Communicating with Technical and Scientific Artifacts between Hermeneutics and Sociology of Science[1]

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Abstract

In this article an attempt is discussed to combine a traditional concept from philosophical hermeneutics with ideas from the sociology of science. The main aim is to describe a way of communicating with technical and scientific artifacts. Thoughts from the hermeneutic concept of the German philosopher Hans Georg Gadamer (1900-2002) will be combined with ideas of the French sociologist Bruno Latour (1947-2022) which he developed in his texts on the sociology of science and technology. Before this approach is developed, the embedding and differentiation from previous hermeneutic concepts is discussed. Especially the concept of material hermeneutics developed by Ihde and Verbeek is outlined in order to contrast the new approach. – The first task of the article's main chapter is to show the similarities between the two concepts of Gadamer and Latour, which at first sight seem very different. The second task is to use these concepts for a better description of the interaction or communication between human beings and technical or scientific objects. An approach is shown and discussed that can help to analyse the process of creation and the roles of entities generated in the course of performing science and technology, which – released into the world – become independent entities in their own right.

Keywords: Hermeneutics; Sociology of science; Philosophy of science and technology; Artifact theory; Dilthey; Gadamer; Latour

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[1] The text is based on a chapter from Würtenberger (2022, p. 291-310), translated and reframed with the kind permission of the publisher.

Общение с техническими и научными артефактами между герменевтикой и социологией науки[2]

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Аннотация
В данной статье обсуждается попытка объединить традиционную концепцию философской герменевтики с идеями социологии науки. Основная цель – описать способ связи с техническими и научными артефактами. Идеи герменевтической концепции немецкого философа Ганса Георга Гадамера (1900-2002) будут сочетаться с идеями французского социолога Брюно Латура (1947-2022), которые он развивал в своих текстах по социологии науки и техники. Прежде чем разрабатывать этот подход, обсуждается встраивание и дифференциация относительно предыдущих герменевтических концепций. Специально в противовес новому подходу изложена концепция материальной герменевтики, разработанная Айде и Вербиком. Первая задача основной части статьи – показать сходство двух концепций Гадамера и Латура, которые на первый взгляд кажутся очень разными. Вторая задача – использовать эти концепции для лучшего описания взаимодействия или общения между людьми и техническими или научными объектами. Показан и обсужден подход, который может помочь проанализировать процесс создания и роли сущностей, произведенных в ходе научной и технической деятельности, которые, выпущенные в мир, становятся самостоятельными независимыми сущностями.

Ключевые слова: Герменевтика; Социология науки; Философия науки и техники; Теория артефактов; Дильтей; Гадамер; Латур

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[2] Текст представляет собой переведенной с немецкого языка и переработанный отрывок главы из книги Würtenberger (2022, p. 291-310), с любезного разрешения издателя.

INTRODUCTION

In order to discuss the ontological determination of technical and scientific artifacts or, more generally, the ontological relationship between human and non-human entities, I would like to confront Bruno Latour's concepts with Hans-Georg Gadamer's conception of hermeneutics. The question behind this is to what extent Gadamer's hermeneutics can be re-purposed in a philosophical context in order to apply it to the process of understanding and communication between human and non-human entities. The point, then, is to harness Latour's radical deconstructivism. It attempts to transcend the dichotomy between human and non-human beings, which can be descriptively illuminating, and uses it methodologically in conjunction with constructive tools.

Gadamer locates hermeneutics itself philosophically or ontologically as part of the human life process. Gadamer develops his concept of hermeneutics on the basis of Heidegger's philosophy. Thus, historicity plays a major role in Gadamer's work – in reference to Heidegger's historical showing of the events of being. This constitutes a major parallel to Latour, who in *Pandora′s Hope* thematises the temporally limited life of research objects that have their validity within their discourses over specific historical periods (Latour, 1999, p. 145-173).

