

Knowledge, uncertainty and the transformation of the public sphere¹

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Abstract

Radical uncertainty plays a major role in the transformation of the social production of knowledge by questioning the centrality of scientific-technical expertise. Important changes are occurring in the discursive and social divisions characterising the production and management of knowledge, but the ability of these innovations to cope with the challenge of radical uncertainty is doubtful. This seems to call for a reassessment of the forms of knowledge-related social cooperation, but the late modern public sphere does not provide favourable conditions for this endeavour. Is there a way out of this impasse? The answer is difficult and conditional on many factors. However, Dewey's theory of inquiry and of the public sphere may represent a good basis for further investigation.

1. Science, knowledge and radical uncertainty

Knowledge, and more precisely scientific-technical knowledge, is a crucial resource (Stehr 1994). However, in recent years this resource has become increasingly controversial. This is particularly evident as regards environmental and technological issues. Expert knowledge must face mounting criticism in a wide range of contexts, from local community mobilisations against the siting of hazardous installations to public concern over the consequences of technological innovation.

Science seems to embody some core values of modern society (Parsons 1951). Above all, modernisation has apparently removed public legitimacy from any type of non-scientific knowledge. However, the alleged value- and interest-neutrality of scientific knowledge is called into question by stakeholder systematic appeals to its authority in support of conflicting claims. Cognitive controversy is inherent to sound scientific practice, as Popper, Kuhn, Merton and many others tell us. However, its entry into the public sphere gives it a novel public saliency; a saliency due to the growing importance of policy-related science (Weingart 1999; Irwin et al. 1997; Funtowicz et al. 2000), the spread of scientific knowledge production 'from academia to many different institutions... [and its] increasing contextualisation, including its marketability' (Nowotny 2000: 13-14), the scientists' deliberate use of the media to bypass peer scrutiny and resolve internal conflicts (Bucchi 1998). Unexpected technical failures and 'side effects' also play a role, fostering public scepticism over the alleged expert control of physical processes.

¹ Early versions of this paper were presented at seminars held at the Faculty of Sociology of the University of Turku (Finland) and at the Department of Historical and Political Studies of the University of Padua (Italy). In both cases I collected very insightful comments, for which I am indebted with the participants.

In spite of growing criticism, scientific-technical expertise still retains its position as *the* source of legitimate public knowledge. Even the critique of official expertise often appeals to different *scientific* evidence (Yearley 1992), thus confirming science as the only legitimate and relevant form of knowledge. However, the increasing importance of radical uncertainty seriously questions this position. What is radical uncertainty? It differs from the kind of uncertainty addressed by rational choice theory. It is a situation where not only the means, but also the goals and structure of a problem are ill-defined. Radical uncertainty is a typical feature of intractable controversies (Schön and Rein 1994), of which environmental and technological issues offer many examples, from GMOs to BSE, from electromagnetic fields to climate change. Intractable controversies are different from the simple ‘disagreements’ of routine political debate. The latter can be resolved by appealing to ‘facts’ – that is, by using shareable kinds of rational argument referred to scientific research, witnesses, past experience, and so on. The former cannot. In this case, the parties in dispute tend to emphasise different facts, or give them different interpretations, so that each party seeks to confute the empirical evidence adduced by the others. There is no consensus either on the relevant knowledge or on the principles at stake. Facts and values overlap.

Radical uncertainty calls into question the rational actor model at the basis of the traditional conception of scientific-technical knowledge production. It often takes the shape of indeterminacy – relevant information is dispersed in an inextricable mass of data, the causal chains are open, etc. – or ignorance – we don’t know what we don’t know (Wynne 1992), and how relevant it is for deciding what to do. Many policy controversies involving scientific-technical knowledge are characterised by the lack of a single description and connection of facts, a shared vision of the meanings of concepts and principles. Radical uncertainty often reveals itself as a ‘surprise’, as an unexpected, sudden change in the state of affairs, as the unintended or underestimated effects of a course of action.

What role does radical uncertainty play in the transformation of the social production of knowledge? My argument is divided into three steps. First, I deal with knowledge controversies at the discourse level and show their connection with social exclusion. Second, I focus on different understandings of the changing role of scientific-technical expertise and of the extending of the borders of public knowledge. Third, I search for the reasons why, in spite of the increasing saliency of radical uncertainty, no major changes in the social arrangements for knowledge production have yet occurred. To this end, I explore the logic underlying the redefinition of deliberative domains and show that the institutionalisation of an inclusive approach – that is, the effort to keep the boundaries of public discourses permeable and mobile, which is likely to be the only effective answer to the challenge of radical uncertainty – is obstructed by the current fragmented condition of the public sphere. A way out of this impasse is difficult to envisage, but I suggest that Dewey’s theory of inquiry and of the public sphere may represent a good basis for further investigation.

2. Knowledge, discourse and social cooperation

The implications of radical uncertainty for the public use of knowledge may be fruitfully considered from the viewpoint of discourse analysis.² For knowledge to be public – and before that, to be social – it must be communicated, i.e. made the subject of discourses. Knowledge discourses include veridictory enunciates, that is, statements concerning the existence of what they refer to. Veridiction is based on the semantic opposition between truth and falsehood and between secret and lie (Greimas and Courtès 1979). In modern knowledge discourses – where the ideal-type of scientific-technical cognition, value-neutral and general, plays a major role – veridiction typically acquires saliency by means of two other semantic oppositions, namely between fact and value and between relevance and marginality. Truth is a matter of fact and of explanatory economy. It is not

² For applications of discourse analysis to policy studies see e.g. Roe 1994; Hajer 1995; Radaelli 1999a.

context-dependent and cannot be hidden. Value-commitments, by contrast, give rise to mistakes, or to lies.

We find these oppositions underlying the two main themes involved in knowledge controversies: the legitimacy of discourses and their veracity. Legitimacy refers to a normative dimension. When I raise criticisms against the normative status of a knowledge claim, I am concerned with my interlocutor's entitlement to speak. We may say that I am raising a problem concerning the *appropriateness* of a discourse. For example, I maintain that my interlocutor does not have the *right* to speak because he or she does not belong to the community affected by the problem. However, the role played in modern society by educational and professional institutions implies that particular importance is given to the formal recognition of the *ability* to speak. Thus, before scrutiny, I can maintain that someone's claims are unreliable because he or she lacks the necessary competence or skill, as officially attested. Veracity, by contrast, refers to a properly cognitive dimension. In this case I am raising a problem concerning the *pertinence* of a discourse. When I criticise a knowledge claim, I may be concerned with its being wrong or futile, with someone's (deliberate or involuntary) false or irrelevant representation of reality. This may depend on his or her value-commitments (e.g. I may think he/she is conditioned by corporate interests) or reliance on defective knowledge (e.g. I may think he/she is too concerned with situational details). Of course, the distinction between legitimacy and veracity is an analytical one: the normative and cognitive dimensions of knowledge controversies are usually intertwined.

