

## FROM THE PHILOSOPHY OF TECHNOLOGY TO A THEORY OF MEDIA

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My aim, in this section on technology and society, is to discuss the possible influence of a theory of media on the philosophy of technology. I have divided this task into three parts. Part 1 is a short description of some basic problems in the philosophy of technology. Part 2 is a brief discussion of a theory of media. Part 3 is the query whether a theory of media can be helpful in clarifying some open questions in the philosophy of technology.

### THE PHILOSOPHY OF TECHNOLOGY

The current debate about technology and its assessment is dominated by two extreme points of view. On the one hand, some people believe that mankind must restrain the self-propelled dynamics of technological development. These considerations are guided by the apocalyptic nightmare of the possible destruction of mankind (possible causes for such scenarios: the greenhouse effect; nuclear winter; nuclear catastrophe; the effects of genetic technology). Others see technology as a chance for self-realization—a liberating from the constraints placed upon us by our nature. As long as it remains unclear, however, what the actual *domain* of the word "technology" is, we are not in a position to decide between the peril and the potential, between the Luddite and the technophile.

A brief look at the current discussion about this domain, in systematic order, shows the following spectrum. I distinguish between two different theses about technology; the first one I call the "thesis of autonomy" and the second the "thesis of heteronomy." Each of these theses is further subdivided into two classifications.

#### 1) *The thesis of autonomy:*

According to this thesis decisions about technological development are based upon constraints which are independent of human interests and desires. This independence can in turn be interpreted in a relative or in an absolute sense.

a) According to the relative independence approach technology establishes a realm of quasi-autonomous decisions; it has a rationality of its own. Technological developments, although triggered by human interests and beliefs, are in respect to their technological decisions something neutral and value-free. This is the instrumentalist view of technology. Seen in this way, technology is just a tool, a rule-governed procedure guided by rational purposes. For technology, interpreted as a problem-solving procedure, human interests are found at the beginning or at the end of a technological development, but not at its core. As a consequence, questions of technology assessment are restricted to the outcome of technological development. We may, for example, decide to use raw material as a source of energy. But the specific technology we apply depends exclusively on facts and information based on technical considerations. Following this view, technology is nothing but a means of solving problems such as the production and processing of raw materials, problems of transportation and so on. As far as human interests are concerned, technological decisions are relatively autonomous. This means that the decisions of the engineer depend on the goals of human interests, but the choice of the means depends only on technical considerations. From the standpoint of humanities and social research, technology in its inner decision logic is just a black box of no further interest for the scientist. Behind this view is the conviction that technology like the natural sciences can be separated from human interests. The engineer and the scientist make their decisions unbiased by external factors. The natural sciences and technology form a realm of logical autonomy. Technology is at the same time independent of natural science because of its more pragmatic goals.

b) According to the second view—total autonomy of technology—technology is not an instrument at all. On the contrary, human beings are completely in the hands of technological productions which develop with law-like necessity. This view is sometimes called technological determinism. But it is not clear what the subject of technological determinism is. The interpretation of the grounds for this necessity depends on particular philosophical positions and I will therefore not go into more detail. Within the scope of this view one finds such different positions as those of Martin Heidegger and Hermann Schmidt (see Moser, 1973, pp. 52-80).

2) *The heteronomy of technology thesis:*

Before going into this thesis in detail, I want to sum up the basic ideas behind this position. Generally speaking, the heteronomy thesis says that technical decisions are at their inner core triggered by human interests, desires, and paradigmatic worldviews. In contrast to the instrumentalist approach, technological decisions are not autonomous in regard to the means. The choice of the means depends on non-technical assumptions. Technological decisions are not a black box for humanities and social sciences; they are in themselves an integral part of their research domain.

