Chapter 4
Representation and Deliberation: New Perspectives on Communication Among Actors in Science and Technology Innovation

Giuseppe Pellegrini(✉)

Abstract Since the 1980s, a large body of analysis in communication and political science has emphasized the importance of activating spaces for public discussion, not only on political issues but also on themes of strong public impact, such as the effects of techno-scientific innovations. Challenge for political transformation is crucial for the concurrent changeover from representation to deliberation in the realm of techno-scientific innovation. In the traditional decision-making processes of representative democracy, all the points of view and interests of civil society are not necessarily—indeed, almost never—represented and considered. This means that representation is always partial, and the arguments of those who will be affected by particular innovations are not part of the debate serving to orient decisions. By contrast, the deliberative model of democracy is founded upon public discussion and the exchange of arguments. Representative and deliberative democracy are strictly interdependent, and it is misleading to consider the two terms as being in opposition to each other. Rather, considering them as terms in the same equation is much more conducive to effective management of the relationship between techno-science and society.

Keywords Communication, deliberative democracy, representation, techno-scientific innovation

The pace of techno-scientific innovation and the pervasiveness of its products raise new issues for policy, especially in a period when it is increasingly difficult for a small elite of decision makers and experts in the Western democracies to take decisions affecting the lives of citizens. Today the public is more aware and expert at formulating questions on issues of strong public impact and areas on which the products of techno-scientific innovation have major effects.

Department of Sociology, University of Padua, Via Cesarotti, 10/12, 35123 Padova, Italy. E-mail: giuseppe.pellegrini@unipd.it

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In the face of the challenges raised by innovations such as biotechnologies, nanotechnologies and communications technologies, it seems necessary to find new methods for their governance. It is consequently important to investigate how the need to take decisions on highly complex issues in the area of science and technology (S&T) can be reconciled with the demands for public involvement increasingly typical of the democratic societies, especially in Europe and the US. Given that this challenge has been taken up by a number of countries in recent years, a lively dialectic has arisen between democratic systems that privilege representative procedures and systems that introduce various forms of public discussion typical of deliberative democracy to involve the non-expert public.

In this chapter, I argue that this challenge for political transformation is crucial for the concurrent changeover from representation to deliberation in the realm of techno-scientific innovation. At the same time, it is misleading to consider the two terms 'representative' and 'deliberative' as being in opposition to each other.

The argument advanced and explored in this chapter is that deliberation is particularly worthwhile in dealing with uncertain techno-scientific innovation impacts because it tends to improve the outcomes of decision making. If deliberation is successfully handled, it will also lead to better knowledge and to confidence in discussions for future decisions, but at the same time it is also important to place appropriate emphasis on representative democracy, legitimacy and responsibility.

4.1 Representation and Techno-Scientific Innovation

Historically, processes of techno-scientific innovation since the middle of the last century have been governed within so-called representative democracies through close relationships between the political decision-making system, techno-scientific experts (particularly scientists) and business. The instruments with which to undertake scientific research and to develop the products of innovation have long been discussed in these three domains in relation to more or less shared concerns, but with rising tensions due to power relations that change according to events and the evolution of knowledge.

From a functional point of view, representative democracy uses the mechanism of delegation, whereby voters transfer decision-making power to their elected representatives. The latter, as a rule, have managed research policies and the governance of innovation mainly by relying on the opinions of experts. For example, after World War II decisions about the mature phase of so-called 'big science', such as the construction of colossal nuclear physics laboratories, were taken with no need to consult local communities or civil society organizations. Such decisions were considered legitimate, in that they were useful and necessary for the progress of science and were based on a mandate received from the electorate.