Discursive distinctions are connected to social distinctions (Foucault 1971). Often, when I dismiss a discourse, I am calling at the same time for the exclusion of a person or a group from deliberation. However, the possibility of excluding discourses by criticising them for a lack of pertinence or appropriateness is not available at will. It depends on the rules of interaction in force. This is what Allen Buchanan calls a 'dominant cooperative scheme'. A cooperative scheme establishes what is to be considered as an ability or disability. A disability is the lack of the capacity to carry out a certain range of tasks or functions that a group is able to perform and regards as important. Hence a disability only exists when the lack of some capacity interferes with 'the performance of socially significant tasks (in one's social environment, relative to one's reference group)' (Buchanan 1996: 38). Thus, by analysing how knowledge discourses are qualified in terms of pertinence and appropriateness, we draw information on the underlying dominant cooperative scheme.

This perspective sheds some light on the relation between scientific-technical knowledge and other forms of knowledge which is at the core of many environmental controversies. As said, modernity has given science the status of the only truly public knowledge. The scientist is conceived as an independent researcher who looks for facts and is free from any value commitment, apart from those proper to the scientific community. According to Merton (1973), these are the principles of impartial evaluation of claims, knowledge-sharing, systematic doubt and personal disinterestedness. Non-scientific knowledge is dismissed as being particular, private, unverifiable, and intertwined with non-cognitive interests. Thus, appeals to scientific knowledge usually play down non-scientific knowledge by referring to the fact/value and relevance/marginality oppositions. The traditional politics of expertise can be conceived in terms of a particular cooperative scheme. This scheme assumes that an essentially technical definition of policy issues is possible, so that they can be settled by relying on specialised knowledge. Specialised knowledge consists of a repertoire of models and approaches. Experts find the most suitable ones according to an unequivocal issue-definition. In this scheme lay citizens are disabled because they lack the ability to speak pertinently and appropriately. Lay local knowledge counts for nothing, or for very little. Moreover, a cooperative scheme focused on specialised knowledge implies the tendency to narrow the definition of the relevant abilities involved in any policy issue, i.e. to increase the specialisation of usable expertise.

This is not necessarily the result of a deliberate strategy. As Buchanan maintains, 'the dominant cooperative schemes (for entire societies) have never been *chosen*, strictly speaking. Instead, they have emerged... from the cumulative (and largely unanticipated) effects of many interactions

among many generations of individuals'. However, he adds, 'at certain critical junctures in a society's history, it may be possible to exercise some degree of choice over some important elements in the dominant cooperative scheme' (Buchanan 1996: 41). Perhaps we are at one of these critical junctures. Scientific-technical expertise is increasingly questioned, and a change in the dominant cooperative scheme of the environmental and technological governance is possibly under way.

3. Broadening the borders of public knowledge

By studying science in terms of cognitive practices and of related interest and power dynamics, sociology has questioned the ideal-type of scientific knowledge production (Jasanoff et al. 1995). Similarly, in many knowledge controversies, official scientific-technical expertise is challenged at the normative and cognitive levels. From the normative viewpoint, the reliability and legitimacy of scientific and technical expertise is questioned for reasons such as the technologisation and commodification of science – the growing reliance of even fundamental research on expensive technical devices, with its consequent dependence on corporate interest – or the intertwining of science and politics.³

Expert failure in controlling technology has fuelled cognitive criticism. Recognition is spreading that business as usual in science will no longer suffice, that the present 'is a fundamentally different world from the one in which the current scientific enterprise has developed' (Gallopín et al. 2001: 220), that 'new relationships are needed that fit the new mould of science, technology and society' (European Commission 2000a: 5). The concept of 'post-normal science', proposed by Funtowicz and Ravetz (1993, 1999), grasps a point felt by a growing number of scholars. Today science has to face situations where the traditional experimental verification of hypotheses proves extremely difficult, or impossible. Current problems are increasingly characterised by very high decision stakes and uncertainty. Both of these derive from the success of science in mastering nature. Broadening the scope of interference with natural processes implies broadening the domain of decision-related uncertainty.⁴ In this sense, radical uncertainty is no longer the realm of scientific speculation: it is at the core of actual, pressing problems. This would require – so the argument goes – enlargement of the peer review process to encompass all those potentially affected by decisions and a range of 'facts' broader than those usually considered as scientifically relevant.

This changing perspective on science, its social role and its relations with other kinds of knowledge leads to a new understanding of what represents 'sound' science. This used to mean adopting approaches that were transparent, systematic, peer-reviewed, accountable, independent, capable of learning. Now increasingly advocated is the importance of being ready to broaden the framing of an issue, to consider different kinds of knowledge, including everyday expertise and the synthetic, anecdotal, informal lay-local insight, to be open to alternatives, to acknowledge incommensurability and ignorance (Stirling 1999). However, broadening the boundaries of knowledge means broadening the range of those who are entitled to participate. That is, being ready to revise the cooperative scheme characterising a given problem-setting.

It may be useful to confront the traditional politics of expertise with different perspectives on the enlargement of the boundaries of public knowledge. The analytical dimensions to consider are the scope of deliberation and the kind of knowledge deemed relevant. Deliberation may be

³ The Manhattan Project to develop the atomic bomb during WW2 was a crucial stage in this process, subsequently fuelled by the Cold War. The ecological crisis and the development of environmental policies further strengthened the reciprocal influence of science and politics. It is worth noting that political scientists are devoting increasingly closer attention to the role of knowledge in policy-making (see e.g. Haas 1992; Radaelli 1995, 1999b; Sabatier 1998).

⁴ The same can be said of the attempt to control and regulate social processes which supports the development of welfare and, more recently, multicultural policies. The consequent increase in the social saliency of radical uncertainty is a major argument in the risk society and reflexive modernisation theses proposed by Beck and Giddens (Beck 1992; Giddens 1990, 1994).

conceived as either able or unable to separately address the natural and social world, while relevant knowledge may be conceived as restricted to expert knowledge, or encompassing different kinds of competence (see Table 1).

		relevant knowledge	
		<i>expert-only</i>	<i>multi-sourced</i>
scope of deliberation	<i>nature or society</i>	(2) new politics of expertise Beck	(3) Funtowicz and Ravetz
	<i>nature and society</i>	(1) traditional politics of expertise	(4) Wynne

Table 1 - Knowledge and public deliberation

3.1. *It's our business: traditional and new politics of expertise*

The first quadrant of the table sets out the traditional politics of expertise. Experts act as advisers to conflicting political actors faced with policy issues of increasingly technical character. Knowledge is scarce and costly and uncertainty may be high, but it pertains to means, not to problem-definition (Pellizzoni 2001a). Expert advice is a matter of rational choice within a thoroughly defined situation, according to the goals at stake. In this sense, social conflict cannot be separated from technical problem-solving. Interests dictate the way natural forces have to be managed.

There is however an emergent politics of expertise which is developing in response to a mounting number of accidents, 'side effects', and criticisms. Consider the European Union's recent efforts to provide expert advice with a higher degree of independence from political and economic influence, as testified by the growing role of the Agencies (Kreher 1997; Dehousse 1997; Majone 1997) and the acknowledged necessity to make the use of expertise more transparent and accountable (European Commission 2001). According to this approach, 'democratising expertise' goes hand-in-hand with 'expertising democracy', that is, providing institutions and citizens with more and more technical and scientific knowledge – usable and of good quality (Liberatore 2001). Beck's Risk Society thesis (Beck 1992) is consistent with this perspective because of its emphasis on the role of 'counter-expertise' as a core aspect of the changes occurring in the public sphere and in the policy process. For Beck, risks derive from natural reactions to human attempts to master more and more aspects of the physical world. Although their definition is socially negotiated, risks ultimately depend on the intrinsic features of physical phenomena. The role of the scientific knowledge of nature is therefore enhanced (Pellizzoni 1999) and deliberation is extended to a broader range of professional experts.

