6   Mobilizing against, Mobilizing within Nanotechnology

Comparing Two Forms of Social Mobilization

The previous chapters have identified various problematizations of nano-technology, which have been described through the analysis of agence-ments. We encountered agencements that represent nanotechnology in museums; agencements based on technologies of democracy; agencements that define regulatory categories; and agencements that make people, objects, and organizations "responsible." How then to reconstruct consis-tent democratic spaces from the variety of these descriptions? This question has two interconnected levels. First, one can seek to connect the descrip-tions to each other and let consistent spaces emerge, "consistent" in that they would be characterized by common problematizations. Second, one can then inquire into the form of critique thus made possible. So far, I have argued that each of the problematizations of nanotechnology I described also realized a democratic construction by organizing oppositions. How is it then possible to ground a critique of democratic societies from this analy-sis? Is there a path toward "democratization" once the nature and effect of democratic values are embedded in particular problematizations (and con-sequently, when there is no stable external basis on which critique could be grounded)?

The last chapter of this book will examine these questions in details, by connecting various empirical descriptions presented elsewhere in the chap-ters and by discussing the theoretical perspective the case of nanotechnol-ogy helps develop for the analysis of democracy. Before coming to this point, this chapter proposes a discussion of two French civil society organi-zations (let us use the expression "civil society organization" here, which is not, as we will see, entirely appropriate). This detour is not anecdotal. First, it will provide empirical materials useful to complement the previous descriptions, especially about the state experiment undertaken with

nanotechnology in France (cf. chapters 3 and 4). Second, and perhaps more importantly, these two organizations are caught in the same quandary as any scholar interested in the questions introduced in this book. They attempt to describe nanotechnology as a heterogeneous assemblage of objects, futures, concerns, and publics. They reflect on the path for democratization. They refuse to engage uncritically in public engagement devices but seek to actively undertake them as objects of reflection and intervention. They problematize nanotechnology by accounting for the problems it raises while also contributing to make it a public problem.

As in the preceding chapters, this chapter builds on comparative analysis. But whereas the previous chapters compare sites of problematization in different countries, I compare here the modes of social mobilization of two organizations in the same country, France. The comparison is relevant, I contend, since it helps illustrate two forms of engagement in nanotechnology that mix description and intervention. The narratives presented in this chapter will thus help me clarify the nature of the scholarly intervention in nanotechnology, and, more generally, in issues related to democratic practices.

The previous chapters have already provided numerous examples of social movements that are involved in controversies related to nanotechnology. Recall the fight of ICTA (in the United States) or the EEB (in Europe) for the recognition of nano substances as "new" chemicals (see chapter 4). In the meantime, we also encountered numerous devices expected to speak for the public, whether when creating debating or deliberating citizens (chapters 2 and 3) or through the "monitoring of public opinion" (chapter 2). The cases presented in this chapter will provide illustrations of different processes, whereby civil society organizations are engaged in nanotechnology as a whole, and question the way of maintaining, or not, a distance to it.

I will begin the description of these groups with an analysis of nanotechnology debates in Grenoble. Grenoble, a city in the French Alps and a major hub for nanotechnology research, is the place where they interacted for the first time, and where many of the actors encountered so far first met. In Grenoble, the connections are numerous among the making of nanotechnology objects, the definition of nanotechnology development programs, the management of its related concerns, and the mobilization of its publics. The Grenoble case will ground the discussion on the forms of mobilization proposed by a group of anti-nanotechnology activists, and an NGO engaged for the "democratization of nanotechnology."

In Grenoble: Introducing Social Mobilization on Nanotechnology

Nanotechnology and the Grenoble Model

Nanotechnology research in Grenoble has developed through tight collaborations among industrial, scientific, and administrative actors. Indeed, scientific and industrial research in Grenoble has received strong support from local administrations. The Grenoble city council, the Grenoble metropolitan area council (nicknamed *La Métro*), and the Rhone-Alpes region have been providing funding for scientific projects. Collaborations between public and private institutions for microelectronics and nanoelectronics R&D were launched in the early 1980s (Robinson, Rip, and Mangematin 2006). They reached a higher level of development in the mid-2000s with the Minatec Research Centre, launched in 2002 and officially opened in 2006, which aimed to "become Europe's top centre for innovation and expertise in micro and nanotechnology."[1] Another core research area in Grenoble is nanobiotechnology. The Nanobio project was launched in 2001 by the Commissariat à l'Energie Atomique (CEA), which has one of its major laboratories in Grenoble, and the Joseph-Fourier University, with the financial support of local authorities. Nanobio, which was conceived as a part of the European Network Nano2Life (see chapter 1), brought together engineers, physicists, and biologists within a broad portfolio of activities, from bioimaging and bio-detection to surface chemistry, "at the interface of biology and micro and nanotechnology."[2]

The tight connections among industries, local administrations, and public research had another dimension, particularly as local officials insisted on the strategic objectives of scientific research in the Grenoble area. For them, science—and in particular nanotechnology—was to be developed for its economic value. When city officials explain their support for nanotechnology, they stress the economic dimension of these research programs. The Nanobio project seeks to "stimulate company creation and technology transfer"[3], and Minatec research center is part of Minalogic, one of the *Pôles de Compétitivité* created by the French government in 2004 in order to foster university-industry relationships.

The interconnections of public and private actors, scientific institutions and industries, for the sake of techno-economic development did not arise in Grenoble with nanotechnology. It followed a path opened after World War II, which embedded research in the physical sciences in a dense network of collaborations between scientific and industrial actors as well as with the city public administration (Caron 2000; Pestre 1990). The reference to Louis Néel, the Grenoble-based physicist who received the Nobel

Prize in 1970 for his work on the magnetic properties of matter, allows local actors to stress the tradition and continuity of the "Grenoble model." In his speech marking the inauguration of Minatec, the president of the local council of Isère explained how the new research center was being launched in the spirit of Louis Néel: "Professor Louis Néel … said: 'I wish to develop a multi-disciplinary institution and link it to the whole set of regional industrial activities, as well as to the university and the CNRS.' It is this vision that has inspired the Minatec innovation centre, and that is why Minatec is situated on a square named after the 1970 physics Nobel Prize winner.[4]

Hence, for the Grenoble actors, the initiatives of CEA officials who pushed for the development of nanotechnology by administrative bodies, industrial firms, and public research institutions were pursuing the "Grenoble model" on yet another scale—that of the "technology of the future."[5] The "model" has practical meaning for the administration of scientific research, as a CEA official explained to me during an interview: "The local administrations are strongly involved in the emerging scientific issues. Everyone knows each other here, in the industries, in the labs, in the city council. … So decisions are made quickly, and engagements are respected. … Grenoble is quite unique in this respect.[6]

This specificity of the Grenoble model has been used as a reference for national policy for the development of innovation clusters. For instance, reports commissioned by the French government to identify processes ensuring national competitiveness referred to Grenoble as the "good example," a place where the close connections among university, industry, and local administrations were able to produce scientific knowledge and transfer it.[7] In the discourse favored by local officials, the Grenoble model is both integrated and comprehensive, the result of the past and a marker for the future. It is both a condition for the success of scientific projects and the reason for the continuation of scientific activity in Grenoble.