This type of innovation governance was characterized by a so-called 'technocratic drift'—a political orientation in which the power of experts in matters of great public importance decisively conditioned public decisions. That orientation was

based on the conviction that experts possess an objective knowledge able to solve not only specifically technical problems but social, political and economic ones as well. The technocrat, therefore, is suspicious of transparency and democratic discussion, and considers political conflict to be a 'consequence of ignorance' (Radaelli 1999). At the same time, because techno-scientific issues of public importance had increased in number and complexity, the experts and the public decision-makers expressing this technocratic orientation acquired considerable power in determining responses, but also in formulating society's demands for innovation. This orientation long characterized the governance of techno-scientific innovations. And today it is still apparent in various countries where it is inconceivable that other forms of knowledge expressed by citizens or civil society organizations could stand on the public stage as points of view alternative or complementary to those of scientists and experts. Again, from the point of view of knowledge and power, this relationship between science and democracy lays bare two systems: a self-referential system based on the possession of certain and 'true' knowledge, and a system centred on the aggregation of preferences and on the principle of participation by citizens via the vote, which is often more important than the decision to be taken. In recent years, there have been many situations in which these two attitudes have strongly opposed each other.

The proponents of the technocratic option grant remarkable authoritativeness to expert systems and the truths of S&T. In his book *The descent of Icarus*, Jaron Ezrahi describes the phenomenon well, stressing that contemporary democracies have used science as a cultural resource to establish mechanisms considered scientific by society (Ezrahi 1990). The reference is to the so-called 'scientificity of political life'. In this view, the scientific community has furnished a method for the functioning of science and at the same time for the functioning of society. The community of scientists, it is argued, is an idealized political collective founded upon internal consensus, and in which common agreement arises on scientific truths. Historically, this view has even deeper roots in the origins of modern society, and it is based on the need to ensure social integration by means of a method grounded, not on authority, but on intersubjectively constructed and validated knowledge, on an expertise still today considered more objective than others. Polanyi (1962) also depicted the community of scientists as an ideal and democratic collective, a sort of perfect republic. Likewise, in an article from the same period ('Science and democratic social structure'), Merton (1968) maintained that the manner in which science is conducted is what makes scientists ethically credible, so that today scientists are idealized above all by the media.

This idealized view of science is one of the bases of the research policies developed since the end of World War II. One famous document testifying to the doctrine is *Science, the endless frontier*, a report submitted by Vannevar Bush to President Roosevelt with the precise intention of emphasizing that the alliance between scientists and governments had brought great benefits during the world war (Bush 1945). Great discoveries and inventions had been achieved in that period, and at the end of the war there should be no return to a model of autonomous science released from a relationship that involved financing but at the same time government control.

In other words, Bush wanted to create and to maintain a stable relationship, inspired by a liberal conception of science as a privileged community financed by public resources, so that scientists could advance knowledge towards unknown ends always legitimated by an implicit mechanism of delegation. All this would involve a tacit accord among society, decision makers, scientists and enterprises.

It is evident that the system of techno-scientific knowledge represented a stable form of power able to condition the choices of numerous nation-states and orient their processes of technological transfer. But from the 1970s onwards this stable and diffused consensus weakened, and the alliance between scientists and decision makers entered crisis following many emergencies, most notably alarms concerning the bio-life sciences and the climate. Moreover, the growth of movements to protect the environment, human rights, women and medical patients, driven no longer by the political elites but from the bottom up, expanded the spaces for participation in political life.

To a large extent, techno-scientific innovations and their impact have revealed the difficulties of contemporary Western democracy in securing public trust in science, and the breakdown of cohesion among the social actors that must take important decisions in this area. Bearing witness to this are the results produced by disciplines that have made democracy one of their main objects of analysis: political science, international relations, political philosophy and the philosophy of law.

Put extremely briefly, for some time a theoretical clash has been in progress. On the one hand are conceptions and models of democracy informed by radical versions of representative democracy based on the thought of Schumpeter (1942). These emphasize the importance of competition among political–economic elites and the action of stakeholder lobbies. On the other hand are democratic forms founded upon participation and deliberation with the active contribution of citizens. These derive from the thought of Kelsen (1966). The concept of representative democracy has been strongly criticized by several commentators, and for various reasons has revealed all its shortcomings in the area of techno-scientific innovation. I now discuss those reasons with a view to making a dialectical comparison with recent developments in deliberative democracy.

