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Denne publikasjonen finnes bare som nedlastningsbar fil.

Arbeidsnotat nr. 1022/08

ISSN-nr.:0804-1873

Antall sider: 18

Prosjekt nr:

Prosjekt tittel:

Oppdragsgiver:

Pris :

kr. 50,-

***Pragmatic Realism vs. Metaphysical Realism –
Implications for Scientific Knowledge Production***

By

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FOREWORD

Based on master thesis in economic geography, University of Oslo (1994): *Selv-organisering: et evolusjonært perspektiv på relasjoner mellom læring og kontekst. (Self-organisation: an evolutionary approach to relations between learning and context).*

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1 INTRODUCTION

This essay focuses on debates within the philosophy of science between varieties of realism. There is a set of basic questions related to this debate which, explicitly or implicitly, have been dealt with in some way or another within every branch of science. The issue investigated here concern implications of two variants of realism for how processes of scientific knowledge production should be conducted.

In part 1, these philosophical issues are placed within the context of the empirical research field of science, technology and innovation (STI) studies. In part 2 and 3, two variants of realism, belonging to two philosophical perspectives, are discussed, taking the point of departure in a shared common ground. Each perspective is accounted for, endeavouring to bring out; i) their basic principles and, through them, their critique of the other perspective; and ii) some of the implications of the basic principles for how social scientific knowledge should be produced. In part 4, the essay is rounded off.

2 REFLECTIVE EMPIRICAL RESEARCH

The point of departure for the following discussion is taken in a conception of scientific practice (Alvesson and Sköldbberg 1996) that I find fruitful for discussing methodological aspects of social science. Elsewhere it is utilized specifically in discussing such aspects within the field of science, technology and innovation (STI) studies (see for instance Jasanoff et al. 1995), explicitly acknowledging its multidisciplinary character, its multiple cultures of investigation and the concomitant implications of this pluralism (Samuelsen, forthcoming). The conception of scientific practice in question is termed *reflective empirical research*. Basically, this attitude implies taking seriously into account how different kinds of linguistic, social, political and theoretical elements are weaved together in processes of knowledge production in which empirical material are constructed, interpreted and explained. Reflective empirical research starts from a sceptical attitude towards that which superficially appear as unproblematic reflections of how reality is constituted and function, while at the same time retaining the belief that studying appropriate aspects of this reality may yield important basis for a knowledge production that opens rather than closes, give possibilities for understanding and explanation rather than establishing «truths». Two basic elements characterize the position termed reflective empirical research: *interpretation and reflection*.

The first element implies that all, both trivial and non-trivial, references to empirical matters are basically *interpretations*. The idea that measures, observations, statements from interviewees or the study of secondary data as statistics or archival material stand in an unambiguous, one-to-one relation to something outside the empirical material are thus rejected in principle. The acknowledgment of the fundamental importance of interpretation implies that a simple reflection thesis regarding the relation between «reality» and «empirical facts» must also be rejected. Interpretation thus becomes the central element in research. This demands a consciousness towards the importance of the theoretical propositions, preconceptions and language which comprise important determinations (but not pre-determinations) behind the interpretations (Alvesson and Sköldbberg 1996).

The second element implies that a *reflective* focus is turned both inwards and outwards, towards the researcher her- or himself, her or his scientific community, the society at large, intellectual and cultural traditions and the central meaning of language and narrative in research. It is not least through systematic reflection on several different levels that interpretation and explanation can attain a quality that makes empirical research a worthwhile enterprise. In Alvesson and Sköldbberg (1996) this reflective attitude is understood as interpretation of interpretation and efforts at critical trial of ones own interpretations and explanations of empirical material. Reflection may lead to a constant awareness of different basic dimensions behind and within ones interpretations and explanations, through which these may be qualified. Thus, the emphasis of reflective empirical research is pushed from dealing with empirical material toward, as far as possible, taking into account the perceptual, cognitive, theoretical, linguistic, (inter-) textual, political and cultural conditions which constitute the background for making interpretations and explanations. These conditions makes scientific inquiry possible, but also implies, to varying degrees, that research becomes a partly naive and unconscious enterprise it is argued by Alvesson and Sköldbberg (1996). In my view this element of reflection explicitly brings forward the very core of the contextualist approach to science, technology and innovation (STI) studies argued for in Jasanoff et al. (1995).

The above sketch has touched upon two philosophical issues; i) the question of how social scientific knowledge should be produced; and ii) the meaning of the notion of reality. It is the aim in the remaining of this essay to elaborate on and discuss these two issues together because the position taken regarding the notion of realism has implications for the question of how social scientific knowledge should be produced.

3 INTERNALIST AND EXTERNALIST PERSPECTIVES OF REALISM

Two philosophical perspectives are contrasted in this part of the essay. The first is termed the *externalist* perspective by Putnam (1981). This perspective is based on *metaphysical realism*, entailing that

«the world consists of some fixed totality of mind-independent objects. There is exactly one true and complete description of «the way the world is». Truth involves some sort of correspondence relation between words or thought-signs and external things and sets of things» (Putnam 1981: 49).

According to Putnam, the favourite point of view of this perspective is a God's Eye point of view - thus the term externalist. The second perspective is termed the *internalist* perspective by Putnam (1981). A basic characteristic of this view is «to hold that *what objects does the world consist of?* is a question that it only makes sense to ask *within* a theory or description» (1981: 49). Another characteristic, shared by many adherents to this perspective, is that

«there is more than one «true» theory or description of the world. «Truth», in an internalist view, is some sort of (idealized) rational acceptability - some sort of ideal coherence of our beliefs with each other and with our experiences *as those experiences are themselves represented in our belief system* - and not correspondence with mind-independent or discourse-independent states of «affairs». There is no God's Eye point of view that we can know or usefully imagine; there are only the various points of view of actual persons reflecting various interests and purposes that their descriptions and theories subserve» (Putnam 1981: 49-50).