3.2. Broadening the boundaries of public knowledge

However, while to a certain extent ignorance could be faced by multiplying expert voices, so as to enlarge the scope of the inquiry into a problem, indeterminacy, inasmuch as it results from ‘real open-endedness in the sense that the outcomes depend on how intermediate actors will behave’ (Wynne 1992: 117), seems possible to address only by involving those very actors. Testifying to this are several examples (see e.g. Irwin 1995; Wynne 1996; Clark and Murdoch 1997). A recent one is provided by the BSE case. As Yearley remarks, ‘regulations demanding the removal from cattle carcasses of potentially hazardous body parts (such as the spinal cord) made assumptions about the conditions of work in slaughterhouses, conditions that inspectors found it impossible practically to ensure’ (2000: 106).

The right side of Table 1 thus includes positions that assert the relevance, besides expert knowledge, of other kinds as well. For Funtowicz and Ravetz (1993), the features of the physical processes dictate the level of uncertainties to be faced when dealing with issues characterised by different degrees of urgency. For Wynne (1992; 1996), on the contrary, uncertainty and decision-stakes cannot be separated: one is the function of the other. Environmental risks are connected to the dependency-producing way in which expert systems operate on people, forcing them to adapt to debatable models of social behaviour and relationships. ‘Science offers a framework that is unavoidably social as well as technical since in public domains scientific knowledge embodies implicit models or assumptions about the social world [...], tacit commitments about audiences or user-situations which may then serve as unnegotiated social prescriptions’ (Irwin and Wynne 1996: 2-3). In other words, experts tacitly impose prescriptive models concerning the human, the social and what is to be considered as good, right and desirable. As a consequence, while for Funtowicz and Ravetz the basic purpose of extending the peer review is to improve the quality of knowledge in conditions of high uncertainty, for Wynne it is first of all to discuss what the stakes really are and the assumptions about the natural *and* social world made by each of the actors involved.

4. Understanding the logic of change

Of course, one may remark that the left side of the table represents the reality of the politics of knowledge and its ongoing transformation, while the right side offers utopian views, speculations that have assumed hardly any practical relevance until now. The boundaries of public knowledge are under pressure, but no major changes in the social arrangements for knowledge production have yet occurred. This urges one to grasp the logic of the current transformation in the governance of industrial democracies.

According to Buchanan, there are basically two conflicting interests involved in choosing a cooperative scheme. On the one side, individuals have an interest ‘in not being disabled, in having access to a dominant cooperative scheme whose demands are matched by their abilities’. On the other side, a person also has an interest ‘in having access to a dominant cooperative scheme that is the most productive and rewarding form of interaction in which he or she can participate effectively’ (1996: 41-42). An interest in excluding is thus set against an interest in being included. This may be a matter of coercion, or bargaining. However, to be legitimate in a democratic society, a cooperative scheme should be publicly defended and justified. A supposedly shared interest has to be put forth. The traditional politics of expertise provides specialised knowledge with a crucial role under the banner of the common good. Such an arrangement is based on what Helga Nowotny calls mode 1 knowledge production: ‘the disciplinary structure... that served as supreme scientific authority, governed by scientific elites [and where]... the authority of discipline-based pure science... became in fact removed from all areas of potential contestation’ (Nowotny 2000: 11). The increasing complexity of society implied that the balance between the interest in maximising the technical

efficiency of the problem-solving, and the interest in maximising the involved actors' right to have a say, gradually shifted towards the former.

Thus behind a cooperative scheme there lies a dialectic of exclusionary and inclusionary goals. Critical junctures call for a redefinition of a scheme that has proved to be weak. New deliberative domains have to be defined – new spheres of pertinent and appropriate discourses, new distinctions between abilities and disabilities, new communities of discussion. Different routes may be followed, according to the combination of diverse goals and strategies. Four ideal-types, four logics of change, can be singled out: excluding by decomposing, excluding by composing, including by decomposing and including by composing.

In the first case, the attempt is to define a new cooperative scheme while preserving the original relations of cognitive (and social) dominance as far as possible. The logic is that of broadening the original community of discussion while at the same time building new discursive boundaries, new distinctions between abilities and disabilities. Some subjects previously disabled are publicly recognised as able, but to perform only specific tasks. In the second case, the discursive domain is redefined in order to accommodate a broader range of themes and subjects, but the basic relations of dominance are again affirmed. More abilities are acknowledged as relevant to the issue at stake, but without a core cleavage between able and disabled subjects being questioned. The third approach is to include previously unacknowledged themes and disabled categories of subjects, while at the same time restricting in functional or spatial terms the scope of deliberation and the actually participating subjects. The fourth solution shares the inclusionary goal of the third, but rejects its strategy of narrowing the scope of deliberation and the range of participants from the outset.

According to the first logic, if the issue-framing and the deliberating community must be enlarged, the discursive domain is to be split into different categories pertaining to different sub-communities of ability. According to the second logic, enlargement should be made possible by including different specifications of a same basic cognitive ability, that is, without moving the dividing line between ability and disability. The third logic is more relaxed from this viewpoint, but aims at giving very stringent definition to the target of deliberation and the related community. The fourth logic is more relaxed also as regards the latter aspects.

		goals	
		<i>excluding</i>	<i>including</i>
strategies	<i>decomposing</i>	(1) PTA methods	(3) self-regulation of social partners
	<i>composing</i>	(2) agencies and committees	(4) social movements

Table 2 - Building new cooperative schemes: the transformation of governance in Europe

4.1. *The logics of change at work: the transformation of governance in Europe*

Many observers claim that a major transformation is under way in the governance of Europe. They focus on the increasing importance of formal and informal regimes based on the interaction and cooperation among public and private actors, or the self-regulation of the latter (Carlsson and Ramphal 1995; Rhodes 1996; Mayntz 1999). These new arrangements are advocated in order to improve the legitimacy and effectiveness of European governance (European Commission 2001). In this context, radical uncertainty is understood mainly as complexity (Pellizzoni 2003). Society – it is remarked – has become too complex to be steered in a centralised, unified manner. No single subject, no matter how powerful and technically competent, is able to handle its dynamics in a traditional top-down style. Thus it is necessary to downscale and ‘diffuse’ policy- and decision-making. Problems are to be framed and solutions developed and implemented ‘in an ongoing process with stakeholders in context’ (Lebessis and Paterson 1999: 34).

In actual fact, we find all the logics of change described above at work in the transformation of European governance (see Table 2).

1) *Excluding by decomposing: participatory technology assessment.* Excluding by decomposing seems the logic of the traditional policy-making based on mode 1 knowledge production. However, this logic also underlies some new governance approaches. The diffusion of participatory technology assessment (PTA) methods involving lay citizens – consensus conferences, citizen juries, scenario workshops etc. – is a major innovation. These often seek to reveal a ‘public opinion’ on an issue by throwing light on opinions and ideas, principles and values, and by comparing them against the ‘facts’ provided by the experts. Hence, experts and politicians are no longer those solely entitled to deliberate on the common good. However, the abilities attributed to citizens are carefully circumscribed. They have a say in matters of values, they have an ethical competence, they can discuss what is to be inferred by looking at facts from their own principled viewpoint, but they do not have a say on the facts themselves – how they are constructed, selected and presented. This feature is mirrored in the broader policy culture, where one can detect ‘long-standing, deeply cultural presumptions of a categorical divide between factual, objective and real knowledge on one hand, and cognitively-empty emotion or values on the other’ (Wynne 2001: 51-52). The GMOs issue offers a good example. Research shows that popular scepticism centres on the experts’ claims that they are able to control the consequences of gene modifications (De Marchi and Pellizzoni 2003), their inability or unwillingness to recognise the limited knowledge on which policy choices have to rely. However, although acknowledging the relevance of public concerns, official discourses characterise them in purely ethical terms, as if they were devoid of any cognitive content (Wynne 2001).

