowledge, the economic and psychological barriers. These barriers are the reason why man's adaptation to an environment, qualitatively altered as a result of the computer, is often of only an informational range, with extremely unclear perspectives for attaining a functional range (Niżnik, 1985, p. 48). Meanwhile, it is precisely the functional range of that adaptation which could be regarded

as a symptom of the "adaptation" of the computer. This adaptation means, however, an adaptation of important life activities of societies, and often of individuals, to the technical requirements of the new machine. It is thus a certain form of subordination to the new technical equipment. The history of civilization includes a number of such inventions which were decisive for the shape of human history. A. Kroeber calls them the fundamental patterns of culture or system models, and mentions among others, the use of the plough, monotheism, and the alphabet. Each of those elements of civilization changed man's world, and it was impossible to ignore it in the further development of human societies. Is the use of the computer another system-like model? This would mean the appearance of such an element in our culture, which one is forced to accept, an element to which one would have to subject oneself. It is true that Mumford shows distinctly that the subordination to each machine is a necessity upon which the fulfillment of its role depends. What can be the consequence of man's "subjection" to the computer? A question formulated in this way is of a somewhat journalistic nature. Yet it expresses the nature of universal anxieties. How can these anxieties be articulated in a more systematic manner? I shall begin with some introductory methodological remarks.

The examination of any sort of effects of new civilizational elements, and in particular of new technologies and inventions, generates serious methodological difficulties. It would be difficult to prove that phenomena connected with such civilizational changes are really the outcome of the latter. Reflections on this subject are a speculation whose reliability depends to a considerable degree on the distance between the scholar and the phenomena under analysis. This is also why it is easier to believe Mumford's theses pertaining to the effects of medieval inventions than the suggestions of modern philosophers who make declarations about the epistemological effects of research concerning artificial intelligence. On the other hand, analyses which make case for the cognitive effects of the application, for instance, of a clock in the Middle Ages, make it feasible to justify at least the question about such effects connected with the use of the modern computer. Perhaps they even indicate analoguous cognitive mechanisms in new condition and in reference to new, revolutionary technological changes.

In these reflections I am interested, above all, in the cognitive and epistemological effects of computerization. In other words, I am interested both in the knowledge which one can regard as the result of the use of the computer, and in the way in which those usages can influence the theory of cognition. It seems that the above mentioned methodological problems are in this case particularly sharp. One could make a whole list of basic questions which appear together with an attempt at formulating at least some introductory theses. Here are some of the questions.

In what way are changes of mentality brought about by computerization? Whom do these changes affect? Are they certain categories of people or do the changes reach dominating structures of thought in the society in

which computers are employed? What sort of application of the computers favours the appearance of such changes?

Do they pertain solely to people who use computers as instruments of their work? Or do they concern also those who are only operators and perform with the aid of the computer work commissioned by others?

The already conducted empirical studies (S. Turkle, J. Rule-P. Attawel) make it possible to determine the ways in which one can deal, at least partially, with the methodological problems signalized in this variety of questions.

It seems that the only reliable way of examining the phenomena of interest to us is to examine the instrument itself and the ways of using information and knowledge imposed by it. The latter are accompanied, it becomes clear, by a redefinition of both information and knowledge. I would like to describe thus oriented an examination of the effects of computerization as the examination of the objective effect. In reality, this is the character of the majority of the existing interpretations of the problem. It holds true also for the well-known study by Sherry Turkle, entitled *The Second Self.*

The most important objective effects of computerization, decisive for the possibility of examining its cognitive and epistemological effects, include the emergence of a "computer culture" i.a. of a certain cohesive whole composed of an ensemble of values, symbols, attitudes and. patterns of behaviour, and equipped with a knowledge characteristic for it. The appearance of a computer culture guarantees a system of communication which makes it possible for the effects of computerization to transcend beyond the environments which use computers directly. Turkle draws attention to the fact that it has become obvious that ideas connected with computerization, similarly to psychoanalysis, were able to go beyond the specialist milieus. Further on the author points out that the ideas connected with computerization do not reach society directly from the "professionals" who deal with computers, but through the intermediary of the family, professional environment, and acquaintances. There also appear specific subcultures which play a special role in this transmission of new ideas. Let us, however, emphasize the author's observation, decisive from the methodological point of view, that the basic factor of the computer culture is the computer itself, that very special tool. The computer culture, writes Turkle, is carried not only by ideas, not only by the writings of its theorists, not only by articles in magazines or programs on television, but by a machine that people bring into their homes (p. 319).