In spite of the obvious differences between these two perspectives, they share a common ground with regard to the notion of realism. Lakoff (1987) refer to this common ground as basic realism and it involves at least the following:

- i) a commitment to the existence of a real world, both external to human beings and including the reality of human experience
- ii) a link of some sort between human conceptual systems and other aspects of reality
- iii) a conception of truth that is not merely based on internal coherence
- iv) a commitment to the existence of stable knowledge of the external world
- v) a rejection of the view that «anything goes» - that any conceptual system is as good as any other» (Lakoff 1987: 158).

From this common ground two differing versions of realism have been developed. In the following I will take a closer look at the basic assumptions of each and the implications for scientific knowledge production that they entail. The so-called «internalist» perspective is considered in part 3.1. and the so-called «externalist» perspective is considered in part 3.2.

3.1 The Pragmatic Realism of the Internalist Perspective

3.1.1 Basic Assumptions

Putnam's perspective, termed variously «*internal realism*» (Putnam 1981) or «*pragmatic realism*» (Putnam 1989), can be seen as a reaction to what he consider shortcomings of metaphysical realism. According to Lakoff (1987) Putnam has provided a «devastating logical critique» of metaphysical realism, arguing that it is internally incoherent (see Putnam 1980, 1981). Its incoherence lies in its epistemology - its view on meaning, reference, knowledge, and understanding. The source of the incoherence is what Putnam calls its *externalist* perspective, that one can stand *outside* reality and find

a unique, correct way to understand it.¹ By taking an internalist perspective, Putnam believe that we can avoid the problems with reference that plague the objectivist, problems due to the impossibility of obtaining *exactly one true and complete description of 'the way the world is'*. Our way of understanding the world in terms of objects, properties, and relations is an imposition of our conceptual schemes upon external reality; reality as we understand it is structured by our conceptual schemes. Further, we are content with living *as if* the world is the way our concepts tell us. Because objects and categories of objects are characterized internal to conceptual schemes, not external to them, the problem of the indeterminacy of reference, sharply criticized by Putnam, disappears. Thus,

«(i)n an internalist view...., signs do not intrinsically correspond to objects, independently of how those signs are employed and by whom. But a sign that is actually employed in a particular way by a particular community of users can correspond to particular objects *within the conceptual scheme of those users*. 'Objects' do not exist independently of conceptual schemes. We cut up the world into objects when we introduce one or another scheme of description. Since objects *and* the signs are alike *internal* to the scheme of description, it is possible to say what matches what» (Putnam 1981: 52. Emphasis in original).

Whereas according to metaphysical realism, there is only one correct and unique way in which reality can be divided into objects, with properties and relations between them, Putnam sees this otherwise. Being a realist, he does not deny that objects exist. But he argues that an object can be viewed *correctly* in many ways. Several views can be correct, but correct within different conceptual schemes. Thus, when Putnam says that «'objects' do not exist independently of conceptual schemes», he is not denying the reality of objects; rather, he is leaving open the possibility that what is characterized as a particular object of a particular sort of conceptual scheme could be described otherwise in another, equally legitimate scheme. The issue is not whether reality exist, but whether there is only one right way to describe it in all cases - in other words, whether the objects of reality has cores of *essential* features of which there can, ultimately, be only one true account.

Internal or pragmatic realism is a form of the basic realism that was characterized above. What makes it a form of realism is, according to Lakoff (1987):

- «i) a commitment to the existence of a real world external to human beings
- ii) a link between conceptual schemes and the world via real human experience; experience is not purely internal, but is constrained at every instant by the real world of which we are an inextricable part

¹ There is not space here to go through the details of Putnam's complex logical argument. Suffice it here to quote Lakoff's (1987) summary at some length. The basic tenet of metaphysical realism, according to Putnam (1980, 1981) - i.e. that one can stand outside reality and find a unique, correct way to understand reality - «would involve a symbol system standing external to the rest of reality and a reference relation pairing symbols and aspects of reality. The reference relation is assumed to «give meaning» to the symbols. First, Putnam shows that this is logically impossible, without violating what we mean by «meaning». Second, Putnam points out that in order for such an understanding to be unique and correct, the reference relation itself must be part of reality. He then observes that this is logically impossible. Putnam's result is a result about symbol systems and their interpretations. The epistemology of metaphysical realism....is formulated in terms of symbol systems and their interpretations. The metaphysical realist view of meaning, reference, knowledge, and understanding all make presuppositions about symbol systems and their interpretations that are logically incoherent. Thus, Putnam concludes, there cannot be such a thing as 'exactly one true and complete description of 'the way the world is'' - that is, there can be no God's eye view of reality. The crucial words here are 'description' and 'view'. They presuppose an external perspective: a symbol system external to reality, related to reality by a reference relation that gives meaning to the symbols. Putnam is not saying that there is no reality. And he is not saying that there is no 'way the world is'. He is not denying basic realism. He is only denying a certain epistemology. He is not saying that we cannot have correct knowledge. What he is saying is that we can not have a privileged correct description *from an externalist perspective*. The problem is the external perspective - the God's eye view. We are not outside of reality. We are part of it, *in* it. What is needed is not an externalist perspective, but an internalist perspective» (Lakoff 1987: 260-261. Emphasis in original).

- iii) a concept of truth that is based not only on internal coherence and ‘rational acceptability’, but, most important, on coherence with our constant real experience
- iv) a commitment to the possibility of real human knowledge of the world» (Lakoff 1987: 263).

What makes it «internal» is that it does not take an external perspective that stand outside of reality. Rather, it focuses on the way that we make sense of reality by functioning within it. The point is that the world is not as we conceive it to be *because* we conceive it that way. Thoughts and beliefs do not simply *cause* the existence and nature of the world. But the internalist perspective acknowledges the contribution of our conceptual schemes to our understanding of our real experiences in a real world. According to Putnam (1981), this means phenomena are just as much made as they are discovered; they are just as much conceptual inventions as they are «objective» factors in our experience - factors that exist whether we want them to or not.

For Putnam (1981) it does not make sense to ask whether our concepts correspond to anything that are completely uncontaminated by the act of making concepts of it.