4.1.1 Rapidity of Change, Progress, Communication

The speed and complexity of technological change in recent decades has prevented science from developing a coherent and complete explanation of it, and from furnishing certain answers to applied problems: What will happen if we use these antenna masts for mobile telephony? If we use such and such medicine? If we construct a high-speed railway line? If we modify the genetic make-up of this species? Our ability to induce enduring and sometimes irreversible changes is more advanced than our ability to foresee the effects of our actions. Moreover, the relationship between laboratory and market has grown increasingly close. And from the communicative point of view as well, science and technology have become so

closely interconnected that they are beginning to form an indissoluble whole. These various factors have led to the birth and development of so-called techno-science (Longo 2001).

The idea of technical and scientific progress that will solve humanity's problems of hunger, unhappiness and so on has entered grave crisis. Slowly, but evidently, the idea of meliorative progress has declined as we have witnessed ever more problematic situations in the rich and industrialized West. For example, the ability to modify life, to solve health problems and to discover new medicines has not prevented increases in depression, addiction and the stress-related illnesses typical of Western societies. And environmental emergencies such as global warming due to the industrialization of almost the entire planet are among the negative effects of the careless use of the products of S&T. Therefore, science and technology no longer embody the myth of beneficent progress. Instead, an ambiguous, double-faced image of science emerges, in which the dark side consists of negative effects that often involve broad segments of the population and are manifested in unexpected ways.

Globalization has afforded unprecedented access to communications. However, while it is true that a hitherto inconceivable number of individuals and groups can not only access information but also communicate their opinions or reach others across the world in real time, is also true that the large majority of the world's population does not yet have daily access to a telephone or even to electricity (Held 1995, Giddens 1999). Therefore, although the potentialities of communication are badly distributed, they allow access to, and therefore assessment of, the activity and knowledge of others, and the consultation of materials that in the past were only accessible on printed paper or through personal contacts. And all this without the intermediation of governmental authorities. From the point of view of democracy, we live in an increasingly global world which has modified the values and norms that traditionally unified entire social groups within the nation-states. For this reason, it is not easy to confine certain choices about innovations within national boundaries; research on stem cells, cloning for therapeutic purposes and the use of nuclear energy are cases in point. It follows that these and other techno-scientific innovations throw into crisis the democracies founded on the idea and law of the nation-state, whose range of action is restricted, as a rule, to a delimited territory from which it draws the necessary legitimation (Habermas 1998).

The globalization of the past decade, however, has not produced an economically, culturally and politically homogeneous society. Rather, it has reawakened a sense of local identity that had long lain dormant. Consequently, globalization has produced and exacerbated unexpected phenomena of diversity and inequality.

The globalized world comprises various levels—local, regional, national and continental—which often generate disputes and complicate decision making, given that some innovations extend beyond such levels. Decisions on the use of stem cells for research may be taken at national level but be in conflict with those taken by neighbouring states in which the citizens can freely state their preferences. Likewise, a refusal to adopt a nuclear-based energy programme for safety reasons clashes with the presence of potentially dangerous nuclear power stations in an adjoining country.

In the past 50 years, the function of representative democracy—understood as the system of principles, values, rules and procedures that arose from the formation of the European states after the wars of religion in the 17th century and from the great bourgeois revolutions, with their social pacts on welfare—has diminished to such an extent that it is now largely symbolic. The causes of its decline are well known: the globalization of production and investments; the dependence of governments on global financial markets, with a consequent loss of control over the levers of economic policy; the cancellation of the social contract between capital and labour; the exponential growth of migratory flows and the formation of an enormous mass of human beings devoid of rights because they have no citizenship status; and the fragmentation of societies that only regain unity through images in the media, which are now the most real locus of politics and trigger processes of spectacularization and personalization.

