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Amor Mundi:

Politics, Democracy, and TechnoScience

A dissertation submitted in partial satisfaction of the requirements

for the degree of Doctor of Philosophy

in Political Science

by

Beltrán Felipe Undurraga

2016

ABSTRACT OF THE DISSERTATION

Amor Mundi: Politics, Democracy, and TechnoScience

by

Beltrán Felipe Undurraga

Doctor of Philosophy in Political Science

University of California, Los Angeles, 2016

Professor Kirstie M. McClure, Chair

This dissertation interrogates the political significance of science and technology in the contemporary world as well as their challenge to our understanding of democracy. It provides a critical examination and integration of contributions from the fields of political theory—represented here by Hannah Arendt, Jacques Rancière, and theorists of deliberative democracy—and ‘science and technology studies’—particularly the works of Brian Wynne, Bruno Latour, and Michel Callon. At the center of the investigation is the question of *amor mundi*, understood as the sense of care for the world as a place fit for the mutually enforcing appearance of new subjects and objects in the public scene. Acknowledging how the doings of technoscientists increasingly shape and structure our conditions of existence below the radar of conventional politics, and the challenge this poses to democratic ideals of self-determination, it is further argued that science and technology are a complex form of agency that unsettles inherited conceptual categories and blurs traditional demarcations between nature and the human artifice.

From the splitting of the atom afforded by the development of quantum mechanics to the creation of new life forms in the field of synthetic biology, the activities of technoscientists are forms of *acting* into nature and *making* socio-technical hybrids whose proliferation has not been sufficiently addressed and recognized. Furthermore, the agency of technoscience *qua* expertise tends to *frame* the scope of public debate along narrow scientific parameters of control, prediction, and standardization, signaled by the dominance of ‘risk’ discourses in the public sphere. The recent profusion of deliberative forums for engaging lay publics with science is shown to be inadequate for confronting this challenge. In the light of contemporary instances of democratic practice around technoscience—exemplarily represented by the case of AIDS-treatment activism—an alternative form of democratic politics is proposed around the two related concepts of ‘interference’ and ‘composition.’

The dissertation of Beltrán Felipe Undurraga is approved

Joshua F. Dienstag

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2016

This thesis is dedicated to Pilar and Juan, who came to illuminate my world and teach me the things that are truly meaningful, and to my wife Soledad, whose loving support has been the *sine qua non* of an otherwise solitary project.

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BIOGRAPHICAL SKETCH

Beltrán Undurraga is a Sociologist with a BA in Philosophy from the Pontificia Universidad Católica de Chile. After working for two years as a lecturer in his *Alma Mater*, he received a Fulbright Scholarship to pursue graduate studies in Political Science at the University of California, Los Angeles, where he also had the opportunity to work as editorial assistant for the *American Political Science Review*. He is currently Assistant Professor at the Sociology Institute of the Pontificia Universidad Católica de Chile, lecturing and researching at the intersection of social and political theory.

INTRODUCTION

Nobody cares any longer what the world looks like

Hannah Arendt

In a research article published in *Science* (Gibson et al. 2010), a group of scientists led by American biochemist, geneticist, and human genome private entrepreneur Craig Venter reported the first successful “design, synthesis, and assembly” of a synthetic life form in the laboratory (52). The team synthesized a DNA molecule containing an entire computer-edited bacterium genome and introduced it into a recipient cell, creating a bacterial microorganism entirely controlled by the new synthetic chromosome. In a recent TED Talk, Venter explained this rebooting of a cell with a man-made genome to a wider audience with the metaphor of a software that creates its own hardware, a digitized DNA inserted into an existing cell that overtakes the latter’s natural genome, transforming it into a new biological entity.¹

The new synthetic bacteria, *Mycoplasma laboratorium*, satisfied the (scientific) requirements of having ‘expected phenotypic properties’ and being *viable*, that is, ‘capable of continuous self-replication. “It’s a living species now,” Venter announced to readers of *The Guardian*, “part of our planet's inventory of life. ... This is an important step both scientifically and philosophically [which] has certainly changed my views of definitions of life and how life works” (Sample 2010). In an interview for *The Independent*, he ventured the not too far-fetched hypothesis that scientists will soon be able to use 3D printers to create synthetic life, and also

¹ https://www.ted.com/talks/craig_venter_unveils_synthetic_life (accessed May 25, 2016)

entertained the possibility of employing alien genomes beamed back to Earth from NASA's Curiosity rover (Vincent 2013).

The High-Level Expert Group for the European Commission defines the emerging field of synthetic biology as “the engineering of biology: the synthesis of complex, biologically based (or inspired) systems, which display functions that do not exist in nature. This engineering perspective may be applied at all levels of the hierarchy of biological structures—from individual molecules to whole cells, tissues and organisms. In essence, synthetic biology will enable the design of ‘biological systems’ in a rational and systematic way” (NEST High-Level Expert Group 2005, 5).² The feat announced in *Science* is the first major achievement in a wider project aimed at deconstructing microorganisms to find the ‘minimal’ amount of genes that a living cell requires. The goal is to develop a ‘minimal cell,’ simple and predictable, that may serve as a ‘chassis’ or ‘platform’ organism on top of which biological systems can be designed that are capable of performing certain (desirable) functions, such as producing hydro-fuels or removing carbon dioxide from the atmosphere (Stemerding and Rerimassie 2013, 4). The J. Craig

² There is some controversy over whether or not synthetic biology represents a new ‘game changer’ discipline with a whole new range of legal, social, economic, and ethical consequences, or simply a new phase in the development of biotechnology, in incremental continuity with cloning and genetic modification (Stemerding and Rerimassie, 2013).

Venter Institute is only one of the three groups currently forging this new field (Torgersen et al. 2011).³

This stage of biotechnology had been anticipated decades ago by Polish geneticist Waclaw Szybalski, who foresaw the transition from description to engineering evinced in this undertaking. In an oral remark made at a conference on “Strategies for the Control of Gene Expression,” held in Israel in 1973, Szybalski observed that “up to now we are working on the *descriptive* phase of molecular biology.... But the real challenge will start when we enter the *synthetic* phase of research in our field. We will then devise new control elements and add these new modules to the existing genomes or build up wholly new genomes. This would be a field with unlimited expansion potential and hardly any limitations to building ‘new better control circuits’... or finally other organisms, like a ‘new better mouse’ instead of a better mouse trap. I am not concerned that we will run out of exciting and novel ideas... ” (Kohn and Shatkay 1974, 405). Scientists are today bringing to fruition the new synthetic phase predicted by Szybalski, moving beyond the mere description of biology to its (re)designing, that is, from the observation of cells to their use as laboratories for technological innovation.

These endeavors have so far been confined to laboratories, but many of their expected applications are meant to involve the release of synthetic organisms into the environment. Being

³ Civil engineer Drew Enry and his Biobricks Foundation/iGEM community at MIT are embarked on a different ‘take’ on the field. Bringing in design and engineering principles of standardization and modularization, Enry’s group’s goal is to develop standardized interchangeable biological parts or ‘BioBricks,’ lego-like fashion, with which to build biological systems or organisms capable of performing ‘desirable functions.’ Enry’s group is also behind iGEM, the “international Genetically Engineered Machines Competition,” involving dozens of participants in a contest for the ‘best’ human-engineered biological system. A third contributor is the group of Jay Keasling at Berkeley. Supported by the Bill and Melinda Gates foundation, Keasling’s work is devoted to ‘metabolic pathway engineering’, which is about converting microorganisms into living chemical factories capable of producing useful substances (such as ‘teaching’ a yeast to produce artemisinin, a substance used in malaria drugs).

a strongly market-driven enterprise with very high commercial stakes, such release is more or less imminent. Indeed, synthetic biology is meant to contribute to ‘smart’ and ‘sustainable’ economic growth. Stressing its significance for innovation, the NEST High-Level Expert Group Report notes that the field “will create highly generic capabilities for the use of bio-inspired tools and processes and thus may be able to realize many of the promises that traditional biotech is still struggling to fulfill in such important areas as biomedicine, synthesis of biopharmaceuticals, sustainable chemical industry, environment and energy, and production of smart materials and biomaterials” (quoted in Stemerding and Rerimassie 2013, 6). On the ‘negative’ side are familiar questions about ‘risk.’ Some relate to ‘biosafety’ and the potential unintended consequences that such interventions can have on nature. This is complicated by the fact that the existing regulatory apparatuses that estimate the potential risks of genetically modified organisms by comparing them to their natural counterparts (organic vs. GM tomatoes) are inadequate for assessing the risks of synthetic organisms which have no such counterpart in nature. Other potential consequences have to do with ‘biosecurity’ and the potential misuse of synthetic biology by terrorist groups, ‘rogue states,’ and state-sponsored bioweapons programs.

Lingering behind the deed and its possible reverberations is a larger question about humans’ relation to nature and the boundaries between the human and natural worlds. As the EC definition acknowledges, scientists are engineering and creating entities and functions *that do not exist in nature*. Although nature, as the theory of evolution teaches us, has been ‘creating’ new organisms by ‘manipulating’ genetic codes since the dawn of organic life on this planet, the selection of those biological traits that enhance the reproductive success of a species among the random mutations that arise in the genome of individual organisms is a ‘natural selection,’ not to

be confused with an ‘artificial’ one. To that extent, synthetic biology is a wholly new affair, a veritable ‘game changer.’ Thus, a Report from the OECD and The Royal Society could candidly state that this branch of technoscience “frees the design of biological systems from the process of natural evolution,” adding “a new layer to the power of nature: giving humans the ability to design and redesign the biological systems of which they themselves are part” (OECD and The Royal Society 2010, 8). These interventions, then, are harnessing nature with new (non-natural) powers.

Venter’s feat, controversial or not, is for all purposes a *fait accompli*. *Mycoplasma laboratorium*, an achievement that promises to launch a new program of interventions into nature potentially affecting everybody on the planet, was the result of a private initiative that occupied twenty scientists for about ten years at an estimated cost of forty million dollars. It was Venter and his team, and nobody else, who decided to create artificial life that could never have existed ‘naturally,’ with repercussions that are likely to transform our conditions of existence. Notwithstanding its potentially beneficial uses in medicine and elsewhere, the creation of a bacterial cell controlled by a chemically synthesized genome is bound to change not only Venter’s own “views of definitions of life and how life works” but also those of a ‘general public’ which has hitherto been confined to the role of mere spectator of this veritable technoscientific feat. Will *Mycoplasma laboratorium* ever become a *public issue*?

The Problem

Technoscientific deeds raise urgent political questions about the projects and basic commitments of our societies: What choices are we making and why? Will these choices ever surface as

matters for debate? Should the scientific use of cells as laboratories for technological manipulation be a public affair? What about the voices of those likely to be affected by technoscientific ‘innovation’? Can they even name the issues at stake, let alone discuss them? Why is technoscience politically significant? What is democratic politics in relation to science and technology?

This dissertation seeks to theorize the political meaning of technoscience and contemporary forms of democratic participation activated around it. Science and technology, I claim, represent an important yet mostly overlooked challenge to political theory. My aim is to reconstruct the nature of this challenge in order to suggest what democratic participation might mean and entail *beyond*—not necessarily *against*—the dominant paradigm of deliberative democracy.

Two features define the outlook of this dissertation. On the one hand, I complement the insights of political theorists (Hannah Arendt, Jacques Rancière, and Jürgen Habermas) with work in the fields of ‘Science and Technology Studies’ (STS) and ‘Actor-Network Theory’ (ANT), represented here mainly by Brian Wynne, Bruno Latour, and Michel Callon. On the other hand, I try to historicize or locate in time and place my own arguments as well as those of the authors I draw on. The latter finds expression in the attention I give to the current status and achievements of technoscience and to the contemporary proliferation of different forms of ‘democratic’ participation around science and technology. I complement this approach with examples taken from empirical cases that illustrate the political uptake of technoscientific deeds and the different forms of democratic engagement discernible in this area. On this basis, the dissertation articulates an account of the political significance of technoscience and the

democratic meaning of certain contemporary forms of ‘participation’. Towards the end, I propose the concepts of ‘interference’ and ‘composition,’ whose articulation takes us a long way into the form of democratic politics that our current situation demands.

Amor Mundi

The political challenge of science and technology that I wish to explore was first formulated by Hannah Arendt in *The Human Condition*, a book written against the uncertain background of the ‘modern world’ brought about by the splitting of the atom. Scientists, she observed in 1958,

have enlarged the realm of human affairs to the point of extinguishing the time-honored protective dividing line between nature and the human world. In view of such achievements, performed for centuries in the unseen quiet of the laboratories, it seems only proper that their deeds should eventually have turned out... to be of greater political significance than the administrative and diplomatic doings of most so-called statesmen. It certainly is not without irony that those whom public opinion has persistently held to be the least practical and the least political members of society should have turned out to be the only ones left who know how to act in concert (Arendt 1998, 323-4).

The technological demonstration of quantum mechanics in Hiroshima and Nagasaki, the launch of *Sputnik* in 1957, and the first attempts to create life in the test tube, were the three major events informing the context of Arendt’s reflections in *The Human Condition*.⁴ They all evinced a wish to escape the ‘human condition,’ “a rebellion against human existence as it has been given” and the desire to exchange it “for something [man] has made himself” (Arendt 1998, 2). In acknowledging that scientists were doing politically relevant things (redrawing the boundaries

⁴ Strictly speaking, biotechnology did not yet exist at the time Arendt pondered these questions. Unlike the spitting of the atom and the first artificial satellite, the manufacture of life was something being attempted, not yet an accomplished feat. The event Arendt foresaw, as we have seen, came to pass with the design, synthesis and assembly of *Mycoplasma laboratorium* in 2010.

“between nature and the human world”) outside of politics as conventionally understood (“in the unseen quiet of the laboratories”), Arendt was pointing to a defining feature of our age. She was adamant that the orientation assumed by modern technoscience was “a political question of the first order [that] cannot be decided by scientific means” (2-3).

A few decades later, the challenge was formulated in similar terms as the transformations induced by the intermingling of science and technology had become more real, uncertain, and fateful. In the late 1970s, to give one prominent example, Langdon Winner asserted that “technology is itself political” because “modern technics, much more than politics as conventionally understood, now legislates the conditions of human existence” (Winner 1977, 323-4). Similarly, reputed German sociologist Ulrich Beck considered technoscience to be an exemplary form of those activities and decisions that “structure and change people’s living conditions” below the radar of institutional politics, a phenomenon he labeled ‘sub-politics’: “The outlines of an alternative society are no longer seen in the debates of parliament or the decisions of the executive, but rather in the application of microelectronics, reactor technology and human genetics” (Beck [1985] 1992, 185-6). More pointedly, “research laboratories and plant managements in the future-oriented industries have become ‘revolutionary cells’ under the cloak of normality” (223). These two prominent observers of the technical dimension of modernity considered science and technology to be forms of political agency operating outside of politics’ ‘traditional’ sites and corresponding modes of legitimation; ways of doing politics *otherwise* and *elsewhere*.

This state of affairs represents a major challenge for any political theory resting on an implicit or explicit invocation of the ‘all-affected principle’: *what touches all must be approved*

by all.⁵ The displacement of the ‘structuring of human conditions’ away from the official procedures and forms of legitimation in the political system undermines long-established ideals of public autonomy, collective self-determination, self-legislation, or popular sovereignty. Indeed, Winner observed that the orientation of technoscientific developments does not consider the views, doubts, questions, opinions, and aspirations of “autonomous, self-determining individuals in a democratic polity” (Winner 1977, 325). Similarly, when Beck denounced a “policy of the *fait accompli*” (Beck 1992, 207) in which potentially irreversible decisions bypass the political process, his focus was on the wrong inflicted to people’s sense of autonomy. The development of *in vitro* fertilization and embryo transplantation, for example, was nothing less than “a revolution of the lay public’s social living conditions without its consent” (206).

It is important to note that these diagnoses are not about the ‘scientization of politics’, in the sense of a colonization of political decision-making by technical standards (Habermas 1971) or the increasing reliance on scientific expert advice for the functioning and legitimation of the political system (Jasanoff 1990). Something different is at stake, namely, a peculiar ‘politicization of science.’ By this I do not mean the conventional interference of ‘political’ interests and agendas in the affairs of scientists (like the Bush administration’s restrictions on stem-cell research in the 2000s), but the becoming political of an ostensibly non-political realm of human activity. In using terms like ‘legislation’ and ‘revolution,’ Winner and Beck call attention to the emergence and consolidation of world-transforming activities whose scope and impact rival those of the classical political process. Thus, many bills passed in congress, court

⁵ The “All-Affected” principle has its origins in Roman private law under the motto *Quod omnes tangit debet ab omnibus approbari*. Current debates link the principle to the problem of establishing the boundaries of “the people,” usually in debates over cosmopolitanism. For a good overview of this literature, see Näsström (2010).

rulings, and governmental decisions pale in importance by comparison to the ‘deeds’ of nuclear scientists, nanotechnologists, or molecular biologists.

The Political Significance of Science and Technology

Apart from the convergence between Arendt and Winner and Beck on the challenge posed by technoscience, there is a subtle but crucial difference between their approaches. Whereas Winner and Beck do not hesitate to assert that science and technology are ‘political,’ Arendt never claimed that much—even though the human condition as we know it was at stake in such endeavors. Throughout her works, she was always careful not to attach the term ‘political,’ which she used rather promiscuously, to technoscientific agency.⁶ What she *did* say, in the passage above and elsewhere, is that the deeds of scientists were ‘of great political significance.’

What could be the difference between calling something ‘political’ and saying it has ‘political significance’? Is there something at stake in this nuance? One of the aims of this investigation is to show that there is. My argument will be that the agency of technoscience is politically significant, and not necessarily political in and of itself, because it is a form of action that does not need a public space of appearance in order to do the things it does. Technoscientific affairs can have political significance without being political. Political action, on the other hand,

⁶ In *The Human Condition* alone, she uses the term as an adjective to qualify more than fifty nouns, and none of these uses appear in passages concerning science or technology (except of course for those pointing to their ‘political significance’), a gesture that places politics at a remove from the object referred to with that expression. The ‘political’ things Arendt names are: animal, philosophy, question, matters, being, judgment, life, people, body, activity, thought, experience, way of life, organization, meaning, realm, action, rule, community, scene, authority, phenomenon, force, virtue, consciousness, sphere, recognition, ideal, purpose, task, principle, device, sense, responsibility, rights, action (63, 77, 156, 188, 190, 301), criterion, insight, sphere of life, emancipation, man, forms of domination, forms of being together, bankruptcy, history, art, language, existence, temptation, genius, validity, legitimation, function, speaking, equality, power, institutions, parties, aspiration, labor movement, élan, productivity, instinct, battle, role, standard, system, condition, strife, origin, and freedom.

consists in carving up spaces of appearance where the deeds and artifacts of science and technology can become objects of contestation, as well as occasions for the emergence of new political actors concerned with their public articulation and demonstration.

In claiming that modern science and technology involve the human capacity for action I follow Arendt's own strangely overlooked remarks about the activities of scientists. "The world we have come to live in," she believed, is "mostly determined by man acting into nature, creating natural processes and directing them into the human artifice and the realm of human affairs. ... [We] have taken nature into the human world as such and obliterated the defensive boundaries between natural elements and the human artifice by which all previous civilizations were hedged in" (Arendt 2006a, 59-60). These are stern, far-reaching observations that try to make sense of an epochal change that brings with it a redefinition of the human condition, and therefore of politics itself.

In her narrative, the meaning of political action and speech discovered by the ancient Greeks lacked the 'processual' aspect indicated in the last quotation. The disclosing and revelatory capacities of political action in relation to the common world and the actors gathered around it (Arendt 1998, 177-8) was a fragile accomplishment whose singularity could be swallowed by the motion and momentum of processes. The public realm of the *polis* was founded precisely as a solution to the frailty and futility of political action and speech (192-9). In contradistinction to Greek experience, with science the modern world discovered a new, processual aspect to action, but no public realm existed to make sense of it and of the blurring of traditional boundaries between nature and the human world it involved. As I will argue in Chapter 1, Arendt might have refused to call 'political' the action of scientists because it lacks

the revelatory aspect of political action associated with a plurality of agents talking to each other about common worldly things in a public realm. Whereas political publicity is not a condition *sine qua non* for the agency of technoscience, political activities are unthinkable without the publicness and commonality of things. In this respect, I will argue, the challenge of science and technology has to do with the difficulty of making them public, with the dearth of public spaces for naming and discussing the consequences of technoscientific activities beyond the narrow perspective of (scientifically defined) *risks*.

The perspective on the politics of science and technology I articulate in this dissertation takes the concerns about the erosion of individual and collective autonomy mourned by authors like Winner and Beck as derivative of a more profound perplexity. In trying to convey a sense of ‘care for the world’ as the primary issue at stake in political life *and* political reflection, my approach is broadly Arendtian. Of special importance here are the predicaments and perplexities of action into nature, the conflation of action and fabrication, and the impact these have on the human world. Arendt’s *amor mundi*, her concern for the world’s objectivity—at stake in the relationship between what she regards as the objective ‘in-between’ of the human artifice and the subjective ‘in-between’ of the public realm (Arendt 1998, 182-3)—is a fundamental element nurturing my approach.⁷ Importantly, in this relationship the human capacity for speech is absolutely essential. I show that from the viewpoint of the perspectival disclosure of the world favored by Arendt (57), things and deeds cannot attain political reality without plural speech in a public realm, which is why in chapter 1 I set out to examine the status of speech in Arendt’s account of modern science.

⁷ Hannah Arendt considered calling her magnum opus *Amor Mundi: Love of the World*. Instead, she settled upon *The Human Condition*. In German it was published as *Vita Activa*.

Between Political Theory and Sociological Studies of Science

Despite its role in shaping the conditions of contemporary life, technoscience has not been a prominent issue in our field. Political theorists have not paid sufficient attention to ‘the politics of science and technology’ and its theoretical implications.⁸ A symptom of this disregard is the fact that the most important political theorist of technoscience, Hannah Arendt, has seldom been acknowledged for her contributions in this area.

Unwillingly or not, political theorists have adhered to the so-called ‘social contract for science’ that granted post-war scientific endeavors autonomy from political pressure and questioning. In this regard, the field has not acknowledged current transformations in science-society relations that have rendered that ‘contract’ and the model of ‘pure’ science ‘speaking truth to power’ increasingly untenable, both descriptively and normatively. As documented in many social scientific narratives, contemporary societies have undergone profound changes in the relationships between ‘science’ and ‘society.’ The modernist view of science as an autonomous realm—divorced from ‘social’ pressures in its objective pursuit of truths about nature, value-neutral, free from politics, and yet capable of delivering technological benefits to society and ‘speaking truth to power’—has begun to be replaced by an understanding that eschews rigid demarcations, and emphasizes instead the ‘co-production’ and ‘hybridization’ of

⁸ Some noticeable exceptions notwithstanding, the topic has been a rather marginal one for contemporary scholars. Here it is useful to distinguish between those political theorists who have made of technoscience the central concern of their work, and those who have engaged it at particular junctures within broader projects. I will engage some of them in due course. The former include Langdon Winner and his study of ‘autonomous technology’ and the politics of technological artifacts (1977, 1986), Mark Brown’s work on science, representation, and expertise (2000, 2009, 2015), and Frank Fischer on deliberation in science and environmental policy (1990, 2000, 2009). The other group includes Stephen Turner (2001, 2003), James Bohman (1996, 1999, 2000), John Dryzek (1990, 2000), Lisa Disch (2010), and Jane Bennett (2005, 2010a, 2010b).

nature and society, science and politics (Jasanoff 2003). Thus, the blurring of those ‘protective dividing lines’ which Arendt foresaw has become the default conceptual ambient in the contemporary theoretical discourse of a certain variety of social science. But the implications go beyond this convergence. Any theorization of democratic politics in relation to technoscience, I contend, ought to address this new context. Otherwise, it is bound to remain trapped in the concepts and assumptions of a discredited conception of science which has traditionally been impervious—if not hostile—to political and democratic interference.

Our political theorizations should also rest on a firm understanding of what science and technology actually *do*. As the expression *technoscience* is meant to convey, scientific knowledge is today indissociable from its material and active demonstrations. The politically significant thing about quantum physics, to take one example, is not the mathematical equation between matter and energy, but the *actual* transformation of matter into energy, including everything involved in it: the bomb, the concerted actions involved, the artifacts that allowed scientists to reach the subatomic realm and split an atom, the unleashing of cosmic processes on the surface of the planet, and the myriad ways in which these developments continue to affect human affairs, from international politics to domestic issue like nuclear waste disposal.

In order to examine technoscience as a complex form of agency that shapes nature, world, and society, and to understand how science and technology *do* these things, I complement my examination of Arendt’s work with a turn to the fields of ‘Science and Technology Studies’ (STS) and ‘Actor-Network Theory’ (ANT), where some of the most original, sophisticated, and empirically informed accounts of our current technoscientific situation can be found. These scholarly works amount to an overturning of extant notions of agency and ‘the

social' that can enrich an Arendtian perspective, and which political theorists in general would do well to acknowledge.

Conversely, the marginal role human speech plays in these accounts can be problematized and brought to the fore by resuming Arendt's reflections on speech and the public realm in the context of more recent experiences. The contemporary upsurge of deliberative forums for engaging publics in technoscientific controversies in Europe, the US, and elsewhere, could be taken as evidence that Arendt's anxieties about scientists' retreat from ordinary language and common sense turned out to be partially unfounded. Many scientist and technicians are spending more time than they would wish to talking to ordinary citizens about the things they do and listening to their concerns. I opt for a more critical engagement with this 'participatory turn,' starting with a careful examination of public speech, its political significance, and its status vis-a-vis science and technology. The agency of technoscience, I argue, not only involves acting into nature and making technical artifacts, but also a specific intervention in the givens of public life, in particular the 'framings,' as I will call them, that structure deliberative arenas. Scientific propositional claims, we will see, have to be distinguished from the account that is made of them in public spaces. In relation to this last point, I shall draw on Jacques Rancière and STS scholar Brian Wynne to articulate an account of science *qua* expertise and its relation to speech in public realms.

Which Democracy?

Only after the question of the 'political significance' of technoscience as acting, making, and framing has been expounded can the question about democracy be formulated and addressed.

Technoscience may not be political, but it can be (and has been) the occasion for political *and* democratic forms of agency. And there are many candidates out there claiming this title. As suggested above, deliberative democracy is the most ubiquitous, both in theory and in practice. But if democratic participation in relation to science and technology is to mean something, it has to confront technoscience in the three dimensions of agency I distinguish: acting, making, and speech-framing. Deliberative democratic theorists, we shall see, have not been particularly interested in the doings of technoscience. In particular, the framing of speech in the public realm tends to be taken as a *condition* for deliberation, not one of its *objects*. The practical, real-world instances of deliberation spreading throughout the world are perhaps more promising. They surely are more informative. Here we will encounter a related but different problem, in which the self-conscious confrontation with technoscientific framing results not in its elimination, but its displacement. When the ‘thing’ to be made is a ‘public opinion,’ something I will refer to with the concept of ‘elicitation,’ it is the experts in deliberation—*qua* makers of public speech—that end up imposing their own framings.

In contradistinction to ‘deliberation’ and ‘elicitation,’ my view about the meaning of democratic politics in relation to science and technology will coalesce, firstly, around the concept of *egalitarian interference*. Returning to Rancière’s thought in the light of my previous examination of public speech, I shall put forward an original theorization of democratic politics capable of addressing the challenge of science and technology once formulated by Arendt. In particular, I will argue that effective contestation of technoscientific expertise over what counts as public speech is the *sine qua non* for further interference with its deeds and artifacts. Such democratic action might very well help to countenance the expropriation of popular sovereignty

denounced by Winner and Beck, but more importantly it could signal a turn *to the world and how it looks*, an Arendtian trope that runs across this investigation.

Other proposals for reviving democracy in the context of science and technology have recently emerged in other quarters. Of particular interest for political theorists is the concept of ‘composition’ at stake in the accounts of ‘dialogic democracy’ and ‘cosmopolitics’ advanced by Michel Callon and Bruno Latour. In their later political writings the founders of ANT build on their redefinition of social theory touched upon before to move away from the deliberative paradigm. The concepts of interference and composition, and their complex relationships, constitute the alternative theorization of democratic politics I am proposing beyond dominant deliberative understandings. In examining these accounts I wish to articulate an encounter between political theory and ANT capable of integrating insights from both fields, identifying points of convergence and divergence, of mutual clarification as well as disagreement.⁹

Outline

This introduction is followed by three parts and a conclusion. The first three chapters comprising Part I (‘What Sciences Do’) introduce the parameters of my approach to the political significance of science and technology through a critical engagement with political theorists and authors in the fields of ‘Science and Technology Studies’ and ‘Actor-Network Theory.’ As intimated before, I distinguish between three forms of technoscientific agency: making, acting, and framing.

⁹ There are some antecedents. The two main appropriations of ANT in political theory are Jane Bennett’s work on ‘vital materialism’ and the ‘political ecology of things’ (Bennet 2005; 2010a; 2010b) and Lisa Disch’s reformulation of conventional notions of political representation (Disch 2010). Although important, an examination of these works is beyond the scope of this dissertation.

In the context of recent feats in the field of synthetic biology that illustrate the kind of activity being undertaken in contemporary technoscience, chapter 1 ('Acting') revisits Hannah Arendt's largely overlooked reflections on science and technology to make sense of her observation that scientists are "the only ones left who know how to act in concert." Technoscience can be understood as a specifically modern form of 'acting' *and* 'making' that blurs the boundaries between nature and the human world. Arendt's approach to science and technology provides the basic conceptual structure of my argument, and suggests the importance of these for a reconsideration of the architecture of *The Human Condition* and its distinctions between labor, work, and action, and between nature and artifice. From Arendt I obtain a perspective on the political meaning of technoscience that highlights its double relation to nature and the world of man-made things (action and fabrication), on the one hand, and to the 'realm of human affairs' (speech), on the other.

Chapter 2 ('Making') extends and problematizes Arendt's perspective on technoscience through an engagement with the fields of Science and Technology Studies (STS) and Actor-Network Theory (ANT). I examine the shift in the view of science and technology from a social construction to a world-building activity that reconfigures the social. Whereas the exposé of science as a mundane and social activity, whose functioning rests on deleting the contingency of its own accomplishments, can be relevant for authorizing, as it were, political questioning, my focus is on the account of technoscience as a form of agency that builds worlds, transforms nature, and reshapes society. I take the main insights of ANT as a further and empirically richer take on Arendt's suggestion that scientists are the only ones left who know how to act in concert. This shall allow us to augment her views about the intricate relationship between 'acting' and

making. The challenge here is to assess Bruno Latour's Clausewitzian assertion that 'science is politics pursued by other means.' ANT's attention to these 'other means' has caused a revolution in social theory with challenging implication for political theory.

Chapter 3 ('Framing') begins by resuming Arendt's reflections in light of the contemporary proliferation of 'deliberative forums' for public engagement with science and technology. On the face of it, this calls for a reconsideration of Arendt's suggestion that the basic truths of modern science cannot be communicated in the ordinary language of the public realm. Drawing on the work of STS scholar Brian Wynne on the cultural authority of science in the definition of public meanings (illustrated with his famous example of sheep-farming in Northern Cumbria), and on Jacques Rancière's theorization of disagreement as a quarrel over the givens—objects and subjects—of speech situations, I argue that the contemporary situation is not defined by the inaccessibility of technoscientific knowledge or the absence of public debate around it, but rather by the tendency of technoscience *qua* 'expertise' to frame speech situations along narrow scientific parameters that predefine the meaning of the objects at stake and the interlocutors legitimately entitled to make arguments about them. I conclude that a contestation of the aims and assumptions of technoscience (as a form of *making* and *acting* into nature and the human world) requires the setting up of disputes over the third dimension of technoscientific agency: the *framing* of speech situations. This will set the stage for introducing the questions about democracy I address in Parts II and III.

In the second part of the dissertation—'The Doubling of Expertise'—I critically examine the theory of 'deliberation' (chapter 4), and its empirical deployment *qua* 'elicitation' (chapter 5) as the two contemporary dominant forms of democratic conceptualization and practice. Chapter

4 deals with deliberative democratic *theory*. I show that most procedural and epistemic approaches display a bias towards moral issues, and consequently neglect the problem of *technical*, as opposed to moral or political, expertise, while those that do address it do so at the propositional level, missing the political question of framing. The most prominent exception to this trend is the work of Jürgen Habermas, whose version of the deliberative paradigm comes closest to acknowledges the problem of expertise as I formulate it. Here I also probe the notion of ‘discursive challenge’ or ‘contestation’ that Mark Warren, James Bohman, and John Dryzek have formulated in relation to the question of expertise and deliberation, arguing that discursive challenge is not itself deliberative, but rather corresponds to the sort of democratic interference with deliberation I articulate in Chapter 6.

The fifth chapter (‘Elicitation’) turns around deliberative practice, examining the so-called ‘participatory turn’ in the governance of science and technology. Extant forms of deliberative democracy around technoscience double expertise through the fabrication of speech situations. ‘Elicitation’ is the form of deliberation that has to be ‘designed’ and ‘organized’ in ways that ‘make’ (Arendt) or ‘construct’ (STS) the topics at stake as well as the publics whose opinions are elicited. As an exemplary instance of the shortcomings of this implementation of democracy I examine the *GM Nation?* public debate conducted in Britain in 2003. Although an essential dimension of the politics of science and technology, deliberative democracy—both in theory *and* in practice—pre-constitutes speech situations and stifles the space of appearance of *new* objects and subjects around technoscientific affairs.

Part III, titled ‘*Amor Mundi*,’ articulates an alternative to the conceptions examined in Part II around two different but complementary ways of understanding democratic politics

around technoscience. Chapter 6 articulates a concept of egalitarian *interference* by incorporating the insights of Arendt and STS through an engagement with Jacques Rancière's theorization of politics and democracy. I present and illustrate my account of interference with the case of AIDS-treatment activism in the US. After arguing that the singularity of this example makes it impossible to subsume it under deliberation or elicitation, I set out to make sense of its specificity through a series of encounters between Rancière and Arendt, Habermas, and Wynne. I then present the idea of egalitarian 'interference' around the questions of appearance, subjectification, and dissensus. My aim is to problematize and augment Rancière's political thought in the context of science and technology. Importantly, I confront the difficulties of adopting Rancière's theorization of democratic politics when inequalities hinge on the possession of expert knowledge.

Chapter 7 ('Composition') examines the political proposals that the main STS-ANT scholars have elaborated to move beyond the deliberative turn. In particular, I examine Bruno Latour's 'cosmopolitical' proposal of a 'parliament of things,' and Michel Callon's 'dialogic democracy' of 'hybrid forums.' These theorizations succeed in taking into account the problem of expertise and putting the question of the technoscientific construction of the common world as a main challenge for contemporary democratic politics. Furthermore, they help us remedy a main shortcoming of Rancière's theorization related to the question of 'inscription,' or the power that interference and disruption can have to actually reconfigure the sensible and reveal a different world with new kinds of relationships between beings. In Latour and Callon, then, we shall find a concept of 'composition' that differs markedly from deliberation and elicitation (Part II), and which stands in a complex tension with interference.

In the Conclusion I weave together my main arguments around larger issues concerning democracy and worldliness. After resuming my understanding of the political challenge of science and technology, I turn to the some questions concerning exemplarity and the relationship between the two concepts that constitute the bulk of my contribution: interference and composition. I close with some reflections on the aesthetic dimension of democratic politics *vis à vis* the Arendtian sense of *amor mundi* that nurtures the outlook of this investigation.

PART I

What Sciences Do

1. ACTING

What I propose, therefore, is very simple: it is nothing more than to think what we are doing.

Hannah Arendt, *The Human Condition*

What kind of thing is *Mycoplasma laboratorium*? What kinds of activity have been involved in adding this new self-replicating bacteria to our planet's inventory? What does it look like? Is it part of a common world? What is its meaning, politically speaking?

This chapter revisits Hannah Arendt's political thought from the perspective of her profound reflections on the political significance of science and technology. This critical examination is meant to introduce and frame the overall argument of this dissertation and to modulate Arendt's basic concerns in light of our current historical situation, anticipating some of the connections I shall make with other authors and literatures in subsequent chapters.

In turning to Arendt, I wish to call attention to the pivotal—but largely neglected¹⁰—role that technoscience performs in her thought. I wish to revitalize her historical account of the *vita activa* by attending in particular to the conceptual structure and historical narrative of *The Human Condition* (Arendt 1998).¹¹ Systematically, her observations about science and

¹⁰ The only noticeable exceptions to the neglect of this aspect of Arendt's thought are Cooper (1988), Tijmes's (1992) and most importantly Yaqoob (2014), who discusses the development of Arendt's perspectives on science and technology in their historical context, including her sources and interlocutors in philosophy and science, such as Heidegger, Jaspers, Heisenberg and Whitehead.

¹¹ Arendt's account of science and technology is most fully elaborated in *The Human Condition* ([1958]1998), particularly in the Prologue, section 32 of Chapter V, and Chapter VI. The topic is also important in "The Concept of History" (Arendt 2006a). She revisited many of those ideas in "The Conquest of Space and the Stature of Man", a 1963 essay published in *American Scholar* and later reprinted in *Between Past and Future* (Arendt 2006c).

technology destabilize the main distinctions that lay the groundwork for the structure of the book. Technoscience, I argue, complicates conventional readings of her work by cutting through the otherwise strict distinctions between labor, work, and action, and transgressing the boundaries between ‘nature’ and the ‘human world.’ *Historically*, her narrative about the deeds of scientists sustains Arendt’s periodization of modernity in terms of the otherwise idiosyncratic distinction between ‘the modern age’ (inaugurated with Galileo’s invention of the telescope) and ‘the modern world’ (brought about with the bombs in Hiroshima and Nagasaki). As I will show, the two epochs differ in terms of the meanings assumed by labor, work, action, nature, and world, and the different historical constellations that define their interrelations.

The Craft of Making Distinctions

I begin this chapter through an engagement with Patchen Markell’s (2011) insightful critique of prevailing ‘territorial’ interpretations of *The Human Condition*. Resisting understandings of labor, work, and action as “disjunctive categories into which individual instances of human activity can be sorted, each of which properly belongs to a separate domain, whose boundaries must be secured for the sake of resurrecting and preserving the especially fragile and valuable experience of *action* in particular” (16), Markell directs our attention to *work* and the pivotal role it plays in the ‘architecture’ of the book. His uptake on the shape of Arendt’s categorical distinctions is a welcome revitalization of a landmark in political theory that tends to be approached and/or ‘explained’ on the basis of a reductive understanding of Arendt’s peculiar mode of drawing distinctions. Such conventional readings, most of which belong to the ‘territorial’ approaches criticized by Markell (20-23), may be ‘correct’ in the sense of being

authorized by textual (if selective) evidence. And many of them do shed light on Arendt's thinking, at least for initial approximations. There is, however, more to Arendt's distinctions than meets the eye.

I shall briefly restate Markell's major insights in order to suggest that Arendt's position on science and technology, articulated "from the vantage point of our newest experiences and our most recent fears" (Arendt 1998, 5), serves to problematize and extend his seminal contribution to Arendtian scholarship. Thus, I set out to resume Markell's revision and bring it to new territory, where the connections and disconnections between Arendt's concepts prove to be even more complicated and thought-provoking.

"Work and not action is the most important concept in *The Human Condition*" (Markell 2011, 18). This controversial but fairly accurate affirmation is founded on Markell's subtle observation that the 'architecture' of the book rests not on the familiar *three-part distinction* of labor, work, action,¹² but on *two pairs of distinctions*: labor and work, and work and action. Although there are many ideas to unpack here, I will concentrate on Markell's claim that "work is not to action as labor is to work" (18). The asymmetry rests on the difference between the more territorial demarcation of work from labor, on the one hand, and the 'relational architecture' separating *and* connecting work and action, on the other. The latter, I believe, is the crux of Markell's contribution, but both deserve some attention.

¹² Arendt characterizes these three terms at the outset of *The Human Condition*: "Labor is the activity which corresponds to the biological process of the human body, whose spontaneous growth, metabolism, and eventual decay are bound to the vital necessities produced and fed into the life process by labor. Work is the activity which corresponds to the unnaturalness of human existence [It] provides an 'artificial' world of things, distinctly different from all natural surroundings Action, the only activity that goes on directly between men without the intermediary of things or matter, corresponds to the human condition of plurality, to the fact that men, not Man, live on the earth and inhabit the world" (Arendt, 1998, 7). "To act, in its most general sense, means to take an initiative, to begin ... to set something into motion" (177).

Labor and work, as he correctly notes, have at least one crucial thing in common, namely the processual, chain-like character that the instrumentality of fabrication assumes when nothing can put an end to the chain of means and ends; the end product of fabrication becomes a means for a further end, which then becomes a means for another end, and so on. The main reason behind Arendt's rejection of Kant's well-known solution to this problem, his positing of the human being as an 'end in itself,' points to the privilege she confers upon the 'world' and its standards over subjective or anthropocentric considerations. Arendt's *amor mundi*, which does not play an important role in Markell's account, is in fact of utmost importance for my own arguments in this chapter, and shall be examined later on. But this processual aspect, present in "the labor of our bodies" and lurking behind the instrumental aspect of work, is also characteristic of the irreversibility of action's new beginnings (Arendt 1998, 230-236). Therefore, it cannot be said to connect one pair of concepts more than the other.

The really interesting interdependence is the one between work and action. Markell's preferred metaphor for this relational architecture is not the impenetrable wall that in Ancient times encloses each household, separating it from the public realm of the *polis*, but walls with passages, which, like doors and windows, connect and separate the inside and the outside. His point here, it should be stressed, is not that Arendt ends up undoing the signature distinctions she appears to draw so forcibly in the first chapters of the book, but rather that distinctions draw boundaries that are not just dividing lines, but also points of passage.

According to Markell, this articulation—and the resulting destabilization of any strong territorial demarcation—occurs during Arendt's discussion of works of art in Chapter IV of *The*

Human Condition (Arendt 1998, 167-174), a section which anticipates the language usually thought to belong to Arendt's treatment of action.

Firstly, the section in question introduces what I would characterize as an affinity between work and action. Going against the grain of familiar accounts of Arendt's thought, her understanding of 'work' turns out to exceed the functionality of use objects and the instrumentality involved in fabrication. These are the two defining aspects of work that separate it from 'labor', an activity in which things are immediately consumed after being produced; the relative durability of use objects separates them from the fleeting and meaningless existence of consumption goods. It is worth noticing that it is the *thing* involved that sustains the demarcation, not the difference between labor and work *qua* human modes of activity. Importantly, as I will argue in detail, the standard is the *world*, as opposed to that of *animal laborans* or *homo faber*. As Arendt had pointed out earlier, "The distinction between a bread, whose 'life expectancy' in the world is hardly more than a day, and a table, which may easily survive generations of men, is certainly much more obvious and decisive than the difference between a baker and a carpenter" (1998, 94).

This sheds light on the other, significant aspect of use objects that 'transcends' their instrumentality and usefulness and connects work to action: the fact that they appear and are seen in public. Every object has a shape, a 'look' that can be more or less 'fit' for public appearance; and this is not a prerogative of works of art, as one could assume. The crucial passage Markell has highlighted reads as follows:

To be sure, an ordinary use object is not and should not be intended to be beautiful; yet whatever has a shape at all and is seen cannot help being either beautiful, ugly, or something in-between. Everything that is, must appear, and nothing can appear without a

shape of its own; hence there is in fact no thing that does not in some way transcend its functional use, and its transcendence, its beauty or ugliness, is identical with appearing publicly and being seen. By the same token, namely, in its sheer worldly existence, every thing also transcends the sphere of pure instrumentality once it is completed. The standard by which a thing's excellence is judged is never mere usefulness, as though an ugly table will fulfill the same function as a handsome one, but its adequacy or inadequacy to what it should *look* like.... In other words, even use objects are judged not only according to the subjective needs of men but by the objective standards of the world where they will find their place, to last, to be seen, and to be used (Arendt 1998, 173).

This has several implications, both for our understanding of Arendt's concept of work, and for its affinity with action. On the one hand, appearance in public—always a matter of how things 'look'—is something that every mundane artifact *can* share with the words and deeds of political actors. I emphasize the contingency of this because whereas action is simply unthinkable without a public space of appearance, the things comprising 'the human artifice' retain a tangible existence even when their 'looks' are not at stake. I will later revisit this question about the import of a thing's appearance in the case of science and technology, and argue that politics is partly about caring and attending to the appearance of the human artifice from the worldly, non-subjective perspective alluded to in the passage above.

On the other hand, work is not the sovereign activity it is often taken to be. "[W]here work had originally been cast as a matter of form-giving mastery exercised in isolation, by the end of the chapter *homo faber's* sovereignty has been qualified in at least one crucial respect: his last act, it seems, is to show his work in public—that is, to surrender it, figuratively or literally, to

its users and judges” (Markell 2011, 32).¹³ A care for what things ‘look like’ is present even in the use objects which *homo faber* proudly displays in the marketplace (Arendt 1998, 159-167). In this sense, the first affinity between work and action is precisely this non-sovereign character: in order to transcend the endless chain of means-ends instrumentality, *homo faber* depends on the presence of a public whose judgment he cannot control or predict. In this sense, fabrication is not necessarily anti-political, as simplistic readings of Arendt’s critique of “the substitution of making for acting” would have us believe (Markell 2011, 19).

Secondly, alongside this connection between action and work in general is the ‘service’ works of art (“the most worldly of all things”) provide *for* political action. As Arendt extensively shows in Chapter V, action is a fleeting, intangible performance whose meaning requires certain forms of ‘reification’ if it is to perdure. And reification is the main task of fabrication (Arendt 1998, 139). “The specific content as well as the general meaning of action and speech may take various forms of reification in art works which glorify a deed or an accomplishment and, by transformation and condensation, show some extraordinary event in its full significance” (187). Thus, work plays a pivotal role by establishing a boundary between action and labor, both of which, if left to themselves, leave nothing perdurable behind. Action and speech “share with life its essential futility,” according to Arendt, because

the ‘doing of great deeds and the speaking of great words’ will leave no trace, no product that might endure after the moment of action and the spoken word has passed ... acting and speaking men need the help of *homo faber* in his highest capacity, that is, the help of

¹³ Incidentally, this complicates Arendt’s famous critique of “the traditional substitution of making for acting” in the chapter on action (1998, 220-230). Markell is therefore right in stressing that the latter disfigures work no less than action. “Rather than see the substitution of making for acting as a territorial transgression, we might represent it instead as a kind of *reduction*, a collapse of the relationship of simultaneous difference and interdependence between work and action. On this reading, importantly, the substitution of making for acting would not merely threaten action: it would threaten work, too” (Markell 2011, 34).

the artist, of poets and historiographers, of monument-builders or writers, because without them the only product of their activity, the story they enact and tell, would not survive at all (173).

Furthermore, labor and action also share a processual character, a relentless movement where nothing can shine forth in its uniqueness. The elements or phases of a process are strictly speaking incapable of appearing, and therefore cannot be an object of judgment, because judgment always bears on particulars (Arendt 1992). Works of art rescue human deeds in their particularity from the whirlpool of processes, creating the conditions for remembrance and meaningfulness which separate them from the activities of *animal laborans*.

Thus, we find some of the language and tone Arendt uses in the chapter on action invading, as it were, the chapter on work. A gesture that any consistent territorial reading would have to dismiss as an improper transgression may very well turn out to be the key for grasping Arendt's mode of drawing distinctions, her own way of doing 'work,' as the title of Markell's essay suggests. Her distinctions, however, are not fixed once and for all, like the blueprint that an architect gives to a constructor expecting a faithful execution, but change in meaning and scope as her theoretical work progresses. In Markell's words, "She makes her architecture subordinate to her craft, rather than the other way around; and she thereby lets her own thinking and writing display a measure of the unpredictability and non-sovereignty that she describes most vividly in the chapter of *The Human Condition* on action" (Markell 2011, 36).¹⁴

¹⁴ "One thing we learn from the dynamics of Arendt's book is that it is not just action but also work, including theoretical work, that would be disfigured if it were seen merely as the rote execution of a plan given in advance. Arendt's book is not disfigured in this way because its architecture, unlike the philosophical fantasy of architecture, is not pure in this way. Arendt shows herself to be willing to complicate her own earlier formulations; to let herself be driven to join work *to* action and to articulate their interdependence rather than simply to separate activities from each other, and to dictate when and where they should be carried out" (Markell 2011, 36).

Consequently, we have it that non-sovereignty (a main feature of *action* in standard accounts of *The Human Condition*) is first discussed in the context of Arendt's crucial observations about the fabricating experience of *homo faber* at the very end of the chapter on 'work.' Like deeds and words in the public realm, any product of human fabrication can be judged by its appearance, apart, that is, from the thing's usefulness and functionality. Likewise, appearance, a crucial feature of Arendt's phenomenological account of action, is first thematized with reference to the products of *homo faber*, including (but not restricted to) works of art.

This way of making distinctions could be taken as an indication of theoretical ambiguity or hesitance, an impurity that needs to be cleansed to convey 'what Arendt really meant,' or as a fertile way of theorizing that draws attention to the intertwinement of the different aspects that make up the human condition. The problematization and revitalization of Arendt's thought which I intend to put forward in relation to science and technology demands that we opt for the second perspective. After all, not even architects can control the use that is made of their buildings.

The upshot of Markell's examination, in my view, is that politics and the sphere of fabrication ought not to be regarded as mutually indifferent. In order to elaborate on this question, the next section addresses the doings of technoscience. One of my purposes here is to redress certain shortcomings in Markell's otherwise instructive account. These have to do with the distinction between the 'processual' and 'existential' dimensions to be found within Arendt's concept of action; the paramount role of Arendt's concept of 'world'; and the asymmetry implicit in Markell's examination, whereby the human artifice is said to be at the service of politics, but not the other way around. My argument will be that politics hinges on transforming the mere existence of (technoscientific) things and deeds into things that are held in common and judged

by a plurality of human beings in a public realm. Indeed, when we depart from Markell's focus on artworks and turn our attention to Arendt's reflections about technoscience, as I propose to do here, the relation between work and action becomes even more intricate and perplexing.

The Agency of Technoscience

As we pay attention to the story of science and technology narrated in *The Human Condition*, the conceptual pairs of labor-work and work-action acquire new meaning. According to Arendt, the modern scientific view of the world began with the substitution of work for reason and contemplation as the primary capacity of humans *qua* scientists. The invention of the telescope at the dawn of the modern age, in particular, completely transformed the meaning and practice of science. Although the heliocentric view had already been suggested by Aristarchus and Copernicus, the true revolution came with the Galileo's artifact. "It was not reason but a manmade instrument, the telescope, which actually changed the physical world view; it was not contemplation, observation, and speculation which led to the new knowledge, but the active stepping in of *homo faber*, of making and fabricating" (Arendt 1998, 274). The advent of the experiment further deepened the importance of work as science ceased to be a matter of contemplation and the *discovery* of truths and began instead to *produce* them. The reliance on artifacts and laboratories for the technological production and demonstration of truth-claims blurred the lines between 'knowing' and 'making.'

That the activities of scientists have involved 'work' throughout modernity is hardly a problematic assertion. More intriguing is Arendt's assertion that this aspect of science did not necessarily yield a durable realm of artifacts, as should be expected from *homo faber*—that is,

that modern science has not always proved to be a worldly affair. As science turned from “a search after the *what*” into “an investigation of the *how*” a shift occurred “from interest in things to interest in processes, of which things were soon to become almost accidental by-products” (2006a, 57). The concept of ‘process’ is indeed the kernel of modern science according to Arendt.¹⁵ By focusing on processes scientists turned away, as it were, from the thing-hood of things. Science, Arendt seemed to believe, has shown no particular care for the appearance of the things it nevertheless produces; no *amor mundi* is discernible in its activities.

At the same time, Arendt’s observation about things as “accidental by-products” connects technoscience to labor. Far from being engaged in adding durable things to the world, the technological progress of the modern age was seen by her as empowering the labor process of production and consumption of *animal laborans*. At least since the Industrial Revolution, she believed, technoscience has been a handmaid of the labor process. The ‘things’ it has added to the world are not things, properly speaking, but the mere by-product of the endless cycle of production and consumption: ‘consumer goods’ instead of ‘use objects.’ This connects to Arendt’s concern over ‘automation’ and the possibility of liberating mankind from the burden of labor. “Nothing could be worse” than the prospect of a society of laborers without labor to perform, she thought, for “this society does no longer know of those other higher and more meaningful activities [i.e. action and speech] for the sake of which this freedom [from the fetters

¹⁵ For Arendt’s discussion of process as the object of history and natural science see “The Concept of History: Ancient and Modern” (Arendt 2006a). It should also be noted that Arendt’s account of process, already developed in her earlier work on totalitarianism, is influenced by A. N. Whitehead. “That ‘nature is a process,’ ... that natural science deals only with occurrences, happenings, or events, but not with things and that ‘apart from happenings there is nothing’ (see Whitehead, *The Concept of Nature*, pp. 53, 15, 66), belongs among the axioms of modern natural science in all its branches” (Arendt 1998, 296 n. 61).

of labor] deserves to be won” (5). Although humankind still awaits the ‘advent of automation,’¹⁶ the fact is that science and technology continue today to be mostly devoted to securing and facilitating the life process of society and the human species. One of the promises of synthetic biology, to mention a prominent example, is to design organisms to produce biofuels to make the current global pattern of economic development ecologically viable.

In this sense, technoscience involves labor and work in ways that complicate any strong demarcation between the two. The facilitation of the labor process, from the steam engine to ‘smart houses,’ bears the imprint of *homo faber* and his work. At the same time, the indifference towards the durability and appearance of the human artifice attests to a further affinity between work and labor. Like labor (and action), work need not leave durable traces behind it. In this sense, science and technology complicate Arendt’s tripartite conception of the *vita activa* by introducing two new forms of human activity, or at least two significant variants of their conventional meanings: automated labor and what I would call ‘worldless work.’

The stakes are even higher when we consider the conceptual pair of work-action, particularly in relation to the experiment. Indeed, with the introduction of the experiment we “began to prescribe conditions and to provoke natural processes” instead of merely contemplating “whatever nature was willing to yield in her own appearance” (Arendt 1998, 231). A crucial development took place later on when the experiment began to unleash *cosmic*

¹⁶ In retrospect, one can say that Arendt put too much ‘faith’ in technoscience’s capacity to ease and ultimately automate the labor process: “in a few decades [automation] probably will empty the factories and liberate mankind from its oldest and most natural burden, the burden of laboring and the bondage to necessity” (4). As the 2008 animated movie *WALL-E* shows, a society released from the burden of labor remains until today the stuff of science fiction. In an interesting illustration of earth alienation and worldlessness, the human society depicted in the movie lives in a spaceship outside a depopulated and devastated earth where robots pile up the garbage left behind by humans, waiting for any sign of resumption of organic life on the planet.

processes that are alien to *earthly* nature and would have never come to pass without human intervention:

What then developed into an ever-increasing skill in unchaining elemental processes, which, without the interference of men, would have lain dormant and perhaps never have come to pass, has finally ended in a veritable art of ‘making’ nature, that is, of creating ‘natural’ processes which without men would never exist and which earthly nature by herself seems incapable of accomplishing, although similar or identical processes may be commonplace phenomena in the universe surrounding the earth. (Arendt 1998, 231)

At stake in this notion of ‘making nature’ is the merging of work and action that we find at the center of modern technoscience. But to see why this is the case we need to pay attention to the historical context that informed *The Human Condition*.

By the mid-1950’s, only two of the three landmarks Arendt refers to in the book’s Prologue were *faits accomplis*, actual ‘events’ defining the contours of the future: the splitting of the atom and the launch of Sputnik. The assembly of artificial life had to await another fifty years until Craig Venter and his colleagues started to ‘innovate’ with the software of life. These three events challenge familiar understandings of *The Human Condition* in ways that go beyond Patchen Markell’s problematization of its ‘architecture.’ They all embody a merging of the activities of homo faber as builder of tools and equipments with the human capacity for untimely beginnings, thus throwing traditional conceptual and experiential demarcations into disarray and making it very difficult to decide which one of the “fundamental human activities” is at stake in them. Indeed, the satellite, the bomb, and the new bacteria are not just ‘things,’ nor are they reducible to the instruments and equipments that brought them into existence. They all involve both ‘making’ *and* ‘acting.’

Readers of *The Human Condition* usually emphasize Arendt's concerns about the *eclipse* of action in the modern world. The 'rise of the social' and the triumph of *animal laborans*, so the story goes, had blurred the distinction between the private and public realms, inundating the latter with household concerns over welfare, consumption, and production. What many miss, however, is that for Arendt the vanishing of action *from the realm of human affairs* did not entail the disappearance of the human capacity for acting and making new beginnings; on the contrary, "the capacity for action... is still with us," although it has become "the exclusive prerogative of the scientists" (Arendt 1998, 323). In a society of laborers it is scientists who are acting.

Consequently, the modern world has brought with it a change in the hierarchy of activities within the *vita activa*. In a move which many readers of Arendt would not expect, she claims that today action has assumed prominence with respect to the human condition. We cannot ignore that "for the first time in our history the human capacity for action has begun to dominate all others—the capacity for wonder and thought in contemplation no less than the capacities of *homo faber* and the human *animal laborans*.... It would be adequate for the world we have come to live in to define man as a being capable of action; for this capacity seems to have become the center of all other human capabilities" (2006a, 62-63). If this passage referred to political action, it would belie the bulk of Arendt's thinking.

The action in question, however, is a different—partial or mutilated—kind of action. Here I wish to draw attention to the fact that Arendt's concept of (political) action actually has two "aspects" that need not go together: an *existential* one and a *processual* one.

The existential side corresponds to "the revelatory character of action as well as the ability to produce stories and become historical, which together form the very source from which

meaningfulness springs into and illuminates human existence” (Arendt 1998, 323). I will return to this revelatory or disclosing aspect of action, arguably the most important lesson Arendt drew from Ancient Greek experience. The ‘processual’ aspect of action, “all-important to the modern age” (232), on the other hand, refers to its ‘irreversibility’ and ‘unpredictability.’ Political action acts in a realm composed of a plurality of acting beings who ‘act’ and ‘suffer’ the actions of each other. “The story that an act starts is composed of its consequent deeds and sufferings,” Arendt writes, and “these consequences are boundless, because action ... acts into a medium where every reaction becomes a chain reaction and where every process is the cause of new processes” (190). And it is thanks to this medium, this intangible ‘in-between’ that human action ‘enacts’ or ‘produces’ stories with or without intention (183-4).

Because political action conditioned by ‘natality’ is inserted in a web of human relations that bears the imprint of human ‘plurality,’ it carries with it the two burdens of irreversibility and unpredictability, of “being unable to undo what one has done though one did not, and could not, have known what he was doing,” and “the chaotic uncertainty of the future” brought about by that action (Arendt 1998, 237). And it is on this basis that Arendt refuses to equate freedom and sovereignty, for the latter (understood as “the ideal of uncompromising self-sufficiency and mastery”) “is contradictory to the very condition of human plurality” (234). Human action is free but non-sovereign: by acting we begin something new, we enact a new story, but we are not able to control or even foretell the course of its unfolding, its consequences and overflowings.

When we turn our attention to technoscience, the difference between these two dimensions of action becomes pronounced because the deeds of technoscientists partake of the processual side of action, but lack its existential aspect. What does this mean?

In order to split the atom, scientists had to adopt an ‘Archimedean point’ in the universe from which to observe and unleash processes in earthly nature. In this Arendt detected a “wish to escape the human condition,” as well as a desire for a “future man ... possessed by a rebellion against human existence as it has been given, a free gift from nowhere (secularly speaking), which he wishes to exchange, as it were, for something he has made himself” (Arendt 1998, 2-3). The important distinction in this regard is “the difference between a science which looks upon nature from a universal standpoint and thus acquires complete mastery over her, on the one hand, and a truly ‘universal’ science, on the other, which imports cosmic processes into nature even at the obvious risk of destroying her and, with her, man’s mastership over her” (268). Whereas ‘natural science’ exploited forces which from the standpoint of our planet were *natural* (albeit dormant), the ‘universal science’ of quantum physics channeled cosmic forces into nature. Importantly, this irreversibility and unpredictability separates the process character of action from the monotonous cycle of labor and the means-ends instrumentality of work, where things are more certain and susceptible to human control (however limited).

Understandably, therefore, the irreversibility and unpredictability with which Arendt characterizes action in the realm of human affairs are also predicated of scientific action into nature. Universal science, she warns us, has become a science “of potentially irreversible, irremediable ‘processes of no return.’” It reveals “the human ability to act—to start new unprecedented processes whose outcome remains uncertain and unpredictable whether they are let loose in the human or the natural realm” (Arendt 1998, 231-2). This formulation, however, only captures part of Arendt’s concern. For the question is not whether these ‘processes of no return’ are unleashed in nature *or* the human world. Rather, what is at stake is precisely the

blurring of boundaries between these two realms, a question that further complicates Arendt's demarcations.

Significantly, here we have an inversion of Arendt's well-known arguments about the invasion of the human world by nature, most familiar from her examination of the 'rise of the social.'¹⁷ In light of the continuous devouring and replacement of worldly things that characterizes a 'society of laborers,' she observed that "It is as though we had forced open the distinguishing boundaries which protected the world, the human artifice, from nature, the biological process which goes on in its very midst as well as the natural cyclical processes which surround it, delivering and abandoning to them the always threatened stability of a human world" (1998, 125-126). The doings of technoscientists transgress these boundaries in the other direction: it is the human capacity for action that has invaded nature, triggering an "unnatural growth ... of the natural" (47) that differs from the boundary transgression accompanying the rise of the social because it has been carried out by humans *qua* beginners, not by the triumph of *animal laborans*. The reason why the activities of scientists "have turned out to have greater news value, to be of greater political significance, than the administrative and diplomatic doings of most so-called statesmen" —and here Arendt had nuclear scientists in mind— is that with their actions (in the processual sense I have indicated) they "have *enlarged the realm of human affairs* to the point of extinguishing the time-honored protective dividing line between nature and the human world" (323).

Arendt's arguments about the transgression of the dividing lines between the human world and nature were articulated to make sense of the atomic age, the 'modern world's age' that

¹⁷ As Margaret Canovan (Canovan 1992) has shown, the idea of nature overwhelming and annulling the public realm is also present in Arendt's influential account of totalitarianism in (Arendt 1973).

began when the equations of quantum mechanics were technologically demonstrated. Although nuclear technology is (and will continue to be) a major part of our human condition, the event in synthetic biology—which marks *our* present situation—ought to make us reconsider some of our basic conceptual categories, first of all those we have inherited from Arendt. So, in order to contribute to a critical update of Arendt’s reflections on science, technology, and politics, we ought to draw a distinction between the A-bomb (which Arendt did witness) and *Mycoplasma laboratorium* (which she foresaw but did not live to see).¹⁸

In one respect, nuclear fission and the synthesis of *Mycoplasma laboratorium* are both examples of action, of the beginning of unprecedented processes in nature: the release of energy, in the case of the bomb, and the self-replication of a new living organism, in the case of Venter’s bacteria. Yet nobody actually *knows* if the latter can be described as the *creation* of new (artificial) life or something else and less troubling. The controversy, in point of fact, reaches the experts themselves. Whereas Venter described the bacterium as “the first self-replicating species we’ve had on the planet whose parent is a computer,” others have downplayed the significance of the feat, including CalTech Geneticist David Baltimore, who declared to the *New York Times* that “[Venter] has not created life, only mimicked it,” and Gerald Joyce at the Scripps Research

¹⁸ A distinction should also be made between the launching into the universe of a man-made object and nuclear fission. Although I do not pursue this further, some observations are in place. As a significant episode in the Cold War, the Sputnik—itself a consequence of the arms race unleashed by the A-bomb—was doubtlessly a new beginning with manifold consequences *in the realm of human affairs*, including US reactions to the panic of realizing the actual capacity of the Soviets for a long-range delivery of nuclear bombs, and all the patterns of action and reaction this brought about. To the extent that the launch of the Sputnik was an event that rippled the web of human relations, affecting for instance the ‘arms race’ and the ‘space races,’ stories can be told to make sense of it. And the same obtains for the nuclear bombs deployed in Hiroshima and Nagasaki. Unlike nuclear fission, however, the launch of the satellite did not unchain a processes *in nature*. Nothing new happened in earthly nature, which remained untouched, as it were, when the satellite was put into orbit. However contained, the splitting of the atom, on the other hand, introduced new forces that according to all evidence would never take place, ‘of their own accord’ as it were, in the surface of our planet. Hence, whereas the Sputnik satellite made its impact felt in the realm of human affairs alone, the nuclear bomb was also a new beginning in the domain of earthly nature.

Institute in La Jolla, California, who also denied that a new life form had been created: “Of course that’s not right — its ancestor is a biological life form” (quoted in Wade 2010). The rationale of these skeptics is basically that since the hybrid’s DNA was synthesised from a ‘natural’ or preexisting genetic code, and since the recipient cell was also an organism that exists in nature, it cannot properly be said that Venter and his team were playing God. According to the Catholic Church, at least as officially reported in *L’Osservatore Romano*, Venter had not created life but rather “substituted one of its engines” (quoted in Glatz 2010). At the same time, however, it is clear that the feat is a milestone in the history of science; one that has augmented the inventory of life on our planet with new living entities that nature would never had ‘synthesized’ by herself. In this sense, Venter’s deed could be comparable to the unleashing of cosmic forces in earthly nature enacted with the A bomb. Both have set into motion processes in nature whose consequences are bound to exceed the controls of human sovereignty.

In another respect, the two feats are quite different. The distinction I wish to call attention to might have a bearing on our perplexity regarding the deeds of synthetic biologists, our difficulty to describe and understand what is at stake. Nuclear bombs and Craig Venter’s artificial cells are different in terms of the specific ‘boundary blurring’ involved in each deed. While the splitting of the atom involves a transgression of the limits between *cosmic* and *earthly* nature (the ‘importation’ of universal forces), Venter’s action-fabrication blurs the boundaries between earthly *nature* and the human *artifice*. Thus, we might ask if the beast belongs to nature or the human artifice. And if we retort that *Mycoplasma laboratorium* is part of both realms, what would *that* mean? Do we have standards with which to judge this hybrid, this ‘thing-deed’?

One of the reasons we don't know with certainty what we are doing when we tinker with the software of life, I want to argue, is this radically novel in-distinction between nature and things. Thus, from the perspective of a conventional reading of Arendt, the term 'artificial life' represents a contradiction in terms, much like 'political economy' would have been for the Ancients according to her account (Arendt 1998, 29). Our perplexity, in other words, reflects the fact that the agency of technoscience, as represented in the synthesis of *Mycoplasma laboratorium* (living organism, artifact, and new beginning, all at once) not only compromises the limits between human *activities* (work and action), but also blurs the boundaries between the *realms* of nature and the human artifice which according to Arendt had never before been transgressed. While Markell has called attention to the connections between labor, work, and action, here I am trying to identify a transgression between earthly nature and cosmic nature (nuclear fission), and between earthly nature and the human artifice (synthetic biology). From this perspective, territorial interpretations of the *Human Condition* are much more difficult to undermine because the demarcations in question refer to actual 'realms,' domains, or 'territories.' Perhaps there is something in Arendt's territorial moments that we should preserve. The boundary transgression at stake in synthetic biology has to be taken rather literally: *Mycoplasma laboratorium* has one foot in nature and another in the realm of worldly, artificial objects.

In order to begin making sense of the deeds of technoscience today, I contend, it is important to acknowledge that the blurring of boundaries between nature and artifice, between the natural and the non-natural, will be at the root of our perplexities no less than the lapsing of work and action into labor or the mixing of action and fabrication. In order to know, scientists build worlds *and* act in concert, overflowing the traditional boundaries between what is human

and what is natural. As I intend to show in the next chapter, the twofold hybridization of work and action, and artifice and nature, might very well count among the basic conditions of contemporary life.

One of the two epigraphs Arendt picked for the chapter on ‘action’ in *The Human Condition*, a chapter that is also, as we will see, a chapter on ‘speech,’ is by the Danish author Isak Dinesen: “All sorrows can be borne if you put them into a story or tell a story about them” (Arendt 1998, 175). The existential aspect of action was indeed dear to Arendt. The question I want to address in the next section is about the stories that can be told about the plots enacted by technoscientific agency. Are these events meaningful? Can human speech be meaningful when things like nuclear fission or the re-booting of existing life forms with artificial DNA are at stake? In order to address these questions we need to turn to Arendt’s concerns about the public life and human speech in an era in which technoscientific expertise seems to undermine the political significance of common sense.