EMBEDDING IN THE DISCOURSES

Before I explain my thoughts on this in more detail, I would first like to distinguish this approach from a position that makes a similar claim. This is the concept of *material hermeneutics* (Ihde, 2005) proposed by the American philosopher of technology Don Ihde, first presented in *Expanding Hermeneutics* (Ihde, 1998), and subsequently also discussed by Peter-Paul Verbeek. Ihde's aim is to transcend European phenomenological concepts, such as those of Husserl, Heidegger and Merleau-Ponty, post-phenomenologically (Verbeeck, 2003, p. 91). In *Expanding Hermeneutics*, he attempts to transfer this to the hermeneutic method (Ihde, 1998, p. 139-150). Ihde describes philosophy of technology itself as a hermeneutic matter. His starting point is Wilhelm Dilthey's interpretation of hermeneutics, which I will therefore briefly outline before discussing Ihde's concept.

 One of the fundamental texts in the debate on hermeneutics in the late 19th and early 20th centuries, alongside Schleiermacher's works, is Wilhelm Dilthey's text *Die Entstehung der Hermeneutik* (*The Origin of Hermeneutics*), published in 1900 (Dilthey, 1900/1973). Dilthey first asks himself how scientific knowledge takes place in relation to individuals and explains this through individuation. Action generally presupposes the understanding of other people. The linguistic, humanities and historical sciences are based on the comprehension of the singular and its objectification.

The object of knowledge in the humanities is the immediate inner reality. The object of knowledge in the natural sciences, on the other hand, is the reflex of an actuality in a consciousness. The difficulty with the process of cognition in the humanities is that I cannot become aware of my own individuation from within myself. Only in comparison with the other, through the perception of differences, do I become aware of my own self. Other existence is conveyed in sensory facts such as gestures, sounds and actions. We

reproduce these within ourselves and bring the other individuality to objective recognition (Dilthey, 1900/1973, p. 56).

Dilthey calls this process, in which inner things are recognized from outer signs, understanding. Understanding is a process in which a mental constitution is recognized from sensually given signs, e.g., "I no longer understand myself." This is said when one's own actions and decisions seem as if they were made or taken by someone else. Understanding is directed towards all products of the human mind: children's babbling, works of art, music, literature, constitutional texts, etc. (Dilthey, 1900/1973, p. 57). These all require interpretation in order to be understood. According to Dilthey, interpretation takes place as follows: Through the most strained attention, we try to understand the other and to objectify them again and again. This interpretation is always dependent on language. "Therefore, the art of understanding has its center in the interpretation of the remnants of human existence contained in writing" (p. 58, translation S.W.).[3] For Dilthey, this art of interpretation has developed slowly over time, similar to experimentation in the natural sciences. The art of interpretation is now itself scrutinized, and rules for interpretation are fixed. This gave rise to hermeneutic science. For Dilthey (1900/1973) it is the "Kunstlehre der Auslegung von Schriftdenkmalen" (rules of the art of interpreting monuments of writing) (p. 59).

For Dilthey, language is required as a means of enforcement, even if communication with the other is not limited to language alone but can also take place via other means of expression or objects. Dilthey's view of the hermeneutic process of understanding is still very ego-centered. The individual recognizes him- or herself on the basis of the formation of differences and analogies in the other. Dilthey's description of the hermeneutic process remains in the image of the hermeneutic circle. This cyclical structure of hermeneutic understanding was first described as a circle by the classical philologist Friedrich Ast (1808, p. 109-110).

Individual signs that I perceive in others help me to better understand myself by comparing them with the context of my own experience and to grasp the whole by projecting them back. The repetition of this process of understanding then leads to the cyclical structure. Another important point in Dilthey's (1900/1973) work is that he contrasts scientific research practice with hermeneutics as the scientific method of the humanities (p. 62-63).

