25th IVR World Congress
LAW SCIENCE AND TECHNOLOGY
Frankfurt am Main
15–20 August 2011

Paper Series

No. 069 / 2012
Series C
Bioethics / Medicine / Technology / Environment

Raúl Sanz Burgos

Democracy and Technological Politic in the Risk Society

URN: urn:nbn:de:hebis:30:3-249275

This paper series has been produced using texts submitted by authors until April 2012. No responsibility is assumed for the content of abstracts.

Conference Organizers:
Professor Dr. Dr. h.c. Ulfrid Neumann, Goethe University, Frankfurt/Main
Professor Dr. Klaus Günther, Goethe University, Frankfurt/Main; Speaker of the Cluster of Excellence "The Formation of Normative Orders"
Professor Dr. Lorenz Schulz M.A., Goethe University, Frankfurt/Main

Edited by:
Goethe University Frankfurt am Main
Department of Law
Grüneburgplatz 1
60629 Frankfurt am Main
Tel.: [+49] (0)69 - 798 34341
Fax: [+49] (0)69 - 798 34523

Raúl Sanz Burgos, Madrid, Spain

Democracy and Technological Politic in the Risk Society

Abstract: New technologies generate risks, for the evaluation of which various mechanisms have been developed; the most frequent of these mechanisms consists of advice from committees of experts to the bodies whose role is to decide whether a new technology should be implemented or not. Such committees try to measure the magnitude of the threats that accompany the introduction of a new technology in order that the policy-makers may take their decisions in the light of the reports of the experts. The legitimacy of such reports is not only found in the technical capacity of its authors, but also in the impartiality of their recommendations. On numerous occasions, nevertheless, the effective presence of this evaluation finds itself today under suspicion. There are various methods that can be employed to try to resolve this problem. Firstly by reinforcing the mechanisms on which the technocratic evaluation of the risk are based; for example, through transparency in the selection of the experts. Secondly, by means of the incorporation of democratic mechanisms in the scientific-technological policy. The exposure of the internal conditions to the dynamics of the technological change that make possible the institutionalised involvement of society in the control of risk, as well as of the mechanisms to realise it are the principal subjects of this work.
Keywords: Technology policy, risk, evaluation, technocracy, democracy.

I. The contract between science and society

In the contemporary world science and technology appear as driving forces of economical growth; hence, developed States invest great amounts of money to keep a pace of developments which allow them to keep their countries in a good position within this dynamics.

Economic development has not been, however, the only driving force of technological innovation, perhaps not even the most important. Especially in the United States, research has been aimed to the development of useful technologies from a military point of view, although the need to make these technologies profitable in the civil sphere has also always been present. The obligation to combine all these aspects has made collaboration among experts from different fields necessary.

As a result of this factor, it has become evident that in order for science and technology to achieve progress, the work of experts in these fields is not enough, but collaboration with other specialists is also necessary. That is, science does not only depend upon the application of methods but also upon a much broader organizational context, which supports its

development. A context of high cost that can be maintained only for the economic contribution of society; that is why we often speak of the existence of a contract between society and science. Society funds research which is expected to produce some future benefits for its citizens.[1] This fact contradicts the widespread perception of what science and technology consist of.

II. The traditional conception of science and technology

From a widespread point of view, science is understood as a "pure science" and consists of procedures which allow evaluating if a proposition that pretends to describe some aspect of reality deserves reaching the rank of scientific knowledge. In order to evaluate if a proposition can or cannot be described as scientific, a double process is followed which, very schematically, consists of contrasting that proposition with the facts as well as with its coherence towards the rest of the theory where it is integrated. Therefore, with the aim of making effective an objective and free of interests knowledge, them not being purely cognoscitive, the scientific method combines logic and experience, that is, combines the so-called epistemic factors of knowledge.

From that same approach, science has a predominant role over technology, which is simply understood as an applied science. Technology understood this way, lucks any value related to knowledge, as this only appears through the practice governed by the combination of logic plus experience. Any other factor –be it political, social or psychological- is valued as an obstacle for the progress of science and its technological application. That is why in order to explain the dynamics of scientific and technological progress, it is considered unnecessary to resort to these factors and, what is more important, that science and technology policies, which consist of leaving both to develop according to their own initiative, without external mediation, are considered adequate. Any attempt to guide scientific research towards a goal other than itself represents an attempt to deviate from the advancement of science.[2]

III. Scientificism and technocracy

The image of science as an activity which, through the application of certain methods, enables us to reach an objective knowledge based on the real nature of the natural or social events is perfectly adequate to political approaches that exclude, or at least try to minimize, the value of

[1] V. Bush, Science: the Endless Frontier, 1945; J. A. López Cerezo, Democracia en la frontera, in: Revista Iberoamericana de Ciencia, Tecnología y Sociedad, 3 (2007), 129

[2] See M. Polanyi. The Republic of Science: Its Political and Economical Theory, in: Criteria for Scientific Development. Public Policy and National Goals, ed. E. Shils, 1968, 9.

citizen's participation in public life. The scientificist ideology embodies itself institutionally in technocracy.

