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Comment

THE SOCIALISATION OF SCIENTIFIC AND TECHNOLOGICAL RESEARCH

A different interpretation of science-society relations: the socialization of scientific and technological research

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ABSTRACT: Recent data delivered by Eurobarometer show how Europeans tend not to perceive science and technology as important factors for the Europe's future. While showing the scarce development of scientific culture in Europe, these data allow to understand how science and technology are exposed to risk of social marginalization, notwithstanding the results they are attaining. In order to interpret this quite contradictory picture, an analytical framework revolving around the notion of "science and technology socialization" is proposed and developed. Implications of such an approach on research policies, on citizens' participation and on the role of social sciences are also briefly examined.

The Eurobarometer report on the latest survey of the Europeans' opinions published last July[1] includes the "scientific research" expression only once. It appears in a chart reporting the interviewees' answers to the question "In your opinion, which aspects should be emphasized by the European institutions in the coming years, to strengthen the European Union in the future?. Scientific research was one of the fifteen options comprised in the questionnaire. Only a scarce 10% of the interviewees selected it as a relevant aspect for Europe's future, a percentage which makes it rank twelfth in the chart. The top spots are taken by "economic affairs", "social and health issues", "the fight against crime", "immigration issues" and "energy issues". Before scientific research, the Europeans' interests focus also on "the fight against climate change", "solidarity with poorer regions", "the internal market", "the European foreign policy" and "the European education policy".

According to the writers of the report, it is not surprising that, during hard and long recession, Europeans most want the institutions to emphasize economic affairs and welfare; indeed, it did not surprise us. What actually surprises is that scientific and technological research ranks twelfth. It is a result sounding like a very serious warning – if not like a real toll – for the Lisbon ambitions expressed nine years ago by the heads of state and of government who stated as a priority goal for the European Union to make Europe "the most dynamic and competitive knowledge-based economy in the world" by 2010.[2] Evidently, it is a prospect which the majority of the citizens do not believe in.

Granted, there are other surveys showing that most Europeans support science and the role by scientists, and others highlighting the public's interest in science museums and science centres. However, evidence suggests they are marginal phenomena if compared with the core of the problem, which is: in general, Europeans do not believe scientific and technological research is an important factor for Europe's future.

All of this shows how scarcely is scientific culture developed in Europe, whatever the meaning you give to the expression. In the mental representation of the citizens (but also of many policy makers, entrepreneurs and even of some scientists) science has a place which is marginal and distant from economic growth and welfare, i.e. distant from the centres of interests and from the concerns of the community.

Moreover, this result does confirm the "exclusion" of scientific and technological research which many observers have long reported – a condition which widely clashes with the growing impact science and technology have on any aspect of social life and even on individual lives. It almost seems as if in Europe the advent of a knowledge-based society represents a process which is more "suffered" than wanted, something happening in spite of everything. And nobody has ever set any (cultural, social, economic,

etc.) instruments needed to understand, drive and guide it; hence we face consequences such as conflicts, missed opportunities, waste of resources, useless ideological discussions, delays, organizational and bureaucratic obstacles, and so on.

It is quite a complex and contradictory scenario, which is far from being properly interpreted. An approach moving along this path and which has being experimented in the past few years is an interpretation of the evolution of science-society relations in the light of the notion of "socialization" of scientific and technological research[3]; an approach which has been recently tested in the framework of the European project "Social Sciences and the European Research Capacity" (SS-ERC)[4].

In a strict sense, the word "socialization" is used to refer to the integration of individuals – for example a child, or a foreigner – within a given society. Through socialization, they acquire the cultural heritage of the social environment they are in and they learn to recognize and evaluate the expectations other people have on them. Thus, they build their own personal identity and find a "place" in society.

Applying the notion of socialization not to human beings but to a social institution such as scientific and technological research may seem weird and even unconventional. However, it helps to grasp what probably represents a typical feature of the so-called "post-modern societies", that is the reversed relation between "structure" and "agency".

In industrial societies, it was social institutions that set the pace of change, imposing an order, a future prospect and a system of rules and ties (legal, social, moral, psychic ones, etc.) on the action by individuals and by the various social and collective players.

