Method and Fieldwork in a Hermeneutical Perspective

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The background of the present text is my ongoing work on a doctoral dissertation at Åbo Akademi, a dissertation that is jointly in ethnology and computer engineering. My academic background is similarly partly ethnology and partly computer science. My professional experience as a programmer, along with my interest in ethnology, prompted me to begin an ethnological study of computer programming.

This text is a reflection on the fieldwork I have done to collect data for my dissertation. The fieldwork consists of interviews with and observations of computer programmers collected during the spring and autumn of 2011. I discuss my method along with an example of an ethnological historical study and I put it all in perspective by arguing for a hermeneutical understanding of scientific method.

The purpose of this text is to show how hermeneutics can help in understanding what happens during the scientific process. Hermeneutics is the classical study of what requisites there are to understanding. It has been particularly developed within Bible Studies – biblical exegesis – but has also been applied to other fields such as law and, increasingly since the 19th century, to texts in general. Ethnology is the study of folk culture and as a discipline has always been informed and inspired by other traditions, not least by the hermeneutical tradition and by anthropology.

The hermeneutical influence can be found in the works of ethnological figures such as Troels-Lund and H.F. Feilberg in Denmark, and Helmer Tegengren in Finland. The anthropological influence in ethnology can be felt especially in the discussions on fieldwork, and is connected with authors such as, for example, Bronislaw Malinowski, Franz Boas and Clifford Geertz. The discussion of the influence of anthropology on fieldwork will in this text be limited to the work of Bruno Latour and Steve Woolgar.

Science as Persuasion

Science is, at its heart, a persuasive activity. Any given research result will at some point be presented either in written form, as a book, article or report, or in oral form, as a talk at a conference or even as a remark during an informal chat between colleagues. The purpose of presenting scientific results is of course to convince the audience of the scientific truth of said result. The ideal of scientific practice is that through free and frank discussion and exchange of arguments between scholars, scientific truth will eventually prevail. The real test of scientific validity lies not in citation count but in the ability to convince educated and informed colleagues of the truth of the matter on the basis of the given scientific evidence. Since argument is the form of all persuasion, this means that scientific activity is a form of argumentative activity. Certainly, a scientific insight may be ever so true, but, if it cannot be presented convincingly, that is, if it cannot be argued, then it will have no impact on science.

We might ask of ourselves now whether argumentation is really an essential part of the scientific process as such. After all, it is possible to imagine that the scientist first reaches his scientific conclusions without giving any thought at all to how they are to be presented and only later constructs the arguments with which to present them. According to this way of thinking, argumentation is added to scientific results almost as an afterthought – as something that is certainly necessary to the spread of scientific knowledge but which is not an intimate

part of how the scientist comes to the knowledge. Argumentation is seen as something external to science. This view, however, is not defendable in light of 20th century philosophical knowledge of argumentation and of science.

Chaïm Perelman and Lucie Olbrechts-Tyteca published in 1958 their *Traité de l'argumentation*, which was the result of ten years of intensive studies of argumentation. In their work, they present what is called "the new rhetorics", a modern theory of argumentation that rehabilitates Aristotle's classical thinking on rhetoric and connected it with present day thinking on argumentation. They compare the way a person addresses an audience with the way he considers a matter in the privacy of his own mind:

> L'individualisme des auteurs qui accordent une nette prééminence à la façon de conduire nos propres pensées et la considèrent comme seule digne de l'intérêt du philosophe – le discours adressé à autrui n'étant qu'apparance et tromperie – a été pour beaucoup dans le discrédit non seulement de la rhétorique, mais, en général, de toute théorie de l'argumentation. Il nous semble, par contre, qu'il y a tout intérêt à considérer la délibération intime comme une espèce particulière d'argumentation. (Perelman & Olbrechts-Tyteca 1958: §9, p. 54.)