The Grenoble model conflates the technical contents of the various S&T fields with the organizational aspects that render multidisciplinary connections possible. Research activities in the Grenoble area associate nanosciences, basic technological research, industrial R&D, and also expertise in software technologies, biotechnologies, and energy microsources. At the level of the laboratory, it means that the institutional arrangements, the scientific instruments, the research projects, and the work status of the researchers and engineers are redefined according to the need of the complete innovation system. Researchers in nanoelectronics laboratories share instruments across scientific disciplines and institutional boundaries,

thereby redefining the nature of their projects in terms of both "fundamental" and "applied" research (Hubert 2007). Research in nanobiotechnology led to bringing patients previously cared for in the local hospital to CEA buildings, where, within a project called Clinatec, physicians, biologists, and physicists could experiment with nanomaterials-based cerebral probes.

The recomposition of institutional, disciplinary, and cognitive boundaries in the Grenoble area has been accompanied by a growing concern for the management of risks and the interrogation about potential ethical issues. François Berger, the promoter of Clinatec, sat in the Nano2life ethics board, and developed a constant preoccupation for the "ethical questions of nanotechnology research" (see chapter 5). CEA is a major partner in successive programs for the study of the health risks of nanoparticles. Regular academic conferences called Nanosafe are organized at Minatec. Employees of CEA participate in national and international discussions about the standardization of nano substances. CEA's lead occupational physicist is a member of the French delegation to ISO, and an active participant in the nano-responsible initiative (see chapter 4). In Grenoble, the concern for the public is also visible. Chapter 2 described the numerous initiatives of the local science center, and its involvement in the display and practice of the "public debate" about nanotechnology.

Against the Grenoble Model
In June 2006, the Minatec research center was officially inaugurated. President Jacques Chirac was expected, as well as ministers and multiple representatives of French and European research institutions. Yet what should have been the symbol of the success of the Grenoble model was disrupted by a demonstration on the streets of the city. Allegedly the first anti-nanotechnology march in the world,[8] the demonstration, which gathered about a thousand people, had been announced on the website of the *Oppositions Grenobloises aux Nécrotechnologies* (OGN)—which had caused, according to the activists, the defection of the President and eventually the shift of the inauguration day from June 1 to the following day.[9] The OGN demonstration was only a culmination of a series of actions opposed to nanotechnology, which had taken various forms in the Grenoble area. Activists had already organized various counterevents in bars comprising movie projections and discussions about nanotechnology. Over the 2000s, the contestation of nanotechnology became visible in Grenoble as "no nano" mottos appeared on the city's walls. These actions were pursued at the national level during the national public debate on nanotechnology, when activists

interrupted public meetings (see chapter 3). But the most important production of the anti-nanotechnology activists in Grenoble was by far the writing of texts, in which anonymous authors would describe the tight connections among the Grenoble scientific, industrial, and administrative actors engaged in the promotion of nanotechnology.

At the origin of the contestation of nanotechnology was a group called "Pièces et Main d'Oeuvre" (PMO, or Parts and Labor), which defined nanotechnology as a "necrotechnology," that is to say a technology that has to do with "death" (Greek: necros).[10] Indeed, the activists described scientific research in Grenoble as part of a global program of control over nature and human beings. PMO targeted the blurring of boundaries that nanotechnology produced. By merging biology and physics in the making of hybrid objects, such as diagnostic tools and brain implants, nanotechnology, so the activists argued, was a threat to the integrity of the human body, and a potential provider of devices controlling human beings; by associating fundamental and applied research, academic and industrial research for the sake of economic development backed by public and private actors, it destroyed the autonomy of science (including social science), and subsumed the public good to economic interests.

PMO is composed of no more than a few people, who are joined by other activists in planning activities, writing texts, or demonstrating. Hence, speaking of the "anti-nanotechnology activists" should not suggest that they form a consistent social movement. They are mostly a collection of people coming from various backgrounds, most of them being loosely associated with various activist groups. Consider the trajectory of a member of OGN, interviewed in a radio program: "I was trained as an engineer. I worked for a big company. After a few years of this work, I was fed up with dissociating my professional consciousness and my moral consciousness, (...) I felt a dissonance between my principles, which lean toward ecology and democracy, and my work. I decided to quit, for a life with much less money but also many more friends and much more political concerns. Since then, I gravitate among the opponents of the race for high-tech. Not only in this group though."[11]

Like this person, the activists I interacted with (in interviews or meetings) were mostly educated people, who had decided to engage "against technology." What an engagement "against (nano)technology" means will be explored at length in the following pages. At this stage, it suffices to say that the activists' description of the Grenoble model is quite different from that of public officials. For the activists, the Grenoble model is not a success story in terms of technological and economic development, but rather an

illustration of the increasing domination of market interests without public legitimization, eventually resulting in the weakening of democratic processes of decision making. A symbolic figure like Louis Néel is thus deconstructed as a representative of unacceptable contacts among basic research and military and economic interests.[12] For the activists, nanotechnology research is a manifestation of another type of convergence, that of political, scientific, military, and economic interests, which leads to decisions based on military or market interests, and, therefore, opposed to the general interest. Decisions in Grenoble, the activists claim, are made by a small group of people without prior consideration of citizens' interests. Officials and scientists constitute what the activists call the "techno-gratin" (the "techno-upper crust"), in other words, a small elite group whose members have close ties to one another. The case of the mayor of Grenoble, a former engineer in CEA and founder of a spinoff research center, is often used to illustrate this situation. This criticism is reinforced by the connection drawn by activists between nanotechnology research and local events apparently not directly connected to technology itself. For instance, the activists' definition of the Grenoble model includes references to past corruption scandals that involved high-ranking local officials.[13] Another example is the arrest of demonstrators by the police during the demonstration against Minatec in June 2006: this was interpreted as an attempt to enforce decisions about technology, as was the police intervention during the inauguration of the Grenoble nanotechnology exhibit (see chapter 2). As such, it was seen as another manifestation of the program of control inseparable from scientific research.

"Public Dialogue" as Another Site for Oppositions

The opposition to scientific projects was not ignored by local officials. The local councils commissioned various events that were variably described as "dialogues," "debates," or "forums." At the initiative of a councilor of a minority group, *La Métro* commissioned a report to a group of STS scholars in 2005. They were asked to work on nanotechnology and the local democracy in the Grenoble area (Joly et al. 2005).[14] The report made the importance of the Grenoble model explicit, and recommended that participatory mechanisms be put in place. It recommended in particular the organization of a citizen conference—which was ridiculed by PMO, as a lame attempt to display a fake concern for democracy while continuing supporting nanotechnology development.[15]

No citizen conference was organized, but *La Métro* commissioned a series of public debates called NanoViv, which a civil society organization named

Vivagora organized. When it intervened in Grenoble, it had been working on nanotechnology for a couple of years. It had organized a series of public meetings in Paris about nanotechnology, which were meant to "expose the opposing views," "confronting the arguments," and eventually "come up with recommendations" for a "more democratic, more transparent, more inclusive governance of nanotechnology."[16] The same model was followed in the organization of NanoViv.