Technology assessment is therefore not restricted to the outcome of technological development; instead, it has to take into account the direct dependency of the technological decision-making process on human interests and worldviews. These interests and worldviews need not always be manifest. They form the tacit background on which the engineer bases his decisions. Let me give an example. I refer to a study of Kluge and Schramm, *Wassernöte: Eine Umwelt- und Sozialgeschichte des Trinkwassers* (1986). In this study a controversy is reported about the question whether drinking water resources should be centralized or decentralized. As it turned out, most of the engineers preferred a centralized solution. But the arguments they put forward for their decision were not entirely rational. Their advocacy of a central solution was, on the contrary, grounded in the idea of an undivided, self-contained, and circular watercourse. The motives behind their decision were grounded in ideological assumptions like the uniformity of nature (see Kluge and Schmincke, 1989, p. 38; Toulmin, 1961). The open question in the heteronomy thesis of technology is, however, how these human interests and worldviews which inform technological decisions are defined. There are, as far as I can see, two alternatives for this definition.

a) Products of technology are nothing but an objective mirror and materialization of ideas in our head. Technological decisions are based upon the psychological state of people who produce technical artifacts. If we want to criticize products of technology, we have therefore to criticize those inner ideas in the head of the engineer. The human-made technological artifacts are not problematic; the problem is human beings. They are responsible for their products.

b) According to the second alternative of the heteronomy thesis of technology, technological products are not just a mirror of ideas in our head. But

neither is there a blind course of technological development which determines our mental state, as technological determinism might assume. Mental states and products of technology are created by a third factor. This third factor comprises the social habits and rituals which shape not only our individual mental states but also the products of technology. The crucial point of this position may be shown by the following example which I call the "Eliza-effect." Weizenbaum's program Eliza allows us to communicate with a computer in a way similar to a natural language (see Weizenbaum, 1976). The idea behind this program is to install a psychotherapeutic conversation in a computer. Now as it turned out, Eliza was very successful. But the actual reason for this success was not the intelligence of the computer program, nor was it the stupidity of the people who communicated with the program. The actual reason for the success was the social role in which the psychotherapeutic conversation, especially in accordance with the method of Carl Rogers, takes place. Only if the conversation happens in a quasi-automatic manner can we personally believe that the conversation is a machine-like communication, and only then is the substitution for a natural-language conversation by a computer conversation possible. To put it in a nutshell: the success of Weizenbaum's Eliza is grounded in the machine-like behavior of our social roles, not in the machine (see Bammé et al., 1983).

Now that I have given this classification scheme for the various definitions of the domain of technology, one additional remark may be in order. My two-fold scheme is only a rough sketch of standard views. An account of the actual range of the term "technology," in contrast to these four ideal types, will be a more or less vague mixture of the listed standard views. I am sorry, but I cannot produce more clarity than there is.

What is especially missing is a clear distinction between technology as a science, the process of technological development, and the products of technology. The reason for this vagueness is that such a clear-cut distinction can be made only after the domain of technology has been defined, and not before. Technological determinism or instrumentalism, just to give an example, may simply stress different aspects of the concept "technology."

A definition of the range of technology is necessary in order to establish the degree of freedom we have to control technological development. Technological determinism and instrumentalism, obviously, give different answers.

## A THEORY OF MEDIA

In the following brief discussion of a theory of media, two aspects have to be distinguished: (a) the fundamental idea of a theory of media which can be summarized with the slogan of Marshall McLuhan, "The medium is the message." This slogan roughly says that the structures of our mind are transformed by the different media we use. (b) Accepting the general idea formulated in point a, we have to spell out precisely, in a further step, the special influences of the different media on the structures of our mind. If the theory of media is on the right track, those structures will differ depending on the media used, and also—as far as the novelty of a theory of media as a science is concerned—depending on the engaged scientists.

Within the limits of this paper I cannot spell out all these distinctions in detail. Instead, I will proceed in an abbreviated manner. Instead of presenting an exhaustive description, I will (1) use a "quick prototyping" method in order to illuminate the possible influence of the employment of media on our cognitive structures; (2) try to interpret this special prototype as a substantiation of a general pattern; and (3) apply this general pattern to the electronic media.

