

FOREWORD

Hermeneutics is still valid to many as a purely humanistic methodology and phenomenology is still known for its strong critic of positivism. At first glance, both the methodologies do not seem to be adequate to substantiate the Philosophy of technics. In the meanwhile, works on a hermeneutic philosophy of science have become quite acceptable. Especially, the approaches on the philosophy of technoscience – the thesis of a technical basis of modern nature – as experimental sciences have offered support to a hermeneutic philosophy of technics. Almost all these approaches find their place in the US. But Heidegger is still recognised as a philosopher of technics also in Germany. Indeed, in the beginning of the 21st century, Heidegger influences more clearly, in the background of the Aristotelean conception of technics, the discussions on the theme of technics not only as a critic of technics after the so called “turn”, but also before his “Being and Time”. The turn on the philosophy of technics of the early Heidegger in “Being and Time” (I noticed it with the help of my friend Nestor Corona) can be fruitfully linked to the approach of “tacit knowledge” (Michael Polanyi) and “expanding hermeneutics” (Don Ihde). The philosophy of technics by, for instance Albert Borgmann, Hubert Dreyfus and Carl Mitcham (to name only a few), Hans Lenk, Hans Poser and Walther Zimmerli in Europe as well as the historical approaches on technology by my colleague in Dresden Thomas Hänseroth have also inspired my hermeneutic philosophy of technics.

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INTRODUCTION: HERMENEUTIC PHILOSOPHY OF TECHNICS AND TECHNOLOGY

The philosophy of technics is a recent discipline, which is only around 130 years old. Still in the 19th century, thinkers like Hegel, Buckhardt and Dilthey did not attach any historical significance to technique. The manual and technical skills and their practical accomplishment of technical activities were seen as objects of lesser grade. They belong to the daily world. This has changed basically with the reassessment of the themes of *Lebenswelt* and *Alltaeglichkeit* by Edmund Husserl and Martin Heidegger respectively. Moreover, technics has become a dominant factor in the daily life of mankind, something which was not the case in previous times. Philosophical reflection on technique and its mouldings as well as different conceptions of the understanding of technology would not allow to reduce the analysis of the development of technique merely to the determination of productivity. It must preferably take into account several factors of development and should methodologically inquire into its significance, meaning and value. What is attempted here is a convergence of perspectives, in which the development of technics can be interpreted. A respective understanding of technics and technology has to be derived and the arguments which are for and against a particular interpretation have to be discussed for this purpose.

The words technics and technology are used in multiple forms. The concept of technics originates from the Greek word “*technikos*”, manual and artificial, which means the knowledge of processing, transferred individually or by guild, and its products. At first identical with the concept of art in the sense of handicraft, technique describes the measures and processes, with the help of which, man manufactures things through the appropriation of natural laws and natural resources and make them available for production. In this respect, technics includes an approach, which integrates the knowledge of natural sciences. The concept of anticipation (prior understanding, tradition, pre-structuredness of paths of development), contains a new dimension in the framework of hermeneutics of understanding. The hermeneutic situation of understanding depends on a pre-structure of understanding of a world-design, which contains anticipation. In the daily conception, anticipation means an expectation of the future behaviour. A particular vision of future manifests itself in such an anticipation. From the perspective of hermeneutics of technics, technics can be understood with recourse to technical traditions and manifestations of technical actions in history. Simultaneously on the other hand it can be understood only with the help of an anticipation of the technical development in future. Hermeneutics of daily life observes along with Martin Heidegger, an essential element of technics in the skills of handling or operation and the knowledge, which serves as its basis.

One can find in Aristotle an early form of the thesis of handling of technics. He writes: since we partly produce the material in different sectors of our manual labour, partly to process it for further use, we treat everything, whatever there is, as means for our ends- for in a certain sense we are also in fact an (nature's) object. The term "object" is ambiguous, it refers to the scripture on philosophy, "now there are two trades every time, which determine the material and the knowledge about what the material contains, that is to say, the trades, which (out of which the material can be produced) are applied and on the other side, the ones, which have a leading function during the process of manufacture [...]. We distinguish the manufacturing manual labour, which includes the knowledge of the material. That is how a navigator conceives the rudder of a ship and states, how it can be designed. But the other one (the ship manufacturer) knows and states from which wood it can be made and which processes can be adopted for its manufacture. The end-use should have only the knowledge of the object, which the concerned has to accomplish each time" (Aristotles 1979, 37f). My own definition ties in with Aristotle's. Technology means 1) knowledge of skills of construction and manufacture of technical artefacts. 2) Knowledge about the structure, function and efficiency of technical artefacts. 3) Knowledge of skills of use, handling, disposal and application of technical artefacts (Irrgang 2008a).

