
The Political Theory of French Science Studies in Context

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Science Studies, as developed initially in France attempt to overcome the distinctions between science and society, and correspondingly between the philosophy of science and political and social theory. Science Studies considers the theories and beliefs of scientists political rather than direct reflections of an objective natural world. I consider here Science Studies as a political theory that emerged and has developed in reaction to a particular social and political context, a crisis of technocratic politics in France.

*Some of the leading contemporary French exponents Science Studies, a group around the journal *Cosmopolitiques* that is loosely associated with the French Green party, including Bruno Latour and Michel Callon advocate the democratization of science. They have developed explicitly and at length the theoretical political aspects of science studies. I examine here critically this political theory against its social background. I argue that the social and political structure of French science explains the emergence of the descriptive and normative political theories associated with Science Studies. I doubt whether the normative prescriptions that Latour and Callon developed would be sufficient to solve the problems that follow from the monolithic and exclusionary structure of French governance and institutional science. Conversely, I doubt their solutions are useful for other democratic systems and scientific institutions that do not share the particular problems of France.*

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political and social theory. Science Studies considers the theories and beliefs of scientists political rather than direct reflections of an objective natural world. However, as “first philosophy,” Science Studies rarely apply the same approach to themselves, to understand themselves as political and embedded in a social context. I do so here, by considering Science Studies as a political theory that emerged and has developed in reaction to a crisis of technocratic politics in France.

If science may reflect the interests of scientists, experts or those who pay them, it may be prudent to democratically limit, curb, control or countervail the influence of scientists on public policy. Science studies have been political since their inception. Already in the early seventies in France, Foucault’s work on the history of psychiatry, his criticism of psychiatry as a science of control and discipline, and even more so Deleuze and Guattari’s (1972) work, led to an anti-psychiatry movement that attacked the psychiatric and medical establishments and their “expertise” as biased and a reflection of political interests. A pre-cursor to Science Studies, Paul Feyerabend, (1981, 25–33) advocated “democratic relativism.” In his opinion, lay citizens and their democratic councils should supervise and control scientific institutions, including their finances, their effects on education and even the academic freedom of scientists. Science is just one tradition among others with no special claim for truth. “[D]emocratic relativism . . . will not be imposed ‘from above’, by a gang of radical intellectuals, it will be realized *from within*, by those who *want* to become independent, and in the manner *they* find most suitable. . . . What counts are not intellectual schemes, but the wishes of those who want change.” (Ibid 33)

Some of the leading contemporary French exponents Science Studies, a group around the journal *Cosmopolitiques* that is loosely associated with the French Green party, advocate a similar democratization of science. The most famous members of the group are Bruno Latour and Michel Callon, both of whom are based at the École des Mines in Paris. They have developed explicitly and at length the theoretical political implications of science studies. I examine here critically this political theory against its social background. I argue that the social and political structure of French science explains the emergence of the descriptive and normative political theories associated with Science Studies. I doubt whether the normative prescriptions that Latour and Callon developed would be sufficient to solve the problems that follow from the monolithic and exclusionary structure of French governance and institutional science. Conversely, I doubt their solutions are useful for other democratic systems and scientific institutions that do not share the particular problems of France, at least not to the same degree.

French Scientific Technocracy

Traditionally, the French bureaucratic class, including politicians and civil servants, ignores public opinion and does not seek democratic feedback between elections (Assouline 2001). Political decisions about new technologies have usually been taken behind close doors in internal consultations among members of the bureaucratic, scientific, economic and political elites. Since the institutional innovations of Louis XIV's minister, Colbert, the French have reacted to external military and political competition, first with the British Empire and then with the Prussian and later German empires, by centralizing power and initiative in an absolute and later large and centralizing state, a political theory the French call *Colbertism*, and the rest of the world knows as *etatism*, statism. Emperor Napoleon Bonaparte's reforms laid the foundations for French law and many of the centralized institutions of the French state. Finally, the Algeria crisis and the ensuing 1958 new constitution of the Fifth Republic further centralized the administration by radically augmenting the power of the president in relation to the parliament.