Vice versa, in a "post-modern society" (also called "post-industrial", "liquid", "knowledge-based", as you prefer), the social institutions' power of ordering, channeling and guiding social life has highly decreased, whereas there has been an equally evident increase in the ability and in the opportunities of the players, both individual and collective ones, in pursuing their own goals, to build their own representations of reality, to create social links, to take autonomous orientations and attitudes, including those once defined as "deviant". This has made contemporary societies much richer in "subjectivity" than in the past; obviously, while it has increased the chances and the pace of social change (according to a mechanism, nearly a Darwinian one, of variation-selection-differential amplification), it has also generated a wide set of problems, which the literature has largely discussed (individual uncertainty, exposure to risk, social polarization, etc.).

In this framework, the "subject-environment" relation tends to be overturned. Whereas before it was primarily the players that had to "socialize" themselves into a highly structured environment, now it is mainly the social institutions that have to "socialize" themselves into an environment characterized by high subjectivity and by higher levels of social differentiation.

The most recent evolutionary trends of scientific and technological research (obviously understood as a social institution) are then to be interpreted in this more general context. Indeed, research appears less "integrated" in the social body than it was at the time of the "industrial society", when only a few institutional mechanisms were enough to guarantee a relatively controlled and harmonious "co-evolution" between science and society. Its identity – i.e. its ability to govern itself and to manage the changes which have been affecting it in the past few years – now appears to have extremely weakened. At the same time, it appears to have a lower degree of adaptation to a society which has become less fragmented and uneven, as the few "sensors" it traditionally used to measure the rest of the society have grown inaccurate and unreliable.

There are many signs of this general "hypo-socialization" of scientific and technological research, even though most of them are still to be recorded and assessed. Among them, the following can be mentioned: the poor appeal scientific faculties have on young people and their families; the falling status of researchers (also in terms of remunerations) if compared with other professional categories; the limited interest of companies in research-based innovation; the rupture between science and culture, owing to which many implications of research do not enter the common culture; the higher difficulties of entire sectors of public administration and civil society towards research and innovation; the persistent forms of discrimination that penalize women in scientific careers; the spreading among large groups of society of strong fears and concerns for the possible risks coming from science and technology.

More than any other signs, particularly alarming are the incapacity, the slowness and even the reluctance many stakeholders in the realm of research (including, aside from researchers and research institutes, also policy makers, trade union representatives, enterprises, civil society organizations and others) show when dealing with the needs of a type of science which has now become "post-academic"

and emerging precisely as a consequence of the general transformations towards a "high-subjectivity" society. In a "post-academic" context, scientific and technological research requires, for example, high levels of coordination and interaction, a better aptitude to "contextualize" the research activity in terms of social and economic innovation or a stronger ability to compete for the access to public and private funds allocated for research.

The attempt to interpret this manifold set of phenomena as a part of a single type of functioning of socialization of scientific and technological research, however still difficult, offers the chance to reconstruct a general profile of the relations between science and society, breaking with the tendency to apportion the analysis into various small parcels, which has led the policy makers to create specialized "worlds" artificially separated. As for social researchers, one should not disregard the great effort they have put over the past two decades to overcome disciplinary divisions, through a progressive training in the interdisciplinary research field of Science and Technology Studies (STS). This has allowed for important results in the integration of different disciplinary perspectives, although one can still detect the tendency to reconstruct hardly interacting sub-circles, possibly on the basis of the research subjects dealt with rather than of the original discipline they belong to.

Restoring this unitary and far-reaching view offers some more chances to distinguish and to "map" the manifold phenomena of a social nature incorporated into scientific and technological research. They can still be divided into different areas (innovation, practice of research, evaluation, governance, etc.), but it does not imply disregarding the sense and the complexity of the whole. On a more operational note, this should be translated also into a better ability to recognize the actual weakness points of European research and to grasp the hidden plot of phenomena and processes which link them with one another.

On the other hand, such an operation is also necessary to take stock of the apparent paradox of a techno-scientific system intrinsically "strong" and able, as it has never been, to produce results, but at the same time socially weak and at the risk of marginalization. Caught in the socialization perspective, science and technology apparently suffer from a lack of elements of "agency", witnessed by a deficit of "responsibility" from important sectors of society and even within the research institutions themselves; and this occurs precisely as research is required to increasingly acquire the features of a "social enterprise" which needs – to be effectively implemented – cooperation from a growing and diversified number of players.

This leads us to identify at least three issues that should be analyzed thoroughly in the future.