Amid all these changes, citizens have scant chance of affecting decisive choices about the products of innovation.

4.1.2 The Role of Scientists and Uncertainty

The ideals put forward in the literature of the 1960s, which extolled the qualities of an independent class of scientists extraneous to economic interests, have rapidly dissolved now that so many scientists have become outright economic operators, with partisan interests and public stances in which they resemble more entrepreneurs than experts motivated by the pure search for knowledge. A celebrated case is that of Craig Venter, promoter of one of the most important research programmes in genetics as the scientist/entrepreneur heading Celera Genomics. The history of the past 40 years has dramatically cast doubt on the neutrality of science, highlighting that the choice is not just between its beneficial and harmful uses, but also between acceptance and rejection of a scientific discovery or a technological innovation. The image of science as a two-faced Janus, the bringer of good or evil according to the intentions of those who use it and the contexts in which it is used, and therefore in itself neutral, is thus no longer current.

The problem of the limits of science does not arise only in the fields of biology and genetics. In the case of information and communication technologies, too, it is increasingly permissible to wonder whether everything that is technically feasible is also socially and politically acceptable, ethically admissible and legally legitimate. It is clear that the role of independent experts in exerting constructive influence for the public good is no longer guaranteed by the principles of a representative democracy, which founds its decision-making on the certain opinions gathered by those who make choices on behalf of voters. Obviously, decision makers can no longer respond to these demands in close accord with industry and the advice of scientists. The renewal of policy is therefore crucial and urgent, especially when one enquires as to which actors can or must contribute to the public debate on techno-scientific issues.

Although science warrants special interest in modern democratic societies, it evidently cannot be released from the guarantees that the rule of law has imposed on all the democratic powers—especially in this contemporary age, when science and knowledge exercise a power able to condition the rights of citizens and profoundly alter economic equilibria. If the notion of an independent science conducted in pursuit of the public good has broken down, the myth of a harmonious scientific community is also disintegrating, given that one frequently hears differing and sometimes contradictory opinions from scientists on issues of significant public impact.

Another major change concerns the uncertainty acquired by scientific knowledge—uncertainty that has become radical and constitutive for two main reasons. The first is that the laboratory of science is today somehow represented by the world as a whole (Latour 1987), and therefore by society at large. This is due to the 'amplification' of science's products and procedures brought about by its alliance with the market. The extension of innovations therefore reduces the capacity (which was always limited) to predict their effects. In this situation, facts are increasingly uncertain, the scientific community often seems divided, and the values under discussion substantially differ. The other reason is that, despite the importance of these issues, the system of norms lags behind the accelerated techno-scientific developments: a further factor that generates uncertainty.

What is proposed as an alternative? The turning point in recent years has been the advent of a broader participatory model. Attempts have been made to encourage broader dialogue among the scientific community, the institutions and citizens in order to bring out their opinions so that constructive discussion can be possible and diverse discourses can merge. This therefore requires a new definition of democracy, whereby the challenges raised by techno-scientific innovations can be managed. Democracy today cannot be founded solely on the prevalence of a majority, for there is a risk that only one language will predominate. This would be the language of techno-science, from which we would objectively draw the consequences for our civil and democratic life, without the uncertainties contained in the black boxes of science, and without different positions being confronted and discussed effectively.

In other words, it is essential to seek to understand how science and democracy can be reconciled today. What meanings and what possible actions are available to policymakers in the democratic states when innovations increasingly invasive of health and the environment must be managed?