Elite education in France consists of disciplinary monopolies, *grandes écoles*. Virtually all top politicians and civil servants graduate from the *École nationale d'administration* and are known as the *ENARCs*. All top engineers graduate from the *École nationale supérieure des arts et métiers*. All top academic philosophers are graduates of the *École normale supérieure* and so on. Consequently, the various French educated elites are more homogenous and cohesive than their Anglo-Saxon equivalents and have more unified and dense networks and rigid class structure. For example, the top managers in private industry, the top civil servants, and the top politicians are likely to be fellow *ENARCs*. The top scientific advisors in industry and government are likely to support each other and have the same opinions. The cohesion of this exclusive elite is further strengthened by its meritocratic nature or at least its self-consciousness as meritocratic. Unlike in Anglo-Saxon countries, admission to these grand graduate schools is determined, at least officially, exclusively by entrance exams, there is no tuition. The technocratic elite perceives itself as the best and the brightest, who just know better what is good for lesser mortals. Even if there are differences of opinion between politicians, the managers of big business, and scientists, they tend to attempt to resolve their differences behind closed doors to avoid publicity, public debate and politically effective popular sentiments. For example, in the case of nuclear waste, both scientists and politicians considered an uncontrolled public debate as the worst case scenario. In such an environment the role of the dissident-scientist, a scientist who "goes public" with her or his worries and breaks ranks with the

elite gains crucial importance (Boy et al. 2000). The French bureaucracy is opaque; it hoards, concentrates and hides information, so nobody can criticize it on the basis of knowledge.

Callon et al (2001, Chapter 4) suggest that members of the French technocratic elite have not been motivated by greed or will to power, but by their belief that they contribute to human happiness against prejudices, medieval fears and primitive passions. For example, (Ibid, 165 note 1), De Gaulle used to react to popular protest with the phrase *Je vous ai compris*, “I understood you.” The General is the legitimate spokesperson of the general will, he understands the people better than they do themselves, so further deliberation or consultation is redundant. Callon et al. also stress that until recently, in France, unlike in the USA, science and technology had not been considered policy issues, subject to the political decision making process.

French MP Maurice Laurent claimed that the French parliament has been attempting to restrict the powers of “a rather poorly defined entity comprised of high civil servants, senior managers of public and private companies, and scientists and engineers, which is generally called the techno culture: “. . . Senior civil servants and public company managers trained in the same colleges constitute an oligarchy that often tends to escape all external control. (Laurent 2000, 126–7) Laurent claimed that the political, elected, elite is different from this oligarchy and is in a power struggle with it. He presents the creation of the parliamentary institution for technology assessment *Office Parlementaire d’Evaluation des Choix Scientifiques et Technologiques (OPECST)* in 1983 that he directed as a weapon in the arsenal of the parliament against the technostucture. However, members of parliament do not usually attend different educational institutions, nor do his own paternalistic statements indicate a different culture:

The widening gap between the basic knowledge of most citizens and the complexity of the world that surrounds them also gave rise to concern about certain technical innovations that they did not always fully understand. In the last few years, growing unemployment has contributed to creating a marked hostility toward industrial modernization, which is blamed for the deterioration of the employment situation.

The Parliament—which faithfully reflects the attitudes of the population—is also sometimes led to question scientific and technical progress, and representatives and senators ponder the part they can still play in a world where the most important decisions for the

future of society are increasingly made outside the conventional political decision-making centres. (Laurent 2000, 125–126)

Clearly, Laurent's OPECST considered its role to educate an ignorant public and politicians about the benefits of scientific enlightenment and technological progress. Calls for scientific democracy in France should be read against this exclusionary bureaucratic culture of decision making.

The French Experiment with Scientific Democracy

During the second half of the nineties, a series of science policy bureaucratic and political blunders, especially the use of contaminated blood in French hospitals and the BSE "Mad Cow" crisis, have shaken the French public's deference to elite technocratic decision making. Jasanoff termed the result "civic dislocation," a mismatch between the expectation of the public from its elected leaders to manage modernity, predict, and ensure that new developments are safe, and their actual behaviour. The result is civic disengagement from the state: "the gears of democracy had spun loose" (Jasanoff 2001, 255)

In 1997, a new red-green coalition government was established under PM Lionel Jospin. This government reversed an earlier decision by the previous centre-right government that banned genetically modified foods (GMF) and allowed the importation of genetically modified maize. The government was split on the topic between the Greens and the Socialists. Traditionally, under such conditions the government would, having appointed a committee of experts to delay, have to take a decision and let debating fatigue set on the public. The committee would have legitimized the original decision following "public consultation" and "expert opinion." However, in this case, following the bureaucratic debacles, the government chose to establish a deliberative democratic forum, a non-expert committee, a *consensus conference* to consider GMF. Jospin's office announced officially on 27 November 1997 the convening of a consensus conference on GMF. The press release reasoned that public opinion on GMF is indecisive, insufficiently informed, and incoherent since the public accepts genetically modified medicines but reject GMF. Despite the large volume of scientific research, citizens refuse to accept GMF before all the opinions have been confronted. No further authorizations will be given to GMF until scientific studies prove that GMF do not pose any danger to health or to the environment (Boy et al. 2000). The consensus conference allowed the French bureaucracy to buy time while negotiating with the American administration that pressured for the admission of American GMF (Assouline et al. 2001). Joly et al (2003) suggested that the consensus conference in France took place as the result of an impasse in technocratic de-

cision making and a new generation of high level functionaries who were more receptive to deliberative democratic procedures.

