University Policy and Ideological Shift – On Reversed Reification and Norm System Changes

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Abstract

Neo-liberal ideology has changed the public sector, its social welfare systems and health care, as well as university research and education. The neo-liberal view of society as steered only by commercial interests is represented also in some research policy theories, which see research project groups at university as small pseudo-firms competing with others for financing in market-like conditions. The idea of a semi-autonomous researcher, who delivers social critique, plays no role in neo-liberal research policy theory. A general trend towards external financing for university research will in the future probably make independent researchers to a rare species. In this article the neo-liberal development of university and research policy is described as a "reversed reification", which is a free elaboration on the complex meaning of the Latin term "res". It means "thing" or "object", but also something that "concern us all", the latter close to ideals often connected to the public sector and the modern state. In the beginning of the last century the idea of "something that concern us all" was applied to the private sector, but with neo-liberal politics in the 1980s the ideal of market economy is invading the public sector and university settings; this is the meaning of the term "reversed reification". It is aimed to be a critique of neo-liberal ideology in politics and economics, as well as its counterparts in the area of research policy theory. The article is also to be seen as an answer to the call from Jürgen Habermas to reformulate the critique of reification that will offer a theoretical explanation of the decline of the welfare state, without surrendering the project of modernity or descending into post- or anti-modernism.

Introduction

For almost two decades, many researchers and teachers on a global scale have witnessed the introduction of market-like behavior at universities, and the use of terms such as market relations and consumer choice in university settings. Universities, as well as the public sector, have seen the shaping of an internal market as guarantor of accountability and efficiency, and competitiveness as an imperative for the activities. As a consequence, most authors in the science policy arena today describe the global research landscape as largely changing.[1] Whereas researchers previously were depicted as peacefully working with their own specific questions on the university campus, today analysts emphasize adaptation to societal development. Research disciplines are seen to collaborate and the abyss between basic and applied science has been over-bridged by heterogeneous collective work, all in answer to the needs of a growing and globalized economy. The changes have important input not only for research policy, but for education policy and university management in general, and have often been welcomed by policy makers and also researchers. Some few critical voices have pointed to several problems with the new scenario.

For one thing, there is a general lack of empirical evidence to support the proposed picture. Also there are difficulties for some disciplines to adapt to the development. Possibilities to commercialise research results are definitely rare in, say, humanist disciplines, when compared to technology and medicine. A third point of criticism concerns the general assumption that society is moving in a democratic corporatist direction, whence all different social interests in research will ultimately merge. The problem with this democratic corporatist view of society is that researchers in their work still have a longer time horizon compared to industry, due to the different culture that exists in university research with its often explicit cry for originality. Many large industrial companies today instead follow a so called "quarter capitalism" where the latest economical 3-month report steers policy decisions. A merging of interests between the two research sectors, i.e. a largely commercialized university research sector, can seriously affect society's social development since there is a risk that the independent researchers disappear. Also industry will in the future perhaps have difficulties finding new and original ideas to develop for commercial use, since these presuppose the existence of basic research which is the primary task of the

universities in many national innovation systems. Some countries also tend to reduce the state support for research, which is a policy in line with the view of merging interests. Consequently, there is a greater dependence on external financing of university research – and this for many researchers means a general lack of funding for activities with no explicit possibility for direct application.[2]

There are many more critical points that might be discussed. However, the present article will take a broader approach, focusing first and foremost on science policy research, and considering the ideological background behind the new theories of production of knowledge. Apart from the need for empirical studies of the changes of the research landscape, deeper and more general understanding of these changes is also needed. The article provides a philosophical interpretation of new economic theories, and investigates their connections to the latest development in research policy theories.

With this approach the article gives a brief overview of three rather different theory areas, which will be loosely knit together. It starts with a short description of the ideas of a post-industrial society with Daniel Bell, the neo-liberal theories in Milton Friedman's writings, and its development in the works of Osborne & Gaebler. After this background, there is a description of the new research policy introduced by Gibbons et al and by Etzkowitz & Leydessdorff. After this there is a brief introduction of the classical concepts of reification, providing these with a new interpretation. Hopefully, this will lead to a new understanding of social changes, which seriously have affected also the research landscape during the last decades. The question put forward is of course whether or not modern university researchers and teachers can adapt to a new entrepreneurial role adopted from the world of commerce, to forge close relations with the private sector without generating problems regarding the traditionally acknowledged independence of researchers. There is also a more general question if the new buy & sell habits in the public sector will serve the norms traditionally attached to the public sector, if these norms still are valuable, and if they are, how can they be reconstructed? The strong influence of commercial norms in the public sector, and also the universities, we shall refer to as "reversed reification", which is a rather free elaboration on the meaning of the Latin term "res". The term originally meant an object, a thing, but more specifically "a thing that concerns us

all". The latter meaning seems to be important for our understanding of the development of society, its public sector and the universities. Contrary to what neo-liberal ideologists would have us think, "things that concern us all" can perhaps not be seen as totally governed by commercial interests.

Theories of economics behind the new development...

Classical liberal ideas on social change have often emphasised the different roles of social groups in society. Differences between various social groups were for instance obvious in the early modern philosophy of Hegel. Already in the early 1800s, he regarded society as divided in three classes: the agricultural, the business and the universal classes. He described farmers as "substantial" or "immediate" because of their work with farming and crop. The business class he called "reflecting", because of their need for fast market adaptation. The "universal" class was that of state servants, who according to Hegel's idea of an absolute Ethical idea governed society in general terms. They were seen as taking care of society's need for a longer time frame without bonds with other classes, and no interests of their own.[3]

This idea of the specific role ascribed to the state civil servants is surprisingly similar to von Humboldt's idea of a university with researchers doing their work with no strings attached.[4] Humboldt's idea comes close to the well-known ivory tower position, a rather conservative view of the researchers' role in society compared to Hegel, who saw the state civil servants actually serving society best when they were semi-autonomous and without particular interests. In their activities, they ought to be guided by some sort of higher modern norms of equality and democratic rights for all. With this interpretation, there is a difference between Humboldt's and Hegel's ideas, and we will use this difference in making sense of the concept of a semi-autonomous researcher.

