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Martin Heidegger and Technology

Murray, Michael. *Heidegger and Modern Philosophy: Critical Essays, Heidegger's Critique of Science and Technology*, A Yale Paperbound. New Haven: Yale University Press, 1978.

Heidegger, Martin. *The Question Concerning Technology, and Other Essays*. 1st ed, Harper Colophon Books. New York: Harper & Row, 1977.

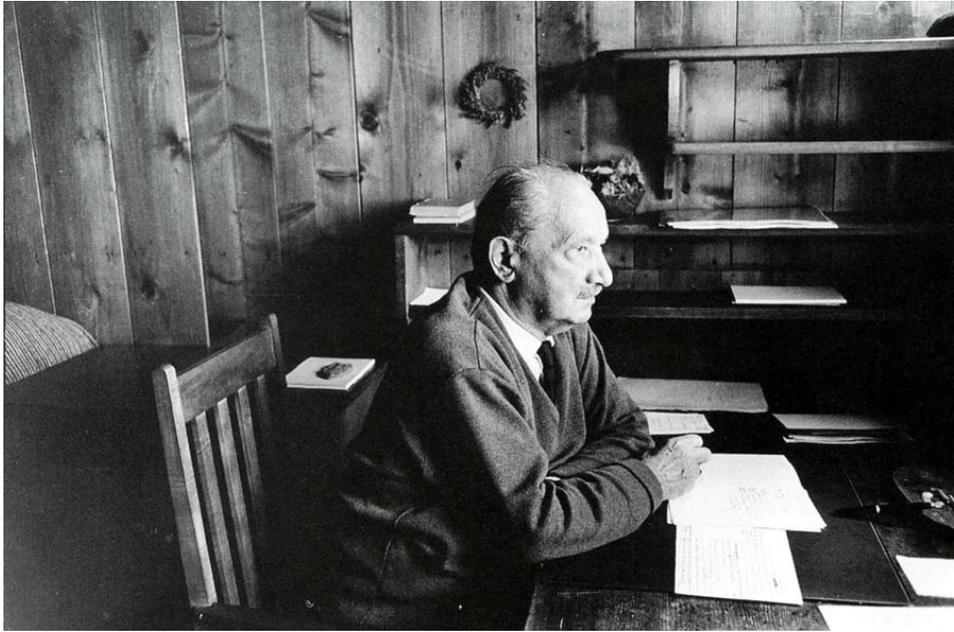


Photo by Digne Meller-Marcovicz
Martin Heidegger in his study at The Hut and in the study at his home in the city.¹

Martin Heidegger's hut was without running water or electricity in the early years. He reluctantly had a phone and electricity installed in his later years. This can be seen to symbolize his views toward technology and man. Many of his writings were done in the hut.

¹ Sharr, Adam. *Heidegger's Hut*. Cambridge, Mass.: MIT Press, 2006.

Heidegger's Critique of Science and Technology

“One of the most important motifs in the work of Martin Heidegger is the critique of science and technology he develops as part of his more general critique of Western thought. In this essay I want to clarify the character of Heidegger's critique by examining the interrelation between his conception of science and his interpretation of modern technology.”²

“Unlike most contemporary analyses of science, Heidegger's critique is undertaken with an eye toward a revolutionary mode of thinking that he believes must supplement scientific thought.”

- 1 First, the relation of science to the thought of Being is construed by Heidegger as the relation between a thought which is domineering and beings-oriented, and one which is acquiescent and Being-oriented.
- 2 Second, for Heidegger a critique of science cannot proceed simply through a logical analysis of scientific language. Such an analysis assumes the foundation of the sciences-logic and mathematics-as its basis, and can, therefore, explain science only to itself.
- 3 Third, Heidegger avoids this narrow analytic reference by showing that science is the contemporary expression of the metaphysical mode of thought which began when Plato yoked Being under the limits of the Idea of the Good, and when Aristotle set the limits of reality in terms of the law of contradiction. As Heidegger sees it science is contemporary metaphysics-the logical terminus of metaphysical thought.
- 4 Fourth, although there is a negativistic element in Heidegger's analysis of science, which stems from the fact that science has arrogated to itself alone the privilege of intelligible and meaningful language, Heidegger is by no means merely opposed to science. The thought of Being, since it differs in intention from science (a theoretical thinking of beings), cannot be an opponent of science. 35-36