Deeds Without Words

What can be said and done about the deeds of technoscience in the public realm? The public realm is a *sine qua non* for whatever stories we might be able to tell about deeds such as Venter’s, and for the disclosure of whatever meaning we can confer to the actions and things involved in the agency of technoscience. The question is also relevant because in the realm of nature we do not enjoy the benefit of the two remedies she identifies to the predicaments of irreversibility and unpredictability: the faculty of forgiving and the faculty to make and keep promises (1998, 236-247). These faculties depend on human plurality and thus are only available

when action unfolds in the realm of human affairs. Insofar as the deeds of scientists are confined to the realm of nature, it makes no sense to speak of forgiving and promising, for here the ‘agents’ of action and reaction extend to natural entities and processes. Modern science and technology, Arendt observes, “have carried irreversibility and human unpredictability into the natural realm, where no remedy can be found to undo what has been done” (238).

The latter perplexity is compounded by the fact that, as I indicated before, the deeds of scientists lack the revelatory and existential aspect of action. *Technoscientific* action, that is, differs markedly from the form of *political* action Arendt associated to the deeds of Homeric heroes in the ancient world, or the revolutionary founding of a body politic in the modern age.

Decisively for my own purposes in this and the next chapter, what sets apart these two sides of action is human *speech* (a conspicuously absent topic in Markell’s treatment of *The Human Condition*). Addressed in Chapter V mainly in reference to the Greek experience, but playing no significant role in her account of the modern age, speech emerges to complicate the triad of labor-work-action in the modern world’s age. The reason is simple: the existential or meaningful aspect of action is unthinkable in the absence of speech. Indeed, action and speech, deed and word, are supposed to go hand in hand: “Speechless action would no longer be action because there would no longer be an actor, and the actor, the doer of deeds, is possible only if he is at the same time the speaker of words. The action he begins is humanly disclosed by the word, and though his deed can be perceived in its brute physical appearance without verbal accompaniment, it becomes relevant only through the spoken word in which he identifies himself as the actor, announcing what he does, has done, and intends to do” (Arendt 1998, 178-9).

Arendt took speechless action to be the new hallmark of technoscientific activities. She made this clear in the Prologue to *The Human Condition*, where she foresaw two “threatening events” connected to technoscience. One was the “advent of automation” touched upon before, and the dreadful prospect of “a society of laborers without labor”(5). The other event, more relevant in our context, was the prospect of knowledge (“in the modern sense of know-how”) being increasingly divorced from thought and speech. To wit, “the sciences today have been forced to adopt a ‘language’ of mathematical symbols which, though it was originally meant only as an abbreviation for spoken statements, now contains statements that in no way can be translated back into speech” (3). Arendt dwelled on this phenomenon as a likely consequence of the ‘crisis’—epitomized by quantum mechanics—which she detected in modern science:

The trouble concerns the fact that the ‘truths’ of the modern scientific world view, though they can be demonstrated in mathematical formulas and proved technologically, will no longer lend themselves to normal expression in speech and thought. The moment these ‘truths’ are spoken of conceptually and coherently, the resulting statements will be “not perhaps as meaningless as a ‘triangular circle,’ but much more so than a ‘winged lion’” (Erwin Schrodinger). We do not yet know whether this situation is final. But it could be that we, who are earth-bound creatures and have begun to act as though we were dwellers of the universe, will forever be unable to understand, that is, to think and speak about the things which nevertheless we are able to do (3).

The prospect of deeds without words, she seemed to suggest, was a political problem of the first order. “[The] situation created by the sciences is of great political significance. Wherever the relevance of speech is at stake, matters become political by definition, for speech is what makes man a political being” (3). Most dramatically, in a formulation that should bother any smartphone-dependent member of our so-called information society, Arendt states that “if we would follow the advice, so frequently urged upon us, to adjust our cultural attitudes to the

present status of scientific achievement, we would in all earnest adopt a way of life in which speech is no longer meaningful” (3-4).

Although she made this claim with reference to quantum physics, a similar if less radical mathematization of knowledge has also been involved in putting a satellite in orbit and creating artificial life in the laboratory. The chances of ‘lay’ or ‘common sense’ thinking and conversation about the deeds of technoscience were scant, and the public articulation of political questions seemed extremely difficult. As Waseem Yaqoob has put it, “science and politics were unable to communicate with one another, not because of inadequate public education, but due to the character of modern science” (2014, 214). The concerted actions of scientists rested on a mathematical language that rendered their knowledge-base inaccessible for political deliberation. In this sense, the challenge posed by technoscience I outlined in the Introduction not only affects political theories centered on ideals of self-rule but also speech-centered accounts, like that of Arendt (and also Habermas and Rancière, as I will show in later chapters).

The ‘crisis’ she identified in modern science and the ‘actions’ of scientists like Heisenberg, Bohr, or Shroedinger, was perplexing because not even scientists themselves really understood (nor could speak meaningfully about) the things they were doing. Arendt is emphatic in declaring, at the end of *The Human Condition*, that the action of scientists, for all its political significance (the scientific organizations founded in the seventeenth century, she writes, “have become one of the most potent power-generating groups in all history”), was not itself political, at least in the existential, that is, revelatory and narrative sense indicated above. This was true at least for the nuclear physicist, whose “action ... acts into nature from the standpoint of the

universe and not into the web of human relationships” (324). Lacking general communicability, the action of technoscientists cannot unfold in this realm.

In light of this examination, Arendt’s account of modernity displays some interesting and surprising features. In this respect, it is important to acknowledge that her way of theorizing privileges storytelling, as opposed to analytical rigor.¹⁹ The story narrated in *The Human Condition* is based on a historicization of the changes in the hierarchy of activities within the *vita activa* (labor, work, and action). The relation between these concepts changes as the book unfolds its narrative of the modern condition. “Not the capabilities of man, but the constellation which orders their mutual relationships can and does change historically” (Arendt 2006a, 62). Hence, the primacy of *homo faber* at the beginning of the modern age, which she relates to the dawn of modern science with Galileo,²⁰ lasted until the “triumph of *animal laborans*” in the nineteenth century and the subsequent erosion of the boundary between the private and public realms. Indeed, her account of the ‘modern age’ buttressed the coming to prominence of labor over the other human activities. The key distinction here was between labor, on the one hand, and action and work, on the other.

The constellation shifts, however, when we turn to her sporadic reflections about the ‘modern world’s age.’ “For the first time in our history the human capacity for action has begun to dominate all others” (Arendt 2006a, 62). But the picture becomes more complicated as soon as we realize the extent to which technoscientific agency not only shifts but also destabilizes

¹⁹ In a 1964 interview with Gunther Gauss Arendt declared she was not a philosopher, but a political theorist (Arendt 1994, 1).

²⁰ Quoting A. N. Whitehead, Arendt compared Galileo’s discovery of the telescope to the birth of Christ. “Since a babe was born in a manger, it may be doubted whether so great a thing has happened with so little stir.” For her, “nothing in these words is an exaggeration” (257).

Arendt's three-part distinction. Since the modern age, science and technology have proliferated the modalities of active life. A veritable doubling of work and action seems to be in place: alongside work as conventionally understood, we find what I have called 'worldless work.' And action, divorced from speech, is becoming speechless (or purely processual) action. Action may now stand at the top of the hierarchy, but it is a mutilated form of action, politically speaking. Therefore, we have at least five, instead of three fundamental activities within the range of human beings in the modern world: labor,²¹ the fabrication of use-objects, world- and self-disclosing action, *and* the worldless and technology-assisted fabrication of consumption goods alongside the speechless beginnings of processual action. Only the last three are involved in the doings of technoscience, outlining the contours of our most recent modernity.

Thus, I wish to suggest that scientists' speech disorder marks the beginning of the modern world's age no less than the channeling of action into nature and the transgression between nature and artifice. If so, the relevant distinction for our epoch would be the one between processual action and speech, or between modern science and the public realm of politics, as I will claim later on. Likewise, if I may be allowed to slightly abuse the logic of transitivity, a further defining distinction would be the one between work and speech. Since Arendt herself acknowledged that scientific action is inseparable from technological fabrication, the troubling prospect about the modern condition is the fate of speech concerning the fabrications of

²¹ Here I exclude a consideration of the ways in which 'automation' might usher in a new form of labor for humans, where "eventually only the effort of consumption will be left of 'the toil and trouble' inherent in the biological cycle to whose motor human life is bound" (1998, 131). I bypass this otherwise interesting suggestion because, as Arendt observed, "Freedom from labor itself is not new; it once belonged among the most firmly established privileges of the few" (4), and also because—unlike worldless work and speechless action—it hasn't come to fruition, even though "the specter of a true consumers' society is more alarming as an ideal of present-day society than as an already existing reality" (133).

technoscience no less than its actions. At stake, in other words, is not only a change in “the constellation which orders their mutual relations,” but also in the forms assumed by labor (toil-free), work (worldless), and action (speechless). The decisive gulf opening up since the twentieth century separates what I would call the ‘thing-deeds’ of technoscience from human, public speech. As I intend to show in the next section, this threat to the public realm is today even more significant than the one posed by the rise of the social.

Political Objectivity: World, Speech, and the Public Realm

At the end of the first section I anticipated a main argument of this dissertation, namely that politics consists in transforming the mere existence of things and deeds (including those of science and technology) into things that are held in common by the plurality of beings in a public realm. I shall elaborate on this question in the remainder of this chapter. And my focal point is the situation regarding speech which Arendt put at the center of her reflections about technoscience in the modern world.

This situation is ‘politically significant’ not only (or mainly) because “speech is what makes man a political being” (Arendt 1998, 3), but more importantly because without ‘common sense’ and communication in ordinary language there is no public realm, and without a public realm the human world loses its ‘reality,’ objectivity, and gathering qualities, and actors are deprived of a space of appearance to reveal to each other their unique identities.

The crucial category here is ‘public,’ which for Arendt signifies “two closely interrelated but not altogether identical phenomena” (Arendt 1998, 50). On the one hand, the term refers to the reality conferred upon self and world when things are seen and talked about by many. “The

presence of others who see what we see and hear what we hear assures us of the reality of the world and ourselves” (50). “For us,” writes Arendt in her most anti-Platonic mood, “appearance—something that is being seen and heard by others as well as by ourselves—constitutes reality” (50). And, importantly for my own argument, this constitution of reality depends on the perspectivalism afforded by human plurality:

the reality of the public realm relies on the simultaneous presence of innumerable perspectives and aspects in which the common world presents itself and for which no common measurement or denominator can ever be devised. For though the common world is the common meeting ground of all, those who are present have different locations in it, and the location of one can no more coincide with the location of another than the location of two objects. Being seen and being heard by others derive their significance from the fact that everybody sees and hears from a different position.... *Only where things can be seen by many in a variety of aspects without changing their identity*, so that those who are gathered around them know they see sameness in utter diversity, *can worldly reality truly and reliably appear* (57, emphasis added).

This phenomenological perspective informs her critique of the rise of the social. In modern society the irresistible and overwhelming character of necessity makes the common world appear only from the narrow and strictly technical perspective of economic utility and social welfare. Things appear like foreshortened figures, like when we admire a sculpture from one corner of the room, in one dimension, without the possibility of looking over it and appreciating all its richness and diversity. Similarly, when everyone involved is not concerned with the same object or when “the sameness of the object can no longer be discerned,” this may portend “the destruction of the common world,” for on Arendt’s account the latter “is usually preceded by the destruction of the many aspects in which it presents itself to human plurality” (58). Thus “the end of the common world has come when it is seen only under one aspect and is permitted to present itself in only one perspective.”

On the other hand, any space of appearance would be empty without an object, that is, without a world being held in common. In this sense, the term ‘public’ also signifies “the world itself, in so far as it is common to all of us and distinguished from our privately owned place in it” (Arendt 1998, 52). I take the *world* to be the major stake in Arendt’s confrontation with technoscience, and it ought to be ours as well. Like work, the ‘human artifice’ separates action from labor and constitutes the stable world that protects human action from becoming a process like the one endured by *animal laborans*, where the remedies and resources of public life are of no use. But what is the meaning of this concept in Arendt?

She distinguishes the world both from the private place people may own in it, as well as from the earth (“the limited space for the movement of men”) or nature (“the general condition of organic life”). Avoiding definitional language, as is always the case, Arendt writes that the common world “is *related*... to the human artifact, the fabrication of human hands, *as well as* to affairs which go on among those who inhabit the man-made world together” (1998, 52, emphasis added). This ambivalence or duality in the concept of world—objective and subjective, as she will later explain—is crucial for understanding Arendt’s political theory and for the argument I wish to make.

On the one hand, we have its “thing-character.” The ‘human artifice’ encompasses all the durable things produced by *homo faber*: the tables of artisans, the buildings of architects, the books of historians, the artworks of artists. Arendt would probably have included technoscientific objects—like the Large Hadron Collider beneath the France-Switzerland border—in the collection of things that make up the human-made world. Beyond the instrumental equipment of the laboratory, however, for her technoscience was not an activity conducted for the sake of the

world in its 'thing-character.' As I pointed out before, Arendt saw modern science as an endeavor invested in processes, not things. At best, the things that make up the material infrastructure of industrial society could be regarded as "accidental by-products," a "heap of unrelated things," to use an Arendtian expression I will return to later on. Technoscience was not a worldly affair concerned with the addition of durable things to the world. Unwillingly or not, it has been mostly devoted to the empowerment of *animal laborans* as consumer.

But we saw that even the most ordinary objects of everyday life can transcend their usefulness and functionality when their public appearance, their shape or look, is taken into account: "whatever has a shape at all and is seen cannot help being either beautiful, ugly, or something in-between. Everything that is, must appear" (Arendt, 1998, 172-173). The crucial question I am trying to formulate is whether or not the things introduced by technoscience into the world ought to be considered from this worldly perspective. Arendt herself did not entertain this possibility. My view is that technoscience is very much implicated in the thing-character of the world, invading our habitat with a plethora of things and gadgets that "structure and change people's living conditions," as Ulrich Beck would put it (Beck 1992, 185). The politically relevant question is whether or not this thing-hood becomes an object of public concern. Basically, politics hinges on the connection between the things that make up the world and the existence of a public realm where those things make their appearance and acquire objectivity, thus becoming a scene for action and speech.

This insight relates to Arendt's other characterization of the world as relating "to affairs which go on among those who inhabit the man-made world together."

To live together in the world means essentially that a world of things is between those who have it in common, as a table is located between those who sit around it; *the world, like every in-between, relates and separates men at the same time*. The public realm, as the common world, gathers us together and yet prevents our falling over each other, so to speak (1998, 52).

The ‘relational’ architecture underscored by Markell is evident in this passage: the world relates *and* separates at the same time. Furthermore, the objective and worldly interests of human beings arise out of “the world of things in which men move, which physically lies between them.... These interests constitute, in the word’s most literal significance, something which *inter-est*, which lies between people and therefore can relate and bind them together” (182). And the problem with mass society, in her account, was that the world had lost this gathering capacity. In a thought-provoking passage, she writes that “The weirdness of this situation resembles a spiritualistic séance where a number of people gathered around a table might suddenly, through some magic trick, see the table vanish from their midst, so that two persons sitting opposite each other were no longer separated but also would be entirely unrelated to each other by anything tangible” (53).

In a critical passage from the chapter on action Arendt articulates the crucial political relation between objectivity and subjectivity:

Most words and deeds are *about* some worldly objective reality in addition to being a disclosure of the acting and speaking agent. Since this disclosure of the subject is an integral part of all, even the most “objective” intercourse, the physical, worldly in-between along with its interests is overlaid and, as it were, overgrown with an altogether different in-between which consists of deeds and words and owes its origin exclusively to men's acting and speaking directly *to* one another. This second, subjective in-between is not tangible, since there are no tangible objects into which it could solidify; the process of acting and speaking can leave behind no such results and end products. But for all its intangibility, this in-between is no less real than the world of things we visibly have in common. We call this reality the ‘web’ of human relationships, indicating by the metaphor its somewhat intangible quality (1998, 182-3).

There can be no disclosure or appearance of acting and speaking agents without worldly things standing as objects common to those affected by them. The words and deeds that today matter the most are *always* about some worldly objective reality, and this not “*in addition* to being a disclosure of the acting and speaking agent,” as Arendt seems to suggest,²² but as *constitutive* of that disclosure. Her metaphor of the web of human relations as a realm which, its *sui generis* reality notwithstanding, always overlays and overgrows the world’s ‘objective in-between’ is essential if we want to absolve Arendt from the charge that she celebrates “a pure, rarefied, and frustratingly contentless domain of action” (Markell 2011, 19). Just like spiders hang their ‘intangible’ webs to solid things like twigs or picture frames, politics as the web enacted by human speech grows out of worldly things and interests and their power to separate and relate actors. Without politics things would ‘lie physically there’ but would not be held in common. The human artifice attains its reality and objectivity thanks to the public realm. Politics, in other words, adds worldliness to facticity, superimposing, as it were, a new layer of reality. As I will argue in Chapter 3, technoscience *qua* expertise tends to work against this perspectival disclosure.

Thus, to recover from Arendt this sense of mutual dependence between politics and the world, this ‘world-oriented politics,’ we need to realize that the appearance and disclosure of (new) subjects has to be accounted for with reference to the object, intangible, worldly or natural, that gathers them, that is *at stake for them*. Conversely, without subjects gathered together around them and concerned with their looks, things remain a non-world. In a nutshell: no

²² For instance: “Action [is] the only activity that goes on directly between men without the intermediary of things or matter” (Arendt 1998, 7).

subjects without objects, and no objects without subjects.²³ The relation between political subjectivity and political objectivity is therefore one of mutual constitution: “Without being talked about by men and without housing them, the world would not be a human artifice but a heap of unrelated things to which each isolated individual was at liberty to add one more object; without the human artifice to house them, human affairs would be as floating, as futile and vain, as the wanderings of nomad tribes” (Arendt 1998, 204).

Politics is about transforming the things that *condition* our existence—including the deeds, things, and gadgets of technoscience—into things we have *in common*, into objects of agreement and disagreement around which the commonality of the world is disputed by subjects who thereby—and only thereby—reveal to one another their unique and plural identities.

This argument, which frames this whole dissertation, can be further elaborated through a reinterpretation of Martin Heidegger’s famous phenomenological distinction between ‘readiness-to-hand’ and ‘presence-at-hand’ in *Being and Time*,²⁴ two basic but clearly distinct ‘modes of being’²⁵ in terms of which humans encounter the entities that make up the world.

In a decisive overturning of the philosophical tradition, Heidegger argues that our ‘primordial’ or closest relationship with entities is not intellectual but pragmatic. People encounter entities as ‘equipment,’ that is, as things that serve certain practical purposes or tasks

²³ In chapters 3 and 6 I show that a similar argument subtends Rancière’s (otherwise subjectivist) notion of emancipation *qua* disruptive appearance of a *demos*. For him politics involves the relation between things and words, objects and subjects.

²⁴ Heidegger (1962, sections 15 and 16).

²⁵ I should make it clear that this engagement with Heidegger does not entail a turn towards ontology or metaphysics. It is simply a phenomenological distinction that I find extremely useful to convey the sense of politics I wish to put forward. Incidentally, being a former student of Heidegger, Arendt was perfectly aware of it.

for the situation at hand. We deal with entities mainly through skillful manipulation, not theoretical contemplation. These entities have a mode of being Heidegger calls readiness-to-hand. In his famous example of the hammer, he writes that “The less we just stare at the hammer-thing, and the more we seize hold of it and use it, the more primordial does our relationship to it become, and the more unveiledly is it encountered as that which it is—as equipment. The hammering itself uncovers the specific ‘manipulability’ of the hammer. The kind of Being which equipment possesses—in which it manifests itself in its own right—we call ‘readiness-to-hand.’” (Heidegger 1962, 98). When I hammer I have no conscious experience of the hammer in use as an independent object, standing before me and endowed with certain properties that exist and matter independently from my hammering. I simply use it just like I am using my laptop as I write these lines: unproblematically. The same goes for the nails, the bench, the room, and so on. While hammering, that is, I do not have awareness of myself as a *subject* standing over against an *object*. These are not the basic categories ordering my everyday experience.

Subjects and objects do become manifest in the other, phenomenologically derivative kind of encounter. In the theoretical attitude, entities do become objects for a subject; removed from everyday practice, they are disclosed as independent objects. This happens when the equipment fails to perform its task, so that it suddenly becomes a matter of concern, foregrounded against the diffuse background of everyday life. This ‘presence-at-hand’ is the mode of being of entities encountered in terms of this subject-object structure. Heidegger used to call them *Things* (Heidegger 1971), a term I shall return to in chapter 7 in the context of Actor-Network Theory’s recent appropriation of John Dewey’s pragmatist conception of ‘the public.’

In an important sense, I take politics to rest on a reversal of Heidegger's order of primordially. Politics has to do with purposefully transforming ready-to-hand entities into present-at-hand 'Things' around which the commonality of the world is disputed, and by reference to which subjects emerge to reveal their singularity to each other. As remarked upon before, *plural* human speech (as opposed to the lonely speech of Heidegger's poets) is absolutely central in this regard. The reality of the 'in-between' can only be experienced, following Arendt, through human speech amidst the plurality of beings in a public realm.

This interpretation, I claim, is significant when considering the things that technoscience introduces into the world. But when Arendt dwelled on the prospects of politics in a world that is being shaped to a large extent by scientists and technologists, and not by "the administrative and diplomatic doings of most so-called statesmen" (Arendt 1998, 323), her reflections were infused with concern over the possibility that scientific knowledge might finally become divorced from ordinary speech and common language.

The reason why it may be wise to distrust the political judgment of scientists *qua* scientists is not primarily their lack of "character"—that they did not refuse to develop atomic weapons—or their naïveté—that they did not understand that once these weapons were developed they would be the last to be consulted about their use—but precisely the fact that they move in a world where speech has lost its power (4).

From a political perspective, then, the doings of technoscience are perplexing because there seems to be no common language to make them public, to transmute them into objects of common concern. For Arendt, the 'truths' of the modern scientific worldview could be mathematically demonstrated and technologically proved, as testified to by nuclear warfare. But, prompted by a 'language' that cannot be communicated in the public realm and therefore bypasses human plurality, these truths and their material embodiments could not themselves be

publicly discussed nor become an object of thought. The trouble is that humans can “experience meaningfulness” only if “they can talk with and make sense to each other and to themselves” (4). Unlike the actions inserted in ‘the web of human relationships’ to which most readers of Arendt pay attention, the actions of scientists lacked the company of others in common speech. What Arendt feared the most about modernity was the prospect of arriving at a situation in which humans “will forever be unable to understand, that is, to think and speak about the things which nevertheless we are able to do” (3).

The much discussed ‘rise of the social’ might have been the broadest historical context of Arendt’s reflections, but the specific situation she was trying to come to terms with was the novelty of a ‘modern world’ in which deeds could be performed without words. With the rise of the social, the human world was narrowly disclosed from the single perspective of welfare, consumption and production. So when Arendt writes that “The end of the common world has come when it is seen only under one aspect and is permitted to present itself in only one perspective” (1998, 58) she had economics and behavioral social science in mind. *One-sidedness* is politically worrying, but utter *silence* could be devastating. If Arendt’s concern about the incommunicability of scientific truths turned out to be well founded, then technoscientific deeds and things would be meaningless.

Finally, also at stake in Arendt’s reflections on science and technology were several aspects of the modern situation related to her concepts of ‘world alienation’ and ‘earth alienation’ (1998, Ch. VI). Although Arendt traces the origin of world alienation—“the distance which man puts between himself and the world”—back to Galileo’s invention of the telescope (which stands behind Descartes’ mistrust of human senses, and the subsequent flight into the self which

inaugurates modern philosophy), in her narrative this phenomenon is related to the twofold process of expropriation and wealth accumulation that marks the ‘rise of the social’ (248-257). Technoscience, she thought, was involved in a related but different form of alienation, ‘earth alienation,’ compared to which world alienation was “of minor significance” (264). Earth alienation was the attempt to escape the human condition made possible by scientists adopting an ‘Archimedean point’ in the universe from which to channel cosmic forces and processes into nature. Whereas world alienation results in “the increase in [the] power of man over the things of this world” (252), earth alienation mobilizes human power over nature.

In light of my preceding examinations, I would contend that science and technology also partake in *world*-alienation, in “the atrophy of the space of appearance and the withering of common sense” (Arendt 1998, 209), no less than the triumph of *animal laborans*. And this is what makes it politically significant. Its political significance, it would seem, is that it renders politics insignificant. This dissertation is to a great extent an attempt to resume Arendt’s reflections in the light of our current situation.

Amor mundi

The ‘modern world,’ Arendt declared, was not the subject matter of *The Human Condition*. It was, however, the background against which the book was written (Arendt 1998, 6). To the “preoccupations and perplexities” of this modern world, she declared, “this book does not offer an answer.” Those answers “are matters of practical politics, subject to the agreement of many; they can never lie in theoretical considerations or the opinion of one person, as though we dealt here with problems for which only one solution is possible” (5). What the theorist can do,

however, is to probe the pertinency and soundness of our inherited concepts for thinking a present situation that evinces the crisis of those understandings. Arendt described what she was proposing in the *Human Condition* as something “very simple: it is nothing more than to think what we are doing. ‘What we are doing’ is indeed the central theme of this book” (5).

The task, however, was anything but simple. And at least in relation to the event itself that had brought about the ‘modern world,’ it looked rather impossible. As we saw, amongst Arendt’s own fears was that the apparent helplessness of common sense and ordinary language for accessing the new physical worldview of quantum mechanics, the ‘truth’ of which had been technologically demonstrated with the explosions, announced a future in which we will forever be “unable to understand, that is, to think and speak about the things which nevertheless we are able to do” (3).

As a theorist, what she could do was to think what we are doing, or, perhaps more accurately, *what we are doing in doing the things we do*, through a reconsideration of the basic categories and articulation of the human condition as it has been given to us. Her position, though never explicitly formulated, is hinted at the very beginning of *The Human Condition* and towards its very end.

In the Prologue she claimed that the scientific deeds and events of the time (the atomic bomb, the launch of *Sputnik*, and the attempt to create life in the test tube) evinced a rebellion against our human condition, “against human existence as it has been given, a free gift from nowhere (secularly speaking)” (Arendt 1998, 2), and a will to exchange it for something of our own making. The trouble, as we saw, was that this veritable ‘making of nature’ escaped the sovereign mastery of *homo faber*; it was also an ‘acting’—the creation of something new, this

time *in nature*. In the nuclear events Arendt had witnessed, this took the form of “processes which without men would never exist and which earthly nature by herself seems incapable of accomplishing” (232). Today, as I have tried to argue, the event that resumes that rebellion is the synthesis of new lifeforms and the processes it is bound to set into motion. Unlike the bomb, whose impact was felt everywhere and immediately became a matter of concern for everybody, the synthesis of *Mycoplasma mycoides* was a secluded affair whose consequences we are only beginning to fathom. The experience, that is, is yet to be articulated conceptually and thought through. But the similarity with the events Arendt had in mind invites a reconsideration and augmentation of her own reflections.

As the story Arendt tells about this escape comes to a close in the final section of the book, the world- and earth-alienating quest for an Archimedean point in the universe, we realize it is a story of self-defeat. The Archimedean point, which scientists had mentally adopted, first for revealing the secrets of nature, and later for unleashing cosmic processes in the infinitely small realm of quantum effects, and which the astronaut, shot into the infinitely large realm of the universe had actually began to reach by the time Arendt returned to the question of science in ‘The Conquest of Space and the Stature of Man’ (Arendt 1967), yielded perplexities that put into question the meaning of the supposed achievements in our scientific knowledge about true reality and our technological prowess to ‘conquer the space.’ As the most consistent expression of the modern radical doubt of the senses and of the attempt to eliminate all anthropomorphic considerations in the quest for knowledge about nature, the escape to an ‘Archimedean point’ outside the earth was self-refuting. Arendt points to Werner Heisenberg’s uncertainty principle as the most significant indication that the quest for knowledge of universal science could be a self-

defeating enterprise. An insurmountable limit for the accuracy of measurements at the sub-atomic level had been acknowledged, one that brought back in the ‘anthropomorphic considerations’ that had been abandoned. The messages of those ‘mysterious messengers from the real world’ could only be answers to questions posed by human observers equipped with man-made instruments. Thus,

The modern astrophysical world view, which began with Galileo, and its challenge to the adequacy of the senses to reveal reality, have left us a universe of whose qualities we know no more than the way they affect our measuring instruments, and—in the words of Eddington—‘the former have as much resemblance to the latter as a telephone number has to a subscriber.’ Instead of objective qualities, in other words, we find instruments, and instead of nature or the universe—in the words of Heisenberg—man encounters only himself. (Arendt 1998, 261)²⁶

This perplexity would later manifest itself in the astronaut “shot into outer space and imprisoned in his instrument-riddled capsule where each actual physical encounter with his surroundings would spell immediate death” (Arendt 1967, 272).

Although the consequences of adopting the Archimedean point in relation to Earth were troubling enough, what worried Arendt the most was the application of the Archimedean point to ourselves and the things we do. Towards the end of *The Human Condition* she turns to Kafka’s cautionary tale, whose aphorism read: “He found the Archimedean point, but he used it against himself; it seems that he was permitted to find it only under this condition” (in Arendt 1998, 248; 322). When seen from a sufficient distance outside the Earth, the activities of humans would appear not as activities (labor, work, action) but as processes of the same kind as the ones

²⁶ As she puts it in ‘The Conquest of Space,’ Heisenberg “concluded that the modern search for ‘true reality’ behind mere appearances, which has brought about the world we live in and resulted in the Atomic Revolution, has led into a situation in the sciences themselves in which man has lost the very objectivity of the natural world, so that man in his hunt for ‘objective reality’ suddenly discovered that he always ‘confronts himself alone’” (Arendt 1967, 271).

observed in atomic particles and distant stars. Again borrowing Heisenberg's words, she writes that from such vantage point "modern motorization would appear like a process of biological mutation in which human bodies gradually begin to be covered by shells of steel" (322-323). Or as she would put it later on also at the end of her essay on 'The Conquest of Space':

If we apply the Archimedean point to ourselves, then [our] activities will indeed appear to ourselves as no more than 'overt behavior,' which we can study with the same methods we use to study the behavior of rats. Seen from a sufficient distance, the cars in which we travel and which we know we built ourselves will look as though they were, as Heisenberg once put it, 'as inescapable a part of ourselves as the snail's shell is to its occupant... the whole of technology, seen from this point, in fact no longer appears 'as the result of a conscious human effort to extend man's material powers, but rather as a large-scale biological process'? (Arendt 1967, 273-274)

What Arendt had in mind here was her previous observation that "[t]he last stage of the laboring society, the society of jobholders, demands of its members a sheer automatic functioning, as though individual life had actually been submerged in the over-all life process of the species and the only active decision still required of the individual were to let go, so to speak, to abandon his individuality, the still individually sensed pain and trouble of living, and acquiesce in a dazed, 'tranquilized,' functional type of behavior." And "[t]he trouble with modern theories of behaviorism," she suggested, "is not that they are wrong but that they could become true, that they actually are the best possible conceptualization of certain obvious trends in modern society" (Arendt 1998, 322).

'What we are doing,' according to Arendt, then, is nothing but "willing" and actually moving close to "the point of developing into that animal species from which, since Darwin, he imagines he has come" (Arendt 1998, 322). Thus, when Arendt declared that *The Human Condition* was restricted "to an analysis of those general human capacities which grow out of the

human condition and are permanent, that is, which cannot be irretrievably lost *so long as the human condition itself is not changed*” (6, my emphasis), it was the prospect that such a change was indeed occurring that prompted her reflections. The hallmark of the modern world, Arendt concluded, was an unprecedented and striking “loss of human experience” (321), that is, of the human capacities we have traditionally associated to the *vita activa*. Not even labor is what it used to be as automation has begun to liberate mankind from the toil of *animal laborans*—a prospect Arendt took quite seriously: “laboring is too lofty, too ambitious a word for what we are doing, or think we are doing, in the world we have come to live in” (322). As we saw, work, for its part, is now regarded as another form of labor, while action “is almost exclusively understood in terms of making and fabricating” (322).

Arendt’s way of coming to terms with this self-defeating rebellion was thus a reconsideration of the human condition we seemed so eager to escape, to take stock of what we are leaving behind and to tell a story about it. As we saw previously in this chapter, the agency of contemporary technoscience—from nuclear physics to synthetic biology—has unsettled traditional demarcations between labor, work and action, and transgressed the boundaries between nature and artifice. Thus, Arendt’s recourse to Greek experience and the conceptual articulation of the triad labor-work-action informed by that experience was not a question of Hellenic nostalgia or a desperate attempt to lean on traditional banisters, but rather a way of confronting our own present by acknowledging the extent to which our categories have lost their capacity to illuminate our experience and orient our action. Arendt’s ‘backward glance’ indeed

suggests that the systematic distinctions she articulates in *The Human Condition* have lost their validity, or at least correspond to ‘a world that is no more.’²⁷

Her point, however, was not that people have completely lost the human capacities of the *vita activa*, but that in the modern world the experience of fabricating and disclosing worlds and, with it, the revealing of new human identities, had increasingly become ‘an experience for the privileged few.’ “No matter what sociology, psychology, and anthropology will tell us about the ‘social animal,’ men persist in making, fabricating, and building, although these faculties are more and more restricted to the abilities of the artist, so that the concomitant *experiences of worldliness* escape more and more the range of ordinary human experience” (323, emphasis added). The same obtains for action, in the two aspects I have tried to demarcate. On the one hand, “[t]he capacity for action, *at least in the sense of the releasing of processes*, is still with us, although it has become the exclusive prerogative of the scientists.” In its *existential* aspect—its “revelatory character” and “ability to produce stories and become historical”—on the other hand, “action, too, has become an experience for the privileged few, and these few who still know what it means to act may well be even fewer than the artists, their experience even rarer than the genuine experience of and love for the world” (323-324, emphasis added).

The question of what we are doing led Arendt to suggest a future in which what most of us will do will be something other than making and acting, and thus will have lost the objectivity of the world as well as the sense of *who* (as opposed to what) we are.

In these passages Arendt reintroduces a somewhat territorial separation between work and the ‘experience of worldliness,’ on the one hand, and action—itself split between the

²⁷ I owe this formulation to Kirstie McClure in one of our graduate seminars at UCLA.

initiation of processes and the story-enacting disclosure of world and self—on the other. A similar tone can be found in other places, like the section on ‘the work of art and the permanence of the world’, where Arendt writes that

In order to be what the world is always meant to be, a home for men during their life on earth, the human artifice must be a place fit for action and speech, for activities not only entirely useless for the necessities of life but of an entirely different nature from the manifold activities of fabrication by which the world itself and all things in it are produced (1998, 173-4).

And yet, it is these very boundaries, and the corresponding ones between nature and artifice, whose blurring I have stressed in my reconstruction of Arendt’s own account of technoscientific agency. What we need in order to resume and augment Arendt’s invitation to think what we are doing, at least with respect to science and technology, is an account that reflects upon our contemporary condition beyond inherited conceptual categories that are no longer relevant and that acknowledges the entangled character of our relationships to things and to each other. In the next chapter I turn to the work of Science and Technology Studies (STS) and Actor-Network Theory (ANT) in search for such a fresh perspective.

2. MAKING

Science is politics pursued by other means

Bruno Latour

By the late 1980s, the boundary-blurring overflows of technoscientific activity had become a central topic of discourses on science and technology in the social sciences. The mutual imbrications of science and society present in the narratives of the risk society, post-normal science, and mode-2 knowledge-production, examined in the Introduction, received its most elaborate formulation in the fields of ‘Science and Technology Studies’ (STS) and its controversial offshoot ‘Actor-Network Theory’ (ANT). Authors adhering to these new research areas interpreted the distinction between science and society as part of a broader modernist divide between nature and society, facts and values, objects and subjects, science and politics, which stood in need of thorough revision.

From the ‘Sociology of Scientific Knowledge’ (SSK) of the Edinburgh and Bath schools in the late 1970s²⁸ to the ‘laboratory studies’ of the 1980s,²⁹ the research programs of STS have transformed our understanding of scientific knowledge-making and practice in profound ways, advancing constructivist accounts at odds with conventional, rationalistic, and objectivistic assumptions about the dynamics and societal impact of technoscience. Interestingly, the outcome of these endeavors has not been another periodization announcing the radical novelty of our

²⁸ Barnes (1974), Bloor (1976).

²⁹ Latour and Woolgar ([1979] 1986), Lynch (1985), Traweek (1988).

times based on a shift from a ‘modern’ to a ‘post-modern’ epoch or condition. The separation and purification of the two distinct realms of ‘Nature’ and ‘Society’ (in their various modulations) had *always* been a fiction according to STS and ANT, a productive one, but a fiction nonetheless. In Bruno Latour’s famous formulation: ‘we have never been modern’ (Latour 1993).³⁰ It turns out that the “time-honored protective dividing line between nature and the human world” that Arendt saw extinguishing was never there in the first place. On the contrary, this new naturalistic, hands-on approach to the practice of science ‘in-the-making’ has revealed the imbrication and mutual constitution of ‘nature’ and ‘society.’

It became apparent that these categories were not *givens* waiting to be discovered and acknowledged, but an historical and provisional *outcome* of the hard-won stabilization of networks whose heterogeneity had been utterly ignored in traditional philosophical discourses about science. As I intend to show, this led to a wholesale reconsideration of ‘the social’ that deserves the attention of political theorists.

The present chapter explores the two related fields of STS and ANT in search of contributions to a theorization of (democratic) politics in relation to science and technology. I draw two basic lessons from this literature. First, STS provides a set of constructivist arguments about knowledge-production that reveal the (political) contestability of expert claims without succumbing to a relativist debunking of claims to scientific objectivity. The quarrel here is with *scientism*, not *science*. Secondly, ANT offers an original and far-reaching reconceptualization of agency that involves non-humans in the construction of world and society, problematizing the sovereignty of human action and yielding an account of ‘the social’ that highlights its ongoing,

³⁰ We will return to this important argument in the final section.

‘rhizomatic,’ and open-ended character. Over the course of the chapter I shall have occasion to remark on some unexpected connections with the work of Arendt. By the end, however, I conclude that the significance of these innovations for political theory finds its limit in the marginal role assigned to human speech in STS and ANT, an issue I attempt to redress in the next chapter.

Technoscience as social construction

Strictly speaking, ‘science’ had not been an object of social inquiry before the 1950s.³¹ Sociological studies really emerged in the wake of Robert Merton’s famous 1942 piece on the normative structure of science (in Merton 1973). Merton argued that the production of certified knowledge depended on a democratic political context capable of guaranteeing science’s autonomy from political pressure, reinforcing its social and cultural status as *the* distinguishing feature that separated liberal democracy from fascism and totalitarianism.³² The research agenda of the nascent sociology of science, however, paid much more attention to the internal condition reconstructed by Merton: the institutionalized *ethos* that bounded scientists. “Four sets of institutional imperatives—universalism, communism, disinterestedness, and organized

³¹ A brief glance at the ‘classics’ shows that natural science stood at the center of social science’s image of itself (Marx 1992; Durkheim 1982; Weber, 2013) and of its discourse about what makes modern society ‘modern’ (Durkheim 2003, Weber 1993), but the actual workings of science itself were largely taken for granted and tellingly eschewed *qua* research topic. This continued to be the case even with the ‘sociology of knowledge’ that emerged in Germany in the 1920s and 1930s with the work of Max Scheler (1980) and Karl Mannheim (1936), who never actually focused on science, despite their avowed interest in knowledge.

³² The elective affinity between science and the institutions of liberal democracy was important for Merton, and continues to be a powerful element in the imaginary of modernity (Ezrahi 1990).

skepticism—are taken to comprise the ethos of modern science.” (Merton 1973, 270)³³ In Merton’s functionalist argument, behavior consonant with these norms explained the production of reliable knowledge, and the norms themselves served to distribute rewards and punishments in the scientific community. Whereas studies of deviance and departure from these norms aimed at explaining errors in scientific knowledge began to proliferate, the truth of theories was left untouched under the assumption that it could be safely explained as a result of scientists’ adherence to these norms.

The insulated and highly valued role of science was bound to restrict inquiry to these institutional and organizational studies for as long as science delivered the promised goods. This situation began to change in the second half of the twentieth century. As Thomas Gieryn has remarked, “perhaps only after the deployment of nuclear weapons, or only after genetic engineering raised eugenic nightmares, could sociologists begin to think about science as a social problem rather than as a consistent solution; or maybe earlier generations of sociologists were guided by epistemological assumptions that rendered true scientific knowledge immune from social causes—thus putting it outside the orbit of sociological explanation” (Gieryn 2001, 13692). Although its development has been arguably reinforced by the risks, perplexities, and

³³ ‘Universalism’ requires that “truth-claims, whatever their source, are to be subjected to *preestablished impersonal criteria*: consonant with observation and previously confirmed knowledge (Merton 1973, 270). ‘Communism’ means that “the substantive findings of science are a product of social collaboration and are assigned to the community.” (273). For its part, ‘disinterestedness’ refers not to individual altruism but to “patterns of institutional control” of scientists’ motives, so that the “virtual absence of fraud in the annals of science” is explained by the fact that “the activities of scientists are subject to rigorous policing.” (276). Finally, ‘organized skepticism’ is “the temporary suspension of judgment and the detached scrutiny of beliefs in terms of empirical and logical criteria.” (278)

anxieties brought about by contemporary technoscience, the field of STS emerged in opposition to notions about the ‘purity’ of scientific knowledge.³⁴

In its beginnings, the field of STS was devoted to exposing technoscience as a ‘social’ or ‘socially constructed’ activity (Woolgar 1981). This was an assertion about the *contents* of science, and not merely about its social *organization*. Rejecting the Mertonian role hitherto assigned to the sociology of science, scholars in the field now began to employ ‘social explanations’ to account for the *truth* of scientific claims. Values, ideologies, and interests were said to explain the accomplishments of science no less than its failures. All the politicking and negotiation we associate with official politics was said to be part and parcel of scientific activities as well. The making of science would no longer be reduced to mere compliance to Mertonian norms. From now on, issues like “experimental tinkering, sifting of evidence, negotiation of claims, replacement of old beliefs about nature with new ones, [and the] achievement of consensus over the truth” had to be taken into account by sociologists interested in figuring out the internal workings of technoscience: “All of these processes—observation, getting instruments and research materials (e.g., mice) to work, logic, criteria for justifying a finding as worthy of assent, choices among theories, putting arguments into words or pictures, persuading other scientists that you are correct—are uncompromisingly social, cultural, and historical phenomena” (Gieryn 2001, 13694). Drawing on historical case studies of scientific controversy, ethnographic observations of scientific practices, and interpretative analysis of

³⁴ There is no simple way of introducing the different research programs in STS. A full-blown survey of a multidisciplinary field that has challenged deeply engrained perspectives in philosophy, sociology, and history of science and technology, is beyond the scope of this investigation. For useful histories of STS see Buchi (2004) Sismondo (2004), and Yearley (2005).

scientific texts, the research fields of STS have set out to articulate a sociology of science that was more empirically grounded and less deferent towards institutional science.

Standard histories of STS usually begin with Thomas Kuhn's *The Structure of Scientific Revolutions* (1962), the work that first opened up avenues for thinking of science as a social and cultural construction by emphasizing the discontinuities and perspectival character of scientific knowledge, as well as the communal and hands-on work needed to consolidate it. In the early 1970s the 'sociology of scientific knowledge' (SSK) seized this space and provided a starting point for the field. Barry Barnes (1974) and David Bloor's (1976) so-called 'strong program' in the sociology of knowledge advocated a symmetrical treatment of scientific knowledge and error. In traditional history and philosophy of science, 'true' or 'rational' beliefs were explained as resulting from a disinterested science marching asymptotically towards truth and rationality. Errors, by contrast, could be explained sociologically by external factors. In opposition to this asymmetry, the 'strong program' espoused a sociological analysis that examined the constructed nature not only of error but also of knowledge deemed 'true.'³⁵ Similarly, the 'empirical program of relativism' (EPOR) of the 'Bath School' set out to expose the contingencies of science and the inevitable role of social configurations by focusing on 'controversies' as privileged moments for

³⁵ The argument was also present in variants of the 'strong program' that linked construction to the role of interests and ideologies in shaping what counts as scientific knowledge (MacKenzie, 1981; Shapin, 1975). Andrew Pickering's 'interest model' was meant to provide causal explanations of changes in scientific knowledge in terms that differed from those of the practitioners themselves, who understandably opted for objectivist and rationalist accounts: better evidence, coherence, robustness, parsimony, utility, predictive power, and so on. Sociologists in the SSK tradition, on the other hand, accounted for scientific judgments in terms of the political or ideological interests of scientists, linking statistical theories of correlation and regression to eugenics, or documenting the inclination of scientists to capitalize on their already acquired skills and expertise (Gieryn 2001).

observing the under-determined character of knowledge (Collins, 1985).³⁶ Highlighting the ‘interpretive flexibility’ of data and methods, these analyses showed that scientific controversies are resolved when a particular position is defined as the only reasonable one to hold by the expert community.

With the ‘laboratories studies’ that emerged in the late 1970s, as Gieryn notes, social studies of science “moved ever closer to the actual processes of ‘doing science’” (Gieryn 2001, 13695) and came to the conclusion that “there is nothing not-social about science” (13696). Science is social action through and through. The departure from the past could not be starker. These ethnographies examined the ways in which controversies are handled in the course of experimentation, data collection and analysis, and how scientific claims are refined and ‘black-boxed’ (Latour 1987).³⁷ Bringing to light the skills involved in laboratory manipulation and observation (Latour and Woolgar, 1979; Collins, 1985), the negotiated nature of data and results oriented towards publishable arguments (Knorr-Cetina, 1981; Lynch, 1985), and the role of culture in setting standards for what counts as valued work and accepted style (Traweek, 1988), these studies revealed how the construction, not only of data but of the phenomena themselves, is

³⁶ A prominent example of EPOR findings was the ‘experimenters’ regress’ identified by Harry Collins (1981) on the basis of a case study in experimental astrophysics. Challenging the standard view of experiments as providing an objective way for testing theories and hypotheses, Collins doubted the possibility of saying objectively when a given empirical finding was confirming or disconfirming evidence. For a measurement to count as sound evidence we must assume that it was produced by a good instrument; but what can a good instrument be if not the one that we recognize as producing good results? Thus the circularity or infinite regress: “What the correct outcome is depends upon whether or not there are gravity waves hitting the Earth in detectable fluxes. To find this out we must build a good gravity wave detector and have a look. But we won’t know if we have built a good detector until we have tried it and obtained the correct outcome! But we don’t know what the correct outcome is until ... and so on ad infinitum” (Collins 1985: 84).

³⁷ ‘Black box’ is a concept drawn from cybernetics: it denotes a device that gives certain outputs as a result of certain inputs, but whose inner workings are unknown. One need not understand what goes on inside a ‘black box’ for it to perform its (usually valued) function.

framed by skills, cultures, and routine negotiations in the laboratory (Sismondo, 2007).³⁸ These studies emphasized the *local* and *material* character of scientific practice, revealing “a science whose order is not to be found in transcendent timeless rules of ‘scientific method’ or ‘good lab procedures,’ but in the circumstantial, pragmatic, revisable, and iterative choices and projects that constitute scientific work. ... Never sure about how things will turn out in the end, scientists incessantly revise the tasks at hand as they try to get machines to perform properly, control wild nature, interpret results, placate doubting collaborators, and rationalize failures” (Gieryn 2001, 13696).

Constructivist analysis has also been used to explain the ‘social construction of technology’ or SCOT (Pinch and Bijker, 1987). As science constructs its facts, so technology constructs its artifacts. Responding to technological determinism, SCOT claims that human action and social contexts shape technology, including its use (artifacts, in this view, also have interpretive flexibility).³⁹ The argument here is that the success of technologies like the chain-driven bicycle depends on the size and strength of the groups that promote it.

As this brief view suggests, cognate terms like ‘construction,’ ‘constitution,’ ‘organization,’ and ‘production’ tie together much of STS scholarship (Sismondo, 2007). In general terms, constructivist STS analyses problematize and undermine objectivist commitments by exhibiting uncertainties, paradoxes, ‘messy’ contingencies, and ‘methodological horrors’ (Woolgar 1988b) in scientific practice. Arguing that objectivist expressions rhetorically delete or disguise the socio-cultural origins and epistemological limits of knowledge, placing

³⁸ On the construction of experimental phenomena in seventeenth-century debates over the legitimacy of experimental philosophy and its relation to the political sphere, see Shapin and Schaffer’s classic *Leviathan and the Air Pump* (1985).

³⁹ For an insightful critique of SCOT, see Winner (1993).

scientific theories and facts inside a ‘black-box,’ the task of STS has been to open these up to expose local origins and cultural limitations hitherto removed from view. Accordingly, scientific knowledge was shown to be underdetermined by natural evidence and logical decision rules.⁴⁰ Hence, it is safe to conclude that the signal contribution of STS is to have revealed sources of contingency and uncertainty in scientific practice, sources inadvertently or deliberately hidden when scientific facts and theories are deployed and made to circulate in society.

The crucial question here is whether or not this social account of science implies a debunking of its claims to objectivity (Hacking 1999). This was one of the issues at stake in the infamous ‘science wars’ of the 1990s that pitted hardcore realists against postmodern relativists

⁴⁰ An example of constructivist analysis might be useful to illustrate the specific sense in which facts are said to be ‘constructed,’ as opposed to simply arbitrary, false, or imaginary. Consider the case of the objective proposition: ‘Thyrotropin Releasing Factor is Pyro-Glu-His-Pro-NH₂,’ examined by Bruno Latour and Steve Woolgar in their *Laboratory Life* (1979). Exploring the history of such a statement, in this case witnessing the process that lead to its consolidation in laboratory practices, a constructivist analysis shows that the unqualified form of the statement is achieved by deleting the contingencies and ‘mediations’ which, if openly acknowledged, would be indexed with discursive modalities like ‘We think X is Y’, ‘X might be Y’, ‘under conditions *a*, *b*, and *c*, X seems to be Y’, etc. As Latour and Woolgar show, qualifications like these were in fact formulated by members of the scientific community at an early stage of the research process, but were subsequently removed as the ‘fact’ became established. Accordingly, scientific ‘facts’ are constructed by deleting qualifications or ‘modalities’ from the initial form of a statement. Latour and Woolgar were not embarked in contesting the evidential basis of the statement, or claiming that the scientists at Salk Institute in San Diego who published the factual claim about Thyrotropin Releasing Factor did so prematurely, had erred, or had failed to control for all the relevant experimental conditions. Although there are studies that are explicitly critical of particular theories, and may as a result contribute to substantive debates or affect research trends, constructivist analyses in STS do not typically represent substantive or internal criticisms of scientific laws and facts. In the example, the thrust of the argument is that the alleged stability of the factual statement ‘Thyrotropin Releasing Factor is Pyro-Glu-His-Pro-NH₂’ is not something guaranteed by natural or transcendental foundations, but the product of a contingent ‘black-boxing’ of muddled mediations and negotiations (themselves also contingent). Since the statement was once subject to debate among experts, there is no unconditional assurance that it will not be rejected or modified in the future. In this sense, opening the black box of scientific facts is not merely a matter of ‘reverse engineering.’

over the status of scientific claims.⁴¹ If something valuable came out of this otherwise embarrassing episode it was a clarification of the position of STS scholars on this issue. To be clear from the outset on this difficult point, I and all the authors drawn upon in this dissertation agree that science remains the paradigm of truth about the natural world. In STS, the social context of science is not thought of as polluting for the simple reason that all human activity is social. The trick is to realize that it is the *constructed* nature of scientific facts and technological artifacts that makes them *real* or objective. STS is not anti-science. And yes, most STS scholars ‘believe in reality.’ As Latour put it, “If science studies have collectively achieved something, I thought, it must be that they have added reality to science, surely not withdrawn any from it. Instead of the stuffed scientists hanging on the walls of the armchair philosophers of science of the past, we have portrayed lively characters, immersed in their laboratories, full of passion, loaded with instruments, steeped in know-how, connected through many vessels to a larger and more vibrant milieu” (Latour 1999, 2-3).⁴²

The challenge faced by scholars in the field has been to put forward simultaneously a constructivist, non-scientistic account of technoscience, *and*, in Donna Haraway’s words, “a no-

⁴¹ The polemic mounted by ‘science warriors’ in the US, Britain, and France, was directed against ‘postmodern’ and ‘poststructuralist’ scholarship in the humanities, accusing the ‘fashionable non-sense’ of Derrida, Deleuze, and Lyotard of promoting an anti-science stance in the academic world, undermining cherished cultural standards without any intellectual rigor. More importantly in our context, it also targeted—and largely misinterpreted—the main tenets of the newly consolidated field of STS. See Gross and Levitt (1994) and Sokal and Bricmont (1998).

⁴² As Latour continues, “Who loves the sciences, I asked myself, more than this tiny scientific tribe which has learned to unfold facts, machines and theories with all their roots, blood vessels, networks, rhizomes and tendrils? Who believes more in the objectivity of science than those who claim that it can be turned into an object of inquiry?” (3) Evoking the issue of expertise at stake in this dissertation, he suggests something of the oddity of the place of science studies in the continuing purchase of C. P. Snow’s ‘two cultures’ of 1959 (Snow 2001): “Scientists always stomp around meetings talking about ‘bridging the two-culture gap’, but when scores of people from outside the sciences begin to build just that bridge, they recoil in horror and want to impose the strangest of all gags on free speech since Socrates: only scientists should speak about science!” (Latour 1999, 17)

nonsense commitment to faithful accounts of a ‘real’ world” (Haraway 1988, 579). It seems possible, then, to theorize democratic politics in relation to science and technology without debunking the validity of its truth-claims.⁴³ What STS does reject, in Sheila Jasanoff’s words, is “the realist ideology that persistently separates the domains of nature, facts, objectivity, reason and policy from those of culture, values, subjectivity, emotion and politics.” Science is not “a simple reflection of the truth about nature nor an epiphenomenon of social and political interests” (Jasanoff 2004a, 3). The dispute inaugurated by the most prominent among STS scholars, in other words, involves *scientism* not *science*.

But why is this foundational work in STS relevant for political theorists?

Constructivism and politics

Surely, questions about the politics of science and technology can be posed without the assistance of STS. An example is Langdon Winner’s famous analysis of Robert Moses’ bridges in Long Island as artifacts with politics. The bridges were designed (perhaps deliberately) to have a particular social and political effect: “Poor people and blacks, who normally used public transit, were kept off the roads because the twelve-foot tall buses could not handle the overpasses. One consequence was to limit access of racial minorities and low-income groups to Jones Beach” (Winner 1986, 23). Winner is not a member of the STS community; on the

⁴³ Of course, this does not prevent reactionary interests from using STS’s insights as ammunition. As Bruno Latour pondered in the context of global warming, “dangerous extremists are using the very same argument of social construction to destroy hard-won evidence that could save our lives. Was I wrong to participate in the invention of this field known as science studies? Is it enough to say that we did not really mean what we meant?” (Latour 2004b: 232)

contrary he has been very critical of it. Nor is his argument here premised on a constructivist view of technology.

The question of the *democratic* stakes in science and technology can also be posed independently from STS scholarship. Arguably, as I pointed out in the Introduction, it would suffice to recognize the pervasive role of techno-science in structuring the conditions of modern life, and then to invoke some inflection of the ‘all-affected’ principle. Thus, as noted before, Winner himself could claim in 1977 that “the processes of technical planning, construction, and control ought to be opened to those destined to experience the final products and full range of social consequences” (Winner 1977, 326).

The question, then, is about the specific contribution that a *constructivist* position can make to theorizing the politics of science and technology, especially considering that critical views about their place in society and the political stakes of techno-scientific questions do not *necessarily* follow from constructivist insights. Thus, in his critique of SCOT scholarship, Langdon Winner famously declared that “although the social constructivists have opened the black box and shown a colorful array of social actors, processes, and images therein, the box they reveal is still a remarkably hollow one” (Winner, 1993: 374-5). In particular, he accused STS authors of advancing a purely academic agenda “carefully sanitized of any critical standpoint” regarding technology as a political choice. Unlike figures like Marx, Heidegger, Ellul, or Mumford, social constructivists “[do] not explore or in any way call into question the basic commitments and projects of modern technological society” (375). Winner went as far as suggesting that, in its playful depiction of ‘science in action’ and researchers immersed in messy negotiations and undeclared uncertainties, STS resembled those theories of political pluralism (in

Dahl's sense) that view decisions as the outcome of pushes and pulls among competing interest groups. An elitist stance could be intimated from analyses restricted to documenting the everyday workings of science. More pointedly:

[There] is an annoying question for political pluralism that can be posed for social constructivism as well. Who says what are relevant social groups and social interests? What about groups that have no voice but that, nevertheless, will be affected by the results of technological change? What of groups that have been suppressed or deliberately excluded? How does one account for potentially important choices that never surface as matters for debate and choice? (369)

As Bruno Latour recently acknowledged, the initial reaction of STS scholars to their own debunking of scientism was “[to] extend the *same* habits of thought that had been developed in parliaments and on streets to each and every one of those far-fetched new sites [i.e. laboratories]. The ... solution was to say ‘everything is political’ but without explaining how the checks and balances of democracy could be extended and made efficient in those exotic domains—hence the accusation of having ended up in some forms of depolitization” (Latour 2007b, 813).⁴⁴

My own account of the field in its constructivist bent is more sympathetic than Winner's. The basic point I wish to draw is that the legitimate (but contestable) epistemic authority which science has enjoyed in liberal-democratic societies (Ezrahi 1990) has usually been justified by reference to those very features of scientific practice, institutional norms, and scientific method that STS has closely scrutinized and found much more unstable and contingent than hitherto assumed.

⁴⁴ The other solution was to “ask scientists and engineers to shrink back to the official sites of politics and render their activity accountable to citizens or their representatives ... to say: ‘Let's find a solution to mix the public and the experts’” (Latour 2007b, 814). The participatory turn in STS will be the subject of Chapter 5.

In a nutshell, if technoscience can be accounted for as a socially constructed activity, then this acknowledgment could motivate affected publics and interested scholars to scrutinize and challenge its status and help reconsider our understandings of accountability, legitimacy, policy-making, representation, participation, deliberation, and other dilemmas of democracy in practice. It is by showing the solid but contestable character of the assumptions that science and technology deploy in public that constructivist STS scholars have made a contribution that no political theorization of technoscience can afford to ignore. Instead of seeing the epistemic authority of science as some kind of inevitable result of the Western scientific outlook, constructivist STS portrays it, in Thomas Gieryn's words, as "an accomplished resource pursued strategically by a profession committed not only to extending knowledge but also to the preservation and expansion of its power, patronage, prestige, and autonomy" (Gieryn 2001, 13697). Empirically grounded arguments about the social construction of science are relevant for political theory because they help to render contingent and negotiable (rather than 'essential') the features of scientific activity normally invoked to justify its epistemic public authority.

Thus, when facts and artifacts enter the public arena, the opportunity is always there to challenge those assumptions through the articulation of perspectives that remain excluded or inadequately incorporated in those assumptions. Political action, in this sense, depends on a capacity to unsettle, disrupt, and sometimes even reconfigure naturalized assumptions about 'the social,' foremost among which are scientifically-based ones.

Many insights from STS, I would contend, should be regarded as authoritative in the sense in which Arendt, following Mommsen, characterized the force of authority as "more than advice and less than a command, an advice which one may not safely ignore" (Arendt 2006b,

123). Under contemporary conditions of rapid technical change, normally presented with deterministic overtones, constructivist arguments have the merit of undermining traditional commitments to scientific objectivity and neutrality. To that extent the field has opened a space for (democratic) politics to rear its head. A politicization of science in correspondence with insights from STS should be about the exclusion, suppression, or dismissive treatment of voices outside of laboratories and scientific institutions. It is a question of identifying and challenging taken-for-granted or naturalized assumptions built into science and technology.

Langdon Winner might have been right in denouncing that the political edge of constructivism was not being explored, at least not explicitly, by authors in the ‘social construction of technology’ (SCOT) literature; and the same can also be said of other similar programs, at least in their initial phases. But the charge of neglecting the political stakes of constructivism in science and technology cannot be leveled against STS as a whole. Even by the time of Winner’s intervention (1993), some STS scholars were very much engaged in confronting those sorts of questions. And they continue to be so. Since the last decade, “the nature of the politics of science and technology appears to be at the very center of the field” (Sismondo 2007, 21).⁴⁵

To recapitulate, I have shown how constructivist STS has opened up the black-box of scientific facts and technological artifacts, and claimed that the political salience of this line of work is to have rendered contestable the cultural authority of technoscience. However, there are two major shortcomings in this approach which limit the scope of its relevance for political theory. On the one hand, STS’s rebuttal of the modernist divide between nature and society (or

⁴⁵ Certainly, the extent and senses in which STS itself has examined and capitalized on the political implications of its conclusions continues to be a contentious issue (Latour 2007b; Law, 2009).

science and politics) risks falling into the equally problematic opposite stance of dissolving science into society with no remainder. What about the impact of science on society? Is there room for a more symmetrical position? On the other hand, and related to the latter, STS scholarship ultimately conveys a rather poor picture of what scientists and technicians actually *do*, and how they do it, notwithstanding its merits in making visible the social character of the inner workings of the laboratory. In order to seize the opportunity for contestation afforded by STS constructivism, a more sophisticated account of the place of technoscience in relation to society and politics is required.

Technoscience as world-builder

The political theorization of science and technology I am attempting in this first part of the dissertation would remain incomplete without taking into account a second moment in STS scholarship, namely, the crucial shift from an account of technoscience as a (socially) constructed endeavor, to one which ‘returns the favor,’ as it were, by drawing attention to technoscience’s own role in the construction of society and the building of worlds. The challenge, now, is to recognize technoscience as *artificer*, rather than *artifice*. And indeed, shortly after STS research in the vein of SSK had begun to show that science was a thoroughly ‘social’ activity, Bruno Latour, Michel Callon, and John Law began inserting the ‘material’ in the picture. By making visible the role of non-humans they struck a major blow against the newly acquired orthodoxy of social constructivism (Callon 1986; Latour 1987; Law 1987). From then on, particles, genes, microscopes and research papers would be placed on equal footing with social interests, rhetoric, and power in accounts of knowledge production and dissemination.

This reversal of science-society relationships became the most theoretically sophisticated and controversial account of the social to have emerged from the study of technoscience: ‘Actor-Network Theory’ (or ANT).⁴⁶

Later in this chapter we will see that the significance of ANT for political theory goes beyond the explicitly ‘political’ writings put forward by the field’s leading figures in the 2000s (Callon et al. 2009; Latour 2004a, 2004b, 2005). In other words, I claim that the political insights behind the hybrid parliaments and forums recently proposed by Bruno Latour and Michel Callon (to be addressed in Chapter 7) rest firmly on the conceptual revolution ANT introduced in social theory in the 1980s with the concept of ‘hybrid’ or ‘socio-technical’ networks. My premise is that lacking a lucid understanding of the meaning and implications of its disruptive accounts of action and ‘the social,’ ANT’s account of ‘the political’ loses much of its theoretical appeal and empirical plausibility. It is the earlier wholesale reconfiguration of the meaning of agency and society that renders those later, ostensibly political works original and relevant for political theorists.

To familiarize readers with the main concepts and tenets, as well as carve out a common ground for discussion, I will begin by quoting and commenting on two sets of descriptions of science and technology that are exemplary of the main literature of ANT. The descriptions I have chosen are not to be found in the classical texts of the canon, but in one avowedly minor but highly informative piece: a brief article for the *International Encyclopedia of the Social and*

⁴⁶ ANT is the product of a group of sociologists associated with the ‘Centre de Sociologie de l’Innovation’ of the École Nationale Supérieure des Mines de Paris. The main authors and works associated with the approach are Michel Callon (1980; 1986; 1987; 1991); Michel Callon and Bruno Latour (1981); Michel Callon, John Law and Arie Rip (1986); Bruno Latour (1985; 1986; 1987; 1988a; 1988b; 1990; 1991; 1992, 2007); John Law (1986a; 1986b; 1987; 1991a; 1991b; 1992a; 1992b; 1999); John Law and Wiebe Bijker (1992); John Law and Michel Callon (1988; 1992).

Behavioral Sciences in which Michel Callon reviews in typical ANT-style what the field has to say about the doings of technoscience (Callon 2001). I trust the reader will find that the insights to be gained with these colorful and detailed accounts more than compensate the costs of these (admittedly extensive) quotations. My aim in this chapter is not to make an internal contribution to STS and ANT by way of actual analyses of technoscience or further refinement of their conceptual apparatus. It is rather to invite political theorists to step outside their home turf for a moment and give attention to two distinctive aspects of ANT scholarship: on the one hand, to its articulation of what is arguably the best available scholarly account of ‘science in the making,’ on the other hand, as we will see over the two concluding sections, to its corresponding conceptual reformulation of ‘the social’ through its imagery of techno-scientific agency. For it is only on these bases that a solid ground can be staked to address technoscience’s insufficiently recognized political significance.

The first set of descriptions refers to the production and dissemination of scientific facts:

Let us enter a laboratory to observe the researchers and technicians at work. The laboratory is an artificial setting in which experiments are organized. The objects on which these experiments are performed, such as electrons, neutrinos, or genes, have been put in a situation in which they are expected to react or prove recalcitrant. It is the possibility of producing a discrepancy between what an entity is said to do and what it actually does that motivates the researcher to perform the experiment (Callon 2001, 62).

Of utmost importance for both the conduct and intelligibility of scientific knowledge-production is the politically significant question about the relation between words and things I previously touched upon in relation to Arendt. Admittedly, the question itself (what is the relationship between what people say about things and what these things are?) is not particularly original. But the answer ANT has provided, based on the pivotal notion of ‘inscription,’ is very much so.

Originally introduced in Latour's and Woolgar's path breaking laboratory study (Latour and Woolgar 1986a), "inscriptions are the photos, maps, graphs, diagrams, films, acoustic or electric recordings, direct visual observations noted in a laboratory logbook, illustrations, 3-D models, sound spectrums, ultrasound pictures, or X-rays as arranged and filtered by means of geometric techniques. All these inscriptions are produced by instruments" (Callon 2001, 62).

The work of researchers consists in "setting up experiments so that the entities they are studying can be made 'to write' in the form of these inscriptions, and then of combining, comparing, and interpreting them. Through these successive *translations* researchers end up able to make statements about the entities under experimentation" (Callon 2001, 62). The inscription provided by a chromatograph, for example, 'articulates' the genes and propositions that circulate among researchers. The gene is 'translated' into a computer printout, which then is translated into a published paper, which then is translated into the official advice of an expert commission, and so on.

ANT researchers set out to 'trace' the proliferation and circulation of such inscriptions, *from* which both statements and referents derive their reality, and *in* which they remain linked and travel together from the laboratory to governmental offices, parliaments, and public spheres. Callon goes on to describe the complexity of this tracing as it moves outward from its initial sites:

The map drawn up by a geologist, based on readings in the field; the photos used to follow the trajectories identified by detectors in a particle accelerator; the multicolored strips stacked on a chromatograph; the tables of social mobility drawn up by sociologists; the articles and books written by researchers: all these circulate from one laboratory to the next, from the research center to the production unit, and from the laboratory to the expert committee which passes it on to a policy maker. When a researcher receives an article written by a colleague, it is the genes, particles, and proteins manipulated by that

colleague in her or his own laboratory that are present on the researcher's desk in the form of tables, diagrams, and statements based on the inscriptions provided by instruments. Similarly, when political decision makers read a report that asserts that diesel exhaust fumes are responsible for urban pollution and global warming, they have before them the vehicles and atmospheric layers that cause that warming (62-63).