The first issue is the research policies. If the problem to be tackled is poor socialization of science and technology, then it is quite evident that the current research policies, implemented at European level, at national level or by the individual research institutions, are achieving their goal only partially. They should be supported and integrated by a wide array of measures specifically aimed at identifying and guiding the factors of a social nature broadly speaking (and therefore also economic, political, relational, organizational and cultural ones), which come massively into play in the research production and in the enhancement and management of its results. This also means to overcome the rigid conceptual and organizational separation (which, for example, is very clear in the case of the policies followed at community level) between the actions supporting research and those aimed at facilitating the relations between science and society.

The second issues concerns the citizens' participation in science and technology. It has often been set in terms of a "defence" of citizens against the risks produced by science and a protection of the citizens' rights to "express themselves" regarding how the funds for research are allocated or to be informed on the results achieved. However, if the general framework is a hypo-socialization of scientific and technological research, this very issue should be considered in a wider and more complex perspective. In fact, when facing a "deficit" of collective responsibility when it comes to science, the development of a "scientific citizenship" able to express itself through practical incisive actions should be promoted, not only for the sake of citizens, but especially for the sake of techno-scientific systems. They should be the first to benefit from a constant involvement of the different sectors of society in the realm of research. It essentially implies the creation of the conditions for the various mechanisms linking science to society (including those developing at the heart of the research institutions) to be taken on by the different stakeholders, each of which has its own skills and viewpoints, which are all necessary for research to go on. Similar processes have already been launched in other realms, such as health care or environment protection. They have witnessed the consolidation of cooperation forms among citizens, civil society organizations, experts, public institutions and enterprises, which have led to tangible results, such as the

definition of new protocols, the development of new knowledge or the introduction of new quality criteria; now it is time for this to happen also in the realm of science and technology.

The third issue is the role played by social researchers. Undoubtedly, the contribution social sciences have provided in the past forty years to grasp and to interpret the transformation trends of science and technology has been a decisive one. It is also to be noted that the value of this contribution has not always been acknowledged, even because – sometimes this has been ascribable to the attitudes of social scientists themselves – it was interpreted as an attack on their authority and on the autonomy of science. In any case, this contribution cannot be considered as marginal – let alone as optional. It is really difficult to imagine how, in the future, it would be possible to give effective governance to scientific and technological research without the contribution of social sciences. However, one cannot underestimate the various obstacles now existing to a higher involvement of social researchers. Until now, they have provided elements which are useful to interpret reality, but they have seldom committed themselves to enhance the results of their studies in terms, for example, of policy making or of instruments for intervention; it demonstrates that even social sciences are facing serious difficulties to take an effective "post-academic" orientation. Moreover, such a commitment requires also an intense dialogue between social sciences and natural sciences, which nonetheless still appears very difficult to be implemented, for example owing to the existence of strong cultural barriers, of an organization of the research facilities which leaves little room to forms of interdisciplinary cooperation and of fund allocation schemes which favor separation among disciplines, also in order to prevent conflicts among the different communities of researchers. It is a state of affairs which should be overcome: in fact, the path to a better socialization of science and technology must necessarily go through this too.

Translated by Massimo Caregnato

Notes and references

[1] Eurobarometer (2009), *The Europeans in 2009*, European Commission, Bussels

[2] Council of the European Union (2000), *Lisbon European Council 23 and 24 March, Presidency Conclusion*, http://www.europarl.europa.eu/summits/lis1_en.htm.

[3] See also: W.E. Bijker e L. d'Andrea eds. (2009), *Handbook on the Socialisation of Scientific and Technological Research,* Rome, available on the following websites http://www.scienzecittadinanza.org/Public/SSERChandbook.pdf e www.techresp.eu/IMG/pdf/Handbook-2.pdf;
G. Quaranta (2007), *Knowledge, responsibility and culture: food for thought on science communication*, *JCOM* 06(04), C05;
L. d'Andrea, G. Quaranta and G. Quinti (2005), *Manuale sui processi di socializzazione della ricerca scientifica e tecnologica*, Roma, available on the website http://www.cerfe.org/public/ManualeRAST.pdf;

[4] The project (has been carried out within the EC Sixth Framework Programme for Research and Technological Development by a network made up of six research organisations: Tor Vergata University Science Park Office of Rome (project coordinator); the Danish Center for Studies in Research and Research Policy of the University of Aarhus (Denmark); University of Maastricht (Netherlands); Laboratorio di Scienze della Cittadinanza (Italy); Primorska University of Koper (Slovenia); La Rioja University (Spain).

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