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What science for what democracy?

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ABSTRACT

The transformations undergone by research and science in the name of the so called "knowledge economy" cover the decisions of scientific policies and the "management" of research, and also the meaning of scientific activities (devoted to innovation) and even more fundamentally the very structure of the sciences (transformed to technosciences). The science that is contributing to capitalist competitiveness (and to the current economic crisis) is not the same as that which would be able to contribute "to the conception and democratic carrying out of another form of globalization and another European project". However, this is not self-evident, and it needs to be thought about since it is not simply a matter of returning to the science of the 20th century that opened the way to technoscience.

Keywords • Science. Democracy. Technoscience. Contextualized research strategies.

Use of the expression "science and democracy" tends to be spreading. Its meaning, consequently, is becoming polysemic. Is there, on the one hand, an eternal "science" (more or less fantasized) and, on the other hand, a "democracy" that has to "administer" that science with a view to "improving" it? Or, more fundamentally, should we not be thinking in terms of the co-evolution of science and society? Addressing these questions must take into account that the present situation of science undoubtedly cannot be understood outside of the ultraliberal, globalized and financialized stage of capitalist society in which it is developing. Thus, must not any project for democratization of society involve in response – and be preceded by – an alteration of science, about which it seems necessary to begin thinking now, so as to give it substance?

By using the term "economy and society of knowledge", or simply "knowledge economy", neoliberal capitalism aims to recruit science behind its banner and make it the pillar of economic war and competitiveness. In doing this, it had to transform Western science to make it a key instrument for profit, consumerism, and the current economic (and ecological) crisis. What is at stake are the scientific policies that give research the role of supplying profit through what is called – without defining it – innovation (cf. Jacq, 2011). These policies are set up both by the financing of research and by its "management", modeled on that of a firm (which introduces a high degree of job insecurity for scientific workers). Thus research workers are asked, as a condition

of receiving credits needed for pursuing their activity, how many patents they have filed, and what are the innovations that they envisage resulting from the research project for which they are asking subsidies. All this is beginning to be very well understood and analyzed at length – and it is important to realize that it profoundly modifies the very nature of research, the significance of science and the nature of scientific activity.[1] The research being carried out today in public laboratories is not of the same kind as that carried out around the middle of the 20th century. *A fortiori*, it is not the same kind of research that contributes to capitalist competitiveness, and that will contribute to (as put in the title of a forum during the Counter G20 in Nice, October 2011) "the conception of the democratic setting up of another form of globalization".

This means that there is no "essence of science", not even in Western science. Research is a social activity that obeys society's imperatives through constraints that can be described as epistemological (methods, material and conceptual tools, theories, dominant paradigms, and the existence of a real object for knowledge research) and political (the research policy of the public and private institutions). Thus the modifications imposed under the term "knowledge economy" have seen the transformation of research from an activity experienced (although in a partly mistaken manner) as an autonomous activity to one primarily driven by profit. Two terms summarize the way science has had to evolve to meet these imperatives: technoscience and innovation. I will here use "technoscience" to describe these transformations, while being aware of the misinterpretations to which this may lead. In no way am I proposing a return to the oil lamp or denying the importance and impact of technologies in certain disciplines and for a great deal of research, and I have the greatest respect for the technologies that have been able (and may yet be more able if better used) to improve human life and even human nature in depth.

Science in the second half of the 20th century was relatively ready for these transformations as it was an essentially reductionist science, giving priority to the analysis of increasingly small and dissociated parts thanks to increasingly sophisticated technologies. Thus, it often neglected the study of processes at all levels, taking into account their totality and dynamic movement. This has resulted in an extreme dividing up of scientific disciplines into compartmentalized sub-disciplines, increasingly focused on techniques, which, with a little financial incentive, it was not too hard to recruit under the banner of technoscience. By adding a career managed (in the name of excellence) by the most rather than the best and a suffocating timetable, driven by the

1 For an analysis of the effects of the knowledge economy on life sciences, cf. Guespin & Jacq, 2006; Espaces Marx, 2007.

necessity for always doing more while seeking funding, we very quickly end up by creating closeted research workers, no longer in their "ivory towers" but in their laboratory without the time or receptiveness to become citizens.

Everything is then ready for setting up structures to guide and manage research that slip completely out of the control of the scientists. The latter put up with this in the cause of the survival of research, even if this research no longer seems so much like that for which the older ones had been using the term. As for the younger scientists, they have not known anything else! Thus, even if there are still exceptions to the rule, science has mainly the mission to contribute to innovation, competitiveness, economic war and even financial profits; this latter contribution via the "*économie de la promesse*" (cf. Jacq, 2009), by promising potential applications rather than obtaining real ones. All of this is inexorably plunging the world into today's crisis.