«Internalism does not deny that there is experiential input to knowledge; knowledge is not a story with no constraints except internal coherence; but it does deny that there are any inputs *which are not themselves to some extent shaped by our concepts* Even our descriptions of our own sensation, so dear as a starting point for knowledge for a generation of epistemologists, is heavily affected (as are the sensations themselves for that matter) by a host of conceptual choices. The very inputs upon which our knowledge is based are conceptually contaminated» (Putnam 1981: 54. Emphasis in original).

In recognizing the way that our conceptual schemes shape our comprehension of our experience, and even our experience itself, internal realism abandons the traditional distinction between fact and value; but because it is still a form of realism, it retains a notion of objectivity without descriptions from a God’s eye point of view;

«Our conceptions depend upon our biology and our culture; they are by no means «value-free». But they *are* our conceptions and they are conceptions of something real. They define a kind of objectivity, *objectivity for us*, even if it is not the metaphysical objectivity of the God’s Eye view. Objectivity and rationality humanly speaking are what we have; they are better than nothing» (Putnam 1981: 55. Emphasis in original).

Putnam’s view on objectivity involves rising above prejudices, and that begins by being aware that we have those prejudices. The primal prejudice is our own conceptual system. To be objective, we must be aware that we have a particular conceptual system, we must know what it is like, and we must be able to entertain alternatives. Practical standards of objectivity are possible in a great many domains of human endeavour. Acknowledging alternative conceptual schemes does not abandon objectivity; on the contrary, it makes objectivity possible argues the internalist. Furthermore, it is argued that although internal realism is a form of realism, its internal character permits the existence of alternative, incompatible conceptual schemes. But because of the limits placed on it by experience of the real world this does not entail a total relativism: It is not the case that «anything goes» in internal realism. In the words of Putnam;

«Why should there not sometimes be equally coherent but incompatible conceptual schemes which fit our experiential beliefs equally well? If truth is not (unique) correspondence then the possibility of a certain pluralism is opened up. But the motive of the metaphysical realist is to save the notion of the God’s Eye Point of View, i.e., the One True Theory» (Putnam 1981: 73).

The path that Putnam has taken breaks both with traditional philosophical perspectives and with common sense views of the world we live in.

«What we have is the demise of a theory that lasted for over two thousand years. That it persisted so long and in so many forms in spite of the internal contradictions and obscurities

which were present from the beginning testifies to the naturalness and strength of the desire for a God's Eye View The continued presence of this natural but unfulfillable impulse is, perhaps, a deep cause of false monisms and false dualisms which proliferate in our culture; be this as it may, we are left without the God's Eye View» (Putnam 1981: 74).

I think that Putnam here touches upon a very important point that we don't need fancy philosophical jargon to understand. The desire for a «God's Eye View», whatever philosophical and ideological manifestations they appear in, is a very significant feature of human history. There are innumerable truths offered and it is deeply characteristic of both individuals and communities that the *one* true and correct account of whatever part of reality *can* be found if we only work hard enough on sorting out all these truths. Thus, the causes of the persistence of the desire for a «God's Eye View» can be found in a complex combination of individual psychology, social psychology and socio-cultural conditions. To me, empirical observations that a plethora of views exist side by side in most branches of science, and in everyday life too - and have always done so - does not urge me to search for *the only true one* in any domain. We have to come to terms with the real existence of several equally coherent but sometimes incompatible conceptual schemes which fit our experiential beliefs equally well.

3.1.2 Implications for Scientific Knowledge Production

Now, I turn to some implications for scientific knowledge production of this pragmatic realist position. Here the focus is on some of Putnam's and other pragmatists' thoughts on how scientific knowledge production *should* be conducted. When doing research within a specific conceptual scheme, a pragmatic realist wants «a method for telling which of (his or her) beliefs are *really* justified, by perception or otherwise, and which are not» (Putnam 1995: 68). But, Putnam continues, «is not the desire for such a method a hankering for an impossible Archimedean point, a vestige of what Dewey excoriated as 'the quest for certainty'?» (Putnam, *ibid*). He gives us the ambiguous answer:

«Yes and No. A 'method' in the sense of an algorithm which solves all of our epistemological problems is a philosopher's fantasy..... But, Peirce also reminded us that the fact that we cannot reduce scientific inquiry to an algorithm, on the one hand, nor provide a metaphysical guarantee that any of our beliefs or methods will never need revision, on the other, does not mean that we don't know *anything* about how to conduct inquiry» (Putnam 1995: 69. Emphasis in original).

Pragmatists like Peirce, Dewey and Putnam believe that our past experience with inquiry have learned us a good deal about how inquiry should be conducted. Some of what we have learned even applies to inquiry in general, and not just to particular kinds of inquiry or particular subject matters.

From the beginning, the pragmatist model of inquiry was *a group of inquirers trying to produce good ideas and trying to test them to see which ones have value*. In this perspective inquiry is *cooperative human interaction with an environment*; and both aspects, the active intervention, the active manipulation of the environment, and the cooperation with other human beings, are vital. The first aspect, the aspect of intervention, is connected with pragmatist fallibilism. Here, Peirce emphasized that very often ideas will not be falsified unless we go out and actively seek falsifying experiences. Ideas must be put under strain, if they are to prove their worth. Concerning the practice within a group of inquirers, pragmatists reject the algorithm model of inquiry, the idea that there could be a computer program for knowledge production, a kind of automated inquiry. Instead, what we have according to pragmatists - whether the subject is science or ethics - are *maxims* and not algorithms. The cooperative aspect of inquiry is central here because the maxims of pragmatist themselves require *contextual interpretation*. Such interpretation will be internal to specific conceptual schemes and scientific communities. This introduces the problem of subjectivity and intersubjectivity for the pragmatists - «not as a metaphysical worry about whether we have access to a world at all, but as a real problem in human life» (Putnam 1995: 71). On this point, Peirce, Dewey and James insisted that

«when one human being in isolation tries to interpret even the best maxims for himself and does not allow others to criticize the way in which he or she interprets those maxims, or the

way in which he or she applies them, then the kind of ‘certainty’ that results is *in practice* fatally tainted with subjectivity. Even the notion of ‘truth’ makes no sense in such a ‘moral solitude’ for ‘truth presupposes a standard external to the thinker²» (Putnam 1995: 71-72).