In this context, the much touted notion of 'network' acquires a very straightforward meaning in this literature. Networks are the stable articulation of these circulating inscriptions in space and time. Most importantly, these networks display a 'hybrid' or 'socio-technical' character (Callon et al. 1986, Latour 1987) in the sense that inscriptions connect humans and their statements with the 'things' these statements refer to (particles, cells, animals, etc.) and the 'things' that make them materially possible (accelerators, microscopes, computers, etc.). In Callon's example,

The sociotechnical network to which the statement 'the hole in the ozone layer is growing' belongs, includes all the laboratories working directly or indirectly on the subject, eco-movements, governments that meet for international summits, the chemical industries concerned, and the parliaments that pass laws, as well as the chemical substances and the reactions they produce, and the atmospheric layers concerned. The statement 'the ozone layer is disappearing due to the use of aerosols' binds all these elements, both human and nonhuman (Callon 2001, 63).

Without capitalizing on this circulation of inscriptions, technoscientific agency would simply be impossible. Actions unfold in networks, and networks exist in this collective activity. As Callon puts it: "Action and network are thus two sides of the same reality; hence, the notion of an actor-network" (63).

This account of the production and dissemination of scientific facts also serves to analyze technology. The second set of descriptions by Callon refer to the exuberant socio-technological orchestration behind the most trivial gadgets employed in people's everyday life. Consider the automobile, a modern artifact that has greatly expanded people's range of action. A closer look, however, reveals a more complicated picture.

Paradoxically, the driver's autonomy stems from the fact that the functioning of the automobile depends on its being but one element within a large sociotechnical network. To function, it needs a road infrastructure with maintenance services, motorway operating companies, the automobile manufacturing industry, a network of garages and fuel distributors, specific taxes, driving schools, traffic rules, traffic police, roadworthiness testing centers, laws, etc. An automobile is thus at the center of a web of relations linking heterogeneous entities (Callon 2001, 63).

Hence, the notion of 'socio-technical' or 'hybrid network' is also at the center of ANT's account of technology. The network itself is an 'actor' because each one of its elements or 'actants' partakes in a collective action.⁴⁷ The agency of humans (what they can do) as well as their identity (as driver, mechanic, traffic officer, polluter, etc.) are defined by the network in which they are embedded.

When the driver turns the ignition key of a Nissan to go meet a friend on holiday at Lake Geneva, the driver not only starts up the engine, but also triggers a perfectly coordinated collective action. This action involves: the oil companies that refined the oil, distributed the petrol, and set up petrol stations; the engineers who designed the cylinders and valves; the machines and operators who assembled the vehicle; the workers who laid the concrete for the roads; the steel that withstands heat; the rubber of the tires that grip the wet road; the traffic lights that regulate the traffic flow, and so on. The automobile—and this is what defines it as a technical artifact—makes it possible, in a place and at a point in time, to use a large number of heterogeneous elements that silently and invisibly participate in the driver's transportation (Callon 2001, 63).

In this sense, ANT represents an original form of semiotics (Law 1999) for which the meaning and agency of any element is *materially*—and not only symbolically—dependent on the other elements in the network, so that the role a subatomic particle plays in a scientific theory is not separable from the particle accelerator that makes it 'visible', the scientists observing it, the peers reviewing the findings for publication, the funding agencies supporting the research, and so on.

⁴⁷ The term 'actant' is borrowed from A. J. Greimas's semiotics, which uses it to designate any element of a narrative that makes a difference for the unfolding of the plot. For ANT, the idea is that things, machines, cells, and the practices of scientists all take their meaning in and through their linkages to other actants within these hybrid networks. The strength of a scientific statement rests in the number of actants connected by the network.

Its pervasiveness and complex ramifications notwithstanding, this collective action is rarely conspicuous or visible in its operations. It works smoothly as long as it remains ‘black-boxed,’ to use a term that ANT authors conserve from STS. The careful and painstaking effort to unpack these black-boxes would be superfluous or redundant if the workings of technoscience, with all its virtues and sins, were simply there for all to see. In this respect, ANT joins a standard position in the social sciences: the assumption that there is a special knowledge to be gained from empirical investigation about the doings of technoscience that is not accessible to the laypeople. However, there is a major difference with the typical form this assumes in the critique of ideology, to name a prominent example—and one that shall resonate later on in chapter 6 in relation to Rancière’s critique of the position of the sociologist (Rancière 1999, 2004). It is not *detachment* from the social that delivers the insight, but full *immersion* in its workings (Latour 2007a). For present purposes, however, it might suffice to note that, for ANT, the vantage point enjoyed by the social analyst does not rest on reserved knowledge or superior enlightenment, but rather on her will to ‘follow the actors’ wherever they go.

How then can the building of networks that encompass such a wide array of actants be studied? ANT has provided two methodological solutions: to focus the inquiry on moments of *failure* and *constitution*. When incidents occur and black boxes burst open, failures make visible the role of actants. In the example of the automobile, “petrol transporters go on strike; war breaks out in the Middle East; a road collapses; taxes increase the price of petrol in a way considered unacceptable; environmental standards curb the use of internal combustion engines; a driver’s concentration flags; alloys tear because they are not resistant enough to corrosion; automobile bodies rip open on impact” (Callon 2001, 64). The other moment when collective action and “all

the negotiations and adjustments between human and nonhuman actants preceding the black-boxing” is visibly displayed is to be found in the constitution of a sociotechnical network, i.e. at the moment when technological artifacts are created and diffused (Law 1987). This latter methodological strategy, the most favored in the field, explains ANT’s penchant for studying ‘innovation.’

Further details of the empirical descriptions and analyses of the sociotechnical networks subtending the production and circulation of scientific facts and technological artifacts need not concern us here.⁴⁸ The preceding exposition should suffice to substantiate a basic point: the doings of technoscience cannot be ‘sociologized’ away. Conventional ‘social explanations’ in terms of interests or ideology fail to do justice to the expanded repertoire of actors comprising the agency of technoscience. The point is no longer that social forces that exist largely independently of scientific practices have a causal impact on these practices, as in standard STS accounts. We cannot presume to know the social better than the natural. Particular inflections of the modernist divide between pure technoscientific facts and artifacts, on the one hand, and the social and political quarrels of humans, on the other, should always be regarded as historical, contingent, and provisional, no matter how deeply entrenched they might seem. In other words, “as a *result* of processes taking place in networks, a scientific claim can eventually be developed about a distinction between the natural and the social, and consequently also about the function of the social for scientific practices” (Detel 2001, 14266), but this will always be an outcome of socio-technical agency, not its starting point (see also Pickering 1992). In lieu of the great

⁴⁸ These would at least include networks’ length, stability, and degree of heterogeneity (Callon 1992; Bowker and Star 1999), and the reformulation of the ‘micro’ versus ‘macro,’ and ‘agency’ versus ‘structure’ debates in social theory (Callon 2001, Latour 2007a).

modernist divide we find a hybrid reality made up of successive ‘translations’ between these heterogeneous actants.

Socio-technical agency

If the political insight to be derived from the constructivist moment in STS scholarship is the contestable character of expert claims, the lesson of ANT is less immediate but arguably more significant. Elaborating on the previous examination, my thesis in the remainder of this chapter is that ANT has articulated a substantial *reconceptualization of agency* and a *redefinition of the social*, both of which are indispensable for thinking about (human) political action in relation to technoscience today. On the one hand, ANT offers an account that punctures inflated accounts of the sovereignty of human action by giving due credit to the part played by non-humans in the construction of world and society. On the other, ANT yields a conception of ‘the social’ that highlights its ongoing, ‘rhizomatic,’ and open-ended character. Moreover, I show that both contributions serve to problematize certain strategic claims in Arendt’s work. I address the reconceptualization of agency in the present section, and the redefinition of the social in the following one.

Technoscience, according to this account, is very much a question of ‘acting in concert.’ Scientific ‘facts’ are viewed as resulting from heterogeneous networks whose components are made to act as if they are in agreement, and artifacts or machines as networks of components made to act together so as to achieve a consistent effect. Hence, the repertoire of actors extends beyond humans to include atoms, microbes, cells, viruses, microscopes, instruments, computers, printouts, scientific papers, etc. For this peculiarly ‘post-humanist’ field, agency is redistributed

and granted to any entity that makes a difference in the process of black-boxing scientific claims and technological artifacts.

In response to criticisms of the postulate of symmetry between humans and non-humans coming from inside the STS community (Collins and Yearley 1992), Michel Callon has been adamant that “[for] ANT this principle of symmetry is not a metaphysical assertion but a methodological choice which facilitates the empirical study of the different modalities of agency, from strategic to machine-like action. In all cases, agency is considered to be distributed and the forms it takes are linked to the configuration of sociotechnical networks” (Callon 2001, 65). The acknowledgment of hitherto invisible actors engaged in this ongoing process of construction sets ANT apart from mainstream approaches in social theory—such as social phenomenology and ethnomethodology—that give too much credit to human agents. ANT shares with the latter the principle that society must be composed, assembled, and maintained. The basic but consequential difference, however, is the role ANT assigns to non-humans in this construction work. By (in)famously expanding the repertoire of entities partaking in the agency of technoscience, an argument that was originally intended to sustain novel descriptions of technoscience soon became the basis for a wholesale reformulation of social theory.

What about the role of *power* in this account of agency? Briefly stated, power is the ability to capitalize on the extension and strength of socio-technical networks. As such, it is present in the black-boxing of scientific claims as well as in the connections between the laboratory and the rest of society. In the first instance, the more ‘allies’ enrolled and aligned into a stabilized network, the less likely it is that dissenters will succeed in disentangling the actants and thus contesting the validity of a claim. This is a markedly managerial account of knowledge-

making that portrays scientists as Machiavellian actors with a special ability to successfully recruit all kinds of entities in order to stabilize or black-box statements and artifacts. Indeed, for ANT power is the ability to articulate and maintain such networks, as the example of Pasteur, who enrolled a wide array of actants (including the hygienist movement, farmers, laboratories, microbes, and so on), aptly illustrates (Latour 1988a). Such distributed agency is far from implying a fraternal community. In order to ‘raise worlds’ with the help of the laboratory, scientists partake in strategic plots and maneuvering to vanquish enemies (in Pasteur’s case, the medical community). In the words of one commentator, despite “his widespread distribution of sovereignty among countless actors, Latour in his early period remains committed to something like a Hobbesian ‘war of all against all,’ or a Nietzschean duel of centers of power in which each tries to master the others without appeal to any higher authority. This is the grain of truth in the charges that for Latour, ‘might makes right’” (Harman 2014, 31).

From a macro perspective, ANT theorizes power relations in terms of observable asymmetries between ‘localities’ in terms of their capacity to connect and mobilize actants. The concept of ‘translation centers’ was coined to designate places where inscriptions and statements converge, providing access to many distant and heterogeneous (i.e. human and non-human) entities to which the action decided in the translation center is delegated. “On the basis of the reports and results of experiments it receives, a government can, for example, decide to limit CO₂ emissions from cars to a certain level. As a translation center it is in a position to establish this connection between the functioning of engines and the state of pollution or global warming. It sees entities and relations that no one else can see or assemble” (Callon 2001, 65). Ultimately, then, agency is collective and distributed, but the mobilization of participating actants is steered

from localities where power is concentrated. “Just as the motorist sets in motion a whole sociotechnical network by turning the ignition key, so the minister for the environment sets in motion an elaborately constructed and adjusted network by deciding to fight pollution” (Callon 2001, 65). Thus, asymmetries of power are accounted for in terms of an unequally distributed ability to summon vast socio-technical networks. In a sense, when we take sociotechnical networks seriously, the question of sovereignty vanishes because agency is so extensively redistributed. Some have more power than others to articulate sociotechnical networks, but no one can claim total control.

This shaping and hybridization of nature, world, and society, I contend, is what makes science and technology politically significant. At stake in technoscience is a form of human agency that reaches beyond itself, overflowing, disturbing, and reconfiguring the givens of nature, the things of the world, and the identities that make up the social. In Latourian vernacular,

Not only are other scientists, bits of nature or empirical data enlisted and regimented, but also political bodies, protest movements, the media, laws and *hoi polloi*. When Louis Pasteur transformed French society by linking together microbes, anthrax, microscopes, laboratories, sick livestock, angry farmers, nervous Parisian milk-drinkers, public health officials, lawmakers, and journalists into what becomes a ‘momentous discovery,’ the boundary between science and the rest of society is impossible to locate (Gieryn 2001, 13696).

I dwell on this issue because this notion of agency as ‘construction’, ‘composition,’ or ‘constitution’ of socio-technical networks is the kernel of ANT’s recent account of politics.⁴⁹ And the major artificers of this ongoing process are located in laboratories, not in “politics as

⁴⁹ See Callon (2001); Callon et al. (2009); and Latour (2004a, 2004c, 2007a, 2007b). For a dissenting view see (Law 2009).

conventionally understood.” In Bruno Latour's Clausewitzian formulation: “science is politics pursued by other means” (Latour 1983). I will examine the implications of this view of politics in Chapter 7. For now I wish to establish a connection between this redistribution of agency and the work of Arendt.

The symmetrical role granted to humans and non-humans in the powerful agency of socio-technical networks marks a point of connection and disconnection between STS-ANT and Arendt's work. As I argued in Chapter 1, the power of the world to gather people together, ‘to relate and to separate them,’ rests on the existence of worldly, tangible, and durable things. At stake in politics is the transformation of what would otherwise remain “a heap of unrelated articles, a non-world” (Arendt 1998, 9),⁵⁰ into a *common world*. The problem with mass society, she thought, was that the world had lost its power to gather people together, to constitute the ‘objective in-between’ that relates and separates them.⁵¹ The measure of Arendt's idiosyncratic humanism is to be found in her observation that “world alienation, and not self-alienation as Marx thought, has been the hallmark of the modern age” (254).⁵² Indeed, her main concern was the world, and not the human self, for the simple reason that a wordless human life is not a truly human one. This paradox of a world-centered humanism is central to her thinking.

⁵⁰ On the world as a mere ‘heap’ of unrelated things see also Arendt (1998: 109, 124, 204).

⁵¹ In a thought-provoking passage, she writes that “The weirdness of this situation resembles a spiritualistic séance where a number of people gathered around a table might suddenly, through some magic trick, see the table vanish from their midst, so that two persons sitting opposite each other were no longer separated but also would be entirely unrelated to each other by anything tangible” (53).

⁵² “The greatness of Max Weber's discovery about the origins of capitalism lay precisely in his demonstration that an enormous, strictly mundane activity is possible without any care for or enjoyment of the world whatever, an activity whose deepest motivation, on the contrary, is worry and care about the self” (254).

In front-staging the ‘thing-character’ of the world as a major aspect of the human condition, Arendt does for political theory what ANT has done for social theory. The prominent place ANT gives to nonhuman ‘things’ in conditioning human life arguably resembles Arendt’s *amor mundi*. But it complicates it as well, for ‘things’ turn out to be more than durable objects with the capacity to gather humans around them. We learn from ANT that things are more than just ‘occasions’ for world- and self-disclosure. Their agential capacities are surely different from those related to human ‘natality,’ but things possess a recalcitrance that usually can interfere with the unfolding of human actions and plans. Non-human actants explain the unpredictability and uncertainty of human action no less than the agency of other humans, simply because human agency is inextricably linked to nonhuman elements. Arendt herself seems to have been aware of this more complex estimation of things when she alluded to human outbreaks of antibiotic resistant pathogenic disease in *The Human Condition*. “Those small living organisms which we fought with antibiotics and which mysteriously have developed new strains to resist us” (Arendt 1998, 323), I would claim, ought to be regarded as part and parcel of the human condition.

In this sense, the redistribution of agency and the role granted to non-human actants curtails the sovereignty of human action. As I indicated in the previous chapter, Arendt rejects the identification of freedom and sovereignty because human actions are inserted in a ‘web of *human relations*’ conditioned by human plurality. By acting we begin something new, we enact a new story, but we are not able to control or even foretell the course of its unfolding, its consequences and overflowings. ANT’s account of agency is well suited to reinforce this fundamental argument by embedding that *human web* within the socio-technical networks articulated through science and technology.

Conversely, Arendt's arguments about the uncertainties and fragility of human action would do ANT a great service by curbing its tendency to portray scientific agency in managerial (i.e. sovereign) terms, as in Latour's praise of scientists' ability to "raise the world with the means of the laboratory" (Latour 1983). In this respect, Arendt would retort that that the mere tangibility and durability of the human artifice (and in the end this is what a sociotechnical network is) do not constitute a *world*. A public space and a common language is required. Furthermore, the concept of power examined above displays an ambivalent character, emphasizing the mutual dependence of actants in the network, but also the unequal distribution of power among different localities and actors. Ultimately, we are faced with a productive tension between proliferations of agency linked to the theoretical extension of the repertoire of actors, which allows for inscriptions to accumulate and combine in unexpected ways, and an empirically-grounded deflationist account of human sovereignty.

Thinking the social otherwise

Alongside ANT's reconceptualization of agency, its further contribution to political theory is its novel conception of 'the social.' The claim that science is a *social* affair remains true on condition that we update our conventional notions of 'the social.' As Bruno Latour (2007a) has insisted, we need to return to the original meaning of 'social' as pertaining to *associations* between things, human and non-human alike. And since these associations are always "temporary and evolving," ANT scholarship abandons conceptions of 'society' as a reality that is always already constituted, constraining actions and fixing identities. Instead, it articulates a social ontology in which 'society' is not that 'given' invoked to explain and account for *other*,

supposedly non-social things like science, but an ongoing and persistently reconfigured achievement which itself stands in need of rigorous analysis. “ANT is an attempt to provide analytical tools for explaining the very process by which society is constantly reconfigured,” and is distinguished from other constructivist approaches by an “explanation of society in the making in which science and technology play a key part” (Callon 2001, 62).

Thus, ANT exhibits both continuities and ruptures with STS and the laboratory studies from which it emerged. Like its predecessor, it strives to provide empirically informed explanations for the production, validity, efficacy, and diffusion of scientific facts and technological artifacts. It rests, however, on a stern rejection of simplistic social explanations, particularly those that reduce scientific facts to the interests and ideologies that shape their construction or see technological artifacts merely as the material embodiment of power relations. “Providing a social explanation [according to mainstream social science] means that someone is able in the end to replace some object pertaining to nature by another one pertaining to society, which can be demonstrated to be its true substance” (Latour 2000, 109). By contrast, the key to assess many contributions of ANT is the acknowledgment that dissolving nature and science into society is no better than the modernist view that takes them to be wholly separate. Put polemically: *the social explains nothing*.⁵³ It is the social itself that has to be described and explained by attending to the process of its ‘constitution.’

But why should any theory of the social be relevant for political theory, let alone one coming from arcane empirical investigations of scientific practice? An invocation of the merits

⁵³ The most famous token of this break with early science studies is the dropping out of the word ‘social’ from the original title of Latour and Woolgar’s highly influential *Laboratory Life: The Social Construction of Scientific Facts* ([1979] 1986).

of interdisciplinary work is arguably not enough to justify the prominent place I have given to this branch of social science.

My basic claim in this respect is that political theory should always be elaborated through a continuous dialogue with social theory in order to test and enhance its analytical, interpretive, and critical power. When this is done explicitly, the dialogue takes the form of polemical opposition, in the sense that accounts of the political are substantially defined in contraposition to what is taken as social. Indeed, certain forms of political theorization and the most prominent strands of social theory are very much incompatible and mutually recalcitrant.

At the risk of simplifying things,⁵⁴ a contrast can be made between political theory's tendency to focus on the *extraordinary* and *transient*, and social theory's penchant for uncovering the mechanisms of the *predictable* and *stable*. Indeed, whereas political action is usually characterized as unpredictable, exceptional, uncertain, disruptive, and transforming, the workings of society tend to be depicted by sociologists as largely fixed, routine-like, predictable, structural, amenable to mathematical modeling, constraining, and even oppressive. The point I want to make here is that forms of political theorization that insist on the untimeliness of politics are usually articulated against the background of well-ordered pictures of the social that render unexpected actions invisible or reduced to marginal 'statistical significance.' Far from being an accessory element, this confrontation enriches political reflection.

⁵⁴ What follows is not intended as an exhaustive account of the complex relation between 'the political' and 'the social,' a topic that has accompanied political theory since the 19th century. My modest purpose is to show that political theory, and democratic theory in particular, is not independent from particular accounts of the social. Note that the opposition is between political theory and social *theory*; not (conventional) social *science*. The latter contrast been made at least at least since Sheldon Wolin's "Political Theory as a Vocation" positioned its specificity against the hegemonic view of social and political science engendered with the behavioral revolution of the 1960s (Wolin 1969).

There is in the social sciences a broadly shared account of the social world as a realm particularly impervious or even hostile to the novelty and disruption we associate with political agency. As Samuel Chambers observes in his book on Rancière, the social sciences join ‘liberal political theory’ (as he finds it expressed in Locke’s theory of limited government) in its aversion to surprises (Chambers 2013). “The liberal commitment to *order*, to structure, to a certain form of hierarchy, and above all to the idea of political stability” shares common ground with the social sciences’ peculiar mode of achieving order, namely, “the attempt to measure social and political life, to quantify it, to ‘operationalize’ ideas, concepts, or phenomena so that they can become ‘variables’” (6). Surprises and anything outside this ‘grid of intelligibility’ are not only eschewed but also eliminated by liberals and sociologists alike, rendering “real novelty a structural impossibility” (7) .

Thus, Rancière sees the social sciences and the ‘reign of the opinion poll’ as actively engaged in suffocating the appearance of democratic subjects: “Political science[’s] ... axiom is that nothing is ever truly surprising.”⁵⁵ A similar hostility can be found in Arendt’s few but telling observations about the social sciences. “To gauge the extent of society’s victory in the modern age, its early substitution of behavior for action ... it may be well to recall that its initial science of economics, which substitutes patterns of behavior only in this rather limited field of human activity, was finally followed by the all-comprehensive pretension of the social sciences

⁵⁵ Quoted in (Chambers 2013, 8)

which, as ‘behavioral sciences,’ aim to reduce man as a whole, in all his activities, to the level of a conditioned and behaving animal” (Arendt 1998, 45).⁵⁶

This mode of theorizing the social resonates in different modulations across otherwise divergent approaches in social theory,⁵⁷ but the most influential sociological theorization of the unlikelihood of transformative (political) action is to be found in Pierre Bourdieu’s theory of practice (Bourdieu 1987, 1990), which seeks above all to explain *regularities* in social life and the perpetuation of social differences in the distribution of economic, social, and cultural capital.⁵⁸ Throughout an impressive corpus encompassing abstract social theory and empirically grounded analyses of different social ‘fields’ like education, politics, literature, religion, and sports, Bourdieu’s sociology seeks to demonstrate that people’s actions, preferences, and taste are highly constrained by their location in the space of capital distribution and the *habitus* or system of dispositions structured by that position. As a rule, the movements in ‘social space’ available for any individual, group, or class are those congruent with these objective positions and subjective dispositions. From life plans and educational credentials to political and cultural

⁵⁶ As Arendt argues in *The Human Condition*, “The laws of statistics are valid only where large numbers or long periods are involved, and acts or events can statistically appear only as deviations or fluctuations. The justification of statistics is that deeds and events are rare occurrences in everyday life and in history. Yet the meaningfulness of everyday relationships is disclosed not in everyday life but in rare deeds, just as the significance of a historical period shows itself only in the few events that illuminate it” (Arendt 1998, 42).

⁵⁷ For instance, Althusser’s famous analysis of ideology was meant to explain the reproduction of ‘social formations’; the fact that capitalist social relations persist despite rampant class exploitation (Althusser 1971). Similarly, albeit from ostensibly opposite political sensibilities, the structural-functionalism of Parsonian sociology set out to account for the stability and smooth operation of social systems by reference to shared cultural norms.

⁵⁸ In an interview conducted shortly before his death (Carles 2002) Bourdieu declared that he was drawn to social analysis in the 1960s by his acknowledgment that society was not, as the mood of the times reflected, in a permanent state of transformation. As he showed in his studies of the French school system, inequalities persisted, although the logic of their reproduction had changed with the increasing importance of cultural and symbolic forms of capital. *Plus ça change plus c'est la meme chose*.

preferences, people's practices and accomplishments are a predictable result of the way society functions to reproduce its structures of domination. Everybody acts according to 'the causality of the probable.' Stepping outside one's own *habitus* may not be impossible—as Bourdieu's own biography indicates—but it certainly goes against social odds. Circumscribed and constrained by their structural position *and* its corresponding subjective expectations and dispositions, people are assigned a relatively fixed place in the social that sets the horizon of possibilities for their agency.

Bourdieu's sociology is relevant here because it stands as the fulcrum against which Jacques Rancière articulates his account of the specificity of politics (a gesture, incidentally, recently replicated by Bruno Latour).⁵⁹ Rancière's polemic against Bourdieusian sociology took shape in the 1980s, but it also informs the outlook of his later and more explicitly political works.⁶⁰ His account of political subjectification in *Disagreement* can be read as an attempt to rescue political theorization from the progressive trap of Bourdieu's social critique, and a token of the importance of this particular polemic is Rancière's claim that sociology has replaced (Platonic) political philosophy as the body of knowledge best suited to enforce contemporary police regimes (Rancière 1999, 91-93). My claim is that Rancière's approach to the specificity and exceptional character of political action reveals its contours and stakes much more clearly when read against accounts of the social for which disruptive forms of agency constitute a theoretical blind spot. If Bourdieu's social theory puts every actor in its place in social space in

⁵⁹ For Latour's rant against 'critical' sociology, particularly Bourdieu's, see (Latour 2007a).

⁶⁰ See Rancière 2004. As Kristin Ross shows in her introduction to Rancière's *The Ignorant Schoolmaster* (1991), the book was meant as an intervention in French debates about public education, in which the sociology of Bourdieu played a prominent role.

order to confirm the predictability of her doings and the resilience of her behavioral dispositions, Rancière's work is about theorizing forms of emancipation defined precisely by people's break with their *habitus*; their refusal to remain in their socially sanctioned place and their willingness to engage in forms of action that disrupt extant distributions of places and roles. Just as Arendt defined her views about political action in opposition to the behavioral sciences that accompanied 'the rise of the social,' so Rancière's account of politics reveals its specificity against the background of dominant forms of social theory.

Now the question is: does 'Actor-Network Theory' represent another version of sociology's anti-political penchant? From a certain perspective, the answer would seem to be affirmative. Socio-technical networks can be oppressive, their rhizomatic fluidity notwithstanding. A network, after all, determines the place and functions of the actants enrolled in it. As one observer puts it, "once a network has been established it implies a sort of closure that prevents other actors or relations from entering the network.... Establishing a scientific belief, theory, or facts comes down, from the point of view of the actor-network theory, to placing these actors in a stable network" (Detel 2001, 14265). The metaphor of the 'black-box' would also seem to justify this view. However, black-boxes can be opened, and once we adopt ANT's constructivist perspective their process of constitution can be traced and denaturalized. Furthermore, if we look at these networks with Arendtian eyes and factor in the unpredictability and uncertainty of action, the oppressive aspect loses much of its force. It could still be retorted that the very complexity of technoscientific networks and the huge amounts of work invested in its composition yield a rather intimidating picture likely to discourage political forms of intervention from the outside. Although there is some truth to this claim, and most people would

prefer to ‘stick to their own business’ instead of engaging the doings of technoscience, the fact is that a robust and naturalistic depiction of science and technology ‘in action’ could also be regarded as a resource for democratic participation. As I will show in Part III, successful examples of lay engagement in scientific controversies are premised on a thorough understanding of the contents of expert scientific knowledge *and* its modes of agency (such as the recruitment of allies, funding, the details of scientific practice, and so on).

To further substantiate my claim about the provisional, contingent, and open-ended character of sociotechnical networking let us briefly turn to Michel Callon’s notion of overflowing, which he introduced to buttress his claim that technoscience proliferates the social by reshaping extant identities and fostering the emergence of new ones (Callon 1998a, 1998b). Inadvertently echoing Arendt’s insistence on the non-sovereign character of action, Callon emphasizes the calculable but ultimately unruly consequences that technoscientific agency introduces beyond the laboratory and the intentions of scientists and technologists.

He uses this concept to refigure what economists call ‘externalities.’ An overflow (*débordement*) is something that exceeds the ‘framing’ of normal calculations established by technical practices and forms of knowledge. A situation becomes calculable when it has been framed.⁶¹ Overflows, for their part, exist outside any given framing (which is always engaged in the identification and containment of these overflows), exceeding what is taken into account.⁶²

⁶¹ “No calculation is possible without this framing which allows one to provide a clear list of the entities, states of the world, possible actions and expected outcomes of these actions” (Callon 1998a, 19).

⁶² In a commentary on Callon, Andrew Barry gives the example of urban pollution caused by cars: “All the effects of a car purchase on noise, the safety of children, on local levels of carbon monoxide and ozone and on global warming are simply not taken into account when a car is purchased—or at least they are unlikely to be taken into account in the transaction between the buyer and the seller” (Barry 2002, 272).

The crucial insight here is that whereas economists take framing to be the norm and see overflows as leaks, ANT constructivism adopts the opposite stance: “that overflowing is the rule; that framing... is a rare and expensive outcome” (Callon 1998b, 252). Drawing on Karl Polanyi's (1975) and Mark Granovetter's (1985) notion of ‘embeddedness’, again in a way that echoes Arendt’s analysis of the ‘web of human relationships’ and the non-sovereignty of action, Callon argues that overflows are the norm because human action is always embedded action:

the objectives, intentions, interests and projects of a given actor, and indeed his or her will, are not simply a set of attributes that define his or her own personal identity which the actor could simply by intellectual application, access or express—even unconsciously—if she or he were given the opportunity.... Nor are they the result of values, norms or institutions which reduce the actor to the status of the ‘cultural dope’ so justifiably ridiculed by Garfinkel. In fact, they cannot be dissociated from the network of interdependencies in which the actor is enmeshed and to which he or she is continuously contributing.... In short, the actor’s ontology is variable: his or her objectives, interests, will and thus identity are caught up in a process of continual reconfiguration, a process that is intimately related to the constant reconfiguration of the network of interaction in which he or she is involved (Callon 1998b, 252-3).

I will have occasion to revisit this question of overflows in subsequent chapters.⁶³ My aim here has been to show that ‘Actor-Network Theory’ performs a marked and explicit break away from conventional forms of social analysis like that of Bourdieu (Latour 2007a). This particular theory yields a notion of the social that differs from the ones that theorists like Arendt and Rancière criticize in order to mark the specificity of politics. ANT is not a sociology concerned with stratification, fixed roles, and class determination, but one that remains attentive to the constant proliferation and reconfiguration of the social, buttressing reflection about inventive forms of

⁶³ In the next chapter I will formulate the question of framing and overflows in human speech, and in Chapter 7 I will turn to the ways in which ANT has tackled the relation between overflowing and the creation of political spaces for the demonstration and democratic processing of overflows.

politics instead of stifling their untimely appearance through appeals to functional requirements, structural rigidity, the reproduction of capital, or good old-fashioned false consciousness.

Finally, ANT's portrayal of the social is also reflected in its disciplinary outlook, marked by its contrast with the kind of constraining theoretical systems so common in modern and contemporary social theory. This is not a 'theory' that one can 'apply' to any particular field of research in order to make sense of collected empirical data and/or fulfill the conventional but rarely significant 'theoretical section' of academic publications (Latour 2007a, 141-156). The theory of the social that emerged from the laboratory studies of the early 1980s is not a ready-made set of commitments and concepts, but an inspirational framework for the formulation of novel questions about the social and its modes of agency. Although many of its basic tenets are sometimes phrased in the language of social ontology or even metaphysics (Latour 1988a, 2004a; Harman 2009), ANT's uptake on such issues is mainly methodological. The *gestalt* switch performed by ANT is largely an invitation to see social things in different and unexpected ways, and to see different and unexpected things as social. Viewed from this perspective, the major distinctions governing social theory (agency/structure, micro/macro, nature/society, science/politics, facts/values, and subject/object) reveal their contingent, historical, and variable character. For this very reason, and much like its object of study, ANT remains "an open building site" (Callon 2001, 65), a solid and ever-expanding conceptual corpus, not a finished and closed construction (Law and Hassard 1999, Lee and Brown 1994, Mol and Law 1994).

Thinking What We Are Doing Without Having Been Modern

At stake in the agency of technoscience is a problematization of the distinction between nature and its science, on the one hand, and society with its politics, on the other. As Arendt observed, modern scientists can only know that which they themselves have made. Thus, the general claim that the building of socio-technical networks involved in the process of securing facts and artifacts transforms nature, world, and society, and the related de-centering of human action in favor of non-human actants, display an interesting convergence between ANT's web-like account of socio-technical networking and Arendt's account of the agency of technoscience.⁶⁴ The two, I contend, can be mutually enriched. Latour's conclusion in his path-breaking study of the 'pasteurization' of French society—a scientific feat that blurred the boundaries between the laboratory and its outside, and forever changed the physiognomy of world and society—echoes Arendt's basic insight on this question no less than Winner's or Beck's: "in our modern societies most of the really fresh power comes from sciences ... and not from the classical political process" (Latour 1983, 168). In this sense, ANT not only serves to persuade us of the importance of Arendt's prescient but largely disregarded call to take very seriously the doings of technoscience in the contemporary world. More importantly, a turn to ANT can challenge and also enrich an Arendtian approach by updating the terms of its formulation. This is why I have engaged what might seem a specialist and arcane literature far removed from the concerns of political reflection. Conversely, Arendt's peculiar awareness of the political significance of the technoscientific blurring of boundaries between nature and the 'human world' can help

⁶⁴ To my knowledge, this connection has not been investigated in STS or political theory.

illuminate the specific political saliency of a research program in the social sciences still in search of its political vocation.

At the end of the previous chapter I argued that Arendt's invitation to think what we are doing Arendt was premised on her conviction that our inherited conceptual categories had lost much of their validity, meaningfulness, and capacity to orient action. The worst thing we could do was to cling to habits of thought that no longer correspond to our most important experiences. The trouble, in other words, pointed to what Arendt took to be a peculiar phenomenon of modern times, and which she would encounter again, albeit in different form, in the trial of Adolf Eichmann, namely: *thoughtlessness*, or "the heedless recklessness or hopeless confusion or complacent repetition of 'truths' which have become trivial and empty" (5).

In the wake of STS and ANT studies, Bruno Latour in particular has opened a path for beginning to make sense of the situation which Arendt envisaged in terms of the crisis of the concepts and distinctions deployed in *The Human Condition*. In *We Have Never Been Modern* (Latour 1993) he makes a similar gesture in relation to what he calls our modernist ways of conceptualizing what we do (and have always been doing) in practice. The argument is important and merits some discussion as a way of framing our return to ANT in chapter 7, where the question shall be about the political responses and inventions that have emerged in relation to technoscientific agency.

Latour begins wondering how is it that people keep dividing reality into two distinct realms, humans-society-politics and nonhumans-nature-science, when all we see and read about evinces their ceaseless entanglements. A brief look at the newspaper show that "[a]ll of culture

and all of nature get churned up again every day” (Latour 1993, 2). Latour's vivid depiction merits extensive quotation:

On page four of my daily newspaper, I learn that the measurements taken above the Antarctic are not good this year: the hole in the ozone layer is growing ominously larger. Reading on, I turn from upper-atmosphere chemists to Chief Executive Officers of Atochem and Monsanto, companies that are modifying their assembly lines in order to replace the innocent chlorofluorocarbons, accused of crimes against the ecosphere. A few paragraphs later, I come across heads of state of major industrialized countries who are getting involved with chemistry, refrigerators, aerosols and inert gases. But at the end of the article, I discover that the meteorologists don't agree with the chemists; they're talking about cyclical fluctuations unrelated to human activity. ... Toward the bottom of the page, Third World countries and ecologists add their grain of salt and talk about international treaties, moratoriums, the rights of future generations, and the right to development. The same article mixes together chemical reactions and political reactions. ... On page eight, there is a story about computers and chips controlled by the Japanese; on page nine, about the right to keep frozen embryos; on page ten, about a forest burning, its columns of smoke carrying off rare species that some naturalists would like to protect; on page eleven, there are whales wearing collars fitted with radio tracking devices; also on page eleven, there is a slag heap in northern France, a symbol of the exploitation of workers, that has just been classified as an ecological preserve because of the rare flora it has been fostering! On page twelve, the Pope, French bishops, Monsanto, the Fallopian tubes, and Texas fundamentalists gather in a strange cohort around a single contraceptive. (Latour 1993, 1-2)

No matter how conspicuous this proliferation of ‘quasi-objects’⁶⁵ or hybrids is, nobody seems troubled by the fact that the same newspaper sticks to headings like “Economy, Politics, Science, Books, Culture, Religion and Local Events” (2), that everybody insists on separating nature, science and knowledge of things from society, power, and human politics. In point of fact, “[t]he smallest AIDS virus takes you from sex to the unconscious, then to Africa, tissue cultures, DNA and San Francisco, but the analysts, thinkers, journalists and decision-makers will slice the

⁶⁵ Latour uses the term ‘quasi-object,’ which he borrowed from his mentor Michel Serres (Latour 1993, 51), as synonymous with ‘hybrid,’ and later also with ‘matters of concern’ (a concept we shall examine in chapter 7).

delicate network traced by the virus for you into tidy compartments where you will find only science, only economy, only social phenomena, only local news, only sentiment, only sex” (2).

Indeed, the ‘modern Constitution’—Latour’s name for the tacitly agreed upon divisions between human and nonhumans, power and knowledge, politics and science we deploy to make sense of what we do—holds sway in our collective imaginary. The imbrogios analysed in STS and ANT are everywhere active, but they do not appear as such in public life and discourse. Somehow we have managed to do one thing and say another; to separate one set of practices that “by ‘translation,’ creates mixtures between entirely new types of beings, hybrids of nature and culture” from another set which, “by ‘purification’, creates two entirely distinct ontological zones: that of human beings on the one hand; that of nonhumans on the other” (10-11).

At this point Latour makes the very clever argument that it is precisely this obstinacy that has made it possible for such a proliferation to continue unabated. “Without the first set, the practices of purification would be fruitless or pointless. Without the second, the work of translation would be slowed down, limited, or even ruled out” (Latour 1993, 11). It is precisely because we refuse to let our theories reflect the imbrogios of our practice that hybridization has proliferated like never before in ‘modern’ times. In Latour’s words, “*the modern Constitution allows the expanded proliferation of the hybrids whose existence, whose very possibility, it denies*” by refusing to conceptualize them as such (34, emphasis in the original). “Modernism was not an illusion, but an active performing” (144).

This trick is what separates us ‘moderns’ from so-called ‘pre-moderns,’ continues Latour, since every other culture knows very well that what is done to nature has repercussions in society, and viceversa. The more people think about the entanglements of nature, culture, science

and politics, the more they refrain from ‘innovating’ and risking the emergence of socio-technical networks with unforeseen overflows: “those who think the most about hybrids circumscribe them as much as possible, whereas those who choose to ignore them by insulating them from any dangerous consequences develop them to the utmost” (41). This, and no other, according to Latour, is the difference between the West and the rest. And we ourselves have never been modern because life on this planet has always been the imbroglia ANT scholars have, as it were, uncovered.

The question is not that hybrids are a recent phenomenon unknown to times past. The difference, what makes moderns so special, is the scale, extension, and sheer number of actants implicated in the sociotechnical networks spawned under the auspices of the modern Constitution. Although the “greatness” and “strength” of this Constitution is “the proliferation of quasi-objects and the multiplication of intermediaries between humans and nonhumans allowed by the absolute distinction between humans and nonhumans” (Latour 1993, 131), we have reached a point, writes Latour in the early 1990s, in which the work of purification is becoming less and less plausible, and the contradiction between what we do and how we think about it more and more visible—even in the pages of newspaper still framed by the terms of the modern Constitution. Latour singles out two events of 1989, “the year of miracles,” which announced the bankruptcy of the bifurcation between society and nature: the failure of socialism in its political attempt to end the domination of man by man, symbolized by the fall of the Berlin Wall; and the failure of ‘naturalism’—the technological and scientific attempt to replace domination by nature with domination of nature—evinced by the ecological crisis and reports of world famine addressed at the first conferences held that year in London, Paris, and Amsterdam on the global

state of the planet. A sense of urgency colors Latour's diagnosis: "There are so many hybrids that no one knows any longer how to lodge them in the old promised land of modernity" (131). The time has finally come, Latour believed, for everybody to catch up with ANT's discoveries and "stop having been modern" and become "retrospectively aware that the two sets of practices [translation and purification] have always already been at work in the historical period that is ending" (11).

Of utmost importance for the arguments I will deploy in chapter 7 is Latour's theorization of this situation as one in which the proliferation of hybrids has run amok in the absence of a public life capable of stabilizing, tracing, and composing our sociotechnical imbroglios. By rendering mixtures unthinkable... the moderns allowed the practice of mediation to recombine all possible monsters without letting them have any effect on the social fabric, or even any contact with it. Bizarre as these monsters may be, they posed no problem because *they did not exist publicly* and because their monstrous consequences remained untraceable" (42, my emphasis). By denying its existence and insisting on purification, the old Constitution allowed too much space of manoeuvre for the proliferation of hybrids.

We need a new Constitution, Latour claims, to manage the proliferation of hybrids in a more deliberate, accountable, traceable, and most importantly, non-modern. The common world is being forged without 'due process,' to use an expression Latour would later introduce in his *Politics of Nature* (Latour 2004a). There he would restate the hypothesis he ventured in *We Have Never Been Modern*, namely, that "we are going to have to slow down, reorient and regulate the proliferation of monsters by representing their existence officially. Will a different democracy become necessary? A democracy extended to things?" (Latour 1993, 12) More pointedly:

We want the meticulous sorting of quasi-objects to become possible—no longer unofficially and under the table, but officially and in broad daylight. In this desire to bring to light, to incorporate into language, to make public, we continue to identify with the intuition of the Enlightenment. (Latour 1993, 142)

Towards the end of the book Latour introduces for the first time the conceptual metaphor of a ‘Parliament of Things’ as quasi-sovereign and arguably global body where hybrids become public things, their translations and mediations are brought to light, and the collective decides on what hybrids are to be held as common to all. “In its confines,” he speculates, “the continuity of the collective is reconfigured. There are no more naked truths, but there are no more naked citizens, either. The mediators have the whole space to themselves. The Enlightenment has a dwelling-place at last. Natures are present, but with their representatives, scientists who speak in their name. Societies are present, but with the objects that have been serving as their ballast from time immemorial” (144). Importantly, and in line with the overall argument about never having been moderns, Latour claims that no revolution is needed; only the ratification of what we have always done. What is crucial is that everybody—scientists, politicians, citizens— be “talking about the same thing, about a quasi-object they have all created” (144).

Latour closes his landmark essay with a nagging question:

Is it asking too little simply to ratify in public what is already happening? Should we not strive for more glamorous and more revolutionary programmes of action, rather than underlining what is already dimly discernible in the shared practices of scientists, politicians, consumers, industrialists and citizens when they engage in the numerous sociotechnological controversies we read about daily in our newspapers?

No, because the promise of the new Constitution is not to stop the proliferation of hybrids (that would make of Latour a pre-modern, or worse, a reactionary). A new Constitution is likely to continue the work of proliferation, “but,” he contends, “it will produce different hybrids” (Latour

1993, 144), that is, public things around which publics can form and gather to discuss the contours of the world they all share. It is this concern with making hybrids public, with turning what is ready-to-hand into present-at-hand things (to return to my Heideggerean formulation), that would animate the work of Latour in the following decades. This preoccupation with how the world looks once we see it for what it is or what we have made of it dovetails with Arendt's *amor mundi*. It is here that we find the strongest connection with her thought, and also with my own arguments.

Politics is about transforming the things that *condition* our existence—including the deeds, things, and gadgets of technoscience—into things we have *in common*, into objects of agreement and disagreement around which the commonality of the world is disputed by subjects who thereby—and only thereby—reveal to one another their unique and plural identities.

As we move to the next chapter, it is important to acknowledge that the main limit to the convergence between ANT and Arendt's political theorization is that the former's front-staging of things brings with it a de-centering of human *speech*. This disconnection between ANT and Arendt (or Rancière) extends to political theory in general. Political theory would arguably cease to exist as we know it if language, discourse, and communication lost their prominent theoretical status. But, more importantly, so would politics itself. Although language does play a role in STS and ANT accounts of technoscience as a world-building enterprise, it is a marginal one. The connection between words and things contained in ANT's 'inscriptions' circumscribes and fixes the meaning of words according to the requirements of networks. Inscriptions, that is, contain simultaneously a statement and the account made of that statement. With this in mind, the next chapter is devoted to speech and its relation to scientific expertise in the public realm.

3. FRAMING

There are more things in heaven and earth than are dreamt of in policymakers' philosophies.

Sheila Jasanoff

By the late 1970s, Arendt's unease about the prospects of public conversation about the doings of science and technology was echoed, among others, by Langdon Winner, who declared that a whole new order was being built with scant public awareness or opportunity to dispute the changes underway. "It is somnambulism (rather than determinism) that characterizes technological politics.... *Silence is its distinctive mode of speech*" (Winner 1977, 324, my emphasis).

Such perspectives, however, appear to be at odds with contemporary experience, in particular with the widely announced 'participatory turn' (Jasanoff 2003) towards new forms of 'public engagement with science' (or PES).⁶⁶ Since the late 1990s, most prominently in the European context but also in the US and elsewhere, public 'participation' has become an important and almost routinized aspect in the governance of technoscience (Hagendijk and Irwin 2006; Horst and Irwin 2010). A glance at this scenario would suggest that contemporary societies have left behind the situation in which the scientific and technological shaping of our living conditions was undertaken in the absence of public debate (as suggested by Arendt, Winner, and Beck). Surely there is a dissonance between this development and Arendt's inclination to believe that, since ordinary people were clueless about the technical jargon and truths underpinning its

⁶⁶ My discussion here will be broadly descriptive. A critical examination of the participatory turn towards public engagement with science will be the subject of Part II, Chapter 5.

activities, no meaningful dialogue could be expected between experts and laypeople on the purposes and aims of technoscience. We seem to have entered a new situation in which science no longer enjoys a privileged a-political position vis-à-vis the wider society, with critical publics apparently defying the hitherto unquestioned prerogatives of technoscientific expertise. Hence, the notion that the esoteric activities of scientists are inaccessible to public discussion would seem to have lost its currency, both in theory and in practice.

One way to account for these engagements of laypeople with science and technology is provided by the prognosis Ulrich Beck put forward in his influential book *Risk Society* ([1986] 1992). Alongside his concept of ‘sub-politics’ I discussed in the Introduction, his notion of ‘reflexive scientization’ announces a new configuration in science-politics relations that makes it possible to interrogate the transition from the ‘public *understanding* of science’ to the ‘public *engagement* with science’ supposedly at stake in the participatory turn documented earlier on.

Beck claimed that public risk consciousness and conflicts were taking the form of a *scientization of the protest against science*, where “science forces itself to run its own gauntlet” (Beck 1992, 161). In order to effectively confront new technoscientific risks without jeopardizing its ongoing expansion, scientific practice becomes increasingly mediated by the scientized activities of lay publics. The public critique of science Beck detected was supported scientifically by the public’s mobilization of ‘alternative’ and ‘advocacy’ science, counter-scientific arguments and counter-expertise. “New public-oriented scientific experts emerge, the dubious aspects of the foundations of scientific argumentation are exposed with counter-scientific thoroughness, and many sciences are subjected through their applied practices to a ‘politicization test’ of a previously unknown extent” (161). Importantly, then, he foresaw “the

opportunity to emancipate social practice *from science through science*” (157). The threats and risks generated by technoscience “require the sensory organs of science—theories, experiments, measuring instruments—in order to become visible and interpretable as threats at all” (162). In the debate over civil nuclear energy, for example, environmentalist groups proved to be as keen about disseminating ‘facts’ and appealing to technical arguments as the pro-nuclear lobby.

Beck saw publics as increasingly participating in a critique of science and expertise, but the terms of this confrontation were those of science itself. And these are the terms I want to critically examine throughout this dissertation, for there are important limits to public participation when discussions are entirely framed within scientific parameters. Risks *are* publicly discussed, but risks themselves, the very *object* at stake in public debate, are *scientifically constituted*. In that sense, the risks in question are conceived entirely as risks ‘out-there,’ such as the ‘physical’ risk of radiation from a nuclear facility. Consequently, both expert and lay discourses tend to be restricted to the idiom of scientific risk management. Arguably, public discussion conducted along these lines is unlikely to problematize and reorientate the aims and purposes of our technoscientific societies. So, given the new spaces that have opened up for ‘public engagement with science,’ the question remains as to whether these spaces have ushered in a more democratic control over science and technology.

I dwell on Beck’s perspective because it opens a venue for revisiting and reformulating the Arendtian challenge that science and technology pose to speech and politics. Arendt has not been proved wrong by all the current ‘democratic debate’ activated around technoscience. The truth of the matter lies somewhere between utter silence and full-blown, transparent public participation. Speech, as I argue in this chapter, remains the issue at stake in the participatory

turn, although not as the either/or question implied by Arendt, but rather in a more nuanced and politically interesting fashion. The problem is not the absence of debate but the narrow and scientific configuration of the ‘official’ speech situations within which those debates tend to be conducted. The crux of the matter is the conditions under which ‘laypeople’ are enrolled and consulted. Although ‘public dialogues’ over technoscientific issues like GMOs have become a sort of new orthodoxy in contemporary governance, a genuine questioning of the basic commitments and projects of modern science and technology is hindered by the way in which these deliberations are *framed*.⁶⁷ Speech is at stake because ‘scientific framings’ impose the parameters of the speech situations where experts and lay publics interact.

This way of looking at the problem opens a new space for theorizing the politics of science and technology. There are indeed important but largely neglected questions about the way in which the public meaning of the issues raised by technoscience are narrowly framed in public discourse. What is the nature of existing public engagements with scientific expertise? How do the thing-deeds coming from laboratories appear in public? What is the relationship between the agency of technoscience and speech in the public sphere? I confront these questions through an attempt to theorize the effects of expertise in the ‘speech situations’ in which citizens try to make sense of the activities of science and technology.

This account will be articulated first through an engagement with STS scholar Brian Wynne’s work on science-public relations. As testified by the field’s longstanding commitment

⁶⁷ I take the term ‘framing’ in the sense given to it by Brian Wynne, to be examined below. It is related to the one employed by Michel Callon (Chapter 2), but the approach I take in this chapter differs in one important respect. Whereas Callon uses the concept of framing and its twin notion of overflow to emphasize the huge investments involved in the framing of interactions in the market, my approach focuses on the public meaning of issues and the preemptive definition of objects and subjects enacted by scientific framings in public space.

to making arguments on the basis of concrete case studies, encounters between ‘expert knowledge’ and the ‘public,’ whether controversial or not, do not take place in a vacuum but rather unfold in everyday lives and around concrete issues of concern. In the next section I retell the exemplary case on whose basis Brian Wynne (1992, 1996a, 1996b) has constructed the bulk of his arguments about the reception of scientific expertise by lay groups.⁶⁸ After examining Wynne’s concept of framing and his subversion of ‘propositionalism,’ I shall introduce my engagement with Jacques Rancière’s theorization of democratic politics. After a brief intervention in current discussions about the proper way of reading his works, intended to justify his incorporation in this dissertation, I turn to his observations about speech to complement Wynne’s analysis in order to flesh out my account of expertise and the framing of speech situations in the final section.

“May the sheep safely graze?”

The hill sheep-farmers in the Lake District of Cumbria, northern England, are located a few miles from the Windscale-Sellafield nuclear fuels reprocessing facility, which dominates the area socially, culturally, and economically. Windscale-Sellafield is a huge complex of fuel storage ponds, chemical reprocessing plants, defunct military piles, and facilities for the processing and storage of plutonium and nuclear waste. In the early 1950s it was used for the production of purely weapons-grade plutonium, but in the following decades became a military and

⁶⁸ Brian Wynne’s involvement with the case dates back to his experience with the 1977 Windscale Inquiry conducted after the proposal for a thermal oxide reprocessing plant. Then he was an advocate for the Network for Nuclear Concern. His initial critique of institutionalized science crystallized in his work on the ritual character of the inquiry (Wynne, 1982). He has continued to ground his contributions on empirical case studies in hazardous waste management, climate change science, and genetically modified organisms.

commercial facility for storing and reprocessing huge quantities of UK as well as foreign spent fuel. Being the biggest employer in the area, many among the farming population have relatives, neighbors, and casual employees working at the plant.

The socioeconomic viability of this community of hill sheep-farmers depends entirely upon rearing large crops of lambs each spring, in order to sell them in late summer and fall before the temporary lamb overpopulation depletes what is a particularly meager valley grazing. The upland hill-farming region is much more vulnerable than lowland sheep-farming, so any perception among the European public of radioactive blight in the region would seriously compromise their demanding livelihood. And this is precisely what happened on April 26, 1986, when a catastrophic nuclear accident occurred at the Chernobyl Nuclear Power Plant in Ukraine.⁶⁹ The explosion and ensuing fire released large quantities of radioactive particles into the atmosphere, which spread over much of Western USSR and Europe. By May, upland areas of Britain underwent heavy though variable deposits of radioactive cesium isotopes rained out by localized thunderstorms.

⁶⁹ Before the events that are the focus of Wynne's analysis, the complex had already been at the center of a series of controversies. The public image of the Windscale-Sellafield facility, its record of honesty and openness, had already suffered greatly before the incidents of concern to us here. In 1957 a nuclear pile in the site caught fire and burned for several days, emitting radioactive iodine and cesium isotopes over the Lake District of Western Cumbria, in what became the world's worst nuclear reactor accident before Chernobyl (Arnold, 1992). In the years after the accident, the fire and its effects on the environment were surrounded by considerable secrecy, and it was only in the late 1980s that a cover-up was made public, when a television program revealed that the burned pile had been allowed to operate with faults, with radioactive spent fuel lying in the air streams well before the accident. The fire had been something of a blessing for the authorities, for any alleged contamination could then be attributed to the fire itself rather than to longer-standing negligent management practices. Another controversy had taken place in the early 1980s, when the plant was accused by nearby communities of causing an excess of childhood leukemia clusters. The excesses were confirmed in 1984 by an official inquiry chaired by Sir Douglas Black, but no conclusive statement was made as to their cause (Macgill, 1987; McSorley, 1990). The controversy continued to be reported and highly covered in the local and national media, especially after it was discovered that the operators had misled the official inquiry over earlier levels of radioactive discharge to the environment. That same year Greenpeace accused the plant of contaminating local beaches above legal discharge levels, and operators were prosecuted. Also, in 1986 the Health and Safety Executive threatened the complex with closure after another incident and a formal audit.

In the aftermath of the disaster, scientists and political leaders rushed to dismiss the effects of the radio-caesium fall-out as negligible. Six weeks later, on June 20, those public reassurances were overturned when the Ministry of Agriculture suddenly announced a complete ban on the movement and sale of sheep from these areas. Over four thousand farms were restricted, five hundred of them located in the Cumbrian region. This was potentially ruinous to this economically fragile sector: their income would be decimated, and because of the limited valley grass and meager grazing on the mountains, farmers would be unable to feed the lamb flock forced to remain in their hands. The possibility of wholesale slaughter of sheep flocks threatened hill sheep farming and its distinct culture with long-term ruin.

These ominous threats were somewhat alleviated when the Ministry experts announced, with the same utter confidence that had previously led them to dismiss the effects as negligible, that the ban would only last three weeks, after which period radioactivity levels in the sheep would have been decreased below critical levels. Prevailing assumptions about the behavior of radiocesium in the environment authorized this projection: a once-through model of contamination assumed that the radioactive fallout would be washed off the vegetation and into the soil, where it would be absorbed and chemically locked up, unavailable to return to vegetation and the sheep food chain. Since the biological half-life for radiocesium in sheep was about 20 days, the contamination would fall below the levels that led to the ban, just in time for the beginning of annual sales.

After the three week period, however, instead of lifting the ban, and contradicting previous reassurances and denials of there being any long-term problem, the government announced an indefinite extension, albeit for a smaller area covering one hundred and fifty

farms. The reason was that after the three-week period measured levels had shown no decrease. As Wynne documents, the experts did not appear to comprehend the implications of the restrictions. For instance, they unrealistically assumed that farmers would be able to bring the sheep down from the high fells to the less contaminated valley grass, ignoring the basic fact that the valley, characterized by a very short supply of grass, would quickly become a desert if the farmers followed the experts' advice. Equally preposterous was their suggestion to compensate the shortage of grazing with straw. In the words of one farmer: "[The experts] don't understand our way of life. They think you stand at the fell bottom and wave a handkerchief and all the sheep come running.... I've never heard of sheep that would even look at straw as a fodder. When you hear things like that it makes you hair stand on end. You just wonder, what the hell are these blokes talking about?" (Wynne 1996b, 66)

In order to placate rising fears about the imminent collapse of hill sheep farming, the authorities relaxed the restrictions to allow for the sale of sheep as long as these were marked as unfit for human consumption. The idea was that the sold sheep would be moved to uncontaminated land, and eventually become clear of radiocesium. The farmers found themselves between a rock and a hard place: if they sold the marked sheep and avoided their overpopulation and likely starvation, they would lose money badly because of the significant decline in market value of these tainted flocks; but if they held on to the sheep, they risked disease, starvation, or the high costs of buying extra feed. So again the experts did not recognize the social dimensions of this quandary. Ultimately many farmers followed the official advice to hold on just a little longer, expecting that the contamination would fall and restrictions be removed soon enough. The ban, however, continued in place. Contamination levels remained

stubbornly high and scientists' advice proved again to be over-optimistic. In spite of their own public embarrassment, throughout the summer of 1986 the experts persisted in their belief that the high levels of cesium would promptly recede.

Over the following years, it became clear that the "three weeks only" scientific judgment had been the result of a mistaken translation from scientific models into policy commitments and predictions. The three-week prediction had been based on the assumed existence of alkaline clay soil, in which the envisaged behavioral properties of radiocesium do indeed occur. But the soil that predominated in the hill areas was of a different kind, namely, acid peaty soils. In these soils radiocesium remains chemically mobile, available for root uptake from the soil back to vegetation which the sheep grazed. Contrary to the once-through model, the sheep were thus exposed to continual recontamination. As Wynne claims, "the problem was that the scientists had overlooked the essentially localized nature of this knowledge, because clay soil was not a universal condition, and in other soils such as those in the hill areas, very different behavior prevailed" (1996b, 64). More generally, "the scientists had made unqualified reassuring assertions then been proven mistaken, and had not even admitted making a serious mistake. Their exaggerated sense of certainty and arrogance was a major factor undermining the scientists' credibility with the farmers" (1996a, 26).

Indeed, by this time farmers were becoming increasingly frustrated over scientists' disregard for local conditions and local specialist knowledges. This was particularly apparent in the way information was collected and then deployed officially in public as formal, "black-boxed" (Latour 1987) scientific knowledge, with any hint of uncertainty or openness confidently deleted. For instance, farmers had witnessed the apparently arbitrary collection of samples in

mountainsides or fields with huge variations in reading, and had even helped scientists change their recorded monitoring measurements of sheep contamination by changing the background reading. Similarly, the measure units used by the experts encompassed several farms and even valleys with one measurement, completely neglecting the significant differences in environment, climate factors, and farming practices within and between neighboring farms. As one farmer put it at the time, “This is what they can’t understand. They think a farm is a farm and a ewe is a ewe. They just think we stamp them off a production line or something” (Wynne 1996b, 67). The farmers were privately suspicious of the standardization built into the routine structures of scientific knowledge, leading them for instance to question the validity of experiments set up to examine the effect that spreading bentonite in the vegetation could have in reducing sheep contamination. The experiment consisted in penning sheep in several adjacent pens on similarly contaminated grazing, spreading different amounts of bentonite over each area, and then measuring radiation levels in the sheep. The farmers immediately noted that the experiment was unavoidably confounded because hill sheep were not used to being penned up and would waste and lose condition in such unreal conditions. Their criticisms were ignored, but were vindicated later when the experiments were quietly abandoned for the reasons that the farmers had identified.

With contamination levels remaining high, suspicions among farmers concerning the actual source of the radiation became widespread. As mentioned above, the initial restrictions affected a large area the size of the county of Cumbria. After three months, the restricted area had been reduced to a small crescent-shaped area in the mountains near the coast, just downwind from the Windscale-Sellafield complex. This was precisely the area where contamination levels

remained stubbornly high. Given its location, the plant almost suggested itself as the source of radiation, and many people asked whether the contamination measured during the previous months had actually been from Windscale-Sellafield rather than Chernobyl, unnoticed or concealed by the authorities. It is important to realize that entertaining this possibility was against the farmers' own economic interests.

In the experts' view, the radioactive "fingerprint" of the radiocesium samples, which could be used to discriminate sources, conveyed unambiguous scientific proof that the contamination had its origin in Chernobyl.⁷⁰ But the farmers were not persuaded. Their position was reinforced by the Ministry of Agriculture's evasive stand in the face of requests for pre-Chernobyl cesium data in the fell-top vegetation, soils, and sheep. The point of demanding this information was to test the authorities' assertion that no significant contamination came from Windscale-Sellafield. After misleadingly referring the farmers to an official document that contained only post-Chernobyl data, the Ministry released pre-1986 data on the lowland coastal strip, but no fell-top data, leaving the farmers without a means to test the official exoneration of the plant. The farmers thus concluded that the authorities were trying to cover up either the fact that they did not have any pre-1986 data (which made them guilty of complacency and incompetence) or the fact that they did have data showing high fell-top levels of cesium radiation before Chernobyl (in which case they were guilty of lying and concealing long-standing contamination from the nearby plant). On top of all this, the experts' confident assertion that

⁷⁰ The rationale was the following: the radiocesium emitted from nuclear fission processes is made up of two isotopes of cesium-134, which has a half-life of thirty years, and cesium-137, with a half-life of about one year. As fission products age with the passage of time, the ratio of cesium-137 to cesium-134 increases due to their different half-lives. In fresh deposits from Chernobyl the ratio was about 2:1, whereas for Windscale-Sellafield emissions, such as those from the 1957 accident, it would be about 12:1. The two isotopes emit gamma radiation of different frequencies, providing for scientists a clear means of distinguishing the two possible sources in the samples.

radioactive “fingerprints” showed that Chernobyl was definitely to blame proved unwarranted, for discriminating between different sources turned out to be not as straightforward as presumed.⁷¹ Later on it was finally admitted that sampled deposits contained half Chernobyl radiocesium, and the other half from other sources, including Windscale-Sellafield (Wynne 1989, 1992).

This case paints a picture rather different from the one assumed in Ulrich Beck’s thesis about the ‘scientization of the protest against science.’ To see how, let us turn to Brian Wynne’s analysis of this example and his political critique of the way in which technoscientific expertise eschews the question of framing by restricting debates to a purely propositional logic.

Subverting ‘propositionalism’

Brian Wynne is a sociologist of science who has made public interactions with scientific expertise the focus of his research. From the early 1980s until today he has been making the same basic but incisive argument that an issue with a *scientific aspect* is not the same as, and should not be reduced to, a *scientific* issue. Reminiscent of Arendt’s phenomenological assessment of the objectivity afforded by the public realm, Wynne has insisted throughout his career that there is more at stake in technoscientific controversies than question of risk as scientifically defined (Wynne 1992a, 1993, 1996a, 1996b, 2002, 2003, 2005).

The context in which he began studying the relationship between scientific expertise and the lay public is important for assessing the meaning and scope of his critique of expertise, and became known as the ‘public understanding of science’ (PUS). The term emerged in the

⁷¹ Actual, or “real-world” soil samples contained mixed deposits, so that any measure of isotope ratios involved combined isotopes intensities. The precise ratio from each source could only be assumed.

mid-1980's in debates over the negotiation of power and social order in relation to science and technology. By then, anxieties had emerged across Europe and the US over the public's response to 'normal accidents' and scientific assessments in biotechnology, new reproductive technologies, AIDS and safe sex, pollution and hazard issues, global environmental change, medical problems, and food safety.⁷² Of special importance was the institutionalization of the subject as indicated by the creation of the Committee for the Public Understanding of Science (COPUS) by the British Association for the Advancement of Science, the Royal Institution and the Royal Society, as well as its American counterpart under the American Association for the Advancement of Science (AAAS).⁷³ Concerns over the public's reaction to expert assessments led to a proliferation of official inquiries. The 1985 UK Royal Society Report on PUS is particularly relevant for grasping the context in which Wynne and colleagues confronted the issue. In many ways the report is exemplary of the strand of PUS that STS was trying to debunk

⁷² As Irwin and Wynne document (1996), though, worries about the public understanding of science were not altogether new. Already in the 1930s the 'visible college' of left-wing scientists was pleading for greater citizen awareness of science (Werskey 1988). J. B. S. Haldane's 1939 book, *Science and Everyday Life*, made similar claims about the public need to understand science: "the ordinary man must know something about various branches of science, for the same reason that the astronomer, even if his eyes are fixed on higher things must know about boots. The reason is that these matters affect his everyday life" (Haldane 1939, 7; quoted in Irwin and Wynne 1996, 3). The Association of Scientific Workers in their post-Second World War statement *Science and the Nation* voiced similar worries. Scientific education, according to their view, ought to be broadened through further edification in the classrooms and widespread circulation of scientific information in newspapers, films, museums, and the radio. Particularly significant was their argument that greater public understanding of science was essential for democratic citizenship, allowing individuals to gauge both the technical and social aspects of everyday problems. "Democracy needs a greater technical awareness, a rise in the standards of social and technical thinking" (Members of the Association of Scientific Workers 1947, 246).

⁷³ The British COPUS was disbanded in the UK in 2002 after many new organizations, both private and public, became involved with PUS. The American counterpart currently functions under a different name: Center for Public Engagement with Science and technology. The transition from "understanding" to "engagement" is symptomatic of recent changes in scientific governance. Its meaning and implications will be addressed in chapter 5.

in the 1990s, specially considering that the UK Government stated a broadly similar position in its 1993 White Paper on Science Policy (UK Government 1993).

The 1985 Royal Academy report (Royal Society 1985) asserted that a better understanding of science would be a major element promoting national prosperity, raising the quality of public decision-making, and enriching the life of the individual. In order to improve the current state of science-public relations, the report advocated reforms to the educational system, parliamentary bodies, the mass media, and industry. Scientists were also requested to take a more active position in educating the public. The aim was to disseminate expert knowledge for a scientifically illiterate public that would then, and only then, resume its relation to science on more amicable, trustful terms. The report also reserved for social scientists the task of measuring current levels of understanding or ignorance of science and discovering the sources from which people obtained their information.

In a nutshell, and largely contradicting Beck's account, official dealings with the science/public gap were based on a view of public controversy over technical issues as created by inadequate public understanding of science, not by the workings of science itself. The epistemic commitments of science, its social purposes, institutional structure, and intellectual boundaries with 'non-science' were constructed as unproblematic, and the conditions under which scientific knowledge was constructed and validated (the bread and butter of STS) were not being examined at all (Irwin and Wynne 1996). The Royal Society Report portrays science as a value-free and neutral activity: "Science *illuminates* and *assists* —it does not constrict or legitimate" (6). On this basis, the standard concern in PUS was to educate an emotional public, win over their support,

and thus handle the crisis of trust and legitimacy in science thought to have emerged in recent years.

This dominant approach in the research field of PUS has been based on what Wynne labels the “deficit model” of the public, a conceptual staple in STS scholarship on these questions. This view presumes science to be the epitome of the modern reflexive institution: an open and self-correcting enterprise engaged in an endless application of skepticism to all of its commitments. Despite contributions such as Kuhn’s (1962) analysis of the functional role of dogma and the ways in which the commitments that define a prevailing paradigm constrain science’s capacity for self-criticism, PUS has upheld a Popperian model in which science’s very intellectual identity is constructed out of a process of enlightened critical reflection of its own founding assumptions. Laypeople, on the other hand, are assumed to be the polar opposite of these virtues. Not only ignorant about the epistemic contents of science, but frustratingly bereft of any reflexive capacity: traditionalist, irrational, as well as risk- and uncertainty-averse. In Wynne’s words, “publics are usually seen as unreflexive cultural dupes who are tradition-bound and incapable of critical reflection upon epistemic issues and their own relationship to knowledge” (Wynne 1993, 325).