In Consensus Conferences, first introduced in Denmark, 14 lay citizens deliberate over science policy by examining and questioning expert witnesses over two weekends. They meet for a third weekend to form their own recommendations. In Denmark, the Danish Board of Technology, a quasi-independent government body decides on the topics of consensus conferences and chooses a steering committee. The steering committee chooses the citizen members of the conference to correspond with the main demographic variables of gender, profession, and domicile; the reading materials, and a list of possible witnesses (Joss 2000, Klüver 2000). The French forum was organized by the *Office Parlementaire d'Evaluation des Choix Scientifiques et Technologiques (OPECST)*, the parliamentary office for technology assessment in cooperation with top bureaucrats. It used a polling institute to obtain a random sample of the French population that had not had prior opinions about GMF. Fourteen citizens who agreed to participate, demographically balanced, were selected. They spent two weekends questioning stakeholders and experts and came with very qualified support for GMF. The steering committee selected the contents of the informational package that all the citizens received, containing articles for and against GMF and a list of potential witnesses for the lay citizens to choose from whom they wish to invite as witnesses. That list included representatives of interest groups from Monsanto to Greenpeace, geneticists who supported GMF and academics with other scientific backgrounds who opposed it. Some environmentalist NGOs charged that the selection of experts by the steering committee was biased.

Joly et al (2003) emphasized that the consensus conference dealt with the problem of evaluating expert opinions, minority opinions, and public participation, questions that are dealt with usually in the literature on sociology of science. Positions that are labeled relativist and hostile to science, were taken by ordinary people. The issue of liability was raised when members realized it would be difficult to collect damages in case of a disaster. However, this conference did not receive much attention. Its conclusions were announced in a press conference and reported to the government and the parliament. But all the MPs abstained from attending the consensus conference. Some told Assouline et al (2001, 8) that there was no place for citizens to make decisions outside of elections in France. Eventually, the GMF issue was resolved when Greenpeace sued the government in front of the *Conseil d'etat* (a French constitutional body in charge of conflicts between the state and the citizen) and the later announced that this issue is beyond its competence and referred the issue to the EU. The European parliament imposed then strict restrictions and a

moratorium on GMF and the French government was released from having to state its own policy on GMF. Boy (2004) interviewed a representative sample of 20 members of parliament. All the MPs claimed ignorance of what are consensus conferences and did not remember the 1998 one.

Latour's Political Theory

Latour's 1999 *Politics of Nature* (2004) reflects the civic dislocation in France and the search for democratic alternatives to traditional technocratic decision making, as well as the political repercussions of Science Studies. As much as Edmund Husserl (1970) assigned the crisis of his contemporary European civilization to subject-object distinctions, Cartesian objectification, and the ensuing loss of the immediate meaningful "lifeworld" of which we are conscious prior to scientific processing, objectification and abstraction, Latour assigned the crisis in contemporary Green politics to the conceptual distinction between nature and society. Latour would like political ecology to have nothing to do with the concept of "nature," which he described as a bland of "Greek politics, French Cartesianism, and American parks." (Latour 2004, 5) He would like to abolish the conceptual distinctions between politics, science and nature and replace them with a single cosmos: hence the name of the group and journal *Cosmopolitiques*. Latour further advocated the abolition of the conceptual distinctions between subjective and objective, society and science, primary and secondary qualities, might and right, knowledge and power, reason and violence, philosophy and sophism, demonstration and persuasion, realism and relativism. These distinctions are the subjects of disputes ". . . between elites to decide what will administer the deathblow to the *demos* first." (187)

As much as Heidegger accused Plato of inventing metaphysics, the distinction between the ideas and appearances, thus obscuring Being, Latour blamed Plato for fatefully distinguishing truth and nature from the social world, and for claiming that the philosopher or scientist must transcend society to perceive the truth (cf. Zimmerman 1997). Latour repeatedly denounced the Platonic myth of the cave from the *Republic*, where the philosopher must escape the cave of society to gradually be able to see the truth. Scientists become then French enlightenment technocrats, lawgivers and saviors, who know the laws of nature and return to the cave to teach them to the ignorant brutes left behind. In Latour's opinion, this myth lies at the core of Western public life and impotent politics, the neutralization of democracy by science and scientists. Latour presents the Platonic philosopher as a French technocrat. He claims that the Platonic tradition is both undemocratic in denying most people knowledge, and false because it ignores the socially constructed aspect of scientific knowledge. Latour ig-