We can see another cooperative aspect of pragmatist inquiry in the introduction of new ideas for testing. This is likewise dependent on a group of inquirers - a standard external to the thinker - «for any human being who rejects inputs from other human beings runs out of ideas sooner rather than later» (Putnam 1995: 72). The danger is that they «begin(s) to consider only ideas which in one way or another reflect the prejudices he or she has formed» (ibid.). Thus, the cooperative aspect of pragmatist inquiry is necessary both for i) the formation of ideas and ii) for their rational testing (ibid.).

To this, Putnam adds two norms of pragmatist inquiry because «cooperation must be of a certain kind in order to be effective» (Putnam 1995: 72). The first is that cooperation within a group of inquirers must follow the principles of *discourse ethics* and the second turns on aspects of power. The point here is that the scientific enterprise always suffers;

- i) when there is no opportunity to challenge accepted hypotheses by a) criticizing the evidence upon which their acceptance was based, or the application of the norms of scientific inquiry to that evidence, or b) by offering rival hypotheses;
- ii) when questions and suggestions are systematically ignored; and
- iii) when relations among scientists become relations of hierarchy and dependence, or when scientists instrumentalize other scientists.

According to Putnam’s interpretation of Dewey’s perspective it makes sense to have such normative notions of science. Not only did Dewey argue that good scientific *practice* requires respect for autonomy, symmetric reciprocity, and discourse ethics. He also argued that the very interpretation of the non-algorithmic *standards* by which scientific hypotheses are judged depends on cooperation and discussion structured by the same norms. One of the persistent arguments through much of Dewey’s writing is that both for its full development and for its full application to human problems, science requires the democratization of inquiry.³ In the words of Putnam,

«(i)t is not....just a sociological-descriptive fact that choosing theories for their predictive power and simplicity, and fostering democratic cooperation and openness to criticism in the generation and evaluation of theories, are part of the nature of scientific inquiry; these norms describe the way we *ought* to function when the aim is knowledge» (Putnam 1995: 73-74).

Thus pragmatist, in the tradition of Peirce, James and Dewey, argue that democratically conducted inquiry is to be trusted; not because it is infallible, but because the way in which one will find out where and how ones procedures need to be revised is through the process of inquiry itself. Further, pragmatists will also argue that what is learned about inquiry in general applies to ethical inquiry in particular. This point is not pursued here.

The basic tenor and principles of the pragmatist perspective is found in the writings of several scholars. Thus, to take a step from the general principles of a pragmatic realist view outlined above, toward more specific accounts of processes of inquiry, I now turn to Alvesson and Sköldbberg’s (1996) outlining of a basis for reflective empirical research. Their point of departure is in Toulmin (1953), according to whom theoretical propositions are comparable to *descriptions of rules*. A rule is first delimited to its *general domain* which indicates the types of cases for which it is applicable. But the rule doesn’t have to apply in all cases. Subsequently the exceptions from the rule - within the domain - may be established. Thus, the *area of application* for the rule - which is separate from the domain - may be outlined. Concerning theoretical propositions, which express some kinds of rules according to which the real world functions, one should first outline the general domain, i.e. the types of cases to

² Quoted from James (1978).

³ See also Putnam (1992), chapter 9, on «A Reconsideration of Deweyan Democracy».

which the rule applies, and thereafter successively try to map the area of application within the domain. In other words, point out those cases of the general type for which the rule really applies and those cases which are exceptions. This research strategy thus implies the successive establishment of the area of application of a theory within a certain domain. Concerning a rule, then, one does not ask «is it true or false», but «when does it apply».

These arguments of Toulmin, as they are interpreted by Alvesson and Sköldbberg (1996), have implications for theory generation, because what has been said implies that when «successively establishing the area of application within a domain» one *already* know that the theory have some area of application within the domain. The work of theory generation has not been conducted in an empirical vacuum based on hunches and guesses without contact with reality. The theory, on the contrary, has been developed in close interaction with the empirical facts that bring it about. It is this original «*bridgehead*» within the domain that needs to be expanded through the process of establishing areas of application. The domains and the areas of application are thus - as Toulmin (1974) emphasize - *theory dependent*, i.e. dependent on which different theoretical conceptions we embrace and include in them. But in every case, the empirical basis of such a process must be problematized. It is also important to emphasize that it is not a matter of investigating when the theory is correct through testing it against empirical material that is theory free: *Domains and areas of application are already theoretical constructs*. Thus, to establish areas of application is a theoretical matter.

According to Alvesson and Sköldbberg (1996), the application of theories does not necessarily exclude their more or less *representing* function. They argue that the condition that application is possible indicate the existence of some kind of accordance, even if this is not of the «reflecting kind» but have a looser coupling - an insecure and fragmented, maybe even only partly recognizable contour likeness. This position try

«to retain the view on theories as something which is used or applied, without loosing their - in some sense - representing function towards reality. Thus one can retain the thought of some kind of structural conformity between theory and reality: the former represent the latter in some sense and the question of reference is not completely thrown overboard. At the same time, matters pertaining to verification of theories are transformed into questions of application, '*pragmatic realism*' to coin a new concept» (Alvesson and Sköldbberg 1996: 34. Emphasis in original).⁴

As far as I understand the concept of pragmatic realism as it is used here, it can not be said to be entirely new but has its roots in the perspective of Putnam (1981). In an «internalist» fashion Alvesson and Sköldbberg (1996) are careful to point out that the «reality» in question here is never directly given as «pure empirical matter». Neither is there such a thing as theory independent of empirical matter, but interpreted «facts» always influence, in their turn, on the theory. If the purpose of research is to discover patterns of inherent orderliness, structures, underlying meanings or hidden driving forces, tendencies and mechanisms, this presuppose that all such kinds of entities in question exists in reality, though hidden or unobservable. One has to distinguish between two issues: on the one side the difficulty of the researcher in discovering the hidden patterns, tendencies, etc. and the necessity to recreate them in another medium; on the other side the question whether hidden patterns, tendencies, etc. exists or not.

