Technology and Life-Worlds:

Towards a Hermeneutics of Technologies

1. The experiences of Japan

In 1853 and 1854, American Commodore Mathew C. Perry visited Japan on warships with steam engines, causing an isolated Japan to open to commerce with the Western World. Japanese called these warships "kurobune" ("black ships") because they raised a dense cloud of black smoke. These powerful technological machines greatly impressed the Japanese people, who began to recognize, although reluctantly, the necessity of cultural exchange. Among the presents from the President to the Emperor, the magnetic telegraph and a one-quarter-scale model of a locomotive engine were the ones which especially stimulated their curiosity. But, among these technological items, it was the ten-inch ship's cannons carried by the ship which became the center of attention of Japanese officials, who soon understood the necessity of urgently introducing modern weapons in order to avoid a third or a fourth visit of "Perry." In the first cultural exchange in the modern age between Western countries and Japan, modern technologies played a decisive role.

This anecdote suggests that it is important to understand the status of technologies in culture when we want to clarify the characteristics of modern culture and cultural exchange. In fact, the telegraph demonstrated by the crew of Perry's ship allowed the Japanese people to introduce telegraph machines from various European countries to learn its technology and to make machines based on them. As a result of this introduction process, a public telegraph service began between Tokyo and Yokohama in 1870. Railroad service with locomotive engines began between Tokyo and Yokohama in 1872. These developments

133

In 1855 and 1856, American Commodore Perry visited Japan.
In the following, I would like to propose an alternative view and to show the possibility and the necessity of a "hermeneutics" of technology with the help of the recent development of social studies of technology.

2. Technological determinism

1) Technology in advertisements

We can begin by looking at advertisements from the 1920s. For example, a 1920 advertisement for an electric iron, with the caption "Ironing Made Easy," shows a happy woman working with the machine on the left and an exhausted woman working by hand on the right (Smith and Marx 1994, p. 18) (cf. figure 1). In another 1925 example titled "Mother," General Electric promotes electric appliances such as electric lights, electric...
machines brought about by technological innovations or we must give them all up. These advertisements encourage people to take the first choice.

2) Technologies as forms of life

This kind of idea or "ideology" about the relationship between technology and everyday life has been continuously strengthened up to now. While at the beginning of the last century it was a matter of course that electric appliances and advertisements prompting their use were necessary, as we can see from these advertisements, it has become so self-evident today that not using them seems out of question. At least in the industrial countries, it becomes unthinkable to live without these electrical appliances. American philosopher Langdon Winner describes this situation in the following words:

"We do indeed "use" telephones, automobiles, electric lights, and computers in the conventional sense of picking them up and putting them down. But, our world soon becomes one in which the very meaning of "use" changes. "Using" becomes a modification of our lives and ourselves, not just a means of action. Light, heat, sound, motion, information, and computation are forms of life in the most powerful sense: life would scarcely be thinkable without them. (Winner 1986, p. 11.)"

The concept of "forms of life," which Winner uses in this citation, comes from Wittgenstein. Wittgenstein criticized the traditional narrow view of language wherein its main function lies in expression and order. For him, life is much more than the mere expression of language. It is a form of life itself. Life is not just a series of actions, but a continuous process of existence and understanding. When everyone has come to use telephones, writing a letter acquires a different and new meaning. The message which we can read from these advertisements is to be taken as technological determinism for, according to these messages, technology is a main driving force for the progress and development of our society. It is not just a tool or instrument to be used, but a part of our life itself. The use of a car, for example, is not just a means of transportation, but a part of our life and identity. It is a form of life itself.

The concept of "forms of life" also applies to the use of technology in the home. The use of washing machines, etc., by showing a mother reading with her children (Bijker 1995, p. 235) (cf. figure 2). These advertisements encourage people to take the first choice. The message which we can read from these advertisements is to be taken as technological determinism for, according to these messages, technology is a main driving force for the progress and development of our society. It is not just a tool or instrument to be used, but a part of our life itself. The use of a car, for example, is not just a means of transportation, but a part of our life and identity. It is a form of life itself.
In sum, modern means already change the world "immanently," independently of the purpose for which they are employed. Our tools have become a life environment; increasingly, we are "thrown in" ("geworfen") to the technological being in the world. Heidegger calls this the "peril" of the age. (Feenberg 1995, p.25; cf. p.228f.)

Technological systems having become our environment means that from a user's point of view we need not consider these preconditions in our normal use of a technological instrument. We... in these systems which make a horizon of each of our actions, and which remain concealed, so long as they function well.