Scientificism is characterized by asserting that each problem has an only correct solution and that the use of the ideal method enables us to reach this solution. Even more, science provides the only adequate criterion to distinguish real needs from other claims which are purely ideological.

These presumptions rest on the distinction between problems whose solution provides some additional information to the previous knowledge of the world, and those other problems whose solution does not rest on or ultimately consist of the knowledge of the facts, but on a decision. The scientificist attitude considers that all the problems that cannot be solved through knowledge constitute a leftover of irrationality. Examples of such problems are the typical matters of political debates, towards whose democratic response the advisability that they are solved through the information provided by science is considered. This way, the solution to human needs would remain entrusted to the experts and not to arbitrary individual decisions.

Another feature of this ideology consists of the consideration of science as a neutral activity, quality which extends to technology as far as this is taken as a simple utilitarian transcription of it. The consequence is that neither of them can be submitted to ethical, political or social analysis. Subject of such analysis can only be the uses made of these technologies, nor the technologies themselves, considered as a collection of tools whose historical evolution enables us to recognize an increase of the capacity of human intervention in reality, but not any kind of change in its substance: the instruments are always neutral, what can be positive or negative is their use. Therefore, the only thing that can be subject to undergo some control is the use made of technologies, not their development. That is, scientists are not responsible for the use – of the technical transformation- of the knowledge generated by them, neither technicians, as devices, or the great majority of them, can get different applications.

The supposed neutrality of science and technology offers politicians as well as those in charge of developing scientific and technological programs their authority to support their decisions by it, which can this way be presented as objective, free of value judgments and prejudices. In short, they can be presented as rational decisions. The trust in the neutrality of science and technology is on the base of the supposed incompatibility between the efficacy of the scientific solution of problems and the interference of non-purely scientific factors. This is

the starting point of technocratic evaluation of technologies and, in general, of political technocracy.

According to this approach, technology "has its own dynamics where external interferences must not be introduced". Consequently, "the question of evaluation becomes a technical question of identification and quantification of impacts with the hope that new and better technologies will solve the said problems and modify the negative public perception"[3]. That is, the evaluation is a competence of technicians who measure the possible consequences of a technology and set out problems which would have to be solved by new technological developments. From this perspective, the democratization of evaluation can only create distortions, inefficiency.

The most important reason by which the need to keep the circle of evaluation limited to the experts is supported, is the ignorance of the majority of the population –and its representatives- in technical matters. This reason is sometimes supported by very complex presentations of the technologies to be evaluated, which makes comprehension difficult and, with it, the possibility of proposing alternatives.

Technocratic reasons, however, have found themselves questioned by several intellectual traditions: some examine science and technology from their roots in the society, others, however, point out that univocity of scientific answers to the problems has been lost at the hands of the increase of the indeterminacy of knowledge precisely because of the magnitude of scientific progress.[4] From that moment, the apparent obviousness of technique as a technicians matter has stopped being evident.

IV. Some criticism towards scientificism

The perception of the dangerous ambiguity of technology is the result of a long record of disasters, some of whose most important milestones are the use of atomic bombs to put an end to the Second World War, the arms race launched during the cold war, as well as several catastrophes which go from the entering into the food chain of contamination by DDT (and its consequences of malformations in the newborns) to the accidents of Chernobyl and Fukushima. As an initial response to the concern caused by technology, during the sixties, some North American academic institutions as well as some of the most developed European countries instituted programs which analyzed science and technology from the perspective of their social, political and economical effects. In the following decade some agencies were also

[3] M. I. González García, J.A. López Cerezo, J. L. Luján López, *Ciencia, tecnología y sociedad*, 1996.
[4] K. Braun and C. Kropp, Beyond Speaking Truth? Institutional Responses to Uncertainty in Scientific Governance, in: Science, Technology & Human Values, 35, 773.

created which, taking those aspects into account, had to give advice to their own governments about the advisability of implementing some technologies or others.

On the other hand, during the seventies, scientificism and its technocratic corollary, were strongly fought against not only because of the contribution of scientists and technicians to the military industry, but also because of the fact that it represented an elitist and antidemocratic ideology. Following, the reasons for this assertion will be discussed to continue afterwards by presenting the transformations in the understanding of the dynamics of science and technology, which justify that the demand to democratize its evaluation may not be considered the futile result of a voluntarism that tries to extend democracy farther than its just limits.