That is to say that to consider a person's deliberation with himself and his private convictions to be the primary object of philosophical and scientific thought, and to consider that arguments directed to an audience are but an afterthought, is both wrong and harmful to the theory of argumentation. Instead, private convictions are a special case of argumentation in general. This view is clearly at odds with the idea that scientific discovery should be independent of subsequent presentation. Accordingly:

> Aussi, de notre point de vue, c'est l'analyse de l'argumentation adressée à autrui qui nous fera comprendre mieux la délibération avec soi-même, et non l'inverse.
> (Perelman & Olbrechts-Tyteca 1958: §9, p. 54.)

That is, the analysis of arguments directed to others informs the study of private conviction and not the other way around. Perelman and Olbrechts-Tyteca point out that this way of understanding argumentation allows an explanation of how a person can be convinced of something and yet not be able to express his conviction in a way that can persuade others. This is because the argumentation that suffices to convince himself can be based on arguments that are valid to him alone. But, such arguments, though they may be true and valid as far as the individual is concerned, are not scientific arguments, since they are not held by the general scientific community to be valid. The practice of science requires the uncovering of arguments that are more generally accepted than personal conviction or opinion. We see thus that, in the light of argumentation theory, we cannot completely separate scientific discovery from the way it is to be presented to a scholarly audience.

Such is the judgment of argumentation theory on the matter at hand. We turn now to philosophical thought on the subject. Hans-Georg Gadamer published in 1960 his magnum opus *Wahrheit und Methode* in which he practically founded the field of philosophical hermeneutics and summed up the preceding centuries' thoughts on the essence of scientific interpretation and scientific understanding. Gadamer points out that understanding is inescapably linked to application. Application is not something that comes after understanding, but is given in advance and determines the whole of understanding. An interpreter of history seeks to apply his interpretation, and the use of it is not something that comes strictly after a general understanding of the text:

> Auch wir hatten uns davon überzeugt, daß die Anwendung nicht ein nachträglicher und gelegentlicher Teil des Verstehens-phänomens ist, sondern es von vornherein und im ganzen mitbestimmt. … Der Interpret, der es mit einer Überlieferung zu tun hat, sucht sich dieselbe zu applizieren. Aber auch hier heißt das nicht, daß der überlieferte Text für ihn als ein Allgemeines gegeben und verstanden und danach erst für besondere Anwendung in Gebrauch genommen würde. (Gadamer 1960: II.II.2.b, p. 307.)

Gadamer gives an example of what this means in the practice of judicial hermeneutics. In judicial hermeneutics, the application of understanding is the action of passing judgment. In order to understand the original intent of a law, the interpreter must understand how the law is used for passing judgment. This means that he must undergo the same process of mental reasoning, of thinking through the consequences of the law, as the judge who is actually passing judgment according to the law. On the other hand, a judge passing judgment in the present situation must understand the intent of the law. That means setting aside the matter at hand for a moment, in order to understand what the original circumstances were in which the law was to be used. Since circumstances always change over time, the letter of the law alone is not enough in passing just judgment. The concept of application of the law is what links the judge of the present with the lawgiver of the past. (Gadamer 1960: II.II.2.c.)

In law, the application of a text is obvious. Regarding history, it seems less immediate. In history, the essential application is to interpret texts and other sources in order to obtain a coherent and meaningful understanding of the past:

> Für den Historiker tritt jedoch der einzelne Text mit anderen Quellen und Zeugnissen zur Einheit des Überlieferungsganzen zusammen. Die Einheit dieses Ganzen der Überlieferung ist sein wahrer hermeneutische Gegenstand. (Gadamer 1960: II.II.2.c, p. 322.)

That is, for the historian, each single text that he studies joins with other texts and sources and forms a whole that expresses the understanding of our past. The unity of this whole is the true hermeneutical purpose of history.

What is of special interest to us in this is that, accordingly, scientific understanding must be understood in terms of scientific application. For a scholar, the immediate application of research is not the eventual practical usefulness of the results, but rather the necessity of persuading other scholars and, as we understand from the above, oneself. An example of this that should be familiar to many is what we experience when we teach a difficult subject for the first time. Even though we feel that we have mastered the subject ourselves, we find that the fullest understanding comes to us only when we try to teach it to others.