This is where Ihde comes in, wanting to overcome the "diltheyan divide" by extending the hermeneutic method to the natural and technical sciences. The hermeneutic approach should no longer be limited to texts, but should also be extended to dealing with artifacts, whereby, as the name suggests, he limits himself to material artifacts with *material hermeneutics*. He says: "a material hermeneutics is a hermeneutics which 'gives things voices where there had been silence, and brings to sight that which was invisible'" (Ihde, 2009, p. 80). He also speaks of *visual* or *perceptual hermeneutics*. By way of the instrumental possibilities of the natural sciences, perception should be directed towards texts, but also transcend or question them.

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[3] „Daher hat die Kunst des Verstehens ihren Mittelpunkt in der Auslegung oder Interpretation der in der Schrift enthaltenen Reste menschlichen Daseins."

For him, scientific hermeneutics is material in two ways, firstly because material entities are examined, and secondly because the instruments used are of a material nature. In his opinion, instruments and technologies generally serve to provide hermeneutic access and an understanding of things. Ultimately, Ihde is not only interested in exposing scientific methods as hermeneutic, but also in applying the newly acquired diversity of methods to the humanities. He exemplifies this with examples from the historical sciences and archaeology in which scientific and historical texts are critically scrutinized and refuted through the scientific examination of archaeological artifacts (Ihde, 2005). However, Ihde is not only concerned with linking methods, but generally with an ontological reinterpretation of the natural sciences in a phenomenological manner. In this he his following Heidegger and Merleau-Ponty. This becomes particularly clear in the reference to the expansion of human perceptual possibilities through instruments. Natural sciences serve people to specify their being-in-the-world or their relationship to the world in an analytical way (Verbeek, 2003, p. 91; Verbeek, 2005, p. 121-145). "Technologies are not thought to estrange people from themselves and their world anymore, but to mediate their existence and experiences. These new directions in the philosophy of technology can inform a new phenomenological approach of science [...]" (Verbeek, 2003, p. 91). This *hermeneutic turn towards things* does not only refer to the interaction between the researcher and the scientific object, but the hermeneutic interaction with artifacts takes place in all social contexts (Verbeek, 2003, p. 94).

Here I would like to make two key points. Ihde and subsequently Verbeek (2003; 2005) deal exclusively with material artifacts, so that their concept of hermeneutics cannot be sufficient for my purposes. However, the possibility of allowing hermeneutic discussion not only on the basis of a linguistic or textual tradition should be kept in mind with regard to the variety of possible interactions between human and non-human beings in Latour's sense, or with regard to the interactions between visible and invisible entities. Verbeek summarizes Ihde's ideas in a trend-setting way when he writes: "Human interpretations of reality are not to be understood in terms of textual and linguistic structures only, but also as mediated by artifacts. In the same vein as Latour, who claims that the social sciences have too exclusively focused on humans and forgot about the nonhumans, it can be said that hermeneutics has only been using half its capacity, occupying itself only with texts and neglecting things" (Verbeek, 2003, p. 94).

GADAMER AND LATOUR

Since I am primarily concerned with the ontological determination of artifacts and the ontological relationship between human and non-human entities in general, before I confront Latour's thoughts with the hermeneutic tradition, I would like to address its reception and transformation by Hans-Georg Gadamer. Although Gadamer falls short of the diversity of methods proposed by Ihde, he locates hermeneutics itself philosophically and ontologically even more radically as part of the human life process. Although Ihde also ties in with Heidegger's thinking, he overlooks the fact that in his late philosophy – explicitly in '*die Kehre*' – the overcoming of Dilthey's divide is already inherently accomplished. According to Heidegger, although people have no influence on when

'*Sein*' (being) shows itself, *Dasein* – literally "being-there"/"there-being," rendered as "Being-in-the-world" – still requires *Sein* in order to show itself or become evident. Gadamer, on the other hand, is fully aware of this when he develops his concept of hermeneutics on the basis of Heidegger's philosophy, even if this supposedly remains in the context of the humanities due to the great focus on the importance of language. Thus, in Gadamer's work – following Heidegger's historical visualization of events of being – historicity plays a major role. This represents a major parallel to Latour (1999) who in *Pandora's Hope* thematizes the temporally limited lifespan of research objects that have their validity within their discourses over certain historical periods (p. 145-173).