In Grenoble, Vivagora and PMO directly opposed each other. As the director of Vivagora, Dorothée Benoît-Browaeys asked PMO to participate in the meetings she was organizing,[17] the activists released texts in which they explained that *La Métro* was "trying to recruit them"—and that they would not participate in this "parody of public debate."[18] For them, any public debate could be nothing but a component of the global nanotechnology program, which was to be mobilized against. Vivagora had no better luck with the administrative and scientific officials: they were "asked to participate in the meetings"[19] but no official acknowledgment of the recommendations was produced at the end of NanoViv. These recommendations were general, and mostly targeted the "lack of transparency" in nanotechnology research in the Grenoble area as they were advocating regular discussions with civil society organizations. They were not well received among Grenoble officials. Years after the Grenoble debates, scientists and officials who had participated in them would still regularly tell me that "Vivagora had made up the recommendations."[20]

For both activists and Grenoble officials, the intervention of Vivagora was to be criticized. For the former, it intervened in the very making of nanotechnology policy (of which dialogue was a central component to ensure at best the "management of impacts" of an unquestioned technology program, at worst the "enrollment" of passive populations) and thus could not pretend to observe nanotechnology from the neutral position PMO contended to occupy. For the latter, Vivagora was involved in ways that went far beyond what it was paid for (i.e., organizing public discussions through which, as a city councilor said to me during an interview, "nanotechnology and its impacts could be presented in a manner that would take the heat out of the debate"[21]). Vivagora's interventions could have been acceptable if it had been an expert in public debate (like the CNDP [National Commission for Public Debate] experts encountered in chapter 3), but its inability to solidify a participatory procedure, to make it independent from the object being discussed, and to eventually produce uncontested results, made it a target for the critique of the Grenoble actors.[22]

Two Forms of Social Mobilization in Grenoble

Grenoble is a site where the components of nanotechnology stand out clearly. Many of the actors mentioned in the previous chapters converge in Grenoble, as the local construction of development projects is connected to the global construction of nanotechnology. Ethical concerns are voiced, the safety of nano substances is discussed, and nanotechnology's publics are engaged. It is a place where the development of nanotechnology as an entity gathering objects, futures, concerns, and publics is undertaken in a visible way. In Grenoble, one cannot reduce nanotechnology to a set of unconnected applications, to a problem of risk management, or to anticipatory visions. Accordingly, it is the place where social mobilization considers nanotechnology as a global program to be targeted, in ways that differ from those of the civil society organizations we encountered in the previous chapters. Opposing a model sustained by local officials, which contends that nanotechnology should be developed for the sake of local economic development while citizens should recognize the validity of expert knowledge and witnesses the management of the risks of each individual nanotechnology product, anti-nanotechnology activists define nanotechnology as a global program of control over nature and human beings, against which citizens need to engage. This latter proposition implies that activists refuse to engage in participatory activities, in order to critique them—as components of the global nanotechnology program they oppose. In arguing for the "democratization of nanotechnology," Vivagora takes a different stance that contends that nanotechnology should be open to collective discussions, which the organization would be in charge of setting up. This seems to imply that the mobilization is based on procedures meant to transform nanotechnology into a series of projects to be constructed by engaged actors, whether experts, administrators, or interested citizens—a proposition that was not well received in Grenoble.

PMO and Vivagora propose original forms of engagement in nanotechnology. They provide examples of practices that do not always follow the distinction between "invited" and "uninvited" participation in public debates, and that propose contrasted modes of critical engagement in or against nanotechnology. The sections that follow describe these two cases.

Mobilizing against Nanotechnology

Demonstrations without a Social Movement

For the local officials and research administrative actors, PMO was "not representative." As a member of the Grenoble city council said, "An

overwhelming majority of people supports the development projects. These people are a tiny fraction of Grenoble inhabitants. ... They're not representative."[23]

The same type of critique ("not representative") was repeatedly heard during the CNDP national public debate on nanotechnology. The "nonrepresentativeness" was a recurring critique of the president of the team in charge of the debate, who would present the number of connections to the website and the number of participants in the public meetings, then compare these figures with the "reduced numbers" of activists.[24] Whether the quantitative arguments hold true or not,[25] the critique misses the point. That anti-nano activists are not numerous is not what matters, since the type of critique they articulate cannot be differentiated from the particular format of action they propose, which is not expected to "represent" particular stakes or social groups.

This particular form of intervention is based on the anonymity of the critical voice. Unlike an organization claiming to represent certain people or issues, PMO's voice is anonymous. This is not trivial, as constant complaints are heard on the part of officials and scientists, who blame the opponents for not "playing the game of democracy" by "refusing to appear as persons with a name."[26] That democracy is at stake is certainly the case. This is not because PMO would not follow the "rules of democracy," but because it proposes a model of citizenship in the democratic society based on "critical inquiry" (*enquête critique*) performed by an individual and neutral "simple citizen" (*simple citoyen*), situated outside of the making of political, economic, and technical decisions. As one of the members of PMO explained, "Refusing to display our identities was deliberate. There are so many people who want to be known ['se faire un nom']. We are not here to build our notoriety; we do not want to be celebrities on these topics. (...). There are three types of authority: scientific, political and related to the media. We have wanted to act out of all that. Judge us on what we do ['sur pièces'], on the texts we write, which are all sourced."[27]

Constituting PMO into a social movement would have meant that the group would have fought for a particular stake, whereas it precisely sought to avoid being part of the negotiation game. Rather, it preferred to conduct critical inquiry, to develop a fine-grained assessment of the interests of the involved actors. Such a position is not foreign to social science. It echoes Bourdieu's perspective on sociology, which objectifies social categories in order to conduct the (social) scientific demonstration. Bourdieu's sociology relies on the ability to maintain a position of exteriority, which, as sociologists know, can be challenging. Reflexivity, then, as a means for the

"objectification of the process of objectification" (Bourdieu 1980), is expected to allow the sociologist to situate her position. For the Grenoble activists, the problem of exteriority was solved not by the recourse to reflexivity but by anonymity—a necessary requirement for the critique of PMO to be articulated.

This directly impacted the form of mobilization, as the contestation of nanotechnology could not be constituted into a "social movement." PMO itself is mainly composed of a handful of people, while friends maintain the website, and friends of friends organize meetings and debates. A student at Grenoble University who had written a humorous (and critical) account of one of the NanoViv public meetings thus explained during an interview: "Yes, we all know each other ... I had a friend who knew Y. [one of PMO's members]. I went to a few meetings in Grenoble. I had a good idea of what is happening in Grenoble. In this case, I found it fun to write a short piece (...) This is often how it works. Someone takes the initiative to write something, and then we circulate it. There is not much more organization."[28]

This does not mean that no organization exists at all. There are indeed multiple connections among people interested in the contestation. Information is exchanged, informally as the previous quote illustrates, or through alternative web media platforms,[29] and ad hoc groups of people are constituted when preparing particular demonstrations (e.g., the OGN group, for "Opposition Grenobloise aux Nécrotechnologies," which organized the demonstration against the inauguration of Minatec).