The point of departure for a hermeneutic concept of technical knowledge and understanding is implicit or tacit knowledge (Irrgang 2001a). An understanding of the technical action based on this develops, which builds upon a conception of the use of tools and respectively also of the handling of natural processes, in the instrumental understanding as the implicit knowledge of handling. What is of pre-eminent significance is not the analysis of tools, instead that of success, which can be achieved with the help of a technical resource. What is explored is the way of realisation of an intended effect. The interpretation of implicit technical knowledge goes in the process beyond Martin Heidegger's existential analysis of technical handling of the material world (Corona, Irrgang 1999). The point of departure of the philosophy of technics is the concept of an implicit knowledge of handling on the basis of a process of understanding of the possibilities of application of natural processes or of tools. This implicit knowledge of handling should be reconstructed in the sense of a mutually interwoven knowledge and skills, determined by the material structure which is dealt with and the habituality of the person handling. Only thereafter becomes the explicit knowledge, mathematicisation and a scientific basis crucial for technics.

Technics and its user meet in a particular referential connection, for example, a stone which can be used as a hand-axe and a nuclear plant which generates electricity. The programme of philosophy of technics suggested here interprets the technical artefacts in the context of their social application with reference to its cultural significance, and hence more or less institutionalised forms of technical handling. Research until now limited itself mostly either to the renewal of construction laws of the technical artefacts or to the formation of social projects. A methodologically

verified mediation of both the approaches after taking into account the socio-cultural aspects seems to be badly essential as a point of departure for the philosophy of technics.

Technical knowledge is not theoretical knowledge in the traditional philosophical sense, instead it is the knowledge of handling or know-how, which can be reflexively worked upon. A hermeneutic approach is apt for exactly this kind of knowledge. The processes of interpretation set horizons of explanations as a prerequisite. Ex: Models, basic settings, guidelines as well as basic anthropological and cultural assumptions in the framework of analysis of technical handling. A hermeneutic analysis of technical handling begins normally not with an individual, instead with social "systems" (forms of praxis), which use the artifacts. Social systems use artifacts for a certain purpose, i.e. with a certain intention. An interpretation-theory of technical handling is assumed to be an art of framing questions regarding technics, which develops its context of use in its cultural significance and in its future potential. The phenomenology and hermeneutics of technical handling as a theory of methodology of the philosophy of technics analyses assumptions and preconditions of interpretations, which serve as the basis of the way of use and development of technical praxis. The analysis of technics means in such a process a form of description of not only the technicised daily world and the know-how, which serves as its basis, but also the reflection and metareflection on technics.

Traditionally, the interaction between man and technics is treated as explained in the concepts of labour and production. But the high-tech society has changed the traditional concepts of labour and production. An analysis of technical handling intervenes here and demonstrates that the daily world right from the beginning has been interspersed with the economisation of technical handling. Technical handling through its processing of nature and artifacts shows a non-specific tendency for symbiosis with natural sciences to the extent they exist. The intended effects, aims and purposes and the non-intended effects are the determining starting points for such a theory of application-contexts of technics, which is shaped communicatively and instrumentally. Traditionally, technical action orients itself initially towards archetypes, models, designs and concepts of technical and non-technical kinds. Its cultural embedment lies in that. One of the essential tasks of such a theory of interpretation of dealing with technics (hermeneutics of technics) is the interpretation of models and images, which guide its handling. Structures, which constitute the technicised life-world and the metaphors, which guide it in its social (for example, in the model of car-free inner city) and ecological dimensions (for example, in the image of our blue planet) constitute, develop and make the technical praxis possible. Also, the social dimension of technical action cannot be understood without the communicative action.

Technical megasystems, especially for the supply of energy, have transformed the daily life in the industrial societies in a drastic manner. The information technology systems and our systems for food production have also had the same impact. Even if there are no convincing theories to account for the interspersing relation between technical artifacts and the ways of their social application and also between social groups and individuals, a glance at the history of technical praxis and its

cultural embeddedness in its formulation can perhaps help in this regard. The determining aspect in the description of technical application is not the contrast of the instrumental and the communicative, instead the mutual engagement of communicative and instrumental behaviour in order to achieve a particular goal. It turns out in the process, that the hermeneutics of technics overcomes as a rather integrating concept the classical dichotomies in the interpretation of technics.