Alvesson and Sköldbberg (1996) do not claim that theoretical propositions apply generally in all cases of the domain. On the contrary, they argue that the theory have *some* validity within the domain - something which is established at its generation - and then proceed to investigate the area of validity, i.e. the area of applicability. Domain and area of applicability is not to be understood as something simple, already given, but are always already interpreted - either in the form of unreflected common

⁴ Quotes from Alvesson and Sköldbberg (1996) are translated by me.

sense or in the form of consciously (re)constructed social objects, termed «surface structures». This argument points to the notion of generalization of qualitative results within a pragmatic realist approach to knowledge. In this perspective - which allows for hidden «mechanisms», i.e. patterns and tendencies common to and underlying several surface phenomena - the successive expansion of the empirical field of application of a theory within a certain possible domain, is both possible and desirable, even for qualitative studies.

A basic mode of reasoning, central to pragmatic realist inquiry and facilitating the search for non-observable, underlying patterns and structures, is *abduction*. In order to spell out this mode of reasoning, Alvesson and Sköldböck (1996) draws on some of the ideas of Peirce. Concerning development of knowledge based on social practice Peirce argues that

“there occurs in science and in everyday life a distinct pattern of reasoning wherein explanatory hypotheses are formed and accepted. He called this kind of reasoning ‘abduction’, a form of inference that goes from data describing something to a hypothesis that best explains or accounts for the data. Thus abduction is a kind of theory-forming or interpretive inference” (Josephson and Tanner 1994: 5).⁵

Abduction is often based on the transfer of metaphors from one discourse to another, the combination of two different frames of reference or the putting together of elements from different sets of theories. Peirce and his followers regarded abduction an important source of creativity, both in science and in everyday life. An abductive mode of inference constitutes the ground for developing concepts and analytic tools that can catch the genuine characteristics of concrete objects by using them to look «backwards» or «underneath» to explain what it is with these objects that enables them to generate specific, concrete phenomena, events and states of affairs. It is argued that metaphors circulate from one discipline to another, perhaps later returning to the discipline of their origin in a modified form (Mirowski 1988). Thus abductive reasoning gives us the possibility of making completely new theoretical combinations and thereby create theoretical innovations. Peirce’s pragmatist philosophy shows the constraints of both empiricist research and research based on rationalistic and formalistic mathematics. He was more concerned with the question of the sources of creativity and innovation in science than the static analytic structure of existing theories.

Concerning explanatory reasoning, a distinction is usually made between induction and deduction as mutually exclusive alternatives. In induction the inference is from particular instances to general rules, while in deduction the inference is from general rules to particular instances. In neither case is there any room for underlying patterns and tendencies. But *abduction* is probably the method which is actually used in many investigations, especially ones based on case studies. The core aspect of an abductive mode of reasoning implies that an (often surprising) single case is interpreted as a hypothetical, general pattern, which, if it is correct, will explain the case in question. Thus a «bridgehead» within the domain is established. This first interpretation should subsequently be confirmed through further observations (of new case studies) and through renewed adaptations to and applications on more cases. Hereby the method of abduction becomes a sort of combination of induction and deduction, but it also adds new features to the process. Through the process, the area of empirical applicability is successively expanded, while, at the same time, the theory is further refined.

Inductive inference starts from empirical material, while deduction starts from theory. Abductive inference starts from empirical facts as induction, but does not reject theoretical conceptions, and is thus closer to deduction. But abduction includes aspects of understanding in addition to pure explanation, and overall,

⁵ Abduction is termed retrodiction by critical realist Roy Bhaskar. See e.g. his (1993). For a synoptic view of Peirce’s philosophy see his *Reasoning and the Logic of Things*, edited by Ken Ketner and H. Putnam (1992).

«abduction appear as more advantageous than both induction and deduction, partly by focusing on underlying patterns or deep structures, partly by daring to take the leap beyond mere summation of facts and partly by basing this on (already theory loaded) empirical matter» (Alvesson and Sköldbberg 1996: 45).

The actual abduction starts when the process is moving from empirical to theoretical pattern, i.e. from surface structures to potential deeper structures. It is emphasized that abductions are neither logically necessary nor safe from mistakes, but allows for fallacies to be made, something which means that they must be controlled against more cases. There is thus a need for a repeated process of movement or alternation between (empirically loaded) theory and (theory loaded) empirical matter. This entails a hermeneutic process through which one subsequently, so to say, is digging into the empirical matter by the use of theoretical pre-conceptions, at the same time as one is also developing the theory (Alvesson and Sköldbberg 1996). A hermeneutically inclined researcher would perhaps argue that abductive inference indicate some sort of hermeneutic spiral, i.e. an interpretation of facts which we already have some pre-conception or pre-understanding of.

The pursuit of deep or underlying structures does not entail that there is or should be one single structure that is correct. As empirical studies of scientific activity show abundantly (see e.g. Jasanoff et al. 1995), in contrast to normative philosophy of science, most, if not all, fields of science have normally several accounts of both different deep structures and phenomena. Which structures we find is dependent on, among other things, which perspective we use, something which is expressed in the form of research questions, frames of reference, selection of cases, hypotheses, etc. But even within a single perspective several different deep structures are possible, depending on where we focus our research. This brings in a subjective element in the form of choice of perspective as Alvesson and Sköldbberg (1996) acknowledge. These different choices made by groups of cooperating inquirers within scientific communities will entail different deep structures, whether they are consciously made or are unquestioned presuppositions of a perspective. Thus from a sceptic view an important issue becomes, not which side is telling «the truth» - and should therefore be allowed to prevail - but why one side manages to persuade the actors who are involved in decision-making processes that their version of the truth is the only one.