² Murray 35

... we must further clarify what Heidegger means by "Being becoming a picture," for science, as Heidegger sees it, does not merely construe its set of propositions as a picture of the world. It does something much more emphatic. It decides, in a normative fashion, that **the world itself consists in nothing other than the picture drawn by science.** The world as a picture, then, does not mean the world understood as a picture. It means instead that the possibilities of Being are exhaustively accounted for in the conception of the world as a picture drawn in the propositions of science. Beings are only what is represented in this picture.³⁶

In the pre-Socratic doctrine which understands Being as *physis*, that is, as emergence, as coming-to-be, it is impossible for Being to become conceived as a picture of man's own construction; man stands before Being and lets beings be. This is quite different from the notion of representation which is central to the modern conception of Being, where representation means to "bring what is present before one as something confronting oneself, to relate it to oneself, the person representing it, and to force it back into this relation to oneself as the normative area ." Man through this maneuver becomes the representative of Being, and, as its representative, he achieves sole power over it. 37

The medieval conception of knowledge yokes the knowledge of beings under the doctrine of faith, which reserves for itself all final and genuine knowledge. 37-38

As a corollary of his understanding of the medieval conception of *knowledge*, Heidegger further argues that science is possible only when God has been displaced from the world so that nature can be studied without reference to God. Because of this, science is regarded by him as godless- not because it is atheistic, but because it necessarily removes god to a distant location. (In this same vein he argues that all contemporary religions are godless.) 38

Originally, *ta mathemata* meant that which man knows prior to his acquaintance with things: the corporeality of bodies, the animateness of animals or-as in Euclidean geometry-the non-intersection of parallel lines. Numbers then are but one instance of the *ta mathemata*. And because they represent the most obvious *ta mathemata* of things, numbers have taken over for their exclusive privilege the name of mathematics.

In modern science, "to get up an experiment means to assume a situation where it becomes possible to trace a definite nexus of motions in the necessity of its course, that is, to control its calculation in advance." 39

An experiment, then, is nothing other than a privileged experience which is designed to elicit the facts that either confirm or disconfirm the law it is to test. 39

In modern science one turns in the end to one's self for confirmation of hypotheses, since it is the *ta mathemata* which is brought to experience by man that determines the conception of fact, experiment, and confirmation.

Since science deals with facts that are temporal, science is necessarily a *dynamic* projection which emphasizes the permanence of change. 40

Given the ultimate possible disclosure of all of nature's mysteries, we see that the doctrine of Being in science allows, at least in principle, for an ultimate perfect knowledge of Being itself. 40

Therefore the scientific objectification of Being becomes more precise by becoming more specialized. 40

As Heidegger sees it, specialization is logically prior to the accumulation of scientific data and therefore cannot be a consequence of it. 40

Specialization is itself at the heart of the "businesslike" character of the sciences that results in the institutionalization of procedures and devices. 40

Being becomes totally objectified only in the institutionalization of the sciences. Once the sciences are institutionalized, the scientific thinker becomes a specialist who approaches Being as a set of problems, the solutions to which can be found by continuous elaboration of the mathematical projection. With the development of scientific institutions, Being becomes fully objectified as a picture re-presented to man. 41

The gigantic then remains to remind contemporary thinkers that not everything is, in fact, calculable, and it is this noncalculable something that the thought of Being seeks to isolate as a datum of thought.