2) *Excluding by composing: agencies and committees.* The second ideal type, excluding by composing, seemingly captures the logic of the emergent approach to expert advice. Governance is transformed also through the ‘irresistible rise of the committee system as a forum for and form of regulatory policy’ (Joerges and Everson 2000: 174), and the growing role of the European agencies. Committees and agencies represent an attempt to bring together different subjects so that they can discursively deal with complex policy issues. The slogan, one might say, is ‘multiply the voices’, i.e. promote scientific multidisciplinary, dialogue among national and European bureaucracies, the inclusion of organised interests. In this way, however, the enlargement of the discursive space and deliberating communities still follows an elitist approach. The most powerful viewpoints are easily over-represented. This inevitably attracts criticism. As a scholar remarks, ‘the participation of a wider range of interest groups is certainly a better alternative to the present model, where it is only the pressure groups most directly affected who participate’ (Kreher 1997: 242). But even if a more balanced representation were achieved, the increasing involvement of NGOs in European governance (European Commission 2000b; Kohler-Koch 2000) raises the question of their actual representativeness of citizen concerns and their accountability to the broader public.

3) *Including by decomposing: self-regulation.* Including by decomposing is the logic underlying another major development in the governance of Europe. The White Paper on

governance (European Commission 2001) and many other documents and academic papers insist on the importance of fostering self-regulation by the social partners. In the environmental sector, this idea is implemented in various ways (Andrews 1998). One is the self-regulation of the relations between suppliers and customers in order to ensure environmentally friendly practices. Another is third party certification of environmental performance: an example being the Eco Management & Audit Scheme (EMAS).⁵ Yet another possibility is that of guidelines or standards of good practice promoted by sectoral business associations. The ambivalence of these solutions is evident. In a sense, they still rely on the myth of the 'invisible hand'. They maintain that a general interest can be pursued by appealing to self-interest. Environmental concern becomes part of corporate self-regulation. These approaches promote a redefinition of the discursive space (we talk of business *and* environment) and the deliberating community (we discuss about our practices with *you*, as customers, suppliers, competitors, auditors). But it is inevitable that, if freed from the control of an external authority, firms will tend to adopt those practices that match their own interests. The obvious problem is that the solutions devised may consist mainly of 'greenwashing', strategies to improve one's public image. But there is more to be said. As regards third-party certification, for example, the auditors may be tempted to accommodate the business they certify; and in any case they only verify whether a firm has met its own targets for environmental performance, which may be distant from what would actually be desirable and possible. As regards sectoral standards, it is likely that, if these are not legally binding, they will be followed only to the extent that they can be reconciled with the firms' goals, which are usually established on a short-term basis. And since standards are the result of negotiations, there is no guarantee that what is adopted is actually the best practice.

These problems do not pertain to the environmental sector alone. They are inherent to the current 'contractualisation' of social relations, sometimes considered the most viable approach to the governance of complex, pluralist societies (Teubner 1997), to the extent that the increase in the social spheres' self-regulation corresponds to a decrease in their accountability to broader constituencies. This regards, for example, the codes of conduct developed in various fields, from TV broadcasting to medical practice, as a result of the intertwining of the discourse of business with the discourse of professional expertise, often to the detriment of an actual public debate.

4) *Including by composing: social movements.* Including by composing is the logic of social movements. Sociology has traditionally paid a great deal of attention to people's mobilisation against exclusionary problem-definitions and deliberative arrangements. For example, early neo-Marxist and anti-modernist environmental sociology regarded social movements as the driving force of transition to an ecologically sustainable society that institutions were unable to prompt (Leroy 2001). In the 1990s, however, the rise of the Risk Society and Ecological Modernisation theoretical approaches (Buttel 2000; Spaargaren et al. 2000) coincided with a shift in scholarly attention, on the one side towards new forms of political conflict focused on individually-based activation and ad-hoc group coalitions, and on the other towards the opportunities for institutional self-correction. This did not entail a disregard for social movements but, as testified by a number of studies, interest was often focused on the institutionalisation of NGOs, their growing involvement in decision-making (see e.g. Dryzek 1996; Eder 1996; Jamison 1996; Yearley 1996), as if the logic of including by composing were eventually absorbed by the other three evolutionary logics of social cooperation. However, the increasing institutional involvement of NGOs is only part of the picture. Grassroots mobilisation is still lively and often evades the organisations' 'guardianship'⁶. And the

⁵ Introduced by Regulation 93/1836, the EMAS is complemented by the ISO 14000 standards patterned on the ISO 9000 quality-management procedures.

⁶ As regards Italy, for example, more than 1000 mobilisation episodes were recorded between 1988 and 1997 in the cities of Milan, Florence and Naples (Diani and Donati 1998). Moreover, the sudden emergence of new issues may take environmental organisations by surprise. One example is community mobilisation against institutional inability or unwillingness to handle the mounting problem of 'electromagnetic pollution' which in Italy gained impressive momentum between 1999 and 2000, with the major organisations compelled to 'run after' popular protest.

‘Seattle movement’, for all its novelty, is provided with a very traditional oppositive flavour. So the classical social movements logic will arguably continue to play a major role.

4.2. *The challenge of radical uncertainty*

Is any of the four logics up to the challenge of radical uncertainty? The answer may be questionable. I have hinted above at the shortcomings of some new governance approaches. But let us consider in general terms the degree of stability that the four logics should ensure for new cooperative arrangements. The fourth logic, that of ‘social movements’, should be intrinsically unstable, as history teaches us. The success of popular protests typically produces a sudden fall of existing discursive boundaries. However, the subsequent ‘anarchy’, the creativity and confusion of intersecting voices and themes, eventually leads to a ‘new order’, new restrictions of domains and abilities, which may be questioned to the extent that they have not been jointly decided – that is, by following procedures deemed legitimate. The other logics entail a less abrupt transition, a transformation ‘from within’ of a cooperative scheme, which should ensure more stability for the new arrangements. Excluding by decomposing should provide the stablest solution because, while empowering a broader range of social subjects, it prevents their discourses from direct confrontation. Excluding by composing could be less effective in obstructing conflicts, because a broadened deliberative domain makes a clash of claims more likely. Moreover, this logic is more demanding in terms of what is to be regarded as a cognitive ability. Thus, it produces deliberative arrangements that are socially more exclusionary, and the legitimacy of decisions may be questioned on this ground. This shortcoming is shared by the logic of including by decomposing. More relaxed conditions of admission and a narrower scope of deliberation may facilitate consensual decisions, but this may also enlarge the range of the subjects affected by such decisions who have no part in them and who consequently mobilise against them.