The hammer in the tool box has no purpose and may be interpreted as value neutral (although most of the technical tools have their own particular purpose, which is more, the more specialised they are and still have only less application possibilities). The hammer, which is used by a carpenter to construct a roof truss exists in a particular social use-context. The apparently value neutral equipment has now a purpose, which can be assessed. It exists in a different use-context and acquires a different significance if it is used as an instrument for committing murder. It is not an instrument as such, which explains a purpose or an aim as implied by the traditional theories of technics, instead rather definite applications, which qualifies more as an artifact. These can be related to different levels of communicative interaction forms, which make in a specific form the living together of humans possible. However, technical artifacts are completely value neutral as technical equipments, since they are created for particular applications and are used accordingly. The technical artifact achieves its significance in the technical praxis. This applies for invention as well as application.

A hermeneutic interpretation of the technical praxis links Edmund Husserl's theory of life-world as world of obvious evidences, on which every theorisation is based, with Heidegger's concept of mundaneness or every-day-life (*Alltäglichkeit*). Technical praxis in this sense is not at all self-evident, instead it is enforced by contingency. Technical daily activities help to come to terms with contingencies, achieve use satisfaction and organisation of the survival and is characterised by technical knowledge of handling, tradition, occasionally by inventions and innovations as well as by success and failure. Technical activities in the daily world, technicisation of daily world, technicisation of science and the technologisation of technics, science and daily world all lead to different types of technical uses and to an emergence of these types in a non-linear "logic of development" (paths of technical development). The mutual effects of technical uses on the daily world, handicraft and trade, later industry and automatised production, technical sciences and technology, technical empirical research as well as society, culture, politics and nature all lead to a complexity, which cannot be comprehended completely by a theory. Different restraints are necessary on this ground (Irrgang 2002a).

Conflicts of interpretation, which can as much as possible be interpretatively, argumentatively and discursively explained, do not originate least on this ground. Hermeneutics of technical-instrumental action links a humanistic understanding of cultural embeddedness, natural scientific-technical explanation of use-contexts, empirical and social scientific model formation and methodically reflects the technical philosophical reflections on the significance and purpose of technical images (and their evaluation) in their specific social ways of use. Hermeneutics is indeed

traditionally a methodology of humanities. But it has to be made fruitful for a science of action of instrumental-experimental and technical reasoning. The reflection on the methodology of technical sciences is one of the prerequisites of a philosophy of interpretation of technical action. We must learn to interpret technics productively. The moralising of technics or at least certain technics leads us aloof and would fail us in the task of evaluation of technics and the appraisal of its impacts. Technics has become a dominant cultural factor in our civilisation. Man may regret the fact that at least in industrial nations he cannot escape the domination of our lives by technology. Hence we need a philosophical response to the challenge of contemporary technics. The very first prerequisite for that is an adequate understanding of technics, technology and technoscience. This does not mean that we must learn to understand thoroughly the ways of its functioning. This is the task of engineers and technical sciences. Instead, the philosophy and the new hermeneutics of technics aim to highlight the significance of technics in its use and bring to light the sense and nonsense of it. The right guidance about its right handling and if need be, also its disposal should be placed next to the hermeneutics explaining the significant ways of functioning and principles of effects of technics. The discourse in the circle of experts can only have the preparative, or rather structuring character. The power of public opinion must be used in the best possible way for the interpretation of technics.

The understanding of the daily language as the metalanguage is the first approach towards a hermeneutics of technics. To understand a technical artifact means to know under which circumstances it can be used (and what consequences it can have). To understand a technology is to know under which conditions its process achieves its aims (and what consequences it can have). Hermeneutics of technics works on a clear interpretative speech on technics and its use. The hermeneutics of technical praxis is not itself a technical praxis but rather its linguistic penetration, reflection and elucidation under an operative-theoretical consideration. It means further that the motivation, situation, the design, the structure of the object and the consequences of operation of technics and technology respectively are explained here. The technical construction is not at all a self-objective (other than the playful-experimental handling of technical artifacts in Hellenism and other forms). The playful dealing with technics also has mostly its own objective, vaguely a religious, artistic or an entertainment-oriented one. Hermeneutics of technics is hence preferably the analysis of goal or meaning. But it should not also do away with the analysis of its consequences.