On the basis of his influential analysis of the encounter between hill sheep-farmers and scientific and government experts, Wynne put forward the argument that in public domains the ‘cognitive’ contents of science are imposed through unexamined, narrow, and quasi-naturalized scientific ‘framings.’ This has allowed him to move beyond the ‘deficit model’ reduction of the conflict between experts and lay publics as a problem of ‘misconstruction’ prompted by public ignorance of scientific propositional contents. His notion that scientific expertise brings with it

the social, cultural, and institutional terms of its own validation has the merit of complicating the lay/expert divide, and suggests that any genuine form of political participation by laypeople will require a subversion of the logic according to which public concern about technoscience ought to be entirely about its cognitive contents and nothing else. The challenge is to address the framing of control, prediction and standardization that renders intelligible those propositions, and which reflects the unreflexive institutional behavior science can display in imposing that narrow framing.

The Cumbrian sheep example nicely illustrates the force of those three aspects of experts' framing. Propositions constructed under laboratory conditions were used for making confident *predictions* on the ground. Repeated assurances that the crisis was under *control* were unqualified by any sense of uncertainty despite the magnitude of the catastrophe. As for *standardization*, measurements and experiments conducted on the ground and scientific models imported from the laboratory were imposed without any regard for local conditions ('they think a farm is a farm and a ewe is a ewe'). For Wynne, these three are typical scientific commitments, part and parcel of modern science's identity. The problem arises when they are deployed in a patronizing and overconfident way, deleting all the sources of uncertainty and messiness STS has identified in the construction of science. At least in public, and despite the succession of embarrassments, government experts perceived no need to curb their confident statements. Taking prediction, control, and standardization routinely for granted, they displayed no awareness that such framing assumptions could be revised or contested.

According to Wynne, then, science's lack of reflexivity has to do with its operative blindness to the difference between 'propositions' (i.e. formal questions and statements internal

to the operational logic of scientific inquiry) and ‘framing.’ That is, experts take for granted, and remove from public scrutiny, the contingent (social and cultural) assumptions behind the construction of their propositional questions and statements. The important thing to realize is that science not only deploys propositions, but also the commitments that make those propositions (and the questions they are meant to address) intelligible and culturally valid. Insofar as science deletes its role in framing debates and the contingency of its social and cultural assumptions, theories premised on a notion of science as the epitome of a self-reflexive modern institution have to be thoroughly revised. For science is not only a social endeavor, as STS and ANT have shown; it is also a cultural enterprise. And like any other culture, it brings with it the terms of its own validation. The point of this is not that laypeople should be allowed to intervene by voicing their own ‘values’ while leaving the ‘technical’ side of things to the experts, as is usually assumed. The claim is rather that *science* has its framing values as well. ‘Values’ are not something separate from the cognitive content of science, but rather what makes them publicly intelligible, relevant and authoritative. As recognized by Kuhn (1962) and Polanyi (1958), scientific modernity has always been imbued with tradition, in the sense of a more or less dogmatic commitment to received scientific authority. Accordingly, the mythical portrait of modern science described in the rhetoric of scientists and the prescriptions of philosophers and epistemologists is put into question.

Wynne’s longstanding position became widely influential in the early 2000s through the notorious debate that pitted him (and Sheila Jasanoff) against prominent STS scholar Harry Collins on the question of expertise.⁷⁴ As we saw in Chapter 2, the demystification of scientific

⁷⁴ Collins and Evans (2002); Wynne (2003); Jasanoff (2003); Collins and Evans (2003). See also Collins and Evans (2007).

practice in the social constructivist approach in STS resulted in a challenge to the conventional distinction between scientific experts and non-experts. The most reasoned reaction against this position did not come from the ‘science warriors’ of the 1990s, but from Collins, a prominent figure in the field of STS. Recoiling from the thrust of most STS scholarship, in a famous review essay of 2002 Harry Collins and Robert Evans claimed that the new phase in the sociological study of science (what they called its “third wave”⁷⁵) had to restore the privileged status of expertise and put an end to the indiscriminate extension of ‘technical decision-making rights’ (Collins and Evans 2002).⁷⁶ Their position, however, did not amount to a plea for scientific approaches to technoscience in the public sphere. They redefined expertise to include practical ‘experience-based expertise’ (exemplified with the ‘lay expertise’ of Wynne’s sheep-farmers and AIDS-treatment activists) alongside certified science. To be accepted, however, the former had to be continuous with the concepts and practices of Western scientific rationality; astrology, theology and other ‘fringe sciences’ and forms of ‘folk knowledge’ had to be excluded.

Collins and Evans’s argument is *prima facie* more inclusive compared to prevalent, scientific accounts that would reserve the status of expert knowledge to conventional science. The problem, as Wynne complained in his response to their article, is that they focus on “exclusively ‘propositional’ decision-questions, such as whether nuclear power, anti-misting

⁷⁵ The first wave corresponded to the Mertonian moment, when research was aimed at understanding, explaining and reinforcing the success of science, without questioning its basis. The second wave encompasses STS constructivism examined in Chapter 2.

⁷⁶ “Our question is: ‘If [thanks to SSK] it is no longer clear that scientists and technologists have special access to the truth, why should their advice be specially valued?’ This, we think, is the pressing intellectual problem of the age. Since our answer turns on expertise instead of truth, we will have to treat expertise in the same way as truth was once treated—as something more than the judgement of history, or the outcome of the play of competing attributions. We will have to treat expertise as ‘real,’ and develop a ‘normative theory of expertise’” (Collins and Evans 2002, 237).

kerosene or UK beef is safe, or how to manage sheep farming under conditions of radioactive contamination. Although these issues are obviously relevant, nevertheless this is a seriously impoverished account of what is involved when we address science in public arenas” (Wynne 2003, 401-402). Although they argued in favor of admitting and recognizing non-certified forms of experiential-expertise, they missed the question of “the institutional neglect of issues of public meaning, and the presumptive imposition of such meanings (and identities) on those publics and the public domain” (402). Wynne’s stakes in this debate were significant also because Collins and Evans used his own study of sheep-farmers as an example of the kind of experiential-expertise worthy of being taken into account. “We should also note that even had the farmers’ (limited) specialist propositional knowledge been recognized and used by the scientists, for example, knowledge about local variations in environmental conditions beneath the resolution of prevailing scientific spatial units, the whole relationship was one in which the power to define the meaning of the questions remained with the institutional experts: scientists and officials” (408).

Wynne’s basic point in this intervention simply recapitulated his longstanding commitment to the difference between framing and propositions, that is, the question about “how public issues are framed and thus given meaning.”

There is a significant general difference between the kinds of process in which scientific laboratories make their interventions in the world outside through technological artifacts and their associated disciplines and consequences, and those in which the wider interventions occur and recur through discursive networks and narratives of scientific knowledge for policy, such as in ‘risk management’ public policy issues and decisions. As studies of the latter kind of issue emphatically demonstrate, contestation is rarely only about propositional truths, but is more usually also, if more obliquely, about what is the proper public meaning and definition of the issue(s) being contested. ... Collins and Evans’ assumption of a ‘contributory,’ propositional role, and its essentialist

implications, corresponds with a neglect of context and a denial of the ultimate contingency of saliency and meaning. This undue reduction and essentializing of frame is also evident in their presumption that for such public issue definitions, science is anyway the proper, 'natural' frame of reference. They thus define the public domain to be only about whether or not something is true (Wynne 2003, 404).

A more adequate response from STS scholars to the question of expert framings would be "to try to articulate what a more inclusive social debate over knowledge and its proper grounds and human purposes should be, and how this would open up spaces, now colonized by existing scientific culture, to collectively negotiable questions of public meaning" (Wynne 2003, 408).

If we return for a moment to the case of *Mycoplasma laboratorium* in light of Wynne's critique of the imposed equation of *public* meanings with the narrow meanings of scientized expertise, we would notice how the meaning of the basic concepts underlying the thing-deed has been narrowly defined according to purely scientific and laboratory standards. Recall that in synthetic biology, computer-assisted DNA synthesis is aimed at building a 'minimal cell' that contains only 'essential' genes, where 'essential' has taken the narrow meaning of anything with an observable effect on viability, itself narrowly grasped as capacity for continuous self-replication. A gene that has "no observable effect on viability" (Gibson et al. 2010, 55) is simply dubbed 'non essential.' All these meanings and the measures of 'success' they bring along might be valid in the laboratory but not necessarily elsewhere. The viability of *Mycoplasma laboratorium* in terms of *other* purposes, however, need not and did not enter the experts' equations.⁷⁷

⁷⁷ Consider also Venter and colleagues' uncontested and taken-for-granted definition of a cell with 'appropriate properties': "The demonstration that our synthetic genome gives rise to transplants with the characteristics of *M. mycoides* cells implies that the DNA sequence on which it is based is accurate enough to specify a living cell *with the appropriate properties*" (Gibson et al. 2010, 55, my emphasis).

Politically speaking, the problem I am trying to formulate is that such particular and instrumental meanings, and the things they name, do not remain inside the laboratory but circulate un-reflexively throughout society not only in the form of new technologies and new social practices, but also in the form of public meanings that structure public debate. These are negotiable and contestable definitions that admit of different social, economic, and political perspectives. Thus, when science journalists introduce thing-deeds like *Mycoplasma laboratorium* to the public without any contestation over the meaning of concepts like ‘viability’ or ‘essential properties,’ narrow scientific meanings become public meanings by default; they colonize public discourse.

In the next sections I introduce my approach to the work of Jacques Rancière to provide a more profound political theorization of the lay-expert divide at stake in Brian Wynne’s reflections.

Displacing Jacques Rancière’s interventions

Jacques Rancière’s mode of thinking about democratic politics resonates throughout this dissertation. A turn to Rancière to make sense of the politics of science and technology, however, may seem surprising. Indeed, if one wished to find out about Rancière’s interventions outside the disciplinary confines of political theory the subjects to be reckoned with would include the poetry of a 19th-century French joiner, the novels of Flaubert and Stendhal, or a film by Roberto Rossellini; not Craig Venter’s data sets, biofuels, nuclear waste disposal, iPhones, the Hadron Collider, or pharmaceuticals.

Why then turn to his interventions about politics? First, because his mode of theorization invites adventures into unexpected territories; and secondly, because a displacement of his thought to the realm of expertise is particularly fruitful for problematizing its major tenets. As for the former, Rancière himself has been adamant. Already thirty years ago, in a recollection of his political and academic itinerary, he had already acknowledged the virtues of the kind of displacement I am proposing:

Experience seemed to teach me that the power of a mode of thinking has to do above all with its capacity to be displaced, just as the power of a piece of music may derive from its capacity to be played on different instruments. I need hardly point out that to argue the contrary has some relation to the doctrine urging everyone to mind his or her own business. ... [A]ny mode of thinking that is the least bit singular reveals itself in always saying basically the same thing, which it cannot but hazard every time in the colorful prism of circumstances (Rancière 2004, xxviii).

The difficult question is how to effect this displacement and remain true to Rancière's 'method' (Rancière 2009c). Surely, one could try to distill from his writings a set of (more or less) logically assembled concepts, arguments, and distinctions, and proceed to see if helps us enhance our understanding of circumstances other than the ones which originally promoted those ideas. However, analytical approaches fail to do justice to the range and subtlety of Rancière's theoretical outlook. Indeed, and perhaps not without some irony in the case of a thinker characteristically averse to propriety and decorum, the question of how readers ought to engage his writings has received some attention. At stake in his works are not simply conceptual and systematic arguments, but also the place and time in which these were meant as interventions (McClure 2003), the original critical dispositif which he articulates (Chambers 2013), and the

style in which he writes and the demands this poses to our reading practices (Panagia 2014). The meaning of his political thought would be lost if we missed these extra-‘philosophical’ aspects.⁷⁸

This approach finds support in Rancière’s own recent clarifications about his way of theorizing (Rancière 2009b, 2009c). In an interesting essay written in the third person, he examines “the method of Jacques Rancière” and opposes two ways of appreciating a thinker: “one can examine his/her ideas, test their consistency, compare them with other thinker’s ideas and judge the good or bad effects that they produce when going from ‘theory’ to ‘practice’. But at another level, one examines the way these ‘ideas’ are produced, the issues they address, the materials they select, the givens they consider significant, the phrasing of their connection, the landscape they map, their way of inventing solutions (or aporias), in short their method” (Rancière 2009c, 114). Put differently, his works “are not ‘theories of,’ they are ‘interventions on’ ... Rancière is only interested in ideas at work: not ‘democracy’ for instance, but ‘democracy’ voiced in sentences that stage its possibility or impossibility, not ‘politics’ in general but discourses and practices which set the stage of its birth or of its fading away, of those who are included in it and those who are not, etc.” (116).

⁷⁸ Thus, the arguments in *Disagreement* and the “Ten Theses on Politics” addressed the widely trumpeted ‘return’ and ‘end’ of politics after the collapse of the Soviet Empire and the triumph of capitalist and liberal democracy. Whatever Rancière says in the book should be read against the background of the rise of consensual, deliberative accounts of democratic politics he saw as characteristic of the reduction of politics to statist administration in European social democracies, and which contradicted and worked to efface what he took to be the essence of politics: egalitarian dissensus. “The opposition of politics and police was proposed as a tool for understanding the logic of this process” (Rancière 2009c, 115). Furthermore, expressions like ‘the return of political philosophy’ or the sociological ‘end of politics’ do not necessarily travel well or unaltered to historical and scholarly contexts different from the markedly French or continental ones in which Rancière usually intervenes (McClure 2003). In his recent attempt to present Rancière’s ‘lessons’ in a non-pedagogical or non-stultifying way, Samuel Chambers, for his part, seeks to disentangle democratic politics from liberalism (Chambers 2013). He avoids a systematization of Rancière’s writings in explanatory mode in order to distinguish the latter’s novel form of critique, which differs from conventional critical theory by its presupposition of equality, its attention to what remains ‘unintelligible’ (as opposed to hidden) within any ‘distribution of the sensible,’ and its positing of dissensus (not understanding) as the goal of critique (149-156).

The critique of analytical approaches to Rancière's writings has been most forcefully expounded by Davide Panagia. Since Rancière is a writer who has nothing to teach (Bosteels 2011, 131; Chambers 2013, ix), "How, then, might we proceed to read his theoretical writings?" (Panagia 2014, 284) Precisely *not* in the way one would approach an author like Jürgen Habermas, whose systematic language and carefully argued theoretical constructions reflect the basic substantive commitment of his project: that language has an immanent *telos*, namely understanding in communication. Although he does not refer to Habermas in particular, Panagia's main point is precisely that 'understanding,' as displayed in critical hermeneutics and deliberative democracy, should not be regarded as the only mode of thinking theoretically, least of all if one wishes to make sense of an author like Rancière. The main lesson to be extracted from the French thinker, according to Panagia, is that "politics is not a project of the understanding, and to the extent that philosophy desires understanding, it must remain tethered to the conditions of necessity that structure and arrange an order of police" (295). Importantly, the dis-agreement (*mésentente*) between the 'sensibility' of philosophy (which calls for understanding) and the 'sensibility' of politics (which interrupts the flow of rational discourse by playing on the 'excess of words') is a lesson that cannot be taught philosophically or analytically. The confrontation between these two 'sensibilities' is therefore best communicated through style, something which Rancière "shows us in his own deployment of polemics and the free indirect style of writing" (294). The key to the meaning of Rancière's theoretical writings would be found in his style, and not so much in his conceptual arguments.

This advice on how *not* to read Rancière ought to be taken into account if we wish to grasp the polemical, and aesthetically situated character of his interventions. As with territorial

readings of Arendt, we have to avoid the reification, abuse, and misuse of concepts and distinctions like the one between ‘politics’ and ‘police,’ which risk becoming ready-made formulas at the service of name calling rather than intellectual clarification. There is no harm in wishing to avoid myopic readings and save an author from an ‘appliances’ approach to political theory (Wolin 1969, 1075) that does not fit his or her intellectual outlook.

However, to identify that infamous off-the-shelf approach to political thinking denounced by Sheldon Wolin with “the purpose of conceptual clarification and analytic application” *per se*, as Panagia does, is to miss the mark. There is a risk in downplaying the importance of ideas and concepts in favor of style. Rancière’s method emphasizes “*ideas at work.*” There is nothing intrinsically hostile to clarity and application (or better: displacement) in his mode of theorization. In my view, this is because conceptual rigor and clarity ought to be regarded as part and parcel of common sense appreciation, as universal resources that open access to that search for common languages which Rancière sees at the center of democratic attempts to verify equality (Rancière and Panagia 2000). A more or less emphatic disregard for such ‘analytical’ standards runs against the grain of Rancière’s own position vis-a-vis the equality of intelligences. “Conceptual clarification and analytic application” need not be harbingers of anti-political philosophical modes of inquiry. They do play a democratic role in Rancière’s thought; no less than stylistics, as Panagia has lucidly shown. The trick is not to conceive of analysis, critique, style, and polemical intervention as forms of theorization involved in a zero-sum game. Rancière’s texts can display conceptual thoroughness *and* rhetorical intervention *and* non-pedagogical modes of exposition. His thought is certainly crippled when we read him with too much analytical intent. But we should not overstate the case.

Furthermore, Rancière's writings are actually more 'analytical' than one could be led to assume. I use the inverted commas because the term fails to capture adequately what I am referring to. 'Rational' would be a tempting expression, useful also for grasping his relation to Habermas (on which more later on). Unfortunately, it would wrongly suggest that things like style and context-sensitivity are somehow 'irrational.' Perhaps the term which best captures the aspect of Rancière's writing I am trying to convey is 'logical.' Indeed, it is not difficult to find passages and formulations in which Rancière displays a penchant for conceptual rigor and logical relations. A close reading of the "Ten Theses on Politics" (Rancière 2001) shows that this fondness goes beyond the formal structure of the text (ten tightly argued and interconnected *theses*) and reaches the definitional level where Rancière declares what he takes to be the specificity of politics: "Politics is not the exercise of power. Politics ought to be defined in its own terms as a specific mode of action that is enacted by a specific subject and that has its own proper rationality" (Thesis 1; 27); "What is specific to politics is the existence of a subject defined by its participation in contraries. Politics is a paradoxical form of action" (Thesis 2; 29); "Politics is a specific break with the logic of the *arché*" (Thesis 3; 30); "Democracy is not a political regime. As a rupture in the logic of the *arché*... it is the very regime of politics itself as a form of relationship that defines a specific subject" (Thesis 4; 31). Such formulations illustrate the analytical, rational, or logical side of his interventions. The merit of Rancière lies precisely in his combination of logical rigor and precision with rhetorical style and historicized inflection, not in the suppression of one in favor of the other.

Furthermore, such expressions are not merely a stylistic departure from free indirect discourse, but reflect the specificity of politics itself. I mean this in two senses. First, politics, for

Rancière, has a *logic*: the paradoxical and always polemical encounter between the logic of police regimes and the logic of equality (Rancière 1999). His account of politics in *Disagreement* and the “Ten Theses” is largely structural. Politics, we often read, is a *form* not a content. “What makes an action political is not its object or the place where it is carried out, *but solely its form*, the form in which confirmation of equality is inscribed in the setting up of a dispute” (32). The other side of this claim is that there are no ‘proper’ subjects and objects in politics. The specific thing about politics is the logical form of their relation, and this cannot be identified with any of the concrete struggles in which this logic can be said to operate. Democratic politics, for Rancière, is always the activation and mobilization of a supplement that interrupts the counting of social parts where propriety, in any of its forms, rules. The particular forms of action involved in each instance, the name given to the supplement, and the specific nature of the ‘police regime’ being disrupted vary from place to place and time to time. But the torsion that democratic intervention provokes in the accounts made of the common world is structural, as I will show: it exhibits a common logic whether we are dealing with the Plebeian secession at the Aventine, the literary adventures of French workers, or the student revolts of May 68. This would ‘authorize,’ as it were, a displacement of Rancière’s account to unexpected objects and subjects like bacteria, nuclear plants, scientists, and farmers. Therefore, the challenge is to find out if the same logic operates in the realm of science, technology, and expertise.

Secondly, Rancière’s logicalness is present in the form of his arguments. Emancipation is logical not only because it follows a certain logic, but also in the sense that its grounds are ‘logical’ in the sense of being transparent to common sense. Consider how in *Disagreement* he uses a ‘syllogism of equality’ to evince the ultimate contingency of any structure of domination.

Every command that enacts inequality is based on the equality of speaking beings which it then goes on to deny. In order to obey one needs to understand what the commander is saying. One has to be, in other words, his equal in speech. Ergo, his domination is arbitrary and therefore disputable. Such simple *reasoning* is the bread and butter of Rancièrian modes of emancipation. In other words, to revolt against a structure of domination that presumes equality while suppressing its effects is a very ‘logical’ thing to do. Moreover, the characters in his historical examples usually exhibit a keen logical sense and mobilize clear-cut modes of argumentation that would make sense to any sincere human speaking being. Like Jeanne Deroin, the woman who in 19th century France polemically announced her bid to run in a political race in which she was not allowed to participate in order to find out if the universality of the ‘Declaration of the Rights of Men and of the Citizen’ included members of her sex (Rancière 1999, 41). Surely, the claim I am making should not be blown out of proportion, nor his arguments wholly detached from the spatial and temporal ties that give them a significant part of their meaning. But neither should Rancière be regarded as a thinker particularly hostile to conceptual rigor, systematicity, and clarity.

In noticing the logical and structural side to Rancière’s writings my aim is not to seduce more analytically inclined political theorists into reading Rancière’s books, but simply to suggest that a rehearsal of some of his insights in novel and unexpected contexts is not unwarranted. The distance between Rome 495 BC and Paris 1968 is not less surmountable by political logic than the one between the latter and contemporary forms of emancipation in relation to technoscientific expertise. Rancière himself has remarked that “lessons of equality can be found everywhere” (Rancière 2009b, 280). I take this observation as an invitation to find out what

happens to his form of theorization when seen through the prism of circumstances different from those that originally provoked it. The premise is not that his ‘theory’ has universal validity and therefore can be ‘applied’ to any situation, but rather that the meaningfulness of an intervention, like that of Rancière’s own cherished ‘singular universals’ (Rancière 1999, 39), is the one that transcends the context in which it originated. In this sense, the structural quality of some of his arguments about politics begs testing them in unexpected historical and thematic contexts, where perhaps new exemplars can be found.

Ultimately, then, the relevant question here is whether or not his political thinking is helpful for elucidating the political significance of science and technology and the disputes these bring forward. Is equality, and the democratic emancipation that presumes it, verifiable or even thinkable in the face of technical expertise? If so, what does it look like? My claim is that Rancière’s theorization can be put to work, to good effect, for making sense of the political stakes of that other exemplary incarnation of Arendt’s *homo faber*, technoscientists. The major part of my appropriation and problematization of Rancière’s work unfolds in chapter 6, in particular with reference to his account of democratic politics. In what follows here, however, I am interested in what he says about speech and expertise, and how that can be linked to Brian Wynne’s analysis of framing.

Noise and speech

A main reason to engage Rancière’s work is that his approach, much like Arendt’s, is centered on the human capacity of speech. This is particularly the case in *Dis-agreement* (Rancière 1999), a book he wrote largely to contest the consensual or deliberative perspectives that had rose to

prominence in the early 1990s. In the Preface he clarifies the meaning of *la mésentente* in rigorous terms:

We should take disagreement to mean a determined kind of speech situation: one in which one of the interlocutors at once understands and does not understand what the other is saying. Disagreement is not the conflict between one who says white and another who says black. It is the conflict between one who says white and another who also says white but does not understand the same thing by it or does not understand that the other is saying the same thing in the name of whiteness. ... Disagreement occurs wherever contention over what speaking means constitutes the very rationality of the speech situation. ... [It] generally bears on the very situation in which speaking beings find themselves. ... It is less concerned with arguing than with what can be argued, the presence or absence of a common object between X and Y. It concerns the tangible presentation of this common object, the very capacity of the interlocutors to present it (Rancière 1999, x-xii).

Here we see how speech plays a pivotal role in his characterization of the specific kind of dispute he sees at the center of political situations. His theorization of speech is quite specific, however. In particular, disagreement “has neither to do with a misconception that would call for additional language nor with a misunderstanding that would call for words to be refined” (Rancière 1999, xi). The situation Rancière is describing is very peculiar and paradoxical: “The interlocutors both understand and do not understand the same thing by the same words” (xi). How could this be? The best way to grasp Rancière’s insight is through his polemical confrontation with Aristotle’s distinction between voice and speech, *phoné* and *logos*.

According to Aristotle, man was a political being because he possessed speech as the capacity to place the just and the unjust in common. The rest of the animals (as well as slaves) only had a voice to signal pleasure or pain (Rancière 1999, 21-23; 2009a, 24). Thus, a slave owner who for some reason encountered a slave speaking in the *agora* could understand his utterance as voice but not speech. This is what Rancière calls the “extreme” form of

disagreement which “first and foremost ... concerns politics”: “where X cannot comprehend that the sounds uttered by Y form words and chains of words similar to X’s own” (Rancière 1999, xii).

The whole question involved in the quarrel of politics, according to Rancière, is precisely to know who possesses speech and who merely possesses voice. Importantly, Aristotle takes for granted precisely that which is the object at stake in democratic politics. As I will show in Chapter 6, Rancière’s critique of Habermas and deliberative democracy is targeted precisely at the implicit commitment to pre-constituted objects and subjects of deliberation.

Rancière’s argument here is structural in the sense indicated before. The distribution of *logos* and *phoné* always already operates within every (thereby divided) political community as a “symbolic distribution of bodies that divides them into two categories: those that one sees and those that one does not see, those who have a logos—memorial speech, an account to be kept up—and those who have no logos, those who really speak and those whose voice merely mimics the articulate voice to express pleasure and pain” (Rancière 1999, 22). Far from being the foundation of politics, the split introduced in language by the *logos/phoné* distinction is itself the object of political disagreement. Every question or proposition in the public realm is accounted for as speech or noise, and the contingency of such accounts is what makes politics, in Rancière’s sense, possible. Thus, “politics exists because the logos is never simply speech, because it is always indissolubly the *account* that is made of this speech” (22-23).

This account dovetails with Brian Wynne’s critique of the deficit model in the PUS literature and practice, where laypeople’s reaction to the technoscientific doings is officially accounted for as the babble or noise of the ignorant many who have no entitlement to discuss

technical issues. Expert scientific framings, that is, are one of the forms that the *logos/phoné* distinction can assume. What Rancière's perspective can add to Wynne's analysis of framing is the political and aesthetic dimension captured in his concept of 'partition of the sensible' (*partage du sensible*), which refers to the regimes that put everyone in her/his right place. The concept refers to "the cutting up of the perceptual world that anticipates, through its sensible evidence, the distribution of shares and social parties." Furthermore, "It is the interplay of these forms of sensible evidence that defines the way in which people do 'their own business', the relation between the personal and the common, the private and the public" (Rancière 2004, 225). Democratic politics, then, is about reconfigurations of the sensible or litigations of the perceptible, where 'the sensible' means the distribution of what is visible and invisible, hearable and un-hearable, common-sensical and non-sensical.

On this basis, it is possible to introduce Rancière's crucial opposition between *police* and *politics*. The former designates what we usually take to be the stuff of politics, namely, "the set of procedures whereby the aggregation and consent of collectivities is achieved, the organization of powers, the distribution of places and roles, and the systems for legitimizing this distribution" (Rancière 1999, 28). The term 'politics,' by contrast, denotes activities antagonistic to policing, actions that reconfigure the given allocation of parts and make visible what had no business being seen, and makes heard as speech what was hitherto heard as noise. In connection with the idea of equality, Rancière writes that "political activity is always a mode of expression that undoes the perceptible divisions of the police order by implementing a basically heterogeneous assumption, that of a part of those who have no part, an assumption that, at the end of the day, itself demonstrates the sheer contingency of the order, the equality of any

speaking being with any other speaking being” (30). Democracy, and politics proper, is about the incursion of an externality that had not yet been accounted for, the interruption of an order by those who remain invisible within it: “Politics is first and foremost an intervention upon the visible and the sayable” (Rancière 2001, 21). It is in this sense that in chapter 6 I explore the possibility of extending Rancière’s account to contemporary challenges of the lay-expert divide. The latter might then be said to structure an important “police regime” in liberal democracies, a scientific-technical partition of the sensible grounded on the lay-expert subordination.

Indeed, Rancière’s work can be interpreted as a prolonged critique of any philosophy that aims to put ‘everyone in her/his right place,’ a critical exploration of the ways in which the proposition ‘let all do their own business and develop the virtue specific to their condition’ (Rancière 2004, 220), first uttered by Plato, persists in its new contemporary modulations. It is in these terms that I understand the connection between Rancière’s thought and the question of technoscientific expertise. For inequality can be related to the ways in which people are allocated specific positions within specific divisions of labor by virtue of their class, race, gender, knowledge, intelligence, etc.

The question of expertise is a central but largely tacit one in Rancière’s political writings of the 1990s. One of the occasions in which he addresses it appears in his Prologue to a recent Spanish edition of one of Joseph Jacotot’s books. The “system of explications” Jacotot contested “continues to work ceaselessly to separate us from what we see and what we do, to transform everything into an enigma that necessitates the aid of experts and commentators of all sorts. Our governments and dominant classes increasingly present themselves to us as our pedagogues: they explain to us how complicated things are and how it is only they who can successfully manage

this complexity. The reasons of power are increasingly identified with the reasons of science, and the wish to resist them is likened to the behavior of the ignorant” (Rancière 2008, 21).

Rancière identifies two ways that have been historically employed for refusing to consider certain groups of people as political beings, namely “the refusal to hear the words exiting their mouths as discourse,” implicit in Aristotle, and “the simple observation of their material incapacity to occupy the space-time of political things” (Rancière 2009a, 24) put forward by Plato, who claimed that the artisan could not spend time in the *agora* to participate in the affairs of the community simply because “work cannot wait.” Both can be detected in the ‘deficit model’ criticized by Wynne and both are pertinent for a theorization of technoscientific expertise today.

In the end, “politics occurs when those who ‘have no’ time take the time necessary to front up as inhabitants of a common space and demonstrate that their mouths really do emit speech capable of making pronouncements on the common which cannot be reduced to voices signaling pain” (Rancière 2009a, 25). In chapter 6 I will assess the extent to which Rancière’s account is ‘applicable’ to controversies concerning technoscience, and elaborate and confront the challenge that technical expertise represents for his theorization of democratic politics.

The speech situation: objects and subjects

Brian Wynne has shown extensively how the cognitive or epistemic authority of science becomes cultural authority, granting science, scientists, and scientific knowledge a grounded but contestable privileged position in the wider society. Experts do have legitimate power to define facts and assess claims to truth, but that definition and assessment rarely suffices to exhaust the

issues at stake. This framing power is wielded beyond the laboratory and the journal, and extends to the halls of governments, the media, and local, national, or global, public spheres. Science's epistemic authority overreaches, colonizes public discussion.

So what is the meaning of Wynne's distinction between framing and propositions, politically speaking? Connecting his insights with my discussion of Rancière, I claim that when commitments prescribing what counts as relevant knowledge for decision-making are deployed without public identification and contestation of the terms and scope of their validity, science becomes the sole authority defining the issues at stake, as well as designating those with the capacity to present it and talk about it as an issue common to all. The political saliency of technoscientists thus goes beyond the world transforming aspect of their agency *qua* fabrication and action, to encompass their role in the framing of public debates.

There are two related arguments involved here. On the one hand, expert framings preemptively define the issue in question, the *object* of discussion. In the example of the sheep-farmers the matter at stake was defined beforehand as one of risk: measuring current levels of contamination and assessing the risk of long-term radiation. Indeed, 'risk' is arguably the best contemporary example of a scientific framing of control, prediction, and standardization; something reflected in the pervasiveness of 'risk assessments' in official handling of the unforeseen consequences of science and technology. Here it is interesting to note how close Wynne's position is to that of Langdon Winner, who also warned that one's initial definition of a problem (its framing) shapes subsequent inquiries into its features. Winner shows how since the 1970s questions that had previously been talked about in such terms as the 'environmental crisis,' 'dangerous side effects,' 'health hazards,' and the like, were gradually redefined as

questions of 'risk.' As he put it, "to define the subject of one's concerns as a 'risk' rather than select some other issue skews the subsequent discussion in a particular direction" (Winner 1986, 142).⁷⁹ In a similar vein, Sanjay Reddy has argued that the victory of 'risk' over 'uncertainty' in economics is subverting democracy by granting experts control over the definition of the issues. Whereas 'risk' entails "a vision of the future as subject to probabilistic analysis," 'uncertainty' implies "a vision of the future as so fundamentally and radically indeterminate so as to preclude such an analysis" (Reddy 1996, 222). This divergence pervaded the Cumbrian farmers' reception of scientific statements in the example: "the typical scientific idiom of certainty and control was culturally discordant with the farmers, whose whole cultural ethos routinely accepted uncertainty and the need for flexible adaptation rather than prediction and control" (Wynne 1996a, 26). Reddy's position is that a focus on uncertainty would greatly enlarge the field of political contention over technoscientific issues.

In the last decades, as I will argue in chapter 5, the widely trumpeted 'debate' on genetically modified organisms (GMOs) in Europe, the issue has been largely defined as a matter of *risk*: 'Is it *safe* for humans to eat GM food?' Without further contestation, such a narrow definition of the issue puts technoscientific experts in a privileged position. And those who do oppose or have reservations about the technology are deemed ignorant of the science that tells them that GMOs are safe.⁸⁰ In the face of such pre-established parameters for public discussion,

⁷⁹ His point was that many issues talked about as risks can be legitimately described in other ways: "A toxic waste disposal site placed in your neighborhood need not be defined as a risk; it might appropriately be defined as a problem of toxic waste. Air polluted by automobiles and industrial smokestacks need not be defined as a 'risk'; it might still be called by the old-fashioned name, 'pollution'" (151).

⁸⁰ "Whilst public opposition is defined as misunderstanding or willful rejection of science, it is more inspired by public alienation from the responsible institutions' insistently imposed frames of meaning, including the convinced view that public reactions are framed within the meaning of risk as defined by science" (Wynne 2003, 412).

other equally legitimate considerations that could alter the definition of the issue or expand it beyond questions of safety and risk, such as the type of agriculture we want for the future, or the place and effects of GMOs on the global food chain, fall below the threshold of intelligibility imposed by scientific expert framings. To be clear, alternative perspectives like these are not *anti-* but *extra-*scientific ones that any democratic society should take into account.

The other part to my claim about the political edge of technoscience is that a monopoly over the definition of the object is accompanied by an equally preemptive distribution of capacities for presenting and discussing the issue at stake. This invariably implies the neglect or outright silencing of *subjects* that are deemed incapable of communicating about the issue (as defined in the expert framing). Indeed, the denial of unpredictability and lack of control endemic to technoscientific agency comes with the denial of any epistemic capacity of laypeople. In the Cumbrian example, the only relevant interlocutors in the official management of the crisis were government scientists and administrators. In denying any relevance to local sources of knowledge among the sheep farmers, the experts were overtly enacting the basic tenets of the ‘deficit model.’ They overlooked farmers’ knowledge of the local environment and hill-sheep characteristics, as illustrated in their imposition of standardized measure units or their attempts at penning sheep under unrealistic conditions. As far as the experts were concerned, the farmers had no business commenting, not to say interfering with, their activities, forecasts, and declarations of confidence regarding the transitory nature of the crisis affecting the community. From their perspective, local reservations about the unrealistic or misinformed conduct of tests and experiments in the hills circulated under the threshold of intelligibility relevant for public decision-making, as if those reservations were merely the clatter of ‘cultural dupes.’ Of

importance here is that the dismissive account made of non-expert communications as ignorant babble is predicated on the social identity or position of those who voice them, and not necessarily on account of the cognitive content of what they could say. In the example, the farmers' misgivings about the experiments being confounded by unrealistic conditions were overlooked even though they were germane in terms of the experts' framing.

This theorization of the givens of a speech situation as comprising both subjects and objects matches Rancière's account. In *Aesthetics and its Discontents*, he describes the specificity of politics in the following terms: "Politics... is not the exercise of, or struggle for, power. It is the configuration of a specific space, the framing of a particular sphere of experience, of *objects* posited as common and as pertaining to a common decision, of *subjects* recognized as capable of designating these objects and putting forward arguments about them. Elsewhere [i.e. in *Disagreement*], I have tried to show the sense in which politics is the very conflict over the existence of that space, over the designation of objects as pertaining to the common and of subjects as having the capacity of a common speech" (Rancière 2009a, 25-6, my emphasis).

To the extent that public dissent is taken only to confirm the starting assumption that the issue in question is a scientific one about risk, and nothing else, and therefore that public dissent only confirms ordinary people's incapacity to understand science, the problem of public mistrust is bound to continue besetting science. This combination of narrow expert framing and dismissive treatment of lay publics characterizes the self-defeating cultural reflexes of institutional science. For Wynne, the public critique of science can be, and usually is, based on more than its propositional contents. It has to address expert framings: the unstated social, cultural, and institutional commitments of science and technology. Such disputes are likely to

have as their object both the expert framing as well as the particular propositions it makes possible.⁸¹ Therefore, rather than assuming that public concern about technoscience is focused on risk, it should be acknowledged that laypeople's concerns are also directed to the unstated and unaccountable human purposes, expectations, priorities, and aims that drive scientific knowledge and technological innovation.

And, importantly, there are no 'proper' subjects for this endeavor. In a passage that resonates strongly with Rancière's thought, Wynne argues that

To the extent that public meanings and the imposition of problematic versions of these by powerful scientific bodies are the issue, then the proper participants are in principle every democratic citizen and not specific sub-populations qualified by dint of specialist experience-based knowledge. Moreover, the participation of these citizens is indeed in the science as so defined, since this is institutionally defined in such a way as to have presumptively encompassed and colonized such broader realms of meaning under the defined umbrella of 'science' (Wynne 2003, 411).

The convergence goes even further as Wynne rejects any *a priori* demarcation of democratic politics from anything else, including science: "In favor of Collins and Evans it could be argued that, in practice, questions of meaning can or should be ignored because the discriminating democratization of one-dimensional propositional deliberations (if such could even be imagined as a separate sphere) would naturally be accompanied by democratization of the negotiation of public meanings. However, this would need at least to be recognized and argued through, with the benefit of empirical illustration. It would be wholly inadequate to argue that this issue of negotiation of public meanings is a separate, political matter, because those very boundaries are

⁸¹ As Wynne puts it, "It is very difficult to effect a boundary between 'negotiation' or dissemination of meanings and frames, and the resolution of propositional issues, since conflicts apparently over the latter often also embody differences over the former. Powerful agents can define public meanings in ways that pre-empt negotiation, but that may still be refused, explicitly or informally, by those who were excluded. Whether the meanings-saliency issues need to be resolved first, or to be resolved along with the propositional issues, we cannot ignore this major dimension, as Collins and Evans have done" (Wynne 2003, 412).

themselves a key issue” (Wynne 2003, 411). This connection between democratization at the level of propositions *and* framings is precisely what I explore in this dissertation, and the “empirical illustration” Wynne asks for will be the case of AIDS-treatment activism to be examined in chapter 6.⁸²

As I have shown, Brian Wynne’s work over the last decades has turned around the fundamental notion that a public issue *with a scientific aspect* is not the same as a *scientific issue*.⁸³ This is not an anti-science stance. Political life inevitably relies on scientific expertise in a twofold sense. On the one hand, when scientific research and innovation is translated from laboratories to society at large, it deeply transforms it, politically, socially, culturally and economically, as the recent developments in biotechnology, nanotechnology, and artificial intelligence amply demonstrate. Because of that, on the other hand, most public problems nowadays involve some sort of technical knowledge. Even though expertise is often uncertain

⁸² In Chapter 6 I will address in more depth this tension between a scientization of public engagement and the introduction of non-scientific perspectives. A basic idea I defend is that the contestation of a framing demands an engagement in propositional debates, something I illustrate with the case of AIDS-treatment activism. In a world in which the doings of technoscience are a *fait accompli*, where democracy seems destined to be *ex-post* democracy, the prospects of democratic politics hinge on the construction of alternative public spaces with a paradoxical relation to technoscience: in order to interfere and disrupt expert framings, lay actors have to begin by engaging technoscientific expertise in its own terms. And this implies the search for a common language I will theorize in terms of Rancière’s notion of a ‘poetics of knowledge.’ Otherwise, the encounter between experts and laypeople is bound to remain a form of Lyotardian *differend*, as opposed to a Rancièrian *disagreement*.

⁸³ For a further iteration of Wynne’s position see his debate with Darrin Durant (Durant 2008; Wynne 2008). A measure of the obstinacy of scientific framings is illustrated by the statement pronounced by former Labour minister Lord Jeff Rooker in his role as Chair of the British Food Standards Agency (FSA) to the steering committee in charge of organizing the public dialogue ‘Food: the use of GM,’ in which Brian Wynne served as Vice-Chair: “GM is a scientific issue, and the public is anti-science.” The event had been commissioned by the FSA itself and was meant to engage ‘experts’ and ‘the public’ in common deliberation over the issue of genetically modified crops and food. Rooker’s declaration provoked Wynne’s resignation. The idea that one would spend \$500,000 pounds of public money in a dialogue organized by authorities that preemptively defined the issue at stake as a scientific one and portrayed the public as anti-science, and somehow still feel the need to engage that public in a democratic exercise was very peculiar, if not bizarre.

and experts disagree on many things, technical knowledge is necessary and important for addressing these issues. Only anti-science populists would deny its role in informing the design, implementation, and evaluation of public policies related to techno-science. The problem is not science *per se*, but scientific framings.

From an Arendtian (i.e., perspectival) conception of public life, narrow technical definitions of what is at stake prevent the pluralization of perspectives that might be brought to bear on the definition of issues and problems that, *while having a technical dimension*, are not for that reason *scientific issues* alone. And this framing, as I have tried to show with the help of Rancière and Wynne, simultaneously prejudices the subjects or interlocutors deemed capable of naming and talking about the technical issue in question—and this despite the otherwise germane and reasonable opinions of those whose utterances are accounted for as noise, as the case of the sheep farmers exemplifies. If ‘deliberation’ in the public sphere is supposed to accommodate different and divergent perspectives on the objects under discussion, those committed to the values of democratic dialogue should pay attention to the ways in which experts tend to dismiss any speech that does not conform to techno-scientific standards of control, predictability and standardized measurement. Under such conditions, lay interventions are usually accounted for as *noise*, suspended between the *silence* from which they have emerged after the participatory turn and the status of intelligible *speech* they do not (yet) possess.

Alongside the question of what science *does* as it intervenes into nature, world, and society, then, is the question about the role that science and scientists as ‘experts’ play in setting the parameters of public debates: the ways in which expertise frames and defines the meaning of the objects at stake and the ‘valid’ interlocutors who can make a ‘legitimate’ or ‘intelligent’ claim

on them. Science frames its own doings; it attempts to contain the overflow of consequences in nature, world, society, *and* the public realm. This framing tends to take place whenever a problem or issue has a scientific or technical dimension to it. Hence, science and technology structure our living conditions *and* the public spheres in which that structuring can be discussed, and this is what makes them significant for democratic politics. The achievements of contemporary science and technology invite reflection about the conditions and prospects of public debate and contestation over issues in which science is involved. Citizens of a democratic polity ought to formulate and confront these questions through participation and deliberation.

To recapitulate, in this chapter I have shown how, on the basis of science's cultural authority, expert framings tend to define the givens of public life: its objects and its subjects. That is, they define the degree to which the issue at stake is *reduced* to its technical dimension, as well as the extent to which the interlocutors that count and the arguments accounted as intelligible are *pre-constituted* in correspondence with that framing. The question we now turn to is whether or not this distribution of the sensible is *democratically* disputable, and in which forms.

PART II

The Doubling of Expertise

4. DELIBERATION

One of the activist's goals is to make us wonder about what we are doing, to rupture a stream of thought, rather than to weave an argument.

Iris Marion Young

Drawing on the work of Hannah Arendt, Science and Technology Studies, and Actor-Network Theory, I have articulated an account of the political challenge posed by technoscience in its multiple forms of agency: acting, making, framing. Scientific action can unleash processes in *nature*, displacing the human capacity for new beginnings to a realm in which our known remedies for the irreversibility and unpredictability of action seem to be of no use. Technoscience *qua* fabrication is actively involved in shaping and augmenting the *world*. But this ‘human artifice’ (Arendt) or hybrid construction (ANT), which, politically speaking, should gather people through the mediation of things that relate and separate, thus constituting the objective *inter-esse* of our worldly interests, is instead erected for the sake of subjective standards of instrumentality and functionality. As expert framing, science and technology also intervene in defining the givens of *public life*, the objective and subjective parameters of speech situations where those modes of acting and making can become that in-between theorized by Arendt and begin to make sense politically. Nature, world, and public space are thus subject to the agency of science and technology. Further, as I claimed in chapter 1, the doings of technoscientists are politically significant because they blur the boundaries between ‘earthly nature’ and ‘cosmic nature’ (as has been the case with nuclear fission), and more recently in the case of *Mycoplasma laboratorium*, those between earthly nature and the human artifice.

The challenge for political theory is that technoscientific deeds and things can be politically significant without being an occasion for politics to happen. Through network-building and the association of humans and non-humans (ANT), science and technology ‘legislate our living conditions’ (Beck), transforming nature and world while blurring the dividing lines between them. All of this can happen without happening politically. Deeds can ‘occur’ and things can ‘be there,’ but doers, makers, deeds, and things rarely appear before plural publics. In the Heideggerean terms I suggested in the first chapter, things like nanotechnology and the myriad everyday gadgets that shape our lifestyles and structure our behavior are ‘ready-to-hand’ but rarely become ‘present-at-hand,’ that is, objects for world- and self-disclosure. Arendt’s anxieties about the human artifice no longer being a “conditioner of human existence” and becoming a “non-world” or “heap of unrelated articles” (Arendt 1998, 9) remain as pressing today as they nearly sixty years ago.

Drawing inspiration from Arendt’s *amor mundi* I have tried to argue that to care about the looks of the world is to care about the public appearance or perspectival disclosure of objects and subjects, doings and doers, without which no story can be enacted and told, and thus no meaningfulness can be wrested from our complex and perplexing modes of agency. “Meaningfulness springs into and illuminates human existence” (Arendt 1998, 324) only if we attend to the world before attending to ourselves *qua animal laborans*. The reverse does not hold: concern for subjective standards of instrumentality and functionality does not in and of itself lead to concern for the world. Put in imperative terms: take care of the world, and the world will take care of yourself (politically and existentially).

The question I turn to in the second and third parts of this dissertation is about the challenge that democratic politics might pose to technoscience. Is democratic politics thinkable in relation to science and technology? In which forms? What sense can we make of contemporary forms of public ‘participation’ in this realm? My account shall be premised on the constructivist insights of STS. Science and technology, as I argued in Chapter 2, are contestable in principle because their knowledges and practices are historical and contingent, which is not to say false, illusory, or more contaminated by interests than other human endeavors. Here I follow Latour’s brilliant equation of construction and reality in his account of technoscience. The more carefully constructed, the more real. But this very constructed character, and the contingency and uncertainty that bedevil this realm of human affairs no less than others, authorizes, as it were, forms of democratic intervention aimed at illuminating the issue in question from an unheard of and normally inappropriate perspective. In a nutshell, contingency allows contestation—not contestation for the sake of contestation, but contestation in the form of a “yes, *but*... something else can be said about this question.”

I will not engage Hannah Arendt’s work again until chapter 6, where I address Rancière’s fraught relationship to her thought. As the preceding paragraphs demonstrate, her thought is a major influence in the way I set up the question of science, technology, and expertise. On the question of democracy, however, Arendt’s writings are more confusing than illuminating. An unresolved and largely unaddressed ambivalence emerges from her observations about democracy in the modern world. On the one hand, she could claim that “[the] attempt to replace acting with making is manifest in the whole body of argument against ‘democracy,’ which, the more consistently and better reasoned it is, will turn into an argument against the essentials of

politics” (Arendt 1998, 220). Thus Margaret Canovan could write in her Introduction to *The Human Condition* that in the 1960s the book was hailed as a textbook of participatory democracy: “Arendt was certainly drawn to participatory democracy, and was an enthusiastic observer of outbreaks of civic activity ranging from American demonstrations against the Vietnam War to the formation of grassroots citizens’ ‘councils’ during the short-lived Hungarian Revolution of 1956” (in Arendt 1998, viii). And in our context, the question about the direction of science and technology, Arendt maintained, “cannot be decided by scientific means; it is a political question of the first order and therefore can hardly be left to the decision of professional scientists or professional politicians” (3). But, on the other hand, democracy, and ‘mass democracy’ in particular, where “the many form a collective body so that the people ‘is many in one’ and constitute themselves as a ‘monarch,’” (221) was for her a troubling feature of our times. As a form of rule, namely “rule by many” (222), democracy had in common with other forms of rulership the suspicion of action and its predicaments which she saw as part of the Western tradition. This reticence to uphold democracy more forcefully is perhaps related to her scant expectations about scientific language being amenable to public engagement through ordinary speech. *Our* contemporary situation, however, allows a less gloomy perspective from which to resume the thrust of her *amor mundi*. An Arendtian democracy turning around technoscience, I argue, would be about opening up the very public spaces she missed and considered remote. Beyond that, we need to look elsewhere than Arendt’s thought in search of clues about what democracy means and can be in relation to science and technology.

Part II is thus more explicitly articulated against the background of contemporary experience. The main context is the twofold rise and ‘coming of age’ of deliberative democracy

and the so-called ‘participatory turn’ towards new forms of ‘public engagement with science,’ in which STS scholars have played a prominent role. I identify and critically examine the dominant conceptions of deliberative democracy in political theory and deliberative practice in STS. In Part III I begin elaborating a third alternative informed by the political theory of Rancière and empirical cases of a peculiar form of participation in technoscience I will call *egalitarian interference*. ‘Interfering democracy’ is about the reconfiguration of the givens of speech situations, and about unexpected subjects emerging to partake in contestation over the parameters that define, include, and exclude the objects and subjects of deliberation. This means that my position represents both a rupture *and* a continuity with deliberative democracy. I seek to problematize, not to abandon, this dominant paradigm in democratic theory. I propose to complicate ‘deliberation’ and draw it closer to the kind of Rancièrian *dissensus* I see as constituting the specifically political and democratic moment that opens up public spaces, preceding or succeeding deliberation itself as a torsion affecting its basic parameters. My position towards deliberative democratic theory and practice is therefore critical not iconoclastic.

The present chapter begins by exploring the status of expertise and framing in deliberative democratic theory. After this I turn to the work of Jurgen Habermas, which I regard as exemplary of the scope and limits of deliberative theorists’ engagement with technical expertise. In this light, I then examine a notion shared by some key authors in the field whose works have been influenced by Habermas, namely ‘discursive contestation,’ which at first sight would seem to coincide with my position. I finally situate my own account of deliberation in relation to some of the main criticisms of the deliberative paradigm. Throughout, my critical

examination of the place of expertise in deliberative democracy is conducted in light of the distinction between ‘framing’ and ‘propositionalism’ put forward in Chapter 3.

The Rise of Deliberative Democracy and the question of expertise

Deliberative democracy or “the idea that legitimate lawmaking issues from the public deliberation of citizens” (Bohman and Rehg 1997, ix) belongs to the ‘tradition’ that places popular sovereignty, understood as the exercise of political autonomy whereby the ‘will of the people’ is the ground of legitimate power, at the center of the concept of democracy. “As a normative account of legitimacy, deliberative democracy evokes ideals of rational legislation, participatory politics, and civic self-governance” (ix). Thus, the rise of deliberative models of democracy is not a wholly new invention but in part represents a revival of civic republican views articulated in Rousseau’s ‘general will’ and Kant’s ‘public use of reason.’ Through rational discussion citizens can come to agree upon a ‘common good’ despite diverging particular interests.⁸⁴

A decade ago Amy Gutmann and Dennis Thompson could confidently claim that “[n]o subject has been more discussed in political theory in the last two decades than deliberative democracy” (Gutmann and Thompson 2004, vii), while John Dryzek stated that this is “the most active area of political theory in its entirety” (Dryzek 2007, 237). To grasp the significance of the rise of deliberative democracy as the *zeitgeist* of democratic *and* political theory (Bohman 1998) it is important to consider the historical and intellectual context that prepared its emergence.

⁸⁴ Other antecedents can be traced back to figures as disparate as Aristotle, Edmund Burke, and John Stuart Mill. (Dryzek 2004, 145).

Before the 1970s democratic theory had been dominated by two developments against which the new paradigm was first articulated.⁸⁵ On the one hand, the ‘elitist’ theory of democracy epitomized in Schumpeter’s *Capitalism, Socialism, and Democracy* (1976). Drawing on the empirical findings of political sociologists about the apathy and misinformation of ordinary citizens, and the trauma that the collapse of the Weimar Republic meant for a generation of European intellectuals, Schumpeter argued that democracy was not about the search for a common good but a method for selecting and replacing competing governing elites in periodic elections. Robert Dahl’s influential ‘polyarchal’ conception of the competition among interest groups (Dahl 1956, 1989), as Bohman and Rehg note (1997, xii), was less elitist than Schumpeter’s but equally centered on competition, interests, and voting.

On the other hand is the ‘economic’ theory of democracy that appeared in the wake of Anthony Downs (1957) view of parties as economic agents or entrepreneurs competing and offering their policies to ‘consumers’ in a market where votes were the functional equivalent of money. And related to this is the critique of democracy in the social choice literature, as in Kenneth Arrow’s (1963) demonstration that no collective choice mechanism can achieve a set of minimal conditions (unanimity, non-dictatorship, transitivity, unrestricted domain of preferences, and independence of irrelevant alternatives), so that no feasible and practical aggregation method can yield a rational outcome expressing a ‘common good.’ Expanding this argument into a critique of the participatory models that had emerged in the 1970s, William H. Riker (1982) argued that no popular will exists independently of the always arbitrary mechanisms that ascertain it.

⁸⁵ See (Bohman and Rehg 1997).

If there is any fundamental agreement among the diverse proponents of deliberative democracy it is the contrast between the merely aggregative conceptions outlined above and the deliberative conception “that includes any one of a family of views, according to which the public deliberation of free and equal citizens is the core of legitimate political decision-making and self-rule” (Bohman 2009, 28).

The ground for the rise of deliberative democracy was prepared by the turn to participatory democracy that attempted to dispute the hegemony of sociological and economic visions of democratic life (Pateman 1970; McPherson 1978; Barber 1984). As evident from Carole Pateman’s study and defense of workplace democracy as a viable practice that could revitalize democratic practice and theory, ‘participation’ was meant in quite literal terms as an ongoing educative process that was democratically valuable in itself *and* capable of performing the administrative tasks of industrial societies.

In this regard, the development of democratic theory in the last forty years displays an interesting irony. In general it is not clear what exactly are the differences between ‘participation’ and ‘deliberation,’ and no explanation for the coming to dominance of deliberative democracy has been elaborated. Nonetheless, one thing that is true is that at the same time that lay participation in science and technology was emerging, ‘participatory’ democratic theories were being abandoned in favor of ‘deliberation.’⁸⁶ Why is it that lay participation in expert debates has not been accompanied by a revival of *participatory* democratic theory but rather been modeled on deliberative approaches? The reason, as I will suggest, is that the prevailing forms of public

⁸⁶ Democratic participation in Pateman’s sense is very much alive, as multiple experiences with ‘participatory budgeting’ throughout the world amply demonstrate, but its reach pales in comparison to the outbreak of deliberative forums in the last two decades. See (Pateman 2012).

engagement with technoscience differ greatly from the kind of participation theorized and documented by authors like Pateman,⁸⁷ as well as from the forms of democratic action I wish to explore and articulate in Part III.

Rather shortly after the ‘deliberative turn’ in democratic theory that occurred in the early 1990s (Dryzek 2004) scholars could celebrate its ‘coming of age’ (Bohman 1998). But as John Dryzek observes, and despite the many schools of thought heralded by deliberative theorists, the striking thing is the field’s uniformity. “For better or worse, deliberative democracy has mostly been assimilated to liberal constitutionalism, which can be defined in terms of the reconciliation of interests established prior to political interaction under a neutral set of rules and rights” (Dryzek 2004, 145). Dryzek distinguishes three modes of assimilation: deliberative justifications of liberal rights in authors like Cohen (1996), arguments that constitutions promote deliberation (as in Rawls 1993), and the claim that constitution making is itself a deliberative process (Ackermann 1991; Estlund 1993; Rawls 1993). This coming of age is thus paradoxical to the extent that liberal approaches to democracy are fairly continuous with the aggregative theories of democracy (elitist and economic) against which deliberative democracy supposedly emerged.

⁸⁷ This does not mean that earlier participatory approaches did give a central place to the problem of expertise. For instance, Carole Pateman’s *Participation and Democratic Theory* contains an interesting but problematic awareness of it. The problem is at the center of what she considered “an almost insoluble dilemma for a democratic and participatory system in industry” (1970, 97). In her discussion of democracy in the workplace, for participation by members of the workers’ councils to be truly democratic a system of rotation had to be established to secure that everybody spent some time discussing “higher policy matters” like planning. On the other hand, because these were rather technical matters workers had to rely on a staff of experts. The dilemma was that an effective participation in decision-making suggested that some workers spent more time interacting at this higher level, so as to counterbalance expert claims. However, this contradicted the idea of giving everybody an equal opportunity. Pateman, however, does not elaborate on the issue and leaves the question open.

Turning now to the role of expertise in theories of deliberative democracy, the topic has received little attention. One main exception is a recent article by Mark B. Brown (2014), who sets some basic parameters when he writes that “Deliberative democracy provides an alternative to both ignorant mob rule and technocratic rule by experts,” oscillating between an Aristotelian regard for the ‘wisdom of crowds’ which gives epistemic credentials to deliberation by the many, and recognition that those with specialized knowledge about particular topics ought to get more credit in deliberations about that topic (50). Brown argues that deliberative democratic theorists have rarely devoted much attention to the kind of questions he deems important, namely: “how can citizens best make use of the expertise they acquire? How can they determine which experts are reliable? Which questions should citizens delegate to experts and which should they reserve for lay deliberation? What should citizens do when experts disagree? Should experts always play the same role in lay deliberation, or does it depend on the specific issue or the specific social context, and who decides?” (50-51)⁸⁸ These are all important questions, but they do not touch upon my concern with expert framings of speech situations; and the answers which Brown outlines (58-67) are suggestive but for the most part orthogonal to my concerns.

Brown’s outline of the problem of expertise complements Alfred Moore’s account of the problem it poses for deliberation. In Moore’s pithy summary:

Deliberative models presume that ‘justification of the exercise of collective political power is to proceed on the basis of a free public reasoning among equals’ (Cohen 1996, p.99). The problem raised by scientific knowledge is whether citizens can be regarded as equal reasoners in the face of expert knowledge. Indeed, scientific knowledge and expertise present a twin challenge for both deliberative democratic theory and for new institutions in the field of scientific governance: that of ensuring deliberative competence; and that of guarding against various forms of expert domination (Moore 2010b, 718).

⁸⁸ In a complementary article, Brown (2015) has listed and examined five conceptions of politics implicitly or explicitly mobilized in the fields of STS.

With this in mind, in the remainder of this section I provide a panoramic view of the place of expertise in the field of deliberative democracy, retrieving the few but telling observations to be found in the field.

At a general level, most standard versions of deliberative democratic theory, whether they ascribe to ‘fair proceduralism’ or ‘epistemic proceduralism,’⁸⁹ display a bias towards moral issues and consequently neglect the problem of *technical*, as opposed to other forms of expertise. This applies to several of the ‘classic’ statements of the deliberative ideal (Habermas 1981; Elster, 1986; Cohen, 1986, 1989; Manin 1987; Rawls 1993; Gutmann and Thompson, 1996).

As Mark Brown has shown, John Rawls did not see technical expertise as a requirement for citizens engaged in public reason about issues of justice, where “they reason only from general beliefs shared by citizens generally, as part of their public knowledge” (Rawls 1993, 70). And among the ‘burdens of judgment’ or sources of irresolvable disagreement between citizens in a pluralist society we find situations in which “the evidence—empirical and scientific—bearing on the case is conflicting and complex, and thus hard to assess and evaluate” (56). In this sense, when technical expertise is uncertain the claims and reasons of experts should not count as public reasons. This would be a truly explosive formula that would go a long way in answering the question of this dissertation if only issues involving science and technology were simply moral ones related to constitutional essentials and ‘justice as fairness.’ In the realm of technoscience, however, Rawls’s position is rather innocuous. As Brown indicates, “public

⁸⁹ Pure proceduralism is the view that the merit of deliberation lies in the fairness of its procedures, which guarantee values like freedom and equality, whereas epistemic proceduralism maintains that deliberation ought to be (and is capable) of ‘tracking the truth’ and yielding correct outcomes defined independently from procedures.

reason can usually rely on scientific consensus [like] when [Rawls] writes that the values of public reason include ‘accepting the methods and conclusions of science *when not controversial*’” (Brown 2014, 52, emphasis added). The last proviso is crucial, for it is the cultural authority of science itself that normally decides which questions in this area are controversial and which are not. In other words, Rawls misses the problem of framing and his reflections remain situated at the level of cognitive or propositional matters.

Similarly, Joshua Cohen’s ‘ideal deliberative procedure,’ whose principles are meant to capture the idea that “outcomes are democratically legitimate if and only if they could be the object of a free and reasoned argument among equals” (Cohen [1989] 1997, 73), does not consider the problem of technical expertise. The four requirements of Cohen’s ‘fair proceduralism’ are that ideal deliberation be free, reasoned, equal, and have rationally motivated consensus as its goal (74-75). The third condition in particular is related to the problem of expertise, but Cohen does not acknowledge the violations of this condition brought about by expert technical framings. “Everyone with the deliberative capacities has equal standing at each stage of the deliberation process” (74), writes Cohen, begging the question of how those ‘deliberative capacities’ come to be defined and distributed.

Another influential formulation of the deliberative model is that of Amy Gutmann and Dennis Thompson (1996; 2004). The question of expertise appears timidly as a by-product of their discussion of ‘reciprocity’ as one of the virtues of deliberation: “Reciprocity asks that our empirical claims in political argument be consistent with reliable methods of inquiry, as these methods are available to us here and now, not for all times and places... . By using [these methods] we demonstrate our mutual commitment to reach deliberative agreement in the

empirical realms that are relevant to moral argument” (Gutmann and Thompson 1996, 56). Here the moral bias that assigns priority to deliberation about issues of social and political justice is patent, as is their implicit contention that expert knowledge only enters deliberation in the form of propositional knowledge, however provisional the latter may be. As Brown’s discussion of their work suggests, but fails to address directly, their account of the limits to expertise in deliberation is potentially important for my own take on the question. This is the case when they conclude that “the constitutional status of the fetus is not likely to be settled by further scientific research,” a stance that would open the way to alternative framings; or when Gutmann and Thompson argue that “even if ‘legislators could show that most significant issues on the dispute over health care funding were technical,’ the relevant ‘medical and scientific information, though important, could not determine the choices that affect basic opportunities’” (quoted in Brown 2014, 53). In other words, moral and political questions are somehow immunized against narrow framings, scientific or other. The challenge I am addressing is about whether this is also the case for technological and scientific questions, something which these authors, also captive in a propositionalist atmosphere, do not consider.

This summary glance at some main exponents of deliberative democracy in its ‘fair procedural’ version indicates how little these accounts have to say about science, technology, and expertise. Overall, their emphasis on justification displays a moral bias and a myopic concern with ‘reasonableness’ that misses the problem of scientific expertise at the outset, and therefore precludes opening up spaces of contestation and disagreement in the techno-scientific domain. As I have tried to argue with the help of Brian Wynne’s approach, technical expertise has a kind of *a priori* advantage in public conversation by virtue of the cultural authority of Western

rationalist science. And this authority requires public acquiescence regarding its cognitive propositions *and* technical framings. Science, in other words, partakes like no other realm of human activity in the definition of what ‘rational’ means.⁹⁰ In this sense, expert technical framings impose a self-validating standard of reasonableness that is very difficult to challenge with deliberative means. Proceduralist conceptions of deliberative democratic theory cannot account for this. My claim is that the postulate according to which deliberation is governed by ‘reasons all can accept, or reasons no one can reasonably reject’ is at the root of an in-built blindness to the question of expert reasons, which are, almost by definition, reasons that laypeople cannot reasonably reject. What counts as reasonable in deliberation is a contingent matter.

From Wynne’s analysis of scientific framings, it can be argued that this blindness is partly explained by deliberative democratic theorists’s understanding of public dialogue as turning around propositional questions alone. This is not an accessory problem in DDT. It affects the very core of its commitments. By overlooking the tendency of scientific framings to preemptively impose definitions of the issues at stake and of the partners deemed competent for dialogue, deliberative theory has failed to adequately theorize the communicative interchange between experts and laypeople in public arenas.

Melissa Williams has examined the problem of standards of reasonableness in authors like Gutmann and Thompson in similar terms: “the judgment that another’s arguments are reasonable is a much more contingent matter than deliberative theory suggests, and... the contingency of such judgment is strongly conditioned by membership in groups structured along

⁹⁰ For an account of science as a model for the liberal democratic imaginary see (Ezrahi 1990).

the lines of social privilege and disadvantage” (Williams 2000, 137). Furthermore, “What deliberators could accept as reasons may turn out to depend importantly on who they are and on who is presenting the reasons to them. This unsettles the premises of deliberative democracy, which appear to contain an implicit supposition that the reasonableness or unreasonableness of others’ arguments will be self-evident” (137-138). My claim is that scientific framings have a distortive effect on deliberation analogous to that of structural or socioeconomic inequalities.

Beyond procedural accounts, an underestimation of the problem of expertise is also characteristic of so-called ‘epistemic’ versions of deliberation. Drawing on and extending Condorcet’s ‘jury theorem’ (List and Goodin 2001), theorists in this vein have argued forcefully against rule by experts or ‘epistocracy’ (Estlund 1993a; 1997; 2008). Notoriously, David Estlund in his *Democratic Authority* (2008, chapter II) argues that even if we grant that there are truths about political decisions (the ‘truth tenet’), and that some people possess better knowledge of these truths than others (the ‘knowledge tenet’), we are not entitled to conclude that superior knowledge of political truths is a warrant for having political authority (the ‘authority tenet’). The reason is that there is no morally acceptable way of knowing who these general experts are. In particular, there is no way of identifying political experts in a way that passes Estlund’s ‘qualified acceptability criterion’: “no one has authority or legitimate coercive power over another without a justification that could be accepted by all qualified points of view” (Estlund 2008, 33). There simply is no way of identifying political experts in a way that can pass this test. Estlund’s moral argument against expert rule is that no ‘invidious comparisons’ between citizens with regard to their political wisdom can avoid qualified objections. Epistocratic proposals are therefore defeated because they cannot satisfy the qualified acceptability requirement; there is

bound to be qualified disagreement in pluralist societies over who counts as ‘wise’ with respect to political matters.

However, as Josiah Ober has rightly suggested with reference to Estlund’s position, “the argument for epistocracy goes wrong at the outset because it wrongly supposes that, because there *are* experts in domains relevant to politics there are *also* general experts in politics (as opposed to relatively competent political leaders)” (Ober 2013, 104-5). Estlund’s case against rule by political experts rests on the absence of a morally acceptable way of identifying them, not on denying the existence of people in possession of better knowledge of political or moral truths. For Ober, on the other hand, epistocracy is ruled out from the outset simply because there is no such thing as general experts in politics. This, however, does not preclude domain-specific expertise from masquerading as general expertise, which is another way of expressing the political quandary I am trying to elucidate.

Rejections of ‘epistocracy’ have been accompanied by arguments in favor of ‘collective wisdom’ or the idea that many minds can be wiser than one (Landemore and Elster 2012) and formal demonstrations that lay deliberation combined with voting based on judgments about the reputations and arguments of experts improves collective judgment (Ober 2013). Although these analytical works rest on a very generous account of the intellectual capacity of ordinary people, one that is very distant from the prejudices of the ‘deficit model of the public,’ their treatment of expertise does not acknowledge the distinction between framing and propositions in the configuration of speech situations. The real problem for democratic politics emerges when the role of technical experts extends from informing policy decisions about public issues that contain a scientific aspect *to actually defining the meaning of the public issues themselves.*

Others who have addressed the question of expertise in deliberation but do not have a stake in the contest between fair proceduralist versus fair epistemic models present similar problems. Two are worthy of mention. Cass Sunstein's work (2002a, 2002b, 2005) echoes the basic tenets of the 'deficit model' of the public and reduces the question of technoscience to an issue of risk. If one begins from that premise it is almost impossible to counter his assertion that deliberative democracy should confer on experts in cost-benefit analysis a central if not exclusive role in decision-making on risk assessment and management. Cherry-picking results in behavioral economics and cognitive and social psychology, Sunstein claims that, unlike experts, laypeople's judgments concerning risks are frequently false: "When they disagree, experts are generally right, and ordinary people generally wrong" (2002a, 55). As far as risk assessment is concerned, technocrats and politicians are the sole deliberators, scientific opinions ought to prevail, and there seems to be no need for creating public forums for debating political questions. Thus Sunstein overlooks the need for a more fundamental debate over what kind of science and technology we collectively want, something that requires specific instances of reframing or reconfiguration of public life.