The notion of society divided along different interests, social groups and classes has since the early 19th century been a hallmark of classical liberalism. It is also a general trait of Marxism in all its versions, however with different conclusions. A general tendency opposing this view on society may be found in different varieties of corporatist ideas. In corporatism interests of different social classes instead coincide. A corporatist view of society also lurks behind Hegel's absolute Ethical Idea, but

remember that he discussed particular interests, which could be orchestrated and kept in balance with the help of independent civil servants who were guided by the idea of a general modern *Zeitgeist*. In the following section, we shall consider a number of proponents of corporatism. Daniel Bell is a classic case. His famous book from the early 1970s on post-industrial society pictures a situation where researchers adopt a guidance role for the general benefit of the whole society: "In the post-industrial society, technical skill becomes the base of and the education the mode of access to power: those (or the elite of the group) who come in the fore in this fashion are the scientists."[5] This peaceful development of society, where scientists in real life finally are doing what Hegel probably saw as an "ought-to-be", attributes a special role to academic researchers in a new post-industrial society, where class conflicts and clashing interests belong to a period already in the past.

The neo-liberal economist and ideologist Milton Friedman too saw the new growing society in terms of merging interests, but in his view the whole society appeared to converge around what many probably would see as plain industrial interests. According to Friedman the globalisation of the world economy calls for a dismantling of the welfare state. Taxes and state regulations must be cut down to an absolute minimum if countries in the industrialised world are to be able to compete with the growing economy in the newly industrialised countries in the South East. In this scenario there is no longer any special role for the civil servants. Thus he writes:

> Instead of regarding civil servants and legislators as disinterestedly pursuing the public interest, as they judged it - in sharp contrast to the behavior we have attributed to participants in business enterprises - economists have increasingly come to regard civil servants and legislators as pursuing their private interests, treated not as narrowly pecuniary or selfish but as encompassing whatever ends enter into their utility functions, not excluding concern for the public interest.[6]

In his view state civil servants have no privileged position. They must work under the same conditions as all others, and of course there is no absolute "Ethical Idea" to follow. Friedman opposed all ideas that did not square with the logic of the market. Thus he claimed:

> There is no objective standard of "fairness". "Fairness" is strictly in the eye of the beholder. If speech must be fair, then it cannot also be free; someone must decide what is fair...To a producer or a seller, a "fair" price is a high price. To the buyer or consumer, a "fair" price is a low price. How is the conflict to be

> adjudicated? By competition in a free market? Or by government bureaucrats in a "fair" market?[7]

Given the new societal conditions where there is a rule or idea governing what state civil servants should do, Friedman suggests that everything in society should be seen as a firm. Thus the market rules apply to all of society, including the entire educational system. In other words:

> In schooling, the parent and the child are the consumers; the teacher and school administrator are the producers. Centralization in schooling has meant larger size units, a reduction in the ability to choose, and an increase in the power of the producers.[8]

The implication for the university setting is that it should be denied public support for research. Or, as Friedman put it:

> ...there is little doubt that the extent to which people in the academic world are being financed by government has a chilling effect on their freedom of speech. What is true for the medical people is equally true for my own colleagues in the economic departments who are receiving grants from the National Science Foundation. I happen to think that the National Science Foundation ought not to exist, that it is an inappropriate function of government.[9]

We can conclude that Friedman in his neo-liberal program saw the rules of a free market economy as the guiding principles for all of society, including the role of civil servants, schooling, university research and teaching, university management, and so on.

The neo-liberal attack on the modern state, the lowering of taxes and the destruction of welfare systems during the 1980s, turned out to be a bitter medicine in many countries, involving severe cut-backs in the public sector, which still had to cope with huge deficits in the state budget. A somewhat milder form of neo-liberalism was introduced in the early 1990s. David Osborne's and Ted Gaebler's book *Reinventing the Government* represents a post-Keynesian version of the same doctrine, now based on the idea that different rules apply to private and public sectors, respectively. The former public sector was seen as a consequence of an industrial society; it was governed top down. The new post-industrial society, it was argued, should have a public sector that would be more closely adapted to the needs of individuals. At the same time, there was a pressure from the global economy to adopt international habits

in financing of public expenditure – i.e. a lowering of taxes and cut-backs in the public sector. Here the solution was not to privatise the public sector but rather to introduce market-like behaviour, inducing competition and a general culture similar to that prevalent in the private sector. The slogan was not "privatise" but rather "steering, not rowing", i.e. the state should still have some control over the public sector, but it should not perform the activities on its own.[10] This new concept brought with it the idea of generating an "internal market", a term we today often hear also in university settings. Different organisations in the public sector should be encouraged to compete with each other; a rule that was justified by the claim that such an arrangement provided an incentive to make those who worked in the public sector more loyal, convinced and willing to collaborate to change the organisation. The new way to organise the public sector obviously had an influence on the minds of those who were working there.[11]

However, critical voices were soon heard. An example was the British authors Stewart & Walsh who criticized the use of language and methods picked up and transferred from the private to the public sector. As they saw it, there were large differences between the two sectors and these should not be blurred. The private sector is necessarily steered by supply and demand, but the public sphere relies on collective needs. Furthermore, the public sphere allows for openness to citizens, whereas the private is "secret". The private is geared to customer demands, whereas the public should be predicated on a fair distribution of public goods. The private sector is essentially competitive, but public administration follows a collective principle and is built around an idea of democratic rights whence every citizen has a right to speak and criticise affairs.[12] To introduce market concepts into the public sector leads to many difficulties; one of the more obvious is of course the way in which organisations in health care should compete with each others adapting to the habits of a free market. Since all treatment in health care for centuries has been controlled by law, regular market competition is difficult, if not impossible. Introducing the profit motive into the treatment of patients is close to a criminal act according to the traditionally accepted regulations in the health care sector.

The changes of the public sector in the wake of the neo-liberal revolution in many countries in the Western world soon also had an impact on the education systems and

finally the universities, which often saw their funding from the Government frozen or cut down. Soon this tendency also had its apologists in the small area of theory pertaining to research policy.

...and its research policy theories

The Mode 2-concept is perhaps the most well-known term used to indicate the impact of changes described above for the university sector. Gibbons et al in the mid-1990s presented their Mode 2-theory saying that university researchers, who previously most often worked on internal disciplinary "Mode 1"-problems, were now more inclined to involve themselves closely in industrial and governmental research collaborations. Economical factors were seen to be the drivers, as closer relations between university research and industry developed to meet competition from the growing economies in the South-East. This trend prompted new organisations like think tanks, centres of excellence and hybrid organisations, which often were places where the new front research was to be found. Gibbons et al referred to these as "Mode 2-organisations", seeing them as generic for the whole research landscape.[13] In a later work Nowotny, Scott and Gibbons noted how these changes also impact academic criteria of quality and the epistemology of science, i.e. what is interpreted as good and "true" science, is no longer only for internal assessment within the academic community.[14] The authors also clearly stated that they saw the development of Mode 2 in research and society as a result of a general economic development towards post-industrialism.[15]