We have argued that, both from a communicative and a philosophical perspective, science is best understood as a persuasive activity. However, though Gadamer's thoughts apply to all understanding in general, he is first and foremost concerned with the phenomenon of understanding within *Geisteswissenschaft*, a term that can be somewhat imprecisely translated as 'the humanities', but one that really means something like 'the sciences concerned with free human thought'. Nevertheless, this does not mean that the persuasive aspect can somehow be avoided in certain fields of science.

The exact sciences are argumentative in exactly the same way as all other sciences. Indeed, Perelman and Olbrechts-Tyteca (1958: §6, p. 37f.) point out that there is no such thing as pure objectivity. This is not to say that objectivity does not exist. Rather, objectivity must always be understood in terms of a subject that regards the object. Without subject there is no object. It is because of this that application has such a central place in Gadamer's explanation of understanding, for it is precisely application that establishes the relationship between subject and object, in that the subject performs some action on the object in order to reach a goal. (Højrup 1995: 65–69.)

In 1979, Bruno Latour and Steve Woolgar published the book *Laboratory Life*, an anthropological study of how science is done in a neuroendocrinological laboratory based on two years of observation. Neuro-endocrinology as a field is at the very heart of exact sciences and the book has since become a modern classic in the field of science and technology studies. Latour and Woolgar show how science is indeed a highly rhetorical, persuasive activity. Facts and findings are constantly being argued for, questioned and recast in new formulations, with the scientists' credibility and rhetorical skills being important factors in the eventual acceptance or dismissal of their ideas. The rhetorical persuasion is so effective that in the end, the scientists are not even aware that they have been persuaded, but come to regard the accepted arguments as objective, immutable facts. (Latour & Woolgar 1979: 240.) As Latour and Woolgar show conclusively, not even in the exact sciences are the bare facts in themselves enough to make up a scientific finding.[1]

The Scientific Argument

As shown above, science is an argumentative activity. In other words, science is persuasion – though not 'mere' persuasion, but a special form of persuasion that is especially convincing. It is therefore of interest to examine what a scientific argument consists of in more detail. In the classical theory of rhetoric, Aristotle divides the means of demonstration that can be used in an argument into two classes: the non-technical and the technical, where 'technical' is to be understood as rhetorical.[2] (Aristotle: 1355b, A.II.2.) Non-technical means are here to be understood as the evidence that is given and available to the argument in the form of documents, witness explanations and the like. It is non-technical (not rhetorical) because it is not common to argumentation in general as such, but is particular to the matter being debated. Put another way, when we argue scientifically, we need both something to speak about, which is the scientific evidence, and a way of forming our speech. Scientific evidence is not the same thing as proof. Rather, evidence is the means of proof. A piece of evidence can be interpreted in different ways, yielding different conclusions.

The problem of obtaining the scientific evidence, the data, is the subject of much scientific method. Sometimes the evidence is more or less given, as in an archive of collected material that is just waiting to be analysed. However, in most cases there are some specific questions that we want to answer and our first problem is how to get any evidence at all. At first glance, it would seem that the situations are very different for historical and contemporary research. In historical research, the material available is that which is preserved. We can never hope to get more, short of an unexpected discovery of previously unknown sources. In contemporary research, on the other hand, our informants are still available; the life we are studying is unfurling around us. We can generate as much data as we want to.

A closer examination, however, reveals that this depiction is not entirely accurate. True, the past is the past and in that sense more historical evidence cannot be produced; it is limited to what has been preserved. However, the decision of how much of the preserved evidence should be included in a scientific argument is left to the scholar's discretion.

To take an example: When studying a Danish peasant doing construction works on his fields in the poor moorlands of Vestjylland in 1834, it is evidently useful to know something about which fields were considered of high quality at that time and in that area. (Gormsen 1982: 13.) Perhaps it would also be relevant to know about the general economic conditions in Vestjylland at the time. Perhaps in all of Denmark. Maybe it would be informative to know about the earlier history of farming techniques, to find out from where the peasant got his knowledge of construction works. The construction works were not particularly successful,

[1] Compare with the quotation from Gadamer in the end of the next section.