The problematic state of the question of expertise in contemporary deliberative democratic theory is also expressed in Thomas Christiano's contribution to a recent major volume on deliberative democracy (Parkinson and Mansbridge, 2012). His article "Rational deliberation among experts and citizens" focuses on social science expertise and examines the ways in which expert research agendas are influenced by the discussions of ordinary citizens. There are two problems in Christiano's position. On the one hand, his analysis restates the hegemony of propositional questions in deliberation. Thus, the question for him is solely "how

does one integrate the specialized knowledge of the sciences into democratic deliberation when it is clearly relevant to good decision-making? ... We cannot take democratic deliberation seriously if ordinary citizens generally ignore relevant specialized scientific knowledge when they are deliberating on issues that require such knowledge” (Christiano 2012, 31). On the other hand, his argument is premised on a questionable ‘division of labor’ in which citizens choose societal aims and experts are charged with the tasks of implementing them with the help of their specialized knowledge. This division is premised on a curious restatement of Plato’s distribution of capacities in the *Republic*, to the effect that laypeople do not have the time and energy for engaging in complex technical discussions: “This is not for lack of native talent, but simply because each citizen has a job of their own to do... once a person has completed their job, and made their contribution to the household, they have some entitlement to some time off from hard work” (31). Instead of theorizing possible contestations of this division of cognitive labor, Christiano restricts his analysis to an accommodation of this division to the deliberative ideal.

Jurgen Habermas: From Political Rationalization to ‘Cultural Impoverishment’

Much more promising is the work of Jurgen Habermas and kindred authors like Mark Warren, John Dryzek, and James Bohman. Habermas’s version of the deliberative paradigm, in particular, is more sensitive to the problem of expertise I formulate in this dissertation. As is the case with Arendt and Rancière, Habermas considers speech as an absolutely essential dimension of politics. His work is also sociologically informed in a way that Guttman’s and Thompson’s, for instance, is not. I mean this in the sense that Habermas is acutely aware of the limitations that modern societal complexity, functional differentiation, and instrumental modes of rationality

represent for the attempt to complement liberal representative democracy with public deliberation. His successive interventions on the nature of the public sphere are historically inflected, in the sense that the bourgeois public sphere of the eighteenth-century was structurally different from the one prevailing in the immediate post-war period (Habermas 1989b) or today (Habermas 1996).

Habermas's work, however, exhibits a significant shift from the relatively optimistic perspective articulated in his critique of technocracy in the 1960s (Habermas 1971) to the more pessimistic diagnosis he offers in his mature work (Habermas 1989a). In his early work he presents the contours of a normative model for critical interaction between experts and politicians mediated by the public. Written in a historical context marked by the development of nuclear technology and the protest movements of the 1960s, and echoing Arendt's reticence to leave the problem to the experts, Habermas presents the issue at stake as one about the 'politically conscious direction of technical progress,' the crucial question being "how can the power of technical control be brought within the range of the consensus of acting and transacting citizens" (Habermas 1971, 61). In this context, he envisions a 'dialectic of potential and will' as the only adequate response to this question.

According to a position he would continue to maintain throughout his career, such a challenge can only be met by setting into motion a politically effective discussion that rationally brings the social potential constituted by technoscientific knowledge and capability into a defined and controlled relation to our practical knowledge and will. The dialectic of potential and will is thus meant as an intentional mediation between 'what we can do' and 'what we want to

be.’ Our self-understanding, Habermas claims, is dependent on what is technically available, but the direction of our technical development is also dependent on our self-understanding.

In order to clarify his position Habermas articulates a ‘pragmatistic model’ aimed at overcoming the weaknesses of ‘decisionistic’ and ‘technocratic’ alternatives. According to the decisionistic model political action cannot rationally justify its own premises, no matter how much politicians make use of technical knowledge. “Rationality in the choice of means accompanies avowed irrationality in orientation to values, goals, and needs” (Habermas 1971, 63). Here, the expert depends on the politician. For Habermas, the shortcoming of this model is that it postulates an ‘abstract’ separation of questions of value from those of objective necessity, such that values disconnected from what is technically feasible become functionless and ideological. Thus, the decisionistic model ignores rational discussion about the relation between available techniques and practical decisions. In democratic terms, the problem with this model is that the public sphere of citizens is reduced to the plebiscitary acclamation of elites instead of enlightened public discussion. The model allows for the legitimation of decision-makers, but the decisions themselves stand outside the purview of public debate. Here, as is the case in the tradition of Weber, Schumpeter, and the bulk of modern political sociology, political power can be legitimated but not rationalized.

In the technocratic model, by contrast, the politician becomes the mere agent of a scientific intelligentsia that not only improves available means, but has also become capable of rationalizing choice as such by means of calculated strategies and automatic decision procedures. Here the politician is left with a fictitious decision-making power and depends completely on the expert. The weakness of this model is that it “assumes an immanent necessity of technical

progress” (Habermas 1971, 64), a sort of self-regulating process that demands adaptation. Habermas’s position is that no matter how expanded and perfected, technologies and strategies cannot make cogent statements about value systems, about social needs and objective states of consciousness, nor about the directions of ‘emancipation’ or ‘regression.’ In democratic terms, the problem with this model is that the public sphere, the central category in Habermas’s work, becomes superfluous and the idea of democracy loses its substance. Political power can be narrowly rationalized according to technologies and strategies, but it cannot be legitimated in those terms.

In contradistinction to these decisionistic and technocratic templates, Habermas elaborates a pragmatistic model in which “the strict separation between the function of the expert and the politician is replaced by a critical interaction” (Habermas 1971, 66). At this stage in his work, Habermas is convinced that reciprocal communication is not only necessary but also possible: “scientific experts advise the decision makers and politicians consult scientists in accordance with practical needs” (67). The challenge is to direct consciously what has previously taken place spontaneously and without planning. This only becomes feasible by carrying out the aforementioned ‘dialectic of potential and will’: “Communication between experts and the agencies of political decision determines the direction of technical progress on the basis of the tradition-bound self-understanding of practical needs. Inversely it measures and criticizes this self-understanding in the light of the possibilities for gratification created by technology” (68). In a nutshell, political rationalization occurs through the enlightenment of political will, correlated with instruction about its technical potential.

The virtue of this model, according to Habermas, is that it is necessarily related to democracy. The relation between experts and politicians crucially depends on mediation by the public as a political institution. Habermas's point is that the (pragmatically corroborated) social interests and value orientations that direct technical progress have to be articulated on the basis of "a historically determined preunderstanding, governed by social norms, of what is practically necessary in a concrete situation" (Habermas 1971, 67). And because this preunderstanding can only be accessed hermeneutically by the participants themselves, the articulation in question can only take place in the democratic form of an institutionalized public discussion among citizens. In other words, the scientific communication between experts and politicians is intrinsically connected to the 'pre-scientific' communication of the public.

Shortly after these interventions, Habermas lowered his expectations about these pressing questions and began to echo Arendt's anxieties about science and ordinary language in terms of a distancing of 'expert cultures' from everyday-life communication. His mature position on this issue, it should be noted, has been largely neglected and eclipsed by the other, more famous and influential thesis about the 'systemic colonization of the life-world' (Habermas 1989).

In his *Theory of Communicative Action* Habermas portrays scientific knowledge and expertise as an esoteric affair cut-off from ordinary communication. To grasp the meaning of this, it should be emphasized that the processes of mutual understanding and negotiation of everyday communicative and discursive situations, so dear to Habermas's overall intellectual project, draw upon the patterns of interpretation and cultural resources sedimented in people's everyday 'lifeworld.' According to the phenomenological and hermeneutic tradition Habermas draws on, humans are always implicitly negotiating with others common definitions of the

particular situations in which they find themselves, and they do this by relying on norms and conventions that they take for granted. And a crucial aspect of Habermas's theory is that the lifeworld of modernity is different from that of traditional forms of life. The 'rationalization' of the lifeworld means that traditions increasingly lose their power to prejudge everyday communicative practice, so that actors increasingly owe their mutual understanding to their own interpretive achievements. In short, "Interaction contexts come under conditions of rationally motivated mutual understanding, that is, of consensus formation that rests *in the end* on the authority of the better argument" (Habermas 1984, 145).

However, a critical problem arises when the resources of cultural rationalization, including those offered by modern science, are cut off from everyday practice and appear to laypeople as esoteric products of distant discourses and institutions. Unable to draw on cultural resources which are not their own because they do not understand the communicative processes that brought them about, ordinary people are left with 'traditionalist leftovers.' Hence Habermas sees a pathology in contemporary societies that consists in inhabiting a disenchanted world in which magical and mythical explanations have lost their force, but where the rational explanations which have replaced them become distant and separated from everyday practice. This is what Habermas calls 'cultural impoverishment': the very forms of cultural knowledge individuals require for being self-reflective and critical members of a technological and science-driven society are alienated from them by the insulation of specialists in charge of their reproduction. In Habermas's view, then, the problem is "an elitist splitting-off of expert cultures from contexts of communicative action in daily life" (Habermas 1984, 330). The diagnosis applies first of all to the rationalization of truth claims by scientific expert cultures, giving a

theoretical formulation to the widespread lament that science and technology are enterprises far removed from the world of the average citizen.

Importantly, Habermas sees cultural impoverishment as deactivating the critical potential of the public by preventing holistic interpretations of social existence from coming into existence. The separation of expert cultures leaves culturally impoverished actors unable to elaborate comprehensive and sound critiques of their social conditions: “*Everyday consciousness* is robbed of its power to synthesize; it becomes *fragmented*” (Habermas 1984, 330).

Note that, for Habermas, scientific expert cultures do have an impact insofar as they serve the *instrumental-technical* rationalization of society. However, the *cultural* rationalization they promote, that is, the changes to people’s collective self-understanding induced by the autonomization of the sphere of truth and the discursive redemption of validity claims within that sphere, remains encapsulated in expert cultures. “Modern science serves technical progress, capitalist growth, and rational administration, but not the understanding that communicating citizens have of themselves and the world” (Habermas 1984, 327-8). In other words, the situation science creates for the lifeworld pertains to what it is capable of *doing* (in terms of its technical applications) but not to what scientific expert cultures *say* or *mean*. Echoing Arendt, Habermas claims, implicitly at least, that ordinary people are affected by the doings of science but remain incapable of talking meaningfully about them. Scientific expertise, while acting into nature and radically altering our conditions of existence, has no influence on everyday speech and meaning. The impact of science is material but not discursive. Consequently, cultural impoverishment threatens the sort of democratic deliberation which Habermas himself puts at the forefront of his intellectual project.

As was the case with Arendt, the concerns Habermas articulated in the 1980s would seem obsolete in light of the profusion of deliberative exercises constituting the ‘participatory turn’ and the substitution of public engagement (PES) for public understanding (PUS), many of which are *ex professo* ‘Habermasian.’ But what is the place of deliberation, speech, and the public sphere in Habermas’s thought?

This is not the place to rehearse a complete exposition of Habermas’s work on politics and democracy. The latter has been presented with admirable detail and scope in his *Between Facts and Norms* (Habermas 1996), Habermas’s second magnum opus after *Theory of Communicative Action*. Habermas discovers a contradiction or paradox in deliberative democracy which he admirably tries to resolve without ever actually confronting the stakes involved. In our context, what matters most are the changes in the conceptions of popular sovereignty he has put forward in different times in relation to historical changes in the public sphere and the meaning of deliberation.

The ‘bourgeois public sphere’ whose emergence and decline Habermas theorized early in his career (Habermas 1989b) revealed a tension between the two sides of the expression ‘deliberative democracy.’ Leaving aside the question of the ‘plebeian’ or subordinate public spheres some have seen as Habermas’s major blindspot in this work (Calhoun 1992, 38), it turns out that when the public began to use the material and communicative infrastructure of coffee houses, clubs, and newspapers, originally associated with literary activities, to debate political affairs in the name of the public interest and to “tell truth to power,” the intelligibility and rationality of the arguments exchanged were preemptively secured by the social position of the actors. The speech of the property-less and of women was for all practical purposes excluded

from ‘public’ deliberation. However, the very Enlightenment values of publicity and openness upheld by the bourgeoisie were taken at face value with the gradual expansion of the franchise between the late-nineteenth and early twentieth century.

Habermas’s narrative in his book on the bourgeois public sphere is a story of the decline and ‘structural transformation’ of this discursive space bought about by the overwhelming expansion of its (potential) members. Still under the influence of his mentors at the Frankfurt School, Habermas basically complained that the democratic (quantitative) improvement ended up compromising the quality of deliberation with the invasion of particular and sectorial interests. The ‘refeudalization’ of the public sphere evident for him in the 1950s suggested a zero-sum game whereby the more inclusive the public sphere, the lower the quality of arguments. Whereas the eighteenth-century public spheres articulated the sovereignty of the people *qua* educated property owners, the newly transformed one of the twentieth century lost any reference to a common will in favor of the negotiation of interests of party politics and mass democracy. Habermas was therefore the first to identify a hard to handle contradiction between the demands of democracy and the demands of rational deliberation.

In his later work Habermas (1996) attempts to escape this conundrum with his ‘procedural’ account of popular sovereignty and ‘virtualized’ model of the public sphere.⁹¹ In *Between Facts and Norms* he is very much aware of the unequal distribution of information, expertise and other resources of deliberation in contemporary societies. “The resources for

⁹¹ The manifold implications of this solution, brilliant in its attempt at forging a middle ground between republican and liberal perspectives need not concern us here, for they have little to do with issues of expertise and speech. Habermas’s solution to the tension between the constitutional state and democracy is his famous thesis that human rights and popular sovereignty are ‘co-originary’ and make each other possible. See (Habermas 1996, Chapter 3).

participating in political communications are in general narrowly limited. This is evident whether one examines the time available to individuals and the episodic attention to topics and issues with histories of their own; the readiness and ability to make one's own contribution to these topics; or the opportunistic attitudes, affects, prejudices, and so on, that detract from a rational will-formation” (Habermas 1996, 326). Indeed, to deny actors such as experts the political influence they have gained communicatively in the public sphere would run against the grain of Habermas’s communicatively rationalist view of the democratic process. Thus,

The reputation of groups of persons and experts who have acquired their influence in special public spheres also comes into play (for example, the authority of religious leaders, the public visibility of literary figures and artists, the reputation of scientists, and the popularity of sports figures and movie stars). For as soon as the public space has expanded beyond the context of simple interactions, a differentiation sets in among organizers, speakers, and hearers; arenas and galleries; stage and viewing space. The actors’ roles that increasingly professionalize and multiply with organizational complexity and range of media are, of course, furnished with unequal opportunities for exerting influence (Habermas 1996, 363).

Nevertheless, “the political influence that the actors gain through public communication must ultimately rest on the resonance and indeed the approval of a lay public whose composition is egalitarian. The public of citizens must be convinced by comprehensible and broadly interesting contributions to issues it finds relevant. The public audience possesses final authority” (Habermas 1996, 364). As Brown concludes, “like Rawls and Guttman and Thompson, Habermas argues that the influence of experts on public deliberation ultimately depends on their power to persuade the public” (Brown 2014, 56). Importantly, citizens are theorized by this later Habermas as a ‘public’ in a very literal sense, not so much as contributors to deliberation but anonymous judges who monitor debates, including those framed by expert

contributions. In effect, the more insurgent public sphere of Habermas's earlier theorizations gives way to a much more domesticated scene in the framework of liberal constitutionalism.

More recently, Habermas has restated this view in the context of a discussion on the epistemic merits of deliberative democracy in mass communications: "Mediated political communication in the public sphere can facilitate deliberative legitimation processes in complex societies only if a self-regulating media system gains independence from its social environments and *if anonymous audiences grant a feedback between an informed elite discourse and a responsive civil society*" (Habermas 2006, 411, emphasis added). This way of seeing the problem, I contend, precludes laypeople from having a say in the definition of the issues and questions at stake.

Habermas's problematic relation to the problem of technical expertise seems to have its roots in his fraught notion of the 'ideal speech situation,' an idea which has been subjected to valid but also unjustified criticism and caricaturization. Although he quickly abandoned this expression after its formulation in the late 1970s, so as to dispel misunderstandings about the impracticality of its requirements, the notion that the only decisions that deserve to be regarded as rationally justified, however provisionally, are those that result from debates in which all those affected have had a say, everybody aims at reaching agreement, and "the force of the better argument" carries the day, still captures the basic thrust of his intellectual project (Habermas 1990, 43-115).

The problem with these regulative ideals for rational discourse is not, I contend, their impracticality but rather their open-ended and under-specified status. Whereas many of Habermas's critics can be said to focus on issues raised by the first two conditions, the question

of expertise points instead to the third condition about the authority of the better argument, the one that more clearly begs the political question about the givens of speech situations forged behind the scenes and before actual deliberation is conducted. As I argued before, science and technology enjoy a cultural authority that sets the status quo concerning what can be said about technoscientific doings and by whom. Rancière's question about what speaking means, the question that interrupts the normal flow of deliberation, constitutes a blind-spot for Habermas's theory. Whereas Habermas follows Aristotle's footsteps in taking such parameters as given, assuming that the subjects and objects of deliberation are always already pre-constituted, thus focusing on *ongoing* deliberation, I follow Rancière in asserting that such public givens of speech situations are the very object at stake in political-democratic disputes. This line of critique is peculiar and different from all those normally addressed at deliberative democracy, and will be further theorized in chapter 6.

Deliberation as Discursive Challenge?

Since the 1990s, some deliberative theorists have tackled the issue of expertise more adequately, resuming the task where Habermas left it. Mark Warren (1996), James Bohman (1996; 1999; 2000), and John Dryzek (1990, 2000) have each elaborated a notion of deliberation based on 'discursive challenge' or 'discursive contestation' that is closest to the argument I elaborated in chapter 3. This is the case even though, as Mark Brown suggests, these authors "have often seen participation in technical policy areas as the most impractical of all" (Brown 2009, 219).

Mark Warren argues that expert authority is constituted in part by the existence and vitality of "institutionalized opportunities for discursive challenge" that enable both experts and

laypeople to publicly challenge expert claims whenever the need arises (Warren 1996, 49; 55-6).

Lay trust in experts, that is, need not be blind. Thus, on Warren's view:

Democratic authority... comes from a set of institutionalized protections and securities within which the generative force of discursive challenge is possible. More specifically, authority operates when the possibility of discursive justification exists and is occasionally exercised, but is not brought to bear on every authoritative decision, precisely because the critical background of attentive publics renews the authoritative status of the decision maker. Democratic authority can exist when an institutionalized possibility of challenge allows individuals to suspend judgment; when individuals act on the decisions of authorities without questioning simply because they know they could question and sometimes do; and when individuals can trust authorities because they know authorities will act with an eye to justifying their decisions even if they do not do so in most of the decisions they make (Warren 1996, 57).

James Bohman (1996, 1999, 2000) and John Dryzek (1990, 2000), each in their own way, display a similar grasp of the political problem of expertise. Bohman's position is premised on a 'cognitive division of labor,' but he considers the possibility of challenging its terms. "The cognitive division of labor in science produces expert knowledge, the content of which laypersons can hardly test or evaluate.... [C]itizens no longer seem to be free and autonomous agents who can directly rule themselves and control their shared circumstances of common life; rather, they are ensnared in relations of epistemic dependence, which at the very least produce political situations in which asymmetric information is increasingly silent" (Bohman, 2000, 47-48). Bohman proposes a reflexive solution: to make the division of labor itself more democratic, which means more open to public deliberation. Crucially, this requires that citizens have a say on the conditions under which the process of deliberation itself is carried out:

Under a more democratically organized division of cognitive labor, there is no need to trade off between democratic deliberation and expert effectiveness. The division of labor can be democratic as long as it fulfills two conditions: it must establish free and open interchange between experts and the lay public, and it must discover ways of resolving recurrent cooperative conflicts about the nature and distribution of social knowledge and

opportunities to communicate. It can do so only if citizens are well informed, particularly with regard to the conditions of social inquiry and public communication (Bohman 1999, 592).

More recently, Bohman (2009) has tried to bridge pure proceduralist and pure epistemic accounts of deliberation, arguing that the epistemic values of deliberation derive from the democratic procedures themselves, and not from some procedure-independent criterion of truth or correctness. Importantly for the convergence this exhibits with my Arendtian account of perspectivalism, Bohman claims that the “juridical standards” that have modeled the notion of impartiality in deliberation “suggest that citizens are civil only if they offer reasons that they think are ‘public’ or that are ones ‘all could accept.’ Instead of these limits on diversity, the epistemic benefits of democracy derive from a practice of deliberation in which many different perspectives are brought to bear in an ongoing process of formulation, testing, and revision, in which each participant proposes the very best outcome, as they understand and are able to express it” (30-31). Although I endorse this epistemic valuation of plurality, the perspective I have articulated following Arendt is aesthetic and political, focusing on world- and self-disclosure instead of truth-tracking or correctness.

Finally, and equally close to my position, is John Dryzek’s conceptualization of democracy as ‘discursive contestation’ (Dryzek, 2000). Reflecting on the aforementioned assimilation of deliberative democracy to a set of rules and rights, which signaled the former’s ‘coming of age,’ he claims that “however invigorating this assimilation of deliberative democracy might be for liberalism, it may be bad news for democracy... thorough assimilation to liberal constitutionalism blunts any critical edge deliberative democracy might have had, and diverts attention away from extra-constitutional agents of both distortion and democratic

influence, as well as novel sites of democratic innovation” (Dryzek 2004, 146). Dryzek believes that the main obstacle to genuine deliberation is this accommodation to the liberal constitutional state of our times. “This state is increasingly subject to the constraints imposed by the transnational capitalist political economy. The first task of all states in this system is to maintain the confidence of actual and potential investors, to avoid capital flight... Public officials under the sway of such imperatives are highly constrained when it comes to the terms of the arguments they can accept; it is very hard for deliberation to reach them” (Dryzek 2000, 29). As I have been suggesting, the cultural hegemony of Western rationalism and science could count as introducing additional constraints on deliberation. Thus, Dryzek advocates the challenging of discourses in the public sphere, which leads him to explicitly address the problem of expertise (163-166).

A discourse, for Dryzek, is “a shared means of making sense of the world embedded in language” (Dryzek 2000, 18). His notion of ‘discursive shifts’ thus resonates with Arendt’s perspectival account of public life, as well as with Brian Wynne’s take on reflexivity: “While discourses do indeed help to condition the way people think, individuals are not necessarily prisoners of the discourses that have helped to create their identities. Instead, the essence of engagement and challenge across discourses is that individuals can be brought to reflect upon the content of discourses in which they move” (163). Ultimately, Dryzek conceives discursive challenges to expertise as a matter of “approaching expert testimony with a skeptical attitude, perhaps questioning the credentials of experts, seeking corroboration for any contentious claim, refusing to believe an expert if his or her research is funded by the offending industry, or if his or her record indicates an axe to grind” (165). To that extent he seems to move, like Wynne, beyond an exclusive attention on propositional questions. However, his claim that “distrust of experts

does not mean that everyone has to *become* an expert” (165) indicates the limits of his proposal. As I will argue more forcefully in chapter 6, challenging the lay-expert divide involves a process of expertization by actors involved in conflict with science. Not ‘everyone’ has to become an expert in a specific domain of controversy, but singular or ‘one-off’ events of this kind might very well suffice to disrupt and de-naturalize scientific assumptions.

Beyond these authors, the only existing treatment of framing in deliberation is that of Mauro Barisione (2012), who makes a contribution from the perspectives of ‘framing theory’ and qualitative research methodology, but with no reference to Wynne’s contributions. Drawing on ‘framing’ as expounded by Gregory Bateson and, most famously, Irving Goffman, Barisione defines ‘deliberative framings’ as “the communication processes of structuring the context of meaning, or the interpretive framework, in which a deliberation is held. These processes concern the definition and the construction of the political or social issue under deliberation, and therefore, more generally, the modes of its formal presentation” (Barisione 2012, 1). This notion of framing dovetails with my own, but it remains incomplete to the extent it is confined to the objects or issues at stake, and does not extend to the subjects or actors deemed competent to make a contribution within the prevailing frame. Furthermore, whereas Barisione analyzes framing but not expertise, I have been arguing throughout this dissertation that *expert* framings in scientific domains are exemplary of *framing*, for the simple historical reason that science and technology are so central to our modern self-understanding. Importantly, however, Barisione raises the politically significant question of how “authentically competing frames (i.e. ‘counterframes,’ and not mere counterarguments framed through the same interpretive principle) [can be introduced] into the deliberative setting, and the structural possibility for ‘reframing’ in

the course of the deliberation” (2). This perspective echoes the notion of discursive challenge examined above, but presents similar problems. Ultimately for Barisione, who draws on Bohman on this point, ‘reframing’ “depends on the contextual conditions allowing (or not allowing) participants to critically reflect around the frame that regulates a discussion” (17), so that deliberation itself is the best way of neutralizing those effects. Barisione does not address the question of *expert* framings and thus can claim that just as framing affects or distorts deliberation, “deliberation affects (i.e., neutralizes) framing” (17).

Mark Brown has summarized the gist of the positions advanced by Warren, Bohman, and Dryzek in the following terms: “The potentially anti-democratic implications of an epistemic division of labor between experts and laypeople can be avoided by creating institutions for public deliberation on the terms of cooperation between them” (Brown 2010, 195). The notion of ‘discursive challenge’—through which those terms of cooperation are supposed to be contested—certainly converges with my argument that democracy is about confronting expert framings in speech situations. But can expert authority be challenged *deliberatively*? I think not. ‘Discursive challenge,’ as theorized by Warren, Bohman, and Dryzek, *is not itself an exercise in deliberation*. To deliberate about deliberation without stepping out from deliberation would be like the deed of Baron Munchausen when he lifted himself out of quicksand by pulling his own hair.

Following Rancière, I contend that if discursive challenge is akin to a reconfiguration of the sensible, of the parameters of speech situations defining its proper objects and subjects, then this is a moment that *interferes* with ongoing deliberations. It is a disruption precisely because it cannot be accounted for in the prevailing distribution of the sensible in public space. It is a *supplement*, not a *complement* to deliberation. Certainly this disruption itself involves a form of

deliberation, but this one is about finding out whether or not a common language exists with which to make sense of the common world, which in our context means arguing about technoscientific deeds and artifacts and their overflows in nature, world, and society. This form of democratic interference, I claim, cannot be institutionalized without forsaking its *raison d'être*, which is precisely a reconfiguration of institutionalized partitions of the objects and subjects that count publicly.

Reflection about procedures and institutions, intrinsic to deliberative democratic theory, is of course necessary. As the emphasis on speech underlying my position in this dissertation ought to make clear, I take deliberation to be an essential dimension of political life. And deliberation, as the rational exchange of arguments and perspectives, is simply not possible outside a definite framing concerning what counts as the common object and how subjects' capacities for enunciation are distributed. The political task is to reconfigure these givens of public life, to introduce punctuations in an otherwise smooth process of ongoing deliberations. Logically speaking, this cannot be a permanent and self-subsisting state of disruption; it is always an abrupt, untimely, and short-lived form of action. It is also historical, in the sense that it operates on a given frame in particular times and places. And it does not constitute politics as a separate or pure realm with a definite content and proper modes of being: it is always the reconfiguration of given framings. Such forms of democratic politics are necessary, now and then, to maintain a sense of public awareness about the contingency, historicity, and exclusionary tendencies of our political arrangements. Deliberation does not take place in a cultural vacuum (Wynne) or outside partitions of the sensible (Rancière). To make democracy count is to dispute those givens of common life. Ultimately, then, the kind of democratic politics I uphold is one in

which speech itself is at stake. Discursive challenge is a much more difficult, messy, and socially upsetting affair than the consensual civility assumed by deliberative theorists like Habermas or Gutmann and Thompson.

Between Democratic Contestation and Deliberation

That discursive contestation of framings is something other than deliberation is indirectly corroborated by the fact that the most influential criticisms of deliberative democracy would be rather pointless if ‘discursive contestation,’ and not ‘consensus,’ was what deliberation is all about. Thus Ian Shapiro (1999, 36) complains about the lack of attention to ordinary politics in the deliberative paradigm, ignoring the pressures of power: “Politics is about interests and power” and not about “understanding” and the “better argument.” Chantal Mouffe (1993; 2000) has repeatedly claimed that deliberative or consensual democracy, by postulating the availability of a public sphere immune to power relations and oriented to rational consensus, fails to embrace the paradox of liberal democracy and acknowledge the ineradicable agonism of politics.

Among the criticisms leveled at deliberative democracy, the ones by democrats concerned with difference and identity like Lynn Sanders (1997), Iris Marion Young (2000; 2001), and Melissa Williams (1998, 2000) are closer to my own, but not without a few significant differences. The problems identified in these works have to do with the criteria of reasonableness and the loose and vague account of equality in deliberation (Williams 2000; Chambers 2008). Deliberation, it is argued, excludes and represses diversity, and so democratic theorists should vindicate those alternative forms of communication through which disadvantaged groups can voice their concerns and needs. As Williams puts it: “Whether or not

citizens will recognize others' reasons *as* reasons may be a socioculturally contingent matter. Moreover, it seems likely that the contingency of this recognition may tend to be resolved in a manner that systematically disadvantages the reasons of marginalized groups in a discursive exchange" (Williams 2000, 125). For Sanders the focus on calm, rational, and dispassionate discussions excludes positions voiced in 'immoderate' ways by those who lack the ability to convey 'reasonable arguments.' In this sense, "Deliberation requires not only equality in resources and the guarantee of equal opportunity to articulate persuasive arguments but also equality in 'epistemological authority,' in the capacity to evoke acknowledgment of one's arguments" (Sanders 1997, 349). Also in this line, Young's (2000) 'communicative democracy' welcomes forms of communication more accessible to disadvantaged minorities, such as greeting, rhetoric, and storytelling, for the exclusion of such non-discursive means is part and parcel of the 'ideology,' 'social imagination,' or 'hegemonic discourse' that sets the terms of deliberation. Incidentally, both Chambers (2008, 321) and Young (2001, 687) single out James Bohmann's work as an important exception to deliberative theorists tendency to neglect this problem, thus suggesting that the latter's theory of discursive contestation, like Warren's or Dryzek's, is not what deliberative democracy is about in the minds of many political theorists. In any case, deliberative democratic theorists should take these criticisms into account. Otherwise, their treatment of marginalized groups will simply double the PUS 'deficit model' account of laypeople and their voices.

Inclusion in deliberation, especially in Sanders' argumentation, is meant to redress a set of wrongs perpetrated upon the actor or subject. This has to do with having his or her perspectives and interests count in the political process, but it also involves self-disclosure in the

sense of a broader acknowledgment of his or her identity. “The goal of democratic deliberation should not be teaching everyone to deliberate, but trying to figure out a way to make sure that everyone participates and is effectively represented and taken seriously in discussions” (Sanders 1997, 369). But the issue or thing in question, and thus the question of world-disclosure, recedes to the background. From the modified and critically updated Arendtian perspective I am trying to articulate, the challenge is to make ‘difference democracy’ make a difference for the world. Both subjects *and* objects ought to be protagonists of democratic politics.

Among political theorists who are critics of deliberation as a paradigm for democracy, Iris M. Young’s work is exemplary, and in many respects resonates with my appropriation of Rancière and Arendt. And much like the position I am trying to articulate, her criticisms do not represent a complete departure or wholesale rejection of deliberation but are better understood as an attempt to broaden its parameters. As Emily Hauptmann has observed, Young’s emphasis on difference as a resource for deliberation (Young 1996) brings her perspective “closest to drawing on both deliberative and agonistic perspectives. Young makes the case that, in their current formulation, deliberative theories of democracy exclude too many kinds of communication and are too preoccupied with reaching general agreement to be satisfactory theories of how to conduct the politics of difference” (Hauptmann 1999, 868).

Young’s account of ‘communicative democracy bears particular attention here, for its many strengths and one weakness might help sharpen my own arguments about the democratic politics of technoscience. The reflections she puts forward in her subtle and insightful hypothetical dialogue between a deliberative democrat and an activist (Young 2001) are especially relevant in our context. She distinguishes four activist arguments against deliberative

democracy, all of which hinge on recognition of the effects of structural inequalities that pervade contemporary societies: outright exclusion of uninvited participants from deliberative settings;⁹² formal inclusion and factual exclusion from deliberative forums like citizen juries;⁹³ constraints on the terms of deliberation and its agenda;⁹⁴ and the ideological distortion of hegemonic discourses. Although the third aspect is related to my argument about framing, the one closest to my position is the fourth. As Young puts the matter:

By a 'discourse,' I mean a system of stories and experts knowledge diffused throughout the society, which convey the widely accepted generalizations about how society operates that are theorized in these terms, as well as the social norms and cultural values to which most of the people appeal when discussing their social and political problems and proposed solutions.... When such discursive systems frame a deliberative process, people may come to an agreement that is nevertheless at least partially conditioned by unjust power relations and for that reason should not be considered a genuinely free consent.... When such hegemonic discourse operates, parties to deliberation may agree on premises, they may accept a theory of their situation and give reasons for proposals that the others accept, but yet the premises and terms of the account masks the reproduction of power and injustice (Young 2001, 685).

The allusion to 'frames' that set the terms and premises of deliberation is very proximate to my own examination of the problem. Indeed, the kind of scientism I examined in the third chapter as imposing a narrow perspective on *risk* is one form of that socio-cultural discursive hegemony Young writes about. Her examples of hegemonic discourse dominating discussions on poverty or greenhouse gas emissions display features and logics analogous to the one framing the encounter

⁹² "Good citizens should be protesting outside these meetings, calling public attention to the assumptions made in them, the control exercised, and the resulting limitations or wrongs of their outcomes." (Young 2001, 677)

⁹³ "Formally inclusive deliberative processes nevertheless enact structural biases in which more powerful and socially advantaged actors have greater access to the deliberative process and therefore are able to dominate the proceedings with their interests and perspectives." (Young 2001, 679)

⁹⁴ "The problem is not that policy makers and citizen deliberations fail to make arguments but that their starting premises are unacceptable" (Young 2001, 683).

of scientific experts with sheep farmers in Northern Cumbria. “That anti-poverty policy must ultimately transform individuals to fit better into the contemporary structures of wage employment... almost goes without saying. There is almost no other way to think about poverty policy than as a labor market policy” (Young 2001, 687). And debates about greenhouse emissions are restricted to the question of how to redistribute the burdens of reduction, for example, through pollution rights markets. But “the social imaginations of both ‘developed’ and ‘less developed’ countries have few ideas for alternative forms of living that would not produce large carbon emissions” (687).

Further, and to the extent that a concern for the world, that is, a concern for how the things (gas emissions) and actors (‘the poor’) at stake in democratic life appear in public is present in her reflections, Young’s critique of deliberation is the one least affected by the bias of subjective standards of instrumentality and functionality I examined in chapter 1. She exhibits an (admittedly timid) sense of *amor mundi* not unlike Arendt’s: although the question of identity and difference or self-disclosure prevails in her account, world-disclosure also has its place.

For Young, the only way to challenge hegemonic discourses is by expanding the repertoire of admitted forms of communication beyond argumentation, where the latter means “the construction of an orderly chain of reasoning from premises to conclusion” (Young 2000, 37). On her view, this includes a range of non-discursive means—“pictures, song, poetic imagery, and expressions of mockery and longing performed in rowdy and even playful ways aimed not at commanding assent but disturbing complacency”—that ought to have a place in democracy (Young 2001, 687). Hence, she argues, a ‘communicative’ model of democracy broader than deliberation is needed:

The ideal of communicative democracy includes more than deliberative democracy, because it recognizes that when political dialogue aims at solving collective problems, it justly requires a plurality of perspectives, speaking styles, and ways of expressing the particularity of social situation as well as the general applicability of principles. A theory of democratic discussion useful for the contemporary world must explain the possibility of communication across wide differences of culture and social position. Such a theory of democracy needs a broad and plural conception of communication that includes both the expression and the extension of shared understandings, where they exist, and the offering and acknowledgment of unshared meanings (Young 1996, 132-133).

The kinds of non-discursive means that Young points out have an element of surprise and a potential for disrupting extant framings of speech situations which are pertinent for my own theorization of democratic politics. At this point, however, a few brief remarks are in order with respect to one significant shortcoming in Young's theorization from the perspective of the Rancièrian position I began to articulate in the previous chapter. Although the latter will come to fruition in chapter 6, the disagreement is important enough to merit some attention now.

The dilemma here has to do not with those non-discursive elements themselves, at least not in the context Young provides, but rather with her endorsement of a form of ideology critique as an important aspect of democratic theory (Young 2001, 685-687): "The conceptual and normative framework of the members of a society is deeply influenced by premises and terms of discourse that make it difficult to think critically about aspects of their social relations or alternative possibilities of institutionalization and action. The theory and practice of deliberative democracy ... lacks a theory of, shall we call it, ideology, as well as an account of the way individuals see themselves and their social world" (686). Echoing Habermas's version of ideology critique and his thesis that 'cultural impoverishment' impedes holistic appraisals of social conditions, Young observes that "certain activists concerned with specific areas of social life claim to identify such ideologies and hegemonic discourses. Their doing so is necessarily

partial with respect to social problems and policy issues because ideology critique of this nature requires considerable thought and study, even for one set of issues.... Such ideology critique needs not only to be able to analyze specific exchanges and speech but also theorize how media contribute to naturalizing assumptions and making it difficult for participants in a discussion to speak *outside* of a certain set of concepts and images” (687, emphasis added).

Importantly, the contestation of hegemonic discourses, Young argues, often has to be done by the kind of “non-discursive means” listed above. In a remarkable passage, she writes that one of the activist’s goals “is to make us wonder about what we are doing, to rupture a stream of thought, rather than to weave an argument” (Young 2001, 687). This dovetails with Arendt’s concerns about our modern disposition to actually “think what we are doing” (Arendt 1998, 5), and the notion of a rupture in the hegemonic ‘social imagination’ is similar to the democratic contestation of expert framings. However, the vindication of non-discursive means can be counterproductive from the perspective of a Rancièrian view of democratic politics. This is because the latter emphasizes attempts at finding out if a *common* language exists between those who sit comfortably in a speech situation and those who want to interrogate its basic parameters; what Rancière calls a ‘poetics of knowledge’ (Rancière and Panagia 2000).

As I have indicated and will make explicit in the chapter 6, contestation of expert framings also involves engagement at the propositional level. This is particularly the case when technoscientific expertise is involved. Thus, the forms of political action defended by Young are likely to be entrapped in Lyotardian ‘differends,’ enacting (instead of contesting) the incommensurability of ‘expert’ and ‘lay’ discourses. In Young’s own words, “the effort to shape arguments according to shared premises within shared discursive frameworks sometimes

excludes the expression of some needs, interests, and suffering or injustice, because these cannot be voiced with the operative premises and frameworks. Jean-Francois Lyotard calls this the problem of the ‘differend’” (Young 2000, 37).

By contrast, I am interested in forms of action that set up Rancièrian *disagreements*, which are not about a clash between mutually unintelligible discourses or forms of communication, but disputes fuelled precisely by the attempt of laypeople to appropriate expert discourses in order to say or do something new, to have their utterances count as *logos* (as opposed to *phoné*). And this is hindered, not facilitated, by the opposition of discursive and non-discursive forms of communication emphasized by Young. At least when technoscientific agency is involved, and since there is no guarantee that the dominant expert groups will acknowledge non-discursive forms of communication as speech, democratic contestation cannot forswear engagement at the propositional level, even if that implies a provisional and partial acceptance of a hegemonic discourse by virtue of which propositions are accounted for as speech or noise.

As I will argue in chapter 6, the disruption and reconfiguration of a framing requires the exploration of a common language, something which, I claim, requires a subversive appropriation of the dominant discourse. The point is not that a Rancièrian view of democratic politics ought to exclude non-discursive means like testimony or storytelling. It is rather that democratic contestation of the terms of deliberation in the technoscientific realm (and arguably in others as well) is foreclosed when the burden is placed on particularity at the expense of universality. In Part III I will revisit this argument and complement it with Rancièrè’s notion of emancipation or subjectification as enacting a logic of ‘dis-identification’ that signifies a rupture with the distribution of different forms of identity and expression among different subjects.

Beyond this important qualification, my Rancièrian perspective coincides with Young's call to imagine "the exchange of ideas and processes of communication taking place in a vibrant democracy as far more rowdy, disorderly, and decentered" (Young 2001, 688). And the task I have set for myself in this dissertation can be read as a theoretical response to her call on activists "*both* to engage in discussion with others to persuade them that there are injustices that ought to be remedied and to protest and engage in direct action. The two kinds of activities cannot usually occur together, however, and for this reason one of them is liable to eclipse the other. *The best democratic theory and practice will affirm them both while recognizing the tension between them*" (689, emphasis added).

Having examined the place of technical expertise in the work of proponents and critics of deliberative democratic theory, it is time to turn to the world and consider its practice and concrete implementation, particularly in the realms of science and technology.

5. ELICITATION

The public realm, the space within the world which men need in order to appear at all... [is] more specifically 'the work of man' than is the work of his hands or the labor of his body.

Hannah Arendt

By the end of the 1980s many of the major statements of deliberative democracy were beginning to change the landscape of democratic theory, preparing the ground for the ‘deliberative turn’ of the next decades. Robert Dahl (1985; 1989), a major exponent of the competitive and aggregative conceptions of democracy from which deliberative theorists wished to depart, could seamlessly incorporate the procedural account of democratic deliberation into his own conception. In doing this, he anticipated the assimilation of deliberative democracy to liberal constitutionalism that according to Dryzek (2004), would ensue in the decade ahead. “Each citizen,” Dahl declared, “ought to have adequate and equal opportunities for discovering and validating the choice on the matter to be decided that would best serve the citizen's interests... . Insofar as a citizen's good or interests requires attention to a public good or general interest, then citizens ought to have the opportunity to acquire an understanding of these matters” (Dahl 1989, 112).

Particularly relevant in this regard was Dahl’s proposal for ‘minipopulus’ (339), which prefigured the enactment of deliberative forums that would proliferate in the following decades. As Jürgen Habermas, another heavyweight champion of liberal democracy rapidly acknowledged, Dahl’s recourse to more participatory forms of political agency was meant to

address the question of expertise. In a passage from *Between Facts and Norms* that echoes his thesis about cultural impoverishment, Habermas made the following observation:

In Dahl's view, the most important bottleneck to advances beyond the present level of democratization lies in the specialization of the technical steering knowledge used in policymaking and administration. Such specialization keeps citizens from taking advantage of politically necessary expertise in forming their own opinions. The chief danger consists in the technocratic variant of a paternalism grounded in the monopolization of knowledge. Privileged access to the sources of relevant knowledge makes possible an inconspicuous domination over the colonized public of citizens cut off from these sources and placated with symbolic politics. Dahl thus sets his hopes on the technical possibilities of telecommunications; with the term 'minipopulus,' he proposes a type of deliberation and decision making that, at once functionally specialized and decentralized, proceeds through specially informed assemblies of representatives (Habermas 1996, 317).

When Dahl first introduced the concept in the 1980s, the prospects of an actual, large-scale implementations of 'minipopulus' could have seemed utopian. Today, such exercises in deliberation are part and parcel of local, regional, national, and supranational structures of governance. Indeed, in the last decades hundreds of experiments and exercises have been conducted to enact deliberation among 'ordinary' citizens, distinctly if at arms' length from the deliberation of parliaments and courts to which theorists like Rawls and Gutmann and Thompson devote most of their attention. These other forms of deliberative engagements, now simply referred to as 'minipublics' (Fung 2007), include 'Deliberative Polls' (Fishkin 1991, 1997; Fishkin et al. 2000), 'Citizens' Juries' (Coote and Lenaghan 1997; Smith and Wales 2000; Crosby and Nethercut 2005), 'Consensus Conferences' (Joss and Durand, 1995) and 'Citizen's Assemblies' (Warren and Pearse 2008).

Thematically, and importantly for the themes of this dissertation, the bulk of minipublics around the world have turned around technoscientific issues in realms such as biotechnology,

nuclear waste disposal, gene therapy, genomics, nanotechnology, pollution, information technologies, and medical imaging. As could be expected, STS scholars have been studying the emergence of such deliberative experiments outside (though not entirely unrelated to) the disciplinary confines of political science and theory. Indeed, a widely announced ‘participatory turn’ (Jasanoff 2003) towards new forms of ‘public engagement with science’ (or PES) has been underway since the late 1990s, unbeknownst to the average political theorist, most prominently in the European context but also in the US and elsewhere, to such an extent that public ‘participation’ has become an important and almost routinized aspect in the governance of technoscience (Hagendijk and Irwin 2006; Horst and Irwin 2010). Much of this participatory escalation has been articulated to confront a widely documented lack of public confidence in science, sparked by repeated crises, disasters, and controversies symbolized by the BSE (mad-cow disease) crisis in Great Britain (House of Lords 2000; European Union 2000; Jasanoff 1997; Phillips 2000). By the late 1990s the material fatigue of deficit models of public-expert relationships so forcefully denounced by authors like Brian Wynne had become widespread and manifest.

To convey an idea of the propagation of these engagement exercises, at the national level alone the EU-funded project ‘Global Ethics in Science and Technology’ (GEST) has identified more than one hundred public engagement processes in European countries devoted to GM food, nanotechnologies, and synthetic biology.⁹⁵ The figure increases considerably if one includes other technoscientific topics as well as panels and forums conducted at the local and regional levels. By 2008 a similar number of ‘consensus conferences’ alone (arguably the most famous

⁹⁵http://www.uclan.ac.uk/research/explore/projects/global_ethics_science_technology.php

variety of minipublic) was reported by the The Loka Institute, covering Argentina, Australia, Austria, Belgium, Brazil, Canada, Denmark, France, Germany, India, Israel, Japan, Netherlands, New Zealand, Norway, South Korea, Switzerland, U.K and the US. In Europe, where the ‘participatory turn’ emerged and became consolidated, a series of documents and actions at the European Community level have signaled an official commitment to public deliberation on technoscience, making societal needs and demands a part of research agendas.⁹⁶

Elicitation and the doubling of expertise

What is it, one should ask, that actually happens in deliberative forums? How do they come about? Which one of the politically significant activities I distinguished in Part I are at stake in this profusion of speech around science and technology? Does *framing* play the role I attributed to it in chapter 3? Is *making* involved in setting up these costly and perhaps unpredictable experiments in deliberation? What about *action* and *speech* as theorized by Arendt and Rancière? These are the main questions that structure my contributions in this chapter.

Although there are many differences among minipublics in terms of their organization and implementation,⁹⁷ they have at least five features in common. First, they are commissioned by public agencies and governments that advocate public deliberation and engagement as a tool for avoiding or fixing controversies. Secondly, and importantly for my subsequent arguments, deliberative forums are designed and set up by social scientists, and private consultants are

⁹⁶ Exemplary with regard to this call for dialogue, participation, and empowerment of the European citizen is the EU “White Paper on Governance” of 2001 (EC 2001).

⁹⁷ See Fung (2007). For a good review that covers both parliamentary and experimental enactments of deliberation, see the two issues of *Acta Politica* based on the conference ‘Empirical Approaches to Deliberative Politics’ organized by the Swiss Chair at the European University Institute in Florence, 2004, edited by André Bächtiger and Jürg Steiner (2005).

usually in charge of their execution. These are not grassroots or spontaneous initiatives taken by citizens themselves, which means that the ‘publics’ in minipublics have to be assembled from the top. Thirdly, the schedules and issues on the table are circumscribed beforehand by the organizers, normally after consultation with the commissioning authorities. Fourthly, detailed instructions on how to proceed and educational materials on the topics to be debated are supplied to stimulate citizens’s discussions. Finally, a ‘balanced’ panel of experts is summoned to explicate the facts of the case and extant points of controversy among the scientific community. Thus, what I have called the parameters of any particular speech situation, namely the objects and subjects of deliberation, are more or less set beforehand. Citizens, that is, are expected to mobilize certain expected themes, identities, and interests. As an example we can briefly consider the ‘consensus conference,’ arguably the most replicated deliberative forum. Originally invented by the Danish Board of Technology in the mid-1980s to engage publics with controversial issues surrounding science and technology, it has attracted substantial scholarly attention as a key example of deliberative democracy in the governance of science and technology (Dryzek & Tucker, 2008). A consensus conference is a deliberative inquiry about an emerging scientific and technological issue that avowedly aims to incorporate the voices of everyday citizens to policy discussions that are normally monopolized by experts. “In the original Danish model, a small group of fifteen lay citizens holds two weekend-long preparatory meetings to set the agenda for a four-day public forum; there, experts give testimony and are questioned, after which the lay panel retires to write a report. That is presented at the end of the fourth day to a press conference, typically attracting attention from politicians and the media” (Goodin and Dryzek 2006, 223; see also Joss and Durant 2005).

The cornucopia of deliberative forums today reaches far beyond their European and North American provenance, carving out a place in the democratic imaginary of many nations. An important question is therefore “whether deliberative democracy should be seen as an alternative to liberal representative democracy, based on a complete restructuring of liberal political institutions, or whether it points to the reform and supplementation of representative structures” (Smith and Wales 2000, 54). The latter seems to be the case, in the sense that minipublics are deployed *within* (and not in *opposition* to) existing political arrangements. They are innovative yet not disruptive. The reason for this is a straightforward fact: deliberative forums nowhere wield the power to actually *decide* on the matters they are commissioned to deliberate about. Although the publics of ‘consensus conferences’ and ‘citizen juries’ are called upon to debate in order to deliver a ‘decision,’ the decision they arrive to lacks political traction. As it turns out, apart from the minimalist expectation that elected officials should take special interest in the considered views of their citizen-peers, minipublics play no part whatsoever in official decision-making.⁹⁸ Indeed, with the exception of the ‘British Columbia Citizens Assembly’ (Warren and Pearse 2008), whose recommendation for the reform of the electoral system was at least put to the whole electorate in a referendum, no minipublic has issued a binding decision.⁹⁹ And there is one big and sufficient reason for that: if a citizen jury could issue collectively binding decisions deliberative democracy would represent a threat to

⁹⁸ This problem does not affect James Fishkin’s deliberative polling, which aims only at opinion formation and the enlightenment of preferences.

⁹⁹ In the realm of science and technology, in particular, the chances for a genuine ‘macro-political uptake’ of minipublics (Goodin and Dryzek 2006) are arguably smaller than in other less esoteric realms. In the sober words of one observer: “in our market-based democracies, dialogic and participatory democracy is not central to the regulation of technoscience, techno-scientific knowledge and products. These are regulated mainly by other institutions that lie outside the dialogic order” (Pestre 2008, 101).

liberal democracy. As Goodin and Dryzek acknowledge, “mini-publics can lack the sort of legitimacy possessed by representatives who have been elected, or even appointed to ‘act on behalf’ of the public. Even statistically representative samples as claimed in deliberative polling hold no ‘commissions’ from the public at large. They have not been ‘authorized’ by them to speak on their behalf” (Goodin and Dryzek 2006, 233). Beyond this question about the degree of legitimacy minipublics can aspire to within political systems where the power to produce collectively binding decisions still resides mainly (if not exclusively) in the representative organs of the state, their lack of efficacy stands as a sobering fact that should curb overenthusiastic assessments about the prospects of refashioning popular sovereignty and collective self-determination, let alone reinventing them, with the means of deliberative democracy.

Still, it could be retorted that such an instrumental or outcome-oriented perspective is misplaced because democratic participation is good-in-itself; a practice with educative effects we should treasure apart from what can concretely come out of it. And one could cherry-pick some passages from the work of Carole Pateman or John Stuart Mill to substantiate the claim. Others might add that the point of organizing and implementing deliberative forums is to ‘confirm’ or ‘disconfirm’ the hypothesis, presumably deduced from the ‘theory,’ that ordinary people are capable of talking to each other in reasonable ways, and thereby of rationally transforming or strengthening their opinions through communication with others. This is most clearly the case in James Fishkin’s ‘deliberative polls,’ where attempts are made at measuring changes or enlightenment of opinion as a result of the deliberative event (Luskin et al. 2000). Still, is there not something wrongful, like taking candy from a baby, in recruiting people to prove to them that they can deliberate, that they are all equals as speaking beings, only to deny them the only power

that matters, namely that power to count in a decision which throughout history has accompanied the power of public speech? Why not take the intelligence and speaking capacity of people for granted and see what *they* do on the basis of that premise, instead of embarking on a dubious and largely redundant experimental corroboration involving so much effort and resources, whose practical effect is ultimately to merely simulate and therefore indefinitely postpone the exercise of political agency? Leaving aside for now this last Rancièrian trope, my point here is that just as deliberative democratic *theory* has been largely assimilated to liberal constitutionalism (Dryzek 2004), so has deliberative democratic *practice* been absorbed by contemporary technoscientific governance. The empirical turn of deliberative democracy *supplements* the institutions of liberal democracy rather than *restructuring* its basic parameters.

The objective of this chapter, however, is not to further substantiate this claim. In what follows I shift the attention from what deliberative forums do not accomplish and focus instead on what they *do* make, or, more precisely, on what social scientific experts, designers, and organizers do as they construct minipublics, make them talkative, and account for their performance. For besides being an attempt at reforming current democratic arrangements, minipublics are also experimental settings for social and political scientists to test deliberative ideals in the real world. To that extent, an examination of the empirical side of deliberative democracy is necessary for probing my argument about expert framings. And, interestingly in terms of their relation to political theory, many STS scholars were actively engaged as advisers and promoters of this upsurge of deliberative forums, before realizing it was a dead end. Finally, and most importantly, the enactment of minipublics serves to further problematize Hannah

Arendt's distinction between fabrication and action/speech, between the activity of *homo faber* and the deeds and words of acting beings.

The point here is that in minipublics expertise becomes more complex, involving forms of both framing *and* making. I propose to call this doubling of expertise 'consultative elicitation,' and set out to critically examine its sources, detours, and democratic meaning. On the one hand, we will see that the framing of speech situations undergoes an interesting displacement as experts in deliberation attempting to neutralize technoscientific framings unwittingly impose a different but no less troubling structuring of the givens of public life. In close connection to this, on the other hand, the making *of publics* becomes a paramount issue in the design and evaluation of these exercises, forcing us to revisit my earlier account of making in relation to Arendt and STS-ANT (chapters 1 and 2 respectively). Before eliciting opinions from 'the public,' that is, contemporary exercises in 'public engagement with science' involve the construction and elicitation of that very 'public.' For reasons I expound more forcefully in Part III, it will transpire that of the forms of agency I distinguished in Part I, *acting* has been absent in these deliberative engagements with science and technology. I conclude with a few reflections on the relationship between minipublics and my Arendtian account of the 'world' before turning, in the next chapter, to a Rancièrian alternative to the deliberative paradigm, and, in chapter 7, to a complication of that alternative.

STS and the 'Participatory Turn': From Illusion to Disappointment

When we take into account the fact that most of the deliberative forums conducted over the last few decades have been about technoscientific topics, it is indeed striking how little attention they

have received from political and democratic theorists.¹⁰⁰ The critical examination of minipublics is to be found elsewhere, namely in the field of Science and Technology Studies, where empirically informed accounts, typically based on case studies, have yielded important reflections on the political and democratic significance of minipublics. To put it polemically, the political theory of deliberative democratic practice has been articulated largely outside ‘political theory’ *qua* disciplinary field. Certainly, this hasn’t been done completely *de novo*, as if political theory could simply be dispensed with. On the contrary, as Bruno Latour (2007) has remarked, STS scholars have mostly adopted an ‘off the shelf’ approach, importing concepts and arguments from democratic theory to understand a realm of human activity which (as I have tried to show) has unsettled those very notions. Thus, as two leading figures in the field of put the matter, “STS studies have often encouraged the idea that deliberation will lead to policy decisions that are both better and more widely accepted in society. In this, some STS scholars seem to be reflecting the classic enlightenment notion that, if only we could think things through openly, properly and thoroughly, then a rational solution will be found” (Horst and Irwin 2010, 109).

The term ‘participatory turn’ (Jasanoff 2003) refers to the heightened attention STS scholars were giving in the late 1990s and early 2000s to the proliferation of engagement exercises that some saw as promising for effecting a transition from the ‘public understanding of science’ (PUS), to a more democratic ‘public engagement with science’ (PES). While it is true that STS authors have at certain points endorsed such deliberative ideals rather quickly and

¹⁰⁰ The main exception among the main figures in the field is the recent work of John Dryzek and colleagues on environmental politics and climate governance (Dryzek and Stevenson 2014; Dryzek and Lo 2015).

unreflectively, without problematizing their premises, it is also the case that later on they adopted a largely critical stance and offered insightful and rich conceptualizations. Thus, as the need for public consultation on technoscientific issues is increasingly recognized by governments and supranational entities, and dozens of ‘minipublics’ continue to be enacted each year, STS researchers have undertaken critical analyses to determine whether or not the democratic promise of PES is being fulfilled (Irwin 2001; Irwin & Michael 2003; Jasanoff 2005a; Leach et al. 2005). As I explain in this section, their expectations have been largely frustrated, and many lessons for our understanding of deliberative democracy can be retrieved from their attempts at making sense of this disenchantment.

Normatively, the ‘participatory turn’ expresses a commitment to the idea that epistemological critiques of expert claims and the concomitant valorization of lay knowledges authorize political demands for greater inclusion and participation in the technoscientific domain. Since technical and scientific advice is not politically ‘neutral,’ and the ‘politics’ within expertise has been identified, a road is open for lay inclusion in ostensibly technical debates. A simplified way of stating this normative aspiration, shared by many STS scholars, is that “the technical is political, the political should be democratic, and the democratic should be participatory” (Moore, 2010a).¹⁰¹

The participatory turn, however, has to be understood in its context. This has to do with relatively recent changes in government-science relations in Europe and the US. In the 1980s, Ulrich Beck announced the coming of a ‘risk society’ where science, having been exposed as the

¹⁰¹ The main exception to this position is the work of Harry Collins and Robert Evans (2002; 2007), which, as I showed in Chapter 3, seeks to restore the authority of expertise regardless of the framing/proposition distinction articulated by Brian Wynne.

cause of many of the very risks it was meant to define and contain, is increasingly forced to become reflexive about its own activities and impact on society (Beck 1992). The risks involved in human genetics, nuclear physics, or biotechnology are of such momentous implications that shielding science from society becomes impossible. Similarly, the dynamics of 'Post-normal science' (Funtowicz and Ravetz 1992) and 'Mode-2' knowledge-production (Gibbons et al. 1994) demand new forms of 'socially robust knowledge' that signal the demise of the 'social contract' between science and the state, in which scientists would provide the public with beneficial discoveries and a trained workforce in exchange for governmental support and freedom to define agendas and methods (Bush 1945; Jasanoff 2003). Technoscience, it is claimed, is abandoning its socially detached position and is now recognized as 'increasingly more embedded in, and hence more accountable to, society at large' (Jasanoff 2003, 235).

The source of these changes is partly located in the proliferation of accidents and disasters that have revealed a mismatch between the deeds of technoscience and its capacity for prediction and control, including the 1984 industrial disaster in Bhopal, India, the loss of the Challenger shuttle, the Chernobyl accident in 1986, the contamination of blood supplies with the AIDS virus, and the prolonged crisis over BSE or 'mad cow' disease in Britain, to name the most prominent ones. The latter seemed to confirm Charles Perrow's prescient notion that increasingly multiple and unexpected failures, or 'normal accidents,' were built into society's complex systems (Perrow 1984). For many observers these disasters were bound to trigger the emergence of new forms of politicization of science and technology, including new relations between 'expert systems' and the lay public.

The dilemma presented by those new relations has been powerfully phrased by Sheila Jasanoff as the problem of “how to live democratically and at peace with the knowledge that our societies are inevitably ‘at risk’” (Jasanoff 2003, 224). Jasanoff has been a relentless and sharp observer of the implications of these changes for the role and status of technoscientific experts in contemporary democracies. Her valuable contribution is a keen historical sense and attention to the different contexts in science-politics relations from which questions about the democratization of expertise become meaningful. This preoccupation has assumed many forms, from comparative studies of different national ‘civic epistemologies’ (Jasanoff 2005a) to epochal transformations between paradigms of science-state relationships (Jasanoff 2005c, 2011). Because the question of ‘civic epistemologies’ exceeds the scope of our present concerns, I will briefly focus attention on her account of science-state relationships.

Jasanoff has distinguished two long generational ‘cycles’ of attempts to reform citizen participation in the technoscientific domain punctuated by two ‘constitutional moments,’ an expression she borrows from Bruce Ackerman (1991) to denote those “brief periods in which, through the unending contestation over democracy, basic rules of political practice are rewritten, whether explicitly or implicitly, thus fundamentally altering the relations between citizens and the state” (Jasanoff 2011, 623). Importantly, a significant though largely overlooked dimension of those moments is that they also “may encompass the relationship between experts, who underwrite almost all contemporary state action, and citizens, who are collectively subject to the decisions of states,” something that ought to involve “renegotiating the manner in which states and other authoritative institutions employ the power of expertise” (623-624).

In the case of the US, she detects two of these cycles. “The first cycle, comprising roughly the period from 1940 to 1980, expanded the public sphere, enlarging the numbers of issues, viewpoints, and actors represented in formulating regulatory policy, and making the debates themselves more formal and visible. Pluralist in inspiration, it presumed that interested actors were best positioned to represent their normative as well as cognitive claims, and it cast the state as the ultimate articulator of collective values” (Jasanoff 2011, 626). What Jasanoff has in mind here is the Administrative Procedure Act (APA) of 1946, with which the US government acknowledged for the first time that technical decision-making was in need of new forms of legitimation to correct the imbalances stemming from avowed superior knowledge. Unlike the deficit model that held sway in later days, APA took the public’s epistemic competence largely for granted and exhorted agencies to engage citizens.

The second cycle corresponded to the deregulation of the Reagan administration, the receding of the regulatory state, and the resurgence of expertise. “In particular, increasing deference by the state to science, technology, and expertise closed down some of the earlier channels by which citizens had expressed concerns about the direction and pace of technological change. Courts took a relative back seat, and science received a green light, especially in the rapidly developing field of biotechnology” (Jasanoff 2011, 630). Jasanoff interprets changes in the regulation of the life sciences, in judicial review of administrative decisions, and in regulatory peer review as ushering in “a new order in which agency expertise was insulated against public challenge, the autonomy of science was reinforced, and the fact-value distinction was written into public deliberation in ways that are deeply antithetical to the findings and tenets of STS. In effect, the ‘social contract with science’ hatched in the 1940s was rewritten, with the

state ceding primary power to the market to deal with both the direction of innovation and the risks of possible failure” (630).

Although these cycles reflect US experience, Jasanoff suggests pointedly that “they can be used as guideposts for commenting on events that, today, may herald another moment of fundamental democratic reordering in the United States and, through the dynamics of globalization, the world” (Jasanoff 2011, 626). And indeed, the participatory turn of the 2000s, much more global in scope, suggest that changes comparable to those constitutional moments might be underway. Official statements about the need to change the relationship between science and society were made early on by regional entities in Europe (European Union 2000, European Commission 2002). And in the UK, where these developments have taken exemplary form, the 2000 House of Lords *Science and Society* report recommended that “direct dialogue with the public should move from being an optional add-on to science-based policy-making and to the activities of research organizations and learned institutions, and should become a normal and integral part of the process” (House of Lords 2000, 43). These tidal shifts, Jasanoff claims, “necessarily involve renegotiating the manner in which states and other authoritative institutions employ the power of expertise, and contests over those processes have become a fixture of modern democratic politics. *Public engagement is but the latest discursive rubric under which that contestation is played out*” (Jasanoff 2011, 624, emphasis added).

Taken at face value, Jasanoff’s contention that ‘public engagement’ is today an object of contestation does not seem very plausible. It might be so in some academic niches, but in most STS and science-policy circles, not to mention national and supranational governance structures, ‘public engagement’ as a ‘discursive rubric’ has come to be associated with the profusion of

minipublics around technoscientific issues. And it has been so since the term gained traction in both academy and governments in the late 1990s. Seen from a different perspective, though, in saying that the meaning of ‘public engagement’ has not been settled Jasanoff was probably making a broader normative and political claim about the need to continue contesting that dominant definition, both in theory and in practice. Indeed, Jasanoff and kindred scholars became quite critical of the implementation of deliberative democracy they had once endorsed and supported. By the late 2000s any ‘radical’ expectations they might have placed on public deliberation had been continuously disappointed, for reasons I will examine later in this chapter.

For the moment, it is important to acknowledge the active involvement of many STS researchers in bringing to fruition the longed-for transition from the ‘public understanding of science’ (PUS) and its ‘deficit model’ of the public, to a more genuine and less scientific ‘public engagement with science’ (PES). As ‘experts’ on the production, dissemination, and reception of science and technology in society, STS scholars themselves were regarded as perfect candidates for advising public officials and policy-makers eager to regain the confidence of the public. Indeed, Brian Wynne’s ideas had become influential in policy and advisory circles, as reflected in the famous *Science and Society* report of the UK House of Lords Select Committee on Science and Technology (House of Lords 2000; Irwin 2006, 307). As another close associate of Brian Wynne notes, “the language of STS, and, specifically, criticism of the ‘deficit theory’ has been partly influential in encouraging the emergent governance discourse.... In remarkably few years, an (admittedly attenuated) form of the language of STS has been reconstructed as the language of policy” (Irwin 2006, 300). Robin Grove-White, another collaborator of Wynne at Lancaster University, was appointed in 2001 as member of the Agriculture and Environment Biotechnology

Commission (AEBC), which alongside the Food Standards Agency (FSA) and the Human Genetics Commission (HGC) formed the three governmental bodies that sought to reshape science-society relations in the UK. Like many other STS scholars, Grove-White found himself “propelled into new situations, harnessed, as it were, to making these experiments work” (Grove-White 2001, 467).

So, during the early years of the participatory turn there was a convergence of deliberative democracy and STS. It was not long, however, before it became clear to STS scholars that such alignment was ultimately counterproductive, if not retrogressive. The encounter was indeed peculiar. On the one hand we have this paradigm in democratic theory which has avowedly inspired certain deliberative experiments despite its in-built blindness to the question of expertise. On the other hand, STS scholars made careers of confronting expertise as a political problem, only to end up endorsing deliberative technologies based on a theory that has rarely confronted the lay-expert divide.

Understandably, then, the *liaison* ended rather quickly, with scholars like Jasanoff, Irwin, Grove-White and Wynne ultimately disowning the concrete forms PES was assuming in the early 2000s, which many saw as resurrecting key aspects of the model they were meant to supersede, yielding domesticated forms of ‘engagement’ that could fit dominant structures of governance at the local, national, and regional levels (Irwin, 2001; Irwin & Michael, 2003; Leach et al., 2005).

Fortunately for political and democratic theorists, an abundant literature critical of PES has emerged from this disappointment.¹⁰² But before drawing on these works to articulate my

¹⁰² Braun and Schultz (2010); Felt and Fochler (2008, 2010); Hagendijk (2004), Hagendijk and Irwin (2006); Horst and Irwin (2010); Irwin (2001, 2006); Lezaun and Soneryd (2007); Michael (2009); Pestre (2008); Jasanoff (2003, 2004b), Wynne (2005, 2006, 2007).

own critique of deliberative democratic practice in the realms of science and technology, the next section presents the *GM Nation?* debate conducted in Britain in 2003 on the topic of genetically modified foods and crops as exemplary of the political and democratic shortcomings of minipublics. In part because its organizers explicitly acknowledged their debt to Habermas' work on deliberation, and in part because it had a very special significance for many STS scholars who adhered to Wynne's diagnosis of the problem of technoscientific expertise, the importance of this case for any critical account of the relationship between democracy and technoscience deserves emphasis. Indeed, this particular deliberative event was explicitly designed to incorporate the critique of Wynne and his colleagues and to avoid the imposition of scientific framings on the engaged 'public.' As I show in the following sections, the platform's failure on this score is intriguing and instructive.