The concept of Triple Helix, developed by Etzkowitz and Leydesdorff, focuses on the same changes. In this view, there are three major actors in science – university, industry and government – and these extend beyond their former specific areas and change their former roles in closer collaborations for the benefit of economic development of society:

The dynamic of society has changed from one of strong boundaries between separate institutional spheres and organizations to a more flexible overlapping system, with each taking the role of the other. The university is a firm founder through incubator facilities; industry is an educator through company universities and government is a venture capitalist through the Small Business Innovation Research (SBIR) and other

programs. Government also has encouraged collaborative R&D among firms, universities and national laboratories to address issues of national competitiveness.[16]

This picture of the present situation reminds of the one described as a corporatist society where strong lobbyist groups can collaborate for their mutual interests. However, in Etzkowitz´ view the collaborations and development seem to follow a single logic: university research is increasingly driven by commercial rules. This in turn affects organisational forms:

> As scientists engage in research, and the gathering of resources with which to conduct research, they create firm-like entities or "quasi-firms". Quasi-firms operate according to the model of classical capitalism as small entities competing with the other for resources. Firm formation, then, is merely a further step in the process by which scientists create research groups at the universities, institutes and corporate, rather than a sharp discontinuity in practice.[17]

Etzkowitz admits that his vision of the new situation in research is close to the idea of "democratic corporatism", in the sense that the original differences of interests in science held by different social groups are diminishing in a post-industrial society.[18] The corporatist view has also wider implications for society since it comes close to what was earlier seen as a military/industrial complex where ordinary citizens' interests are marginalized. This seems to be something that Etzkowitz also realizes when he notes:

> A new institutional configuration to promote innovation, a "Triple Helix" of university, industry and government is emerging in which the university displaces the military as a leading actor.[19]

Several authors have questioned such interpretations of the new situation, and consequently also the associated concepts. Slaughter and Leslie, for example, regard the new situation as depending not so much on a general economic trend but rather as a result of a general constriction of the public sector inspired by neo-liberal politics, which in turn forces researchers to seek financial support elsewhere[20] – and that is close to the view put forward also in this article.

John Ziman for his part questions the idea of a research community in which the interests of different actors are merging. With his term "post-academic research", the classical ideals of free research and neutrality among university researchers do not

disappear, but are rather competing with new norms underlining the commercial value and social role of science.[21] Steve Fuller has questioned the description of the situation as something "new", since collaborations between university and a surrounding society were tendencies already witnessed in early modern science in the 1700s. Fuller has also noted how the concept knowledge society has made it easier for university researchers to adapt to market-like and entrepreneurial behaviour.[22] Alister Scott has raised the question of why there is no room for other research areas, such as the social sciences, in the discussion on science policy concerning the new situation in research.[23] Aant Elzinga has recently questioned the concepts of Mode 2 and Triple Helix and pointed to its focus on disciplines with well-known possibilities for commercial use, i.e. technology and medicine, whereas other disciplines are mostly ignored.[24] Thorpenberg has criticized the role of democratic corporatism in Etzkowitz´ Triple Helix-concept since the term largely ignores the different interests in science expressed by different social groups. Investigating the Nordic institute sector with its long standing position between the two worlds of science – university and industry – and consequently for a long time having a likeness to "Mode 2-organisations", Thorpenberg found no support for a merging of interests between researchers and industry. Researchers at the institutes instead reported a shorter research perspective when the contacts with industry became more intimate in the 1990s.[25] This process was seen as influenced by reductions in state-support, an explanation quite close to the one put forward by Slaughter & Leslie.

These changes will probably have a large impact on the norm-system traditionally held by researchers. Sheldon Krimsky has pointed to the problems, and questioned the new developments involving closer relations between what he calls not a "Triple Helix" but the "triad between industry, government and university". The loss of critical voices necessary for society's development can lead to:

> ...the disappearance of a critical mass of elite, independent, and commercially unaffected scientists to whom we turn for guidance when we are confounded by technological choices.[26]

With this the democratic corporatist approach in the Triple Helix concept is questioned. Academia's internal interests for research questions seem still to be far away from industry's interest for commercial products or the government's interest

for useful results, or even from ordinary citizens' more mundane problems. This emphasis on an arm's length independent approach on the part of academia cannot *a priori* be regarded as totally useless, at least not when it comes to a long term perspective on the development of society.

The closer contacts between university and industry also generate problem on a more daily basis for researchers. Boyd & Bero have shown that American university researchers have developed close relations with financiers, and also often have accepted positions on boards and committees at industrial firms. This has led to a situation in which other researchers sometimes hesitate to send their articles to journals where they know these "member of the board researchers" are referees, because they expect bias in quality assessments, or suspect that the results may be stolen.[27] The general commercialization trend in research will probably also disturb the development of new and original ideas, as the obvious application is often difficult to assess.

This discussion leads to the general view of the framework of the inner dynamics of university research. Barry Barnes, among others, has seen the activities in university research being performed within a credibility circle, where researchers publish their results, not for immediate gain but in order to increase their credibility (which later may lead to academic posts), in a way which differs from a surrounding commercial society.[28] Barnes' credibility circle obviously does not treat university researchers with the same conditions as the commercial world, but recognizes the differences between the sectors. The same credibility circle has, however, also been described by Latour & Woolgar in their work *Laboratory Life*, but instead, it is interpreted being similar to the commercial world. Researchers run their activities according to the rules of supply and demand within a market. Unfortunately, Latour & Woolgar´s version of the credibility cycle is remarkably close to the neo-liberal doctrine described earlier, a view that understands everything in society in market terms.[29]

The different versions of a credibility cycle also prompt the questions regarding what norm system should guide researchers. Merton's CUDOS norms depicting the research community as dependent on higher ideals of sharing and organized skepticism etc, are well-known.[30] However, we here want to go further back to the issue implicit in the Hegelian explanation of why it originally was necessary with a

semi-autonomous role for civil servants. The new situation for university researchers where state support in many countries is frozen or diminished, will certainly affect the base from which a researcher can deliver independent critique, and hence the integrity of the research process. With a heavy dependence on external funding the possibilities for critique will probably decrease, and perhaps researcher's critical mission in the future will be totally taken over by intellectuals in social movements. Still the economical base as such does not dictate the actions undertaken by living people, and the social institutions where researchers perform are probably also important. The social credibility cycle as described by Barry Barnes above does not require a researcher to stay silent in debates regarding society's development. Journalists have for many centuries been employed by privately owned newspapers, but they nevertheless retain an *ethos* that encourages critical investigations of society without worrying about their institutionalized position in the commercial world. Researchers have also for many decades criticized society and government but have had their basic financing from state resources. The new situation with reduced state funding has in the UK developed to a situation where only 20% of post-doctoral researchers today end up in full-time posts on the universities. With a majority of the researchers working on short-term contracts, there will be less room for civil courage, whereas the numbers of dissidents who can still work on the basis of tenure posts decrease.[31]

However, a critique of a general trend in society's development, which is seen as having a strong impact on the overall development of research as well, should perhaps not only be addressed in specific and detailed terms, but also in general and more comprehensive. The changes of the public sector and the universities in many countries of the Western world can also be understood in philosophical terms, and we will now investigate the classical reification concepts and explain and criticise the current situation with the help of the term "reversed reification", which will be elaborated in the following text. Before doing so, it is necessary to briefly review the history of the concept of reification.