[2] Since Aristotle considers rhetorics to be a technique, *τέχνη*, which means something like an art or a craft – something that can be taught. (Aristotle: 1354a, A.I.2.)

so perhaps it would also be useful to have some knowledge of farming techniques in later times in order to interpret the lack of success – not to speak of comparing similar construction works in the area at the time. Also, the construction works were just a small aspect of the peasant's activities.

As we see, the limited availability of historical evidence is only apparent, since much more historical evidence has been preserved than a single person can possibly process in its entirety. The real limit on the availability of evidence is that the evidence does not always speak about the things that we want to know about. The peasant's diary speaks mostly of farming tasks, of construction works and money loans, when what we are really interested in is the farmer's perception of his existence, a classic ethnological subject. Any historical research involves a selection of the relevant historical evidence. This selection is a limitation that the historian imposes on herself in order to be able to make an interpretation; see for example Jill Bradley's discussion of how to select material for image research in this volume of *RMN Newsletter*. Thus, the fundamental limits on the availability of historical evidence is in essence a problem of interpretation rather than quantity.

Let us now examine the case of contemporary research. My current research involves conducting interviews by phone with engineers in other countries, transcribing those interviews and finally analysing what the engineers tell me. It is often quite difficult to make out what the engineers say over a bad phone connection and in a language that is foreign to both of us. Even if I can understand what they are saying, it does not always make sense to me. Of course, since the research is contemporary, I can always collect more evidence, either by talking to the engineers again or by finding some other engineers to ask. There is, though, a limit to how much evidence I can process – I cannot talk to every single engineer in the world. And even if I could, the problems of understanding the engineers are still there. If there is something I do not understand, I can ask the engineers again, but it is perfectly possible that I will still not understand the answer.

The essential problem of the availability of contemporary scientific evidence is, as in the case of historical research, one of interpretation. This is, of course, assuming that the people I am studying want to let me interview them in the first place. People have their reasons for wanting to talk to me or not, and that is a factor outside my control. The access to the field of study is a fundamental limitation in contemporary research. This is akin to historical research in that, for some reason or other, the people of the past chose to write some things down and not others, as in the diary mentioned above where the peasant chose to write about his work, not his emotions. That cannot be changed. This limitation evidently does not preclude contemporary studies of a field that is difficult to access or historical studies of a sparsely documented subject, but the available evidence will be more indirect and the task of interpretation accordingly more difficult.

This discussion of the availability of evidence reveals that it is of crucial importance when talking about scientific method to know what it is that we want to know something about – the research goal. We mentioned that the scientific argument has to have something to speak about and a way of saying it, and a final requirement is of course that there is something we want to say. This something, which is the research goal, is determining for the interpretation of evidence, and this is the reason that Gadamer devotes so much effort to the relationship between interpretation and application in *Wahrheit und Methode*. Gadamer puts it this way:

> Der Historiker verhält sich zu seinen Texten wie der Untersuchungsrichter beim Verhör von Zeugen. Indessen macht die bloße Feststellung von Tatsachen, die er etwa der Voreingenommenheit der Zeugen ablistet, noch nicht wirklich den Historiker, sondern erst das Verständnis der Bedeutung, die er in seinen Feststellungen findet.
> (Gadamer 1960: II.II.2.c, p. 321.)

That is, the historian's relationship to the historical document is like that of a judge to a witness being interrogated. The raw facts in themselves, stripped of the bias of the witness, are not interesting but for the understanding of meaning that the historian finds during the discovery of facts.

Examples of Method in Fieldwork

As argued above, availability of evidence and research goals are factors that are important in forming scientific method. I will now give some examples from my ongoing research of how scientific method is influenced by these factors and how it in turn influences them.

My research is concerned with the work practices of computer programmers. The goal is to present a characterization of programming work based on my observations and on an ethnological perspective on culture, and to compare this characterization with the programmers' own understanding of their work practice. The focus on work practice and its connection to cultural context makes my research comparable to studies such as *Arbetets flytande gränser* by Billy Ehn from 1981, in which Ehn presents the results of the seven months he spent as a factory worker in the medical industry. Gudrun Gormsen's 1982 study of the diary of a moorland peasant in the years 1829–1857 is also an inspiration for my research, since Gormsen's work can be perceived as a historical work study.