Therefore, the first three logics seek to rework the structure of social cooperation by designing new communities of deliberation and by raising new boundaries between truth and falsehood, fact and value, relevance and marginality. However, this attempt is challenged by radical uncertainty. As regards the first logic, this is testified to by the experts’ ambivalent position when participatory technology assessment methods are applied to highly controversial issues. On the one hand, they retain their role of key informants and advisers, and are thus confirmed in their privileged access to knowledge. On the other, applying these methods to such issues finds its *raison d’être* in allowing the inclusion of lay citizen in a deliberating *peer* group. This downplays the status of the experts’ contribution and may thus encourage, rather than obstruct, an adversarial use of expertise (Pellizzoni 2003).

The logic of excluding by composing is at risk of being overtaken by sudden changes in the interpretation of the issues as ‘internally’ agreed by the established expert community, with consequent criticisms and unexpected failures in the implementation of regulatory solutions. Moreover, as said, radical uncertainty means that the possibility of distinguishing in the usual way between facts and values, the cognitive and normative components of arguments, is increasingly questionable – and questioned. The evolution of the GMOs issue since the mid 1990s provides a particularly clear example (Levidow et al. 2000; Levidow and Marris 2001). The initial approach to the assessment of risks was increasingly criticised by previously silent subjects, from the food industry to retailers, from farmers to consumers. Criticism addressed for example insufficient concern about how GMOs may affect biodiversity and agricultural practices. The interpretation of the concept of ‘adverse effects’, to be evaluated and prevented, was the subject of fierce discussion, with the subsequent shift to that of ‘indirect effects’ encompassing a broader range of changes in agricultural practices.

As regards the logic of including by decomposing, a problem inherent to self-regulation is fragmentation. The cost of improving opportunities to settle a controversy discursively may be the production of negative externalities and ‘tragedies of the commons’. The incentives to externalise

the costs of environmental protection ‘are not unique to businesses: government also face similar temptations to externalise social costs onto downwind or downstream jurisdictions, and onto politically weak constituencies including future generations’ (Andrews 1998: 192). In this sense, if self-regulation is intended to be an answer to complexity, its outcome may be more complexity, reduced efficiency and effectiveness. A solution may be ‘locally’ (in functional or spatial terms) sound and successful, but at the cost of worsening the situation outside the setting considered. A clean solution here produces dirt elsewhere. Downscaling and ‘spreading’ the policy process may lead to a tangle of unrelated, overlapping choices, with a consequent reduction of overall efficiency and effectiveness. And if small-scale solutions are likely to be more easily reversed if necessary, the sum of several uncoordinated actions decided in self-regulatory isolation may produce unforeseen and irreversible effects.

Thus, radical uncertainty threatens current attempts to revise the division of labour in the production of knowledge by setting new discursive and social boundaries. This suggests reconsideration of the fourth logic. An orientation to including by composing, that is, to keeping the discursive and social boundaries permeable and mobile, seems in principle more suited to addressing the surprises, the side effects of the unknown, the indeterminate, the complex. Of course, the problem is whether, to what extent, and how such logic may be institutionalised. Answering these questions is certainly far from easy. However, it is striking that to date systematic attempts in this direction are very difficult to find. One might discuss at length on the reasons. I only expand on the unfavourable conditions offered by the late modern public sphere.

5. Radical uncertainty and the fragmentation of the public sphere

Historically, the modern public sphere rests on a particular interpretation of some semantic oppositions. Public and private, reasonable and unreasonable, capable and incapable: all these distinctions acquire specific meanings in the context of the bourgeois public sphere. They define the purpose of the claims that can be raised, the way in which they can be advanced, and the identity of the persons who advance them. According to Habermas, the bourgeois public sphere is not the place of political action, as opposed to the private one of the *oikos*, as is the case with Hannah Arendt’s model of the Greek *polis* (Arendt 1958). Rather, it is the place where the property owner and patriarch of the conjugal family deliberates with his fellow citizens on the laws and rules enforced by the government. The essential purpose of public discussion is thus the defence of the private autonomy of the household (Habermas 1989). The bourgeois public sphere draws on a conception of the private person as a ‘human being’ endowed with moral subjectivity, and on the related values of voluntariness, critical inquiry, self-reflection and self-development. This conception of subjectivity provides a basis for the confrontation of rationally justified opinions and viewpoints. ‘Given a presumption of shared values articulated through the discursive processes of the public sphere itself, private individuals were able to confront each other, not as rivals, but as discussants, ready to persuade and open to the persuasion of the stranger’ (Johnson 2001: 220).

This understanding of the public space rests on the bracketing of social differences based on the presupposition of their contingency. The contradiction between the idea of a universally open space and its actual accessibility only to sufficiently wealthy and acculturated people is not seen as critical. The condition of the bourgeois householder, guaranteeing his individual autonomy, is regarded as achievable by every man of good will, thanks to the emancipatory power of the market economy.

However, since the 19th century, this assumption has seemed increasingly untenable. ‘The liberal public sphere proved vulnerable to the new kinds of demands placed on its own principled commitment to the ideas of democratization, universal access and voluntary association’ (Johnson 2001: 223). The recognition of deep, structural, social divisions – initially class divisions, subsequently also religious, racial, ethnic, cultural, gender ones – implies that the individual’s private autonomy can no longer be presumed to be a precondition of public confrontation, but itself

becomes the subject of public claims. Such claims thus address first of all the opposition between capability and incapability. Increasingly, what was conceived as a transparent and open space of discussion is denounced as the reproduction of unfair and unequal cooperative schemes. The distinction between capable and incapable subjects, 'naturalised' by appealing to human qualities, is exposed in its dependence on power relations and social discriminations, and the ideological connection between the semantic oppositions foundational to the public sphere becomes evident. Indeed, once the identity of the participants in the discussion has been specified, both the issues that can be publicly addressed (in contrast to those pertaining to the sphere of private self-determination) and the way in which one's own position can be supported (by means of rational arguments rather than emotional, expressive communication or the appeal to discursively insurmountable diversities) follow as logical consequences.

Aimed at reducing resource inequalities, welfare policies proved ill-equipped to address claims concerning racial, ethnic, religious, cultural, gender differences. These claims represent a serious attack on the ideological heart of the bourgeois public sphere, questioning the alleged neutrality of the procedural norms that should ensure fair and equal opportunity to advance arguments in a public debate. Feminist thinking has advanced far-reaching criticisms focused on the close connection between the public/private and reasonable/unreasonable opposition. The implications of the 'naturalisation' of the bourgeois style of public discourse have been explored, particularly the restriction of the topics and style of discussion to those functional to specific conceptions of impartiality and universality. Feminists maintain that public reason cannot be totally detached from group membership, from the variety of experiences tied to biological, cultural and social features. Nor is there a unique style of public communication. As a consequence, the character of a problem and the way it is to be addressed cannot be decided beforehand: only the participants are able to decide what is public and what is private, and how a public issue must be dealt with (see e.g. Young 1989; Benhabib 1992; Landes 1995).