Additional strength is given to Heidegger's understanding in Werner Heisenberg's discussion of "The Idea of Nature in Contemporary Physics." In this paper Heisenberg argues that contemporary thought is endangered by the picture of nature drawn by physics. This danger lies in the fact that the picture is now regarded as an exhaustive account of nature itself, so that science forgets that in its study of nature it is merely studying its own picture.

In technological thought we shall see the calculative rationality and the insistent aggressiveness meet in perfect harmony. Using a characteristic etymological maneuver, Heidegger argues that it is possible to understand technological thought only if we first understand the Greek term "*techne*."

We must, as it were, understand what is left out of technology before we can know what technology is. He interprets the term "*techne*" as signifying any way in which beings can be made manifest, as any mode of lighting up a realm of beings. In this original sense of the word, a technician would be a kind of poet who succeeds in an originative uncovering of beings, that is to say in a disclosure of a particular world. Thus Heidegger emphasizes the connection between the Greek terms "*techne*" and "*poiesis*." He further holds that the term "*techne*" was closely associated with the meaning of "*episteme*," and that both of these terms connoted a kind of functional cognition in which one could be said to know one's way around within some realm of beings. 43-44

Thus it was a matter of *techne* to uncover beings in a work of art, or to uncover them for use-as in the crafts. The essential and original meaning of *techne* is then that of "making manifest" and not merely that of "making" in the sense of practical construction. As we shall see, the fundamental difference between the original *techne* of *poiesis* and the modern *techne* of technology is that the first is responsive and contemplative whereas the second is domineering and challenging. 44

The construction of a craftsman – e.g., a potter-has something of both elements. The potter using the earth makes a bowl; he assumes responsibility for the earth as a bowl by bringing it forth through the application of his craft. In this respect the craftsman works in harmony with nature. On the other hand, he also is necessarily violent in the crafting of the pot. His art, therefore, shows elements of both the *poiesis* of *physis* and the *poiesis* which is a mere human making. According to Heidegger, it becomes the fate of contemporary technology to forget the *poiesis* of *physis-the* responsible uncovering that is in harmony with Being itself. 45



A Salt Glazed Shino Cup, from the thesis of “648 Cups, 7 Teapots and 8 Paintings: An Installation,” by the author, 1993³

³ From the author’s Master of Fine Art thesis, *648 Cups, 7 Teapots and 8 Paintings: An Installation*, of the University of Mississippi in 1993, which explored the feed-back loop of making, drawing and using the teacup.

A further significant feature of scientific technology is that technological man denies that technology is anything so mysterious as a mode of making beings manifest. The technician sees technology simply as the means in an ends-means relationship. Ends are chosen in some way (the technician does not ask how), and technology merely shows the most efficient way to produce those ends. Technology is in this view only a set of techniques used by men to achieve some goal or other. 45

Technological thought can be more deeply characterized by contrasting it with the very scientific thought upon which it depends. To make the contrast as graphic as possible we shall consider two specific examples of analysis. The first case deals with the difference between the scientific and technological approaches to a mountain. For the science of geology, a mountain is viewed as a conjunction of substance and historical processes that can be scientifically described. The mountain lies "over there" in scientific nature and one may study it impersonally and spectatorially as is required in an objective study. If we approach the objectified mountain from the point of a mining engineer who has discovered an ore in the mountain, all traces of this objectivity vanish. The mountain becomes regarded simply as a repository of the ore. It is a being that is a necessary resource in so emphatic a sense that the mountain itself becomes identified with that resource.

Technology approaches nature as a repository of resources containing energies that are unlocked by technology, accumulated, stored, transformed, and utilized in the production of goods.

A being thus technologically uncovered stands in a position to be disposed of in a productive process, and the beings of technology are nothing more than this passive stance of waiting to be used by man.