The data I have collected for my research falls in two parts. The first part consists of interviews conducted by telephone with software engineers from about twenty companies from all over Europe. The companies all work with safety-critical systems, that is, they make automobiles, airplanes, medical equipment and so forth. The second part consists of notes from four weeks I spent as an observer in a small company that makes computer games. I was present during work hours: ordinary office hours, usually nine to five. The time was spent predominantly in observation and taking notes, without interacting with the people concerned. This is supplemented by interviews with the employees and a collection of some photographs and written material.

The collection of the first part of the data is a prime example of how the availability of evidence can influence method. I was offered, as part of another research project, to participate in making the interview series. The interviews were to be focused on how software engineers describe their work, as that was the focus of the other research project. My original intent was to perform observations on site in companies. However, it is time consuming to find informants who are willing to be studied. Moreover, from my contacts in academia, I knew that it could be difficult to get access to companies in this particular branch of the software industry because they are sometimes secretive about their detailed operations. Thus, when it became possible to gain access to informants from all these companies with whom it might otherwise have been difficult to establish contact, I chose to collect data with the prescribed method of the other research project – telephone interviews – instead of my original preference, observation on site.

This, on the other hand, also offers an example of how method can influence research goals. The telephone interview method and the focus on the informants' descriptions of their work practices was not as well suited as the observation method for my prime research interest at the time, the concrete day to day work practice. With the telephone interview material, I have to infer the work practices from the conversations with the engineers instead of observing it directly. This could be seen as a deviation from my original intent; however, I realized that the material offers other possibilities. Specifically, the telephone interview material shows in a much more direct way than observations of practice how the programmers describe their work and thus how they understand their work. The programmers' understanding of their work and the relation it has to their work practice thus became a much more important aspect of my research goals than previously. This also goes

to illustrate the point of the preceding section, that availability of evidence is more a question of interpretation than of quantity.

The influence of research goals on method is in many cases immediately obvious: a method is chosen for its ability to generate evidence that can reveal something about that which we want to investigate. This influence also applies to the collection of the second part of my data. To observe work practice as directly as possible, I chose to use immediate, direct observation. This choice may perhaps seem obvious, but it is not the only option available. I could have chosen to rely exclusively on interviews, to do a pure academic literature study or to collect written evidence from the internet. All of these methods have their merit. However, as I seek to investigate programming not only as it is understood but also at is it concretely practiced, I chose the method that has the most immediate connection to concrete practice, namely to be present during the work. Or rather, there exists an even more immediate method – which is to actually do the work, as Ehn did in his factory study. I decided not to do the latter, partly because it would take longer than I was prepared to spend on the study and partly because I already have years of practice as a programmer and thus judge myself capable of understanding the practice that I observe without carrying out the practice myself.

The influence of method on the availability of evidence is also exemplified by the second part of my data collection. Choosing on-site observations as my method limited the availability of companies to study. Having an observer present affects the workplace and this can be seen as an unnecessary burden on the company. I was thus turned down by one company on this ground. Even within the observation situation, the choice of method can be felt. Because I was more interested in the programmers' interaction with each other than with me, I sought to minimize my interaction with them. This meant that explanatory comments and casual remarks directed to me, evidence in their own right, became much scarcer. The relative availability of two kinds of evidence that to a degree exclude each other was affected by my choice of method.

The Role of Scientific Theory

Let us now take a look at how we can understand the role of scientific theory in the scientific argument. At a very general level, a theory explains what is relevant about the subject matter and how the relevant parts relate to each other. It is a point of departure for our understanding. Thus, theory ideally tells us how we expect things to be before we start an investigation into the matter.