Reification: background and different interpretations

The notion of reification was originally introduced in modern philosophy by Hegel. An interest for Adam Smith's economical theories led him to investigate the impact modern production circumstances have on the mentality of workers. In addition, there

was probably a specific epistemological problem. Post-Kantian philosophy strongly exaggerated the role of the "subject" in the interpretation of an "objective" world existing outside the individual minds. The Kantian idea of a thing-in-itself, or *Ding-an-sich*, was often lost in early post-Kantian philosophy. Hegel's approach was to avoid the subject-object dichotomy by postulating dialectic between a subject and an object. However, he had to explain how the epistemological process at hand worked, and perhaps it was good to relate to the modern production process when explaining this. A possible material factor was the modern production process in as far as people in connection with their labouring activities have to see the resulting products as something different from themselves. They see them as "objects", external to themselves; otherwise they could not relate the products of their work as something to be later sold on a market. This strictly epistemological version, with its balance between object and subject, characteristic for Hegelian "objective idealism", is highlighted in Lukács´ explanation from 1938 of the reification problem in modern society. He distinguished the process of objectification as described above from alienation. Reification follows from the situation of objectification when alienation is at hand, but objectification and alienation are not synonymous:

> For alienation (*Entfremdung*) is sharply distinguished from objective reality, from objectification (*Vergegenständlichung*) in the act of labour. The latter is a characteristic of work in general and the relation of human praxis to the objects of the external world; the former is a consequence of the social division of labor under capitalism...[32]

Concepts of reification had earlier been described by the early Karl Marx in his famous *Paris Manuscript*, and compared to Hegel's version they represent a more harsh critique of capitalism. In Marx' view, the capitalist mode of production transforms the worker into a total stranger, to a veritable appendix in the whole production process:

> The **alienation** of the worker in his product means not only that his labour becomes an object, an *external* existence, but that it exists outside him, independently, as something **alien** to him, and that it becomes a power of its own confronting him. It means that the life which he has conferred on the object confronts him as something hostile and **alien**.[33] (my italics and underlines/ST)

Alienation is related to a situation where ownership and control of a product no longer lies in the hands of the worker, since the product becomes a commodity. In the

citation above one can see three different levels involved in the reification concepts. There is an "objectification", an "*externalisation*" and an "**alienation**"; terms which we here have given different italics and underlining. As touched upon in the earlier citation from Lukács, these concepts are not on a similar level, nor do they have the same problematic result for people involved in the production process. In addition, Marx' original German text also had a different line-up, starting with externalisation (not alienation), moving back to objectification and ending with the depressing result of the alienation of the worker in modern industrial process (see footnote).[34]

The gradually increasing impact of the modern production process on the workers' mind is probably an influence from the journalist background Marx had, a background often demanding an agitated style of writing. Still, there is a problem with the translation of the terms in the English *Collected Works*. Starting and ending with alienation, instead of starting with externalization (*Entäusserrung*) and ending with alienation **(fremd)**, gives the terms an almost similar meaning. The view of objectification as a "characteristic of work in general and the relation of human praxis to the objects of the external world" is difficult to have: it is all just a part of the whole alienation and reification process.

The alienation problem in modern production in Marx' early *Paris Manuscript* from 1844 was only shortly touched upon in his later *Capital*, but then in terms of "commodity fetishism". Also in this later work, Marx tried to find a balance between reality and subjective perception. Marx compared physical qualities and commodity values, and regarded the latter as being close to religious beliefs:

> ...the light from an object is perceived by us not as the subjective excitation of our optic nerve, but as the objective form of something outside the eye itself. But, in the act of seeing, there is at all events an actual passage of light from one thing to another, from the external object to the eye. There is a physical relation between physical things. But it is different with commodities. There, the existence of the things quâ commodities, and the value-relation between the products of labor which stamps them as commodities, has absolutely no connection with their physical properties and with the material relations arising therefrom. There it is a definite social relation between men that assumes, in their eyes, the fantastic form of a relation between things. In order, therefore, to find an analogy, we must have recourse to the mist-enveloped regions of the religious world.[35]

But this fairly subjective interpretation of the values of commodities was, however, mediated through the social reality of modern capitalist production:

> ...the relations connecting the labor of one individual with that of the rest appear, not as direct social relations between individuals at work, but as what they really are, material relations between persons and social relations between things.[36]

With this dialectic between subjective perception and actual social reality, the danger of commodity fetishism for the minds of workers becomes obvious. The belief in commodity values was not just a brain ghost; it also corresponded to the social reality which the workers experienced. The alienation concepts were, however, given a lesser place in the later work of Marx, and perhaps the placement depends on the large hope that Marx had for the working class as a historical subject. A strong interpretation of the reification concepts, i.e. the whole process of objectification, externalization and alienation depending on the modern industry production, will leave the worker hopelessly alienated and reified – and modern society with no historical subject. The reification concepts were, for a long time, forgotten in philosophy and played no part in the labor movement of the early 1900s.

First with Lukács´ *History and Class Consciousness* from 1923, the view of production circumstances as having an impact on the workers minds was re-introduced in modern philosophy. Lukács did not know about the *Paris Manuscript*, which was first discovered in 1932, and in his version the differences between the concepts were somewhat lost. Instead the term reification, or German *Verdinglichung*, was used to sum up the whole process. The reason for this was that the original word in the epistemological discussion in the already mentioned term *Ding-an-sich*, something objective lying outside the human mind, had a meaning of "not possible to change". Lukács *Verdinglichung* meant that the worker was objectifying the products stemming from his hands in the working process, which also led to the view that he was seeing himself as an object. He sold his work on a labor market and consequently was involved in a process he could not influence. In translations, Latin entered into the picture. The Latin term for "thing" is "res", leading to the term reification, rather than "thing-isation", which might have been more suitable for expressing the same idea.