The anonymous position means that the form of PMO's demonstration is not performed as a public display of a particular stake or interest. As Andrew Barry suggests (Barry 1999), one can use the term "demonstration" to point to two operations: the performance of public proofs and the social event expected to make issues public. But contrary to Barry's examples, which deal with a case of mobilization against a planned highway in the British countryside, where the demonstration was about the connection between the people and the land, the demonstration that the Grenoble anti-nanotechnology activists proposed was not directed to one particular issue, but multiplied into a wide range of public proofs. PMO activists and their friends in the Grenoble area have worked hard to render visible the multiple connections that constitute the network of people in scientific, industrial, and administrative spheres that regularly interact and allow the Grenoble model to be sustained. One of PMO's most distributed productions is a graph that displays the multiple links among the officials in the local administrative bodies, the industries, and the management of

scientific research. Connected to this representation of the control of the local decision-making process by a small group of people is the demonstration of the physical transformation of the city of Grenoble. The occupation of a crane during Minatec construction work is a telling example of such demonstration. Another type of demonstration is based on ironic and humorous interventions: in 2007, activists distributed a fake version of the information magazine of the local administrative council, announcing the end of nanotechnology programs in Grenoble.

Ultimately, the demonstrations performed by anonymous "simple citizens" do not aim to constitute a social movement and argue publicly for the validity of a particular stake or interest. Rather, they aim to render the critical gaze directed toward nanotechnology immediately visible. In doing so, they act as devices through which spectators of the demonstration can be turned into critical citizens, potentially contributing to the critical inquiry. That these demonstrations are performed by anonymous actors is important, for that matter: it is a way of creating a parallel public space, "public" in the sense that it belongs to every citizen and not those particularly affected by a given problem. This parallel public space operates outside the scope of the official one. It is composed of websites, independent media, and places in the Grenoble area (and, during the CNDP debate, all over the country) where public meetings were held and activists discussed nanotechnology.

The parallel public space does not operate with publics other than simple citizens. In the model of the critical inquiry that the anti-nanotechnology activists propose, the nature of the "public" of nanotechnology is indeed twofold. On the one hand, the "official public" is part of nanotechnology programs, which comprise public meetings, dialogues and forums, and can be probed by measures of public opinion. On the other hand, the simple citizen is expected to put nanotechnology at a distance in order to demonstrate the interests behind its development and the noxious links on which it relies. Thus, the "public" of nanotechnology and its "problem" are conceived at two separate levels by PMO. On the one hand, the "problems" of the "impacts" of nanotechnology and their associated publics fit perfectly well within the global nanotechnology program that is to be rejected. On the other hand, nanotechnology *as a global program* comprising not only technical objects and future developments, but also publics and concerns, is a problem for which individual simple citizens need to mobilize and that needs to be discussed and acted upon through spectacular demonstrations performed in the parallel public space, but visible from the official one.

Thus, PMO's critique attempts to reconstruct a space for citizen intervention about technological issues. This space is both material and abstract. It is material in that it relies on the many places where activists meet and perform spectacular demonstrations. It is abstract in that it is from there that the simple citizen produces her critique. It is in this space that the citizen may become "simple," detached from any private interest in ways that resonate with a Rousseau-ist theory of democracy. Rousseau's *Social Contract* can be read as a theory of the general interest, construed as a condition for social stability, and requiring that private interests are subsumed into it. This political philosophy makes citizens "simple," in that they are supposed to gain equality of rights by renouncing their particularities. This figure of citizenship, central in the development of the French democracy (Rosanvallon 1992, 2011b), is remobilized by PMO as a way of contesting what transforms citizens who could be "simple" by turning them into "debating citizens," by making economic interests the matter of national and local research policies, and by developing technologies that might act on the very identity of political subjects.

Constructing Distance to Nanotechnology

The refusal of nanotechnology that PMO proposes is more complicated than a request for a moratorium, as some civil society organizations advocate,[30] and which requires boundary work in order to distinguish what is nano and what is not. PMO refuses to enter the process of defining nanotechnology from within, and blames what shifts and blurs boundaries: scientific developments that are at the same time economic development programs, social scientists who intervene in the conduct of nanotechnology research, and opponents who negotiate with industrialists about norms and standards. Accordingly, PMO is not interested in debates about the definition of nanotechnology objects in standardization and regulatory institutions, nor in discussions within science policy offices about how to make nanotechnology futures "responsible" (see chapters 4 and 5). An analysis of the oppositions within ISO about how to define nanomaterials, for instance, would be considered unnecessary for PMO. Arguing that other definitions than the size-based ones are possible, albeit eliminated within the international standardization processes, would, for PMO, still contribute to the development of nanotechnology.

The challenge of PMO's social mobilization is to maintain the distance from which critique can be voiced. I experienced this directly when I first attempted to meet PMO activists in January 2007. We had several email exchanges (using an anonymous electronic address) before I could settle a

meeting. The meeting happened at night in a low-key bar close to the Grenoble railway station, where I was asked to go and "be ready to be recognized by them." Two people eventually came to me, and it was only after another hour of discussion about the objective of my work and my tie to nanotechnology that I could start asking them questions. A young graduate student at that time, with no funding originating from nanotechnology programs, I needed to convince them that our meeting could be a contribution to my academic research without involving them in the entity they wanted to critique at a distance.

In other cases, PMO activists preferred turning down offers to voice their opinions alongside others'. A notable exception—and a challenge for PMO's critique—was the four-month debate organized in 2009–2010 by the CDNP at the initiative of the French government (introduced in chapter 3). What to do with the CNDP debate was indeed an issue for the anti-nanotechnology activists. Not that participation alongside NGOs, industries, and government bodies was considered for a minute. The organizers did contact PMO and asked them to participate as an "official" member. But participating was of course not an option, for it would have meant that the activists would have entered the game of public discussions about nanotechnology. Yet maintaining the distance, in this case, could not be limited to a refusal to participate. For the national debate on nanotechnology was an opportunity not to be missed to perform spectacular demonstrations: demonstrations that the device was organized by the proponents of nanotechnology, that it was driven by the interests of nanotechnology development, that participation was not an acceptable way for the citizen to act, and, eventually, that the objective of "total inclusion" was absurd. The parallel public space had to interact with the official one.