4.2 Deliberation

When investigating the reasons for the crisis of contemporary representative democracy in managing techno-scientific innovation, and with particular regard to communication among the actors concerned, one soon encounters developments in so-called deliberative democracy. Since the 1980s in the US, and subsequently in Europe, a large body of analysis in political science has emphasized the importance of activating spaces for public discussion not only on political issues but also on

themes of strong public impact, such as the effects of techno-scientific innovations. In the traditional decision-making processes of representative democracy, all the points of view and interests of civil society are not necessarily—indeed, almost never—represented and considered. This means that representation is always partial, and the arguments of those who will be affected by particular innovations are not part of the debate serving to orient decisions. By contrast, the deliberative model of democracy is founded upon public discussion and the exchange of arguments. The deliberative process therefore proceeds through rational and impartial discussion, and it is democratic in that it is grounded on the principle of giving voice to the interests of the citizens and actors affected by the certain and uncertain consequences of techno-scientific innovations.[1]

Deliberation therefore consists of a complex set of processes (Held 1995, Giddens 1999) that are bound to alter the structural configuration and institutional arrangements of existing political systems. I consider in this chapter, in particular, the discussion-based and inclusive nature of the deliberative approach, dealing with its strengths and weaknesses but not going into details on individual procedures experimented with around the world in recent years.

The main purpose of 'deliberative arenas' is not to decide, but rather to encourage open discussion among actors with important interests in the subject being discussed. These practices are deliberative in that they emphasise the importance of superseding elitist forms of decision making and the democratic mechanisms founded upon majorities obtained by aggregating preferences. It is therefore a paradigmatic form of democracy that disputes the legitimacy and effectiveness of decision-making processes based on representation of the electorate. Implicit within it is a denunciation of the weakness of traditional democratic systems when complex decisions must be taken on controversial issues. And this objection also applies in cases where policymakers, together with scientists and enterprises, have taken decisions strongly resisted by the entire population at the moment of their implementation. Environmental conflicts over the construction of dangerous waste disposal sites and protests over the construction of infrastructure such as high-speed railway lines are two well-known examples.

Deliberative practices are mainly processes of communication used to activate relational links that extend beyond the normal mechanisms of power between elected and electors, decision makers and scientists, to address new controversies of great public concern, such as cloning, GMOs and the patenting of genetic material. The discussion in this chapter refers to deliberative democracy in the strong sense given to it by Elster (1998), Cohen (1997) and Habermas (1998), for whom the exchange is based on arguments put forward with criteria of validity. In this case, comparisons among arguments may also produce a change in the actors' attitudes during the deliberative process, as has been apparent on several occasions (Bobbio 2002).

[1] I refer to the group of deliberative procedures which, in various forms, and with the varying involvement of experts, non-experts and decision makers, have been used in recent years to manage phenomena of techno-scientific innovation. For a classification of these procedures, see Rowe and Frewer (2005).

The discussion thus far has shown that, in a more general sense, deliberative democracy is intended to deal with the crisis in institutions and democratic practices by introducing new dialectical forms to evince the reasons for particular choices, and to extend as far as possible the array of objections concerning the effects of decisions. In regard to techno-scientific innovation, I believe that there are two areas of particular importance in which procedures of deliberative democracy have contributed significantly to resolving decision-making deadlocks: governance for the citizens, and communication.

4.2.1 Governance and Citizenship

The challenges raised by the products of techno-scientific innovation cannot be countered in the absence a model of enlarged regulation predicated upon governance. This is a system that associates the conventional state/market binomial with the role and participation of a civil society organized at national level, and eventually at global level as well. From this perspective, the theorists of deliberation propose the adoption of inclusive and pluralist models of citizenship able to manage, through negotiation, the diverse cultural and normative attitudes expressed by the members of an increasingly diversified and complex society.

Given the new and growing demands that severely test the decision-making autonomy of the traditional democratic systems, the proposal is to promote a techno-scientific citizenship characterized by the enforceability of rights and the creation of opportunities to participate in the discussion phase with a view to decision making (Frankenfeld 1990). The most characteristic examples concern the role of patients' associations in decisions about the allocation of research funding and the selection of priorities, and the broad movement of computer users who collaborate with software producers in the production of new IT tools.