nores the Socratic aspect of the Platonic tradition, the emergence of truth out of dialogues between citizens in the agora. Latour identifies French technocracy, the silencing of democracy by the experts, as an element in the Western political tradition. However, technocracy is an exception more than the rule. For example, in Scandinavia, the state is often actively inclusive in seeking the opinions of citizens about a variety of issues, including science and technology policies, between elections. In the United States, scientists and big science have to compete when lobbying the Congress and administration with other pressure groups (Dryzek et al. 2003). For example, religious fundamentalists lobbied defeated the scientific lobby in the case of U.S. federal funding for stem cell research. Less technocratic democracies are better able to manage science and technology in correspondence with the wishes of their citizens than the French monolithic ruling class not so much because Scandinavian or American bureaucracies are less prone to making bad decisions, but because they can fix such decisions more quickly and efficiently, without feeling compelled to deny and hide their mistakes without correcting them.

Latour attempts to articulate a democratic political theory that is not subservient to what he considers “epistemology,” and recognizes science as inherently political, and “nature” as a construct of science. According to Latour, politics is not everything, but it gathers everything together. He redefines politics as “the entire set of tasks that allow the progressive composition of a common world.” (2004, 53) From this perspective, deep ecology is modernist rather than radical because it endorses the man/nature dichotomy as do its opponents. Political ecology, the French Green Party, should drop then its concern with independent nature and concentrate on uncertainty, for example the issues where the French technocracy failed to resolve due to its over-confidence in objective scientific knowledge: cancer causing asbestos, genetically modified foods, prions and the mad cow disease.

The common world, “pluriuniverse” is not a given—Latour, as a “post-modern” diverges from Husserl or Habermas who assumed the life-world to be single and universal—but what is obtained in democratic “due process.” Latour accused scientists of making decisions about the common world without such due process. Like Feyerabend, Latour wants scientific issues to be decided democratically rather than by unelected scientific elites. Currently, scientists presume to be the spokespersons for mute nature. Latour would like to democratize the process by including non-humans and spokespersons for other social groups, as was the case in his opinion in the Kyoto forum on global warming. Following a radical linguistic turn, Latour’s resulting democratic collective is composed of “propositions” rather than persons. Latour’s democratic political ecology

implies resistance to scientific exclusions of some propositions from being taken into account in discussion (Ibid, 104). Instead, he advocates an attitude of perplexity and exploration that gives way eventually to the institution of certain propositions that are not discussed or debated temporarily but become a tentative presence within collective life. For example, prions, the unconventional proteins that may have caused mad cow disease, are a cause of perplexity, they initiate discussion. When president Chirac, as a modernist, asked the scientist M. Dormont to assume responsibility and tell him whether or not prions are responsible for the mad cow disease, Dormont answered that he does not know. This opened a discussion, consultation and a search for spokespersons. Consultation leads eventually to the construction of a hierarchy in the propositions that becomes institutionalized. Unlike most philosophers of science, Latour denies there is an established method or set of methods for establishing such a hierarchy (Ibid, 111–4). Propositions that are judged low on the hierarchy and are not discussed may come back to haunt the collective later, and generate new cycles of perplexity, consultation, hierarchy and institutionalization. For example, the 8000 annual deaths from traffic accidents in France have currently a low position on the hierarchy and therefore are not discussed, but may return to haunt the collective later.

Now . . . *the laws of nature have their own parliament*, a public assembly that votes on them, records them, and institutes them. Yes, after its deliberations, entities do indeed find themselves bound by efficient causalities, and the chain of responsibilities finds itself quite definitely assured. The prion is indeed responsible for the mad cow disease; the minister of health is indeed responsible for the deaths from blood transfusions. . . . (Ibid, 179)

Latour did not discuss concrete institutional democratic designs that should deliver better decision making about science and technology policies. His negative examples, the mad cow disease, contaminated blood, and genetically modified foods crises correspond with the standard political reasons for experimenting with deliberative democratic forums in France (Jasanoff 2005). Latour offers political theoretic reasons for democratic forums that mix lay persons and a multiplicity of experts in scientific and technological decision making, especially on new issues that raise perplexity and demand consultation.

However, the perplexing case of mad cow disease that did not have a determined scientific solution or even analysis till quite late, too late for French and British farmers, may well be an exception. Most or many issues in science policy do not raise particular perplexities. Instead of uncertainties born of insufficient evidence, most issues in the politics of science

and technology may involve choices between well-defined options with approximately known risks, costs and benefits. In such cases, Latour would have scarcely anything to say normatively, beyond holding in reserve the possibility of future perplexity.

While it is clear what Latour dislikes about present politics of science, especially in France, it is less clear what would his democratic politics of nature entail in concrete institutional terms, how to reconstruct democracy to apply to areas that have hitherto been dominated by unelected experts and their old school mates in industry and state bureaucracy? Latour's general ideas and approach were applied with greater political relevance and detail by his colleague in the *École des mines*, Michel Callon and his team.