3.2 The Metaphysical Realism of the Externalist Perspective

3.2.1 Basic Assumptions

The above position may, at a first glance, look appealing as an approach to scientific knowledge production. But when consulting metaphysical realists on these matters (see e.g. Malnes 1997) one soon enough learn that the direction taken by Putnam (1981, 1989) and other pragmatists from the common ground of «basic» realism identified above is unsatisfactory, to say the least.⁶ Malnes have taken issue with the pragmatic realism of Putnam and see this as, though seriously meant, an ultimately failed intellectual enterprise. Thus, he has taken another direction, avoiding what he regards as the deficiencies of the «internalist» perspective. His position is spelled out in contrast to the notion of *anti-realism* which entails that everything is constructed in the minds of humans and that the world on closer inspection turns out to be a world of images. Such a view is termed *constructivism* in Malnes (1997). Here the anti-realist view is pushed to its limits by claiming that «things are the way we believe them to be; they become what they are through perceiving them in one way or another» (Malnes 1997: 25).⁷ This view is quickly dispensed with through pointing out its obvious absurdities. Here, Malnes quote Putnam (1981) on the consequences of believing that one can fly and observe that Putnam is distancing himself from such a full-blown constructivist view and that he acknowledges some objective element in human interaction with the world. This is interpreted as necessary in order to retain some credibility in the critique of metaphysical realism.

⁶ They might not even acknowledge such a common ground.

⁷ Quotes from Malnes (1997) are translated by me.

But the problem with this critique, according to Malnes (1997), is that it also retains, and is based on, too much of untenable constructivist ideas. For instance, the seriously meant anti-realist position entails that the phenomena of the world are partly *made* by us and partly *discovered* by us. They are a joint result of human accomplishment and the external world itself. This ambiguity is found in Putnam when he argues that

«‘objects’ do not exist independently of conceptual schemes. *We* cut up the world into objects when we introduce one or another scheme of description. Since the objects *and* the signs are alike *internal* to the schema of description, it is possible to say what matches what» (Putnam 1981: 52. Emphasis in original).

Malnes (1997) summarizes the ambiguous view of anti-realism in three revealing points:

- i) What we know is partly known through experience; this means acknowledging the experience and existence of objective phenomena and thus a refutation of pure constructivism. This is a point that metaphysical realists can accept.
- ii) Our experiences may be conceptualized in different ways; this means that the phenomena known through experience can take more than one shape because it is possible to make different concepts about them. Further, this means that there is more than one road to conceptual experience; one can conceive of facts in the shape of several accounts that all are founded on experience. This is problematic from a metaphysical realist’s standpoint because it is difficult to imagine how anti-realists can answer questions about how we can know if there exists a foundation for an account. They can not answer by arguing that some concepts manage to catch the phenomena we experience, while others fail and give misleading characteristics, because such an answer presupposes the existence of phenomena independent of concepts and descriptions.
- iii) We only experience that which we have concepts about on beforehand; thus the noted ambiguity enters the picture in full because we - allegedly - need concepts to include the objective phenomena in our world of experience. Here is the real source of the failure of anti-realism, according to metaphysical realists. This premise of the anti-realist argument is simply wrong, they argue. Let’s take a closer look at Malnes’ (1997) interpretation of this problem.

The noted problem turns on the relation between *experiences* of a phenomenon and *concepts* that is used when talking about the experiences and describing phenomena. The relation between experiences and concepts is an important one in metaphysical realism. The experiences have their origin in *impressions* that we get of phenomena. Such impressions can - and often will - instigate our efforts to find concepts that create understanding of the phenomena. Thus, we can make concepts *because* we get impressions of some phenomenon and seek to put names on what we see and reach an understanding of it. Moreover, this leads to the following core proposition of metaphysical realism: *we can experience phenomena through impressions without being able to conceptualize what we experience*. This argument amounts to what Malnes (1997) terms the condition of *the immediateness of impressions*:

«We do not need concepts to receive impressions. The impressions arise immediately; they present themselves for the senses - often surprising and always without complete control.... They force themselves on us whether we like them to or not» (Malnes 1997: 31-32).

Malnes (1997) elaborates on this point by establishing that this argument from the immediateness of impressions is not based on the condition that impressions dictate conceptualization and descriptions. Impressions are ordered and interpreted and thereby something is added that does not arise immediately. Further in this argument it is important to introduce a distinction between *false* and *true* impressions. Some impressions are based in strong preconceptions, others on distortions. But then there are the impressions that «force themselves on us whether we like them to or not.... (These are the)...true impressions and impressions that are very hard to misrepresent» (Malnes 1997: 32). The recommended attitude is to try to meet the world with open eyes and let as much as possible force itself upon us. The basic experience of the immediateness of impressions is exactly why constructivism can not be taken seriously. Thus,

«(i)f impressions arise whether they are wanted or not, it follows that empirical phenomena exist independent of the concepts that are used about them. They exist in the capacity of the source of the impressions» (Malnes 1997: 33).

Here we are at a core difference between the externalist view and the internalist view. The latter argue that we make sense of the world through concepts internal to a scientific or epistemic or cognitive community. The former are not concerned with concepts in this sense. The argument goes beyond concepts and communities; we do not need them in the first place to receive impressions of the world. When we get an impression of some phenomenon but lack a concept about it, we are, so it seems, in direct, unmediated contact with the external world. From such a glimpse of the external world we are sometimes urged to conceptualize about it in order to understand it better and tease out its essential features. Such activity may or may not take place within or «internal to» the conceptual schemes of scientific communities, but, as far as I understand, that is of secondary importance. It is the basic inputs received prior to, outside or «external to» such schemes and communities that are of primary importance to the metaphysical realist.

Putnam's critique referred to above is directed against an external perspective, i.e. a symbol system external to reality, related to reality by a reference relation that gives meaning to the symbols. When the argument of the immediateness of impressions is invoked, the question of symbol systems seems simply to disappear because they are not needed in the first instance. Having received pre-symbolic, pre-linguistic or pre-conceptual impressions of the real world, the task of the serious and rational truth-seeker is then to account for these impressions in terms of; i) in the short run, the best - the most true - conceptual scheme available at the present time; ii) in the long run, the absolute best - the absolutely true - conceptual scheme. I return to this issue below, in relation to modes of knowledge production.