Regarding the elitist and antidemocratic nature of technocracy, it has to be pointed out that the sophisticated technical instruments have not contributed to democratize power relations, rather the opposite: technicians have become part of the elite which keeps the majority of population protected and in a never ending under age. The increase of technical mediations, with the increase of the complexity that this carries within in every aspect of life, is the cause for one more advance towards the dependency of the majority in relation to a minority; in this case the experts and its esoteric knowledge.

Regarding the second question, the studies about science and technology assert that the constitution of problems as subjects of scientific investigation is the result of social processes. This means that it is not possible to reach a good description of scientific dynamics if we only pay attention to its epistemic factors (that is, logic + experimentation/contrast of hypothesis), but it is also necessary to take into account other aspects as, for example, T. S. Kuhn does, for whom the explanation of scientific practice must also include the training of professionals in one speciality and their effective constitution as a scientific community.

In this way, science is no more understood as an adequate description of reality to become a conventional representation of it.[5] That is, the preservation and change of scientific doctrines can no longer be explained as a continuous improvement of the experimentation and generation of hypothesis, but the social dimension of science needs also to be present. Under the rubric of the social dimension of science we mean the study of the social circumstances where each scientific-technological formation is created and consolidated, as well as the consequences of such formations over life and social organization. In the light of this new knowledge, the fact that the best policy related to science and technology consists of leaving

[5] Conventional does not mean, however, arbitrary, as doctrines are constructed according to ways of performance considered acceptable by those participating in the paradigm where the researcher has carried out his studies.

them to develop themselves according to their own impulses, being them understood as purely cognoscitive, is no longer plausible.

V. The evaluation of technology

Technological evaluation consists of the application of a collection of methods which allow foreseeing which will be the consequences of implementing a technology in the productive processes of consumption. With this prospective aim, they try to find which will be the affected group in order to lessen the negative effects over them. From a critical point of view towards the evaluation of technologies, it is also pointed out that this pursues, mainly, to make social acceptance of the implementation of the technology in question easier.

The specific evaluation of a series of processes can be summarized, very schematically, in the following way: it is about trying to determine the consequences of the implementation of a technology for the individuals as well as for the social, institutional, natural environment, the technological system itself, etc. It is therefore necessary to establish which are the most affected groups and their predictable attitude towards such implementation: that is, if technology will or will not be easily accepted by the most affected groups. The fact of carrying out these tasks correctly should favor the adoption of decisions of scientific-technological policies suitable to the circumstances and support this way their foundation. This kind of evaluation, however, suffers from some defects which make the achievement of these objectives difficult. The most important of such defects is the marked economistic nature of the assessment.

The evaluation is usually carried out according to a cost-benefit criterion that takes for granted that financial yield is an indisputable sign for a correct policy. This approach, however, systematically leaves out of its balances pollution and, generally, the destruction of the environment. Facing this fact, in some occasions, this circumstance is proposed as an "externality" and the valuation of the damages are included in the price of the products to use the increase of the final price to activities that reduce the impact on the natural environment. In other cases, on the other hand, this possibility is not even taken into account and it seems that the only possible policy consists of hoping that some technology developed in the future will be able to solve these problems.

For this reason, it is necessary to point out that when the evaluation of technologies is carried out through economicist models, the social and environmental consequences of the implementation of technologies are reduced to monetary costs, which often leave on the darkness consequences too heavy to assume. Consequently, against assessments which consist

of quantifying such costs as lower to the predicted economic benefits, it is necessary to always ask ourselves if those are anything else than a rhetorical mechanism thought to promote the interests of the corporations which benefit by the adoption of such technologies.

To try to correct this one-sided way of understanding evaluation it is necessary, therefore, to establish evaluation processes which do not take for granted what a correct policy of science and technology consists of. If there was an agreement on this point we would be in view of a similar situation to the dynamics of normal science, taking an expression from T. S. Kuhn. The indeterminacy of knowledge as a result of techno-scientific progress together with the controversy inherent to the question about what a correct policy consists of take us to consider, however, that the process of evaluation of new technologies places us in a rather similar circumstance to the one which precedes scientific revolutions, when the evidences are unable to solve the problems and the difficulties are not settled through the application of the method, but through discussion, an activity to which all the members of the scientific community are called.[6]

This circumstance justifies, over and above any suspicion of democratic voluntarism, the need of evaluation processes where all those affected by the introduction of a technology are involved. The nomination can be extensive, but it becomes evident to point out that among those called to express their opinion about whether it is convenient or not to apply a new technology, must be the engineers who developed it, the business people who are hoping to obtain some benefit from its use and who for this reason sponsor it, ecologist groups, population groups on whom it is expected this technology will have an impact, political representatives of those population groups, trade unions as well as the professional people in charge of evaluating the impacts.