Is this the moment to make a distinction between the natural sciences and the human sciences? No, because the latter are also threatened with extinction, as are all areas that do not directly fit into the knowledge economy. All this has taken place in barely a dozen years, throughout the world, in all the developed countries, even though the rates and the methods used in the technoscientific transformation may have differed from one country to another. In Europe, the European Commission has set up a European Research Area (ERA) to ensure the evolution of convergent scientific policies of all member countries (cf. Guespin & Jacq, 2006). However, Japanese and Australian researchers tell the same story, the same transformations and the same suffering as well.

Evidently all this is not done without generating conflict and resistance. The many trade union struggles fought out in France, for example, illustrate this well. These struggles, however, are more over the methods of managing research and its financing than over the nature of scientific activity or its meaning. However, it would be a dangerous mistake for these resistance struggles to aim just for going back to the science of (let's say) the 1960s, the science that had been so easily transformed into technoscience. It would also be a mistake to think that it would suffice simply to add democracy to science such as it has now become, in order to reverse the situation.

My argument is that another science is needed rather than our present technoscience. It needs to be a science that is different from that of the last century, so that it may both have a place in an alternative society, and also contribute to the struggle to overcome the crisis. This would initiate a virtuous circle! Ideas and experiments exist already. Here, I want to stress the possibility and, indeed, the necessity of articulating together the defensive struggles against subservience to the quest for profit, and creative struggles to invent another kind or research – and to start organizing it immediately.

Modern Western science developed around the idea of mastering nature. Other forms of knowledge, of those called "native peoples" for example, are based on another view of the world that includes humanity in nature. Does the idea of mastering nature necessarily lead to the science we know? Or even to a single way of doing science, a single paradigm that I have summarized here as technoscience? Or has not this idea led, in the light of the climate crisis and world capitalism's incapacity to deal with it, to a situation in which there is currently more of a danger of nature's mastery over humanity? The idea advanced here is that features of science and society coincide, not only their respective methods of management, but even features that are reflected in the structure and character of science – in the questions its raises, in those that it considers scientific or trivial in what Kuhn called the dominant paradigms (cf. Kuhn, 1970). This in no way means that I deny the possibility of objective knowledge, or that I consider that everything in science as it is today should be cast aside. Does this mean retuning to a sort of latent Lysenkoism, a "proletarian (or democratic) science" as opposed to a "bourgeois science"?

It is a question that should not be dodged. In my opinion the philosopher Hugh Lacey provides the best tools for dealing with this problem in making a distinction between impartiality and neutrality in science (cf. Lacey, 1999, 2005). What he calls impartiality covers the cognitive values that the scientific community recognizes as being true (provisionally) such as theories or models or interpretations of facts. These values are independent of values in the moral sense. Radioactivity or genes are true however they are used and the quantum theory does not need the consent of public opinion or the banks to be proved correct.[2] On the other hand, Lacey observes, this does not mean that science and scientists should be indifferent to the implications of their impartial work of inquiry, or that researchers should work without being responsible to society for their activities. Research workers must be impartial but not neutral. Being involved in the interactions between science and society does not simply mean being aware of, or involved with, the applications of their research. This also covers the framework in which the objectives of a research project are defined.

Lacey contrasts two major kinds of strategies (cf. Lacey, forthcoming; Lechopier, 2011). Decontextualized strategies are those in which the issues and type of pertinent data are defined by solely focusing on those that are related to structures, processes and underlying laws, of the phenomenon being investigated, thus enabling it to be analyzed and mastered. They are "decontextualized" since they explicitly disregard all the context of actions, values, description and experiences in which the phenomenon stud-

2 It was by seeking to interfere at the level of impartiality in the name of alleged "dialectical laws" that Lysenko turned his back on a proper scientific approach, and at the same time cast a lasting discredit on dialectical logic!

ied lies. Reductionist approaches are, by definition decontextualized. As against this, contextualized strategies embody, in the very construction of the research project, factors linked to the manner in which the phenomenon being studied is structured around practices, how is part of the ecosystem, how it interrelates with the agents etc. The one is no less scientific or less fundamental than the other. While both kinds of strategies are necessary, present day science massively gives priority only to decontextualized ones. On the other hand, it is at the level of contextualized strategies that new methods and partnerships can be set up and that the concept of relations to society and democracy takes a new meaning. This approach draws upon the contributions of complex thought, since in both cases what is given priority is the plurality of approaches to arrive at more complete knowledge, in contrast not only to present day science, but also to that of the first half of the 20th century. Reductionism remains one of the scientific methods, but should no longer be the "gold standard" of scientific culture.