The question of prerequisites to understanding is treated in depth by Gadamer. What he arrives at is that there can be no understanding without prejudice (*Vorurteil*). (Gadamer 1960: II.II.1.a.α.) Prejudices are perspectives and opinions, and we all always hold some prejudices. No mind is a blank slate. Without prejudice we cannot even begin to comprehend. For example, if I try to read a Greek play without knowing Classical Greek, the text will just appear to me as incomprehensible scribblings. A first prerequisite is to have a basic understanding of facts, e.g. to know the letters and the words. This basic understanding (*Vorverständnis*) is a part of prejudice. (Gadamer 1960: II.II.1.c, p. 278.) When this is present, the actual process of understanding can begin. Here prejudice is crucial. Prior to reading the text, I will have formed an idea, accurate or not, of whether the author is to be trusted to tell the truth or whether he for some reason lies. If I read Aristophanes' plays as a literal description of ancient Greek society, my understanding will falter. To make sense of the plays, I need to have the proper prejudicial view that they do not literally tell the truth – that they exaggerate and distort it in order to amuse, and to criticize society. The task of hermeneutics is to distinguish between true and false prejudice. (Gadamer 1960: II.II.1.c, p. 282f.)

We can thus understand scientific theory as a part of our prejudices in the sense of Gadamer. We always have prejudices, whether we acknowledge them or not. Scientific theory is a form of prejudice that we are conscious of, have made explicit and have written down. What makes it prejudice – as opposed to simply judgment – is that we take the theory as a starting point whenever we encounter new evidence. Exactly because this explicit prejudice is not unconscious and taken for granted, we are able to have a scientific discussion about it. We need to keep in mind, though, that understanding is a continuous process. (Gadamer 1960: II.II.1.d.) In good scientific practice, theory is constantly confronted with evidence and revised. As understanding deepens, theory changes.

Science as Dialogue

Choosing good metaphors is an essential part of science. A metaphor for scientific understanding itself is that it is a dialogue with the evidence, the field. The scientist poses a question by looking at the evidence in a certain way. The 'answer' is the new understanding that the scientist gains, in turn leading to more questions, and more answers. The process of understanding is described in this way as an ongoing dialogue between scientist and evidence.

Is this metaphor justified? Gadamer himself points out that questions play a central role in understanding (Gadamer 1960: II.II.1.c, p. 283) and the entire last third of *Wahrheit und Methode* is devoted to examining the relationship between language and understanding. As we have seen earlier in this article, Perelman and Olbrechts-Tyteca consider private deliberation to be a special case of argumentation, which means that it can also be considered a special kind of dialogue.

As McCloskey writes in a treatise on the scientific rhetoric of the field of economics, science is not a privileged way of knowing, it is a way of speaking about things (McCloskey 1985: ch. 4, p. 67). This fits well with our characterization of science as a persuasive activity and as dialogue. We can then ask what characterizes scientific speech, what is the prototypical form of scientific argument. Here we can find a model in the classic rhetorical concept of epicheireme. Ordinarily, an argument[3] does not state fully and completely all of its premises; something is left out and meant to be tacitly understood. The epicheireme is the fully elaborated argument where the major premises, minor premises and conclusion are stated in their entirety. (Kennedy 1984: ch. 1, p. 17.) This, then, is the ideal model for the scientific argument where everything is laid bare for other scholars to examine. Of course, in practice, most scientific writing is not composed of epicheiremes and most scientific investigations are not even epicheiremes in themselves; instead, they build upon each other. As an ideal though, the epicheireme is the rhetorical concept that best characterizes science.

If we view scientific understanding as a dialogue with the field, then method becomes the way of engaging in the dialogue, of posing questions and listening to answers. Good method, then, is to let the dialogue guide the method in such a way that we always engage in the dialogue in the most fruitful manner. Bad method is to choose once and for all to fix a method and let it impose arbitrary and unwarranted restrictions on the dialogue with no regard to how the said dialogue is evolving. In other words, both the subject of scientific research and the increasing scientific understanding need to be both the determinant for and to be above method. "Wie man sieht, ist das Problem der Methode ganz von dem Gegenstand bestimmt …" (Gadamer 1960: II.II.2.b, p. 297.)

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[3] In rhetorical terminology: enthymeme.

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† With an English summary.