Those most critical of these processes stress the difficulty, for the modern democracies, of responding appropriately to an increasing number of demands. For the proponents of deliberative practices, this is instead an assumption of responsibility that, vis-à-vis a particular problem, also involves broad strata of society in identifying possible solutions and in finding the necessary resources.

4.2.2 Communication and Deliberation

If the relationship of governance with citizenship raises many interesting topics for reflection, its relationship with communication is no less important. Communication, in fact, is one of the bases of a democratic state: communication among institutions, political associations and citizens; communication among the various institutions themselves.

In the perspective of deliberative democracy, it is vital that the sphere of the political institutions should not be perceived by citizens as a separate body behaving

incomprehensibly and unpredictably. On this conception, communication is a *res publica*, a good of public interest. It must be possible to communicate and to interact with the state through effective tools accessible to all, especially when issues of great public concern are involved. This is the case for questions such as whether GM foods should be placed on the market; where it is best to process radioactive waste; what measures should be taken to combat global warming; or whether research on embryonic stem cells for therapeutic purposes is ethically admissible. These are some of the issues on the media and political agenda, and on which important decisions are taken by means of the mechanism of political delegation.

And the same applies to the relationships between citizens and the mediatory associations of representation, which in democratic countries take the form of political parties. Only transparent communication ensures that citizens can select their representatives in a conscious and informed way, control and direct their activities, and, in general, freely and responsibly exercise their rights to participate in the formation of the general will.

The form of deliberation described here takes place on the public stage through the use of the many instruments, with almost limitless potential, which today enable exchanges in real time. This mode, characterized by easy access, concerns the practices of 'discursive democracy' described by Dryzek (1990) as increasing the opportunities for connection among various actors while respecting their roles as decision makers and citizens—as those who must somehow control and promote sensible demands. Besides these potentialities, one must also consider the forms of control that the communication media may produce through their invasion of the private sphere and their conditioning of social and commercial relations and of learning processes.

The facile optimism apparent in the claims of the theorists of deliberative democracy has been harshly criticized on grounds that have a certain cogency. Although deliberative democracy, by relying on dialogue and participation more than on mediation and political representation, may give rise to a different relationship among the actors of techno-scientific innovation, between governors and governed, at the same time it may create some general problems, which I now briefly discuss.

The first problem concerns effects. Deliberative procedures have at times been disappointing in their outcomes: that is, in their capacity to enable real influence to be exerted on the choices of decision makers. The empowerment activated by deliberative arenas, in fact, provokes frustration in participants when their opinion is not considered during the public debate. While it is true that the procedures typical of deliberative democracy are not necessarily intended to produce decisions, they may nevertheless generate expectations in the individuals and associations involved (Einsiedel and Eastlick 2000).

A second problematic area is resources. The correct organization of deliberative procedures, whether local or national, requires a wide array of capabilities, large amounts of funding, third-party bodies and experts on participation. On summing these resources, there are those who argue that the costs exceed the benefits. Moreover, only recently have governments or local public administrations begun to invest in the management of controversies by means of deliberative procedures.

Third, there is the question of participation. Citizens generally tend to delegate to politicians and experts the task of taking decisions on complex techno-scientific issues, often claiming that their involvement is pointless because they lack the necessary knowledge. The concern of citizens is normally aroused when problematic and controversial situations occur. In these cases, typified by the NIMBY (not in my back yard) syndrome, deliberative procedures are able to activate participation only in regard to specific and localized issues. It is more difficult to attract the attention of civil society actors to more general issues of a national or supranational character.