Gadamer generally admits – like Dilthey or Ihde – that hermeneutic engagement takes place not only through texts, but also through art or the like. In doing so, he transcends Dilthey's concept, which emphasizes empathy with the other for individual individuation. He describes hermeneutic understanding as constituting one's own being-in-the-world or the fundamental process of living. According to Gadamer, understanding proceeds by confronting the interlocutor with one's own experiences and preconceptions, but with an open attitude that allows one's own opinion to be revised in the confrontation with the other. Understanding is thus linked to the context of application. This is constituted by an individual question with which the other is approached. The question must have an open structure that is nevertheless guiding. This presupposes the knowledge of one's own non-knowledge. The meaning of the answer, which only makes sense in relation to the question, does not result from the author's original intention, but from the reader's respective thematic confrontation. Understanding thus always takes place through understanding, and for Gadamer this is always based on language. For him, language is the basic preference of our being-in-the-world and thus stands in the middle between the self and the world. The pre-conception revised by the process of understanding leads to a different understanding on a higher level (Gadamer, 2010, p. 387-409). This Gadamerian conception of hermeneutics has been discussed not only as circular, but also as spiral.

Gadamer tries to symmetrize and dynamize the hermeneutic discussion between two partners and to think of hermeneutic development as a process in the history of the spirit as a whole. In the hermeneutic process, the interlocutors, or rather the authors and interpreters, come closer to each other in their opinions on a higher level, until finally a fusion of horizons can take place. The prerequisite for understanding is a common language horizon or living in one language. The reader or translator of a text can never fully empathise with the feelings of the writer. This is why understanding ends in interpretation and is not a mere comprehension of the other. Hermeneutic text interpretation is similar to a conversation between two interlocutors. Author and interpreter find a common language by giving meaning to the text as they put it into words. This makes communication between two partners possible, even if only one of them is really speaking. Understanding and interpreting are one and the same in the medium of the interpreter's language (Poser, 2009, p. 220-225).

For Gadamer, language is so important precisely because it makes communication across time possible. For him, writing is not the only means of transmission, but it is the preferred one. Writing always establishes simultaneity in the present and thus creates the

coexistence of the past and the present. Written tradition is not part of a past world, but rises above it into the sphere of meaning. What is recorded in writing exists in this sphere of meaning independently of the original author and his or her addressee. Anyone who knows how to read can now take part in it. What is fixed in this way has freed itself from contingency and positively freed itself for a new reference. However, one's own horizon of understanding is prior and cannot be transcended. Historians who try to place themselves in the past and free themself from their own context are doomed to failure, since they cannot problematize the preconditions for their understanding at all. Each interpretation thus belongs to its respective hermeneutic situation. Even non-linguistic interpretation, such as the interpretation of and in works of art, presupposes linguisticity. For Gadamer, words are not tools as interpreted by the philosophy of language, but refer to the interweaving of all understanding through conceptuality. Understanding and language are not mere facts, but encompass everything that can ever become an object of thought. Following Heidegger, the ontological quality of the historical is also important to Gadamer. Meaning is detached from the individual in the linguistic artifact. The fact that meaning can be reconstructed later is conditioned on the fact that the interpreter is per se part of the same intellectual-historical tradition through his or her linguistic realisation of the world (Gadamer, 2010, pp. 258-269 and pp. 387-409).

Bruno Latour comes to similar conclusions in a different way. He pleads for the recognition that non-human beings, just like humans, have a temporal horizon or a time-limited life span. Even if it seems to us, for example, that scientific discoveries have an existence in nature prior to discovery by science, it must be recognised on closer inspection that they each exist only within their relations to the scientific community or the social acceptance gained through the work of the research community. Non-human entities (including objects of research) exist because of ontological transformations that humans perform on them by releasing them into their social contexts through the assignment of determinations which render them actants of their own. If scientific views or habits change, they become obsolete and become part of history (Latour, 1999, p. 153-159).