Callon's Hybrid Forum

Michel Callon introduced the concept of "hybrid forum," a deliberative democratic forum that involves scientists and lay persons deliberating together, in a paper he co-authored with the Dutch social scientist Arie Rip in 1991 and presented at a non-academic conference about the environment and sustainable development. In a recent interview, Callon et al. (2003) distinguished their proposal from Habermas' deliberative democracy by noting that Habermas wishes to distinguish science from ethics and politics, thus granting autonomy to scientists in non-normative issues, whereas they would like to break these distinctions. Whereas Habermas wishes to play communicative against instrumental rationality, they claim that such distinctions are impossible in situations of uncertainty where communicative reason is useless in the absence of information, when it is impossible to distinguish indisputable facts from disputed values. Unlike Rousseau, Rawls and Habermas who would like the participants in such deliberations to be detached from their identities and emotions, Callon et al. consider active identities to be an advantage in a process of research. Unlike Habermas' elitistic rejection of the mass media, hybrid forums can use it to create public space for discourse, for example, the telethon has been a successful medium for hybrid research-political activity.

Accordingly, Callon et al. criticize the French Citizens Conference on genetically modified foods as an unoriginal copy of the Danish consensus conference model that merely added "citizens" in the title (2001, 19–20). They would have preferred a hybrid model. They considered a hybrid forum that took place in Japan on genetic therapy, financed by the Toyota Foundation, successful. Callon praised the Japanese for borrowing the consensus conference model from the West and then exporting it back with improvements. This praise for Japanese democracy aims to tease Harvard

professor Sheila Jasanoff who was less enthusiastic about the Japanese procedure, claiming that there is more to democracy than a “gadget” and praising the American system of checks and balances as a better alternative for technology management than deliberative democracy (Jasanoff, 2001).

Callon et al. (2001) distinguished “risky” from “uncertain” situations. In risky situations we possess an exhaustive list of all possible scenarios. We do not know, though, the probabilities that are attached to each scenario. In uncertain situations we do not know the possible scenarios and therefore cannot prepare for all eventualities. Hybrid forums are particularly appropriate in their opinion for uncertain situations. The traditional expert, somebody who mastered known competencies, certified so, and mobilized in a decision making process is irrelevant for new situations where old competencies are useless. Such situations require organizing a process of production of knowledge that may create competencies later. This appears like an interpretation of Latour’s proposal above that the first stage in the democratization of science is a state of perplexity. Callon et al. presented hybrid forums as a solution to the recent uncertain situations that led to French bureaucratic blunders, like nuclear waste disposal and genetically modified foods. In all these cases the central bureaucracy made a decision that affected local or sectoral populations without consulting them. Affected populations learned of the decision, created a new identity, and reacted by arranging local grass root protest. The bureaucracy ignored the protest with disdain. This led to greater, even violent, protest and more public debate. As the debate unfolded, more and more social sectoral or local groups become involved and contributed to the hybrid deliberative process. Facing this mounting pressure, the bureaucracy made a tactical retreat. It postponed decision or maintained the status quo. As more social groups became involved in debate, the democratic discourse became broader, but more significantly, science itself was enriched by new perspectives. However, as in the case of Latour above, it is not altogether obvious that most cases of scientific policy choice have much to do with situations of uncertainty, nor is it clear that bureaucratic government systems more heterogeneous than the French one cannot correct their blunders more smoothly.

Latour has been considering science a text that is connected indirectly with reality via a series of “inscriptions.” (Latour & Woolgar 1987, Zammuto 2004) There is no world on one side and its readings on the other, but a thick expanse of traces and readings that bridges the gap between the world and science. Through “translations” science becomes more remote from reality, it reduces and simplifies nature to control it through symbolic manipulation. Increasing precision and control of inter-

vening variables requires the separation of the laboratory from nature. Science is about a reality that is constructed in the laboratory rather than about what is out there in the “open air.” Callon et al.’s (2001) solution is the involvement of lay people in the process of scientific research beyond the laboratory. Lay people can find patterns where scientists see only uninteresting unique unconnected events. Callon et al. claim that the cooperation between scientists and laity is particularly fruitful in health and environmental issues because of their proximity to the immediate experiences of people. For example, AIDS activists became involved in the search for cures after the scientists had ignored the problem. Echoing traditional populist, communitarian and Republican positions, Callon et al. liken representative democracy to Latour’s scientific reductive transcription. As much as language and text gradually fail to represent reality, parliamentary democracy gradually fails to represent the population, in five stages:

1. The exclusion of “aliens” who are not called to the ballot box.
2. The reduction of holistic collectives and communities to liberal individuals with free choice and judgment.
3. The reduction of electoral choice to names on lists, or to yes/ no answers in referenda.
4. Through complex electoral calculations the voters are reduced to representatives.
5. Between elections, voters are reduced to silence, entrusting the right for political expression to their representatives. To avoid “explosions” democracies grant avenues of expression to citizens on prescribed topics and during prescribed times in consultations, committees etc. to prevent them from actually speaking. Likewise, Callon et al. chided social scientists for silencing the people by pretending to speak for them and by telling them what are their interests, distinguishing the “rational” from the “irrational.”