A characteristic of the computer culture is closely associated with cognitive processes and epistemological effects of particular interest to us. It, therefore, seems justified to leave its detailed presentation to separate reflections. On the other hand, it is worthwhile already at this stage to consider the type of cognitive and epistemological effects which we are seeking in the planned reflections. I shall look for an answer to the question about the way in which man's mode of thinking and his mentality alter as a result of the application of computers. I shall also deal with

the way in which man understands such fundamental concepts as knowledge, information and intelligence. How his way of viewing human specificity alters. How culture appears as a consequence of those changes. How the cultural functions of the computers can be observed in environment under examination. Whether the computer culture leads to a cohesive symbolic universe.

The existing reflections of specialists approaching these questions are full of anxiety, although this feeling is often expressed more in a literary than a scientific form. David Burnham begins one of the chapters in his *The Rise of the Computer State* with a motto borrowed from T. S. Eliot. This quotation succinctly reflects the already mentioned unrest. Burnham asks, using the words of T. S. Eliot, "Where is the wisdom we have lost in knowledge? Where is the knowledge we have lost in information?" (p. 145).

In this fragment, contrary to he enthusiastic reports about the possible use of computers, he draws attention, in a poetic and philosophical manner, to the fact that computerization also leads to losses. It is impossible to describe precisely what is a gain and what is a loss without accepting a definite system of values. Does computerization, by resulting in a redefinition of man, as it is suggested in certain analyses, also forejudge our evaluations? Is it, therefore, possible that we have *already* found ourselves in the power of the computer?

For the sake of evaluating the influence of that new instrument it is worthwhile to apply an analysis whose purpose is to define world outlook and the cognitive changes produced by the introduction of certain essential technical equipment in the past. For this purpose I shall return to some of the suggestions made by L. Mumford.

Every tool is a cultural fact. This statement encourages towards exploiting the useful differentiation between culture and civilization since it suggests that speaking about the tool as a cultural fact we have in mind the sphere of civilization. In such a meaning this would be an extremely trivial statement. On the other hand, the possibilities of examining the role of the tool for culture understood as "spiritual culture," in other words, the role of the tool in the cognitive processes and the transformation of evaluation, are intriguing. It appears that we are dealing with such a role of the tool long before the invention of the computer for whom this type of meaning does not give rise to doubts.

The cultural effects of technology, understood in this way, were given an excellent analysis by Lewis Mumford. His reflections concerning the cultural role of the clock are particularly useful as an illustration of my deliberations. Mumford shows that the significance of the mechanical clock consisted not so much in the efficient functioning of its mechanism as in the outcome of its appearance in the human environment, effects of a cognitive nature.

Mechanical clocks had been constructed already in the thirteenth century, while at the end of the fifteenth century there appeared the first tower clocks. In this way the instrument became insistently present in human

communities. The possibility of a precise measurement, division, and planning of time was by no means a simple improvement. The presence of the clock changed the sense of the concept of time, its social meaning, economic role and thus, as a consequence, achieved a profound transformation of the human vision of the world. The "product" of the clock as a machine, writes Mumford, are minutes and seconds, and by the very nature of things the clock distinguished time out of the tidal wave of events and contributed to the appearance of a conception of the independent world of mathematically measurable sequences: the special world of science (p. 15). By altering the very concept of time, the clock made time a decisive element in cognitive processes as well as in human social relations and in production processes. It particularly made it possible to break with the natural rhythm of nature as a universal measure for putting into order the events of human life. As a result, it provided the beginning of inventions and discoveries which, to an increasingly great extent, made human beings independent of the necessities of nature. This is why there is little exaggeration in Mumford's statement that the modern industrial system would have found it easier to do without coal, iron or steam than without the clock.