We may read the rise of the bourgeois public sphere and its transformation in the 19th and 20th centuries as the result of the individualisation process accompanying modernisation. Its emergence is closely linked with a first phase in this process. The subsequent challenges to the existing definition of its boundaries highlight the importance of unacknowledged differences, whatever their source, among social subjects previously conceived as similar; differences which are increasingly difficult to reconcile. In this sense, radical uncertainty is not simply a feature of some environmental problems, but penetrates to the core of the self-understanding of modern society, as a consequence of modernisation itself. Within public discourses, it typically appears as incommensurability among conflicting visions of the world. By 'incommensurability' is meant that there is no common language or conceptual framework; that the exercise of reason may be a shared quality of humans, but it does not necessarily lead to unitary visions of problems. Incommensurability is not so much a pawn in negotiation processes as an emergent feature of the issues at stake. Of course, defining something as an unyielding matter of fact or principle may be a strategic device to be used in bargaining. However, in this case it is still possible to withdraw. By contrast, rather than broadening agency, incommensurability reduces it. Often it comes as a surprise and its non-negotiability may be strategically disadvantageous. Non-negotiability typically depends on its breaching the boundaries of a common discourse (Lyotard 1983). Dialogue is thwarted by difficulties in the acknowledgement of actual dissimilarity: languages are heterogeneous and the claims of one part are meaningless for the counterpart. Intractable controversies, like those over abortion or 'cultural rights' such as wearing the chador at school or infibulation, testify that incommensurability may obstruct not only reasoned dialogue but also strategic negotiation.

Thanks to particular social conditions, incommensurability seemed to have been expunged from the bourgeois public sphere, but it progressively emerged with the pluralisation and individualisation of society which gave saliency to more and more differences. Incommensurability is possibly *the* problem of the late modern public sphere. This problem has been addressed, theoretically and practically, in different but mostly – I think – unsatisfactory ways. Four ideal-types of (peaceful) conflict settlement can be singled out (see Table 3), according to the goal

pursued (mere compromise or principled resolution) and the strategy adopted (avoiding or tackling incommensurability).

		goals	
		<i>compromise</i>	<i>principled dispute resolution</i>
strategies	<i>avoid incommensurability</i>	(1) Rawls	(2) Communitarians
	<i>tackle incommensurability</i>	(4) strategic negotiation	(3) Habermas

Table 3 - Public deliberation and incommensurability

5.1. Keeping incommensurability at distance: Rawls and the Communitarians

Avoidance is the answer to incommensurability of those versions of liberalism unwilling to accept that only strategic negotiations are possible in a pluralist society. Their endeavour is to define a space for principled agreements. But the result may be different from expectations and declarations.

Consider the example of John Rawls’s theory of ‘political’ liberalism (1993a). Rawls acknowledges that dissent on empirical evidence, on the importance given to it, or on the definition of related concepts, may lead to ‘reasonable disagreement’ on the reasons why a solution to a problem is to be accepted: reasons that each actor finds by referring to his or her own worldview or ‘reasonable comprehensive doctrine’ – reasonable in that it is organised coherently and its proponents assert it through critical reflection and the acquisition of new knowledge (Cohen 1993). However, ‘overlapping consensus’ among the subjects involved is to be distinguished from mere strategic compromise or, as Rawls calls it, a ‘modus vivendi’, to the extent that the former entails a moral conception asserted for moral reasons that each actor draws from his or her own vision of the world. The area of overlap among such visions defines the boundary of what is common, ensuring the cohesion of a society. As a consequence, outside this border there lies the realm of what has to be left to the self-determination of each actor, according to his or her own self-understanding. Thus, we might say, the arena of public choices is lightened by the overlap of the different issue-descriptions – first of all as regards their public status, their being amenable to the plurality of social actors’ joint deliberation.⁷ Beyond that lies the shadow of private choices.

However, the point is that Rawls’s concept of reasonable pluralism leads either to denial of the plurality of reason or to a deliberate self-containment of discussion (Pellizzoni 2001b). In fact, either the possibility of an overlapping consensus is ultimately due to a ‘common human reason’, the sharing of ‘fundamental intuitive ideas’ (Rawls 1993b: 247, 250), allowing distinction to be made between reasonable and unreasonable claims – but then there is no actual incommensurability – or, if the reasonableness of a belief is to be measured according to the corresponding worldview, that is, if incommensurability *does* exist, overlapping consensus is indistinguishable from mere

⁷ Many intractable controversies concern first of all the public or private, political or cultural, nature of an issue. Consider again the chador and infibulation disputes.

compromise based on fortunate coincidence;⁸ or, more likely, on deliberate choice. In other words, agreement on the solution to a problem, and before that on the nature of the issue – particularly its public status – can be obtained either because there is no fundamental diversity of worldviews, or because discussion is conventionally confined within a ‘safe’ limit, ensuring that the ‘hot spots’ will not be touched – or by a stroke of luck.

Avoidance is also the Communitarians’⁹ reply to incommensurability. Again, a principled dispute resolution is sought. However this time the plurality of worldviews is addressed not by narrowing the scope of deliberation, but by restricting the deliberating community. The assumption is that mutual understanding among different worldviews is impossible. Thus, every social group, identified in cultural terms, i.e. by the sharing of a particular set of principles, must address its own issues by itself. The result is the pursuit of a policy of separation, with no outsider being entitled to criticise the rules, constraints and outcomes of the internal debate.

5.2. *Tackling incommensurability: Habermas and strategic negotiation*

Strategies of avoidance thus imply a restriction of the space of public discussion. The growing saliency of incommensurability entails that more and more issues are to be assigned to the private realm. A completely different approach is Habermas’s attempt to recast the inclusive spirit of the bourgeois public sphere on new bases. Habermas conceives the boundary between public and private matters as a mobile one. No thematic restrictions can be imposed on public discourses. One can talk about anything at all, arguing for the public relevance of any issue; what counts is the inclusion of everyone’s viewpoint (Habermas 1996a; 1996b). As a consequence, severe conflicts may frequently develop in the public sphere. However, this does not lead to the relinquishment of rational deliberation. Rather, attempts to find solutions based on a common reason can follow two routes. Discussion may proceed at the ethical level, in an endeavour to clarify the principles underlying a shared form of life, seeking a common value that will serve to settle the controversy. If this proves impossible, discussion may shift to the moral level, that is, to questions of justice. Here incommensurability can be overcome through the identification of generalizable interests (Habermas 1996b). At this level, reason can be brought to unity. From Habermas’s viewpoint, therefore, incommensurability should be confronted by looking at higher, more encompassing perspectives on an issue.

A straightforward way to address incommensurability is the strategic approach to conflicts. Assumption that incommensurability *cannot* be overcome or insulated leads to abandonment of any effort to actually *resolve* an intractable controversy. Conflicts can be settled only in terms of interest accommodation. Power plays a major role, of course, but those who come to the negotiating table have good reasons for accepting some democratic rules. These are the result of long historical processes of trial and error. They ensure that confrontation among each position may take place in commonly acceptable conditions, allowing the expression of interests while reducing the possibility of reciprocal oppression and humiliation.

It should be noted that strategic negotiation is not entirely rejected by the other approaches. As regards Rawls, beyond the limits of overlapping consensus a clash of worldviews and private goals

⁸ In his latest writings Rawls repeatedly connects the idea of reasonableness with reciprocity. I am reasonable when I do not expect others to accept my solution to a problem as the best one, but only as a reasonable one, and when I am prepared to accept a solution proposed by others if it seems reasonable to me, although not the best one (Rawls 1997: 770, 801, 805). This more moderate account of rationality does not answer the difficulty in Rawls’s position outlined. Reciprocity implies commensurability. If a common property or a comparative measure is lacking it is impossible to agree on the terms of a fair exchange between conflicting reasons. What I am prepared to concede, the limits of what I believe to be reasonable, may still seem unreasonable to my opponent, and vice versa. As a consequence, there only remains room for strategic compromises.