The transformation or justification of scientific results usually takes place in several steps. For example, the direct results are first transformed by translating them into illustrations, graphs or measurement curves, by preparing obtained sample material, by schematising, by statistics or by comparing them with already existing models or findings. Latour (1999) refers to these often sequential steps of mapping as circulating references (p. 150).

Latour, like Gadamer, also turns against the classical division by philosophers of language between the material world and language as two separate ensembles between which there is a barely bridgeable gulf that must be overcome by correspondences. He replaces this dichotomous image with a mediating chain of many small translation steps. The mediation takes place from matter to form, that means to thought structures of the human mind, whereby the chain does not end on either side. Complete correspondence is thus never achieved, but only asymptotically approximated. It is important that these circulating references can be reversibly traversed from transformation step to transformation step, so that reconstruction always remains possible. From one partial

reference to the next, a little material information is always replaced by formal information or linguistic analogy. However, these steps remain retranslatable in both directions (Latour, 1999, p. 91-92).

IDENTITY AND ARTICULATION

It would be worth discussing to what extent such a chain of reference can be constructed and defended even without a truly factual starting point in the matter. Perhaps, with regard to research subjects, it is sufficient if their potentiality is first conceived theoretically in order to bring them to real life through a circulating chain of artifactual manifestations, such as scientific research approaches and publications which release them into society as independent entities. In society, other defence mechanisms, such as political legitimation or social acceptance, feed their ontologies.

But back to Latour's model once again. It is only through these partial fixations gained through the circulating reference steps that the dynamic artifact (for example microorganism, chemical compound, physical effect, living being) becomes nameable as something static. For Latour, the transformations obtained through the mappings are translation aids into existing, human and social thought patterns that serve to linguistically defend or individualise the artifacts into entities in their own right. What is important here is that for Latour, the transformation of artifacts by the scientific community or other social discourses always changes all the actors involved. Latour does not see this as a mere process of transformation or translation, but rather as a gain in knowledge. He therefore opposes the classical scientific interpretation of experiments, according to which they merely transform something naturally existing into something artificially determined. For Latour actors change or grow through research. Researchers work towards their research object and vice versa. Both change and reinvent themselves in the process (Latour, 1999, p. 122-127).

As a parallel to Gadamer, it should be noted that Latour sees the individualisation of non-human beings as essentially taking place through the linguistic discourse of human beings, whereby the latter are dependent on the discursive confrontation with non-human artifacts. Thus, for Latour, it is probably not a good idea to parallelize on an equal footing written documentation and experimental findings that are obtained through instrumental methods. Rather, the transformation processes described by Latour can be integrated into Gadamer's model of understanding by adding his notion of symmetry. It is true that Gadamer's approach refers primarily to interpersonal communication through language, or at most he has in mind the communication of one person with another expression through a textual artifact. Gadamer does not transfer this to other, instrumental forms of communication and artifact types. However, as has already been mentioned, he describes the hermeneutic discussion between interlocutors or between author and interpreter as one characterised by an increase in knowledge.

This identity of thinking, language, and world, as it is shown in the ontologies of Gadamer and Heidegger, is not completely overcome by Latour, at least in his model of circulating references, since this approach retains the notion of approximation. Nevertheless, Latour overcomes the differences between thinking, language and world,

but without wanting to replace them with a thinking of identity, like that of Gadamer and Heidegger. Latour's model can be read in analogy to Gadamer's hermeneutic spiral movement if the model of circulating reference is understood as the knowledge-expanding engagement of researchers with their objects of research, step by step producing either illuminating scientific texts or better graphics or models. Latour, however, does not only allow for non-linguistic forms of expression, but describes precisely the hermeneutic engagement with non-human entities. In the end, both images – circulating reference as well as hermeneutic spiral – serve only to analyse the hermeneutic discourse between two partners, whereby two new discourse partners can always enter into dialogue on the basis of their linguistically or materially fixed cognitive results.