GM Nation?

The *GM Nation?* public debate was an experiment in large-scale participation conducted in the UK during 2002-2003. Organized by (but at arms length from) the British government, the platform was meant to elicit public deliberation about genetically modified (GM) crops and GM-derived food against the background of their possible commercial introduction in the UK. The exercise was intended to provide meaningful information to the government about the nature and spectrum of the public views on the issue so as to inform decision-making.¹⁰³

¹⁰³ For discussions, see Gaskell (2004); Gaskell et al. (2003); Healey (2004); Horlick-Jones et al. (2004, 2007); Pidgeon et al. (2005); Pidgeon and Poortinga (2006); Poortinga and Pidgeon (2004); Public Debate Steering Board (2003); Rowe et al. (2005); Taylor-Gooby (2006); Horlick-Jones et al. (2007).

At a general level, we can situate the initiative at the intersection of two trends. On the one hand is the aforementioned participatory turn towards public engagement and the new official mantra that ‘good governance’ ought to incorporate the ‘voice’ of the ‘lay public.’ On the other hand, as recognized explicitly in policy circles, *GM Nation?* was also a concrete manifestation of the ‘deliberative turn’ in democratic theory (Dryzek 2000) examined in the previous chapter. In particular, the team of policy researchers officially charged with providing an external evaluation of the debate acknowledged the event’s debt to Habermas, whose “writings have proved particularly influential in the work of a great many social scientists who have attempted to develop the notion of deliberation in practical ways” (Horlick-Jones et al. 2007, 182-183). Such *de rigueur* acknowledgments, however, and the homages paid to intellectual patrons by both organizers and commentators, have always been brief and superficial and have not ushered in serious engagements with the work of political philosophers and theorists. Otherwise, the discrepancy between the practice and the theory of deliberative democracy I examined earlier on in relation to Habermas would have been noticed.

Much more important for understanding the meaning of *GM Nation?* is the form that the new governance of technoscience assumed in the UK in the early 2000s. Of relevance here was Tony Blair’s New Labour administration’s program for ‘modernizing government’ (Her Majesty’s Government 1999; Blair 1998), and the official shift away from the ‘deficit model’ of PUS and towards public involvement (House of Lords 2000). Importantly, it should be noted at the outset that the scope of such involvement, and the domain of potential contestation, was significantly restricted when in 2002 the British government adopted ‘risk management’ (described as “getting the right balance between innovation and change on the one

hand, and the avoidance of shocks and crises on the other” (Cabinet Office 2002, 2) as the basis for administrative practice within the British policy-making community (Horlick-Jones 2005).

In the case of the particular technology in question, the UK was markedly different from the US in terms of public attitudes and governmental policies toward GMOs (Bauer and Gaskell 2002; Toke 2004). The apparent enthusiasm for GM agriculture in the US contrasted strongly with the public ambivalence and ‘precautionary’ approaches to governance that prevailed in the UK in particular, and Europe in general. In 1996, the concerns of scientists who had studied the potential environmental hazards of GM crop plantings came to the public’s attention. “There were two main sources of anxiety: that the habitats supporting rare species and biodiversity might be degraded or destroyed ... and that traits from GM crops might be transferred to other plant varieties contaminating neighboring crops and generating unwanted ‘superweeds’ that had developed resistance to targeted herbicides” (Horlick-Jones et al. 2007, 4). During the next two years the controversy involved environmental groups such as Greenpeace and activist campaigns calling to destroy trial GM crops and to persuade supermarkets to remove GM products from their shelves; the sacking of Arpad Pusztai, a scientist who claimed to have found evidence of adverse effects in rats; and Prince Charles’s public siding with organic farmers. The bulk of British scientists, on the other hand, were firmly behind genetic modification on the basis that it could help farmers produce plants that are healthier and need fewer pesticides.

Faced with such controversy, in July 1998 the government called for a three-year moratorium on commercial planting of GM crops and put a stop to the approval process. The European Union soon also introduced a de facto moratorium, fueling tensions between Europe and the US over regulatory approaches to biotechnology and eventually leading the US and other

countries to threaten to take action against the EU anti-free market position through the World Trade Organization (Toke 2004).

Furthermore, the controversy around GMOs in the UK took place in the wake of major government failures in the 1990s, epitomized by the recent experience with bovine spongiform encephalopathy (BSE) or ‘mad cow disease,’ and the perceived need to restore public trust in science and government (Horlick-Jones et al. 2007, 1–3). Thus, Tony Blair’s famous speech delivered to the Royal Society in London in 2002, suggestively entitled ‘Science Matters’ (Blair, 2002), was determined to combat these trends and placate public anxieties. His panegyric of science made three major points, neatly summed by Alan Irwin with a pithy closing observation: “First, that science is ‘vital to our country’s continued future prosperity.’ Second, that science is posing ‘hard questions of moral judgement and of practical concern, which, if addressed in the wrong way, can lead to prejudice against science.’ Third, ‘the benefits of science will only be exploited through a renewed contract between science and society, based on a proper understanding of what science is trying to achieve.’ The clear implication is that society must understand science better rather than vice versa” (Irwin 2006, 308). Expounding a view of Britain as a ‘powerhouse of innovation’ Blair warned against resistance to new scientific developments that amounted to “a retreat into a culture of unreason” (Blair 2002, 159). At the same time, the Prime Minister called for a “robust, engaging dialogue with the public. We need to re-establish trust and confidence in the way that science can demonstrate new opportunities, and offer new solutions” (159).

In this context, the legacy of suspicion spawned by the BSE disaster was transferred to the question of GMOs, with little faith in the competence of authorities and government

regulations to handle technoscientific controversies among the British public. These anxieties were famously depicted in a front-page of the *Daily Mirror* portraying Blair as a monster under the headline ‘The Prime Monster’ and the text ‘Fury as Blair says: I Eat Frankenstein Food and it’s safe’ (Horlick-Jones 2007, 8).

GM Nation? had its origin in the recommendations of the Agriculture and Environment Biotechnology Commission, one of the new multi-stakeholder advisory bodies created to institutionally confront the question of GMOs. In its report *Crops on Trial*, which examined the field trials designed to investigate the impact of GM crops on biodiversity, the Commission suggested that the results of the field trials would not resolve the question of whether or not to proceed with the commercialization of GM crops, calling instead for “an open and inclusive process of decision-making” and recommending the need for a public debate (Agriculture and Environment Biotechnology Commission 2001, 19). Subsequently, in July 2002 the government announced that ‘a public dialogue on GM’ should take place, and in September an independent Public Debate Steering Board (PBSD) was created to design it.¹⁰⁴

The debate was designed to be “innovative, effective and deliberative” and to “provide meaningful information to Government about the nature and spectrum of the public’s views, particularly at the grass roots level, to inform decision-making.” Importantly, it was also meant to be “framed by the public” (Public Debate Steering Board 2003, 11). Indeed, what makes *GM Nation?* an interesting case for probing my arguments about framing and deliberation is that the AEBD recommendations taken up by the Public Debate Steering Board “were recognizably

¹⁰⁴ The terms of reference imposed by the government can be found at <http://webarchive.nationalarchives.gov.uk/20081023141438/http://www.defra.gov.uk/environment/gm/crops/debate/aebc-response.htm>

influenced by a distinct critical perspective on matters concerning technology, risk and society.... This perspective [namely Brian Wynne's] argues that ostensibly neutral 'scientific' risk assessments possess implicit social and political framings" (Horlick-Jones et al. 2007, 11). In order to see if and how Wynne's proposed 'subversion of propositionalism' was brought into practice, we need to briefly consider the design and implementation of the debate.

The debate took the form of "a preliminary series of workshops [the Foundation Discussion workshops], designed to allow a range of lay perspectives to frame the terms of the process; an open engagement phase, comprising public meetings, availability of information materials, a website, and the opportunity to comment on the issues or complete a questionnaire; [and] a series of focus groups [the so-called 'Narrow but Deep' groups] that were conceived as providing some degree of 'control' over possible bias arising from the public engagement perhaps only attracting participation by those with pre-existing (and fixed) views" (Horlick-Jones et al. 2007, 36). The exercise began in November 2002 with a total of nine Foundation Discussion workshops, eight with 'ordinary citizens' pre-selected to represent a spread of socio-demographic characteristics and another with GM stakeholders. These were meant to incorporate Wynne's concerns about framing and let the public itself explore the issues in preparation for the main debate to be conducted in the following summer. The latter consisted of three 'tiers': six major national meetings organized by the PDSB, forty meetings organized by local councils or national organizations and supported by the PDSB, and six hundred and twenty-nine local meetings organized by community groups. A debate website was put in place including information on GMOs and both qualitative and quantitative opportunities to comment. Finally, seventy-seven 'ordinary citizens' were grouped into ten 'Narrow-but-Deep' closed focus groups

that met twice to deliberate, with a period in between to gather information. The transcripts and rapporteur's reports of the open meetings, qualitative analysis of participants' discourse in the closed groups, emails and letters received on the website, and the dozens of thousands of questionnaire responses from the three platforms all informed the Steering Boards' final report published in September, 2003.

As the different phases of the debate unfolded, concerns about the government's actual commitment to the exercise became widespread. On the one hand was the tight budget involved (initially £250,000, later expanded to £500,000) and the short timing of the event (about five weeks). But more important was the end of the moratorium on GM cultivation decreed a few months before the open phase of the debate was scheduled to begin. "When in March 2003, the EU GM products approval process was re-started under [directive] EC/2001/18, serious questions were raised about the credibility of holding a public debate about the cultivation of GM crops in the UK" (Horlick-Jones 2007, 5). Compounding these concerns was the simple fact that decisions and recommendations resulting from *GM Nation?* would have no binding force for authorities.

From the perspective of the Blair administration's commitment to transform the UK into a 'powerhouse for innovation,' the merely consultative nature of the debate turned out to be crucial when the elicited opinion of the public pointed in a direction different from what was expected. The main conclusions of the PDSB report were that "people are generally uneasy about GM crops; the more people engage in GM issues, the harder their attitudes and the more intense their concerns; there is little support for early commercialization; there is widespread mistrust of government and multi-national companies. Simply put, the report characterizes public opinion

over the commercialization of GM crops as ‘not yet—if ever’” (Irwin 2006, 311). As many observers anticipated, the voice of the public was registered and taken into account, but without any major influence in governmental policy. “In its eventual response to the dialogue, the UK Government opted for a ‘case by case’ approach to the future development of GM. [The Department for Environment, Food and Rural Affairs] observed that ‘the general public may have a lower degree of outright opposition to GM than the participants in the debate’ and ‘that to some extent GM crops have become a focus for much wider concerns.’ The implication of this Government response is that the debate is now seen as officially over, with business as usual resuming (although certain points from the wider discussion have been officially acknowledged)” (313). In 2015, a decade after the deliberative event, the European Parliament approved a deal to let countries decide for themselves whether they want to plant GM crops. As of 2016, the growth and sale of GMOs is permitted in England and Wales, subject to an intensive authorization process at the European Union level. “In retrospect, this experience of deliberative democracy in Britain was ‘one-off’ in character: it took place relatively late in the decision-making process; it focused upon specific issues; and after it ended, the Government returned to ‘business as usual’” (Hagendijk and Irwin 2006, 181).

On the basis of the *GM Nation?* example, in the remainder of this chapter I wish to make three arguments about ‘deliberative democracy’ as it is practiced in the dominant format of minipublics. First, in the next section I call attention to two disconnections between the practice and the theory of deliberative democracy. I highlight this double mismatch to account for my treatment of the two sides of deliberation in two separate chapters. Indeed, the meaning and stakes of the question of technoscientific expertise in minipublics are different from those

discussed in the previous chapter on deliberative theory. Deliberative democracy in practice, in other words, is a very different animal from the theoretical specimen. After that, two other arguments resume and complicate my previous claims about technoscientific agency *qua* framing (chapter 3) and making (chapter 2). Although analytically distinct, these two politically significant modes of agency are closely intertwined in contemporary enactments of ‘public engagement with science.’

Practice Without a Theory?

A curious discrepancy between the theory of deliberative democracy and the empirical cases of deliberation avowedly inspired by it becomes manifest as soon as one tries to make sense of their relationship. The disconnection I wish to highlight is not about the fact that deliberative theory predated and thus could be articulated independently of these concrete implementations. That much is uncontroversial.¹⁰⁵ The discrepancy runs deeper than this, and has two aspects of disconnection that are worth examining more closely.

The first disconnection concerns the work of Habermas in particular. It is not unusual to find minipublics whose organizers claim to draw inspiration from the theory of deliberative democracy and who acknowledge the influence of authors like Jurgen Habermas (Fisher 2000; Horlick-Jones et al. 2007; Horst and Irwin 2010). In my view, such endorsements represent a significant misunderstanding. Minipublics like the famous ‘consensus conference’ do not enact the way in which (at least) Habermas has theorized the conditions of deliberation in the public

¹⁰⁵ “The defenders and various critics of deliberation share one belief: that matters can be resolved at the level of theoretical stipulation, with little recourse to empirical evidence beyond illustrative anecdotes” (Dryzek and Braithwaite 2000, 242).

sphere *today*.¹⁰⁶ In *Between Facts and Norms*, to take his most recent and elaborate conceptualization of deliberative ideals, he is adamant in rejecting concrete, face-to-face forms of deliberation as a viable paradigm for realizing deliberation in ‘complex societies.’ Indeed, a basic tenet of his procedural account of popular sovereignty is his rejection of subject-centered conceptions: “According to the discourse-theoretic conception of government by law, popular sovereignty is no longer embodied in a visibly identifiable gathering of autonomous citizens. It pulls back into the, as it were, ‘subjectless’ forms of communication circulating through forums and legislative bodies. Only in this anonymous form can its communicatively fluid power bind the administrative power of the state apparatus to the will of the citizens” (Habermas 1996, 135-6). This is why he deemed Dahl’s proposal of *minipopulus* “abstract” and “somewhat utopian” (318).

This discrepancy between Habermas’s own theory of the public sphere and the real-world exercises in deliberation conducted in his name stems from his conviction that the only guarantees required for deliberation are the procedural ones *already* enshrined in many Constitutions under the form of basic, political, and social rights (Habermas 1996, 82-131). This does not mean that Habermas’s ‘updated’ public sphere is not bedeviled by the problem of expert framings. Far from it, as Habermas himself acknowledges (363). It does testify, however, to the disconnection between deliberative democratic theory and the practices conducted in its name. My contention here is that the procedural conditions for Habermasian deliberative democracy

¹⁰⁶ See (Habermas 2005) where he recognizes his unfamiliarity with the empirical research program on deliberation. His conclusion is not very enthusiastic: “Whereas the observed behavior of an actor does or does not fit the paradigm of rational choice, the communicative behavior of participants in deliberative practices always fits the paradigm to some degree, once the actor is at all participating in a practice of that kind” (387). See also (Habermas 2006).

were already in place, and had been so for some time, when minipublics were first set up for making deliberation ‘real,’ as it were. The procedures Habermas is so keen at articulating and defending yield an ‘anonymous,’ ‘subjectless’ and ‘floating’ public, not the face-to-face, concrete, and episodic character of minipublics.

The second disconnection between theory and practice pertains to the tension between the ‘deliberative’ and ‘democratic’ sides of deliberative democracy, which I highlighted in the previous chapter. Theorists have tended to emphasize *deliberation*, its standards, procedures, and norms, at the expense of its *democratic* character. As my review of the main criticisms of the theory of deliberative democracy indicated, the paradigm has been largely blind or strategically silent about the structural inequalities and power imbalances that frustrate a truly equal participation in debates. There is an emphasis on the quality of deliberation (providing reasons everyone can accept) at the cost of neglecting the problem of who exactly is included in the process, and how. The only democratic thing about deliberation in the work of authors like Gutmann and Thompson is that a *fair* treatment of the opinions and preferences *of those included* is guaranteed. The theory, in fact, is more of an improvement or ex-post legitimation of what people in liberal democracies already have, than a radical departure from the aggregative and strategic accounts it was meant to supersede.

In the case of minipublics, one witnesses the opposite imbalance: a stress on the democratic aspect (‘who is included’) over the deliberative element. Although one can find in the empirical literature both descriptive and evaluative assessments of the processes of deliberation taking place in minipublics (the kinds of arguments advanced, who did the talking, and so on) there are no significant connections made with the procedural requirements on which the theory

puts so much emphasis. In organizing ‘deliberative polls,’ for example, James Fishkin and his colleagues seem more concerned about assembling representative publics and providing balanced information and balanced panels of experts, than with placing procedural restrictions on the kinds of arguments that ought to be advanced in the discussions. Thus, it would seem that compared to whatever concrete setting authors like Gutmann and Thompson might have in mind, deliberations in minipublics are *more democratic* to the extent that organizers explicitly aim to include citizens from all walks of life. In this sense, a specific concern with the democratic pedigree of minipublics, in the sense of how ‘representative’ these are of the general population, is evinced in the organization and conduct of most of these forums. The classic problem of democracy and representation reemerges as a problem of experimental design, a question that, as I will show later on, figures prominently also in the literature STS have devoted to consensus conferences and other variants of minipublics. Importantly, one does not hear much about the extent to which the opinions of those traditionally excluded actually mattered in the debates, whether or not they influenced decisions, and so on. Inclusion becomes a matter of statistical representativity. Implicit in all this is a certain conviction that we can artificially create the democratic conditions that existing social structures impede, with randomization and the filling of quotas solving the problems of exclusion denounced by the critics of deliberative democracy.

If the practice of deliberative democracy cannot be seamlessly linked to its theory, then we should expect some changes in the question of framing as I theorized and critically deployed it in chapters 3 and 4. The following section shows that this is the case. Furthermore, as I argue in the subsequent section, minipublics reveal another somewhat unexpected form of expertise which pertains to the very ‘fabrication’ of these publics. The concept of ‘elicitation’ introduced at

the outset is meant to account for these two aspects of expertise: the technically assisted elicitation of both publics and their speech.

Expertise and Elicitation (1): Framing Speech

In chapter 3 I argued that, on account of science's cultural authority in Western societies, technoscientific expertise enjoys a privileged role in framing the givens of public life: the objects at stake and the competent interlocutors. And in chapter 4 I drew on this claim to substantiate my critical examination of deliberative democratic theory. The question now is whether such framing unfolds in experimental settings and, if so, how. On account of the disconnection previously noticed between the theory and the practice of deliberative democracy, it does not necessarily follow that the critique targeted at the 'theory' will automatically apply to the 'practice.' At any rate, close attention to the participatory turn eventually reveals that more than framing questions are at stake in this trend. In effect, the interesting thing about minipublics are the new questions and perplexities they provoke. In this section I return to the question of framing to shed some light on whether 'public engagement' truly replaces the 'deficit model' of the public's understanding of science or merely recreates it in new guises. I begin with the wide consensus among STS scholars about the role of framing in minipublics, and then turn to the specific case of *GM Nation?* for purposes of illustration.

If we follow the criticism of Wynne, Jasanoff, Irwin, and Grove-White, the verdict is clear.¹⁰⁷ As the editors of *Science and Citizens* already observed ten years ago, "It has become evident ... that the tacit prior framing of the modes and scope of ... participatory initiatives" can

¹⁰⁷ See Grove-White (2001); Hagendijk and Irwin (2006); Irwin (2001, 2006, 2014); Jasanoff (2003a, 2003b, 2005b), and Wynne (2002, 2003, 2005, 2006, 2007a, 2007b, 2008, 2014).

lead to a “paradoxical ‘new tyranny’ of participation ... especially in relation to scientific knowledge and the sometimes uncritical enthusiasm for deliberative techniques” (Leach et al. 2005, 11).¹⁰⁸ For Brian Wynne, the new approach announced in the 2000 report from the House of Lords may have once embodied “the potential for new, more constructive models and practices of citizenship, human subjects and, correspondingly, of knowledge and ‘epistemic agency’ as a key, novel dimension of citizenship” (66). However, this potential was almost immediately compromised by the “cultural assumptions and commitments framing most such initiatives,” a failure continually masked by “the extravagant investments of enthusiasm, energy and expectation pouring relentlessly into new participatory initiatives by which citizens may influence science” (Wynne 2005, 66-67). The ‘subversion of propositionalism’ (Wynne 2003) was to remain a question confined within STS journals.

What Wynne had observed in his classic study of the encounter between experts and sheep farmers in the hills of Northern Cumbria, namely the imposition of a framing of control, prediction, and standardization that narrowly defined issues as questions of *risk*, has also bedeviled the upsurge of minipublics. Thus one finds Wynne redeploying the gist of the critical claims he had made twenty years before in his critique of lay-expert encounters:

Risk discourse, as scientific idiom, dominates the public definition and treatment of the social issues of new techno-scientific trajectories such as energy, genomics and biotechnology, nanotechnology and the like. This risk discourse in modern societies ... is automatically imposed as the natural and universal objective representation of public issues (and hence of public concerns) as their natural public meaning, which, it is implied, all proper citizens would recognize.... Virtually all of the mushrooming commitment to public citizen engagement in ‘science policy’ or ‘scientific-technical issues’, or to ‘democratizing science,’ is something of a mirage, at least thus far. It

¹⁰⁸ The thesis that participation has become a ‘new tyranny’ comes from the literature on development and was popularized by Bill Cooke and Uma Kothari (2001).

imposes severe and unspoken framing limits around these new processes, such that the continuing failure to *democratically sensitize* science, and its persistent non-accountability to publics even in the new (if still limited) ‘participatory’ ethos, is omitted from critical attention (Wynne 2005, 67-68).

Accordingly, far from being abandoned, the ‘deficit model’ is continually reinvented in deliberative democratic practice (Wynne 2006; 2007b; 2008), against the democratic aspirations that many had associated with the transition from PUS to PES. If the issue at stake is a ‘risk issue’ and nothing else, then public resistance can only be explained by public rejection or ignorance of risk science: “So, the deficit model is dead—Long live the deficit model!” (Wynne 2008, 23)

Robin Grove-White extended these arguments from minipublics to the official advisory bodies and commissions charged with designing and monitoring such deliberate exercises, based on his own experience as member of the first Agriculture and Environment Biotechnology Commission (AEBC) where *GM Nation?* originated. The work of these commissions, he acknowledged, was framed by narrow normative understandings of what biotechnology *is*. In particular, the EU-wide legislative framework demands risk assessments on the assumption that “new technologies should be allowed to enter markets, thereby contributing to the evolving shape of society itself, unless compelling reasons of risk or safety to health or the environment can be identified in advance” (Grove-White 2001, 468). As a corollary of this, “the inherited framing brings with it a particular—and equally unsatisfactory—conceptualization of *what the GM controversies have been about*” (467):

People’s concerns about GM crops ... focus less on what is known about the likelihood or otherwise of specific *harms* from individual GM plants, and far more on unease about such matters as who is driving these developments and why; about escalating ‘tampering’ with nature and foods driven by science harnessed to commerce; about the inevitability of

‘surprises’ unanticipated, indeed effectively denied by science; about the claimed social benefits of GM (including ‘feed the world’ claims); about regulatory frameworks seen as compromised by prior political commitment to the expansion of biotechnology overall; about who will be responsible when and if unanticipated things go wrong; and about the overall *ownership* of the technology and the underlying knowledge from which it arises (Grove-White 2001, 468).

This passage is exemplary in how it conveys a sense of the plurality of perspectives from which the deeds and things of biotechnology could potentially be disclosed in our public spheres.

Sheila Jasanoff has a similar view, stressing the mismatch between the global nature of sociotechnical networks where innovations are produced and the local or national character of the (ostensibly democratic mechanisms) and institutions officially in charge of dealing with the impact of those innovations. In an article on the controversy around ‘golden rice,’ a GMO bioengineered to produce beta-carotene, a substance which then converts to Vitamin A in the human body, she suggests some neglected questions about the political management of biotechnology:

How should innovations of global significance in the engineering of life be governed to meet the needs and demands of a global civil society? How should civic capacity to cope with biotechnology’s revolutionary potential be created and institutionalized in an unequal, but ever more interdependent, world? How, more generally, can societies that, for now, play little or no part in originating invention in the life sciences nevertheless gain meaningful roles in governing the trajectory of innovation? As yet, these questions remain unasked and largely unanswered (Jasanoff 2005b, 186).

For Jasanoff, as for Wynne and Grove-White, “growing awareness that policy framings not only solve problems but allocate power” should lead us to “recommend greater democratic scrutiny of framing processes” (Jasanoff, 2005b, 194–95).

In his recent piece in a volume celebrating the twenty years of the journal *Public Understanding of Science*, devoted (not without irony) to reviewing the state of the art in public

engagement with science, Alan Irwin raised the nagging question of whether STS researchers and policymakers have been ‘moving forwards or in circles’ (Irwin 2014). His judgment on the ‘participatory turn’ and its legacy summarizes many of the issues at stake in this chapter as well as the disappointment of many people in the field:

There can certainly be something all too familiar about engagement initiatives which start out high on political rhetoric only to succumb to narrow issue framings, over-hasty deadlines and a recurrent tendency for officials to approach engagement exercises as if they were schoolteachers setting an end-of-term test for which most pupils are disappointingly underprepared. I must also confess to the occasional sinking feeling as I realise that I have agreed to review yet another academic case study of engagement practice—a case study which invariably reaches familiar conclusions concerning the limitations of the exercise in question. When the underlying challenges are so well-established and the social scientific critiques so firmly set, is it possible that the high-water mark for activity in this area has been reached or possibly even passed? There was a period in the 1990s when I gave an apparently endless number of talks on the theme ‘from deficit to democracy?’ Could I convert my blurred old overhead transparencies to PowerPoint and give the same presentation today? (Irwin 2014, 72)

After a sober and equanimous assessment, Irwin concludes that “despite all the ‘from deficit to democracy’ talk, no such easy shift has been made. At best, and speaking as an advocate of greater democratic engagement with science and technology, I can on a good day claim partial progress” (Irwin 2014, 73).

The *GM Nation?* debate illustrates some of the ways in which the recycling of old assumptions unfolds in practice. Importantly, here we encounter a paradox similar to the one I illustrated in the previous chapter with the image of Baron Munchhausen lifting himself out of quicksand by pulling his own hair; namely, the impossibility of contesting expert discourses through deliberation as conventionally theorized. As I mentioned, the debate was explicitly designed to avoid the imposition of scientific framings and to allow ‘the public’ itself to propose

the issues to be put on the events' agenda. In order to elicit lay framings of GM-related issues nine workshops or discussion groups were organized.

It would be easy to dismiss these efforts by simply noticing that they were preemptively neutralized and emasculated by an already operative risk-framing mobilized by the government before, during, and after the implementation of *GM Nation?* While this is true to a large extent, more interesting insights can be obtained from this example. Two are significant.

First, the official evaluators of the event (Horlick-Jones et al. 2007) identified unforeseen problems with the 'translation' through which the information gathered from the initial phase of *GM Nation?* was supposed to shape the subsequent stages (the open meetings and the closed control groups). They claimed that the six framings identified in the discussion workshops ('food,' 'choice,' 'information needs,' 'uncertainty and trust,' 'targets and intended trajectory,' and 'ethics') "were steadily eroded throughout subsequent stages of the debate process" (140). In the end, the public's own framings were reduced by organizers to stimulus materials for the remaining phases of the event, only to end up being largely ignored in the open meetings. As the evaluators poignantly concluded, "attempts to capture the richness of such deliberations [in the Foundation Discussion Workshops] were largely restricted to a small number of closed questions in the 'feedback' questionnaire, which focused on ratings of a number of pre-assigned attributes of GM. Arguably, these somewhat limited data were then over-interpreted by a small number of time-pressured individuals during the process of producing the debate's final report" (140).

My contention is that even if the issue-framings elicited from the public had been adequately translated and effectively used in the open meetings, closed groups, and information materials, the problem of framing would have re-emerged in a different guise. This is because a

striking feature of the *GM Nation?* debate was the compartmentalization of ‘the public’ into different groups, carefully sequenced, like a Fordist assembly line, to achieve the desired outcome: the ‘public’s opinion on GMOs.’ Hence, the open meetings and online forums where the bulk of the participants were engaged were subject to framings proposed by those attending the Foundation Discussion Workshops. A veritable partition or distribution of discursive agency was built into the event’s design and implementation from the outset.

Secondly, as the evaluators observed, the initial Foundation Discussion groups “were very much facilitator-oriented, which meant that interaction between participants was highly mediated by the instructions and prompts of the (two) facilitators” (Horlick-Jones et al. 2007, 127). Moreover, the six ‘lay frames’ subsequently used to inform the stimulus materials for the other phases of the event were identified *ex-post* by the facilitators, and not by those who had agreed upon them, through vaguely defined methodologies. Thus, the Foundation Discussion Workshops were not about *contesting* expert framings, but rather about *eliciting* framings from the participants via social scientific expertise. This raises the question of whether frames can actually be elicited or artificially extracted from a public, a problem we’ll turn to in the next section. For now it is sufficient to note that the problem of expertise was not neutralized or eliminated, but rather *displaced*. The otherwise well-intended effort to allow ‘the public’ itself to define the framing of the debate did not impede the methodical infiltration of a different framing, namely that of the social scientists in charge of conducting, monitoring, and facilitating the experiment.

Alan Irwin had reached similar conclusions early on in the participatory turn (Irwin 2001). His analysis of the Public Consultation on Developments in the Biosciences, a precursor

of *GM Nation?* conducted in the UK in the late 1990s, drew attention to the role of facilitators and intermediaries between government policy and the wider public as “spokespeople” for that public. By virtue of a series of institutional framings like the ones considered here, the participants appeared “as essentially reactive members of the public rather than as citizens in any more active sense of that term” (13). Moreover, in the case of *GM Nation?* the opinion of ‘the public’ was for all practical purposes reduced to their aggregate responses to a closed questionnaire, later converted into soundbites by the media.

In the end, the commendable effort to loosen the framing of scientific experts ends up consolidating the framing of organizers. As Nikolas Rose has stated, “New ‘experts of community’ have been born, who not only invent, operate and market these techniques to advertising agencies, producers, political parties and pressure groups, but who have also formalized their findings into theories and concepts” (Rose 1999, 186). Indeed, the question of the design and organization of deliberation is a prominent topic in the empirical literature of deliberative democracy (Gastil and Levine 2005). In the words of two STS scholars also influenced by Foucault, “Technologies of elicitation, and the cohorts of experts that control their application and interpret their results, constitute a veritable *extractive* industry, one that seeks to engage publics in dialogue and generate certified ‘public opinion’ with the ultimate goal of increasing the *productivity* of government” (Lezaun and Soneryd 2007, 280). In this sense, the displacement of framing from *natural* to *social* scientific expertise in the movement from PUS to PES is the Pyrrhic victory of STS scholars.

In chapter 3 I theorized framings as the particular and contingent forms in which the *logos/phoné* distribution operates to shape speech situations. Being a structural feature of

deliberative spaces, framings cannot be proceduralized away. They cannot be confronted with deliberative means for the simple reason that no consensus is possible without a framing. Thus Maja Horst and Alan Irwin note the implausible requirements that would have to be fulfilled for achieving consensus around GMOs. Such closure, they write, would be possible only “if the problem were well-defined (perhaps as a matter of establishing an acceptable level of risk), the analytical methods agreed (environmental risk assessment), the solutions clear (tight regulation, control and oversight) and all stakeholders shared a single perspective (based for example on unproblematic scientific evidence)” (Horst and Irwin 2010, 108).

My claim, then, is that contrary to what deliberative theorists like Mark Warren, James Bohman, and John Dryzek contend about discursive challenge and the possibility of confronting expertise *within* deliberation, the parameters that yield the givens of a speech situation cannot be challenged through deliberation, least of all in fabricated forums like *GM Nation?* Deliberative democratic practice is always *organized* deliberative practice, and this organizing has so far been the work of experts, not of citizens.

Expertise and Elicitation (2): Homo Faber and the Making of Publics

A related but different set of issues presents itself when we acknowledge that what is elicited in deliberative forums is not only the opinion of ‘the public,’ but *this public itself*. The ‘publics’ of minipublics do not appear surprisingly on the scene; they have to be summoned, enrolled, checked, and enlightened in experimental conditions by commissioned bodies and experts in deliberation, who then, and only then, can extract their ‘opinions’ and (ac)count (for) them. Minipublics are, to a great extent, *experiments* conducted in quasi-laboratory conditions, in

which experts try to discover what ‘the public’ believes, prefers, opines, feels, or fears. In order to do this, experts have to ‘make’ this deliberating public. As one STS scholar has acutely observed, “while society at large is becoming a laboratory in which knowledge is produced, public participation is retreating from society into the lab” (Bogner 2012, 521). Thus some have claimed that minipublics like *GM Nation?*, consensus conferences and citizen’s juries, are *artifacts* that can be studied with the tools of STS and ANT (Laurent 2011). Indeed, ‘a certain amount of engineering’ (Braun and Schultz 2010) is involved in constructing the publics of the participatory turn, such that new forms of deliberative engagement in technoscientific controversies display a paradoxical *top-down* commitment to *bottom-up* engagement (Horst 2003). Even if framings were truly the publics’ own framings, these publics themselves are framed and crafted by experts in deliberation.

This idea that contemporary exercises in ‘public engagement with science’ involve the construction of publics no less than the extraction of their opinions has been articulated in various ways by STS scholars, including ‘senior’ disappointed authors like Brian Wynne and Alan Irwin and others from a younger generation of researchers in STS and ANT. The titles of some of the scholarly pieces based on cases of deliberative engagement in countries like Austria, Germany, UK, and France, testify to the centrality of the notion that ‘the public’ is not given, but made: “Constructing the scientific citizen: science and democracy in the biosciences” (Irwin 2001); “Consulting citizens: technologies of elicitation and the mobility of publics” (Lezaun and Soneryd 2007); “‘... a certain amount of engineering involved’: Constructing the public in participatory governance arrangements” (Braun and Schultz 2010); “Machineries for making publics: inscribing and de-scribing publics in public engagement” (Felt and Fochler 2010);

“Publics performing publics: of PiGs, PiPs and politics” (Michael 2009); “Technologies of democracy: experiments and demonstrations” (Laurent 2011). I will review some of these formulations before presenting, in the concluding section, my own perspective on this question in relation to the other categories examined in Part I (acting, making, framing).

As we have seen, Brian Wynne has devoted all his energies to contesting and debunking scientific, ‘deficit-model conceptions’ of the lay public, replacing them with an account of laypeople as reflexive, knowledgeable, and worthy of epistemic recognition. But the question of the public I am addressing here is a different one. *GM Nation?* and minipublics in general reveal a new dimension of the question of expertise that we could not have encountered in Wynne’s favored example. The Cumbrian sheep farmers were never engaged (that is: made) as a ‘public.’ To the extent that they appeared publicly—and they largely failed on this score—they did so *motu proprio* and not via social-scientific expert mediation. As it turns out, however, Wynne has recycled his old ideas about framing to account for the phenomenon we are dealing with here (Wynne 2005, 2006, 2007a). Thus, the experts’ yardsticks of *standardization*, *control*, and *predictability* (the three main aspects of expert framings presented in chapter 3) reappear respectively through the imposition of a “standardized model of the citizen” as concerned purely with scientifically defined ‘risks,’ of an “instrumental model of human existence” centred on control and security and blind to “more substantial questions of appropriate and worthwhile human ends,” and of a “model of citizens as incapable of dealing with uncertainty, and expecting scientifically informed institutions to protect them from it” (Wynne 2005, 72). Thus, Wynne denounces the imposition of “dominant scientific discourses of risk implicitly project and impose corresponding normative models of the ‘public’ and thus the ‘citizen’” (72).

Wynne's point here is important, but it does not take us far away from his familiar views. By sticking to his category of 'framing' and emphasizing the imposition of contestable normative assumptions, the publics he refers to are projected or imagined publics (no doubt with real implications), but not concrete groups of people materially assembled together in the ad-hoc, 'one-off' character exemplified by *GM Nation?* In other words, we need to take seriously the notion of publics as being fabricated. Although my concept of framing involves the preemptive definition of subjects as well as objects, it is only now, in light of the participatory turn, that we realize how the framing of subjects becomes the fabrication or construction of publics; how imperatives of standardization, instrumentality, and prediction are imposed to produce the subjects of deliberation, and not only to narrowly circumscribe the objects or issues in question (radioactive contamination as a matter of risk). Only when we realize that the framing of speech situations in minipublics like *GM Nation?* is only part of the story, and that we need to pay attention to the making of publics can we begin to grasp the political significance of the participatory turn in contemporary technoscientific governance.

A provocative perspective along this line has been articulated by Javier Lezaun and Linda Soneryd (Lezaun and Soneryd 2007). Also in reference to minipublics, and particularly to the case of *GM Nation?*, these authors call attention to a crucial distinction that structures the design of deliberative exercises, namely the one between 'stakeholders' who already have more or less strong views on, or interests in, the issue under discussion, and the 'real' or 'general public' made up of those who, in the estimations of organizers, have no opinion or interests in the matter. The politics that results from the prioritization of the latter over the former is one in which "the individuals seen to abstain from participation in political life, what the ancient Greeks would

have known as “idiots” (*idiôtēs*, private individuals who are exclusively dedicated to the privacy of one’s own, or *idion*), become the most highly valued constituency in what is allegedly an attempt to broaden political participation” (280).

Similar forms of production or fabrication of ‘neutral citizens’ with no a priori interest or stakes in the topics of deliberation have been documented in France. For example, Brice Laurent has shown how the Institut Français d’Opinion Publique (IFOP) has been refining its facilitation techniques and methods for the selection of participants:

For instance, deliberation requires diversity on the panel. Diversity is ensured through a series of criteria, originally limited to sex, age and professions, but then refined over IFOP experiences. Acting as lay sociologists, IFOP employees have remarked that panel members often referred to their children in discussions related to risks: thus they added the number of a potential panelist’s children to the list of criteria. The neutrality of the panel members is ensured through two rounds of interviews that panel participants go through before being selected.... [Citizens are expected to] ‘play the game’ of the conference ... an expression an IFOP facilitator used [to refer] to all the actions the panel participant is expected to perform when engaged in a citizen conference: listening to others, following the instructions of facilitators, cooperating with facilitators during the writing of the recommendations. But ‘playing the game’ also relies on the technical competency of the facilitators: they need to make sure that all the participants speak, that they examine all the dimensions of the issues at stake, that their final recommendations are adequately written—in short, they need to make the neutral citizen speak (Laurent 2011, 657).

The general distinction between ‘stakeholders’ and the ‘general public’ has received these and other modulations in the STS literature about the participatory turn, all of which emphasize the painstaking efforts of organizers to summon the latter at the expense of the former. Thus, Laurent (2011) contrasts the ‘neutral’ and the ‘interested’ citizen, whereas Michael (2009) distinguishes between ‘publics-in-general’ or PiGs (undifferentiated wholes defined in relation to ‘science in general’) and ‘publics-in-particular’ or PiPs (those who have identifiable stakes in particular technoscientific issues). Similarly, in a comparative study of Germany and the UK, Braun and

Schultz (2010) examine ‘the construction of the subject of participation’ and identify four types: the ‘general public,’ the ‘pure public’ constructed by organizers, the ‘partisan public’ everywhere abhorred, and the ‘affected public’ or groups in possession of some experiential expertise. I will return to this last type, which rarely plays a part in deliberative forums, in the two remaining chapters.

This ongoing tendency to fabricate ‘general,’ ‘pure,’ or ‘neutral’ publics can be strikingly at odds with deliberative democratic theory. Nowhere in that literature can one find procedural conditions demanding that participation be restricted to people without opinions, or that the latter ought to be favored at the moment of reaching conclusions and decisions (Habermas is often misinterpreted as suggesting that much, when all he and other deliberative theorists demand is that individuals be willing to transform their opinions and preferences if a good argument persuades them). My point here is that unlike ‘stakeholders’ and autonomously organized activists, publics of ‘idiots’ have to be crafted or fabricated by organizers on the basis of demographic and attitudinal parameters of what the ‘general public’ is supposed to be like. General publics, in other words, have to be statistically ‘figured’ out. “Technologies of democracy,” as one author has called them, “require material and cognitive investment to become stabilized and produce their intended outcomes: publics and collective problems. Only then can they allocate public roles for citizens, define rules for legitimate actions of public and private actors, and identify suitable public issues for collective examination” (Laurent 2011, 651).

In the case of *GM Nation*, this was done through the ‘narrow but deep’ discussion groups enacted to ‘control’ for the possible bias of the open meetings, which were largely composed of

self-selected opinionated individuals, “with ‘narrow’ referring to the limited scope of representation, and ‘deep’ alluding to the anticipated extended level of engagement and deliberation in these groups” (Horlick-Jones et al. 2007, 46). These ten discussion groups were designed deliberately to exclude people with an active interest in issues surrounding GMOs. The participants in these closed exercises were selected by the organizers and carefully screened and vetted to make sure that no vocal individuals would ruin the purity of this sample of the ‘neutral public.’ Indeed, these ‘idiots’ received much more attention and were able to ‘deliberate’ extensively on two occasions, and their opinions, which were somewhat less emphatic about GMOs than those registered in the open meetings,¹⁰⁹ were given pride of place in the final report, in an official effort to counterbalance the more negative views elicited in the other phases of the event. One cannot help wondering: What is the point for sponsors and organizers of implementing such a costly large-scale event while hoping that the aggregated opinion of the participants will match what social scientific datasets reveal as the view of the genuine, i.e., statistically counted public? Why not simply poll the population or include a few questions on attitudes towards biotechnology in the national census?

More pointedly, if the issues and questions asked to participants simply mirror those administered to a survey sample, or the same issues and questions are polled before and after the deliberative engagement, then no major value is being given to the epistemic dimension of deliberation (Estlund 2008) or the perspectival enrichment that results when new light is shed on issues. Thus, the more successfully accomplished the making of publics that mirror or represent

¹⁰⁹ “We found that the participants in the public aspects of the debate were not representative of the general public as a whole, in terms of their demographic or attitudinal characteristics” (Horlick-Jones et al. 2007, 132).

the absent ‘general public,’ the more disappointed will expectations be about the cognitive gains of deliberation and the pluralization of perspectives brought to bear on them. Indeed, when we consider the role of risk- and social scientific-expert framings in narrowing the exchanges that can take place in minipublics, it seems unlikely that new perspectives will actually emerge from the debates. If there is a ‘wisdom of crowds’ and many minds can be wiser than one (Landemore and Elster 2012), it is not being tapped in minipublics and is bound to remain under the threshold of perceptibility and communication set by extant technologies of elicitation.

Certainly, any public has to be ‘made’ in one sense or another. Unless one believes in a ‘public in general’ existing somewhere, any particular gathering of speaking beings has to be brought into being. I shall expand on this question in the next chapter in relation to John Dewey’s influence on recent ANT scholarship. For the moment, I wish to call attention to the fact that to speak of a public is always to speak of a *mise-en-scène*. It makes a major difference, however, if this scene is set up from the top along the premises of existing social and political arrangements or emerges rather disruptively to the surprise of authorities and social science experts. The latter form of interference is likely to reveal new facets of the technoscientific issue at stake, as well as new subjects emerging around this object. Thus, when Arendt observed that “the public realm, the space within the world which men need in order to appear at all, is ... more specifically ‘the work of man’ than is the work of his hands or the labor of his body” (Arendt 1998, 208), her point was that the ‘subjective in-between’ is the work of humans in a way which differs (thus her use of inverted commas) from the crafting of a chair or the baking a loaf of bread, precisely because no design for setting up such space of appearance is available, as it were, to the mind’s eye. The reason is that the standards that matter in the public realm are the standards of the

world. And these standards exist only through the exchange of plural perspectives on the common world in action and speech. In a passage in *The Human Condition* that conveys Arendt's *amor mundi*, she writes that

The melancholy wisdom of Ecclesiastes—"Vanity of vanities; all is vanity.... There is no new thing under the sun, ... there is no remembrance of former things; neither shall there be any remembrance of things that are to come with those that shall come after"—[...] is certainly unavoidable wherever and whenever trust in the world as a place fit for human appearance, for action and speech, is gone (Arendt 1998, 204).

If it is to enlarge the repertoire of already-known actors and the inventory of already-known things, appearance, we could say, has to be a kind of emergence without a blueprint.

The Worldlessness of Minipublics

The harsh judgment on deliberative democratic practice presented in the preceding sections arises from the frustrating recognition that for all the participatory deployment of the last decades, nothing much has changed in the politics of technoscience. Although 'silence' may not be its distinctive mode of speech, as Langdon Winner once remarked, the agency of science and technology keeps moving relentlessly forward, without genuine democratic input, and with governmental policy and STS research revolving in the circle of the shift from PUS to PES and then back to new incarnations of the deficit model. *Plus ça change, plus c'est la même chose.*

Certainly, minipublics can be valuable and represent the most interesting democratic innovation of the last decades. They give a handful of people the opportunity to discover and actualize a capacity that might otherwise have laid dormant in their everyday lives; to learn about issues with structuring implications for their everyday lives; to form an opinion or strengthen or modify one already held, and so on. These are all 'benefits' for the individuals involved.

Importantly, however, the deliberative turn in scientific governance stifles the appearance of new objects and subjects around technoscientific doings. Much like opinion polling, the implementation of deliberative engagements is a way of extracting opinions from ‘the public’ in an effort to replicate what is already presupposed as an exhaustive count of its relevant parts. In the participatory turn, *Homo faber* crafts minipublics with organizational blueprints designed to anticipate and preclude disruptive forms of democratic action.

I conclude this chapter with a different (although related) criticism inspired by Arendt’s *amor mundi*. When trying to make sense of the participatory turn we should always ask: What about the world? Do new perspectives appear from which to judge human affairs and the human artifice in relation to science and technology? Are the issues in question (for instance, GMOs) disclosed anew by newcomers who unsettle extant forms of enacting and counting the voices of the community?

I have emphasized the artifactual character of the publics of deliberative democratic practice. Elicitation invariably demands the design and implementation of forums and the making of a ‘general public’ skillfully and carefully carved out from the formless mass of citizen-consumers. A significant aspect of minipublics, in this sense, is the enrollment of *homo faber* as designer, builder, and organizer of deliberative arenas in which acting and speaking beings are allowed to play a part. For this reason, this aspect of the ‘deliberative turn’ presents specific problems that rarely appear in the theoretical literature examined in the previous chapter.

The problem is not in the involvement of *homo faber per se*. As I explained in chapter 1, we must avoid rigid interpretations of Arendt’s work that confine politics to ‘action’ and look suspiciously upon ‘work.’ In line with Patchen Markell’s invitation to de-territorialize

conventional readings of *The Human Condition*, I showed how *homo faber* renders a valuable service for political action with works of art that capture, ‘reify,’ and preserve the meaning of enacted stories and the unique identities of their protagonists. We saw that the passage connecting the otherwise distinct realms of ‘work’ and ‘action’ is public appearance: i.e. the circumstance that artifacts and actions depend on the appreciation and judgment of a ‘public’ in order to escape the meaninglessness that threatens work and action when they lapse into the logic of ‘processes,’ be it the unending chain of means to ends that bedevils the standards of *homo faber*, or the irreversibility that plurality infuses to the new beginning unleashed by human action. From the perspective of a non-territorial reading of Arendt, not only are ‘work’ and ‘action’ closer to one another than usually assumed; they are both connected to labor as well, always ‘at risk’ of being swallowed in the whirlpool of a process, devoid of singularity and uniqueness: without appearance, without a public. Thus, although Arendt always uses the term ‘public’ adjectivally and never as a noun, the concept of ‘a public’ is implicit in her insistence that the beauty and meaning of things and deeds is disclosed by plural spectators, not by the author or performer. The non-sovereignty, which, according to Arendt, accompanies action as soon as it enters the ‘web of human relations’ or befalls fabrication the moment artworks transcend the functional and utilitarian standards of *homo faber*, is most emphatically *not* a failure or lack to be regretted. On the contrary, it is the very condition for the existence of publics as plural subjects who care for the meaning of human work and action.

The political challenge is, from an Arendtian perspective, to care about how the things of the world and the actors gathered around them *look* and are disclosed beyond the utilitarian standards of fabricators. When we consider minipublics, however, we realize that

technoscientific matters of worldly interest, the very questions that prompt the elicitation of pure publics, recede to the backstage. Far from caring for the world, *homo faber* devotes his or her attention and effort to the calibrated making of artificial publics. The main ‘casualty’ in this deliberative upsurge is the world itself. I mean this in the sense that, ultimately, the issues or things at stake in the politics of technoscience become secondary in favor of the artful, complex and resource-intensive fabrication of specific publics. The object *qua* thing or event of the world remains backstage, while sponsors and organizers overwhelmingly focus their concerns on the public: Is it representative? Is it polarized? Is it made up of ‘idiots’ or vocal activists?

For Arendt, the world can be held as something in common only when the material ‘in-between’ of things makes possible the intangible disclosure of new subjects in the web of human affairs. The latter, as I insisted in chapter 1, is not simply something that ‘overlays’ the human artifice, as Arendt suggests at some point (1998, 182-183), but depends entirely on it. From this perspective, far from constituting an ‘in-between’ in which the world and the things and deeds at stake in it can publicly appear, their meaning disclosed from manifold perspectives and their fitness judged according to standards of the world, democratic politics *qua* consultative *elicitation* is first and foremost an experimental, instrumentally oriented affair aimed at making definite subjects, and making them talk. The doings of technoscience exist in an inverted phantasmagorical state: GM soybeans and genetic manipulation are real in their material, social, and political effects, but, politically speaking, they do not *appear* in public, at least not through deliberative elicitation.

Democratic politics in the participatory turn is trapped in the purely instrumental dimension of *homo faber*’s activity. Minipublics may be artifacts (Laurent 2011), but they do not

serve the preservation of the meaning of actions and they are not a site for things to appear. The deliberative forums of PES are not artworks, but, equally importantly, neither are they democratic scenes. I contend that the elicitation of minipublics, by which I mean its construction as ‘pure’ or ‘general’ publics together with the framing of their speech situations, is not the form of democratic politics required to make democracy count in relation to the deeds, artifacts, and frames of science and technology.

It would be tempting to close this chapter with a new acronym so as to escape the fetters of PUS and PES conceptualizations in STS. At the risk of provoking something like the confusion between the Judean People's Front (JPF) and the People's Front of Judea (PFJ) so memorably satirized in Monty Python's *Life of Brian*, I could propose PPS or ‘public *participation* in science’ as the banner for a new understanding of democratic politics in relation to technoscience, with ‘participation’ meaning something different from the paternalist top-down instruction of PUS and the paradoxical top-down commitment to bottom-up engagement in PES, and ‘publics’ as emerging not from the work of *homo faber* but from the concerted practices of acting beings.

In the final chapter, on the political proposals that have emerged from Actor-Network Theory (ANT), I will examine a conception of ‘the public’ that takes into account the emerging aspect I alluded to above. In the pragmatist turn underpinning those ANT proposals we shall encounter a notion of mobile publics emerging and turning around the things or issues at the center of technoscientific controversies. The challenge will be less that of making publics into things, and more about ‘making things public,’ a Latoureaan expression much closer to Arendt's perspective. In chapter 6, to which we now turn, I claim that whereas publics have to be elicited

(this chapter), the *demos* theorized by Rancière is defined by its untimely, surprising, and disrupting appearance on the public scene; closer to Arendt's 'newcomers' than to the 'general public' discussed so far. As Brian Wynne has remarked, "invited public involvement nearly always imposes a frame which already implicitly imposes normative commitments—an implicit politics—as to what is salient and what is not salient, and thus what kinds of knowledge are salient and not salient. ... Uninvited forms of public engagement are usually about challenging just those unacknowledged normativities" (Wynne 2007a, 107).

Reviewing his long experience as an STS scholar involved in the participatory turn, Alan Irwin has recently expressed his current conclusions on the question of 'public engagement with science.' What we need, he suggests, are "new stories to tell about engagement, stories which connect issues large and small and which confront us with both the challenges and the possibilities" (Irwin 2014, 74). To find such stories, I believe, we have to look elsewhere, beyond minipublics, beyond deliberation. In Part III I turn to some of these alternatives.

Part III

Amor Mundi

6. INTERFERENCE

Man is a will served by an intelligence.

Joseph Jacotot

The intellectualist rationalization, created by science and by scientifically oriented technology... [does not] indicate an increased and general knowledge of the conditions under which one lives. It means something else, namely, the knowledge or belief that if one but wished one could learn it at any time.

Max Weber

In this chapter I articulate a concept of egalitarian *interference* as an alternative to the accounts of democratic politics in relation to science and technology examined in Part II. I shall do this by critically augmenting some of the insights we have retrieved from Arendt, Habermas, and Wynne, through an engagement with Jacques Rancière’s theorization of politics and democracy. At the same time, I seek to problematize Rancière by displacing his thought to the terrain of technoscientific agency, particularly by probing his ideas around ‘subjectification’ and ‘dissensus,’ and posing the question of *what follows after* interference. I will give empirical substance to this reciprocal augmentation between political theory and STS-ANT, and the concept of interference this cross-pollination yields, with the case of AIDS-treatment activism in the US in the late 1980s and early 1990s, a movement that illustrates with exemplary validity the notion of democratic politics I seek to articulate in this chapter.

After introducing the main events and protagonists in the story of AIDS activism in the first section, I call attention to its singularity and argue that this case—and the form of

democratic politics it exemplifies—cannot be accounted for in terms of deliberation or elicitation. Following a preliminary definition of ‘interference’ I shall reintroduce the work of Rancière through three ‘excursions’ that set up comparative encounters between the French theorist, on the one hand, and Arendt, Habermas, and Wynne, on the other. After these I return to the example of AIDS treatment activism to assess the scope and meaning of a Rancièrian theorization of democratic politics vis-à-vis technoscience. I conclude with a central limitation of this approach that will pave the way for the concept of ‘composition’ we shall address in the concluding chapter.

‘Silence = Death’¹¹⁰

When Margaret Heckler, then US Secretary of Health and Human Services, announced in a press conference on April 24, 1984, that the cause of AIDS had been identified *and* that vaccinations would be available within two years, the scientists and experts who sat at the conference in order to support her first claim could hardly hide their surprise and embarrassment concerning Heckler’s other claim. Although scientific controversy around the aetiology of AIDS was going to resurface in the ensuing years, with UC Berkeley’s prominent scientist Peter Duesberg as the

¹¹⁰ In this section I draw for the most part on Steven Epstein’s insightful and rich account of the case in (Epstein 1995; 1996). I have also considered the following works: ACT UP/New York (1989); Altman (1994); Arno and Feiden (1992); Bohman (1999); Byar (1990); Callon (1999); Callon et al. (2009); Collins and Evans (2002); Corea (1992); Cotton (1990); Dobson (1990); Edgar and Rothman (1990); Elbaz (1992); Epstein (1995, 1996); Gamson (1989); Harrington (2008); Hiltz (1990); Indyk and Rier (1993); James (1986, 1988, 1989); Krieger (1991); Patton (1990); Quimby and Friedman (1989); Raphael (1990); Smith (1989); Treichler (1990); Wachter (1991, 1992); Wolfe (1994). I have also consulted some of the transcript of interviews to former ACT UP members available at <http://www.actuporalhistory.org> as well as David France’s powerful 2012 documentary *How to Survive a Plague*.

key dissenter,¹¹¹ the claim that the set of ‘opportunistic diseases’ comprising AIDS was caused by a new human retrovirus (HIV) had been already ‘black-boxed’ (Latour 1987) or turned into a matter of fact. Blood tests for antibodies were soon available in the US and elsewhere. Secretary Heckler’s confident assertion about the prompt availability of a *vaccine*, on the other hand, was unwarranted. By the mid-1980s only a handful of relatively effective vaccines had been developed for viral illnesses.¹¹² Dr. Anthony Fauci—head of the National Institute of Allergy and Infectious Diseases (NIAD), a division of National Institute of Health (NIH)—quickly stepped in to curb public enthusiasm in the pages of *The New York Times*: “To be perfectly honest, we don’t have any idea how long it’s going to take to develop a vaccine, if indeed we will be able to develop a vaccine” (in Epstein 1996, 182). As of today, no vaccine exists to prevent HIV infection. The story I want to tell in this section is not about laypeople’s involvement in

¹¹¹ See Epstein 1996, chapters 3 and 4. Besides Duesberg’s ongoing criticism of the HIV hypothesis, presented in the highly prestigious pages of *Cancer Research*, *Science*, and the *Proceedings of the National Academy of Science*, the other prominent episode in the causation debates was the infamous quarrel over the discovery of the AIDS virus between US virologist Robert Gallo (who had discovered the first human retrovirus) and Luc Montagnier of the Pasteur Institute in France. The controversy, including Gallo’s questionable conduct and the eventual agreement to co-author the discovery, is a wonderful example of the practice of ‘science in action’ as analyzed by Bruno Latour, as well as of the heterogeneous network of actors, human and non-human, involved in the establishment of the scientific fact: “AIDS is caused by HIV.” The story is memorably depicted in the 1993 film *And the Band Played On*, directed by Roger Spottiswoode and based on Randy Shilts’s book of the same title.

¹¹² Unlike bacteria, which can be treated with antibiotics, viruses invade cells’ DNA and become a part of the organism. The challenge then is to destroy infected cells as early as possible without killing the healthy ones. Genetic mutations of viruses further complicate the prospects of treating a viral disease.

questions of AIDS causation¹¹³ or prevention. Although these two issues have also been an object of AIDS activism, it was the question of *treatment* that that gave rise to a truly novel form of democratic politics.

A bit of technical background is necessary here. As a syndrome, AIDS is a set of opportunistic diseases, including Pneumocystis pneumonia (PCP), Cytomegalovirus retinitis (which causes blindness), and Kaposi's sarcoma (a cancer otherwise prevalent among male Italians in their sixties) that affect patients whose 'Helper T cells' have been depleted through HIV infection. Strictly speaking, then, to die of AIDS is to die of one or more of these opportunistic diseases. As Steve Epstein points out, "[t]he discovery of Luc Montagnier's 'LAV,' Robert Gallo's 'HTLV,' and Jay Levy's 'ARV'"—the three guises in which the same retrovirus circulated in scientific journals until the scientific community settled on the name 'HIV'—"instantly changed the scientific agenda for AIDS research. Suddenly it became possible to use a new vocabulary, one with terms like 'cure' and 'vaccine'" (Epstein 1996, 181-182).¹¹⁴ As

¹¹³ Grassroots AIDS organizations were involved in the early debates about causation, joining biomedical institutions, public health services, and the media in support of the HIV hypothesis advanced by virologists. Arguably due to the dramatic and perplexing nature of the epidemic (the disease was killing people in their twenties and thirties, that is, those who were supposed to be healthiest), the rather swift 'black-boxing' (Latour and Woolgar 1986) of the statement "AIDS is caused by HIV" as a scientific *fact* benefited from public input to an unusual extent. Put differently, the credibility of scientific experts was a necessary but not sufficient condition for the achievement of 'closure' in the AIDS causation debate. Without such heterogeneous involvement, and without the widespread eagerness to identify and name the 'culprit' of a crisis that was rapidly overflowing extant expert knowledges and practices, the aetiology controversy would have probably unfolded more slowly and less visibly within the scientific community and its conventional mechanisms of peer-reviewed and indexed publications. My point here is that the involvement of actors outside the expert community in debates about AIDS causation did not disturb scientific practice and knowledge-making, but made it more expeditious.

¹¹⁴ Whereas regular viruses are made of deoxyribonucleic acid (DNA), retroviruses like HIV are composed of ribonucleic acid (RNA). This means that the replication of retroviruses had to be different from the direct use of viral DNA to transform infected cells into virus factories known from normal viruses. An enzyme known as 'reverse transcriptase' that transforms the retrovirus's RNA into DNA had been discovered as the agent responsible for retroviral replication. Thus, the rationale was that by eliminating this enzyme the virus could be stopped in its tracks.

the epidemic spread, the question of treatment quickly turned on anti-viral drugs that promised to prevent the onset of diseases. Partly by virtue of the leverage they could wield as representatives of people living with AIDS vis-à-vis a medical establishment that depended on recruiting patients for the conduct of clinical trials, activists quickly understood they could have a say in research and knowledge-making concerning treatment.

With this context in mind, we can begin to tell the story of AIDS-treatment activism. The first milestone of the early years were the ‘Denver Principles’ of 1983 (PWA 1983), a statement from a group of activists (the ‘People With AIDS Advisory Committee’) led by architects of ‘safe sex’ Michael Callen and Richard Berkowitz.¹¹⁵ The drafted document was addressed to the attendees of a gay and lesbian health conference held that year in Denver, Colorado. It opened with the following declaration: “We condemn attempts to label us as ‘victims,’ a term which implies defeat, and we are only occasionally ‘patients,’ a term which implies passivity, helplessness, and dependence upon the care of others. We are ‘People With AIDS’” (PWA 1983). This preamble is significant because it anticipates what was to become a main feature of the movement, namely the claim that a new subjectivity was emerging that could not be reduced to extant categories such as ‘patient’ or ‘victim.’ The document was followed by two sets of recommendations, one addressed to people in general and the other to people affected by the disease, and five ‘rights of people with AIDS.’¹¹⁶

¹¹⁵ Before the Denver Principles, the first reaction to the AIDS epidemic in the US had been the creation of Gay Men’s Health Crisis (GMHC) in 1982, an agency that provided care and support for people living with AIDS. That same year, before HIV was discovered and sexual transmission identified as the main cause of infection, Richard Berkowitz, Michael Callen, and Dr. Joseph Sonnabend became the pioneering advocates of ‘safe sex’ with the publication of the small booklet *How to Have Sex in an Epidemic: One Approach* (Sonnabend 1982).

¹¹⁶ The complete document can be accessed at http://www.actupny.org/documents/denver_principles.pdf

Of all these, one of these ‘recommendations’ (“[to] be included in all AIDS forums with equal credibility as other participants, to share their own experiences and knowledge”) and one of the ‘rights’ (“to full explanations of all medical procedures and risks, to choose or refuse their treatment modalities, to refuse to participate in research without jeopardizing their treatment and to make informed decisions about their lives”) are worth addressing. These principles point to a pivotal and productive tension between equality and expertise that would come to define the outlook of AIDS-treatment activism. Both allude to equality: one advising inclusion of laypeople in AIDS forums with ‘equal credibility’ as experts, and the other presupposing the equality of all as intelligent beings capable of understanding technical information and making judgments about their situation. Indeed, whereas equality has traditionally been invoked to demand inclusion in political arenas involving little if any technical knowledge, the equality hereby asserted was bound to come up against the cultural and institutional inertia that scholars like Brian Wynne have denounced as part and parcel of our dominant scientific and bureaucratic arrangements.

Importantly, the contestation of expert framings was going to involve the ‘expertization’ of many activists, and the irruption of a new and paradoxical subject: the ‘lay-expert.’ On the other hand, as I intend to show, the polemical scenes enacted by activists also involved the public appearance—or the appearance under new guises—of *objects* that did not exist before or were hidden from public view: the virus itself, the opportunistic diseases, the anti-viral drugs, the clinical trials with their statistical and experimental standards of sound evidence, drug companies headquarters, the right to health care, and the regulatory bureaucracy of government agencies, to name the most important ones. In this sense, the story of AIDS-treatment activism in the US is the story of the mutually conditioned emergence of new actors and new issues, of new forms of

enunciation and new forms of dealing with technical problems. I will present these objects and subjects in relation to some of the key episodes that punctuated the unfolding of events, from the outbreak of the epidemic to the first successful combination therapies.¹¹⁷

AIDS-treatment activism was born in 1985 in the midst of increasing mainstream attention to the epidemic after actor Rock Hudson was reported to have acquired AIDS, and the widespread fears of mass contagion and increasingly overt stigmatization of homosexuals epitomized in the infamous op-ed piece in *The New York Times* where William Buckley Jr. proposed that “everyone detected with AIDS should be tattooed in the upper forearm to protect common-needle users, and on the buttocks, to prevent the victimization of other homosexuals...” (Epstein 1996, 187). Activists were provoked and drawn into action by the Reagan administration’s overall lack of interest in the epidemic, the squalid funding of emergency AIDS-treatment it promoted, and its failure to protect affected people against discrimination. The disease, as Epstein has argued, blurred the dividing lines between private life and public affairs that had been drawn earlier by the gay movement itself. “For a generation of relatively privileged, middle-class gay men, government had been something to restrict, to keep out of their ‘private’ lives. As the boundary between private illness and public health exploded, these same men sought active governmental involvement...” (187). When those expectations were disappointed, people started to take matters in their own hands.

The first obstacle activists encountered in their efforts to advance an anti-viral drugs research agenda was the bureaucracy of the Food and Drug Administration (FDA), the federal

¹¹⁷ Although it will become clear how activists partook in creating the conditions that led to the successful combination of anti-viral drugs which in the mid-1990s transformed AIDS into a manageable chronic disease (at least for those able to afford treatment), I will not examine the episode itself.

agency in charge of regulating the production, marketing, and advertising carried out in the pharmaceutical and other industries.¹¹⁸ Ever since President Kennedy signed the Drug Amendment Laws in 1962 in response to the discovery that thalidomide, a drug widely prescribed to pregnant women, caused infant deformation, drugs had to demonstrate both efficacy *and* safety. In order to do this, preclinical developments in test tubes and animals had to be followed by three phases of testing. Phase I trials are small and short and give every participant ever larger doses to determine toxicity and effective dosage. Phase II involves the use of placebo controls in order to determine efficacy, while Phase III uses other known treatments as active controls to compare their efficacy. Phases II and III are longer and larger, with patients randomly assigned to experimental or control arms. Under this scheme, neither doctors nor patients know who is receiving the treatment or the placebo. As one leading figure in the movement recalls,

The FDA controlled all four routes for access to potential AIDS drugs. FDA decided which drugs would be licensed and available *by prescription*. FDA approved experimental treatments available *through clinical trials* at medical centers. FDA could allow certain experimental drugs out on *special release programs* such as Treatment IND or ‘compassionate use.’ Finally, FDA oversaw the *AIDS drug underworld*, and could allow or forbid PWA buyers’ groups to import drugs approved abroad, or to sell unlicensed substances to people with AIDS. FDA could easily shut these organizations down, and sometimes did (Harrington 2008, 331).

Faced with procedures that made little sense in the midst of what many considered a plague—the normal time-frame for drug approval was six to eight years—affected people could not help seeing the bureaucracy of safety and efficacy as a deadly bottleneck. *Anger*, indeed, was

¹¹⁸ The FDA had its origins in the Food, Drug and Insecticide Administration (FDIA), created in 1927 to enforce the Pure Food and Drugs Act of 1906 with which the federal government had responded to the meatpacking scandals in Chicago denounced in Upton Sinclair’s *The Jungle*. In 1930 the FDIA was renamed and became the FDA (Harrington 2008, 330-331).

the main passion mobilizing activists eager to expedite the approval process for anti-viral drugs. Thus, when people's hope and excitement after reports from the first International Conference on AIDS in Atlanta, Georgia in 1984 announced that small-scale trials had shown promise for a handful of drugs (including ribavirin) clashed with the sober assessment of experts like Dr. Martin Hirsch of Massachusetts General Hospital, activists concluded that the scientific establishment was bent on doing business as usual despite the dramatic tenor of the circumstances. "We have a long way to go before AIDS is preventable or treatable... but the first steps have been taken, and we are on our way" (Epstein 1996, 186), Dr. Hirsch had declared at the conference. In practice, from the activists' perspective, the experts' "way" meant that years could pass before a treatment was approved and made available to the public. Alternative, unofficial paths were about to be explored.

In this context, the first polemical scene enacted by activists was the design and implementation of clandestine community-based trials to determine the benefits of the drugs that were becoming increasingly available in the black market through so-called 'buyers clubs.' Impatient with the caution of experts and officials, many people suddenly became entrepreneurs of sorts and began to smuggle drugs from abroad, mainly from Mexico, where ribavirin was sold for two dollars a box (Epstein 1996, 188). Others, like Rock Hudson, could afford to move to cities like Paris, where other promising drugs were available, some of them over the counter. This was risky business, especially for the patients, given the toxicity of these drugs and the pervading uncertainty about their efficacy and side-effects.