⁹ The Communitarian critique of Liberalism, as a philosophical-political theory of democracy, justice, society and the individual, was developed between the 1970s and 1980s by Alasdair MacIntyre, Michael Sandel, Charles Taylor and others.

can only lead to a *modus vivendi*. Similarly, according to the Communitarian viewpoint, recourse to strategic negotiation may be necessary if the boundaries of what pertains to the self-determination of a community are called into question by other groups. Strategic negotiation may also be inevitable when an effort is made to address incommensurability discursively. Habermas admits that if neither a shared value nor a generalizable interest is (temporarily) to be found, the participants in a dispute only have recourse to practical compromises (Habermas 1996b). However, it is not clear how Habermas's solution may work with intractable controversies, that is, with disputes characterised by profound conflict on the principles at stake and the description and relevance of facts. If there is no agreement on principles and facts it is very likely that no agreement will be found on the interpretation of a dispute either. Is it a matter of values or of generalizable interests? And what interests are actually at stake? Therefore, if Habermas's approach is correct, strategic compromise is probably bound to remain much more widespread than he would like it to be.¹⁰

5.3. Lines of fragmentation

By comparing table 2 and table 3 we can grasp the connection between the logics of change in the cooperative schemes and the ideal-types of dispute resolution. Rawls's approach clearly applies the logic of excluding by decomposing, while the Communitarian approach corresponds to the logic of including by decomposing. Strategic negotiation applies the logic of excluding by composing. It admits that if a controversy is to be pacifically resolved, the negotiating table must be broad enough to include all the relevant (i.e. sufficiently powerful, organised etc.) positions, but it asks them to speak only the language of interests: no other competence and expertise matters, no other frames of discussion are allowed. As for Habermas, his belief in a principled resolution based on the definition of more and more encompassing viewpoints is consistent with the logic of including by composing.

What should be stressed, however, is that, albeit for different reasons, all these ways to deal with incommensurability (re)produce a fragmented public sphere. Fragmentation is inherent to the logic of the first three, which break down either the issues at stake or the related communities of discussion, or both. But even Habermas's approach does not effectively counter fragmentation. He understands the logic of including by composing in terms of generalizing, abstracting processes. If efforts to find a common ground for discussion fail, what remains is simply a clash of reciprocally deaf voices.

Thus, strategic negotiation seems the most likely answer to incommensurability. But it is hardly a good one, at least beyond a short-term perspective. This is not simply due to the inherent instability of a power-based equilibrium. Incommensurability makes a problem-setting more complex. Complexity, in its turn, challenges strategic behaviour. A controversial, flawed definition of the situation, of the nature of a problem and its foreseeable evolution, makes identification of one's own interests more entangled than is usual. Surprise, unexpected changes in the state of affairs, may oblige each actor to revise his or her own plans, and even seek to share them with other actors (Pellizzoni 2003).

This brings us back to the already discussed shortcomings of fragmentation. Most new governance approaches to environmental and technological problems (and other intractable controversies) mirror and emphasise the existing fragmentation of the public sphere. Vertical and horizontal fragmentation affects the scope of deliberation and the quality of its outcomes. Vertical disconnection is for example brought about by technical and scientific expertise, insofar as it asserts

¹⁰ In other words, radical uncertainty raises a major difficulty for the core of Habermas's theory, namely his 'universalization test' (Habermas 1983). The impossibility of establishing with mutually acceptable approximation what the outcomes of a choice will be prevents a justification in terms of its being in the interest of everyone affected. Agreement on the 'best argument', on a shared justification of a course of action, cannot therefore be reached, even if all the participants are sincerely committed to this endeavour (Pellizzoni 2001b).

itself as independent from particular conditions and contingencies but proves weak when it has to adapt to the multidimensionality of practical contexts, appearing meaningless or defective to the lay people affected and, at the same time, unable to benefit from their own insight (Wynne 1995; Pellizzoni 1999). Self-regulation, as already noted, easily produces horizontally disconnected social spheres, unable to devise and address an issue as a common concern. Negative externalities and overall inefficiency and ineffectiveness are the likely consequences. Moreover, fragmentation affects flexibility: new cooperative schemes enforced in different policy areas, and the related distinctions between abilities and disabilities, tend to 'crystallise' and become fragile in front of radical uncertainty.

A fragmented public sphere is itself the expression of an overall cooperative scheme as the product of historically determined conditions. What seems to us the 'miracle' of the bourgeois public sphere was a historical 'window' allowing advantage to be taken of the enhanced individual agency determined by economic transformations and, at the same time, the bracketing of the consequent increase in social complexity, in the importance of differences and inequalities. The bourgeois public sphere was able, for a short period, to institutionalise the logic of including by composing usually embraced by the protest movements. Thus, in a sense, needed today to improve the legitimacy and effectiveness of institutional answers to radical uncertainty is a reproduction of the 'miracle' of the bourgeois public sphere. But this would require account to be taken of the fragmentation of late modern society in all its breadth and depth, including the condition of the private sphere.

As said, since its beginnings the modern public sphere has been closely linked to the autonomy of the private individual. According to Habermas, human rights and popular sovereignty, private liberty and civic liberty, the householder and the citizen, are to be conceived as co-original, their genesis as a joint development (Habermas 1996a). The transformation of the public sphere in the 19th and 20th centuries is thus inseparable from the corresponding increase in the individualisation of society. This means that the fragmentation of the public sphere cannot be conceived independently from the fragmentation of the private sphere.

The latter has been widely analysed by social scientists. Horizontal disconnection was, for example, a central concern for Weber (the pluralisation of the value spheres) and Simmel (the personality of the city dweller), and more recently for Berger, Elster and many others (homeless mind, multiple self and so on). Vertical disconnection is, on the other hand, a central concern for Beck and Giddens. It lies behind their interest in the late modern individual's self-determination as a necessity and a crucial ability in every aspect of life, from love and family relations to the professional career and numberless everyday choices in a context dominated by expert systems (Giddens 1990, 1994; Beck and Beck-Gernsheim 1994).

However, sociological exploration of the connections between the fragmentation of the private and public sphere is less satisfying, as testified by deliberate or unintentional attempts to naturalise some novel boundary between public and private. It is striking, for example, that Giddens and Beck advance their view of individualisation as self-determination and risk-taking by underestimating the many factors still affecting individual agency. They downplay the enduring influence of the inequality of chances, and they naturalise, as if they were the product of some unavoidable evolutionary law, the criteria by which the selection of personnel is made and the overall success or failure of one's own individual biography is socially sanctioned.

Besides sociology, attempts to (re)naturalise the public/private threshold are today quite common. An example is provided – as recently in Italy with reference to genetics – by scientists' manifestos in defence of the freedom of research supposedly threatened by growing public distrust and opposition against new technologies supported by 'compliant' authorities. By neglecting many aspects of the question, for example the dubious freedom of heavily corporate-dependent research or the difference between the freedom to conduct research and the right to be funded, these claims take for granted the existing, problematic separation between private choices and public consequences of technology development.