1) As a prototype for the basic research goal of the theory of media, I refer to Eric Havelock's investigation of the influence of writing on the cognitive structures of the ancient Greeks. In order to analyze this influence, Havelock draws our attention to one basic function of media: the storage of human knowledge and the preservation of human tradition. In exclusively oral cultures this job has to be done by telling a story. In order to memorize something it has to be put in the context of an action. In a mnemonic exercise we might give somebody, for example, the two words, "monkey" and "banana." The mnemonic trick is to invent a story: the monkey eats the banana. Because of the lack of writing, oral cultures have to preserve their tradition in a narrative way which is always bound to a singular, concrete situation. In the ongoing process of literalization, this way of memorizing by telling a story became more and more redundant. But, following the thesis of Havelock, changing style also changed the cognitive structures. Havelock mentions especially the following cognitive revolutions: (a) a shift from situational and concrete thinking to categorical thought; syntax changed from "poetic performance" (Havelock, 1963, p. 245), from "a discourse of 'becoming'" (Havelock, 1963, p. 182) to a more abstract,

conceptual and formal discourse (Havelock, 1963, p. 283); (b) a separation between knowing and the known, between outside and inside and—due to this separation—an increasing awareness of the autonomy of the self; (c) the beginning of morality. The emergence of morality was a consequence of the development of an autonomous self.

2) If we want to draw a general lesson from Havelock we need not take into account the specific cognitive attributes Havelock found in literacy. We must, on the contrary, dig out the more formal skeleton underlying the change from orality to literacy. The task is to find a pattern which is able to characterize a media revolution in general, whatever the specific media will be.

In order to fulfill this task, one specific remark of Havelock concerning the change from oral tradition to literacy becomes crucial. The process of literalization which took place in Greek civilization did not come from the outside. Havelock emphasizes: it was the Greeks themselves who undertook that change—and not some colonialists from other cultures (Havelock, 1986, p. 87). Therefore the spirit of orality was still present during the process of literalization. Moreover, the Greeks became aware of their own oral tradition only in the moment of the *breakdown* of this tradition. The experience of their own oral tradition happened in the very moment when this tradition began to vanish (Havelock, 1986, p. 90).

The general lesson we can draw from Havelock's considerations is this: not only in the change from oral tradition to literacy, but in every medium revolution, the former development level can only be understood in the moment of the breakdown of this level and through the spectacles of the higher development level. It was Whitehead who already presumed that former development levels of mankind can only be understood in the light of higher development levels.

Two additional remarks about a revolution in a medium may be in order. It should be obvious that there are no grounds for supposing that this revolution takes place in one moment at a specific time. A whistle does not just blow, and one medium is immediately exchanged for another. Instead, this exchange happens over a long period of time. But we should also take into account the following consideration: the influence of our use of media on the structures of our mind should not be interpreted as a one-way street. The question, what was there first, the use of a medium or the corresponding structures of our mind, is rather

similar to the question of what was there first, the chicken or the egg. Maturana's technical term, "structural coupling," may be helpful in describing this mutual dependency of our use of media and the structures of our mind.

3) I am coming now to the third point. Following the general remarks about the impact of media on the structures of our mind, what specific influence of electronic media can we extrapolate? Within the scope of this paper I can mention only some basic topics.

First of all we should see the different functional role and the different risks of the old technologies compared with computer technologies. In contrast to the old, "dirty" technologies like coal-fired industries, computer technology is a "soft" technology. The computer is interpreted less as a threat coming from outside; it is the new partnership between computer and humans which creates new problems. As Michael Heim points out: "The danger of technology lies in the transformation of the human being, by which human actions and aspirations are fundamentally distorted" (Heim, 1993, p. 61). Using computer technologies, especially using the hypertext structure of the Internet and multimedia, a radical change of our everyday thought and work takes place (Heim, 1993, p. xvii).

Let me just outline this development. First of all an *ontological* shift: a change in the world under our feet. Lost in the computer matrix of cyberspace we run the risk—literally—of losing our grounding in the earthly world. Having sex on the Internet and by-passing physical contact is an illuminating example. How this development could escalate in the near future is shown by William Gibson in his impressive book, *Neuromancer*. It was Gibson who coined the word cyberspace. In the course of using the new electronic media—this is an extreme viewpoint, of course—the distinction will be blurred between the natural and the artificial, between truth and illusion, between the formal and the material. Because of the interchangeability of the protagonists in interactions via the Internet, the role of the autonomous subject vanishes and may be replaced by an anonymous agent.