"We don't know for sure how these drugs will work. ... But it makes more sense than the next best thing, which is dying without trying anything" (Epstein 1996, 188). Such was the

conclusion that led Martin Delaney, a ribavirin-smuggler who had been a seminary student and business consultant, to found in 1985 the organization Project Inform to conduct studies of experimental drugs so as to provide “a safe, monitored environment to learn what effects they are having” (188). These underground tests were similar to the preliminary studies and Phase I trials sanctioned in the official regulatory process. Although Delaney’s initiative stood in conflict with existing guidelines for protecting patients from harm in clinical trials, the bulk of which had been established after the infamous Tuskegee syphilis study,¹¹⁹ these improvised researchers were actually mimicking the logic and practice of clinical trials, albeit without strict adherence to the ‘gold standard’ of randomized control and experimentation.¹²⁰

Importantly, as mentioned above, the requirements of ‘pure science’ included the use of placebos, a practice that from many activists’ perspective amounted to treating dying patients with sugar pills. This was deemed ethically and morally unacceptable, and the controversy was going to fuel many struggles in the future. As we will see, this mixture of ethical and scientific claims was a main feature of AIDS activism as it set out to reinvent clinical trials after acknowledgment that community-based ones were not sufficient to advance the research agenda that the circumstances demanded became widespread.

Another politically significant episode was the publication of community-based magazines and newsletters that focused on the technical aspects of AIDS and its treatment. In

¹¹⁹ The most important guidelines for the conduct of clinical trials had been defined in 1974 when Congress created the National Commission for the Protection of Human Subjects in response to the scandal of a syphilis study in which poor black sharecroppers had been denied treatment, allowing researchers to monitor the ‘natural’ unfolding of the disease (Collins and Pinch 2002, 132).

¹²⁰ Project Inform would later play an important role in the resurgence of controversies around causation (Epstein 1996, 156-158).

1986 activists set out to provide updated and rigorous information to the public, to some extent bypassing the conventional routes of certified scientific journals. Similarly to community-based trials, these publications demonstrated that laypeople were entitled and perfectly capable of speaking publicly about the issue, *including its technical dimensions*. Exemplary in this regard was *AIDS Treatment News*, a San Francisco newsletter edited by John James that became a primary source of information for patients *and* doctors alike, with a circulation of thirty-five hundred copies (Epstein 1996, 194-195). “A former computer programmer with no formal medical or scientific training,” Epstein observes, “James had just launched what would become the most prominent grassroots AIDS treatment publication in the United States” (195).¹²¹ The call to arms was made by James in the issue of May 1986 under the heading “What’s wrong with AIDS treatment research?”:

So far, community-based AIDS organizations have been uninvolved in treatment issues, and have seldom followed what is going on. ... With independent information and analysis, we can bring specific pressure or bear to get experimental treatments handled properly. So far, there has been little pressure because we have relied on experts to interpret for us what is going on. They tell us what will not rock the boat. The companies who want their profits, the bureaucrats who want their turf, and the doctors who want to avoid making waves have all been at the table. The persons with AIDS who want their lives must be there, too. ... To rely solely on official institutions for our information is a form of group suicide (Epstein 1996, 195).

Furthermore, in the September issue James claimed that the problem with experts was not the status of their knowledge, but the narrowness of their perspective, an argument that resonates with the question of framing I introduced in chapter 3. “Non-scientists can fairly grasp treatment-

¹²¹ In particular, the newsletter “provided the latest inside word on the up-and-coming drugs as well as the alternative therapies that didn’t make it into formal clinical trials. It would go on to engage as well in sweeping and detailed critique of the federal drug-testing and regulatory enterprise” (Epstein 1996, 195).

research issues; these don't require an extensive background in biology or medicine" (Epstein 1996, 195-196).

When the National Cancer Institute (NCI) requested drug companies to send any drugs they might have that could inhibit a retrovirus, North-Carolina Burroughs Wellcome submitted ten compounds, among which was AZT (azidothymidine or zidovudine), a drug that had been shelved in the 1960s after proving unsuccessful for cancer treatment. The NCI found that it was a strong anti-viral that inhibited reverse transcriptase (the enzyme behind HIV's replication). However, as James reported to the readers of *AIDS Treatment News*, this promising drug was bound to fall into the bottleneck of FDA regulations. Indeed, large-scale trials were months away and, if proved effective, years would pass before doctors could begin to prescribe the drug to their patients. Thousands were going to die of opportunistic diseases that would have been prevented if the compound turned out to be efficacious and safe. It was on these grounds that James called upon activists to participate in treatment research.

Partly due to mounting social pressure, the Phase II testing of AZT was ended early when the drug showed enough promise to conclude that 'equipose' no longer held.¹²² The NIH's Data and Safety Monitoring Board concluded in September 1986 that a statistically significant difference existed between the two arms of the study.¹²³ This time, it was the prohibitive market price of the compound (eight to ten thousand dollars a year per patient) the eclipsed the hopes unleashed by the early approval of AZT. Moreover, affected groups began to regret the absence

¹²² Equipose is "the state of uncertainty as to which of the two arms in a clinical controlled study is receiving the better treatment" (Collins and Pinch 2002, 135).

¹²³ By approving the drug in such an early phase, the possibility of assessing AZT's long-term effects under close-to-ideal controlled conditions was lost, at least for the time being.

of a diversified strategy on the part of public authorities—the fact that all the eggs were being put in the single basket of azidothymidine, a very toxic drug whose efficacy remained uncertain. It is in this context that the main AIDS-treatment activist organization in our story was formed: the AIDS Coalition to Unleash Power (ACT UP).

ACT UP was formed by about a hundred people inspired by the famous speech that playwright Larry Kramer delivered at New York’s Lesbian and Gay Community Center on March 10, 1987:

We have not yet even begun to live through the true horror.... The real tidal wave is yet to come.... Two-thirds of this room could be dead in less than five years.... What does it take for us to take responsibility for our own lives? Because we are *not*—we are not taking responsibility for our own lives.... we must immediately rethink the structure of our community.... Do we want to start a new organization devoted solely to political action? I want to talk to you about power. We are all in awe of power, of those who have it, and we always bemoan the fact that we don’t have it.... *All power is the willingness to accept responsibility*.... It’s easy to criticize.... It’s harder to do things. Everyone here is capable of doing something. Of doing something strong. We have to go after the FDA—fast. That means coordinated protests, pickets, arrests. Are you ashamed to be arrested? (Harrington 2008, 325)

ACT UP was formed two days after Kramer’s speech, and within two weeks its first demonstration—including arrests—took place on Wall Street. The slogan was ‘No More Business as Usual,’ and the chosen location signalled the movement’s early acknowledgment that the profit motive (‘corporate greed’) of Pharmaceutical companies like Burroughs Wellcome had to be factored in, compounding the challenges ACT UP members were soon going to assume vis-à-vis medical science and government bureaucracy.

According to Mark Harrington, “ACT UP attracted an eclectic mixture of gay and lesbian activists, feminists, peace activists, Quakers, and people without previous political experience. Movement veterans passed on activist lore—how to run meetings with a minimum of hierarchy,

how to train people for demonstrations while assuring their safety, how to work the legal system—and the newer recruits brought skills honed during the 1980s: media savvy and an irreverent, punky wit” (Harrington 2008, 326). The original Working Document of 1987 (ACT UP 1987)¹²⁴ established the minimal organizational structure ACT UP was going to maintain throughout the ensuing years, and certain of the claims contained therein warrant some attention

The document focused on the necessity of having a Coordinating Committee to articulate the activities of the five subcommittees that were going to deal with the different aspects of the agenda: outreach, logistics, issues, media, and funding. Each subcommittee would choose and send a representative to the Coordinating Committee, which also included a Treasurer, a Secretary, and two “At-Large” members strategically selected by the group. The coordinating committee would work by consensus, and in the absence of consensus issues would be decided by ACT UP as a whole. Importantly, there would not be executive officers, Presidents, or Chairs. Weekly meetings were held every Monday night, opening with the group’s mission statement:

ACT UP is a diverse, non-partisan group united in anger and committed to direct action to end the AIDS crisis. We protest and demonstrate; we meet with government and public health officials; we research and distribute the latest medical information, we are not silent (Harrington 2002, 326).

The statement reflected the ‘inside-outside’ strategy chosen by the activists (Epstein 1996, 233), who set out to combine conventional demonstrations and civil disobedience outside drug companies and government headquarters with autonomous ‘scientific’ research and face-to-face negotiations with government officials.

¹²⁴ Available at <http://www.actupny.org/documents/firstworkingdoc.html>

Acknowledging the success of ACT UP's first actions, including a targeted 'zap' at Burrows Wellcome to protest against the price of AZT, the original Working Document called for an escalation of activities: "We can do much, much more. With planning, we'll have 600 angry people at our next demonstration, not 300. And the demonstration after that will have 1200 people. As our numbers grow, our power will grow. *We can continue to shed light on the drug situation and bring new insight to AIDS education, insurance discrimination, and other aspects of the AIDS crisis*" (ACT UP 1987, my emphasis).

During its first year of activities, the group deployed many of the usual strategies and tactics known from previous social movements. They protested the inaction of the Reagan administration in front of the White House; set up an 'AIDS concentration camp' at the 1988 Gay Pride Parade in New York City; denounced hospitals and airlines for the discriminatory treatment of people with AIDS; and in the gay and lesbian March on Washington of 1988 an enormous quilt with the hand-sewed names of thousands of AIDS fatalities was laid out in the Washington Mall (Harrington 2008, 326). That day, as reported by Harrington, "ACT UP's contingent stood out in stark black 'SILENCE=DEATH' T-SHIRTS, camaraderie, exuberance, and noisy chants. Something new was afoot. Many who saw them there for the first time returned to their own cities to found ACT UP chapters, each one autonomous" (326).

Of the five subcommittees the one most relevant for assessing and making sense of the political agency of ACT UP was the 'Issues Committee' in charge of researching and reviewing activists' demands. As they began projecting a campaign to end 'business as usual' with the aim of refashioning the regulation and approval of drugs, and to build a case against the FDA, activists began to gauge the complexity of the science involved and the baffling vagaries of the

federal bureaucracy. In June 1988 the ‘Treatment and Data Collection’ (T+D) group of the Issues Committee organized a first ‘teach-in’ on AIDS drug trials. “The teach-in was confusing,” Harrington would later recall:

Over two hours we were asked to absorb a daunting array of disparate information couched in obscurely technical jargon. There was HIC, the virus, and the various possible anti-HIV drugs; all the opportunistic diseases which struck people with AIDS, and drugs which might treat them; experimental trials, with their ostensibly scientific rules and regulations; federal bureaucracies, academic research sites, public hospitals, and drug companies (Harrington 2998, 328).

When a second, larger teach-in was scheduled for the entire membership of ACT UP in July 1988, Mark Harrington decided to make a glossary of AIDS research terminology, putting to new use the skills he had developed as an undergraduate at Harvard University interested in German Critical Theory. He set out to “summarize the confusing jargon of AIDS research and drug trials into a document for activists and people with HIV” (Harrington, 2008, 328). The other three members of the small Treatment and Data Collection subcommittee helped Harrington clarify and edit the text before the teach-in. Particularly important was the assistance of Iris Long, a feminist and former scientist with a PhD in chemistry, who would go on to partake in the development of ACT UP’s research agenda.

The glossary, distributed to all the members, was the first attempt at self-education and direct engagement with the technical expertise surrounding the drug testing system that activists had decided to transform. Members normally pursued what one activist dubbed an “ass-backward approach” (Epstein 2996, 231), whereby the initial examination of some research protocol led to autonomous research on the mechanisms of drug action, and from there to the ‘basic science’ of viral replication or immunopathogenesis. The July teach-in had been a success

in assisting people who wanted to know about the virus, potential anti-viral drugs, and the logic of clinical trials, and it paved the way for ACT UP's first national demonstration against the FDA on October 11, 1988: 'Seize Control of the FDA.'

The FDA demonstration was preceded by a meeting between five ACT UP members and FDA Commissioner Dr. Frank Young together with the director of the FDA's Division of Antiviral Drug Products, Dr. Ellen Cooper. ACT UP wanted to present two connected principles formulated by activist Jim Eigo, another playwright who was also part of the T+D group. "Health care is a right," they declared. And since most drugs were only available for clinical trial participants, "drug trials were health care, too" (Harrington 2008, 332). Placebos, in particular, were unethical. And importantly for the activists' willingness to engage experts on the latter's own terrain, they argued that placebos encouraged recruited patients to cheat, either by taking drugs outside the experiment or by mixing experimental and control pills so as to make sure at least some dosage of the drugs under trial entered their bodies.¹²⁵ This double claim addressed the experts' interests no less than their fears. As two prominent STS scholars explain, "[t]his was a clever argument because rather than rejecting the idea of clinical trials it suggested a way in which such trials could be made more reliable" (Collin and Pinch 2002, 142). Although ACT UP activists had tried to meet officials and experts half way, as it were, the meeting was not what they had expected. "Activists and bureaucrats were speaking different languages. We did not yet have a common vocabulary in which to negotiate" (Harrington 2008, 333). Ellen Cooper, Harrington recalls, "was impatient with our ignorance of the fine points of clinical trial design,

¹²⁵ As Martin Delaney of Project Inform constructed the argument, "[s]uch practices are a direct result of forcing patients to use clinical studies as the only option for treatment," so the FDA's 'policy of restriction' would soon make it impossible "to conduct valid clinical AIDS research in the US" (Epstein 1996, 228).

and quick to show her disdain. One year later, she was just as quick to show interest in our unorthodox ideas, once we had mastered the complexities of her science and regulation” (334). Indeed, following the ‘Seize control of the FDA’ event, and after many demonstrations *outside* and countless negotiations *within* the system, AIDS activists ended up forcing the FDA, the NIH, and drug companies to speed up research and broaden access to experimental anti-viral drugs.

ACT UP’s subsequent irruption into the Fifth International Conference on AIDS held in Montreal in June 1989 represents the high-point of AIDS-treatment activism. It combined the different strategies, tactics, and targets activists had rehearsed and developed throughout the years. More conventional protests and demonstrations against pharmaceutical companies were conducted in tandem with negotiations to enrol Anthony Fauci’s support for ‘parallel tracks,’ the scheme proposed by ACT UP to make experimental drugs available to patients who refused to enter the clinical trials. The proposal included activists’ assurances that patients would continue to enlist for the trials needed to continue advancing the scientific research agenda. Activists at Montreal also presented formal posters with their views on the technical side of drugs and trials. And a document was distributed that criticized the trials run by Fauci’s NIAID: the *AIDS Treatment Research Agenda*. Significantly, the main target was no longer the FDA, but the agency in charge of conducting actual research.

The document was sophisticated enough to draw the attention of Susan Ellenberg, the chief biostatistician in charge of the trials criticized by ACT UP activists. In an interview with Epstein (1996, 247), Ellenberg recalled: “I walked down to the courtyard and there was this group of guys, and they were wearing muscle shirts, with earrings and funny hair. I was almost afraid. I was really hesitant even to approach them.” To her own astonishment, and besides the

many mistakes and misunderstandings she found in the document, “there were many places where I found it was very sensible—where I found myself saying, ‘You mean, we’re not doing this?’ or ‘We’re not doing it this way?’” (247) After bringing the document back to her colleagues, who were equally impressed with these arguments, Ellenberg persuaded Fauci to expand her Statistical Working Group to include ACT UP representatives.

In the next International Conference on AIDS of 1990, activists spoke from the podium instead of shouting from the back of the room. They had disrupted the AIDS forums, become ‘lay-experts,’ and ultimately gained a seat at the experts’ tables. Members of ACT UP, I want to argue, struggled to raise their claims above the threshold of public and official intelligibility by turning the attention of their expert audiences away from the looks and social positions of activists, and towards the substance of their arguments, until they ended up collaborating to determine research directions and methodologies on equal footing with scientists.

By the early 1990s, AIDS-treatment activists had made some impressive achievements. They had become voting members on the committees of the AIDS Clinical Trials Group. Their arguments had been presented at scientific conferences and published in scientific journals like *Science* and the *Journal of the American Medical Association* (Delaney 1989; Smith 1989; Barr et al. 1992; Smith et al. 1992). As Epstein shows, “[t]heir voice and vote on review committees have helped determine which studies receive funding” (Epstein 1996, 338). Indyk and Rier (1993) have documented how ACT UP has diversified and enhanced the dissemination of medical and other technical information. Corea (1992) argues that activists’ interventions have led to changes in the very definition of AIDS to incorporate conditions that affect women infected with HIV. Without their actions new mechanisms like expanded access and accelerated

approval would have never transformed the FDA and NIH bureaucratic bottleneck (Edgar and Rothman 1990; Jonsen and Stryker 1993). As Epstein concludes, “[t]heir arguments have brought about shifts in the balance of power between competing visions of how clinical trials should be conducted. Their close scrutiny has encouraged basic scientists to move compounds more rapidly into clinical trials. And their networking has brought different communities of scientists into cooperative relationships with one another, thereby changing patterns of informal communication within science” (Epstein 1996, 339).

As Jonsen and Stryker wrote in their Report to the National Research Council on the institutional impact of AIDS, “not since randomized clinical trials became the orthodox mode of clinical investigation have the most basic approaches and assumptions regarding research methodologies been open to searching critique in the context of an epidemic disease” (Jonsen and Stryker 1993, 111). Although many more things could be said about AIDS-treatment activism in the US, I have emphasized how laypeople transformed the organization and pace of research on AIDS treatment. After emancipatory struggles of a very Rancièrian nature, the same activists that undertook visually arresting, angry, and provocative demonstrations against the biomedical community in the late 1980s became voting members on many of the expert committees that had formerly derided their claims to participation.

By the early 1990s AIDS activists had successfully contested the limits of expertise by intervening into the design, conduct, and interpretation of the clinical trials used to test the safety and efficacy of AIDS drugs.

The Singularity of AIDS-Treatment Activism

By the mid-1980s the AIDS epidemic had become a crisis overflowing extant regulatory and scientific framings, what Michel Callon calls a ‘hot situation’ (Callon 1998b). “Our knowledge of the world and... the composition of the collective” (Callon et al. 2009, 119),¹²⁶ of objects and subjects, was uncertain and fraught with controversy. When Steven Epstein published his famous study of AIDS activism in 1996, a boisterous and busy forum had emerged around the many facets of AIDS, from causation to treatment. What was known by then about AIDS had been the outcome of contestation and deliberation among a vast array of actors and perspectives. The list provided by Epstein conveys this plurality:

Inside a large and often floodlit arena with a diffuse and porous perimeter, an eclectic assortment of actors has sought to assert and assess credible knowledge about AIDS: biomedical researchers and health care professionals of different stripes; activists, advocacy groups, and people with AIDS or HIV infection; health educators and social scientists; politicians and public health officials; government agencies and advisory committees; pharmaceutical and biotechnology companies; writers, journalists, and the institutions of the mainstream and alternative media (Epstein 1996, 2).¹²⁷

AIDS-treatment activism contributed decisively to the emergence of this variegated forum and to the reconfiguration of identities and forms of knowledge-production by *interfering* with extant expert framings and the public givens of the situation. It involved forms of contestation that tried to make visible and hearable what would have otherwise remain outside the radar of existing parameters and procedures in both scientific research and bureaucratic regulation.

In terms of the approaches examined in Part II, we find that neither ‘deliberation’ nor ‘elicitation’ help us illuminate our example. In Arendtian terms, the forms of ‘democratic

¹²⁶ We shall return to this formulation in chapter 7.

¹²⁷ See also Epstein 1995, 408-409.

engagement' with science and technology we found in the 'participatory turn' (chapter 5) have been a site for the activities of *homo faber*; not of humans qua acting beings and beginners. In many ways, AIDS-treatment activism is the opposite of consultative elicitation and the fabrication of minipublics. None of the forums set up by activists' demonstrations, experiments, and publications were sponsored and designed *ex-ante* by government agencies; no agendas, time schedules, and locations were given beforehand; and the activists themselves did not constitute one of the pure 'general publics' fabricated by social science experts in the 'participatory turn.' Put differently, these were not *idiots* (Lezaun and Soneryd 2007), but active, angry, and deeply affected parties, with urgent interests at stake.

If we consider the theoretical side of deliberation, a similar mismatch is evinced. Still, the example of AIDS treatment activism has been appropriated and enlisted by James Bohman (2000, 53-54) as proof of the vitality of the deliberative paradigm. The case, Bohman claims, is a clear example of the pragmatist process of democratic inquiry he defends. He rightly observes that "the important point of the activism was not to challenge expertise or the division of labor; rather, it challenged the advantages of experts *in defining the cooperative enterprise of producing knowledge about AIDS*" (54, my emphasis). Bohman misinterprets the story, however, when he claims that "[t]he continued cooperation between researchers and their public depended... on *deliberating* about epistemic norms" (54, my emphasis). The trouble with such a formulation is that it assumes as a given what was actually the outcome of a struggle, namely the public account of lay claims as speech (*logos*) instead of noise (*phoné*), a struggle that cannot be taken as an instance of 'deliberation' as theorized by authors like Gutmann and Thompson or Habermas. The concept of 'discursive contestation'—as theorized by deliberative theorists like Bohman himself,

John Dryzek, or Mark Warren—will not do either, because the challenge and contestation of the framing of speech situations (‘the terms of cooperation’ in the pragmatists’ democratic inquiry) is not itself deliberative, as I argued in chapter 4. None of the achievements of AIDS-treatment activists listed at the end of the previous section were achieved by conventional deliberation or minipublics’ forms of elicitation. How then should we theorize this case and make sense of its specificity? What is it an exemplar of?

The form of democratic politics I wish to oppose to deliberation and elicitation consists in the twofold interference with the public account of objects and with the social account of groups, whereby new and ‘improper’ subjects appear to polemically pluralize the perspectival disclosure of objects. The concept of ‘interference’ I am proposing, in other words, corresponds to a disruption and torsion of the givens of public life.

In order to unpack this admittedly preliminary definition, I return in the following sections to the work of Jacques Rancière, which we first encountered in chapter 3. Instead of presenting a systematic account of his political thought, I wish to address the pertinent concepts and arguments by examining the relationships between Rancière’s position and that of some of the main authors we have examined in previous chapters. I begin in the first excursion with Rancière’s complex link to Hannah Arendt’s political thinking, which I believe is a fertile context for grasping his notions of equality, democracy, and subjectification, as well as his peculiar antagonistic take on the commonality of the world. The next excursion examines his critique of Habermasian deliberation to underline Rancière’s idea of a ‘poetics of politics’ as well as the related notion of the ‘singular universal.’ In the third excursion I close these rounds of comparative encounters by returning Brian Wynne’s example of the sheep-farmers and his take

on the lay-expert divide in order to further clarify Rancière's concept of dissensus or Dis-agreement (at stake in AIDS-treatment activism) through a comparison with Jean-François Lyotard's *differend* (which, I argue, serves to illuminate Wynne's Cumbrian case).

After all this, I problematize Rancière's political thought and his concepts and arguments presented in the previous sections in light of the example of AIDS-treatment activism. My aim here is to augment his theorization to see what democratic politics might mean in relation to science and technology. A crucial limitation concerning the question of 'inscription' will pave the way for the concept of composition examined in the next chapter.

Excursion I—Faraway, So Close: Rancière on Arendt

Rancière, I want to claim, has more points of agreement with Arendt than his polemical observations about her work could lead one to assume. But there are also significant differences that I would like to address in order to specify my own notion of 'interference.'

Rancière has presented his opposition to Arendt's thought largely by targeting her (putative) distinction between 'the political' and 'the social,' and the 'purity' she seems to attribute to politics as a realm with its own proper spaces, subjects, and modes being.¹²⁸ The secondary literature has also focused on this question about the 'purity' of politics to draw a line

¹²⁸ Such opposition, according to Rancière, is at the root of her ultimately dismissive analysis of human rights (Rancière 2010, 62-75), and it also sustains her distinction between *poiesis* and *praxis* and corresponding failure to grasp the paradoxical character of political action (29-30).

between the two thinkers (Schaap 2011, Chambers 2013).¹²⁹ We should tread carefully here, however, especially in light of Patchen Markell's critique of territorial readings of Arendt we touched upon in Chapter 1, which is meant precisely to question the supposed purity of her distinctions. Besides, it is also the case that Rancière seems more obsessed with demarcating politics than Arendt ever was, especially with his insistence on the "specificity" of politics throughout the "Ten Theses on Politics" (Rancière 2001).

In the Preface to *Dis-agreement* (Rancière 1999, vii-xii) we find a critique of the philosophical idea of a politics 'in itself' at stake in the so-called 'return of political philosophy' of the late 1980s and early 1990s; a critique, that is, of the idea that there is a specificity to politics, which one then can oppose to something else. More recently, in "The Use of Distinctions" (Rancière 2010, 205-218) he articulates his distance from Arendt more explicitly. Arendt, he claims, is one of the main thinkers to have contrasted the purity of politics with a certain impurity, "an opposition between political distinction—and therefore freedom—and social indistinction—or necessity—or even an opposition between 'living together,' 'living well' or the 'common good' and bare life" (206). Similarly, in the "Ten Theses on Politics," Rancière takes issue with Arendt's opposition between politics and the social. According to his own account of the position presented in that influential writing, what he objected was precisely that "anti-political logic, the logic of the *police*, that marks off a specific realm reserved for political

¹²⁹ Samuel Chambers notes that Arendt's account of politics "as novelty (as surprise) and as the creation of something new—the production of a political stage where before there had apparently been none—resonates in various ways with Rancière's thinking of politics" (Chambers 2013, 46). At the same time, Chambers resists attempts to accommodate Rancière into an Arendtian framework, such as the one he sees at play in Cristina Beltrán's work (45-50; see Beltrán 2009).

acts in this way—which is ultimately to say for beings whose own business and destination is to engage in politics” (206-207).

Of course, Rancière also has his own ideas about what politics *is*; after all, “what can be thought of specifically as politics?” is the question that opens his *Dis-agreement*. So in what sense is Rancière’s idea of politics not simply another discourse on the specificity of politics? As I see it, Rancière articulates a *second-order* specificity which stands at a different logical level than the specificity of politics we find in the distinction between ‘politics’ and ‘the social’ that he denounces. In a nutshell, the specific thing about politics is that it stands against any specification of politics. Thus, “[t]he police/politics opposition... puts into question every principle that marks out positive spheres and ways of being. There is no domain of the political as opposed to that of the social and domestic obscurity” (Rancière 2010, 207). The specificity of politics consists in it being a disruption or interruption of any regime that posits certain activities, qualifications, and ways of being as ‘political.’ Philosophical specifications about what is proper to politics, including, it would seem, Arendt’s own take, belong to the ‘police.’

To place Arendt’s thought on the police side of the politics/police distinction is highly problematic. Although this is not the place to address this question, a few words might be warranted. Rancière’s explicit claim that *Dis-agreement* sets out to test the hypothesis “that what is called ‘political philosophy’ might very well be the set of reflective operations whereby philosophy tries to rid itself of politics” (Rancière 1998, xii) sounds very much like Arendt’s position vis-à-vis the ‘tradition of political thought.’ Indeed, she was the first to proclaim that “the greater part of political philosophy since Plato could easily be interpreted as various attempts to find theoretical foundations and practical ways for an escape from politics

altogether” (Arendt 1998, 222). Against Rancière, I think Arendt’s separation of politics from socioeconomic concerns is not based on its putative purity as a special realm with its appropriate objects, subjects, spaces, and modes of being. Rather, the question about whether an activity is political or something else depends on whether or not human plurality is allowed to produce its effects in the perspectival sense we elucidated in the first chapter. In other words, a space or activity is political to the extent that it discloses new aspects of the common world through the agency of beginners.

The key to the fraught relationship between Rancière and Arendt, then, might lie in the relationship between the former’s opposition between ‘politics’ and ‘police,’ on the one hand, and Arendt’s distinction between ‘politics’ and ‘the social,’ on the other. But we need to clarify what exactly is Arendt’s distinction between ‘politics’ and ‘the social.’ Instead of answering this in the abstract, I’d like to focus on her story of the labor movement in *The Human Condition*. This represents a good point of comparison with Rancière, for whom the working class (the ‘proletariat’) represented the last of the “great subjectifications of wrong” (Rancière 1999, 125), that is, the last political subject to emerge and disrupt the police regime of modern society. The comparison also serves to address the crucial question of political appearance.

In Arendt’s narrative (1998, 212-220), the emancipation of labor took place with the abolition of property qualifications for the right to vote. Importantly, one of the “side effects” of this emancipation “was that a whole new segment of the population was more or less suddenly admitted to the public realm, that is, *appeared* in public, and this without at the same time being admitted to society, without playing any leading role in the all-important economic activities of this society, and without, therefore, being absorbed by the social realm and, as it were, spirited

away from the public” (218). A far reaching and largely neglected claim is contained in this observation. At one moment, the workers *appeared in public* as a “new segment of the population” but, significantly, they remained *outside of society*, that is, they did not yet play a leading role in its economic activities.¹³⁰ An *interval* existed, therefore, between appearance in the realm of politics and absorption into the social.

Arendt argues that the withering of the public realm is consummated when laborers are absorbed by the social realm, that is, when they cease to be outside society and become one of its parts, another pressure group defending its economic interests. Or, as Rancière would put it, politics ceases when its subjects become another partner in the negotiations of consensus democracy: when the part of those who have no part receives its due and is incorporated into the counting of police regimes. To that extent, Arendt and Rancière agree that society prevails—and political activity recedes—when the actor or subject in question becomes a part of society, that is, when this part that now *does* have a part is counted. As Arendt puts it, the working class eventually became just another pressure group: “[t]he workers today are no longer outside society; they are its members, and they are jobholders like everybody else” (Arendt 1998, 219).

Beyond this convergence, we now need to direct our attention to two differences between Arendt and Rancière. One pertains to the way they theorize *appearance*, and the other hinges around the relationship between *dissensus* and the commonality of the *common world*.

First, whereas Rancière and Arendt share an emphasis on how objects and subjects *appear* in the aesthetic or sensory sense of the term, on what it means for something (an action or speech act) or someone (a newcomer, a *demos*) to appear in public, ‘to be seen and heard by all,’

¹³⁰ Indeed, Arendt insists that the pathos of the labor movement stemmed from its fight against society as a whole: it sprang from the injustices and hypocrisies of class society (Arendt 1998, 219).

they diverge on the meaning they confer on the moment of appearance. Although Arendt and Rancière coincide in demarcating the appearance of a subject from its assimilation or reduction to the social counting of parts, Rancière sees the appearance of workers on the public scene not as a ‘side effect’ of acquiring the right to vote, but as the polemical dispute that made the extension of the franchise itself possible (Rancière 1999, 35-42). Rancière, in other words, identifies politics with the moment of appearance of the proletariat as subject. Arendt, on the other hand, sees the political and revolutionary role of the labor movement in something *else*, something that occurred in the interval between the labor movement’s initial appearance and its eventual absorption into the social realm. In her narrative Arendt does in fact point to a difference in content between ‘political’ and ‘social’ activities in terms of the between two trends in the working class: the ‘economic’ demands of trade unions and the ‘political’ aspirations of the labor movement (Arendt 1998, 216-217), a distinction often blurred, as she admits. What was this political role of the labor movement we shouldn’t confuse with demands for economic security, decent wages, and so on? The articulation of a new form of government: the council system and its attempt to found a new public space. The economic activities and demands of its members, she claims, were *incidental* with regard to political action. And here we have an important divergence with Rancière’s rejection of the idea that there are proper political activities (like inventing new forms of government) and improper or incidental ones. The proletariat acquired political existence as a subject, in his view, when it put to the test the inscription of equality in the Declaration of the Rights of Man and Citizen, asking if it also extended to those who possessed nothing but their labor power (Rancière 1999, 50-51). The dispute over the private or public character of those very concerns Arendt classifies as social was precisely what

brought the proletariat into political existence, according to Rancière. This is why he writes that “in the modern era, the social has been precisely the place where politics has been played out, the very name it has taken on. This name is, it is true, similar to the name of its negation” (Rancière 1998, 91).

‘The social’ can name the field of politics as well as its negation; it is one of those homonyms on which politics works. It has been the police name for the distribution of groups and functions, but also the name in which mechanisms of subjectification have come to contest the naturalness of such groups and functions by having the part of those who have no part counted. Thus, if by ‘the social’ we mean a certain realm of activities previously secluded from public view, then the social may very well be the site of politics. Here Rancière would be at odds with Arendt. If, on the other hand, by ‘the social’ we mean the endless counting of parts of consensual democracy, then the social is the negation of politics. Here we have a convergence. Put differently, if ‘the social’ refers to a realm of activities that encroach upon politics proper and should therefore be separated from it (like Arendt’s insistence that economic activities were distinct and incidental with regard to the political role of the working class) then the politics/police distinction directly contravenes the politics/social distinction. If ‘the social’ designates the consensual counting of parts and distribution of roles (what Arendt theorized as the ‘absorption’ of the labor movement in society), then the two distinctions are pretty much equivalent.

In Arendt’s theorization of politics one can therefore distinguish between appearance in public, which in the case of the labor movement was the ‘side-effect’ of an exogenous event (the extension of the franchise), and political action (*qua* invention of a new form of government). In other words, the disclosure of new agents, the natality of ‘newcomers’ who appear in the public

realm, is not in and of itself the beginning of something new. As Arendt puts in *The Human Condition*, “the newcomer possesses the *capacity* of beginning something anew, that is, of acting” (Arendt 1998, 9). From the perspective of Rancière’s thinking, by contrast, the political act is public appearance itself, which he theorizes as ‘subjectification.’ While for Arendt newcomers reveal their unique and plural identities in an already existing public realm of appearance, for Rancière it is this space itself which is at stake with the appearance of newcomers. The emancipatory reconfiguration of the sensible that defines political action is coextensive with the subjectification of ‘wrong’ that marks the appearance of the *sans part*. I will address the polemical logic of this subjectification in light of the example of AIDS-treatment activism in the next section. For now let us turn to the second difference.

Although Arendt is often taken to be a theorist of agonistic politics (Honig 1995), Chantal Mouffe’s judgment that Arendt’s agonism is an ‘agonism without antagonism’ is no less true, meaning that “while Arendt puts great emphasis on human plurality and insists that politics deals with the community and reciprocity of human beings which are different, she never acknowledges that this plurality is at the origin of antagonistic conflicts” (Mouffe 2007, 4). I wouldn’t go so far as to ascribe to Arendt a ‘consensual’ view of the public realm, as Mouffe does. Still, there is nothing in Arendt quite like Rancière’s assimilation of politics to “the structural antagonism of a life in common” (Rancière and Panagia 2000, 118). This does not mean that the French thinker is not concerned with the question of what people might have in common, the world that they share. On the contrary: “[p]olitics,” Rancière writes, “is the manifestation of a *we* that restates the scene of the common, the objects that belong to it and the

subjects that it counts” (Rancière 2009c, 121). His take on the common of the community, however, is a paradoxical one. Thus, in *Dis-agreement* he writes that

The assertion of a common world... happens through a paradoxical *mise-en-scène* that brings the community and the noncommunity together. And such a conjunction always arises from paradox and the scandal that overturns legitimate situations of communication, the legitimate parceling out of worlds and languages, and that redistributes the way speaking bodies are distributed in an articulation between the order of saying, the order of doing, and the order of being (Rancière 1999, 55).

In this sense, Rancière can be interpreted as problematizing Arendt’s account of the common world by conceiving politics as a dissensus that splits the shared world of the community in two.

From the perspective of politics, that is, the community always emerges as a divided community.

“The *inter* of a political *inter-esse* is that of an interruption or an interval,” argues Rancière in a

clear reference to Arendt, adding that “[t]he political community is a community of interruptions, fractures, irregular and local, through which egalitarian logic comes and divides the police community from itself” (Rancière 1999, 137). Indeed, one could interpret his political thinking

as a torsion of Arendt’s key notion of the worldly ‘in-between’ that, like the table in her example (Arendt 1998, 52), relates and separates people. For Rancière, politics is a contentious activity

where the question at stake is the very existence of a common world, and this contention is always antagonistic because it involves the irruption of a *demos* that separates the community

from itself. As one commentator puts it, “political community is not based upon having something positive in common, but rather is a sharing of ‘what is not given as being in-common,’

ties that ‘bind the given to what is not given’” (Norval 2012, 815).

Given the relative paucity of resources for thinking political contestation from an Arendtian perspective, my concept of democratic interference is more indebted to Rancière's theorization of dissensus. According to him,

politics is comprised of a surplus of subjects that introduce, within the saturated order of the police, a surplus of objects. These subjects do not have the consistency of coherent social groups united by a common property or a common birth, etc. They exist entirely within the act, and their actions are manifestations of a dissensus; that is, the making contentious of the givens of a particular situation. The subjects of politics make visible that which is not perceivable, that which, under the optics of a given perceptive field, did not possess a *raison d'être*, that which did not have a name... [The] ground for political action [is that] certain subjects that do not count create a common polemical scene where they put into contention the objective status of what is 'given' and impose an examination and discussion of those things that were not 'visible', that were not accounted for previously (Rancière 2009a, 24–5).

I depart from Rancière's vision of politics, however, to the extent that interference need not be about imposing an examination of things that were previously "not visible, that were not accounted for... ." Interference can also be about disclosing *new aspects* of a thing, in the perspectival and world-enriching sense I have taken from Arendt. Although the disruption of a framing can in principle involve the appearance in public of an unprecedented object, it is more likely to concern the appearance, *under a novel guise*, of an already present thing. This is what I meant at the outset when I spoke of interference with the public account of an object. And insofar as the issue at stake in this dissensual interference is the transformation of an object into a *common* object, a certain 'care for the world' (or *amor mundi*) is involved as well. I also claimed that interference disrupts the social account of groups, by which account I mean the sociologically informed expectations about what an individual or collective is assumed to be capable of doing and saying given its identity and place in the social division of labor. These are

the sort of expectations that ‘police regimes’ are in charge of patrolling, and the ones that the emancipatory subjectification theorized by Rancière sets out to interrupt.

Now, the difference we find between Arendt and Rancière regarding the contentious or antagonistic nature of politics is arguably rooted in the different status of human speech in their works. Like Aristotle and Habermas, Arendt takes for granted the human capacity for *logos*, in the sense that she never addresses the distribution between *logos* and *phoné*, speech and mere voice, which for Rancière represents the very stakes of democratic politics. At the same time, this difference regarding speech in the public realm connects to a fundamental aspect of Rancière’s political thinking, one that also marks his distance from Arendt. I am referring to the question of *equality*. I shall dwell on this issue before moving on to the next section.

Rancière’s radical rethinking of democracy and politics has been largely conducted through polemical interventions around the question of equality. Our main reason for engaging his work has to do precisely with the possibility of using his notion of equality to assess, from a novel perspective, practices that challenge the lay-expert divide. In his Afterword to *The Philosopher and His Poor* he adamantly states that equality “is not a goal that governments and societies could succeed in reaching. To pose equality as a goal is to hand it over to the pedagogues of progress, who widen endlessly the distance they promise they will abolish. *Equality is a presupposition, an initial axiom—or it is nothing*” (Rancière 2004, 223, my emphasis). It is the principle verified each time an intrusion upsets the inegalitarian hierarchies keeping everyone in their place. To ‘verify’ this presupposition, then, is to act *as if* no pre-

established allocation of places and occupations were in force.¹³¹ Furthermore, equality is not a principle on which political communities can be founded; rather, it is an empty property whose political effect will always depend on the specifics of the police regime against which it is declared. As Rancière explains, “[t]his equality is simply the equality of anyone at all with anyone else: in other words, in the final instance, the absence of *arkhê*, the sheer contingency of any social order” (Rancière 1999, 15). By presuming their equality as speaking beings, and acting on that assumption, political subjects interfere with the police partition of the sensible.¹³²

Rancière’s notion of equality is inextricably linked to his conception of democracy. In fact, one of the interesting aspects of his thought is that it allows us to exit conventional debates on the meaning of democracy. Thus, “democracy is neither the consultation of the various parties of society concerning their respective interests, nor the common law that imposes itself equally on everyone” (Rancière 2004, 225). Instead, every politics is democratic, not in institutional terms “but in the sense of forms of expression that confront the logic of equality with the logic of the police order” (Rancière 1999, 101). His notion of democratic politics refers not to ideals of

¹³¹ In *The Nights of Labor* ([1981] 1989) Rancière explored the *intellectual* revolution brought about by the emergence of working-class thought in nineteenth-century France. The proletarians who spent their nights (i.e. their leisure time) creating newspapers and writing poetry were transgressing a division of labor that assigned them no role of that sort; according to Rancière, that is, they were acting as if intellectual equality was something real and effectual (Rancière 1989). Rancière revisited this splitting of times and occupations in *The Philosopher and His Poor* ([1983] 2004). There he argued that the “progressive” sociology of Pierre Bourdieu, which became dominant together with the coming to power of the Socialists in the early 1980s, was actually based on what I would call a *non-egalitarian* notion of inequality. According to Rancière, Bourdieu’s denunciation of the symbolic violence residing in the imposition of high cultural forms on the oppressed classes, and the corresponding calls for an adaptation of the school curriculum to the needs and manners of the masses, actually reproduced the inequality it promised to overcome. “Everyone with her taste,” one might say, was yet another modulation of the motto “Everyone in her place.”

¹³² In Todd May’s instructive example, the four African Americans who in 1960 unexpectedly sat at a segregated lunch counter in Greensboro were presupposing equality and challenging the order according to which black people ought to get their meals in specified places (May 2008, ch. 2).

collective self-legislation, but rather to the disruption of the contingent parameters that frame the exercise of that autonomy.

In *The Ignorant Schoolmaster* ([1987] 1991) Rancière resuscitates the intellectual adventure of maverick professor Joseph Jacotot, who in the 1830s “raised the banner of intellectual emancipation and proclaimed, in the face of academicians and progressive educators, that everyone could learn on his own without a master, and even teach someone else [that] about which one was ignorant oneself” (Rancière 2004, 222). Rancière reads Jacotot’s experience as a French-speaking professor who enabled his Flemish-speaking students to teach themselves French as an intellectual adventure that factually refuted, once and for all, the common sense claim that the ignorant needs to learn through the explications of the wise. What are explications for, then? “Explications do not teach the student *that which* he could not otherwise learn; they teach him *that* he could not learn without explications, they teach him his own incapacity” (Rancière 2008, 13-4, my translation). It is this “system of explanations” that allocates times and occupations that Jacotot’s practice undermined. The autodidactic adventures in research undertaken by AIDS-treatment activists, epitomized in the Glossary of AIDS-related technical terms, followed a similar emancipatory logic that allowed them to contest and ultimately reconfigure the design of clinical trials for testing AIDS drugs.

Hence, Rancière understands democracy in terms of the *demos* that gives it its name. The *demos* is the political subject that constitutes itself in the act of transgressing a given allocation of places. It can be the proletarians who dare to write bourgeois poetry, or the students who learn a foreign language without an explication of its grammatical rules. In other words, the *demos* is

the collection of those individuals who are doing something other than what they are supposed to do: “the part that has no part” (*le part sans-part*).

Excursion II—From Deliberative Politics to ‘Poetic’ Politics: Rancière on Habermas

In chapter 4 I pointed to a blind-spot in Habermas’s theory, namely Rancière’s nagging question about ‘what speaking means,’ about the givens of speech situations; the question, precisely, which interrupts the normal flow of deliberation. Whereas Habermas tends to assume that the subjects and objects of deliberation are always already pre-constituted, Rancière claims that this distribution is the very object of democratic politics. In this section I expand on this difference by attending to Rancière’s twofold critique of Habermas in *Dis-agreement* (Rancière 1999, 47; 55-56).

On the one hand, Rancière argues that Habermas’s account of the speech situation favours the points of view of the first- and second-person in detriment of the third-person perspective, without which the speech situation itself cannot become the object of contention. When speakers address one another as ‘You’ and ‘I’ their status as speakers is not at stake. That status can only become an object of speech from the perspective of a third person that looks at the scene from a distance. The third-person perspective is troubling for Habermas because it “freezes rational communication, which does its work in the play of a first person engaged in embracing the second-person point of view” (Rancière 1999, 47). Thus, Rancière transforms Habermas’s reluctance to embrace the third-person perspective of the observer—the reluctance that grounds his critique of the objectifying glance of Systems’ Theory (Habermas 1984, 1989a)

—into the very source of consensus democracy’s incompatibility with the kind of democracy Rancière vindicates. Unwittingly or not, Habermas

locks the rational argument of political debate into the same speech situation as the one it seeks to overcome: the simple rationality of a dialogue of interests. In underestimating [the] multiplication of persons associated with the multiplication of the political logos, Habermas also forgets that the third person is as much a person of direct and indirect speech as a person of observation and objectification. He forgets that one commonly speaks to partners in the third person, not only in several languages’ formulas of politeness, but *whenever the relationship between speakers is posited as the very stakes of the interlocutionary situation* (Rancière 1999, 47, my emphasis).

Rancière’s second, related critique refers to the “challenge to the opposition between legitimate and illegitimate speakers” involved in his key notion of a ‘poetics of politics’ (Rancière and Panagia 2000, 116). In *Dis-agreement* Rancière discusses the term in relation to Habermas’s distinction between “‘poetic’ languages that open the world up and the closed-world forms of arguing and validating” (Rancière 1999, 55; Habermas 1987). Whereas Habermas insists that aesthetic languages must legitimize themselves according to the rules of formal pragmatics and communicative action (no less than cognitive or normative ones), Rancière considers that the ‘demonstration’ he takes to define politics always involves “both *argument* and *opening up the world* where argument can be received and have an impact—argument about the very existence of such a world” (Rancière 1999, 56, my emphasis). In the terms of another Habermasian opposition Rancière also seeks to neutralize, the “reconfiguring of the partition of the perceptible” at the center of political agency “is indissolubly a communicational intervention, bringing into play certain utterances’ claims to validity *and* a strategic intervention, shifting the power struggle that determines whether utterances can be received as arguments on a common stage” (55, my emphasis). Rancière’s point here is not that

such distinctions are false or pointless. They normally hold sway. But *politics*, in its specificity, is the transgression of such demarcations between proper and improper modes of enunciation. By pointing to the simultaneity of poetic and cognitive speech acts Rancière is making a larger claim: democratic politics is always a poetic contestation of the public givens of a situation, of the relationship between speakers and the world they take as something in common. As Rancière explains in a recent article,

‘Dis-agreement’ and ‘dissensus’ do not imply that politics is a struggle between camps; they imply that it is a struggle about what politics is, a struggle that is waged about such original issues as: ‘where are we?’, ‘who are we?’, ‘what makes us a we?’, ‘what do we see and what can we say about it that makes us a we, having a world in common?’ (Rancière 2009b, 116)

Ultimately, at stake in his rebuttal of Habermas is the question of ‘universality’ so dear to the German philosopher. For Rancière, it is not about the universalizability of interests as a test for the validity of arguments within a speech situation; rather, universality concerns the belonging of speaking beings in a linguistic community. This question is always dealt with in “abnormal communication situations” (55) that escape the Habermasian framework, not to mention that of other less insightful formulations of the deliberative paradigm—situations, as Rancière explains, that introduce ‘cases’ of dissension. More specifically, “[s]uch polemical situations are those in which one of the partners of the interlocution refuses to recognize one of its features (its place, its object, its subjects). The universal is always at stake here in a peculiar way, in the form of cases whereby its very existence and pertinence are in dispute. ... It must first be acknowledged and be made to be acknowledged that a situation presents a compelling case of universality. And this recognition allows no division between a rational order of argument

from a poetic, if not irrational, order of commentary and metaphor. It is produced by linguistic acts that are at the same time rational arguments and ‘poetic’ metaphors” (Rancière 1999, 56).

As we shall see in the following excursion, Rancière’s quarrel with Habermas’s account of political communication does not place him in the camp of postmodern critics of rationality who renounce the quest for common languages by declaring the incommensurability of language regimes. A ‘poetics of politics,’ as I will show in the subsequent section in light of our example, is inextricably linked to that quest.

Excursion III: From différend to méésentente: Rancière and Wynne

Commentators on Rancière’s political works rarely address the difference between his concept of dissensus or Dis-agreement (*mésentente*) and J. F Lyotard’s influential differend (*différend*),¹³³ even though in *Dis-agreement* he explicitly demarcates both concepts (Rancière 1999, xi-xii; 46; 50). The contrast is relevant because Rancière should be read as rejecting Lyotard’s notion that ‘litigation’ is a modern fiction or charade, as well as opposing the polemical verification of the equality of speaking beings (the ‘singular universal’) to Lyotard’s conviction that “a universal rule of judgment between heterogeneous genres is lacking in general” (Lyotard 1988, xi). Egalitarian interference involves the search of a common language between interlocutors; or, more precisely, it implies a venturing of the egalitarian hypothesis that we are all speaking beings capable of naming and debating the objects that constitute our common world. The distinction I wish to accentuate between dissensus and differend is also important for understanding how the case of AIDS-treatment activism differs from Brian Wynne’s example of the Cumbrian sheep-

¹³³ An exception is (Deotte 2004).

farmers, which I used in chapter 3 to illustrate the operation of expert framings. In this sense, to shift from differend to dissensus is to explore avenues for the *disruption* of framing.

Let us begin with the differend. Lyotard is interested in injustices that take place in the context of language:

A case of differend between two parties takes place when the ‘regulation’ of the conflict that opposes them is done in the idiom of one of the parties while the wrong suffered by the other is not signified in that idiom (Lyotard 1988, 9).

Somewhat simplifying Lyotard’s thinking, we can reduce his argument to its bare bones by focusing on three correlated distinctions: between ‘litigation’ and ‘differend’; between the figures of the ‘plaintiff’ and the ‘victim’; and a third between ‘damage’ [*dommage*] and ‘wrong’ [*tort*]. In contradistinction to a litigation, Lyotard writes, “a differend would be a case of conflict, between (at least) two parties, that cannot be equitably resolved for lack of a rule of judgment applicable to both arguments” (Lyotard 1988, xi). The injustice lies in that, this lack notwithstanding, the idiom of one of the parties prevails and the conflict is settled as if it were a litigation, thus wronging one of the parties. ‘Litigation,’ by contrast, is a dispute that can be equitably resolved because the parties involved do agree on a common rule of judgment. But because according to Lyotard there is no universal rule of judgment between heterogeneous genres, all conflicts involving parties who speak in different idioms are actually cases of differend posing as litigation. Secondly, a Lyotardian ‘victim’ is someone who is not able to prove that she has been done a damage, in contrast to a ‘plaintiff’ who does have the means to do so. In a litigation, then, the plaintiff’s ‘damage’ is presented as such. In a differend, by contrast, the plaintiff’s damage cannot be presented as such, thereby becoming a ‘wrong’. Accordingly, a wrong [*tort*] is “a damage accompanied by the loss of the means to prove the damage” (5). Put differently, a

plaintiff is the damaged party in a litigation, and a victim is the wronged party in a differend. In a litigation accuser and accused speak a common language, whereas in a differend they speak two radically different idiolects.

Significantly for the contrast I want to make between AIDS-treatment activism and the sheep-farmers' encounter with scientific expertise, a differend is signaled by the silence of the wronged party. According to Lyotard: "The one who lodges a complaint [a plaintiff] is heard, but the one who is a victim... is reduced to silence" (10). There are many ways in which this disempowerment takes place, but in general the plaintiff becomes a victim when no presentation is possible of the wrong she says she has suffered, when what obtains is "the silence of the witnesses, the deafness of the judges, and the inconsistency (insanity) of the testimony" (8).¹³⁴

Rancière's 'dissensus' follows a different logic. In a differend, the subordinate party cannot but reckon with the fact that the account the other gives of his own statement (the framing, we would say, that counts it as competent speech) is the conclusive way of interpreting its meaning. The conflict is thus settled as a question of power. Rancièrian 'dis-agreements,' by contrast, are those in which the conflict is settled not on the premise that "a universal rule of judgment between heterogeneous genres is lacking in general," but rather by risking the politically essential question: 'Is there a language common to all parties?'

As Rancière observes in reference to Lyotard:

¹³⁴ The famous example Lyotard gives is the silencing of survivors of the Shoa by the terms of historical inquiry of revisionist academic Robert Faurisson. For the latter, the only acceptable proof of the existence of gas chambers was testimony from an eye-witness who saw the gas chambers in operation. Lyotard, bearing witness to the differend, retorts that neither those who died in the gas chamber nor those who survived can prove its existence in the terms imposed by Faurisson: the former because they are dead and the latter because they are alive (to have seen the gas chambers operating, for Faurisson, means that one died in them). The holocaust survivors are therefore victims of a wrong, reduced to silence.

The problem is not for people speaking ‘different’ languages, literally or figuratively, to understand each other. ... The problem is knowing whether the subjects who count in the interlocution ‘are’ or ‘are not,’ whether they are speaking or just making a noise. It is knowing whether there is a case for seeing the object they designate as the visible object of the conflict. It is knowing whether the common language in which they are exposing a wrong is indeed a common language (Rancière, 1999: 50).

In contradistinction to a differend, then, dissensus is “a dispute over the object of the discussion and over the capacity of those who are making an object of it” (Rancière 1999, xii); it is the setting up of a polemical scene of interlocution in which the wrong whereby one party accounts for another party’s words as mere babble is publicly exposed and contested as such. The politically relevant question is not whether Rancière himself believes in the existence of such a common language, but whether or not people act *as if* such a language can be found in specific circumstances and used for processing disputes. There are no guarantees; only the venturing of a hypothesis (‘what if...?’) and the attempt to verify it through action and speech.

Constructing a scene of dis-agreement is a necessary condition for any attempt at reconfiguring unequal distributions of speaking capacities. The challenge is to verify the existence of a common rule of judgment on the premise of the equality of speaking beings, to substitute a Rancièrian wrong for a Lyotardian wrong, a Rancièrian subject for a Lyotardian victim.

In light of these distinctions, it is plausible to interpret the encounter between scientists and hill sheep-farmers at the Lake District of Cumbria as a differend. As Wynne acknowledged, “even though the farmers rejected some official meanings, they rarely openly challenged them, and the dominant issue-definitions, which affected what kind of knowledge was recognized as salient, remained unscathed on the face of things, whilst being dismissed wholesale by the

farmers more privately” (Wynne 2002, 408). For all political purposes, the farmers did not act on the premise that an egalitarian interlocution with the experts was possible. ‘We can’t argue with them.’ It was as if the anticipation of an impending differend had haunted the farmers in their private deliberations.

One could say that the *damage* of radiocesium contamination on the hills and the sheep, and how this jeopardized the farmers’ demanding livelihood, became a *wrong* because the expert framing hindered a signification of the damage in the idiom of the farmers. As Brian Wynne observed, “[t]he typical scientific idiom of certainty and control was culturally discordant with the farmers, whose whole cultural ethos routinely accepted uncertainty and the need for flexible adaptation rather than prediction and control” (Wynne, 1996a: 26). In my view, however, Wynne’s farmers may very well have had the means to prove the damage. The politically sterile dynamic of public acquiescence and private dissent, in other words, was not preordained. That the farmers did have the means to make the case that a language common to all those involved existed is suggested by Wynne himself: “The farmers gathered—and used—evidence which was drawn from science, including scientific inconsistencies on which the scientists themselves did not focus” (Wynne, 1996a: 31). This was the case, for instance, in their reservations about the confounded character of the measurements and experiments conducted in the hills. A public contestation could have forced the framing of control and prediction to count the farmers’ ethos of uncertainty and flexible adaptation as a reasonable position. Or at least it could have created an occasion for exposing the wrong done to them as a matter of litigation. But the farmers did not take this route and kept their dissent largely as a private matter, not publicly signifying the

meaning they attached to the contamination crisis, and failing to abandon the identity dictated upon them by the ‘deficit model’ of the public: lay or folk ‘cultural dupes.’

In this chapter I have introduce a different, exemplary case: AIDS activists in the US who did succeed in setting up a polemical scene of interlocution with the experts, exposing the wrong done them by the standard clinical protocols for testing treatment drugs. Unlike the farmers, and after many struggles, they disrupted the lay-expert divide and made their speech heard as speech rather than noise, as testified by the dramatic shift in prominent virologist Robert Gallo’s account of the activists: from “I don’t care if you call it ACT UP, ACT-OUT, or ACT-DOWN, you definitely don’t have a scientific understanding of things” in 1987, to “it’s frightening sometimes how much they know and how smart some of them are” in 1994 (Epstein 1996, 116; 338).

Democratic politics *qua* egalitarian interference bears on the ways in which new subjects polemically interfere with extant definitions of the object at stake, demonstrating its overflows in nature, world, and society, expanding its dimensions and public meaning, and disrupting the proper repertoire of subjects entitled to speak about the issue and present it as a common object. The formula for staging dis-agreement would then be: *Do you see what I am pointing at? Do we share a common language and a common world?*

Appearance, Subjectification, and Dissensus in AIDS-Treatment activism

Steve Epstein’s list of the various actors engaged in the production of knowledge about AIDS between 1985 and 1995, quoted at the beginning of this chapter,¹³⁵ makes it clear that the crisis was a veritable ‘hot situation,’ a complex issue that gathered biomedical researchers, health care

¹³⁵ See Epstein (1996, 2; 1995, 408-409).

professionals, health educators, social scientists, activists, politicians, public health officials, government agencies, pharmaceutical companies, and journalists. One of these actors, however, was an infiltrator of sorts—an (initially) unwelcome newcomer that did not in fact exist as such before the crisis. Activist groups, indeed, are an odd addition to the list because they emerged *in and through* their interference with the controversies attending the AIDS epidemic. Put differently, while there are many stakeholders in Epstein’s list, there is only one *demos*.

In order to make sense of democratic politics around science, technology, and expertise, I contend, we need to embrace a Rancièrian concept of the appearing *demos*.

The *demos* is neither the ideal people of sovereignty, nor the sum of the parties, nor even the poor and suffering sector of this society. It is properly a supplement to any ‘realist’ account of social parties. In the natural history of the forms of domination, only this supplement can bring forth democratic exceptionality. If equality is efficacious on the social order, it is by means of the constitution of this scene of appearance in which political subjects inscribe themselves as a litigious, ‘fictitious’ supplement in relation to every account of social parties. (Rancière 2004, 225)

The AIDS Coalition To Unleash Power (ACT UP) was a *demos* in this sense. Bringing to fruition a crucial element of the ‘Denver Principles’ that kicked-off AIDS activism in the US—to be included in all AIDS forums with equal credibility as other participants—treatment-activists emerged as a litigious supplement that eventually threw the social order of the scientific and regulatory establishment back on its contingency.¹³⁶ Unlike the fabricated ‘general publics’ of a deliberative event like *GM Nation?*, the figure of the lay-expert was not intelligible within prevailing official framings. No blueprint had them registered, and no account could be made of them. By appearing on the public scene and verifying their equality as speaking beings capable of naming and debating AIDS, they manifested what Rancière refers to as the fundamental

¹³⁶ I take this formulation from Rancière (1998, 101).

‘miscount’ of democratic politics: “There is politics—and not just domination—because there is a wrong count of the parts of the whole” (Rancière 1999, 10). From the perspective of the ‘police,’ AIDS-treatment activists appeared on the public scene without any right to be counted as speaking beings in the AIDS forum. The people from ACT UP made themselves of some account through a largely autodidactic process of expertization and a daring attempt to verify their equality as beings capable of engaging experts in their own language.

Now, this emancipation was the result of an arduous and polemic confrontation that set up a litigious community around the AIDS issue. What lay activists placed before the experts as something to be shared in common was first and foremost this confrontation itself, “the contradiction of two worlds in a single world,” to use one of Rancière’s formulations in *Dis-agreement*; the confrontation between “the world where they [i.e. the activists] are and the world where they are not, the world where there is something ‘between’ them and those [i.e. the experts] who do not acknowledge them as speaking beings who count and the world where there is nothing” (Rancière 1999, 27). The world where activists ‘are’ and where there is something in ‘common’ with the experts is a world they had to set up in the ‘poetic’ sense I addressed earlier in this chapter. Far from being a given of speech situations around AIDS, this common world had to be wrested from the police order of scientists and bureaucrats.

What made it possible for AIDS-treatment activism to appear as a *demos* was above all else their decision to engage scientists in their own terrain and demand participation in the production of knowledge. At stake here is Rancière’s notion of subjectification as *disidentification*. “Any subjectification is a disidentification,” Rancière writes, a “removal from the naturalness of a place, the opening up of a subject space where anyone can be counted since

it is the space where those of no account are counted, where a connection is made between having a part and having no part” (Rancière 1999, 36). This is why “[p]olitics designates... the forms of collective subjectivization which call into question the police distribution of positions” (Rancière 2009c, 121). As Aletta Norval puts it, the French thinker “suggests that disidentification from the places and subject positions offered by the police is what opens up the possibility of creating political bonds and imagining alternative worlds” (Norval 2012, 817).

In the case of ACT UP members, this disidentification is nicely illustrated by Brenda Lein, an activist who has described her attendance at formal conferences in the following terms: “I mean, I walk in with... seven earrings on one ear and a Mohawk and my ratty old jacket on, and people are like, ‘Oh great, one of these street activists who don’t know anything...’ (Epstein 1996, 232). “But once she opened her mouth and demonstrated that she could contribute to the conversation intelligently,” as Epstein points out, “Lein found that researchers were often inclined, however reluctantly, to address her concerns with some seriousness” (232).

A parallel with the ‘proletarian political subjectification’ which Rancière uses as example might serve to clarify this point. The proletarian subject, according to Rancière, is not the expression of a particular ‘culture’ or ‘ethos’ with a distinctive ‘voice’ already registered in the police counting of parts: “It presupposes, on the contrary, a multiplicity of fractures separating worker bodies from their ethos and from the voice that is supposed to express the soul of this ethos: a multiplicity of speech events—that is, of one-off experiences of conflict over speech and voice, over the partition of the perceptible” (36). And significantly, Rancière contends that “any disruption of the prevailing system” we may attribute to the proletariat as political subject came less from “a specific working-class culture than from these *singular apprenticeships in a*

common culture. ... A worker who had never learned how to write and yet tried to compose verses to suit the taste of his times was perhaps more of a danger to the prevailing ideological order than a worker who performed revolutionary songs” (Rancière 1988, 50, my emphasis). Likewise, a freelance writer who spends his nights confecting a glossary of biomedical technical terms to help set up a polemical stage of interlocution with the experts in charge of handling AIDS can be ‘more dangerous’ than an anti-vaccine zealot who refuses to speak the scientific language of his putative oppressors.

A *demos*, in other words, emerges precisely as a subject that is different from any identified part of the community. In our example, this new subject was the ‘lay-expert,’ represented by the members of the Treatment and Data Collection committee of ACT UP. From the perspective of the ‘police’ this is an improper or scandalous subject because it cannot be pigeonholed into any extant sociological category. It occupies a space ‘in-between’ identities: no longer a lay individual that can be easily put in its place, and not yet a wholly accredited expert engaged in ‘business as usual.’

As Mark Harrington reminisces in relation to the Glossary of technical terms he found himself crafting,

Late at night, after completing work, I started entering into the computer words I didn’t understand, from ‘accrual’... to ‘zidvudine.’... I got my information from newsletters such as *AIDS Treatment News*, mainstream media such as the *New York Times* and *The Wall Street Journal*, the ACT UP special issue of *October* magazine, ... Randy Shilts’s often useful, sometimes sensationalistic *And the Band Played On*, and elsewhere. ... I stayed up later and later in the darkened Chelsea loft, working into the early morning hours, filling in definitions and garnishing them with tart activist rhetoric (Harrington 2008, 328).

Still, in conflicts around science and technology the opposition between legitimate and illegitimate speakers is inseparable from very real inequalities in expertise. Indeed, when we place Rancière's ideas in the context of technoscience we encounter a particular difficulty. He is notorious for claiming that there is no entitlement to partake in political affairs other than the capacity for speech we all share, with democratic politics consisting precisely in the verification of this premise through cases that introduce a 'singular universal.' In a nutshell, democracy is the rule of those who have no qualification to rule. It is "the institution of politics itself, the system of forms of subjectification through which any order of distribution of bodies into functions corresponding to their 'nature' is undermined, thrown back on its contingency" (Rancière 1999, 101).

This argument is plausible when the presumed capacity to rule is based on wealth or virtue. But things may not be so simple when entitlements are based on the possession of technical knowledge and language, a fact that is bound to complicate the possibility that a language common to all as equal speaking beings be verified in political action. Expertise is not the same as wealth, virtue, or the possession of arms. It is one thing to verify equality to demonstrate one has the same capacity for speech as those whose domination is based on their property or nobility. This is clear in the political irruption of the demos, the plebeians, the Third Estate, and the proletariat. Here the contingency of domination equals its arbitrariness. But something different occurs when the distribution of capacities is based on scientific expertise. Here it is not as straightforward to identify contingency with arbitrariness. The rule of experts may be contingent, but it is not arbitrary in the same way that the power of wealth is.

That this constitutes a blindspot of sorts for Rancière is suggested in the Preface to *Dis-agreement*. In the context of a polemic with Plato, intended to set the stage for his characterization of ‘Dis-agreement,’ he writes that “[i]t would not doubt be convenient if, to say just what he understands by justice, the philosopher had *entirely different words at his disposal* from those of the poet, the merchant, the orator, or the politician. Divine wisdom apparently did not provide these. ... Where philosophy runs up against poetry, politics, and the wisdom of honest merchants, *it has to borrow the others’ words in order to say that it is saying something else entirely*” (Rancière 1999, xi, my emphasis). As I have emphasized throughout this dissertation, however, the trouble is that science, unlike philosophy, *does* have an esoteric language at its disposal. Indeed, the peculiar thing about lay challenges to scientific expertise is that invocations to formal equality will not do the work. Put differently, the *logos/phoné* distinction means one thing regarding traditional forms of political rulership, and another when applied to technoscientific controversies.

What do we make of Rancièrian democratic politics when scientific knowledge and expertise determine the parameters that condition the objects and subjects of speech situations? To answer this question we need to augment Rancière’s thought. Fortunately we can do this by drawing on some of his own resources.

Rancière’s formula of ‘singular apprenticeships in a common culture’ is quite apposite for making sense of practices of emancipation such as those of AIDS activists. It directs our attention to his largely neglected notion of a ‘poetics of knowledge’ (Rancière and Panagia 2000). By this he means the “operation on the objects of knowledge and modes of knowing *that brings them to the level of a common language* and... the invention, *within this common*

language, of various modes of argumentation and manifestation” (116, my emphasis). An expression of this ‘poetics of knowledge’ can be found in Mark Harrington’s testimony:

I mean, I wouldn’t exaggerate how polite we were. ... I would just say it was clear from the very beginning, as Maggie Thatcher said when she met Gorbachev, ‘We can do business.’ We wanted to make some moral points, but we didn’t want to wallow in being victims, or powerless, or oppressed, or always right. *We wanted to engage and find out if there was common ground.* (Epstein 1995, 417, my emphasis)

Thus, while the poetics of *politics* we examined before in relation to Habermas “is a challenge to the opposition between legitimate and illegitimate speakers, a poetics of *knowledge* presents a challenge to the divisions between the disciplines and the discourses of knowledge” (Rancière and Panagia 2000, 116, my emphasis). According to Rancière, all knowledge discourses—including science, we can now say—rest on the same capacity for linguistic invention. This is what AIDS-treatments activists dared to verify, and what the Cumbrian sheep-farmers did not attempt in public.

Significantly in this regard, and somewhat reminiscent of Jacotot’s ‘intellectual adventure,’ some activists have described their own adventures in expertization as akin to learning a foreign language. As one activist who attended a meeting of the Treatment and Data Collection committee put it: “I walked in the door and it was completely overwhelming, I mean acronyms flying, I didn’t know *what* they were talking about.” But after reading several times a document distributed at the meeting she concluded: “Oh, this is like a subculture thing; you know, it’s either surfing or it’s medicine and you just have to understand the lingo, but it’s not that complicated if you sit through it. So once I started understanding the language, it all became far less intimidating” (231).

This leads us to a more general point. In general, all the demonstrations and performances enacted by ACT UP possessed a hallmark combination of anger, theatrics, and well-reasoned technical claims. A good example was the *mise-en-scène* set up by that the Boston chapter in the first day of classes at Harvard Medical School in fall 1988. “Equipped with hospital gown, blindfolds, and chains, the activists broke into a chant: ‘We’re here to show defiance / for what Harvard calls ‘good science’!’” (Epstein 1996, 1) A mock syllabus was distributed that outlined the course for an ‘AIDS 101’ class:

PWA’s—Human beings or laboratory rats?