Hermeneutics of technics is moreover a methodologically verified and reflected introduction of an academic language of the hermeneutics of technics, which is obviously built on the foundation of an everyday language of technics and society. Its main tasks consists of re-construction of genesis, ways of functioning and the impacts of technics and technology respectively in working out its aims and also accordingly the meaning of ways of application of technics or technology and its argumentative evaluation with respect to its acceptability. Hermeneutics of technics is a search for an adequate language on technics. It must include explicit and implicit knowledge. It deals with the modelling of technics, the technical praxis and

the competences that are its basis as well as the leading paradigms. The introduction of a terminology can be explained from the perspective of its factual and potential use as well as from that of its ways of functioning. With regard to the cultures of innovation, it is a matter of interplay of changes in use and design between the manufacturer and the user with a view to the formulation and development of paradigms. The question: what is the purpose of this technical artefact or this technical process is a prominent one in the methodological introduction of technical-hermeneutic formulation of questions and problems. It is about the conditions of possibilities of uses of technics, its success and failure. These conditions are the embedding factors. The analysis of these is central to the hermeneutics of technics.

This task is the most pressing one. We have been experiencing the digitisation of the technologised daily world for a few decades. The experience of the upheavals that accompany it leads to loss of tradition and change in values. Philosophy acquires new significance of life in the face of the lack of orientation in the technicised daily world. It is a matter of public philosophising outside the academic walls. Philosophy has to recognise the inevitability of technicising of the daily world and will lead to other forms of organisation of philosophy. Philosophy should take into account modern technologisation and should not develop a philosophy of technics in the sense of a discipline (Zimmerli 1997b, 9). In all, technics and science should be understood as culture. The hybrid of technics and science developed in the second modernisation has brought about a second dialectics of enlightenment (Zimmerli 1997b, 13). The most important characteristic of this second modernisation is the microelectronic revolution and its complete penetration of our world. It is clear here, that the development of technics cannot be described solely as a logic of development of technics in itself, instead it should be seen in the social and cultural context.

Technics is more than the entirety of technical artefacts. System concepts in technics can be described by the Heideggerian expression “Gestell” (framework). “Gestell” is the direct translation of the system-technics. Technics as system applies to every technics, not just to modern technics. The earlier technics can certainly be understood as an accident in the sense of an accidental success of technical operations. This technics exists also among the higher animal species. Higher technics can certainly be viewed as regulated technics. It is a technics, in which the sources of disturbances are sealed off in the sense of cybernetics. Safeguarding means to guarantee the preservation of functions. To that extent system-technics is safe. In the epochs it is a matter of accidental development of resources, energy sources and material. In the second phase of the development of technics, experiments are discovered and they become the central point of a new understanding of technics. There is a structural analogy between experimental knowledge gaining and technical invention. The central concept today is the expansion of stock rather than its protection. This leads to the hybridisation of man in the sense of man-machine interface and new forms of insecurity. The cultural pessimistic interpretation amounts to the statement: the modern technics has outstripped its subject (Poser 2008, 112–129). The decisive problem in the hyper modern technics for me certainly is the structuring of the knowledge of operation under the changed conditions of a new

man-machine interaction. The user preferences should in any case be taken into account.

The idea, that science can all solve all problems started to fail in the beginning of the 20th century. The quantum theory, Goedel's theory and Kuhn's theory were major milestones in this account. It became clearer, that there is a lack of exact understanding of scientific aspects. Science and technology had to be understood better on account of this. A new sociology of expertise was developed. One of the models in this connection was the linguistic competence. Apart from that commonsense or daily understanding was also taken into account. It deals with the claim, that the normal crowd is more intelligent and wise when it comes to mundane problems than the experts in many technical fields. It is hence necessary to analysis the expertise and define different types of experts, for example to distinguish technical experts from meta expertise. The unhealthy monopoly on scientific and technical judgment had also to be done away with. It is so to say not a problem of the methodology, instead that of the consensus of experts. In this respect, the critic of science and technology is linked to the critic of scientism and points to its dissociation from mundane analysis (Collins, Evans 2007, 13–40). Intelligence is a bodily affair, which requires altogether the social embedment of corporeality (Collins, Evans 2007, 78f). Different levels of trusts and criteria of separation between the individual levels have to be distinguished from each other (Collins, Evans 2007, 114).