Yet the CNDP device is meant to include as many forms of expression as possible, including the most critical ones, and the organizers are ready to adapt the procedure in order to look for diverse participants. This was not ignored by the activists when they discussed the format of their interventions. During a meeting in February 2010 in Paris, in which I sat, about fifty activists discussed the way in which they could intervene during the first Parisian meeting of the CNDP debate.[31] An issue that was debated was the opportunity to stress the negative aspects of nanotechnology in order to convince people to join the anti-nanotechnology movement. The proposition was not well received, since "negative aspects" like risks were already part of what was being discussed within the CNDP debate. Activists preferred targeting "worldviews" such as "the machine man in a machine world" (*l'homme machine dans un monde machine*). Yet even if "the machine

man in a machine world" was accepted as the object of the critique, the forms of the demonstration were not given, and could potentially be harmful for the activists, since it could also render explicit *to the organizers of the public debate* a position that could then be included as "the opinion of the activists" alongside that of the participants in the debate. The activists did not ignore this, as they reflected during the February 2010 meeting on the possible means they could use to perform the demonstration. They considered "taking the mic" (*prendre le micro*), but eliminated the option because of the risks that the activists would take to appear "just like the other participants." "Shouting" was eliminated for the same reasons. Discussions about the banners lasted for a few minutes. The activists had crafted a series of mottos, and published them on the website. But the problem was still present. For instance, one of the mottos targeted the financial interests of the organizers of the public debate. At the Rennes meeting, the organizer of the debate could directly answer this critique, and start a discussion about the wages of the members of the organizing commission members ("it's a good thing you ask, because we are not paid," said one of the organizers). Hence, every formulation of argument within the perimeter of the public meeting, under one form or another, was to be considered within the dialogue device and then be captured in it. The activists' interventions eventually did not even try to convey arguments but were meant to render the conduct of the debate impossible: activists would blow whistles, shout unformed words, and refuse to talk to whoever was asking them questions. This was the price to pay in order to stabilize the distance to an inclusive device absorbing every argument, while in the meantime conducting spectacular demonstrations. Even so, the organizers of the debate were able to devote a large part of their final report to the interventions of the activists. The organizers presented the opponents as participants who had been able to shift the debate to questions that the organizers considered more interesting ("opportunity"). While criticizing their refusal of "dialogue," they considered the positive side of the activists' interventions, which "increased the visibility of the debate" and raised the questions of "the society we want" and of "governance."[32] The intervention of PMO within the CNDP debate can be seen as a trial for PMO's mode of critical intervention. While PMO succeeded in interrupting public meetings, the conduct of spectacular demonstrations within the CNDP debate raised the issue of the practical construction of the distance from which critique was possible.

Extending Critical Inquiry

The crucial role of the CNDP debate for PMO is also visible when one considers the extension of critical inquiry beyond nanotechnology. The debate was an opportunity to gather various people under the banner of the "converging fights"—an expression regularly used by the activists, and which mirrors the "converging technologies" they are acting against. During the CNDP debate, the activists who intervened came from various cities in France. Some of them traveled across the country, going from one debate to another. Some had been active in the critique of nuclear energy, others in the anti-GMO movements: in all these cases, what was at stake was the possibility for the simple citizen to perform a critique, and what was targeted was the democratic organization.

As CNDP was organizing its last public meeting, about two hundred activists coming from various locations and with diverse experiences in anti-technology activism gathered in Paris to discuss the actions to undertake after the CNDP debate.[33] They compared the experiences they had had with various environmental and green political parties in order to examine how the "converging fights" could develop. While participants talked about the cooperation they had had with *Confédération Paysanne* (an anti-GMO farmer union) or *Sortir du Nucléaire* (the main French anti-nuclear group), others (most notably the most active PMO members) warned against the risks of entering "a dynamic of negotiation rather than contestation." They used the illustration of the anti-nanotechnology contestation to argue for the pursuit of critical inquiry and the refusal to constitute a social movement that would engage in participatory mechanisms. At stake was again the stability of the distance from which critical inquiry could be performed, and which was crucial for the construction of the "converging fights."

As the group is not organized and does not argue for a given interest, the nature of its critical intervention is constantly reopened, and the ways of producing the adequate distance to technologies of democracy such as the CNDP debate are not pre-given. This results in narratives about past choices, past interventions that helped clarify the mode of action but ended up raising new questions. That the written production of PMO is abundant is not anecdotal for that matter. In addition to the many texts circulated online and within activist networks, it also includes several books published by independent publishers (PMO 2008, 2009). These productions present the results of critical inquiry while also reflexively re-narrating actions undertaken in the past and discussing their contribution to critical inquiry. Consider, for instance, the case of activism against nuclear

energy, in which the instigators of PMO were actively involved. While crit-icizing the civil society organizations that chose to participate in public dialogues about nanotechnology, PMO often refers to previous events related to the critique of nuclear energy, sometimes quite distant in the past, during which differences in the conduct of the critique of technology had been visible. For instance, a demonstration conducted against a nuclear project in Creys-Malville in 1977 led to lengthy debates among the activists about whether or not violence was acceptable. Writing in 2005 about this event, the simple citizen considered it marking the separation between the environmental movements that were willing to negotiate with public bodies and private actors, and radical activists (which were, for the author, the only ones able to perform critical inquiry).[34] The Malville demonstration was yet another site where the practice of critical inquiry was at stake. It recomposed the spectrum of antinuclear activism in ways that, according to the PMO narrator, continue to have consequences in the 2000s. Described in the mid-2000s by PMO, it became a component of the parallel public space of radical critique, and another moment of trial for the stability of critical distance.

How to Make PMO a Research Topic?

While PMO constructs a parallel public space from which critical inquiry can be undertaken, it integrates social science in its critique. Thus, PMO produces numerous critical accounts of social science, whether comment-ing on STS scholars advising *La Métro* to organize a citizen conference,[35] or discussing the concepts of "technical democracy"—which does not ques-tion, according to the activists, the very logic of technologic development.[36] We have already encountered the intervention of social science in nano-technology programs in the previous chapters, as I described social scien-tists involved in the design of science exhibits (chapter 2), in the organization of technologies of democracy (chapter 3), and in the definition of "respon-sible" futures for nanotechnology (chapter 5). But the intervention of PMO invites one to theorize further the position from which such a description is even possible. Indeed, including the anti-nanotechnology movement within problematizations of nanotechnology described at a distance would replicate PMO's approach. But rather than adopting PMO's exteriority solu-tion, one can contrast PMO's production of exteriority with other ways of producing critical distance, particularly those in which the analyst himself is engaged. If we follow this approach, PMO is less an entity to be put at a distance than a group of people raising issues similar to this book's, of the good description of the issue at stake, of engagement, and of the

construction of democratic orders. As such, the practical issues that PMO faces in maintaining its exteriority within inclusive agencements, and its refusal to pursue its critical inquiry in places such as standardization organizations and science policy offices show that the descriptions produced by PMO might miss important sites where nanotechnology is problematized. The next section contrasts PMO's production of exteriority with the multiple distances produced by another organization, Vivagora.