Following the above argument, the metaphysical realist position limits itself to a negative characterization of how the world is constituted (Malnes 1997): Its constitution is independent of our conceptions of it. These can be true or false; they can or they can not be in accordance with what they are about. This view implies a move from metaphysics or ontology to theory of knowledge or epistemology. This view is also the core of the *correspondence* theory of truth, according to which truth is defined as *correspondence between conceptions and reality*. But it does not follow from metaphysical realism - or the correspondence theory of truth - that any conception of anything is or has been true. It is possible that we never succeed in conceptualizing the world as it really is - its essential features - exactly because the world is something else (and more) than conceptions about the world. In the following, I will take a closer look at the indicated move from ontology to epistemology. Here implications for scientific knowledge production of the metaphysical realist position are discussed on the basis of some of Malnes' (1997) thoughts on how such production *should* be conducted.

3.2.2 Implications for Scientific Knowledge Production

In the words of Malnes (1997), we lay the foundation for conceptions of what is going on and exist through investigating the world and thus producing knowledge of it. These conceptions cover everything from simple common sense descriptions to abstract theory. What all conceptions or concepts have in common is that they are used to order phenomena so as to understand what *kind* of phenomena they are, how they *function* and how they have *come into being*. But when impressions enforce themselves upon us, we are confronted with phenomena that exist whether there is room for them in our conceptual world or not. Thus, for a metaphysical realist it is mistaken to claim that phenomena exist only if someone has conceptions of them in advance. This means that something *more* than conceptions of the world exist. There also exists a world independent of conceptions about it. But there are many conceptions of this world. Is it possible to comprehend empirical phenomena as they are in themselves - their essences - or the world as such? This question leads to the methods and procedures used when analyzing phenomena in the world. But first, it should be established what science is in a metaphysical realist perspective:

«(S)cience is rational search for truth. More specifically, empirical social research is systematic efforts at elucidating the courses of social life and why it takes the courses that it does» (Malnes 1997: 9).

Following this view on what science should be; what are the implications for social science knowledge production of a metaphysical realist position? To Malnes (1997) the question is whether we can accomplish the correct conceptions about empirical phenomena - or at least correct our conceptions and bring them closer to the correct understanding of the phenomena. With «correct conception» Malnes means a conception that is true according to the correspondence theory of truth: *The conception correspond to what it is about*. For a metaphysical realist, to correct a conception is to remove mismatches between it and reality. This makes the conception more *reliable*. She or he can put more confidence in it in her or his efforts to understand what exist and happen. Growing reliability is, in other words, the same as progress in the pursuit of truth. It also amounts to increasing degree of *objectivity* in conceptions of the world. A conception is correct to the degree that it give an account of a phenomenon the way it is in itself - i.e. its essential features - without adding or subtracting anything. Malnes find it more adequate to talk of objectivity rather than reliability, because this notion indicates the causes of mismatches between conceptions and reality:

«They have their origins in the *subjective* treatment of information about empirical phenomena by people. The more traces of subjectivity are eliminated, the more objective conceptions become. Complete objectivity appears if a conception can be made by anyone» (Malnes 1997: 37).

One implication of the realist metaphysical precondition is that conceptions can not be compared to what they are about just by holding them up against existing facts, as one may compare a map with the landscape it represent. To find out if a conception is true a metaphysical realist ask; where does it come from? What kind of grounding does it have in what it is about? Is it based on impressions that give good proofs about how the world is? An important point here is that impressions limit the content of descriptions:

«they not only tell that a world exists that is different from conceptions about the world, but also bear witness to how the world is. They limit our epistemological freedom unless we consciously overlook or displace them» (Malnes 1997: 42).

We should adapt conceptions according to what kind of proof we have in efforts to get *behind* the descriptions of the world to find out how things *really are*. This is accomplished through examining the causal chains leading from phenomena, via impressions of what exist and happened, towards conceptions. How reliable the conceptions are, depend on how good proofs the impressions give in each case.

The optimal accomplishment for a metaphysical realist is to account for a phenomenon the way it is in itself, to establish the *absolute truth* about it. Thus we know the essence of the phenomenon. But *historical truth* is the best estimate of the absolute truth that available information at any point in time allows. How good the estimate is, depend decisively on how strong grounding it has in reality by virtue of the impressions it builds on. For a metaphysical realist it is a relevant question whether repeated improvements of historical truths may, eventually, lead us to the absolute truth about a phenomenon. Even if new information about a phenomenon may always discourage such efforts, it is an implicit aim of science according to this view since different conceptions are compared as to which is the best account of truth, i.e. of the essence of the phenomenon. Thus to accomplish this, what Putnam has termed a God's Eye View is invoked. Here, a pragmatic realist would be content to acknowledge that standards and procedures for establishing what is - at the present moment - the best account, are external to the individual researcher but internal to a scientific community.

In processes of knowledge production based on a metaphysical realist view it then becomes an important task to eliminate elements that may hinder the pursuit of absolute truth and the efforts to supply empirical conceptions with increasing reliability and objectivity. To give the best possible

account of the true essence of a phenomenon, good proofs must be actively collected. Thus conceptions of truth will be rooted in reality by systematically seeking out and sorting impressions of the phenomenon. In the words of Malnes,

«to conquer the obstacles in the pursuit of truth amount to going rationally about in making conceptions for ourselves. Sceptical doubt in the possibility to reach any true conceptions is to a large degree due to a lack of confidence in the ability and urge of humans to make rational beliefs» (Malnes 1997: 45).

At the core of such processes of making empirical conceptions in a rational way is *the power of judgment*, i.e. the ability to make wise decisions that are neither guided by rules nor take the shape of ad hoc discretion (Elster 1983). According to Malnes (1997), there are two reasons why a person needs just this ability when he or she wants to make a reliable conception of something that is not completely clear at the outset. First, it is difficult to imagine stable and exhaustive rules for how to summarize mixed and ambiguous information about a phenomenon into a description close to reality. Second, a purely arbitrary appraisal of a complex situation can hardly give a correct account of the situation. The ability to comprehend in a reliable and objective way is, in other words, based on wisdom of the kind that power of judgment represent; a power exercised when a conception of a situation is made with the attention directed fully at the situation itself. This will amount to a situationally conditioned conception, made with reference to contextual conditions.