It becomes more and more obvious that modern forms of social organization, and especially of economic activity, are unable to do without modern information technologies among which computers hold a prime position. Fears connected with those technologies preceded the use of the first effectively working equipment. These fears took on the form, for instance, of science fiction in which robots subjected man, and this subordination took on forms well-known from human societies i.e. the form of coercion, including physical compulsion.

Much speaks in favour of the assumption that the power of the computers consists not so much in physical compulsion as in epistemological compulsion. The latter is an unambiguous steering of human consciousness, the intellectual processes of man and, above all, the transformation of human identity, that is, the self-perception of man. It also seems increasingly certain that alterations of the conception of man lead to another perception of nature. In other words, the metaphor of the sorcerer's apprentice, which was frequently used to criticize unpredictable processes in the domain of nuclear armaments, currently makes its presence known in the world of information technologies. It is true that the computer is the product of man but its objective effect comes down to the fact that neither is man what he was before, nor is nature what it once used to be.

From ancient times it was natural to define man as opposed to animals. Almost always man perceived himself as a being specially distinguished among animals. Even religious doctrines which claimed that man was created as the image of God were unable to obliterate convictions of that sort. Evolutionism made sound the vision of man as a peak achievement of developing nature. This vision was not undermined even by those conceptions of culture which described human civilization as a symptom of man's parasitism in nature. In their light man revealed himself to be

a dissonance in the development of nature; as an autonomous being. however, he made it possible to be constantly seen as its part.

Is it possible that this autonomy of man reaches such a level in which his reference point ceases to be nature and becomes his own products? Is it possible for man to define himself not in an opposition to animals but in an opposition to machines? Neither is this a primitive materialism similar to the conception proposed by La Mettrie. It is not a theoretical idea constructed to particular professional environments. We are speaking of a spontaneous, mass-scale universal perception of the human creature as a thinking machine. In that case, the problem deals not with the difference between man and the most perfect of animals but between man and the most perfect "thinking machines," both those already existing and planned. The question of man's specificity in comparison with an excellent computer, in comparison with an "artificial intelligence," draws attention to the little noticed but radical change of the consciousness. Unnoticeably, man comes close to the borders of his traditional, until now inviolable, system of values within European culture.

It is already early observations of the effects of computerization which show that in many domains the latter are ambivalent. The new perception of the essence of man is accompanied, as if by necessity, by a perception of nature, that is different from the one held so far. Likewise those changes in the perception of nature are clearly ambivalent. Nature to an ever smaller degree is regarded as man's environment and, at the same time, the awareness of the dependence of man's future upon the state of the natural environment is increasingly frequent.

Much speaks in favour of the fact that the alterations experienced by man's consciousness are controlled by him to a small degree. The over-powering vision of the "thinking machine" which, after all, is a human product, is already living its own life. Its psychological and epistemological effects are most often the consequence of logic which is imposed by the conception of such a machine. The very technical-utilitarian characteristic of the computer, and even more so the characteristic of even the initial experiments with artificial intelligence, structuralize human thinking and consciousness, often contrary to rational, although traditional, ways of seeing the world. The concurrence of the appearance of the idea of man as a thinking machine with an instrumental treatment of nature, or even an instrumentally understood idea of its protection, is also typical. This contemporary instrumentalism in reference to nature is something completely different from the traditional, active attitude of man towards nature; man who uses nature for his own purposes, who changes it into his artificial environment but who is fully aware of being a part of it.

Ecology at the end of our century has become the object of universal interest not as an expression of the union of man and nature but as a symptom of the awareness that this union has been irrevocably lost. At present, man faces the problems of saving nature which is treated exclusively instrumentally. He also seeks an ecological equilibrium with the

assumption that man must anyhow satisfy his artificial needs. Under the cover of preserving nature man wishes to preserve only himself. Nature, after all, cannot become what it was once. Man's expansion remains the fundamental value. Nature is protected only as long as it does not undermine that value.

The emphasized problem — a general change of man's mentality — cannot be treated as an accusation against him. Although technologies, effecting the changes of interest to us, were created by man, he himself was unable to foresee their outcome or to avoid the consequences of his inventions. It is, however, necessary to subject those effects to an analysis whenever possible, even in a limited range. This is how I understand the purpose of my further reflections.

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