The differences between the terms in the reification concept were not apparent for Herbert Marcuse either when he, as one of the first writers to do so, commented on the newly discovered *Paris Manuscript* in 1932. Marcuse saw the concept as having a general impact on mankind, but the differences between the specific terms were not clear.[37] With a similar meaning for the terms for objectification and alienation, the road towards a view of the modern society where technology is an enemy to the minds of the workers was open. The workers' role as a historical subject must certainly be forgotten if they immediately are to be totally reified by the rationality in the working process. Theorists of the early Frankfurt school were also known to have an overly pessimistic view towards the possibilities to change society for the better, which led Lukács to ironically refer to them as the "Grand Hotel Abyss". Habermas has later pointed to the problem with this version of the interpretation of the concepts. When merged with a strong interpretation of Weber's concept of *Rationalität*, not only the modern production process but also technology and science appear as reification instruments because of their inherent rationality.[38] This interpretation of the reification concepts today is often seen in post-modern and social constructivist texts, which will be briefly discussed below. One author is Bruno Latour who speaks about the social consequences of modern technology:

> No technology without rules, without signatures, without bureaucracies and stamps. Law itself is no different from the world of technologies: it is the set of the modest technologies of writing, registering, verifying, authenticating that makes it possible to line up people and statements.[39]

The similarity between the early Frankfurt school and the social constructivist Bruno Latour in the interpretation of the reification concepts is striking. And the reification concept played a role already in early social constructivism. When David Bloor in his book *Knowledge and Imagery* of 1976 motivated the need for a "strong" sociology of science, he noted why scientists generally do not like social studies of science:

> Science is sacred, so it must be kept apart. It is, as I shall sometimes say "*reified*" or "mystified". This protects it from pollution which would destroy its efficacy, authority and strength as a source of knowledge.[40] (My italics/ST)

This is a view of science that has for long time inspired social constructivists to deconstruct all kinds of scientific results. They saw a need for a "subjectification" of scientific results, since the objectivist epistemology led to incontestable "true" results

that were impossible to argue against: science had a general "reifying" effect. The background in reification terms was also discovered by the strong programmist Barry Barnes, when in 1993 he criticised the movement:

> In making a conception of what is real visible as a *reification* they seek to devalue the account: the move away from the real serves to change the standing of the account just as it would for traditional epistemology. The only difference between the two schools is an incidental one: the realist epistemologists are typically enthusiasts for science, most unwilling to call its authority into question, whereas constructionists are not.[41] (My italics/ST)

Barnes here points to the general problem with a social constructivist epistemology: the move away from the real, triggered by the view on an epistemological object as a reification, is thought to devalue scientific results. According to Barnes, this is the same old epistemology in which a result must be objectively true to have scientific value. Habermas has also commented on the interpretation of the reifications concepts in the early Frankfurt school since there is a risk for a critique of society and technology to abandon the modern project in itself, and to become a plain anti-modern civilisation critique. The book *The Discourse of Modernity* was written as a reaction to this:

> ...my real motive in beginning the book in 1977 was to understand how the critique of reification, the critique of rationalization, could be reformulated in a way that would offer a theoretical explanation of the crumbling of the welfare state compromise and of the potential for a critique of growth in new movements, without surrendering the project of modernity or descending into post- or anti-modernism, "tough" new conservatism or "wild" young conservatism.[42]

To avoid a "descending into anti-modernism", our conclusion is that sociology of science should develop a more complex interpretation of the reification concepts in line with what is indicated in the quotation from Lukács above. Such a more sensitive analysis has to distinguish between several different aspects in the process wherein human beings first see a surrounding world as "objects", and later start to externalise them. However, it is only in a later form and in modern production that "objects" and "facts" become alien to them. The term reification should be reserved to this latter form which is contingent on a specific kind of modern society.

As soon as an epistemological object, a *Ding-an-sich*, is accepted, the "strong" sociology of knowledge will be replaced by its "weaker" version, originally advocated by Karl Mannheim. And there is a difference between a strong and weak sociology, which was explained already in the early 1980s by Restivo & Chubin: "...whereas the strong programme makes claims about the negotiations of reality, particularly our conceptions of it, the weak programme emphasises the actions that people apparently take based on those conceptions."[43] A weak programme becomes more policy oriented and must as such soon be involved in a discussion of what norms should guide human activities. This was discovered by the sociologist Brian Martin who introduced "the standpoint of the citizen" as a norm for science studies.[44]

The norm of a "standpoint of the citizen" was soon attacked by Harry Collins who saw no need for it; instead, he reinforced the necessity of a symmetric or neutral perspective in science studies.[45] The resulting debate was later criticised by Bryan Wynne. In his own work, Wynne invoked reification concepts when arguing for a more complex understanding of the connection between society and science:

> The confrontation between "neutralist" and "committed" perspectives operates from a mutual *reification* of "sides", and neglects other alternatives. Despite their sharp differences over the "taking sides" question, both neglect the more fundamental reflexive question: what constitutes a "side" in the first place? Both *reify* the identities and interests of the participants, not only into diametrically opposed camps, but also into what are implied to be essentially given forms.[46] (My italics/ST).

Obviously, reification concepts have traveled a long way: from Hegel's epistemological analysis to a view of modern production on a micro-level, from the early Marx' critique of capitalism and the views of the mature Marx explaining influences on the minds of modern citizens. The terms were later re-introduced by Lukács and his version evolved into a general civilization critique with the Frankfurt school. In the quote above, the terms are instead used as a critique of the idea of having a standpoint in science studies, which is thought to be impossible because of the development of a post-modern society where traditional classes and social movements have disappeared.

Brian Martin's view of a standpoint, however, lies within the range of the more complex interpretation of the reification concepts, where an objectification is not

taken to be equivalent to the final result of alienation and/or reification. Perhaps it is also necessary to remind the reader regarding the original idea of a "standpoint".[47] The original reason for scientists to take part in social movements was according to Marx not "moral": these movements were seen as a historical subject, which in the future was thought to help Modernity in the fulfillment of higher social goals. To see the "taking sides question", with its background in the development of modern society, as reifying in itself tends to relegate all forms of social critique to purely academic concept analyses. The reification concepts should rather be used as a critique of the present development of modern society "that would offer a theoretical explanation of the crumbling of the welfare state compromise", as said by Habermas.