One example should illustrate all of this: the selection of agricultural seeds. Bonneuil and Thomas (2009) have shown that the majority of research in this field, which appears to be decontextualized and focused on the properties of the seeds alone, or even their genes, is in fact contextualized – and with a very precise perspective. The contextualized factors taken into account are not those of agricultural practice, but the dominant political and economic demands. Developing an agriculture that enables increasing yields, reducing agricultural labour, creating a seed producing industry, developing outlets for industry, meeting the expectations of millers and industrial bakers. All these factors are totally integrated into the logic of public research, that works in close cooperation with the selectors of seed varieties. These are very strong contextualizing factors that determine the genetic criteria that are favored. It is they that encourage the epistemic framework: Mendelian at first, then genetic and now transgenetic, allowing varieties to be obtained that best correspond with the productivist model being applied to agricultural production. This strategy, which is positioned implicitly in the context of the capitalist economy, is very largely based on a sub-discipline (plant genetics) and, to that extent, appears as decontextualized, this reinforcing the idea that only decontextualized research can be scientific. For his part, Lacey (cf. 2005) studied the evaluation and selection of agricultural seeds in agroecological research. There, the seeds are considered in the context of a system of food production. This brings into play the sustainability of such production on economic, technical and social levels (that is to say the impact on biodiversity, social relations and the land). This strategy, clearly contextualized, requires the cooperation of a number of sub-disciplines and often implies a participative approach. Nevertheless, scientifically, both research strategies contribute to the accumulation of knowledge about seeds – neither is "more scientific" than the other.

Thus questions arise about the criteria on which one strategy is chosen rather than the other, and about the consequences of such a choice. However, we can observe today that, in a science subjected to the knowledge economy, great efforts are made to discredit – scientifically – the second kind of strategy, for reasons that are not scientific but based on values, those of neoliberalism; and, in this way, the questions are avoided. The hegemonic position of the decontextualized tradition (which, as we have seen may not really be totally decontextualized) carefully conceals its contextualizing factors. This reflects its mutual reinforcement with the values of a society based on domination, which favors the solution of problems by technological innovations that enable the massive exploitation of natural resources.

This example illustrates the interactions between choosing a strategy and choosing a society. Democracy would thus involve allowing a plurality of approaches and strategies (and not doing the opposite, that is, of solely favoring a single strategy). I have lingered over this example to illustrate what I mean by the necessity of changing the very structure of science. It can be seen, for example, that contextualized strategies require a complete overhaul of the present pigeon-holing of disciplines. This involves not only another way of carrying out research that is interdisciplinary and linked to society, but also another way of teaching science. More fundamentally it also means another way of thinking, in which reductionism and linear rationalism cease to be the only key to rationality. Thus, thinking in terms of scientific activity in relation to the problems of society can also lead to raising epistemological questions.

However, this is just an example, an illustration to open a field of research and thought, and not a ready-made recipe. Talking about a plurality of approaches implies the necessity for (or at least the possibility of) unceasingly seeking new approaches, new strategies, and new frameworks for thought. This, however, does not mean allowing anything to be done anyhow. The criteria for determining that research has a genuinely scientific character (impartiality) that makes sense of, for example, the peer evaluation of a research, are still valid, provided that the criterion of subjection to some paradigm or other, even the dominant one, is not (explicitly or implicitly) added.

Is it, then, possible and desirable and even necessary to tackle such a task now? Possible yes, since the science of complex systems is beginning to introduce, in the field of knowledge, precisely those concepts needed for thinking about a plurality of research strategies. It is also possible because this plurality also covers the requirement of cooperation between scientists and many social actors and citizens, which is coming into existence in society in reaction against the hegemony and ravages of technoscience. Finally, possible since several examples already exist, and because life is increasingly showing the limitations and even the damages caused by decontextualized science, for example, in the case of bio-fuels.

It is also desirable because, once again, today's science will become of use to the science of tomorrow, desirable because there is a mutual strengthening of the practice and its acceptance in the minds of people. Since, for many scientists today (and above all the young ones who have never known anything else), only decontextualized strategies can be considered scientific, challenging this dogma is also to question the legitimacy of the society that imposes it.

Finally, it is necessary because contextualized strategies are the ones that enable work between professional scientists and actors of "civil society", joint work that may enable better mutual understanding and may make more general the involvement of citizens in the democratic management of choices of scientific policy. All those who get involved in this kind of joint work know how difficult it can be. They have to deal with the tendency of scientists (and many other citizens) to agree implicitly to make science (and also scientific policy) an exclusive preserve that may wind up in the pockets of the multinationals. Nevertheless, by beginning to work together now on certain problems, even limited ones, citizen-scientists and citizens are preparing themselves for democratic management of scientific policy.

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