In prescientific technologies, man was a being *within* nature, whereas in contemporary scientific technology man sees himself as a being *over* nature. 48

Consider the difference between an old bridge built over the Rhine and a modern power plant that uses the Rhine as a source of energy. The bridge, which is built into the river, lets the Rhine be itself and brings forward its essential character by bridging its separate banks. The hydroelectric plant, however, builds the Rhine into the plant itself so that the river becomes merely part of the machinery needed to generate electricity. The riverly character of the river is denied as it becomes a mere resource used to turn the generators. 48

The currents and the winds around a body of water also enter into motorboating, but do so as obstacles to be surmounted. In motorboating one attempts to dominate the river, and can gain the illusion that such domination is possible. No such illusion is possible in sailboating. It is precisely such an illusion of domination that lies at the core of scientific technology. 49

Heidegger's critique of science and scientific technology does not constitute a romantic flight from mathematics and machines. If we recall that the technician is a kind of poet—a poet who makes technical beings—then we can understand what is required of scientific technology: that it become aware of its own foundations and through this self-awareness rid itself of the pretense of being the *ur-voice* of Being. The hope for technological man does not lie in giving up his technology. 49-50



Tournalayer No. 2, Longview, Texas. Concrete house casting and laying system, 1946. The photo shows the outer form being lowered onto the inner form. Photo courtesy of the LeTourneau University Archives.

The Question Concerning Technology, and Other Essays

“For him both man *and* Being are finite, and their relationship never dissolves in sheer oneness.” (xiiiv)

“Heidegger is not a foe of technology and science. He neither disdains nor rejects them as though they were only destructive of human life.” (xiv)

“Being may perhaps best be said to be the ongoing manner in which everything that is, presences; i.e., it is the manner in which, in the lastingness of time, everything encounters man and comes to appearance through the openness that man provides. Hence for Heidegger Being is the very opposite of an abstraction fashioned by human thought. Rather it is "what is given to thinking to think. True thinking should not concern itself with some arcane and hidden meaning, but with "something lying near, that which -lies nearest," which, in virtue of that very nearness, man's thinking can readily fail to notice at all (WN 111). *" (xv)

“Being manifests itself continually anew. In keeping with this, thinking can never be for Heidegger a closed system. Rather it is the traveling of a road. Each thinker goes along a way that is peculiarly his own. In a fundamental sense it is the way and not the individual that assembles what is thought, that provides bounds and lets everything stand in relation to everything else.” (xvi)

“Heidegger is primarily a teacher. He does not wish to travel alone and then report what he has seen, nor does he wish to go as a guide merely pointing out objects along the road. He wishes the reader to accompany him on the way, to participate with him, and even to begin to build his own way through thinking, and not merely to hear about what it is or should be.” (xvi)

“For him the proper function of words is not to stand for, to Signify. Rather, words point to something beyond themselves. They are translucent bearers of meaning. To name a thing is to summon it, to call it toward one.” (xix)

“The intricate system of techniques and apparatus that we call modern technology belongs essentially to this same realm. In it contemporary man's inveterate drive to master whatever confronts him is plain for all to see. Technology treats everything with "objectivity." The modern technologist is regularly expected, and expects himself, to be able to impose order on all data, to "process" every sort of entity, nonhuman and human alike, and to devise solutions for every kind of problem. He is forever getting things under control.” (xxvii)

“This simultaneous juxtaposing of the destining of Being and the doing of man is absolutely fundamental for Heidegger's thinking.” (xxviii)

“Heidegger points out that, on the contrary, modern science and machine technology are mutually dependent upon one another.” (xviii)

“The rule of such a way of revealing is seen when *man* becomes subject, when from out of his consciousness he assumes dominion over everything outside himself, when he represents and objectifies and, in objectifying, begins to take control over everything.” (xxix)

“Today all things are being swept together into a vast network in which their only meaning lies in their being available to serve some end that will itself also be directed toward getting everything under control. Heidegger calls this fundamentally undifferentiated supply of the available the, "standing-reserve" (QT 17).” (xxix)