A fourth problem is the weakness of deliberation procedures. Given the difficulty of organizing occasions for participation that aggregate all actors representative of the general public, it may happen that the discussions and the instruments used are not neutral in the sense that they permit open and frank debate. Moreover, there is a serious risk that such procedures may involve only citizens, organizations and institutions already experienced in public debate, sidelining a silent majority of subjects who do not normally have access to public discussion. In other words, the procedures may become manipulatory and instrumental to undeclared purposes, or they may produce unwanted effects. All of this confirms that the management, control and evaluation of effective public arenas are complex undertakings that require the deployment of various skills and the impartial conduct of the process and contents.

A final problem concerns the pertinence of deliberative practices. Can these forms of discussion be used to resolve conflicts and disputes, especially those concerning the most controversial issues? For critical commentators, there is no certainty of success in this regard. They stress that some issues require a different form of communication among actors. More institutional means must be found, lest conflicts degenerate and deadlocks arise, with the consequence that processes of techno-scientific innovation are no longer manageable. It is not by means of open debate that situations of impasse can be resolved. Rather, recourse must be made to third-party bodies or to superordinate institutions credible to the contenders. This is the case in debates about the adoption of infrastructures with a strong impact on local communities, where intransigency and paralysis often arise. Deliberative procedures are not a panacea.

4.3 Conclusions: Beyond a Useless Dualism

The critical aspects I have discussed derive principally from the widespread perception of representation and deliberation as elements in a dualism—if not, indeed, as two entirely antithetical processes. After briefly discussing the strengths and weaknesses of the two approaches in democratic regimes, I shall stress that they should be regarded as strictly interdependent. I argue, in fact, that it is misleading to sustain the representation/deliberation dualism, because it strengthens the idea that science and society are separate worlds—that society is some sort of inconvenient interloper between politics and science. To insist on this polarization, maintaining

the terms on different planes, prevents valorization on the one hand of the responsibility of the decision makers and the institutions, and on the other of civil society's vivacity and ability to raise pertinent issues and to contribute to the public debate. Considering them as terms in the same equation is much more conducive to effective management of the relationship between technoscience and society.

In a representative democracy, citizens periodically elect representatives who exercise power on their behalf through the institutions of parliament and government, with no constraints on their mandate. While citizens dissatisfied with their representatives' action on techno-scientific innovations may decide to change them at the next elections, citizens have scant real power to affect their representatives' choices and are not empowered to revoke their mandate. Hence, in order to complete this democratic system, deliberative procedures can be used to implement relational systems. Those procedures are important in so far as they are able to provide a reference framework for the action, identities, and individual and collective interests activated by problematic situations and controversies. The problem of deciding whether to use the procedures and who should promote them remains. At present, they are most often sustained by civil society organizations and to a lesser extent by the institutions.

Again in regard to deliberation, the processes of conflictual action produced by citizens and organizations should not be assessed negatively. They are deemed useful by scholars because they constitute a field of tensions and contrasts in civil society that enables the inclusion of new sectors of the population in citizenship, and they stimulate institutional innovation (Geuna 1998). Mention has frequently been made of a democratic deficit in innovative techno-scientific processes, but the problem is instead a lack of harmonization between the representative and deliberative dimensions. For example, in a regime of representative democracy, the state should act as the regulator of public goods and the protector of collective interests. In theory, the state's task is to regulate the market, seeking to moderate the increasing power that it has wielded in recent decades. It is evident, however, that economic interests have much greater power than the regulatory and protective function performed by the public administration. This is why a vigilant civil society—also thanks to deliberative procedures such as citizens' juries or consensus conferences focused on issues of great public impact—can curb the influence of powerful economic and political actors. Obviously, not all citizens are willing to take up the challenge of participation and involvement, but current experiences in various parts of the world testify that the commitment of civil society organizations is able to foster these processes of involvement—even if they are restricted to forms of consultation—and activate virtuous processes that are repeatable over time.