Mobilizing within Nanotechnology

Engaging for the Democratization of Science

Vivagora is a small organization, which never reached more than a couple hundred members and a small group of employees. But its involvement in the discussions about nanotechnology in France was far more significant than what its size would suggest. Vivagora is an organizer of "public dialogues" such as, in Grenoble, the NanoViv debate series. It is tempting to think of Vivagora as a "mediator" that would "not take part" in the discussions it helps organize. This would separate nanotechnology from its treatment within a public debate arena, organized by a specialist, in this case Vivagora. This, however, does not account for the activities of the organization: Vivagora is neither a "stakeholder" nor an "advocate of public debate" using participatory instruments independently of the issue at stake; the case of Vivagora is significant because of the impossibility of delineating a priori boundaries for nanotechnology. The organization indeed became part of nanotechnology programs, allied to administrative actors involved in the making of science policy, while, at the same time, constantly reflecting on the specificity of its position.

Another characteristic of Vivagora is indeed to be self-reflecting. Members of the organization and employees regularly gather to discuss the objectives of their group. During the board meetings of the organization, members invite external speakers, express their wishes about the future of the organization, and discuss its "identity." "We have an identity crisis" is a sentence I heard many times during my exchanges with Vivagora members and employees.[37] That the organization was so concerned about its identity, its "values" and "objectives" is connected to the nature of its commitment to the "democratization of technology." As will be seen in this section, Vivagora's concern for democratization could not be separated from an engagement in the actual production of nanotechnology objects and policy instruments. This makes the case of Vivagora different from that of the experts of participatory procedures encountered in chapter 3.

   As I was participating in numerous meetings about the definition of nanomaterials, the identification of ethical issues, or the design of science exhibits, I had multiple interactions with Vivagora, whose members were present in all the fieldwork I worked on. Vivagora collaborated with the Grenoble science center in the organization of local public meetings in connection with its nano exhibit (see chapter 2). It participated in the CNDP debate, at first a supporter of the process, and then turning more critical. The organization was involved in discussions at AFNOR about standardization and the nano-responsible project (see chapter 5), then later joined the European Environmental Bureau, and signed a declaration about the "principles for the oversight of nanotechnology" prepared by the American ICTA (see chapter 4). More than from external interactions with the organization, a significant part of my knowledge about Vivagora stems from my active involvement in it. As I began working on the nanotechnology debates in Grenoble, and, more generally, on the assemblage of nanotechnology in democracy, I interviewed members and employees of Vivagora and observed some of the events they were organizing. I was increasingly involved in their activities and entered a process of ongoing negotiations about my role and relationships with the organization.

The Experience of the Nanoforum: From an Expertise on Public Debate to the Construction of Publics and Problems

Vivagora was created by science journalists and conceived at first as an organization that provided information about controversial topics related to emerging technologies. This was the spirit of several of its initiatives in the mid-2000s, when the organization organized public meetings during which the public's concerns related to nanotechnology were discussed by actors in the field. But the many criticisms it encountered in Grenoble forced the organization to rethink its mode of intervention and the objective of its actions. The Grenoble experience was interpreted by Vivagora members as the demonstration that the external position from which one could describe the various positions related to nanotechnology was a fantasy. "We're included," the president of Vivagora repeatedly said. Whereas PMO responded to the quandary caused by nanotechnology's inclusive character with the anonymity of a simple citizen performing critical inquiry at a distance, Vivagora chose to rethink what it meant to mobilize on the "democratization" of technological choices. Rather than picturing technological issues at a distance, as if it could maintain an external position, the organization would engage actively into them.

This shift manifested itself in the initiatives Vivagora undertook after the Grenoble experience. One of the most visible was the Nanoforum, yet another series of public meetings about nanotechnology, albeit grounded on a different approach than the Grenoble events. The Nanoforum was organized in Paris, and lasted from 2007 to 2009. A first group of meetings focused on various industrial domains of application of nanotechnology (e.g., construction and cosmetics). They were examined through the participation of invited industrialists, civil servants, and representatives of NGOs. Another group of meetings was devoted to nanosilver and the modalities of its regulation within French and European law. Rather than delving into the details of the discussions during these meetings, it is more interesting for our concerns here to characterize the agencement that the Nanoforum resulted in, and the problematization of nanotechnology it entailed.

First, the Nanoforum was experimental in the sense that it made participants question their roles and responsibilities. For the civil servants involved, the scope of their engagement toward nanotechnology and its regulation was at stake: because they did not use a known technology of democracy (as the CNDP debate procedure), the modalities of action were not preestablished. For Vivagora, the form of social engagement for the democratization of nanotechnology (and technology in general) was directly at stake in the Nanoforum initiative. As the organization did not know in advance what it was looking for in putting together the device, it also explored the modalities of its engagement in public debate about nanotechnology through the Nanoforum. Eventually, the Nanoforum also called my own role as an engaged analyst into question. I was invited to participate in the organizing committee by Vivagora, as both a member of the organization and a nanotechnology "expert." While sympathetic to the objective of the Nanoforum I did not know in advance what my engagement was going to be.

The Nanoforum experiment was connected to others. Participants and organizers of the Nanoforum were active in the development of the AFNOR nano-responsibility standard (see chapter 4). The organizers of the Nanoforum wrote a contribution to the CNDP debate in which they explained that it was necessary to explore the uncertainties surrounding the risks and benefits of nanotechnology. As such, and it is the second aspect of the Nanoforum that I want to underline here, the initiative was a component of the state experiment in France that nanotechnology resulted in. The discussions undertaken within the Nanoforum dealt with choices engaging the state, and involved the civil servants in charge of nanotechnology

within the French public administration. The main initiator of the Nano-forum, William Dab, a former senior official at the ministry of health, saw the initiative as a way of transforming the government of uncertainty undertaken by the French state. In various public statements and publications, William Dab explained that the French state was ill equipped to deal with uncertainty, because of the centralization of decision-making processes, too much reliance on technocratic expertise, and a refusal to account for the politics of technological evolution (Dab and Salomon 2013). In contrast, the Nanoforum was for him an initiative that could be seen as a "technology of trust," because its objective was to make uncertainties explicit, and to introduce dialogue across various components of the French government before any rigid position had been crafted (Dab 2009). The Nanoforum was a component of a series of interventions performed under the eyes of European and international organizations that targeted the regulation or standardization of nanomaterials in this context of uncertainty (see chapters 3 and 4). It directly questioned the channels of political representation beyond the election, as the CNDP debate would soon do.[38]

There is a third experimental dimension within the Nanoforum, and it is related to the political engagement of Vivagora. In its previous initiatives, the organization had attempted to describe the various positions related to nanotechnology—as science journalists would have described opposing views on a technical question. Within the Nanoforum, Vivagora was not only an organizer but also an active contributor. It intervened, for instance, in the support given to local civil society groups in Grenoble, which were invited to talk at the Nanoforum. This was a component of a broader objective meant to "structure civil society" (an expression regularly used by Vivagora's members), that is, encourage social actors to mobilize on nanotechnology. The example of the Nanoforum illustrates the trajectory of Vivagora after the Paris and Grenoble debate series. Rather than stabilizing a technology of democracy that could have been replicated independently of the issue at stake, the organization preferred to set up ad hoc procedures that could evolve according to the need of the participants and the questions that were raised.