The metaphysical realist's efforts at eliminating elements that may hinder their pursuit of absolute truth are directed against a set of mental mechanisms that nourish scepticism about the ability to arrive at such conceptions of the world. These mechanisms can potentially lead to a breakdown in cognitive rationality and distort the production process. Among the most important ones are conceptions steered by interests, wishful thinking, instrumentally made conceptions, prejudiced conceptions and ambiguity. Malnes (1997) argue that they can be kept in check by conscious reflection on the process of pursuing truth. Even when these mental mechanisms are managed satisfactorily, there remain the most radical of doubts. But in order to be able to produce knowledge that we believe is true, we must proceed as if this doubt does not exist. We must keep the confidence in the ability of humans to make rational beliefs.

4 SUMMING UP

To round off this essay, I turn to some of the most significant and enduring results of research in social studies of science and technology. This research has demonstrated how truth is the contingent upshot of social action rather than its prerequisite. Knowledge claims are deemed to be true as a result of a particular concatenation of social relationships; truth is the ex-post shorthand for agreement on a state of affairs; facts become true (facts) by virtue of actors' beliefs; beliefs are not caused by true facts (Jasanoff et al. 1995). I find it more relevant to interpret this as empirical realities in contexts of inquiry, not some irrational and distorting factors that can be eradicated by hard work and logic, as the metaphysical realists tend to believe. Regarding, for instance, social studies of technology, the crucial role of interpretation and persuasion in the internalist perspective suggests we need to attend closely processes of interpretation of technologies by relevant actors, rather than assuming that we are persuaded by their «inborn» essences, like e.g. inherent capacities. This does not mean that any interpretation is as good as any other. Rather, the point is to analyze why some accounts - of scientific facts or technological artefacts - seem more persuasive than others.

Discourses of scientific communities are not so much reflections of material reality but (re)constructions of it; particular ways of representing the world through language and practice. As Gergen (1992) argues, the modernist assessment - often based on metaphysical realism - construes «truth» and language in a reflective relation, such that language acts as a slave to the «truth»; the more objective the empirical measure of «reality» the closer is language to the «truth». Against this, more sceptical currents - often based on pragmatic realism - prioritize the status of language and representation more generally: what count as true and false is not determined by the essence of the phenomena themselves because such phenomena are only brought into existence through representation. In short, the «truth» is determined by the power of the discourse. As Foucault argues: «Truth isn't outside power each society has its regime of truth, its 'general politics' of truth (1980: 131). This means that, in an internalist perspective, we are faced with representations of reality, not reflections of reality. A reflection implies *the* truth, a representation implies *a* truth. But an internalist will not say that some interpretations are true and others are false since this assessment would require access to an unmediated reflection of the truth. Instead the aim of an internalist approach is to remain agnostic about the contending representations, in order to expose and account for the ways in which some representations become more powerful - and hence acquire a stronger claim to «the truth». In the course of inquiry any claim may, of course, be disputed and an alternative «truth» may subsequently replace it. To take the example of social studies of technology again, the interesting questions are not 'What does the technology do?' or 'What are the effects of technology?' since these questions presume an objectively verifiable - that is, unmediated - truth. Rather, the point is to analyze the way certain technologies gain specific attributes. But this is not to suggest that machines do not have effects. Instead, what counts as an effect (or even a machine) is taken to be a social process involving the persuasive interpretation of information and the convincing attributions of capacities.

In short, the scepticism of the internalist approach insists that constructed narratives are accounts, not reflections, of for instance, the technical capacity of a machine. The significance of groups of inquirers and interpretative communities in the internalist approach and the acknowledgment of much the same mode of inquiry in commonsense practice means that our knowledge - both scientific, technological and other - is the results of our interpretations of other people's interpretations and practices.

REFERENCES

- Alvesson, M. and Sköldbberg, K. (1996). *Tolkning och Reflektion. Vetenskapsfilosofi och Kvalitativ Metod*. Lund: Studentlitteratur.
- Bhaskar, R. (1993). *Dialectic. The Pulse of Freedom*. London: Verso.
- Elster, J. (1983). *Sour Grapes. Studies in the Subversion of Rationality*. Cambridge: Cambridge University Press.
- Foucault, M. (1980). *Power/Knowledge*. Brighton: Harvester.
- Gergen, K. J. (1992). «Organization Theory in the Postmodern Era», in Reed, M. and Hughes, M. (eds.), *Rethinking Organization: New Directions in Organization Theory and Analysis*. London: Sage.
- James, W. (1978). *Pragmatism and The Meaning of Truth* (one-volume edition). Cambridge, Mass.: Harvard University Press.
- Jasanoff, S. et al. (eds.) (1995). *Handbook of Science and Technology Studies*. London: Sage.
- Josephson, J. R. & M. C. Tanner (1994). 'Conceptual analysis of abduction', i Josephson, J. R. & Josephson, S. G. (ed.). *Abductive Inference. Computation, Philosophy, Technology*. Cambridge University Press, New York.
- Ketner, K. and Putnam, H. (1992)(eds.). *Reasoning and the Logic of Things*. Cambridge, Mass: Harvard University Press.
- Lakoff, G. (1987). *Women, Fire, and Dangerous Things. What Categories Reveal About the Mind*. Chicago: The University of Chicago Press.
- Malnes, R. (1997). *Filosofi for Statsvitere*. Oslo: Tano Aschehoug.
- Mirowski, P. (1988). "The Philosophical Basis of Institutional Economics", in Tool (ed.) *Evolutionary Economics, Vol. 1 Foundations of Institutional Thought*. Armonk, London: Sharpe.
- Putnam, H. (1980). «Models and Reality», in *Journal of Symbolic Logic* 45: 464-82.
- Putnam, H. (1981). *Reason, Truth and History*. Cambridge: Cambridge University Press.
- Putnam, H. (1989). *Representation and Reality*. Cambridge, Mass.: The MIT Press.
- Putnam, H. (1995). *Pragmatism. An Open Question*. Oxford and Cambridge: Blackwell.
- Toulmin, S. (1953). *The Philosophy of Science*. London: Hutchinson.
- Toulmin, S. (1974). «The Structure of Scientific Theories», in I. F. Suppe (ed.). *The Structure of Scientific Theories*. Urbana: The University of Illinois Press.