Though the first four reductions are true of all modern representative democracies, the fifth reduction is particularly true of the exclusionary French technocratic system, less so of more inclusive systems as in Scandinavia or the U.S where citizens are hardly silences between elections.

Callon et al. seek a radical solution to eliminate the two analogous schisms between scientists and laypeople, representatives and represented. Their solution comes in three stages: First, the free and gradual spontaneous emergence and construction of groups and identities. Second, members of the self-constructed groups begin to talk among themselves, with their spokespersons and with other groups. This discourse leads to reformulation of identities, changes of opinions etc. to the effect that communities replace statistical aggregates. The result should be the emergence of

a general will that respects peculiarities and singular identities, rather than abstract them as in Rousseau's (2001) original formulation of the general will. For example, the identity of people who share an illness and search for its scientific basis through primitive accumulation of knowledge and pressure on the scientific community is at once objective-real and subjective-constructed. Finally, negotiations between identities create a collective. Callon et al. promise that all people will find a place in some collective and that individual rights will be preserved. However, beyond these promises, they do not provide any institutional mechanism or other guarantee or reason to think so. Without such guarantees, well organized activist minorities that construct identities can hijack the democratic process, especially since Callon et al. write that hybrid forums are always the result of struggles, often violent. Conversely, many unorganized groups like illegal aliens who do not construct identities with spokespersons who can negotiate may be left out of the collective. As is the case with the prescription for hybrid forums for solving problems in science and technology policy, Callon et al.'s formula would and did succeed only in a narrow range of cases that are not at all typical. As Callon et al. assert, hybrid models involving lay people and experts are most effective when there is a long gestation period of public debate. This period should abolish the monopoly of a steering committee over information and the ensuing opportunity for manipulation. Still, if such democratic forums follow a long gestation period of public debate, the public may already adopt firm opinions by the time of the forum that would miss then genuine deliberations and revisions of opinions, rather than negotiation or bargaining.

Callon et al. evaluated the quality of concrete cases of scientific democracy according to their intensity, openness to diverse groups, independence from pre-established groups, seriousness and continuity of discussion, and transparency and clarity of the rules and regulations that govern the debates: *Public opinion surveys and referenda* aid in elaborating strategies for the power that be to prove that the activists are a noisy minority and that new information favours the acceptance of new technologies. The process does not allow space for dialogues or the emergence and examination of identities. *Focus groups* allow some freedom for formulating questions, discussion and the emergence of a collective; and they are transparent. But they involve no research and no interaction between "confined" and "plain air" researchers. They do not transcend existing identities. There is no continuity or sufficient time for studying complex issues. *Committees of sages*, of intellectuals, academics, and medical personnel advise the French government about topics such as ethics, AIDS, social security, Justice and employment. They transcend the limits of representative democracy and

introduce an element of serious and continuous deliberation, but they are opaque and tend to represent the biases of the male white elites that comprise them. Especially in the French case, as we noticed above.

The quality of *consensus conferences* varies according to criteria of selection of lay members; whether or not the organizers prepare a list of questions; the duration of the process, and the place of the conference in political decision making. Callon et al. praise the intensive interrogation of scientists and research under conditions of uncertainty. The recommendations for regulation of research “invade” the confined realm of the laboratory. Consensus conferences proved that ordinary people can understand scientific research and its social dimensions. The conclusions of consensus conferences are impervious to lobbying. For example, the French consensus conference about genetically modified organisms, recommended the prohibition of antibiotics resistant genetic markers and the reform of the Biomolecular Genetics Council that advises the government, to make it less susceptible to external influences. Something like long term universal common interest has emerged from this consensus conference. However, consensus conferences do not generate collaborative research of citizens with scientists and there is no continuity. Consensus conferences create an open space where diverse opinions can be expressed, but only for pre-existing spokespersons of pre-existing groups. They fail to become collectives in search of their identity; the terms of their construction prevent them from entering the public sphere as a collective. Callon et al. (Ibid, 237) hail the achievements of a 1998 UK consensus conference on GNF that recommended in addition to prohibiting all genetically modified foods, outlawing non-organic agriculture because this panel exceeded its assigned mandate. Callon et al. do not provide more information about this conference, especially how could a purportedly random unbiased group of citizens recommend raising the prices of vegetables to the level of organic ones?! As much as the French technocracy attempted to control the results of their consensus conference, activists on the other side may attempt to ensure the results of theirs, only more effectively.