Reversed reification: a critique of neo-liberalism

Therefore, there is a need for a concept of reification that tends itself to the analysis of the present situation in our societies at large. For this, it is necessary to elaborate quite freely on the concept, and we return once more to the German discussion at the time of Hegel. It should be noted that the German term *Ding* does not only correspond to the English word "thing". It also has a broader root going back to the word *dinc* or *thing*, as used in the Icelandic word Thingvellir, i.e. the original parliament on Iceland. For some reason, this is also the case for the Latin word *res*, which does not only mean "thing", but refers to matters of discussion, or things that concern us all. The German philosopher Martin Heidegger reminded us of this in the immediate wake of the Second World War, when he wrote:

> The Romans called a matter for discourse *res*. The Greek *eiro* (*rhetos, rhetra, rhema*) means to speak about something, to deliberate on it. *Res publica* means, not the state, but that which, known to everyone, concerns everybody and is therefore deliberated in public.[48]

In this passage, Heidegger's critique was turned against the neo-Kantians, whose enlightenment epistemology emphasised freestanding objects, a *Ding-an-sich*. Heidegger instead saw an object as something integrated in the fabric of humanity, something relative and not absolute and therefore open for public discussion and intervention. What is incorporated in Heidegger's view here is also his specific conservative longing for the antique Greek or Roman society, where everybody understood everything to a greater extent, compared to the common view within

modern society that there is an object, and a true truth out there which scientists can investigate.

However, if Heidegger's linguistic insights here are used for our purpose, the word "reification" becomes very interesting, since it suddenly is saying something about the modern state and the public sector. In Sweden, for instance, the county councils are called "landsting", and the lower judicial organisations are called "tingsrätt". In other words: not only Greeks and Romans had the same word for "things" and "things that concerns us all", such as the public sector, but also in modern Swedish the word "ting" means an object and refers to something which is of common interest to all citizens. If we remember Hegel's view of an absolute Ethical idea, a norm which should guide civil servants in the modern state, it becomes clear that this comes close to understanding the state as *res*, as "something that concerns us all", i.e. it should also be something that is "outside ourselves" and not something that is occupied or dominated by strong lobby groups.

If this interpretation of the reification concepts is translated to the political situation in the early 1920s in Europe, one has to recall also what motivated Lukács´ interest in reification in the first place. As a minister of culture in the short-lived Hungarian Soviet republic, he was surprised to see that the workers did not support the revolution, but rather found it impossible to change the system. In Marx' *Capital* he read the concept "commodity fetishism" as a depiction of the workers' spontaneous view of the market and society as something sacred, something which was functioning outside his control. When he sold his labour on the labour market, the result of his productivity also became a part of the logic of the market – a system which could not be changed. The view of the private sector as something the worker also was a part of, being something that concerns us all, lies close to the idea of the norms according to the modern state as "res". This double meaning of the reification concept gives a new and different understanding of Lukács´ interest in it, and following this new interpretation, it becomes clear that the neo-liberal ideas stemming from Friedman and Osborne & Gaebler translate the rules and habits from the commercial world into norms for the public sector. The concept "things that concern us all" was in the early 1900s attached to the private commodity production sector, but now it is done the other way: the private sector is taken to the public. The "res" is in a non-reflexive way

transformed backwards; it is a "reversed reification" in political terms, rather than strictly philosophical. This new understanding of the reification is not so far from the mature Marx´ concept of commodity fetishism where the work process was seen as having a general influence on the minds of the citizens. The term reversed reification is, however, more a critique of the neo-liberal changes in society, the public sector and state universities during the two last decades. The changes have been built on the view of society being a small and perfect functioning commercial firm, and this view is now promoted as being the only alternative, the "one-way politics".

The "new" norms that have made their entry have radically changed the public sector, as many activities have been sold to private interests, generating new firms which now are selling services and products to other public sector firms. Stewart & Walsh have pointed to the fundamental differences between these sectors, the difference between supply and demand in the commercial world and the public sector´s traditional dependence on norms on democratic rights and possibilities to criticize and change according to the needs of the citizens. Slaughter & Leslie have shown how the new habits have entered the university world, where an "academic capitalism" has changed the former university habits as well as in research and teaching and in general management. Earlier research was mainly oriented to basic science and dependent on governmental funding. Today, universities are the hosts for firm-like entities hunting for external money in market-like competition with other firm-like project groups. If this is a quite adequate description of the present situation, the question arises – does it matter? This is a subject that warrants serious investigation on the part of STS-scholars as a basis for public debate.

Summary and discussion on a changing norm-system

For more than two decades, we have witnessed large changes triggered by the neo-liberal influence in politics, economics and social welfare on a global scale. The neo-liberal agenda looks at a first glance quite simple: a lowering of taxes is the overall formula to solve problems in modern society. The following cut-backs in the public sector certainly become the "one-way politics", and the solution to the problems with the financial deficits in public sector seems to be to let them finance themselves. This will be a problem since the public sectors in many modern countries for centuries have been driven by norms stating that it should be governed by collective needs,

work for a fair distribution of public goods, be built on the idea of democratic rights and be open for all citizens to criticize. The neo-liberal view instead sees the whole society, including the public sector, as a small and perfectly functioning firm – a view of business life which probably sounds somewhat unfamiliar also for many persons working in the private sector.

The general change can be described as a commercialization of all sectors of society. In our view, the tendency of norms and habits from the business sector occupying the rest of society may be called a reversed reification. The original notion of reification probably dealt with modern epistemology and tried to answer the question what made modern man understand things as "objects". The modern labour process made the workers seeing the result as things outside themselves, forcing them to not only externalize the results, but also become alien to the whole process. The mature Marx saw modern production, with its focus on selling and buying, impacting the mentality of the working class. Since the worker was selling his labour force on a market, he tended to see himself as a thing that was circulating on a market – an "object" in a process impossible to change or influence. Commodity fetishism as described by Marx is quite close to what we call reverse reification in the text above. The new term is, however, aimed at depicting the ideological shift that has occurred in Western societies under neo-liberalism in the late 1900s and early 2000s. Ultimately, the term involves an elaboration of the complex meaning of the Latin word "res", meaning "thing", or object, but also "something that concerns us all", the public and general interest at the heart of society at large. The early 1900s can be described as a general reification where all citizens saw a public interest in developing a growing private economy; ideals of "res" invaded the commercial sphere to become something that "concerns us all". The late 1900s with its neo-liberal ideology has reversed the direction of reification. The logic of the market place dictates that there is no other way to handle public interests or the public sector except the commercialization of it – the ideals and norms of the commercial sector are invading the public sector and thus becoming something that "concerns us all". As is shown by Stewart & Walsh, the norms guiding the public sector are sometimes very different from common practice for a private firm. For example, the laws and regulations applied to public health care do not allow for certain profitable solutions to be adopted by a hospital as these

solutions may even be considered criminal, thus making it impossible for a public health care firm to act according to the rules of a business market.

The neo-liberal changes have also had an impact on the publicly funded university sector. The "internal market" habits introduced in the public sector have in many cases become the normal way to handle things also at universities. Buying and selling between institutions, the marketing of services, and tenure posts replaced by project employment have drastically changed the university climate; this is what Slaughter and Leslie describe as a development of academic capitalism.