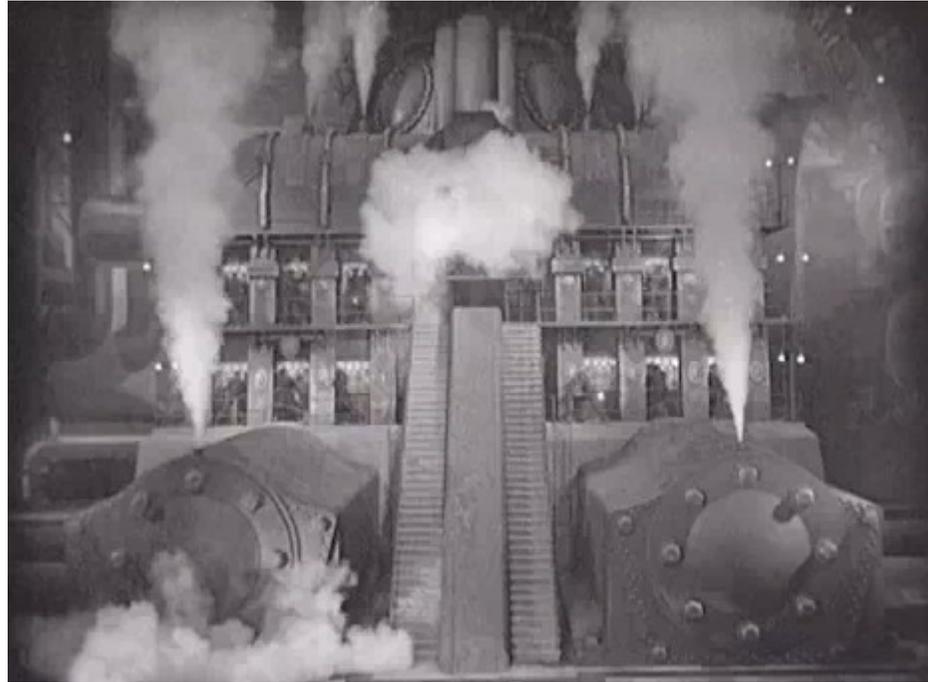


Image from *Metropolis* a 1927 German expressionist film in the science-fiction genre directed by Fritz Lang.
<http://www.youtube.com/watch?v=ZSExdX0tds4&feature=related>

“The challenging claim that now summons man forth, that "gathers man thither to order the self-revealing as standing-reserve," Heidegger calls *das Ge-stell* (Enframing) (QT 19). As "Enframing," that claim ceaselessly, brings both men and things to take their places in the stark configuration that is being wrought out through ordering for use.” (xxix)

“The dominion of Enframing as the essence of modern technology and the concomitant presence of the standing-reserve are most clearly seen in the realm of machine technology, where no object has significance in itself and where the "orderability" of everything, from energy and statistics to machines and persons, is all-important.” (xxx)

“Man needs above all in our age to know himself as the one who *is* so claimed. The challenging summons of Enframing "sends into a way of revealing" (QT 24). So long as man does not know this, he cannot know himself; nor can he know himself I in relation to his world. As a consequence he becomes trapped in one of two attitudes, both equally vain: either he fancies that he can in fact master technology and can by technological means by analyzing and calculating and ordering-control all aspects of his life; or he recoils at the inexorable and dehumanizing control that technology is gaining over him, rejects it as the work of the devil, and strives to discover for himself some other way of life apart from it. What man truly needs is to know the destining to which he belongs and to know it as a destining, as the disposing power that governs all phenomena in this technological age.” (xxxiii)

“The danger is real that every other way of revealing will be driven out and that man will lose his true relation to himself and to all else. Language, the primal mode through which man may experience and think and know whatever is, in its Being, may be bereft of its power, to become only a mere instrument of information. And man may be divested of his true essence and become one who "manufactures himself" (Sem. 34; d. QT 26 ff.). Man himself, through whom the ordering characteristic up into the standing-reserve and may come to exist not as the "*openness-for Being*" ("*Da-sein*"), but as a merely self-conscious being knowing himself only as an instrument ready for use.” (xxxv)