Callon et al. idealize most the interaction between AIDS activists, who at the same time explored their identities and became involved in scientific research. They explored various approaches for dealing with the medical and pharmaceutical establishments and generated new politics of HIV. The French state encouraged these hybrids forums through founding the AIDS Council, the State Agency for Combating AIDS, and the National Agency for AIDS Research. In an interview (Callon et al. 2003), the editors of *Cosmopolitiques* criticized Callon et al. for being excessively metaphysical and not offering practical political methods and means for implementing dialogic democracy in their 2001 book. Callon et al. answered

that there is no general procedure that fits all situations. Rather, each hybrid case results from a specific conjuncture of circumstances where emerging minorities demand to be consulted. Despite their emphasis in the book on rigorous rules, they leave the details to emerge and fill in the blanks spontaneously.

Implementation of the Theory

Following the work of Callon et al., a team of social scientists in the French National Institute for Agronomic Research (INRA) have developed an innovative “interactive technology assessment” of genetically modified vines.

In 1999, a French satirical magazine exposed under the title: “Transgenic champagne bubbles” that a private firm has been experimenting with genetically modified vines. This led to the immediate suspension of the experiments and the firing of the scientists involved. The state funded INRA immediately hired them and allowed them to continue their research. The issue of genetically modified vines is particularly sensitive in France. French vine growers are in stiff competition with new quality wine producers, especially from Australia and the New World. On the one hand, since vines are particularly vulnerable and require strong and toxic pesticides, growers and their soil could use vines that are more resistant to diseases and pests. On the other hand, vine growers are afraid of losing their brand name (*appellation contrôlée*) if their wines become associated with genetics rather than with sun and earth, and therefore called for a moratorium on genetically modified vines. Since wine is a significant part of French culture and national identity, the issue has broad implications. The directors of INRA contacted then the authors of Joly et al. (2004) in 2001 to organize a technology assessment process for this research project. They chose an interactive model that involves the deliberations of a small group composed of lay citizens, scientists and professionals who are selected as representatives of “different visions of the world.” Deep sociological interviews about the nature of good wine, transgenic plants, and science ascertained the desired diversity.

The resulting group was composed of four lay members with no particular connection to the issue, six professionals who were either involved with growing vines or making wine, and four scientists-researchers at INRA with different methodological approaches to research on genetics or vines. The panel deliberated for seven days between April and September of 2002. The directors of INRA posed a question about open field experiments with disease resistant vines. The panel broadened and reformulated the question to comprise four parts: the symbolic and commercial value of wine; the characteristics and constraints of systems of production; eco-

conomic and political aspects; and the current state of vini-cultural research. They called for different methods for fighting diseases in vines and for holistic research of the plant in its environment. Otherwise, the group was divided between those who supported the continuation of the experiments under certain restrictions and those who opposed them. This is hardly surprising given the selection criterion for the group. Joly et al. (2004) who were also the organizers claim that this cleavage appeared only towards the end, in response to the requirement to reply to concrete questions from INRA.

The report of the working group was presented to the directors of INRA on September 2002. They announced their policies on January 2003: INRA will continue experimenting only with disease resistant genetically modified vines. The present experiments will continue cautiously for another five years. Any innovation, within the above mandate, will have to be approved in advance. INRA will create a mixed committee with vine producers that will suggest directions of further research. Joly et al. (2004) stressed that this is a new policy of parsimony, of minimal research in open field, according to social needs. INRA no longer promotes innovation as a goal in itself, but explores diverse means to diverse ends, to widen the possible choices and improve knowledge of the effects of innovation. Joly et al. (2004) concluded that though the process did not have an affect on the social legitimacy of the vine experiments, it effected decisions making. During 2004 a local committee of researchers and vine growers from Alsace (where the experimental field is located) has convened to direct together the research.

As idealistic as this hybrid scientific democratic procedure may appear, it is also possible that the directors of INRA, in a classical French technocratic fashion, may have been interested in continuing the field research and used this hybrid forum first as a delaying tactic, and then to legitimize their decision, since research on disease resistance was what the research was all about to begin with. Anti-GMF NGOs condemned the exercise as a program for manipulating public opinion.