From what we have seen, we can say that technological determinism has pointed out an important aspect of modern technology: a technology cannot be considered as functioning neutrally as it constitutes our environment, it is not a question of choice but rather that we are from the beginning "thrown in" ("geworfen") the technological being in the world.

It is exactly this characteristic of modern technology in our Life-World that makes us see the history of technological development from the deterministic point of view. The picture "American Progress" (by John Gast 1872) shows this deterministic standpoint very impressively (cf. figure 3). "The painting clearly conveys the dominant culture's attitude toward nature, Native Americans, and, more... is no choice but to accept this technology and "progress" which is transferred from the center of the East. "Fleeing from 'Progress' are Indians, buffalo, wild horses, bears and other game, moving westward—ever westward. The Indians... turn their despairing faces toward the setting sun, as they flee from the presence of wondrous vision" (Smith 1994, p. 9).

But, is technology really the only driving force for the development of history and society, as technological determinism insists? Are there really only two alternatives, namely to accept or flee from the linear development of science and technology?

We have seen a hint for another possibility in one phase of Japanese television as another example. Who would have predicted at the beginning phase of its invention that one of the most important roles of television today would be that of a universal baby-sitter?

In the above-mentioned General Electric advertisement titled "Mother," no technical devise was pictured in the situation of a mother's intimately being with children, but today a television set could be placed exactly at the center of such a situation.

Probably, we can see this kind of transformation of forms of life whenever new technologies are introduced to our life. In this sense, we could say that the use of a new technology in everyday... (cf. E. Cassirer 1985/1930, K. Miki 1967/1941). From the stone age through the bronze and iron age to the present atomic age, we have constituted various kinds of new combinations of ends-means and new forms of actions.

In contrast, the usage of technological instruments today is not simply related to the "forms of life" in the sense of individual forms of action. As modern technological instruments are closely related to other kinds of technologies which belong to other spheres, the... dependent on the "forms of life" in the sense of complex and large technological systems and material infrastructures.

In our ordinary life, the use of tap water constitutes a fundamental form of life. In order to drink water, we need only to turn a faucet and need not to go to a well and draw water from it. The use of water depends on the natural environment, i.e., the weather. We can see a similar situation in using a car. The use of a car presupposes a worldwide technological system of production and supply of oil, a system of construction and management of roads, etc. Feenberg describes this situation in the following way:
This "symmetry thesis" concerning a sociological explanation is one of the most important outcomes of the recent current of the sociology of science, and this thesis has been extended to the realm of technology. According to this thesis, the success of a technology, for example, the fact that some technological machine has been invented, used and diffused, can and must be explained not only by technological factors but also by social factors.

The developmental process of a technology is often characterized as a linear process characterized by the following scheme: scientific investigation – technological conception – invention – ... from one step to the other possible, not only technological factors but also social factors play an important role.

Pinch and Bijker, representative social constructivists, have demonstrated the "open" process of this technological development with the example of the technology of bicycles very clearly. They have shown that the whole process of the formation and replacement of a technological system is a process of social construction. In other words, the technological system is not just a product of scientific research and technological development; it is also a product of social practices and social interactions. Therefore, in order to make the innovation more persuasive, it is necessary to take into consideration and see the process by which the technological system is developed, before it has been established.

In recent studies of technology, a theory called social constructivism has become popular, influenced by the current view of the sociology of science. According to the post-Kuhnian philosophy, a sociological explanation of a theory must be as valid in the case of the failure as in the case of the failure of a theory.

In order to make the innovation more persuasive, it is necessary to take into consideration and see the process by which the technological system is developed, before it has been established.
In this way, we seem to have come to an extreme opposite position to the one we have seen in technological determinism. But, we must be careful and not be too hasty.

First of all, social constructivism does not propose that there exist social factors independently of technological factors. Actually, a society without technology is unthinkable, and if society is internally and immanently related to technology, the reverse must also be valid. Bijker emphasizes this situation:

> Purely social relations are to be found only in the imaginations of sociologists or among baboons, and purely technical relations are to be found only in the wilder reaches of science fiction. ... constructed. All stable ensembles are bound together as much by the technical and by the social. (Bijker 1995, p. 273.)

This point of view brings us very near to the view of an "actor network" developed by the French sociologist, B. Latour. According to Latour, we must recognize not only humans but also non-human artifacts as actors in the social world.

I would like to call this view a "double aspect theory" of the technology/society relation. Just as the double aspect theory of mind/body relation emphasizes that mind and body are not independent entities but inseparable aspects of one fundamental entity (person, according to one version), this theory indicates that society and technology are inseparable aspects of one fundamental socio-technical network. This does not mean that technology determines society, but rather that technology is determined by society.