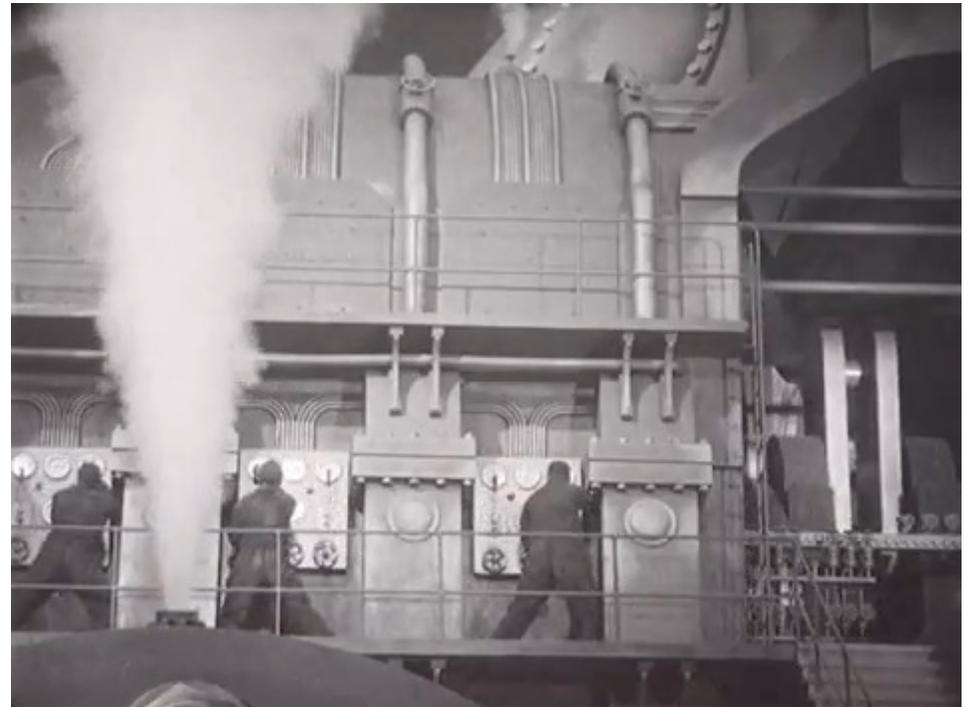


Image from *Metropolis* a 1927 German expressionist film by Fritz Lang.

The Question Concerning Technology



“In what follows we shall be *questioning* concerning technology. Questioning builds a way. We would be advised, therefore, above all to pay heed to the way, and not to fix our attention on isolated sentences and topics.” (3)

“Likewise, the essence of technology is by no means anything technological. Thus we shall never experience our relationship to the essence of technology so long as we merely conceive and push forward the technological, put up with it, or evade it. Everywhere we remain unfree and chained to technology, whether we passionately affirm or deny it. But we are delivered over to it in the worst possible way when we regard it as something neutral; for this conception of it, to which today we particularly like to do homage, makes us utterly blind to the essence of technology.” (4)

“But this much remains correct: modern technology too is a means to an end. That is why the instrumental conception of technology conditions every attempt to bring man into the right relation to technology. Everything depends on our manipulating technology in the proper manner as a means. We will, as we say, “get” technology “spiritually in hand.” We will master it. The will to mastery becomes all the more urgent the more technology threatens to slip from human control.” (5)

Original 1927 theatrical release poster
Metropolis is a 1927 German expressionist film in the science-fiction genre directed by Fritz Lang.

“Only at the point where such an uncovering happens does the true come to pass. For that reason the merely correct is not yet the true. Only the true brings us into a free relationship with that which concerns us from out of its essence. Accordingly, the correct instrumental definition of technology still does not show us technology's essence. In order that we may arrive at this, or at least come close to it, we must seek the true by way of the correct. We must ask: What is the instrumental itself? Within what do such things as means and end belong?”