This means that the external position, from which Vivagora could have hoped to represent the various arguments exchanged within controversial situations was no longer possible. As a member of the board said during a general assembly on March 4, 2009: "We have been in a process of collective reflection on the vocation of Vivagora since 2008. At the beginning, we were above all interested [*orienté vers*] in public debate. Today, we

think it is better to intervene on innovation processes. We need to go beyond what we have already done [*aller plus loin*], we need to think about the ways in which social experiments are possible. How to launch new formats of public debates."

To "go beyond" could imply, as in the Nanoforum, work in common with social movements, administrative officials, and industrialists, in making nanotechnology a public concern, rather than organizing participatory procedures thanks to a procedural expertise. In any case, "social experiments" required transforming the forms of social mobilization.

Experimenting on Engagements and Distances

In addition to the publication of articles on its website and through its newsletter, which critically examined technological innovation and the evolution of national and European regulation (for instance, by commenting on public agency reports, and blaming the administration for not regulating nano substances), Vivagora was involved in 2008 in seventeen different projects.[39] About two thirds of them dealt with nanotechnology. Some of them consisted in the organization of public meetings on the model of the Grenoble public debates. Others were punctual events (such as an "Innovation and Responsibility" colloquium) or ad hoc processes such as the Nanoforum. Another group of activities were projects funded by public bodies intended to study participatory democracy on technology issues and experiment with forms of public dialogue. Other projects were regular events organized for industries (e.g., breakfast meetings to present the positions of various stakeholders to industrial actors), or partnerships with industries to experiment with "participatory design" (that is, industrial design involving representatives of civil society organizations). Eventually, Vivagora also participated in public committees where civil society organizations were invited to intervene. For instance, when the National Council for Consumption (CNC, an advisory body of the French ministry of economy) launched a working group for nanotechnology, Vivagora was one of the two civil society organizations represented in the committee, alongside a consumer group. Vivagora was also represented at the French National Agency for Research (ANR)'s committee for nanotechnology research, in the French standardization nanotechnology committee, and, later, in the nano-responsible project (see chapter 4). As a member of the European Environmental Bureau, Vivagora was also involved in the European discussions about the definition of nanomaterials.

My objective at this point is not to be exhaustive and present in detail all the projects that Vivagora was conducting. Rather, it is to point to the

evolution of the activities of the organization, and its shift from its initial position of public debate organizer to that of an actor engaged in the making of both the "problems" and the "publics" of nanotechnology. This was the explicit objective of many of Vivagora's projects. The "Open Innovation" project was conducted in partnership with a cosmetics company that agreed to enter a process of "collaborative design" for one of its products. "Coexnano" was a "pluralist expertise" process, funded by the French ministry of the environment, during which Vivagora brought together representatives of environmental movements in order to interview industrialists in the construction sector about the use of nanosilver and nano titanium dioxide in paints and coatings.

In all these activities, the organization was actively engaged in the problematization of nanotechnology. It sought to make it a public issue, on which social movements could have a say, and which could lead to a transformation of the innovation processes (both at the policy and technical levels). The theoretical and practical difficulties related to this objective were reflected upon by the organization itself. During one of the 2009 general assemblies, the president of the organization, historian and philosopher of science Bernadette Bensaude-Vincent, explained, "This is a globalizing process. Everything is included: social sciences as well, as they are asked to monitor the changes and the evolutions, and tailored to the overall objectives of development and growth. Everyone becomes a stakeholder, everyone is included. There is no exteriority any more. Even for ourselves as citizens. Then the question is how can we adopt the position of the critique? I think we don't have many choices. We have to act from within, and experiment with new methods."

Affirming the "no exteriority" motto shifted the form of mobilization from the organization of public debates to participation in the construction of nanotechnology. Such a choice—opposed to that of PMO—had particular importance for Bensaude-Vincent. As a historian and philosopher of science working on nanotechnology, she wrote books and papers on the topic, and was regularly asked to talk publicly about nanotechnology. Her own engagement as president of Vivagora was never unproblematic but intersected in complex ways with her scholarly work. Listening to her, taking notes, and participating in the collective discussion about the impossibility of the exteriority position for Vivagora, I was in the same quandary. This meant that as social scientists, Bensaude-Vincent and I were always caught in the same problem of distance the other members of Vivagora faced when working with industrial or administrative actors. For the organization, "being included" meant that it had multiple links—including

funding ones—with private or public institutions. It forced Vivagora to be constantly involved in negotiations about the nature of its mobilization, while under the continuing threat of being used as an alibi. For the researchers involved, "being included" was both a condition for the empirical work about the organization, and a trial of one's own engagement with nanotechnology.

For the social scientist, the practical problem of inclusion is manifest in situations where he or she is expected to "give voice" to the organization. I was indeed caught in situations in which I could speak for it, and others in which I could not. Invited by Vivagora to participate in the Nanoforum process, I could insist on the critical examination of instruments like nanoparticle labeling, as I thought it was necessary in order to critically account for the development of nanotechnology. In the somewhat informal organizing committee (in which other academics were also present and which did not have the rigid nature of a long-standing administrative body) I could negotiate the specificities of my position as both a member of Vivagora and as an academic, and feel comfortable with the research environment I was a part of. Throughout the various exchanges with the organization, my interventions contributed to the evolution of the Nanoforum, as well as Vivagora, while the various projects of the organization transformed the research I was doing. However, such relative ease to speak with and for the actors did not easily translate to other situations, in which "traditional" forms of representation were expected, as, for instance, when Vivagora was looking for someone to speak in its name during hearings conducted by a French administrative body. My engagement with the organization, provisional and explored through constant negotiations with Vivagora, was never a given. As the organization was experimenting with various types of distance with the public and private actors of nanotechnology, so did I, when accepting or refusing to represent the organization.

Accounting for his own relationships with the French Muscular Dystrophy Organization, which he studied at length with Vololona Rabeharisoa, Michel Callon speaks of the dual "engagement/detachment" strategy of the analyst, who produces social realities with the actors he studies/works with, but nonetheless needs moments of detachment in order to write accounts of the interactions, craft his own repertoire of description, and confront empirical cases with one another (Callon 1999; Rabeharisoa and Callon 2004). The case of Vivagora points to the many adjustments, the multiple negotiations and the microtrials that are part of the day-to-day interactions with the actors, and necessary conditions for the stabilization of a situation

of work and analysis. For articulating attachments and detachments is clearly not easy or straightforward. My own experience with Vivagora demonstrates some of the difficulties it may entail, and that switching from "attached" to "detached" requires permanent adjustments with the actors. As much as the organization needs to constantly question its form of engagement with administrative, industrial, or civil society actors, I had to constantly question the modalities of my own engagement with Vivagora (and, consequently, nanotechnology) when studying and working with the organization.