In order to describe the confrontation and hermeneutic possibilities of an encounter in a human and non-human network of references, Latour proposes his model of propositions. For him, propositions are neither things nor statements, but actants. Latour describes these as "occasions given to different entities to enter into contact. These occasions for interaction allow the entities to modify their definitions over the course of an event [...]" (Latour, 1999, p. 141). It could also be said that propositions are possibilities of action or optional roles that an entity can take in relation to others in the network. Propositions are simultaneously possibilities and events that transform the ontologies of entities. They thus characterise the openness or processual character of seemingly closed entities and thus refer to an invisible space of possibility on the basis of which we perceive and encounter each other as seemingly limited beings. Therefore Latour goes on to write: "Propositions do not have the fixed boundaries of objects. They are surprising events in the histories of other entities" (p. 143). They are constituted by small differences among themselves – differences that are no longer of the order of magnitude of the difference between language and world in the classical picture, but necessary shifts or ontological differences between partners communicating with each other in the network.

For Latour, propositions also interact via language. However, he intends to overcome the image of language bridging the gap between matter and form through rarely sufficient correspondences. Latour therefore views propositions as interacting through articulation. All articulation is based in the linguistic, but transcends it, since on the one hand it includes other forms of expression, and on the other hand, the ability to articulate is not a purely human quality (Latour, 1999, p. 139-141). He thus sums up: "Instead of being of a human mind surrounded by mute things, articulation becomes a very common property of propositions, in which many kinds of entities can participate. Although the word is used in linguistics, articulation is in no way limited to language and may be applied not only to words but also to gestures, papers, settings, instruments, sites, trials" (p. 142).

Similarly, Alfred Nordmann argues for reading the connection between technology and language not only in terms of the philosophy of technology, but also in multilinguistic terms. In this way, the two spheres of linguistic and technical dealings with the world, which are otherwise always kept separate, could be connected with each other. He sees technology as the way we deal with things or with the material world itself. This creates a structural relationship to language, as this is the way we deal with other people. He

speaks of a grammar of things that is needed within technology to make new technical developments and to make assessments about technology. However, to discuss technology as a language or containing many different languages also means that we live and work in a multilinguistic environment within the technologised world (Nordmann, 2020, p. 86-89).

CONCLUSION

I will now conclude by linking this multilinguistic idea of society or Latour's assumption that articulation is not limited to language with Gadamer's (2010) sentence: "Being that can be understood is language" (p. 478, translation S. W.). This sentence implies that there can also be being that cannot be understood, just as there can be language that does not tend towards being. However, the sentence points out that something can be constituted as being through the comprehension-based performance of language. In relation to technical artifacts and scientific research objects, this means that they, just like a non-humanly produced entity, come into an equal being through the creative character of the hermeneutic process that takes place not only between scientists, but also between them and their research technologies.

Thus, it could be asked whether the philosophical mediation between language and world which underlies Heidegger's and finally Gadamer's conceptions, can be used as a basis for a multilinguistic network communication model that goes beyond Gadamer's hermeneutic process between two partners. Here Latour's idea of symmetrisation comes in. It refers to existing entities extended to potential, historically possible technical and scientific entities that exist in the background of being. Symmetry is thus extended to the dualism between visible and invisible entities. Thus, Gadamer's (2010), statement "Being that can be understood is language" (p. 478, translation S. W.) also receives a further meaning when, in the sense of Latour's concept of articulation, being is understood as something that actively addresses me in order to be understood, and in order to become an independently existing entity through me and my language.

Such an approach can help us analyse the process of creation and the roles of entities generated in the course of performing science and technology. By engaging with the created entities, understanding emerges from their histories and the tasks for which they were created by the spiritual generative power of humans and with which they were released into the world – in which they now take on a life of their own as independent agents.

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