“For centuries philosophy has taught that there are four causes: (1) the *causa materialis*, the material, the matter out of which, for example, a silver chalice is made; (2) the *causa formalis*, the form, the shape into which the material enters; (3) the *causa finalis*, the end, for example, the sacrificial rite in relation to which the chalice required is determined as to its form and matter; (4) the *causa efficiens*, which brings about the effect that is the finished, actual chalice, in this instance, the silversmith. What technology is, when represented as a means, discloses itself when we trace instrumentality back to fourfold causality.” (6)

“The principal characteristic of being responsible is this starting something on its way into arrival. It is in the sense of such a starting something on its way into arrival that being responsible is an occasioning or an inducing to go forward [*Ver-an-lassen*].” (9)

“*Physis* also, the arising of something from out of itself, is a bringing-forth, *poiesis*. *Physis* is indeed *poiesis* in the highest sense. For what presences by means of *physis* has the bursting open belonging to bringing-forth, e.g., the bursting of a blossom into bloom, in itself (*en heautoi*). In contrast, what is brought forth by the artisan or the artist, e.g., the silver chalice, has the bursting open belonging to bringing forth not in itself, but in another (*en alloi*), in the craftsman or artist.” (11)

“But where have we strayed to? We are questioning concerning technology, and we have arrived now at *aletheia*, at revealing. What has the essence of technology to do with revealing? The answer; everything. For every bringing-forth is grounded in revealing. If we inquire, step by step, into what technology, represented as means, actually is, then we shall arrive at revealing. The possibility of all productive manufacturing lies in revealing.” (12)

“Technology is therefore no mere means. Technology is a way of revealing. If we give heed to this, then another whole realm for the essence of technology will open itself up to us. It is the realm of revealing, i.e., of truth.” (12)

“One is that *techne* is the name not only for the activities and skills of the craftsman, but also for the arts of the mind and the fine arts. *Techne* belongs to bringing-forth, to *poiesis*; it is something poetic.” (13)

“The other point that we should observe with regard to *techne* is even more important. From earliest times until Plato the word *techne* is linked with the word *episteme*. Both words are names for knowing in the widest sense. They mean to be entirely at home in something, to understand and be expert in it. Such knowing provides an opening up. As an opening up it is a revealing.” (13)

“Whoever builds a house or a ship or forges a sacrificial chalice reveals what is to be brought forth, according to the perspectives of the four modes of occasioning. This revealing gathers together in advance the aspect and the matter of ship or house, with a view to the finished thing envisioned as completed, and from this gathering determines the manner of its construction. Thus what is decisive in *techne* does not lie at all in making and manipulating nor in the using of means, but rather in the aforementioned revealing. It is as revealing, and not as manufacturing, that *techne* is a bringing-forth.” (13)

“In opposition to this definition of the essential domain of technology, one can object that it indeed holds for Greek thought and that at best it might apply to the techniques of the handcrafts man, but that it simply does not fit modern machine-powered technology. And it is precisely the latter and it alone that is the disturbing thing, that moves us to ask the question concerning technology per se. It is said that modern technology is something incomparably different from all earlier technologies because it is based on modern physics as an exact science.” (13-14)

“What is modern technology? It too is a revealing. Only when we allow our attention to rest on this fundamental characteristic does that which is new in modern technology show itself to us. (14)

“This setting-upon that challenges forth the energies of nature is an expediting [*Fordern*], and in two ways. It expedites in that it unlocks and exposes. Yet that expediting is always itself directed from the beginning toward furthering something else, i.e., toward driving on to the maximum yield at the minimum expense. The coal that has been hauled out in some mining district has not been supplied in order that it may simply be present somewhere or other. It is stockpiled; that is, it is on call, ready to deliver the sun's warmth that is stored in it. The sun's warmth is challenged forth for heat, which in turn is ordered to deliver steam whose pressure turns the wheels that keep a factory running.” (15)