The development of evaluation processes which take public participation seriously makes these processes into something transparent and, consequently, makes easier the acceptance of the technologies submitted to test. The involvement of citizens in decision-making on scientific and technological policy can mitigate social resistance to the development and implementation of technologies in as much as it gives rise to a genuine process of social learning, in relation to which the contribution of empirical or local knowledge to science and even more to the technical applications should not be underestimated.

[6] T. S. Kuhn, La tensión esencial, 1982, 296-297.

VI. The democratization of the scientific-technological policy

The implementation of the above mentioned methods makes the public control of the evaluation of technologies easier, but it is not enough for reaching an effective democratic control of the scientific-technological policy. This requires increased citizens' participation from the genesis of the programmes in which that policy is substantiated: the participation cannot be limited to the final stages of the innovation processes, when the democratic contributions can only be to approve or reject the implementation of costly programs. Such control is necessary, apart from other considerations, because the representative and bureaucratic authorities do not manage to convince about their efficient impartiality when it comes to relating the different components that have to be taken into account in order to decide in favor of one policy or another: environmental factors, social, economical, political, technological, etc.

The usually proposed solution to lessen this difficulty consists of guaranteeing the impartiality of the decisions through reports from experts who establish the purely techno-scientific facts, free from ethical and political adhesions. Naturally, this requires for the experts impartiality to be beyond all doubt, for which the processes of accreditation would need to be impeccable and the selection processes of the experts transparent, able to guarantee the impartiality of their reports. The economic importance of the decisions to be taken and the connections of the experts from some areas to the businesses interested in introducing certain technologies into the production and consumption processes have generated, however, major doubts about the impartiality of the technical reports on the risks associated with some technologies.[7]

There is no doubt about the usefulness of truly impartial experts who can act as advisors over the democratic evaluation of the scientific-technological policy; this way, also, one of the most deeply-rooted approaches of technocracy can be integrated into the democratic control of science and technology. This way of control is the ultimate unavoidable aim given the impossibility of establishing a clear distinction between neutral components (technicians) and those who depend upon values and, consequently, are subject to discussion. This is the reason why decisions must not –and cannot- be exclusively entrusted to the experts: the citizens advised by the latter must be the ones who decide in favor of some technologies or others. This approach means to admit that technological decisions are political decisions and

[7] See J. Corti Varela, Globalización y percepción del riesgo: las preocupaciones de los consumidores del primer mundo como barrera al comercio agrícola internacional, in: Globalización y Derecho. Una aproximación desde Europa y América Latina, ed. J. Lima Torrado, E. Olivas, A. Ortiz-Arce de la Fuente, 2007, 157.

that the decisions adopted on the margins of the technocratic approaches are not placed therefore outside the limits of rationality.

In order to unite rationality and democracy in the decision processes about science and technology policies, a series of assumptions about the final discussion and decision should be effective: it is essential to make explicit the values that lead to the response to a problem –for example the technocratic response- being itself understood as arguable. This way, the idea that the answer to a problem can deserve greatly varied answers which depend upon the point of view from which is dealt with becomes effective. The fact that the technical problem is shaped the same way as a social problem does not mean and incorrect or misleading formulation, especially once the character of social construction of scientific problems as one of the best settled data in the revolution of the history of science represented by T. S. Kuhn has been acknowledged.

One aspect of public participation whose importance should not be scorned is its institutional articulation. Public participation has to be real, hence the complaints that are frequently formulated against government agencies – including parliamentary ones. In these agencies participation is through representatives and experts who escape with difficulty from the gaze of public opinion from the stigma of having been elected by representatives of one of the stakeholders. However, the reasons that the evaluation of these technologies are left in the hands of parliamentary committees should also be underlined. The democratic legitimacy to discuss and decide on any political matter lies in the Parliament; opening this to public discussion can disguise manoeuvres to steal from the legal body the power of decision and control over these policies[8].

Before concluding, a problem that afflicts the possible democratic control of technological change and which perhaps explains the reluctance to accept it, should be noted clearly. Given the strong relationship between economic growth and technology mentioned at the beginning of these pages, one has to ask if the democratic control of technological change does not entail –nor even consist of - the democratic control of the economy.

Address: Raúl Sanz Burgos, Universidad Nacional de Educación a Distancia, Madrid / Spain.

[8] See J. A. López Cerezo (note 1), 137.