6. A basis for further investigation

To sum up, the new governance approaches respond to the challenge of radical uncertainty by erecting new, more encompassing, discursive and social boundaries. However, these arrangements are unlikely to cope effectively with the increasing saliency of ignorance, indeterminacy, incommensurability, complexity. This should encourage the development of governance arrangements based on the logic of including by composing, but the fragmentation of the public sphere (and of the private sphere as well) does not offer favourable conditions for this endeavour.

Is there a way out of this impasse? Should we assign any possibility of substantial change to social mobilisation? The answer is difficult, and conditional on many factors. But it is important to consider that there is more than a historical coincidence between the way science and the bourgeois public sphere emerged, earned undisputed success and then were called into question. In both cases, success has been due to the ‘bracketing’ of most of their actual working conditions, and decline has been due to this very success, which ‘released’ and multiplied, provided body and voice to what had been denied.

The bracketing of the actual conditions of scientific knowledge production generates effects vividly described by Bruno Latour (1991) as the proliferation of ‘hybrids’. According to Latour, mediation and adjustment between nature and human agency are inevitably present, but strenuously denied in scientists’ ‘purified’ accounts of their work, where nature appears as completely objectified and apprehensible in its constitutive mechanisms, and humans manipulate it without ‘intermingling’ with it. The proliferation of hybrids unmasks this purification process. Hybrids are neither entirely social nor entirely natural. They are human because they are man-produced or induced, but they are not human because they are not man-made. One thinks of the greenhouse effect, the hole in the ozone layer, the GMOs. Hybrids, we may say, embody radical uncertainty because we cannot properly describe them.

Thus, the proliferation of hybrids is due to their denial, but it makes such denial increasingly difficult to maintain. Similarly, the rise of the bourgeois public sphere is due to the bracketing of social differences in a ‘purified’ account of social conflict as the confrontation among equal individuals driven by the same goals. And the crisis of science is just as much due to its success in multiplying the number of hybrids as the crisis of the public sphere is due to its success in bringing to light, in making meaningful and expressible, a growing number of social differences. The discursive equivalents of Latour’s hybrids are those voices which, in order to question the dominant account of a matter, are compelled to use a language tailored to this very account.

Therefore, science and democracy are closely connected. This is hardly news. Such connection has long been maintained, most famously by Popper and Dewey. However, Popper is faithful to the traditional divide between scientific and other forms of knowledge, between the ‘inner’ values of science and the ‘external’ values pertaining to political, economic, moral, aesthetic commitments (Popper 1956). The logic of including by composing may be applied, from his perspective, only within the realm of science.

Dewey’s approach seems more promising, and I believe it may offer a good basis for further investigation. Take his theory of inquiry as a form of action. According to Dewey (1938), inquiry rests on human practical engagement with the world. It begins when a problematic situation arises and calls for a solution. It begins in doubt and ends in knowledge. There are no a priori criteria for the resolution of problematic situations: they emerge as a result of the practices of inquiry. Inquiry is communal: its findings must be subject to scrutiny by other inquirers. But, again, there is no way to define a priori who is to be included in the community of inquirers. Moreover, for Dewey ‘interpretation is constitutive of facts in any sphere of inquiry’ (Festenstein 2000: 736), and inquiry is reflective thought that can take different forms. Natural sciences do not represent an absolute model.

Hence, there is no neat separation between knowledge and opinion, scientific deliberation and discursive practices based on reason-giving in the public sphere. The Deweyan theory of inquiry is

consistent with those approaches to intractable controversies which maintain that relevant knowledge is typically multi-sourced; and it is closer to those positions which affirm that no sharp distinction between natural and social issues can be established (see Table 1).

Dewey's concept of the public sphere is just as interesting. He believes that inquiry as rational problem-solving is not instrumental to democracy but constitutive of it. The public sphere originates from the attempt to analyse and resolve problems extending beyond the participants in single interactions. 'The public consists of all those who are affected by the indirect consequences of transactions to such an extent that it is deemed necessary to have those consequences systematically cared for' (Dewey 1927: 245-6). Thus, the public sphere is to be conceived as made up of different, partially overlapping and potentially inclusive circles, from the neighbourhood up to national and supra-national levels. What is critical from the perspective of the 'insider', the member of a deliberative community, is the possibility of shifting from one level to another more encompassing one, to the extent that this appears necessary for the issue at stake to be effectively dealt with. Similarly, from the perspective of the 'outsider', what is critical is the accessibility of any functionally or spatially 'specialised' sphere: his or her claims should never be rejected a priori. Therefore, the critical factor is the permeability of the boundaries of each sphere of discussion.

This view of an inclusive public sphere made up of partial but permeable arenas comes very close to Habermas's (1996a). However, there is a significant difference (Honneth 1998). According to Dewey, the public sphere is not to be conceived as the extension of civil rights, but as the extension of problem-solving procedures adopted in direct interactions. The basis for social cooperation does not lie in the sharing of some political values, but in the joint deployment of individual resources in response to problems. What is crucial for a lively public sphere is the experience of cooperation in the division of labour. The individual is motivated to seek the common good to the extent that he or she sees his or her activity as a socially recognised contribution to a co-operative process. While Habermas's idea of the co-original development of private and public rights tends to obscure the relevance of the transformations that have occurred in the social division of labour, Dewey's approach sheds sharp light on the connection between the private and public sphere. It invites careful consideration of the role the current fragmentation of the private sphere (largely dependent on the transformation of industrial capitalism) plays in the fragmentation of the public sphere and its legitimation in terms of effectiveness and rationalisation. In this sense, delegating the endeavour to state what is good and wise – for example in the application of gene technologies – to expert committees in the absence of a thorough public discussion, is consistent with the widespread disregard for co-operative problem-solving encouraged by increasingly individualistic and competitive work conditions. Dewey's theory of the public sphere urges us to address the private preconditions of the fragmentation of the public sphere.

7. Conclusion

According to a Deweyan approach, promoting the logic of including by composing means fostering an associative life as open as possible to what lies beyond the functional or spatial borders of each deliberative community.¹¹ It means making discursive arenas more flexible, interconnected with different or broader concerns and publics, sensitive to the externalities of decisions. Undoubtedly a very difficult endeavour. A positive note, however, is that there is evidence¹² of a growing awareness that narrow issue-definitions and fragmented approaches are inadequate means with which to address radical uncertainty; that openness, flexibility and inclusiveness are required by the very nature of many intractable questions. Moreover, institutional reform wouldn't have to

¹¹ Environmental problems often call the temporal borders of deliberative communities into question as well. The issue of the future generations is a tough one for any approach to public deliberation (see e.g. Parfit 1984).

¹² See e.g. Pellizzoni and Ungaro (2000); De Marchi (2001); Pellizzoni (2001a). See also major opinion polls like the Eurobarometer on biotechnology (Eurobarometer 2000), particularly the questions on the acceptability of genetically modified food and animal cloning.

start from scratch: inclusive, non-strategic forms of rationality are already applied in both Western and non-Western societies (see e.g. Laville 1994; Cohen and Sabel 1997; Latouche 1999; Holmes and Scoones 2000). By systematically collecting and analysing such experiences we can try to understand the conditions most likely to promote governance arrangements based on the logic of including by composing. In particular, we can explore the conditions under which cases of dialogical problem-solving may assume exemplary value, fostering public pressure for a change in the forms of social cooperation.

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