“Everywhere everything is ordered to stand by, to be immediately at hand, indeed to stand there just so that it may be on call for a further ordering. Whatever is ordered about in this way has its own standing. We call it the standing-reserve [*Bestand*].” (17)

“The forester who, in the wood, measures the felled timber and to all appearances walks the same forest path in the same way as did his grandfather is today commanded by profit-making in the lumber industry, whether he knows it or not. He is made subordinate to the orderability of cellulose, which for its part is challenged forth by the need for paper, which is then delivered to newspapers and illustrated magazines.” (18)

“Wherever man opens his eyes and ears, unlocks his heart, and gives himself over to meditating and striving, shaping and working, entreating and thanking, he finds himself everywhere already brought into the unconcealed. The unconcealment of the unconcealed has already come to pass whenever it calls man forth into the modes of revealing allotted to him.” (19)

“Plato exacts of this word, however, utterly extraordinary: that it name what precisely is not and never will be perceivable with physical eyes.” (20)

“Enframing means that way of revealing which holds sway in the essence of modern technology and which is itself nothing technological. On the other hand, all those things that are so familiar to us and are standard parts of an assembly, such as rods, pistons, and chassis, belong to the technological. The assembly itself, however, together with the aforementioned stockparts, falls within the sphere of technological activity and this activity always merely responds to the challenge of Enframing, but it never comprises Enframing itself or brings it about.” (21)

“Enframing as a destining of revealing. In this way we are already sojourning within the open space of destining, a destining that in no way confines us to a stultified compulsion to push on blindly with technology or, what comes to the same thing, to rebel helplessly against it and curse it as the work of the devil. Quite to the contrary, when we once open ourselves expressly to the *essence* of technology, we find ourselves unexpectedly taken into a freeing claim.” (25-26)

“Yet when destining reigns in the mode of Enframing, it is the supreme danger. This danger attests itself to us in two ways. soon as what is unconcealed no longer concerns man even as object, but does so, rather, exclusively as standing-reserve, and man in the midst of objectlessness is nothing but the orderer of the standing-reserve, then he comes to the very brink of a precipitous fall; that is, he comes to the point where he himself will have to be taken as standing-reserve.” (26-27)

“Enframing blocks the shining-forth and holding-sway of truth. The destining that sends into ordering is consequently the extreme danger. What is dangerous is not technology. There is no demonry of technology, but rather there is the mystery of its essence. The essence of technology, as a destining of revealing, is the danger. The transformed meaning of the word "Enframing" will perhaps become somewhat more familiar to us now if we think Enframing in the sense of destining and danger.” (28)

“The arts were not derived from the artistic. Art works were not enjoyed aesthetically. Art was not a sector of cultural activity. What, then, was art-perhaps only for that brief but magnificent time? Why did art bear the modest name *techne*? Because it was a revealing that brought forth and hither, and therefore belonged within *poiesis*. It was finally that revealing which holds complete sway in all the fine arts, in poetry, and in everything poetical that obtained *poiesis* as its proper name.” (34)

“Because the essence of technology is nothing technological, essential reflection upon technology and decisive confrontation with it must happen in a realm that is, on the one hand, akin to the essence of technology and, on the other, fundamentally different from it. Such a realm is art. But certainly only if reflection on art, for its part, does not shut its eyes to the constellation of truth after which we are *questioning*.” (33)

“Thus questioning, we bear witness to the crisis that in our sheer preoccupation with technology we do not yet experience the coming to presence of technology, that in our sheer aesthetic mindedness we no longer guard and preserve the coming to presence of art. Yet the more questioningly we ponder the essence of technology, the more mysterious the essence of art becomes.

The closer we come to the danger, the more brightly do the ways into the saving power begin to shine and the more questioning we become. For questioning is the piety of thought.” (33)