#### INFLUENCES OF A THEORY OF MEDIA ON THE PHILOSOPHY OF TECHNOLOGY

We can now use these considerations about the influence of electronic

media as an example to illustrate the insights we can gain by applying a theory of media to the classic view of a philosophy of technology. Concerning the range of the term "technology," I have mentioned two extreme points of view: technological determinism on the one hand, and the theory of the heteronomy of technology on the other hand. According to the first viewpoint, the only possible attitude towards the increasing dematerialization of our *Lebenswelt* is a kind of tragic heroism, whereas with the second alternative we can annul this development simply by changing social conditions. The answer to this conflict depends on defining the range of technology. For this definition a theory of media can provide some clarification. In particular, a theory of media holds a middle position between the two extreme opposites. Three remarks may be in order. With these remarks I will conclude this paper.

a) After a medium revolution has happened there is no way back to the earlier situation. We can only talk about a former development level in the light of the breakdown of this development level. An annulment of the outcome of a medium revolution is therefore impossible. This consideration seems to support the viewpoint of technological determinism. But a medium revolution is also an opportunity—I am coming now to the second remark.

b) The ontological shift in the electronic media may sharpen our awareness of theoretical questions which were formerly limited to speculative philosophy. Initial metaphysical questions get a technical foundation. At the very moment in which the distinction between the natural and the artificial seems to become blurred a new awareness of this development could take place. Our task is not to undo this development but just to become aware of it. (This awareness could become extremely important, for example, in gene technology.) But already this awareness is an intervention, an intervention in the sense in which psychologists use the expression.

c) A last remark may be in order. As I have already mentioned, the influence of the use of media on our cognitive structures should not be interpreted as a one-way street. Moreover, changes in the structure of our mind can only be reinforced by using media. It would be better therefore to interpret this change as a gradual shift and not as a total replacement. The answer of a theory of media to the dilemma of technological determinism on the one side and the heteronomy thesis on the other is not an all or nothing question. Neither tragic heroism nor



deliberate decisions is the appropriate attitude towards new technological developments. What remains for us to do is to emphasize different things within a cultural revolution—a revolution which we can never watch from the standpoint of a neutral observer and which is always an integral part of our own development.

#### REFERENCES

- Bammé, A., Feuerstein, G., Genth, R., Holling, E., Kahle, R. and Kempin, P. 1983. *Maschinen-Menschen, Mensch-Maschinen: Grundrisse einer sozialen Beziehung*. Reinbek bei Hamburg.
- Gibson, W. 1984. *Neuromancer*. New York.
- Havelock, E. A. 1963. *Preface to Plato*. Cambridge.
- Havelock, E. A. 1986. *The Muse Learns To Write: Reflections on Orality and Literacy from Antiquity to the Present*. New Haven.
- Heim, M. 1993. *The Metaphysics of Virtual Reality*. New York.
- Kluge, T., and Schmincke, B. 1989. *Technikphilosophie, Technikgeschichte, Techniksoziologie und Technikfolgenanalyse: Sozial-ökologische Fragestellungen an den Forschungsgegenstand*. Frankfurt/Main.
- Kluge, T. and Schramm, E. 1986. *Wassernöte: Eine Umwelt- und Sozialgeschichte des Trinkwassers*. Aachen.
- McLuhan, M. 1969. *The Gutenberg Galaxy: The Making of Typographic Man*. New York.
- McLuhan, M., and Fiore, Q. 1989. *The Medium Is the Massage*. New York.
- Moser, S. 1973. "Kritik der traditionellen Technikphilosophie." In H. Lenk and S. Moser, eds., *Technik Technologie: Philosophische Perspektiven*, Pullach. Pp. 11 - 81.
- Toulmin, S. 1961. *Foresight and Understanding: An Enquiry into the Aims of Science*. London.
- Weizenbaum, J. 1976. *Computer Power and Human Reason: From Judgement to Calculation*. New York.