Gibbons et al instead portray the changes of universities as a further development towards a post-industrial society. The problem with this view is that it is perhaps impossible to protest against the iron hand of a general worldwide economic trend. However, far from being a natural trend, the changes were first introduced in the US and UK in the wake of neo-liberal victories in national elections. Leaders were put in place who responded to the so called tax revolt of the middle classes, and the whole project to transform the public sector was prompted by a need to cut taxes, which in turn led to general cut backs in all activities funded by the government. The view of the development of society in terms of a Triple Helix, where universities, the government and industry in a state of democratic corporatism take over the previously different roles, and where university researchers run firm-like project groups and start up new spin-off companies, will unfortunately fit into the neo-liberal view in which the small firm is promoted to the status of an exemplary model for the rest of society. The Triple Helix model resonates well with a process of reverse reification in the field of research policy theory.

There is also a need to discuss the problems associated with changing norms in the public sphere. These concern a more general background in the view of the modern state, and what it originally meant to be a civil servant. Milton Friedman was aware of this and posed the question, but in his answer he abandoned altruism in favour of a cynical position, suggesting that civil servants today merely follow and maximize their own interest. Norms saying that they ought to be disinterested, and not work for their own personal winnings, no longer exist or get crowded out in this scenario. In opposition to this, we mean that it is still necessary for civil servants to be un-attached

to interests, and let equal rights, justice, democracy and social development in a longer perspective guide the work of civil servants devoted to public service.

The same goes for university researchers. One can of course smile ironically at the naivety of Merton with his CUDOS norms. These have always been far from what we know about everyday reality within the universities. However, we are here not talking about particular situations but rather about ideas. Seen as such, norms held by researchers in common still exist, are alive and important to uphold. Likewise, the norm that researchers should be independent of external interest is important. This norm is often confused with the idea of a special entitlement; legitimating the notion that academe occupies a sacred place far away from ordinary citizen's concerns in normal life. This latter is the "Humboldtian" ivory tower version of a norm that actually has a deeper motivation, one that lies in the need of independence from particular interests in order to serve societal development in a longer time perspective. In this respect, it has to do with the integrity of the research process as a common good, just like the principles of equality, democracy, free speech etc. These are norms associated with modernity and include what may be called the "Hegelian" version of independence for researchers. Moreover, as Sheldon Krimsky argues, researchers should not only be active in the innovation systems and deliver valuable results for industry; they should also participate in public debate and critique, since this has a value for the social development of modern society in a longer time perspective.

The contrast to industrial interests today are striking given the latter's strong emphasis on immediate profit. No matter what humanitarian visions a charismatic manager of a large firm might express, the stockholders always want to see a substantial pecuniary result. Given the dictates in corporate life, it is still necessary with state funding for much research of a basic character. The norm of social benefiting development in the long run is difficult to attach to the commercial sphere; ultimately this ideal has a political and ideological content rather than an economical one. Norms on a higher "meta-level" prescribing that a researcher ought to be an independent seeker of truth are supported on a lower "meso-level" in state research councils. These criteria stipulate that good research should be original and challenging to be valuable in the eyes of peer reviewers. On a daily "micro-level" furthermore it is evident that researchers stealing results from others and/or otherwise cheating cannot be accepted

by others – obviously the norms for the research community have support on all these levels.

The general and different norms for university researchers are forgotten when the whole public sector is governed by rules taken from the commercial society. To defend the previous norms can be interpreted as a somewhat conventional and even conservative position in the debate on the future role of the universities. However, the new habits in both the public sector and the university world are also depending on norms, and since there seems to be a danger with these norms in the general development of the modern society, it is perhaps necessary to reconstruct, rather than deconstruct the earlier ones, and also explain why they are necessary. Thus: for the development of modern society in a long-term perspective, it is necessary for norms in which university researchers have a role close to that of a civil servant: that s/he should have a long-term perspective and perform in research, which is different from industrial research in its "scientific" rather than "commercial" view. The interest for science and technology development in broader and longer terms should, however, be combined with social critique. The reversed reification, the view of society where the commercial sector is the norm for all other sectors, is consequently to be seen as a danger for modern society in a long-term perspective.

Notes

1 The term "research landscape" here refers to the whole research community; universities, industry, state, county councils, etc.

2 This development is not general for all Western countries. Canada still has a large state budget for research, and in the UK, the government recently decided to boost state funding for research. See Randerson, J. "The Future of UK research – Playing Catch-up", From *New Scientist* 15 May 2004.

3 Hegel, F. *Philosophy of Right*. (*Philosophie des Recht*. 1820) London: Oxford Univ. Press 1981 p.131

4 Pöggeler, O. in "Editorial Introduction" to Hegel, F: *Lectures on Natural Rights and Political Sciences*. London: University of California Press 1995, p. 39-40

5 Bell, D. *The Coming of Post-industrial Society – a Venture in Social Forecasting.* Harmondsworth: Penguin Books 1976, p. 358

6 Friedman, M. ”Has Government Any Role in Money?” (1986). In *The Essence of Friedman*. (Ed. Leube K. R.) Stanford: Hoover Institution Press 1987, p. 499-500

7 Friedman, M. ”Fair Versus Free”. (1977). Ibid., p. 147

8 Friedman, M. ”Whats Wrong With Our Schools?” (1980). Ibid., p. 98

9 Friedman, M. ”The Economics of Free Speech”. (1978). Ibid., p. 12

10 Osborne, D./Gaebler, T. *Reinventing Government - How the Entrepreneurial Spirit is Transforming the Public Sector*. Reading: Addison-Wesley Publ. Co. 1992, p. 33-45

11 Ibid., p. 84

12 Stewart, J./Walsh, K. ”Change in the Management of Public Service”. In *Public Administration* vol. 70, 1992 p. 511

13 Gibbons, M *et al. The New Production of Knowledge: The Dynamics of Science and Research in Contemporary Societies*. London: Sage, 1994.