From these considerations and analyses of social constructivism, we gain a very important insight into the relationship between society and technology. From this point of view, social factors influence technology not externally but rather internally, and they are integrated into the technological system as a whole. The view of a "double aspect theory" allows us to understand that the technological system is not determined by external factors alone, but rather by the interaction of social and technical factors.
Two examples from L. Winner help us again to think about this characteristic of a hermeneutics of technology. There are bridges over the parkways from New York to Long Island. Many of them are extraordinary low, so low that normal buses cannot pass under them. The goal that the designer of this parkway wanted to realize was keeping poor people and blacks, who normally use public buses, off Long Island. The technological structure seems to be innocent, but that structure itself embodies a meaning of social discrimination and realizes it perfectly.

In the 1880s, at McCormick's reaper manufacturing plant, a large, new molding machine, which could be used by unskilled workers, was introduced at a very high cost. It has been made clear that the function of the machine in that context expresses a meaning of the destruction of a labor union and realizes it very well.

What is important is that these meanings are not given to technological products externally, but they are embodied in the structure and function of the products as such. According to Winner, "certain technologies in themselves have political properties" (Winner 1986, p. 20). Concerning the political characteristics of technology, Winner carefully differentiates two kinds of technologies. First are the technologies in which design and arrangement of technical devices provide political purposes. These technologies are more closely connected with a particular type of social structure, for example, hierarchical social structures. Second are the technologies in which design and arrangement of technical devices are more closely connected with a particular type of economic system, for example, market economy. In the former case, technologies are more closely connected with a particular type of social structure, for example, hierarchical social structures. In the latter case, technologies are more closely connected with a particular type of economic system, for example, market economy.

Surely, this difference is very important, especially when it comes to the political problem in the explicit sense concerning the relation between technology and society. The question is whether or not technological products remain neutral with respect to various interpretations because the meaning of technological products is not given externally, but it is "embodied" in the structure and function of technological products themselves. In Winner's view, this embodiment of meaning is not accidental but necessary, and it is inherent in the very nature of technological products.
In the late Medieval period of Europe, windmills became one of the important power plants. But, as Lynn White has explained, “In Tibet windmills are used only thus, in the technology of prayers; in China they are transferred to a certain socio-technical network which is integrated into a certain socio-technical system that is in a certain socio-technical network. In Europe, windmills became integrated into a certain socio-technical network that is transferred to a different cultural system that is necessary to act in a certain socio-technical network. This hermeneutics does not always remain within a sphere of philosopher, historian, or sociologist. When a socio-technical system becomes unstable, producers or some important members of the system have the opportunity to become active to the framework or slogans (Grote 1994) (cf. figure 4, 5). Even the use of water in general could be seen as a kind of political action.

![Figure 4](image1.png)

![Figure 5](image2.png)
In addition to this, as long as in the process of the technology transfer the connection between the periphery and the center of the network is necessary, the process of the transfer cannot be considered only one-sided. In order for the East to be the center of culture and power, it must be able to control the flow of information, machines, and people. That means the network of "American Progress" brings not... remains, even though the two networks are unequal. According to D. Ihde: "For every contact the Euro-American technologized culture makes with the Other, there returns a countercurrent of the culture contacted. This is the phenomenon of what I shall call post-modern pluriculture" (Ihde 1993, p. 28; cf. Ihde 1990).

I am not sure whether this characteristic can be called postmodern. But in any case, in the process of the encounter between two different cultures it is inevitable that there occurs action and reaction and a kind of circular movement, which brings... each culture in some way or other. The "hermeneutical circle" is also inevitable in the case of technology transfer.

Once again, consider the picture "American Progress," which depicts one case of the struggle of interpretation between two networks very impressively. In the center of the picture, a beautiful maiden appears carrying a telegraph wire in her right hand, connecting her firmly with the center. From this, we can clearly understand why the "interpretation" belonging to the center of the Eastern U.S. is so... supports and defends one direction of interpretation and guarantees the validity of European science and technology.

Facts and machines are like trains, electricity, packages of computer bytes or frozen vegetables: they can go everywhere as long as the track along which they travel is not interrupted in the slightest... Forgetting the extension of the instruments when admiring the smooth running of facts and machines would be like admiring the road system, with all those fast trucks and cars, and overlooking civil engineering, the garages, the mechanics and the spare parts. Facts and machines have no inertia of their own; like kings or armies they cannot travel without their retinues and impedimenta. (Latour 1987, p. 250.)

In this sense, we could see the image of "American Progress"...