A Temporary Intervention in the French State Experiment with Nanotechnology

By transforming its mode of social mobilization from the organization of public meetings to an active intervention in the problematization of nanotechnology, Vivagora continued the French experiments with the public management of nanotechnology within the practices of social mobilization. In doing so, it directly contributed to the extension of the state experiment with nanotechnology in France. Take, for instance, the national debate on nanotechnology. At first, Vivagora supported the process. It participated in a contribution written under the aegis of the Nanoforum and released on the CNDP website, which framed the then-upcoming public debate in terms of the exploration of the uncertainties related to nanotechnology. Vivagora then grew more critical, and its director and president eventually wrote a tribune in *Le Monde* claiming that, while CNDP was "legitimate," the participatory device itself was not adapted to large-scale issues such as nanotechnology, and proceeded to blame the government for not questioning enough the very objectives of nanotechnology development.[40] Yet the varieties of Vivagora's position made it very difficult to stabilize a consistent form of intervention. Criticized both by the radical activists (for participating in the development of nanotechnology) and by public officials (e.g., during the public debate, for not supporting the process throughout), Vivagora's experiment with social mobilization on nanotechnology required constant care, and an ability to permanently rephrase the objectives and practices of the organization. This fine-tuning eventually proved difficult to sustain for an organization in constant search of financial resources and allies in both the industrial and the civil society worlds.

Nanotechnology Trials for Social Mobilization

Nanotechnology is a trial for social movements. Environmental movements wishing to push for more stringent regulation of nanotechnology need to make visible the risks of nano substances and products, and, consequently, the substances and products themselves. This means that any mobilization on the environmental or health impact of nanotechnology will necessarily result in the participation in boundary-making for the definition of the nano-ness of substances and products. This implies that these organizations enter the sites (legal arenas, standardization institutions, European regulatory bodies) where the definition of nanotechnology objects are discussed, and adopt a form of mobilization that solidifies a stake on which it can fight for (e.g., "nanosilver is a new substance," or "300 nm is an appropriate upper size limit to define nano-ness").

Such a construction of "publics" and "problems" adopts the form of negotiation among stakeholders about risk issues. It is part of nanotechnology as a technical domain about which regulation is discussed. As seen in the previous chapters, it might conflict with the mobilization of the "broad public" by science policy officials, and, consequently, with the objective of the collective and consensual construction of nanotechnology. In Europe, for instance, the insistence of the European Environmental Bureau for more stringent regulation, and, in parallel, the preferred route of the "scientific understanding of the public" on the part of the European Commission illustrate differences in the vision and practice of the adequate representation of the European public. In the United States NGO actors explicitly disregard the intervention of science museums (see chapter 2) or the small-scale social science experiments meant to demonstrate the interest of real-time technology assessment (see chapter 6). As Jaydee Hanson, in charge of nanotechnology at the International Center for Technology Assessment, said, "They claim they want to listen to the public, but that doesn't make the nano people listen to what we say."[41] For Hanson, the mobilization of ICTA through the petitions it sent to EPA was the only way for civil society to make itself heard, that is, out of the scope of nanotechnology programs' initiatives aimed to the construction of publics.

For all the oppositions among civil society and industrial and administrative actors, the problematization of nanotechnology that these forms of mobilization propose is based on the discussion around the modalities of the definitions of nanotechnology objects. As such, it directly fits within collective discussions that occur at ISO, OECD, EPA, or the European Commission. This does not mean that from their own viewpoints, the

conditions of NGOs' interventions could not be made easier.[42] But it does illustrate that NGOs can play the negotiating game in the definition of "nano-ness," through the defense of stakes by organized stakeholders. Hence, the nanotechnology trial can be passed, through the transformation of nanotechnology into a topic of negotiation under the adversarial format EEB or ICTA are used to.

The examples of mobilization that we encountered in Grenoble do not follow this pattern. Equalizing negotiation with integration in the making of nanotechnology, anti-nanotechnology activists consider that what matters the most is the construction of a distance from which critical inquiry can be performed. Starting from the very same refusal to reduce nanotechnology to a matter of negotiation on well-defined stakes, Vivagora contends that the exteriority position cannot be sustained, and that, consequently, the object of social mobilization is the construction of nanotechnology's problems and publics. In both cases, the position needs to be stabilized through constant adjustments. In both cases, the problematization of nanotechnology is less about negotiating about the nano-ness of substances and products than about considering—pretty much as this book does—nanotechnology as a global program of development gathering objects, futures, concerns, and publics. PMO considers that the global character of nanotechnology requires putting all its components (including participatory mechanisms and stakeholder negotiation processes) at a distance. It criticizes the agencements described throughout the book (be they participatory instruments or risk management methodologies) for the connections they perform between the development of nanotechnology and the engagement of citizens, between science and science policy programs, between science and social science. In turn, PMO hopes to propose a "pure" critique at a distance, which would avoid the complex arrangements nanotechnology is made of, but which requires constant care to be sustained. The agencement on which it relies is never a given, as PMO encounters participatory devices that aim to integrate even the most critical positions. Vivagora, on the other hand, considers that social mobilization has to cope with the impossibility of being exterior to nanotechnology. This requires experiments to produce publics and problems, intervention in the very making of agencements, and, consequently, results in permanent uncertainty about the identity and objectives of the organization. Whereas PMO works hard to distance itself from any form of organized social mobilization, Vivagora hopes to "structure civil society" by circulating information, meeting with representatives of environmental social movements, participating in collective actions in the United States and Europe, and inviting

members of NGOs to speak at events it organizes or to participate in projects it undertakes. The mobilizations of PMO and Vivagora problematize nanotechnology through practices of engagement and modes of collective and individual actions. How to mobilize is then part of what to mobilize on. The spectacular demonstrations and critical inquiry are part and parcel of the critique of the global program of nanotechnology, as much as the various experiments undertaken by Vivagora are components of its mobilization on the "democratization of nanotechnology." Problematizing nanotechnology through social mobilization is at the same time problematizing social mobilization itself. Eventually, the forms of social mobilization encountered in this chapter participate in the making of political actors acting within the French state experiment on nanotechnology. Whether they adopt a Rousseau-ist political philosophy and thereby refuse the very terms of this experiment, or attempt to engage in it by rethinking the role of civil society, the organizations we encounter are part of the institutionalized practices of the French democratic life.

In such a process, the engagement of the actors crosses that of the social scientist. Whether he or she adopts a position at a distance to describe activists or engage with others in the experimentation of agencements, the problematization of nanotechnology and social engagement in it is, by the same token, that of the engagement of the analyst. These two organizations are particularly interesting as both of them, for all their differences, ask similar questions as those of this book: how to describe nanotechnology? How to understand its relationships with the construction of democratic order? How to envision a path toward the democratization of nanotechnology, and technology more generally?

How to learn from the experiences described in this chapter for our own development of the democratic analysis of technology and our form of engagement and critique? This will be examined in the next chapter.