Reestablishment of the Scientific "Ancien Regime"

The failures of the French government and bureaucracy to foresee and control the results of the GMF consensus-citizens conference led them to lose interest in new exercises of this sort and attempt to re-establish the old technocracy. An opinion piece by Hervé Gaymard, the French Minister of Agriculture, Food, Fishing and Rural Affairs, published in *Le Monde* on 1 July 2004 is emblematic: Gaymard stated that science and democracy are not governed by the same logic. Scientific truth does not depend on majority rule. Still, the opposite evils of oligarchy and demagoguery

should be avoided. He raised rhetorically the question whether the French people would accept that their leaders would follow “fashions, myths and fears,” or delegate decision making to scientists?! The answer is neither. Elected politicians should make decisions. He stated as an obvious axiom that France is not America, where an independent Federal Agency like the Food and Drug Administration controls both risk assessment and risk management. Echoing De Gaulle he wrote, “I note and understand the persistent worries of our citizens,” especially when the complexity of the situation foils the popular desire for dualistic solutions. The problem with food security is that “often passions invade the debate.” Yet, we have one of the highest levels of food security in the world. We have to better organize our risk evaluation and distinguish it from risk management. He justified his decisions to reduce the variety and amounts of chemical pesticides that are allowed, and approve eight new programs of research about genetically modified plants. Gaymard wanted a France that does not sacrifice to “technological idolatry and to profitability at all costs,” but also a France that is “competitive, does not retard its position in the world, a model of progress.” How to reduce the tensions between science and society without either playing “the sorcerer’s apprentice,” or falling into “neo-obscurantism”? Gaymard’s answer is *government!* The scientists should conduct risk assessments, but leave the decisions, risk management, to politicians according to global social and economic cost/benefit analysis. He called for better definition of the limited authorities of committees of experts on the national and European levels to prevent them from making decisions on their own. He called on the media to restrain itself, not to over simplify complex scientific issues by calling on experts to pronounce yes or no judgements that disorient and scare citizens. Politicians should adopt an ethics of responsibility and follow the examples of Cicero and Max Weber!

Conclusion: Science Studies and Scientific Democracy

Since scientists are just as corruptible as the rest of us, their results must be checked and replicated, and their adherence to the scientific method scrutinized. In social structures where the scientific elite is unified and in-bred with the political and economic elites, it is particularly prone to corruption, to presenting its interests as science. In polyarchic systems, like in the U.S.A, where the scientific community is neither unified internally, nor fully integrated with other elites, the scientific community may conceivably check and control itself with the help of external independent regulative institutions like the Food and Drug Administration. The unitary and exclusionary character of the French technocratic elite has fa-

voured both its corruption and the emergence of the ideas of Science Studies.

A political reading of Science Studies as they emerged in France would be a critical theory of French technocracy, of the converging symbiosis between the scientific, technological, technocratic and political elites. Exposing the relations between apparently neutral science and expertise and political and other interests had undoubtedly a liberating effect, especially in the realm of psychiatry. The series of technocratic blunders in the second half of the nineties put the French scientific, bureaucratic and political elite under pressure to reform and democratize. In this new political environment, ideas about scientific democracy that had been circulating ineffectively for more than a decade earlier received a new lease on life as applied democratic theory. However, the old ruling technocracy has had no intention of changing the constitution of the French state, its centralized distribution of power, just because it committed a few obvious blunders. The bureaucracy used apparent democratic deliberative models as a ruse to defuse public pressure. In light of this history, the kind of abstract principles advocated by Latour appear sufficiently vague to allow manipulative bureaucracies or NGOs to use pseudo-democratic institutions to legitimize their decisions or interests. The information gap between scientists, bureaucrats or activists and ordinary people is an opportunity for manipulation. Callon et al.'s solution, the holding of a hybrid forum in the delicate moment, after the public is already familiar with the issues and cannot be manipulated, but before their opinions congeal beyond openness to deliberation, limits the range of circumstances where hybrid forums are useful. Callon et al. tried to fit their model to actual spontaneous eruptions of popular democracy in France. But the pre-requisite perplexity or uncertainty is too rare to be a useful solution to the wider problems of French science policy. The history of the transgenic wine forum demonstrates that even hybrid forums are open to manipulation.

I would read Science Studies mostly as a critical theory of French politics and the monolithic class hierarchy, especially in relation to the politics of science and technology and the peculiarly French inbred symbiosis between scientists, engineers, managers and bureaucrats. This social context explains both the emergence of social studies of science in France, and their limitations. Individual scientists, just like any other office holder, are corruptible and prone to bias. When the institutional structure of science is that of a monolithic hierarchy, the biases are particularly apparent because nothing checks them. However, there is a difference between science as an international network of interconnected institutions and individuals that checks and control each other and the scientists that comprise it. What may be true of the French political and academic system is not

necessarily true of international science. Likewise, the solution to the crisis of French politics of science may not be more or less wholesale utopian democratization of science that can also be corrupted easily, but constitutional reform that would introduce a variety of measures for checks and balances, democracy could well be one of them.

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