14 Nowotny, H./Scott, P./Gibbons, M. *Re-Thinking Science – Knowledge and the Public in an age of Uncertainty*. Cambridge: Polity Press 2001

15 Ibid., p. 11

16 Etzkowitz, H. *The Triple Helix of University-Industry-Government Relations – Implications for Policy and Evaluation*. Working Paper 2002: 11, p. 2. From www.sister.nu

17 Etzkowitz, H. ”The Entrepreneurial University and the Emergence of Democratic Corporatism”. In *Universities and the Global Knowledge Economy - A Triple Helix of University-Industry-Government Relations*, (Ed. Etzkowitz, H./Leydesdorff. L.) London: Pinter 1997, p. 145

18 Ibid.

19 Etzkowitz, H. *The Triple Helix of University-Industry-Government Relations – Implications for Policy and Evaluation*. Working Paper 2002: 11, p. 2. From www.sister.nu

20 Slaughter, S./Leslie, L. *Academic Capitalism - Politics, Policies, and the Entrepreneurial University*. Baltimore: Johns Hopkins University Press 1997

21 Ziman, J. *Real Science*. Cambridge: Cambridge University Press 2000

22 Fuller, S. *The Governance of Science*. Buckingham: Open University Press 2000

23 Scott, A. "The Influence of Social Science on Innovation: a Significant Missing Element in Mode 2/Triple Helix Debates?" In *VEST* no 3-4, vol 13, 2000, p. 53-72

24 Elzinga, A. *The New Production of Reductionism in Models Relating to Research Policy*. Paper to the Nobel-symposium *Science and Industry in the 20th, Century*. The Royal Swedish Academy of Science, Stockholm 21-23 November 2002. http://www.center.kva.se/NS123/Paper%20PDF/ElzingaPaper.pdf

25 Thorpenberg, S. *The Changes of the Nordic Research Institute Sector – A Critique of the New Theories of Production of Knowledge*. Göteborg: Dep. of History of Ideas and Theory of Science, Göteborg University. Report no 203, 2002

26 Krimsky, S. *Biotechnics and Society - The Rise of Industrial Genetics*. New York: Praeger 1991, p. 79

27 Boyd, E.A./Bero, L.A. "Assessing Faculty Financial Relationships with Industry". *Jama* November 1 2000 vol. 284 nr. 17 p. 2209-2214

28 Barnes, B. *About Science*. Oxford: Basil Blackwell 1985 p. 45

29 Latour, B./Woolgar, S. *Laboratory Life*. Beverly Hills: Sage 1979, p. 197

30 Zuckerman, H./Merton R. K. "Patterns of Evaluation in Science: Functions of the Referee System". From *Minerva* January 1971 vol. IX no. 1 p. 66-100

31.Randerson, J. "The Future of UK research – Playing Catch-up", From *New Scientist* 15 May 2004, p. 52

32 Lukács, G. *The Young Hegel*. (*Der junge Hegel*. 1938). London: Merlin Press 1975 p. 549

33 Marx, K. "Economic and Philosophic Manuscripts of 1844". In *Collected Works* vol. 3. London: Lawrence and Wishart 1975 p. 272

34 Marx, K. "Ökonomisch-philosophische Manuskripte, Zweite Wiedergabe". In *Gesamtausgabe, Erste Abteilung, Band 2*. Berlin: Dietz Verlag 1982, p. 365. We have again given the terms different italics and underlining: objectification/gegenstand, *externalisation/Entäusserrung* and **alienation/Entfremdung**:

"Die *Entäusserrung* des Arbeiters in seinem Produkt hat die Bedeutung, nicht nur, dass seine Arbeit zu einem Gegenstand, zu einer *äussern* Existenz wird, sondern dass sie *ausser* ihm, unabhängig, **fremd** von ihm existirt und eine selbständige Macht ihm gegenüber wird, dass das Leben, was er dem Gegenstand verliehn hat, ihm feindlich und **fremd** gegenübertritt." This version can be compared to the English translation in *Collected Works* vol 3 above.

35 Marx, K. *Capital vol 1*,Chapter 1, section 4 – The fetishism of commodities and the secret thereof, p. 103-104

London, UK ElecBook 2001. See http://site.ebrary.com.ezproxy.ub.gu.se/lib/gubselibrary/Doc?id=2001687

36 Ibid., p. 104

37 Marcuse, H. "Neue Quellen zur Grundlegung des Historischen Materialismus" (1932). In *Schriften*. Band 1. Frankfurt am Main: Suhrkamp Verlag 1978, p. 551. The original German text says:" ...wenn Hegel die Vergegenständlichung und **Entfremdung** in ihren abstrakten Formen beschrieben hat, so hat er doch die Vergegenständlichung und **Entfremdung** als wesentliche Bewegungen der menschlichen Geschichte gesehen." It seems that Marcuse saw the terms objectification and externalisation as having a similar meaning.

38 Habermas, J. *Technik und Wissenschaft als "Ideologi"*. Frankfurt am Main: Suhrkamp 1968 p. 94

39 Latour, B. *Aramis or The Love of Technology*. Cambridge: Harvard University Press 1996 p.45.

40 Bloor, D. *Knowledge and Social Imagery*. London: Routledge & Kegan Paul, 1976, p. 43

41 Barnes, B. "How to do the Sociology of Science". In *Danish Yearbook of Philosophy* vol. 28 1993 p. 9-10.

42 Habermas, J. *Autonomy and Solidarity*. London: Verso 1986, p. 107

43 Chubin, D. E./Restivo, S." `The Mooting´ of Science Studies: Research Programmes and Science Policy". From *Science Observed*. (Ed. Knorr-Cetina, K. D./Mulkay, M.) Bristol: Sage Publications 1983, p. 63

44 Martin, B. "The Critique of Science becomes Academic" From *Science, Technology and Human Values* vol. 18 No. 2 1993 p. 256

45 Collins, H.M. "Captives and Victims: Comment on Scott, Richards, and Martin." From *Science, Technology and Human Values* 16 1991 p. 249. Collins wrote: "We need to distinguish between the politics and the methodology of our work. That is, while as analysts we can understand that all sciences are in a broad sense `political´, as researchers we need to keep this knowledge in a separate compartment."

46 Wynne, B. "SSK´s Identity Parade: Signing-Up, Off- and -On". From *Social Studies of Science* vol. 26 1996, p. 362

47 The standpoint was originally touched upon by Karl Marx when he spoke about the role for scientists in the development of modern society: "...in the measure that history moves forward, and with it the struggle of the proletariat assumes clearer outlines, they (the theorists/ST) no longer need to seek science in their minds; they have only to take note of what is happening before their eyes and to become its mouthpiece. So long as they look for science and merely make systems, so long as

they are at the beginning of the struggle, they see in poverty nothing but poverty, without seeing in it the revolutionary, subversive side, which will overthrow the old society." From *The Poverty of Philosophy*, (1847). See http://www.marxists.org/archive/marx/works/1847/poverty-philosophy/index.htm : Chapter Two: The Metaphysics of Political Economy, Part 1, The Method, Seventh and Last Observation

48 Heidegger, M. "The Thing". (*Das Ding*. 1950). In *Poetry, Language, Thought*. New York: Harper and Row Publ. 1975 p.174

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