Three factors are crucial in sustaining the fruitful relationship that can be established between representative and deliberative democracy. The first is the definition of objectives. If, as I mentioned at the outset, one of the shortcomings of institutional relationships within representative democracy is that questions are formulated that do not match the interests and needs of citizens, it is difficult to avoid fierce conflicts if there are no spaces for consultation, discussion and deliberation. Certain techno-scientific innovations, given their powerful influence over

collective life, cannot be managed without the attentive involvement of significant stakeholders. This space of involvement and participation in which to clarify the goals to pursue will be more effective, the more it is possible to forestall the frequent attempts of politicians to delegate the responsibility to decide, relieving themselves of the burden of awkward decisions and relying on the opinions of experts or on forms of direct democracy such as referendums, which shift the problem onto citizens without an appropriate process of discussion and opinion formation. In this sense, the exercise of deliberative democracy allows the involvement of citizens in the definition of public policies and, ultimately, heightens their awareness of problems of far-reaching importance.

Under what conditions can close integration between representation and deliberation be achieved? The first requirement is a democratic context where there are opportunities to listen and to conduct institutional and informal discussion, where the issues to be treated are consequently selected by general consensus, and where deliberative processes take place with the contribution of effectively neutral bodies, whether public or private. For these conditions to come about, it is above all necessary that the public institutions do not resort to normative solutions, but instead work on the framing and discussion of problems. For example, the proposal to install an incinerator for urban waste cannot be put forward on legal grounds alone; rather, it should be accompanied by a process of communication that considers, besides the legitimate interests involved, the level of public debate in a particular area—the purpose being to foster appropriate discussion and decision making.

Finally, what actors should be involved? Who decides, and how, the subjects to be included in discussions about techno-scientific innovations? Such matters obviously cannot be decided by technicians and scientists alone, or by firms. It is the duty of the political system to mediate among the parties to protect the public interest, extending participation to other actors as well. But which other actors? Obviously, there is no single answer, but rather a set of criteria that enables a correct balance to be struck between making a utopian attempt to involve all citizens on all issues and restricting discussion to a few powerful experts. When selecting the actors, it should be expressly recognized that new technologies must be used to construct a more mature relationship among the state, citizens, firms and civil service organizations, privileging the direct beneficiaries and placing the citizen at the centre—as envisaged, for that matter, by numerous democratic constitutions.

In this manner, more effective use can be made of the places of representation that generally constitute the first level of the political mediation, where different demands and interests, normally particularistic and corporative, are elaborated before they are introduced into public discussion with non-experts. To resort at this point to deliberative procedures is a risky undertaking, but it is not demagogic, and does not involve the addition of even one more element in the mosaic of opinions. It should always be borne in mind, however, that the opinion of the non-expert does not stand at the same level as the opinions of experts and institutions. One cannot be so ingenuous as to ignore the different levels of information and the different capacities to influence decision-making processes. And, as powerful and authoritative scientists or the market seek to impose their points of view, the only antidote against uniformity of

thinking and unilateral decisions is to strengthen channels of information and democratic consultation. In this way the credibility of the actors involved can be evaluated, and the interests that they represent made more transparent.

To conclude: there is no 'first' and 'second' between representative democracy and deliberative democracy. Rather, the deliberative approach with all its various procedures should be conceived as a historical necessity that completes representative democracy. While not every issue can be resolved through dialogue, and citizens do not have to decide everything, it is no longer possible to imagine that all communication on decisions should concern only experts and politicians.

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The Author

Giuseppe Pellegrini (giuseppe.pellegrini@unipd.it)
Giuseppe Pellegrini has a PhD in sociology, and teaches methodology of social research at the University of Padova, Italy. His current research focuses on the sociology of science, citizenship rights and public participation, with a specific focus on biotechnology issues. He is the coordinator of the Science and Citizens research area at Observa—Science in Society. He is a member of the EASST (European Association for the Study of Science and Technology) and of the Society for Social Studies of Science (4S). His most recent book, *Biotecnologie e cittadinanza* (*Biotechnology and citizenship*), was published by Libreria Gregoriana Edizioni in 2005.