AZT—Why does it consume 90 percent of all research when it’s highly toxic and is not a cure?

Harvard-run clinical trials—Is the pursuit of elegant science leading to the destruction of our community? (Epstein 1996, 1)

As Epstein has aptly noticed, “[t]hese were no simple slogans of the ‘Up with *this*, down with *that*’ variety; each cryptic item hinted at arguments of some depth and complexity. ... These protesters were not rejecting medical science. They were, however, denouncing some *variety* of scientific practice—‘elegant’ science, ‘what Harvard calls good science’—as not conducive to medical progress and the health and welfare of their constituency” (Epstein 1996). In an observation that strongly resonates with Rancièrerean subjectification, emancipation, and the search for a common language, Epstein neatly captures the kernel of AIDS-treatment activists’ action:

While activists have also insisted in the need to bring ‘non-scientific’ language and judgments into their encounters with researchers, they have nonetheless assumed that the capacity to speak the language of the journal article and the conference hall is a *sine qua non* of their effective participation. (Epstein 1996, 231)

Insofar as democratic interference in technoscientific affairs demands an expertization of the lay actors involved, the ‘poetics of politics’—whereby a *demos* reconfigures the sensible partition of police regimes—is inseparable from a ‘poetics of knowledge’. The latter consists in demonstrating that, despite technical expertise, a common language can be carved out between experts and ordinary people. Such demonstration involves the construction of polemical scenes of interlocution as well as the aforementioned disidentification of actors from their lay identities. Importantly, democratic politics thus understood cannot be proceduralized without becoming something else entirely. The political purchase of the exemplar is in the moment of interference, disidentification, and dispute; when a newcomer, to paraphrase Arendt, appears in the public realm without yet being absorbed into ‘the social.’

As the case of ACT UP shows, the infiltration and reconfiguration of the frames of control, prediction, and standardization in clinical trials demanded from political subjects a process of self-instruction and assimilation of the perspective of the experts. Although laypeople had in the past claimed to speak credibly on biomedical questions (Dutton 1984), AIDS-treatment activism was “the first social movement in the United States to accomplish the mass conversion of disease ‘victims’ into activist-experts” (Epstein 1995, 413-414).

A feature of the AIDS movement usually noticed by commentators is the fissure that emerged between the Treatment and Data group, as it became ever more closer to the scientific establishment,¹³⁷ and the rest of the members of ACT UP who began to resent and look with suspicion at these new experts. Thus, the lay/expert divide was ultimately replicated within the movement in terms of a divide between the ‘lay-expert’ activists and the ‘lay-lay’ activists (Elbaz

¹³⁷ Many of them, as Epstein notes, “have come to voice an increasing faith in the formal principles of the clinical trial” (Epstein 1995, 424).

1992, 448). Rancière wouldn't be surprised or disappointed, and neither should we. After all, democracy—as Rancière has famously claimed—“is not a political regime” (Rancière 2001, 10).

In relation to this last point, I conclude with a reflection on what comes *after* democratic politics (thus understood). In a sense, this is not something difficult to convey from a Rancièrian perspective, since after politics always comes the police. Still, something else might be at stake. Rancière's crucial but underdeveloped claim that “one kind of police may be infinitely preferable to another” provides a clue. Indeed, as he claims, “[t]here is a worse and a better police—the better one, incidentally, not being the one that adheres to the supposedly natural order of society or the science of legislators, but the one that all the breaking and entering perpetrated by egalitarian logic has most often jolted out of its ‘natural’ logic” (Rancière 1999, 30-31). And a consequence of AIDS-treatment activism has been precisely a reconfiguration of the police order of scientific research (and bureaucratic regulation). It would not be an exaggeration to claim that these orders have indeed become a ‘better police’ *after* the egalitarian interference of the AIDS *demos*. After democratic politics came deliberation; but these deliberations were framed according to new, reshaped parameters. New objects and new subjects had made their appearance on the public scene, interfering with and eventually reconfiguring previously scientific distributions.

And yet, Rancière himself offers little resources to theorize the novel distributions of the sensible that result from interruptive *re*-configuration via subjectification and dissensus. Here I am referring to the question of egalitarian *inscription* insightfully examined by Aletta Norval (Norval 2012). She rightly argues that the moment of inscription cannot be bypassed if we want

to consider the “reconfiguration of existing political imaginaries” (Norval 2012, 810).

Importantly,

if the verification of equality is to take the form of an inscription that resignifies the sensible, then it has to have the power to reconfigure (Norval 2012, 810).

According to Norval, “Rancière tends to refrain from explicitly engaging with the issues that arise after moments of rupture, when previously excluded senses of wrong become visible and alternative ways of doing things need to become institutionalized, and thus inscribed into the current order” (812). Importantly for the arguments of Bruno Latour and Michel Callon we will encounter in the next chapter, the missing question regards “the processes through which democratic challenges find a foothold in existing orders” (812).

Norval argues that the examples Rancière himself offers in his more historical writings go beyond the purely disruptive character that is the focus of most commentators. Examples, she claims, “have a further role that exceeds that of disruption. Each also acts as *an exemplar* of the possibility of being and acting differently” (819). In particular, “thinking about the exemplarity of the example, enables one to focus on *both* the distancing from the given order, a turning away, *and* the possibility of another way of being and acting—a turning toward—that is inscribed in it” (820).

My treatment of the AIDS activism example moves a long way in the direction suggested by Norval. But there is something else at stake in inscription, beyond exemplarity. Norval glimpses at this when she quotes Rancière to the effect that

the possibility of entertaining and maintaining passions and desires for another world arises not simply from disidentification, but from ‘revelation of a different world and the initiation of a new kind of relationship between beings,’ from other possibilities becoming visible. In terms of the initiation of new relationships between political

subjects, Rancière argues repeatedly that a democratic community must be both a community of ‘interruptions’ and one in which ‘intervals constructed between identities, between spaces and places’ inaugurate a political ‘being-together’ as ‘a being-between: between identities, between worlds’ (Norval 2012, 818).

The “initiation of a new kind of relationship between beings,” I contend, exceeds the question of exemplarity. Furthermore, as Norval claims, such “possibility of altering and initiating new relations between beings... cannot occur so long as one holds onto the idea of an undifferentiated police order” (Norval 2012, 819). This new articulation is what I wish to address in the next chapter with the concept of ‘composition’ that is at the center of recent political theorizations by two key ANT authors: Bruno Latour and Michel Callon.

7. COMPOSITION

What if the definition of politics were to be reshaped as deeply as the definition of science has been by STS? Not simply expanded or shrunk but entirely redistributed?

Bruno Latour

In Part I of this dissertation I fleshed out the political significance of science and technology by resuming and augmenting Hannah Arendt's attempt to 'think what we are doing.' Scientists, Arendt claimed, "have enlarged the realm of human affairs to the point of extinguishing the time-honored protective dividing line between nature and the human world" (Arendt 1998, 323-324). In the work of STS and ANT, and particularly in Bruno Latour's narrative about our modern condition, we found a similar diagnosis: the hybridizations of humans and nonhumans have extinguished the dividing lines between nature and society, and science and politics, stipulated in the modernist Constitution. What is peculiar about the modern period is that we have allowed an immoderate proliferation of these imbroglios precisely by refusing to think about them as what they are.

In ANT accounts, however, there is no event signalling the beginning of a new epoch, as we find in Arendt with relation to the splitting of the atom. What is new is the scientifically and technologically driven intensification and extension of these sociotechnical networks. The events that matter for Latour are not these deeds but the point of inflection in public awareness about them reached in 1989, at least in Europe, with the twin failures of socialism and naturalism, that is, of the *separate* attempts to put an end to the domination of humans by humans, and to place

humans in a detached position of mastery, respectively announced by the fall of the Berlin Wall and the first global conferences on the ecological crisis and world famine (Latour 1993, 8-10).

As we saw in chapter 2, Latour closes his reflections in *We Have Never Been Modern* speculating about a different democracy articulated around a ‘Parliament of Things,’ where hybrids can finally appear in public light. Latour’s central hypothesis was that “we are going to have to slow down, reorient and regulate the proliferation of monsters by representing their existence officially” (Latour 1993, 12). This chapter turns around the question of democratic politics and the meaning it can assume in a situation of boundless proliferation and radical uncertainty.

This issue is not one that Arendt addressed in any detail. Indeed, the answers to the “preoccupations and perplexities” examined in the Prologue to *The Human Condition*, she believed, were “matters of practical politics, subject to the agreement of many” (Arendt 1998, 5). She took such answers to be part and parcel of the political challenge she saw emerging in the midst of that “new and yet unknown age” (6) to which *The Human Condition* served as a prologue. Still, a clue can be found in the passage where Arendt observes that “[i]n order to be what the world is always meant to be, a home for men during their life on earth, the human artifice must be a place fit for action and speech... ” (1998, 173). My own argument is that the task of politics is precisely to provoke ‘experiences of worldliness’ and to make the world a place ‘fit’ not only for action and speech but *also*, and inevitably, for the appearance of the hybrids we have been doing and making. The political challenge is to make things fit for public appearance, to care for how they look by constructing scenes in which technoscientific actions and works can be held as common.

As the example of synthetic biology and the scant public repercussions of Craig Venter's new bacteria seem to imply, no robust public realm is in place where the meaning of scientists' deeds and artefacts can be interrogated, examined, and judged. Surely, there has been some discussion about 'risks,' but this hardly amounts to the plurality of perspectives which Arendt saw as a condition *sine qua non* for the disclosure of worldly reality. What is *Mycoplasma laboratorium*, politically speaking? A thing-deed without a public space of appearance. Public appearance, in this sense, is not guaranteed: technical things do not disclose themselves. But it always remains a possibility as long as humans transcend their subjective necessities and standards, and adopt those of the world. There are many other areas, however, in which the question about the configuration of spaces where 'the things that we are doing' with science and technology are coming out of their clandestine existence to become matters of concern for actors and publics gathered around them.

When we consider the question of 'thinking about the things we are doing' we should bear in mind not only 'the doings of technoscience' (its deeds, artifacts, and framings) but also 'the doings of political actors' that emerge to confront the former. In other words, we should reexamine not only the way we theorize technoscientific agency, as we did in Part I, but also the way we theorize existing forms of democratic politics in this area; what political actors, citizens, publics, or whatever term one chooses to speak about the 'sufferers' of technoscientific agency, *are doing* in (re)action to those doings. We examined deliberative democracy—in theory and in the practice of 'minipublics'—and found it wanting (chapters 4 and 5). In the preceding chapter I articulated a concept of 'interference' in the company of Jacques Rancière, and illustrated it with the case of AIDS treatment activism. Compared to deliberation, this form of democratic politics

is truly capable of confronting the challenge of technoscience; and it takes us a long way into ‘caring for the world.’ And yet the concept of egalitarian interference doesn’t say much about what comes *after* the moment of disruption. The ‘inscription’ without which democratic politics fails to reconfigure the givens of public life in a durable way is under-theorized by Rancière himself. And although the example of ACT UP shows us some ways in which inscription might take place—namely the refashioning of clinical trials and the partaking of hitherto silent and silenced voices into the official forums in which the direction and production of scientific research in the area are debated—conceptually there is something missing in interference.

In this chapter I turn to the redefinitions of politics put forward by key ANT authors Bruno Latour and Michel Callon. Notwithstanding their differences in language, scale, and approach to contemporary experience, I want to argue that their works represent two variants of a form of democratic politics I will call ‘composition.’ As it will transpire, and apart from one or two occasional flirtations by Callon, the concept of composition, like interference, is markedly different from both deliberation and elicitation. The interesting relation, we shall see, is the one between composition and interference which I will address in the Conclusion.

In their initial attempts at tackling questions about public deliberation and democratic participation, STS scholars drew rather lightly upon theoretical and conceptual resources from political theory. Reflecting on the ‘participatory turn’ and the engagement of STS scholars, an authoritative figure like Bruno Latour could claim that the field had taken its political theory “off the shelf” and engaged in a largely uncritical advocacy of participatory (i.e., deliberative) democracy as the means for “bringing the sciences into democracy” (Latour 2007b, 811). But he also came to regard his own early view that ‘science in action’ is ‘politics pursued by other

means' as equally inadequate. Both approaches, the one "to bring science and technology back to the arenas of 'politics as usual'" and the other "to expand politics to everything," "equally retain the definition of politics taught in political science departments" (Latour 2007b, 814), meaning, presumably, understandings of political activity in terms of interests, preferences, aggregation, elections, deliberation, participation, all attributed exclusively to individuals and groups. Hence the ambitious question he put forward: "What if the definition of politics were to be reshaped as deeply as the definition of science has been by STS? Not simply expanded or shrunk but entirely redistributed?" (Latour 2007b, 814)

In response to the shipwreck of extant formulations in their home field, Bruno Latour and Michel Callon have articulated provocative, sophisticated, and inventive ways of thinking what we have been doing in the last three decades or so in response to (and from within) the hybridizations and overflows produced by and around science and technology. Both urge us, in one way or another, to get rid of the habits of thought we have inherited from the 'social contract for science' and the modernist divides between nature and society, facts and values, science and politics. Unless we acknowledge the bankruptcy of those terms and distinctions and come to terms with the uncertainties of our contemporary situation, whatever might be happening amongst us—politically and democratically—will pass us by, unnoticed, unattended, uncared for, like deeds without words.

The chapter unfolds in five steps. The first two sections place Callon and Latour on common ground by fleshing out their accounts of the basic *uncertainties* that mark our contemporary condition, one concerning the constitution of the public and the other is concerning the things we find ourselves attached to and which we strive to integrate into the

inventory of the world that is to be held in/as common with others. The two are closely related, for we know from ANT how humans and nonhumans are always entangled. What we don't know, because of our modernist conceptual habits and practices, is how to trace, describe, and interrogate those entanglements and the 'collectives' they enact. The inscription that is missing in Rancière's account will show some of its features around this question. After this we turn to Latour's and Callon's kindred but different attempts to rethink the meaning of democratic politics in light of such diagnoses. The third section examines Latour's more recent articulation of the 'Parliament of Things' in his *Politics of Nature*. After this we shall probe the 'dialogic democracy' that Callon and his colleagues trace in the 'hybrid forums' that have emerged over the last three decades in response to crises and controversies involving science and technology. A brief last section concludes the chapter by asking the question of the relationship between composition and interference, which will be taken up in the Conclusion.

Michel Callon: 'Hot Situations,' and the Co-Production of Scientific Knowledge

We can begin with Callon's distinction between what he calls 'cold' and 'hot' situations, and how this connects to his other distinction (examined in chapter 2) between 'framing' and 'overflows.' Cold situations are those in which agreement about overflows is easily arrived at; where "[t]he possible world states are already known or easy to identify: calculated decisions can be made" (Callon 1998b, 261). In hot situations like the controversy over the commercialization of GM crops in Europe, by contrast, the basis of those calculations is called into question: "everything becomes controversial: the identification of intermediaries and overflows, the distribution of source and target agents, the way effects are measured" (260). Such controversies

feed on the lack of a stabilized base of scientific blackboxes, and for this reason involve a plethora of actors. Importantly, “[t]he actual list of actors, as well as their identities, will fluctuate in the course of the controversy itself and they will put forward mutually incompatible descriptions of future world states” (260).

In today’s world, science and technology increasingly unleash (and partake in) hot controversies that overflow the framings (technical practices, forms of knowledge, and institutions) through which experts seek to contain and render calculable the agency of technoscience. “Our societies, that is, are ‘hot’ thanks to the technosciences” (Callon 1998b, 263). This excess of consequences unfolds in the realm of nature and the world of human artifacts, as we have seen in relation to Arendt, but in society as well. As we shall see throughout this chapter, whereas ‘cold’ situations can be dealt with by summoning experts and their laboratories, ‘hot’ situations involve a reconfiguration not only of knowledge production, but of social identities as well.

Callon coined the term ‘hybrid forums,’ a staple of recent ANT scholarship, to name the spheres of interaction that have emerged to make sense of hot situations. His exuberant portrayal of the infamous ‘mad-cow disease’ crisis in Britain is illustrative:

This hybrid forum is overflowing continuously, with an ever-growing, ever-more-varied cast of characters beside which Leporello’s *catalogo* pales into insignificance. By turns we hear from vets, farmers, manufacturers of animal feed, proponents of Thatcherite deregulation, Cordelia (daughter of the British agricultural minister, who appeared on television with her father, eating a beef-burger with evident enjoyment), Brussels, the British government denouncing protectionism, the Germans (accused in passing of ‘perfidy’ by the British), outraged members of the public, the media, prions (or rather the biologists studying them), butchers frantically acquiring every quality certificate going, politicians losing their heads.

Nothing here is certain. We don't know; and we can barely measure. As a result, "[n]ot only are the various actors and their interests in constant fluctuation, but even when they enter the debate they are incapable of reaching agreement either on the facts or on the decision that should be taken. Framing—predicated on the assumption that actions and their effects are known and measured—is a chaotic process, the implementation and control of which depend directly on the evolution of the controversies involved and on the construction of an agreement regarding the reality and scope of the overflows (Callon 1998b, 260-1).

Callon has famously argued that the inquiries conducted in hybrid forums blur the traditional boundaries between experts and laypeople, and between laboratories and society at large (Callon 1999; Callon et al. 2009). In a seminal article written in 1999, he proposed to move the critical analysis of the lay/expert divide beyond the 'deficit model' in PUS (which he called the 'public education model' or Model 1), and also beyond the public engagement or consultation exercises of the 'participatory turn' (the 'public debate model' or Model 2). Instead he underscored the role of lay publics in the *co-production of scientific knowledge* (Model 3). "In Model 1 the priority is on the education of a scientifically illiterate public. In Model 2 the right to discussion comes first because lay people have knowledge and competencies which enhance and complete those of scientists and specialists. Yet, beyond their differences, these two models share a common obsession: that of demarcation. [Models 1 and 2] deny lay people any competence for participating in the production of the only knowledge of any value: that which warrants the term 'scientific'... and in both cases the fear is that laboratories will be taken up by hordes of non-specialists" (Callon, 1999, 89).

This question of the involvement of ‘lay’ groups in the production of ‘expert’ knowledge, and the paradoxical figure of ‘lay expertise’ that emerges from it, was integral to my arguments about interference in the preceding chapter’s focus on Rancière’s thinking about democratic politics, emancipation, and the appearance of new subjects in the public scene. The remainder of this section examines Callon’s account of lay co-participation in the production of knowledge and how this disrupts and unsettles extant framings, modes of political engagement, and normal scientific practices.

Callon builds his argument around cases of groups of patients suffering so-called ‘orphan diseases,’ who, ignored by institutional medicine, organize themselves to have their existence recognized. Sooner or later groups realize that the only way of making themselves count is to partake in the production of scientific knowledge: researching and identifying diseases, organizing and actively participating in the collection of DNA, comparing clinical developments and assessing the effects of certain treatments, and sometimes even publishing articles in academic journals. As Callon writes, “Knowledge, from the most universal and general (e.g., on genes) to the most specific (e.g., the art and ways of dealing with a tracheotomy patient) is appropriated, discussed, and adapted by a hybrid collective composed of patients and specialists” (Callon 1999, 90-91).

Just as Brian Wynne has a signature case of his own (sheep farmers of Northern Cumbria), Callon’s arguments about the interrelations between the construction of patient identities and the collective form of research in which they participate came initially from his study of the ‘Association française contre les myopathies’ (AFM) (Callon 1999; Callon and Rabeharisoa 2003; Rabeharisoa and Callon 2002, 2008). This hybrid forum emerged in the 1980s

in France from the organization of parents of children with spinal muscular atrophy (SMA), a terrible neuromuscular disease owed to a small genetic muddle that condemns affected children to a wheelchair and a difficult struggle with death. Faced with a rare disease that appeared to wound and kill at random, a public emerged to confront and make sense of it. After ‘researching in the wild’ (Callon and Rabeharisoa 2003), that is, conducting inquiries and investigations outside laboratories, the group organized the now famous Téléthon to fund research on this rare disease. This eventually led to the establishment of Généthon, the research center where, in the early 1990s, scientists located and identified the gene responsible for the disease in close collaboration with the families of the AFM. Without the parent’s active involvement, furthermore, their children would have remained in the shadows, as they had been for decades, hidden in their homes by families too fearful of people’s reactions.

As Callon shows more generally in his studies of ‘emerging concerned groups’ (Callon and Rabeharisoa 2003; Rabeharisoa and Callon 2002, 2008), it is impossible to take overflows into account without setting up a political space where the emergent identities linked to technoscientific overflows can be recognized, dealt with, and mobilized in order to ‘compose’ or ‘constitute’ the collective (see Barry and Slater 2002). A consequence of overflows, in other words, is a constant (re)creation of new political spaces, new forms of debate, new forms of knowledge-production, and new social identities.

As I suggested earlier, this proliferation of the social can be unsettling, and for Callon the outcomes are never certain. For one thing, controversies are bound to ensue between groups with an already defined identity who sit at the public table (from NGOs to corporate firms) and publics whose very identity is still being erased and redrawn in relation to the issue in question,

‘in-between identities,’ as Rancière would have it. Unlike Latour, indeed, Callon displays a heightened sensitivity to the question of emerging identities, and a less rigid and more open-ended view than the one we saw in relation to Brian Wynne. Callon’s view of the social has strong resonances with William Connolly’s ‘ethos of pluralization’ (Connolly 1995).¹³⁸ When the object in question is fraught with uncertainty, as is the case today in science and technology, the new public that forms around it is equally uncertain and fragile, without a defined identity, and thus below the threshold of perceptibility afforded by dominant social and political arrangements. In the case of patients with SMS, Callon is emphatic in declaring that the groups did not have a publicly recognized identity until the gene SMN was identified, partly thanks to the work of those affected. What is at stake for an emergent public is its very identity, the place it can have in a ‘collective’ or ‘common world.’ The co-production of knowledge between laypeople and experts in hybrid forums is in this sense intended to allow for flexible explorations and the emergence of identities in the making.

Getting rid of bad conceptual habits: Latour on ‘publics’ and ‘matters of concern’

In Bruno Latour we find a kindred theorization of the two uncertainties surrounding the human actors and things comprising the collective, albeit in a different language and with more decidedly philosophical allegiances. Indeed, Latour’s contributions to political thinking in the 2000s were significantly informed by the work of two Anglo-American philosophers from the early twentieth-century: John Dewey and Alfred North Whitehead. Although the foundations of

¹³⁸ This could be traced to the influence Gilles Deleuze has had on both Connolly and Callon. See Callon (2006).

Latour's philosophical outlook were already formed when he engaged these authors,¹³⁹ their ideas have been pivotal in the articulation of at least two of his key political insights. On the one hand, he has expanded on Dewey's pragmatist argument that 'the public' emerges from the diffuse and inchoate body of citizens when people experience the negative consequences of transactions beyond their control, to make a larger argument about the issue-oriented character of politics and the need to abandon ready-made definitions in favor of a more experimental approach, particularly though not exclusively in relation to technoscientific overflows. On the other hand, Latour augments his account of political life through an engagement with Whitehead's process philosophy and critique of the 'bifurcation of nature' that has bedevilled the philosophical tradition. This permeated Latour's key Whiteheadian concept of 'matters of concern,' which he deploys in order to replace the mistaken and counterproductive modernist habits of thought we have been using to make sense of the entanglements of nature, world, and society.

Latour and other figures in ANT have turned to Dewey to uncover the intertwining of publics and things as an uncharted political dimension in sociotechnical controversies. This engagement, it should be noted, has been largely restricted to Dewey's reflections in *The Public*

¹³⁹ The first systematic statement of his philosophical views can be found in his "Irreductions" (Latour 1988a).

and its Problems (Dewey 1984). The result has been a conception of democratic politics which places ‘things’ or ‘issues’ at the center of the formation of publics.¹⁴⁰

The credit for introducing Dewey’s reflections on democracy into social studies of science, however, goes to Noortje Marres, a doctoral student of Latour in the early 2000s (Marres 2005; 2007). Although STS scholars have studied political engagement around the objects and overflows of technoscience, Marres rightly observes that “STS research does not provide an explicit answer to the question of why an object-oriented politics would have to take the form of *democratic* politics” (760, emphasis added). Dewey offers an answer by urging us “to approach practices of public involvement in politics as dedicated to the articulation of public issues” (761). Reminiscent of Arendt’s observation that words and deeds are always about some worldly objective reality, Marres draws on Dewey’s arguments on the formation of publics in democratic societies to claim that political action always turns around problems, ‘things,’ or ‘issues’ of interest. What sets this apart from a technocratic approach is the fact that objects can in fact *engage* ordinary people with such an intensity of concern and practical commitment that

¹⁴⁰ In this respect, Latour’s engagement with Dewey differs from the one we find in certain variants of critical social theory connected to deliberative democracy (Westbrook 2005). Deliberative theory has turned to Dewey mainly for cognitive reasons. This has been most fully elaborated by James Bohman (1999; 2000; 2009), who argues that a pragmatist view has the merit of emphasizing the conditions of democracy as inhibiting or promoting adequate ‘problem solving’ in the face of ‘social facts’ like “expertise and the division of labor, cultural pluralism and conflict, social complexity and institutional differentiation, globalization and the fact of increasing social interdependence” (Bohman 2009, 31). And solving problems of such complexity, so the argument goes, requires a transformation of democracy into a continuous self-corrective and self-transformative endeavor; a cooperative inquiry modeled after science itself. “Pragmatists have long emphasized the relationship between democracy and science, an analogy that works in both directions once we see democracy as a form of inquiry and science as a cooperative enterprise” (Bohman 2009, 30). For Dewey, participation by the ‘well-informed’ citizen was feasible, but given the scope and complexity of the ‘indirect consequences’ of collective action in industrial society (akin to Callon’s ‘overflows’), the decisive challenge for handling these consequences (particularly stemming from technoscientific agency) was the formation of ‘publics’ addressing such ‘problems,’ an experimental process that according to Dewey was hindered by the framework of extant democratic institutions. On this basis, Bohman (2009) calls attention to the epistemic virtue of procedures of deliberative democracy and their contribution to this cognitive, problem-solving task assigned to democracy by pragmatists.

rule by experts is more or less out of the question. As she notes, “to articulate a public affair is to demonstrate for a given issue that, first, existing institutions are not sufficiently equipped to deal with it, and, second, that it requires the involvement of political outsiders for adequately defining and addressing it” (772). Marres summarizes Dewey’s contribution to the study of public involvement in technoscientific affairs with a motto that has become broadly influential in STS and ANT circles: *no issue, no public*.

Bruno Latour has been particularly enthusiastic about this turn to pragmatism, and Marres’s attention to Dewey in particular (Latour 2004a; 2004c; 2005a; 2007b). In his interpretation, “[t]he radical departure pragmatism is proposing is that ‘political’ is not an adjective that defines a profession, a sphere, an activity, a calling, a site, or a procedure, but it is what qualifies a type of situation” (Latour 2007c, 814). In Dewey’s work, Latour claims with an apposite metaphor, we find “a Copernican Revolution of radical proportions: to finally make publics turn around topics that generate a public around them instead of trying to define politics *in the absence* of any issue” (814-815). This, I believe, is a powerful way of augmenting Arendt’s hesitant position about the *sine que non* of worldly things for political life. Publics do not exist independently of their attachments to non-human things and issues; it is the latter that summon their formation. “Whatever the term one wishes to use—object, thing, gathering, concern—the key move is to make all definitions of politics turn around the issues instead of having the issues enter into a ready-made political sphere to be dealt with. First define how things turn the public into a problem, and only then try to render more precise what is political, which procedures should be put into place, how the various assemblies can reach closure, and so on. Such is the hard-headed *Dingpolitik* of STS as opposed to the human-centred *Realpolitik*” (Latour 2007,

815). Latour is calling us to relinquish our old habits of thought and wonder at the amazing power of objects to gather concerned publics around them.¹⁴¹ “[O]bjects—taken as so many issues—bind all of us in ways that map out a public space profoundly different from what is usually recognized under the label of ‘the political’ (Latour 2005a, 5). Later in this chapter, we will see that Michel Callon and his colleagues agree on this question.

It is very important to realize the extent to which Latour’s endorsement of the idea that “things turn the public into a problem” represents a departure from a main tenet of earlier ANT scholarship. Previously, Latour held that the mediation of non-human actants had a stabilizing effect on ‘human societies,’ as opposed to those we can find in the animal kingdom.¹⁴² As I showed in chapter 2, the implications for power and domination of ANT’s understanding of sociotechnical networks depended on the extent and durability of hybrid attachments. Hence “in order to understand domination we have to turn away from an exclusive concern with social

¹⁴¹ Thus, in a vivid passage we read: “Just go in your head over any set of contemporary issues: the entry of Turkey into the European Union, the Islamic veil in France, the spread of genetically modified organisms in Brazil, the pollution of the river near your home, the breaking down of Greenland’s glaciers, the diminishing return of your pension funds, the closing of your daughter’s factory, the repairs to be made in your apartment, the rise and fall of stock options, the latest beheading by fanatics in Falluja, the last American election. For every one of these objects, you see spewing out of them a different set of passions, indignations, opinions, as well as a different set of interested parties and different ways of carrying out their partial resolution. It’s clear that each object—each issue—generates a different pattern of emotions and disruptions, of disagreements and agreements. There might be no continuity, no coherence in our opinions, but there is a hidden continuity and a hidden coherence in what we are attached to. Each object gathers around itself a different assembly of relevant parties. Each object triggers new occasions to passionately differ and dispute” (Latour 2005a, 4-5).

¹⁴² This is what Latour took from his collaboration with Shirley Strum, a primatologist at UC San Diego, which resulted in a co-authored article entitled “Redefining the social link: From baboons to humans” (Strum and Latour 1987). Whereas baboons can only rely on their bodies and accumulated experience to navigate in their everyday interaction, human relations are mediated, and thus (crucially) *stabilized* thanks to the mediation of things. Thus, “monkeys almost never engage with objects in their interactions” whereas “for humans it is almost impossible to find an interaction that does not make some appeal to technics” (Latour 1996, 238). In a related piece Latour states that for humans “the enrollment of nonhumans can *stabilize* social negotiations.... They are at once pliable and durable; they can be shaped very fast, but, once shaped, they last much longer than the interaction that has fabricated them. Social interactions, on the other hand, are extremely labile and transitory” (Latour 1994, 803).

relations and weave them into a fabric that includes non-human actants, *actants that offer the possibility of holding society together as a durable whole*” (Latour 1991, 103, my emphasis). Dewey’s ‘Copernican revolution’ has largely modified this view on the mediating role of things as *stabilizers* in human society and politics, stressing instead their part as actants that *destabilize* society, introducing disorder, agitation, and surprise.

The public is not an already-made up conglomerate of people whose opinions and interests can be registered and monitored along the lines of Rancière’s police regimes. The public, rather, is plural; and the physiognomy of each public depends on the issues or things that gather people around them. Contemporary politics, in this sense, is ridden with uncertainties about its subjects in ways that challenge, as we will see, the conventional procedures and practices of liberal democracy.

The second modification in Latour’s thought, to which we now turn, runs parallel to the shift in his account of things from stabilizers to destabilizers of society and politics. This time, however, the focus is on the uncertainties surrounding *things* themselves. And here Latour’s discourse becomes more decidedly philosophical; even metaphysical. “The mistake we [i.e., STS scholars] made, the mistake I made,” Latour has acknowledged, “was to believe that there was no efficient way to criticize matters of fact except by moving away from them and directing one’s attention toward the conditions that made them possible. But this meant accepting much too uncritically what matters of fact were.” Reality, Latour claims, “is not defined by matters of fact. Matters of fact are not all that is given in experience” (Latour 2004b, 231-232). A redefinition of the meaning and purpose of ‘critique,’ based on a ‘renewed empiricism’ and ‘a stubbornly realist attitude,’ was in order. “For too long,” he insists, “objects have been wrongly

portrayed as matters-of-fact. This is unfair to them, unfair to science, unfair to objectivity, unfair to experience. They are much more interesting, variegated, uncertain, complicated, far reaching, heterogeneous, risky, historical, local, material and networky than the pathetic version offered for too long by philosophers” (Latour 2005a, 9-10). How then are we supposed to theorize objects? By shifting attention from ‘matters of fact’ to ‘matters of concern.’

Like publics, and also due to the proliferation of hybrids, things themselves also present us with more uncertainties about their matter of factness than ever before. Indeed, Latour’s turn to things *qua* matters of concern is inscribed within his larger (and earlier) philosophical attempt to redefine the basic categories we have employed to characterize modernity, a project that he expounded systematically for the first time in *We Have Never Been Modern* (Latour 1993), and which he significantly augmented in his more recent *Politics of Nature* (Latour 2004a). Before engaging this more recent work in the next section, I will reintroduce the basic tenets of Latour’s effort to ‘think what we are doing’ otherwise, this time in the company of Alfred N. Whitehead.

In Whitehead Latour found a kindred spirit for augmenting the ideas laid out in *We Have Never Been Modern*—especially his critique of our knee-jerk attempts to pigeonhole actants into *one and only one* of the purified realms of nature and society—as well as company for the metaphysical speculations that were beginning to inform many of his published writings.¹⁴³ “Of all the modern philosophers who tried to overcome matters of fact, Whitehead is the only one who, instead of taking the path of critique and directing his attention away from facts to what

¹⁴³ Latour’s reception of Whitehead philosophy has been largely mediated by the work of Belgian philosopher Isabelle Stengers, a lucid and penetrating reader of Whitehead (Stengers 2002), who would also influence Latour’s cosmopolitical proposal (Stengers 2005; Latour 2004c). For his explicit acknowledgment of Whitehead’s influence see (Latour 2004b). More recently, Latour wrote the Foreword to the English translation of Stenger’s book on Whitehead (Stengers 2011).

makes them possible as Kant did; or adding something to their bare bones as Husserl did; or avoiding the fate of their domination, their *Gestell*, as much as possible as Heidegger did; tried to get closer to them or, more exactly, to see through them the reality that requested a new respectful realist attitude” (Latour 2004b, 244).

Although it is not my purpose to engage the philosophical underpinnings of Latour's thought in any depth, there are two elements of his recourse to Whitehead that are as important to his political interventions as his appropriation of Dewey, and which merit some attention, if only to remind us of Latour's larger and highly ambitious project to contest and refashion our inherited habits of thought , which encompasses and arguably surpasses his explicitly ‘political’ writings.¹⁴⁴

First, Latour revisits his thesis that ‘we have never been modern’ by adopting Whitehead's critique of the ‘bifurcation of nature’ at the root of Western philosophy and epistemology (Whitehead 1920). Since the seventeenth-century, according to Whitehead, philosophy has insisted on a distinction between primary qualities (substances, atoms, particles, genes, etc.) and secondary qualities (color, odour, texture, and so on), the former taken as the building blocks of reality, and the latter as their effect on the human mind perceiving those entities. Furthermore, this ontology is based on the premise that the relations that a substance has with other entities (like the human mind that senses it) is accidental, thereby prompting all the epistemological doubts and suspicions about human senses and worldly experience that is the

¹⁴⁴ The place of politics as one among many ‘modes of existence’ is examined in his latest work (Latour 2013). I do not engage this more recent part of Latour's output in this dissertation.

mark of modern philosophy *and* science (as Hannah Arendt knew very well).¹⁴⁵ Whitehead emphatically rejects this bifurcation in our explication of the nature of reality: “We may not pick up and choose,” he famously wrote. “For us the red glow of the sunset should be as much part of nature as are the molecules and electric waves by which men of science would explain the phenomenon” (Whitehead 1920, 28–29). When he set out to reject the ontology of timeless material substances, he did so based on the conviction that the physical theory emerging in the early twentieth-century had struck a mortal blow to the worldview of Galileo and Newton and demanded a new understanding of reality (Whitehead 1947). Natural phenomena could not be seen as substances or objects, but rather as *processes* or ‘actual occasions’ (Whitehead 1978).¹⁴⁶

This new processual understanding of reality is what, according to Latour, allows us to “see through” matters of fact into the multiple relations of *matters of concern*—Latour’s equivalent to Whitehead’s ‘actual occasions’ (Latour 2004b, 245). Decisively for the French thinker, Whitehead “considered matters of fact to be a very poor rendering of what is given in experience and something that muddles entirely the question, What is there? with the question, How do we know it?” (244) This abandonment of epistemology in favor of ontology is what opens up the space for the political inquiry that Latour, as we well see, connects with the

¹⁴⁵ In *The Human Condition* Arendt quotes approvingly Whitehead’s claim that the Cartesian method of securing certainty in the face of universal doubt “is the outcome of common-sense in retreat” (Arendt 1998, 283)

¹⁴⁶ In Whitehead’s ontology the world is not constituted by static things like Aristotle’s substances or Leibniz’s ‘windowless’ monads, which subsist apart from their changes and relationships to other substances, but of momentary events or ‘occasions of experience,’ “the final real things of which the world is made up” (Whitehead 1967, 18), all of which are essentially self-determining, experiential, and internally related to each other. Any one of the things we perceive and tend to grasp with the notion of substance, such as a virus, a tree, or a person, is actually a temporally serial composite or string of indefinitely many overlapping occasions of experience, never be-ing, as it were, but rather always in a process of becoming. Process or change is not accidental to Whiteheadean entities; it is what nature or reality is made of. Incidentally, Arendt’s observations about the modern conception of nature as process were directly influenced by Whitehead (Arendt 1998, 296 n.61; 2006a, 62).

detection and articulation of the “many participants [that] are gathered in a thing to make it exist and to maintain its existence” (246). Hence Latour assimilates the bifurcation of nature into primary and secondary qualities to the distinction between what we have in common (we are all equally made up of atoms and genes) and the qualities that divides us “because they refer to the specifics of our psyche, our languages, our cultures, or our paradigms” (Latour 2004a, 47) so as to call attention to the dispossession of politics that operates in the modern Constitution. In positing a reality that is always in a process of becoming, Whitehead’s philosophy helps us realize that “all objects are born things”; that new things, relations, and events are always arriving as issues that affect and are felt rather than cognized and known in the modernist sense; that “all matters of fact require, in order to exist, a bewildering variety of matters of concern” (Latour 2004b, 247).

Secondly, Whitehead’s philosophy also stands as a major inspiration for Latour’s formula of ‘matters of *concern*.’¹⁴⁷ In his Presidential Address to the Eastern Division of the American Philosophical Association of 1931, later published as the essay “Objects and Subjects,” Whitehead set out to overcome the conflation of subject-object relations and knower-known relations he saw as part and parcel of seventeenth- and eighteenth-century philosophy (Whitehead 1967). He observed that, as distinguished from the “conscious discrimination” that belongs to the cognitive relation between a knower and a known object, “[the] basis of experience is emotional.” “The basic fact” of experience, he stressed, “is the rise of *an affective tone originating from things whose relevance is given*” (176, my emphasis). Whitehead adopted the word ‘concern’ from Quaker usage—where it conveys the idea of a weight upon the spirit—

¹⁴⁷I owe this observation about the Whiteheadian provenance of Latour’s ‘matters of concern’ to Kirstie McClure.

in order to express the fundamental structure of experience as one that is “divested of any suggestion of knowledge” (176). Thus, “the occasion as subject has a ‘concern’ for the object. And the ‘concern’ at once places the object as a component in the experience of the subject, with an affective tone drawn from this object and directed towards it” (Whitehead 1962, 176).¹⁴⁸ When something concerns us we feel compelled to respond and engage it; we open ourselves to it in an *affective* way. ‘Objects’ affect us not in terms of cognition (‘matters of fact’ or things that are *known*) but of experiential-emotional engagement (‘matters of concern’ or things that are *felt*). Only the latter clears the path for a close empirical examination of those attachments and the gatherings they enact, as well as for the task of composition of the common world that we will see is at the center of Latour’s redefinition of politics. As his Archimedean motto reads: “Give me one matter of concern and I will show you the whole earth and heavens that have to be gathered to hold it firmly in place” (Latour 2004b, 246).

With Whitehead’s assistance, then, Latour’s notion of matters of concern replaces the object/subject dichotomy and dissolves the fact/value distinction so deeply engrained in our modernist bifurcation of nature into primary and secondary qualities.

In order not to misunderstand this move, it is important to realize that Latour is not proposing that we get rid of matters of fact and *replace* them with matters of concern. His argument is more complex and subtle. He makes a passing reference to Heidegger’s analysis of the ancient etymology of the word *thing* or *Ding*. Whereas we usually use the term *thing* to

¹⁴⁸ Or as he put it in *Modes of Thought*: “each occasion [of experience] is an activity of concern, in the Quaker sense of that term. It is the conjunction of transcendence and immanence. The occasion is concerned, in the way of feeling and aim, with things that in their own essence lie beyond it; although these things in their present functions are factors in the concern of that occasion. Thus each occasion, although engaged in its own immediate self-realization, is concerned with the universe” (Whitehead 1968, 167).

denote a matter of fact, in all the European languages the word originally designated an archaic, quasi-judiciary assembly or *gathering*.¹⁴⁹ Latour is thus moved by the fact that “the banal term we use for designating what is out there, unquestionably, a thing, what lies out of any dispute, out of language, is also the oldest word we all have used to designate the oldest of the sites in which our ancestors did their dealing and tried to settle their disputes.” Importantly, after concluding that “the same word *thing* designates matters of fact and matters of concern” (Latour 2004b, 233), Latour takes issue with Heidegger’s distinction between object (*Gegenstand*) and thing (*Ding*) in his famous analysis of the handmade jug (Heidegger 1971). He perversely asks: Why not put a can of Coke in the solemn company of the jug? Whereas for Heidegger the former would always remain “abandoned to the empty mastery of science and technology,” the handmade jug, “cradled in the respectful idiom of art, craftsmanship, and poetry, could deploy and gather its rich set of connections” (Latour 2004b, 233). In a brilliant gesture, Latour proposes to democratize the use of the “powerful vocabulary” Heidegger employs in his portrayal of the jug: “What would happen, I wonder, if we tried to talk about the object of science and technology, the *Gegenstand*, as if it had the rich and complicated qualities of the celebrated *Thing*? ... Heidegger’s mistake is not to have treated the jug too well, but to have traced a dichotomy between *Gegenstand* and *Thing* that was justified by nothing except the crassest of prejudices” (233-234).

On the basis of the preceding examination it is easier to understand why Latour complains that the *res-publica* so dear to political philosophy has always been strangely devoid

¹⁴⁹ “Icelanders boast of having the oldest Parliament, which they call *Althing*, and you can still visit in many Scandinavian countries assembly places that are designated by the word *Ding* or *Thing*” (Latour 2004b, 233).

of the things (*rei*) that the very word names, “the matters that matter, the *res* that creates a public around it” (Latour 2005a, 16). “From Hobbes to Rawls, from Rousseau to Habermas, many procedures have been devised to assemble the relevant parties, to authorize them to contract, to check their degree of representativity, to discover the ideal speech conditions, to detect the legitimate closure, to write the good constitution. But when it comes down to what is at issue, namely the object of concern that brings them together, not a word is uttered” (15-16).

Also in contrast to conventional accounts in political theory, and importantly from the political perspective I am pursuing, a *Thing* is an issue that brings people together *not because they agree* on what the issue itself is, but precisely because *it divides them*. In a passage that bears some remarkable affinity to Rancière’s political theorization of the political community as divided community, Latour writes:

We don’t assemble because we agree, look alike, feel good, are socially compatible or wish to fuse together but because we are brought by divisive matters of concern into some neutral, isolated place in order to come to some sort of provisional makeshift (dis)agreement. If the *Ding* designates both those who assemble because they are concerned as well as what causes their concerns and divisions, it should become the center of our attention: Back to Things! Is this not a more engaging political slogan? (13)

Having examined the uncertainties produced by the contemporary proliferation of hybrids and matters of concern, let us turn now to Latour’s position in his *Politics of Nature*, where he articulates the new arrangements necessary if we are going to “slow down, reorient and regulate the proliferation of monsters by representing their existence officially” (Latour 1993, 12).

‘Cosmopolitics’ and the ‘Parliament of Things’

Latour outlines his alternative to the participatory turn and the attempt of other STS scholars “to bring science and technology back to the arenas of ‘politics as usual’” by taking the construction metaphor of STS to a metaphysical level that is at once speculative *and* rooted in contemporary experience, an approach he dubs ‘experimental metaphysics.’¹⁵⁰ He acknowledges that the breakthrough of STS was the discovery that science and technology are ‘political.’ He rejects, however, the idea that these are political in the usual sense of the term (elections, votes, deliberation, decision-making, etc.). His radical redefinition of politics can be accomplished once we learn to ‘see through’ matters of fact into the variegated matters of concern that complicate any hasty composition of our hybrid collective. We need to attune our sensibility and conceptual resources so as to see what agitates, troubles, and provokes speech (Latour 2004a, 103) in the very things we have hitherto seen as standing apart, shutting up dissenting voices, and canceling out politics.

¹⁵⁰ In the Glossary of terms attached to *Politics of Nature* Latour defines ‘experimental metaphysics’ as “the search for what makes up the common world” (Latour 2004a, 242), in opposition to traditional metaphysics, which avowedly comes ‘after’ (meta-) physics and knowledge about nature, prematurely assuming as settled precisely that which needs to be explored. For an insightful exposition of Latour’s metaphysics, see Harman (2009).

The notion at the center of *Politics of Nature*, a book meant largely as an intervention in contemporary debates about ecologism and climate change, is ‘political ecology.’¹⁵¹ Latourean political ecology is characterized by the abandonment of the recourse to Nature through which moderns have short-circuited the task of composition. This includes the ecology movement itself, as it has developed over the last three decades or so, which Latour sees as entrapped in a conceptual confusion about its own practice; for “*under the pretext of protecting nature, the ecology movements have also retained the conception of nature that makes their political struggle hopeless. ... Thus we have every right, in the curious case of political ecology, to speak of a growing divorce between its burgeoning practice and its theory about that practice*” (Latour

¹⁵¹ In other works Latour uses the term ‘cosmopolitics,’ following the work of Isabelle Stengers (2005; 2010; 2011), the philosopher who originally used the expression in the metaphysical sense of a ‘politics of the cosmos,’ as opposed to the more conventional (i.e. Kantian or Habermasian) notion of cosmopolitanism, which has also been the target of Latourean critique (Latour 2004c). Thus, in a famous article from 2004 Latour takes issue with Ulrich Beck’s cosmopolitan manifesto (Beck 1998). “Beck takes his key term [‘cosmopolitanism’] and its definition, off the shelf, from the Stoics and Kant. Those definitions (Beck’s, Kant’s, the Stoics’) are problematic: none shows understanding that the cosmos itself is at stake” (Latour 2004c, 453). The problem with this tradition, according to Latour, is that it assumes the existence of a single, unproblematic nature or ‘cosmos’; as it were, indeed, a matter of fact. Thus, for Beck “nature, the world, the cosmos, is simply there; and since humans share basic characteristics, our view of the world is, at baseline, the same everywhere” (453). From such a perspective, “wars rage because human cultures have (and defend) differing views of the same world. If those views could be reconciled or shown to differ only superficially, peace would follow automatically” (454). The maladies of multiculturalism could then be resolved by reference to a ‘mononaturalism’ on which everybody agree. Instead, Latour follows a constructivist path geared towards the well-ordered composition of that cosmos which is anything but singular, unified, and transparent. In his phrasing: “It is possible—and from a Western (from my Burgundian) point of view, desirable—that, in the distant future, we come to live within a common world defined as naturalism defines it. But to behave as if the settlement were already in place and as though it requires no negotiation to achieve it is a sure trigger to further warfare” (458). Hence Latour would return the term ‘cosmos’ back to its “Greek meaning—‘arrangement,’ ‘harmony’” and join this to its meaning in the modern tradition as “world” to mark “*the good common world*” he thinks possible (Latour 2004a, 239-240, my emphasis). ‘Cosmopolitics’ receives only a handful of mentions in *Politics of Nature*: in Latour’s acknowledgment of his debt to Isabelle Stengers, whose *Cosmopolitics* he confesses to have “shamelessly looted” (Latour 2004a, viii); in passing in page 193; and in the Glossary of terms, where it is defined in the same entry along with the term ‘cosmos’ (238-239).

2004a, 19, original emphasis).¹⁵² Whereas the ideology of the ecological movements insists on the unity and purity of nature, in practice “ecology dissolves nature’s contours and redistributes its agents” (20). Political ecology, in this sense, “does not shift attention from the human pole to the pole of nature” like conventional ecological discourses do. It is rather directed at matter of concern: “it shifts from *certainty* about the production of risk-free objects ... to *uncertainty* about the relations whose unintended consequences threaten to disrupt all orderings, all plans, all impacts” (Latour 2004a, 25). So when Latour proposes to introduce “a distinction between the practice of ecology movements over thirty years or so, and the theory of that militant practice” (Latour 2004a, 19), what he has in mind as a viable substitute for the latter in the quest for thinking what we are doing—the discipline that can help us “reinvent shared forms of public life” (Latour 2004a, 18)— is the discipline of science studies. Acknowledging its esoteric and arcane status, Latour claims that his field can nevertheless “help us define a future common sense... if we combine it with the immense social movement of political ecology, which it will unexpectedly clarify” (18). To the doings of technoscience, then, we must now add the doings of political actors. And it is to the composite articulation of these (and other) forms of agency that Latour devotes a significant part of his *Politics of Nature*.

Here we are particularly interested in Latour’s cosmopolitical ‘Parliament of Things’ and his ambitious outline of the ‘due process’ required for bringing the collective of humans and non-humans into a ‘common world.’ This conceptual metaphor, however, is only one aspect, albeit a

¹⁵² Latour’s judgment about the theorists of the ecology movement is indeed harsh: “Their efforts are obviously desperate ones, because these theorists end up quenching the fire of democracy that they had sought to revive, by further humiliating humans through a still more indisputable recourse to the real truth of the natural order. The gulf between theory and militant practice explains the slenderness of ecology’s contributions to the common philosophy of politics and sciences” (Latour 2004a, 129).

fundamental one, of the overall argument of *Politics of Nature*. In order to avoid misunderstandings we need to grasp the book's general purpose in broad strokes before examining the particulars of the new 'Constitution' he envisions.

Latour's goal in *Politics of Nature* is to bring to fruition in a systematic way the reconceptualization of the triad nature-science-politics he has been attempting at least since *We Have Never Been Modern* (Latour 1993), and which has been further refined with his engagement with Dewey and Whitehead, among others. The book, he declares, "is a work of political philosophy of nature or political epistemology. It asks what we can do with political ecology" (Latour 2004a, 231), a question whose answer hinges on the relationships that obtain between nature, science, and politics once they have all been thoroughly recast. In particular, it is on the basis of the already achieved redefinition of *science* in ANT that Latour is able to deal with the other two terms, for the rejection of the divide between nature and politics is premised on Latour's prior debunking of the modernist account of science which enacted that divide, and its replacement with the view of technoscientific production and agency we examined in chapter 2. What holds together Latour's theoretical edifice, indeed, is the substitution of 'the sciences'—with their myriad ways of hybridizing humans and nonhumans— for the 'Science' that posits a unified and purified Nature as the mute silencer or 'savior' of human public life. We should free nonhuman things from the false necessities that the all encompassing notion of a transcendent 'Nature' brings with it, and restore to each one of them (rivers, animals, genes, no less than technical artifacts) their specific historicity and modes of agency. On the other hand, Latour

urges us “to abandon the politics of the Cave for politics defined by the progressive composition of the good common world” (235).¹⁵³

The Platonic reference expresses the new and more explicitly ‘political’ terms in which Latour modulates his critique of our modernist habits, extending the ‘modern parenthesis’ and its corresponding division between the world of facts accessed by science and the political forums of humans back to the beginning of Western thought. In a gesture that should resonate strongly to readers of Rancière, who also tends to see more continuity than rupture in the history of our philosophical habits, Latour reinterprets Plato’s famous allegory as the first expression of our stultifying modern Constitution, the first enactment of a double rupture or interruption that allows a certain idea of society and politics to serve as a foil for a certain idea of Science.

The Philosopher, and later the Scientist, have to free themselves of the tyranny of the social dimension, public life, politics, subjective feelings, popular agitation—in short, from the dark Cave—if they want to accede to truth. ... There exists no possible continuity between the world of human beings and access to truths ‘not made by human hands.’ ... But the myth also proposes a second shift: the Scientist, once equipped with laws not made by human hands that he has just contemplated because he has succeeded in freeing himself from the prison of the social world, can go back into the Cave so as to bring order to it with incontestable findings that will silence the endless chatter of the ignorant mob. Once again, there is no continuity between the henceforth irrefutable objective law and the human—all too human—logorrhea of the prisoners shackled in the shadows, who never know how to bring their interminable disputes to an end” (Latour 2004a, 10-11).

Today, we are told, the allegory of the cave serves the modern Constitution and its organization of public life into two discontinuous ‘houses.’ “The first house brings together the

¹⁵³ To avoid misunderstandings, in the Glossary Latour states that he uses the politics “in three senses that are distinguished by periphrasis”, the third of which we will address shortly: “a) in its usual meaning, the term designates the struggle and compromises between interests and human passions, in a realm separate from the preoccupations of nonhumans; in this sense, I use the expression “politics of the Cave*”; b) in the proper sense, the term designates the progressive composition of the common world* and all the competencies exercised by the collective; c) in the limited sense, I use the term to designate just one of the five skills necessary to the Constitution, the one that allows faithful representation by the activation—always to be repeated—of the relation between one and all” (Latour 2004a, 247).

totality of speaking humans, who find themselves with no power at all save that of being ignorant in common, or of agreeing by convention to create fictions devoid of any external reality. The second house is constituted exclusively of real objects that have the property of defining what exists but that lack the gift of speech” (Latour 2004a, 14). What holds this whole Constitution together, as Latour is quick to point out, is the power granted to scientific experts, who are the only ones who can move back and forth between the two houses; the only ones “endowed with the most fabulous political capacity ever invented: *They can make the mute world speak, tell the truth without being challenged, put an end to the interminable arguments through an incontestable form of authority that would stem from things themselves*” (14, emphasis in the original).¹⁵⁴

Recall that in reconceptualizing the triad nature-science-politics Latour believes himself to be thinking (anew) what we have been doing all along. “The double rupture of the Cave” as he swiftly claims, “is not based on any empirical investigation or observed phenomena; it is even contrary to common sense, to the daily practice of all scientists; and if it ever did exist, twenty-five centuries of sciences, laboratories, and scholarly institutions have long since done away with it” (Latour 2004a, 13). On the contrary, we have a situation in which “the problem of the apportionment between the common world and private worlds” is opening up:

¹⁵⁴ Also important in this plot is the role of philosophers and epistemologists as the patrollers of the division that empowers scientists and forces the inhabitants of the cage to choose “between the reality of the external world and the prison of the social world” (17). Latour’s name for them, in a sense not too distant from Rancière’s, is the ‘epistemology *police*.’ Its goal is “by no means to describe the sciences... but to short-circuit any and all questioning as to the nature of the complex bonds between the sciences and societies” (13). There is no use, then, in trying to escape the cave with the tools of traditional philosophy of science and epistemology, for these tools have been forged precisely to keep everybody inside. “Against the epistemology police,” Latour declares, “one must engage in politics, and certainly not epistemology” (17).

everywhere, every day, people are fighting over the very question of the good common world in which everyone—human and nonhuman—wants to live. Nothing and no one must come in to simplify, shorten, limit, or reduce the scope of this debate in advance by calmly asserting that the argument bears only on ‘representations that humans make of the world’ and not on the very essence of the phenomena in question. ... None of [the] members of the collective wants to have an ‘opinion’ that is personal and disputable ‘about’ an indisputable and universal nature. They all want to decide about the common world in which they live. Here ends the modernist parenthesis; here begins political ecology. (Latour 2004a, 129-130)

Latour, in other words, is prepared to take the collapse of the modernist bifurcation of nature and politics itself as a matter of fact. Rhetorically stressing the febleness of the modernist divides and conveying the relative ease with which these have been dismantled in his home field, Latour declares that “[t]he object of the present work is not to prove this small point from science studies, but to spell out its consequences for political philosophy" (17-18). Once we have exited the cave and closed the modernist parenthesis, we can begin to formulate the relevant political questions:

How can we conceive of a democracy that does not live under the constant threat of help that would come from Science? What would the public life of those who refuse to go into the Cave look like? What form would the sciences take if they were freed from the obligation to be of political service to Science? What properties would nature have if it no longer had the capacity to suspend public discussion?

In what follows I wish to focus on some of the answers Latour offers with the new, non-modern, Constitution he envisions, in particular the conceptual image¹⁵⁵ of a ‘Parliament of Things’ he employs to reconfigure the philosophical armory of the moderns.

Latour’s Parliament is meant to slow down, trace, reorient, and regulate the proliferation of hybrids by officially representing their existence *and* democratically finding their place in the

¹⁵⁵ The figure of the Parliament should not be taken literally: “We know perfectly well that we are not dealing with ordinary assemblies, with closed, concentrated spaces, but rather with flowing basins, as multiple as rivers, as dispersed as tributaries, as wild as the brooks on a map of France” (Latour 2004a, 165).

collective. The ‘citizens’ of this collective are ‘propositions’ (Latour 2004a, 141; 232), the name Latour prefers for entities or things in *Politics of Nature*. Neither subject nor object, the notion is used by Latour in “the metaphysical sense to designate not a being of the world or a linguistic form but an association of humans and nonhumans before it becomes a full-fledged member of the collective... Rather than being true or false, a proposition in this sense may be well or badly articulated” (Latour 2004a, 247). “To convene the collective,” Latour explains, “we shall thus no longer be interested in nature and society, but only in knowing whether the propositions that compose it are more or less well articulated” (82). It is this question of articulation that stands at the center of the Parliament of Things. We need to outline, according to Latour, the institutional *procedures* that make possible a democratic way of dealing with the hybrids of modern societies, so that things and not only humans have their existence officially represented.

Latour’s envisioned Parliament, depicted in Figure 1, consist of two chambers (2004, 91-127), each addressed to answering a specific question: “How many are we?” and “Can we live together?” (108). The ‘Upper House’ wields the ‘power to take into account,’ deciding which hybrids may become part of the collective, while the ‘Lower House’ possesses the ‘power to arrange in rank order,’ deciding how they will coexist with already incorporated entities (human and non-human). Each one of these two chambers is to solve two specific tasks, so that each ‘appellant’ hybrid or ‘proposition’ has to undergo four phases or ‘trials’ in order to be included in the collective. These correspond to the four requirements (109) that according to Latour allow the collective to proceed according to ‘due process.’

OLD BICAMERALISM

	House of Nature <i>Facts</i>	House of Society <i>Values</i>
First house: taking into account	Perplexity 1	Consultation 2
Second house: arranging in rank order	Institution 4	Hierarchy 3

NEW BICAMERALISM

Figure 1: “After a ninety-degree reversal, the fact-value distinction becomes the distinction between the powers of taking into account and the powers of arranging in rank order” (Latour 2004a, 115).

The first requirement, which Latour says was formerly contained in the notion of ‘facts’ reads as follows (109): “You shall not simplify the number of propositions to be taken into account in the discussion.” This is the requirement of ‘perplexity.’ The second function of ‘consultation’ was hitherto contained in the concept of value: “You shall make sure that the number of voices that participate in the articulation of propositions is not arbitrarily short-circuited.” These two requirements make up the Upper House’s ‘power to take into account’. The ‘power to arrange in rank order’ corresponds to the Lower House and hinges around the two remaining functions: ‘hierarchization’ and ‘institution.’ According to the former, also previously contained in the notion of value, “You shall discuss the compatibility of new propositions with those which are already instituted, in such a way as to maintain them all in the same common

world that will give them their legitimate place.” ‘Institution,’ formerly contained in the concept of fact, reads as follows: “Once the propositions have been instituted, you shall no longer question their legitimate presence at the heart of collective life.”

Thus, ‘perplexity’ is about the active search for new entities in the surrounding world of the collective (which Latour calls ‘external reality’), many of which, like GMO’s, are potentially risky. ‘Consultation’ allows as many ‘spokespersons’ as possible to articulate the new hybrids in terms of their importance for the collective. Whereas traditionally the first requirement has been associated to the sciences and the second to politics, Latour’s point is that both tasks have to be confronted and solved in the same chamber, that is, by a single experimental *and* political endeavor. The requirement of ‘hierarchy’ names the process in which different representatives of the collective publicly discuss and negotiate the effects that the new appellant proposition is expected to have in the collective. Closure can come in one of two forms, either with the ‘institution’ of the hybrid in question in a new *cosmos*, or with its rejection and externalization. In Latour’s parliament of things, however, excluded entities can always have their claim to existence re-evaluated: “In the new Constitution, what has been externalized can *appeal* and come back to knock at the door of the collective to demand that it be taken into account—at the

price, of course, of modifications in the list of entities present, new negotiations, and *a new definition of the outside*” (125).¹⁵⁶

To these two powers and four tasks or functions Latours adds two further functions—‘separation of powers’ and ‘scenarization.’ Whereas the old Constitution was based on the fact/value opposition, the collective shall now be based on a new ‘differentiating principle’: the distinction between the power to take into account and the power to put in order. Although the whole construction is meant for the Parliament to connect the two questions of ‘how many are we?’ and ‘can we live together?’ a confusion between the two powers has to be avoided in order to impede a relapsing to the fact/value distinction. The issue is not about the necessity of a ‘border police’ like the one that patrolled the boundary between nature and society. The image Latour provides is that of a shuttle that connects the two houses while keeping them separate.¹⁵⁷ ‘Scenarization,’ on the other hand, “amounts to defining the border between inside and outside; but instead of starting from an already-constituted unity (nature or society), the various skills (of the sciences, politics, government, and so on) propose scenarios of unification that are all provisional and that the reconsideration of the collective will quickly make obsolete” (248-249).

¹⁵⁶ The case of AIDS-treatment activism in the US can be interpreted in light of Latour’s ‘Parliament of Things’ (Latour 2004a) and his Deweyan theorization of ‘publics.’ In fact, all the tasks he assigns to the cosmopolitical composition of “the good common world” (Latour 2004a, 240) have been present in the AIDS forum. As a result, modernist distinctions between facts and norms, humans and non-humans, would seem to have been undermined. Thus, given the uncertainty about the nature of a new human retrovirus, the number of ‘propositions’ taken into account had not been simplified (requirement of *perplexity*); as concerned groups advanced their claims, the number of participating voices in the articulation of those ‘propositions’ had not been short-circuited (*consultation*); the requirement of *hierarchization* was also met as the compatibility of new propositions (for instance, concerning more flexible clinical trials) with those already instituted (such as controlled randomization as the orthodox standard) was hotly debated; and finally laypeople had secured their participation in the production of medical knowledge about treatment, as demanded by Latour’s requirement of *institution*.

¹⁵⁷ “It is enough,” writes Latour, “simply that the discussion about the common world not be constantly interrupted by the discussion about the candidates for existence, and that discussion of the new entities not be constantly suspended on the pretext that one does not yet know to what common world they belong” (Latour 2004a, 116)

We shall have occasion to return to this important notion of provisional closure towards the end of this section.

In this new Parliament of Things no expertise enjoys a monopoly on solving any of the four tasks required for the composition of the ‘good common world.’ Latour’s four requirements are thus collective challenges. Scientists, politicians, moralists, and economists all have to contribute to each of the six tasks. Indeed, when Latour sets out to redefine each of these ‘professions’ (Latour 2004a, 136-161) his focus is not on the conventional, routine-like sense of a rigid role, but on the *skills* that the collective requires for handling its tasks and the contributions that “existing callings” can make to fulfilment of those tasks. Each one, in other words, brings *different* skills to bear on the *same* six functions of perplexity, consultation, hierarchy, institutionalization, separation of powers, and scenarization.

Latour has many interesting things to say about these callings, but here we can only briefly examine the two that bear more directly on the political meaning of Latour’s envisioned conceptual architecture, namely ‘politicians’ and ‘moralists.’ The former “do not exercise their skill on a separate domain of reality—the social world, values, power relations” (Latour 2004a, 143-144), because they are attached to the same propositions or imbroglios of humans and nonhumans we find in scientists’ laboratories. To the requirement of perplexity politicians contribute with their special ‘sense of danger’ and ability to detect the multitude of excluded entities that return to appeal and trouble the collective. Without this skill the work of the Parliament would stagnate and fail to resume periodically the work of composition. The second skill of politicians, which assists in consultation, is what Latour calls the ‘production of voices’: the formation of “concerned parties, reliable witnesses, opinionated stakeholders” (144), a process that according to Latour involves the “metamorphosis of enraged or stifled voices into a

single voice” (148).¹⁵⁸ As for hierarchy, “their principal competence, the one that even the most imaginative scientists cannot emulate, comes from their aptitude to *compromise*” (145), that is, their capacity to “*modify those whose opinions [spokespersons] are supposed to represent faithfully*” (146).¹⁵⁹ In a Schmittian turn of sorts, Latour claims that since the collective cannot comprise everything, the ability of politicians to ‘make enemies’ is indispensable for the task of institution whereby certain propositions are excluded from the collective until the next round of composition.

In relation to the two additional functions mentioned before, politicians have always been adept at separating powers. This time, however, the separation is about distinguishing the phases of ‘deliberation’ and ‘decision.’ Thus, “[t]he first house is going to look to [politicians] like the *precinct of freedom*—where people inquire, speak, consult—and the second like the space *where necessity is forged*—where one establishes hierarchies, chooses, concludes, and eliminates” (Latour 2004a, 147). Finally, the competency of politicians that is “the most decisive and that has been neglected the longest” is the one bearing on composition and the provisional scenarizations with which politicians achieve a *provisional* unity of the collective. In an argument that places his politics at a remarkable distance from a Rancièrian notion of police regimes, Latour emphasizes the impossibility of a final suture of the collective and the importance of understanding composition as a *process* that is always resuming its work at the

¹⁵⁸ The resonance with Rancière’s distinction between *logos* and *phoné* is remarkable: “this production of voices is not going to create a big ruckus, but will instead bring together an assembly that is already more credible, more serious, more authorized” (145). Latour asks rhetorically: Is the basic job of politicians not to create out of the whole cloth voices that stammer, that protest, that express opinions? Is this not what explains their ceaseless coming and going, their constant alertness, their ever-renewed resumption, their uninterrupted worry, their speech impedimenta?” (Latour 2004a, 145)

¹⁵⁹ Without acknowledging it, though probably familiar with it, Latour is here recasting the debate between the Madisonian or delegative model of the political representative and the trustee model famously upheld by Edmund Burke (see Pitkin 1967).

very moment it would be taken as completed. Politicians, in other words, are essential for securing the progressive character of composition. They

do not hope to fall, by an unanticipated stroke of luck, on an already-constituted ‘whole,’ or even to compose once and for all an ‘us’ that would no longer need to be reconsidered. They expect the outline of the borders of the collective to come from nothing but the very movement of incessant resumption, rather like the way burning brands trace shapes in the darkness of night only through the rapid motion to which we subject them” (147-148).

The counterpoint with the figure of the moralist is interesting.¹⁶⁰ The skill of moralists is to maintain the collective’s responsiveness to externalized entities by refusing to accept as final a closure of the collective that will always be based on the treatment of certain hybrids as simple means. Moralists are important because “they know that everything that will be done well will necessarily be done badly, and as a result will have to be done over again right away” (156). Moralists, in other words, are going to make it very difficult to accomplish the tasks of perplexity, institution, and scenarization without discussion, making sure that insignificance is never a final condition of hybrids; they “are going to equip the entities that have been set aside with the *right to appeal*” (156). Without moralists, ‘enemies’ would be forever externalized and the collective would learn by painful experience that excluded entities might later reenter the collective “in the form of friends, included parties, and potential allies” (157). Thus, in another passage that echoes Rancière’s notion of the *demos* as the supplement that comes to throw the counting of police orders into disarray, Latour declares that “[f]or the moralists, we can never

¹⁶⁰ Morality, says Latour, can be defined as “*uncertainty* about the proper relation between means and ends,” albeit extending Kant’s dictum ‘not to treat human beings simply as means but always also as ends’ to nonhumans. Latour attributes the uncertainties surrounding the proliferation of hybrids in what Callon would call ‘hot situations,’ including ecological crises, to “*generalized revolts of the means*: no entity—whale, river, climate, earthworm, tree, calf, cow, pig, brood—agrees any longer to be treated ‘simply as a means’ but insists on being treated ‘always also as an end’” (Latour 2004a, 155-156).

call it quits. With them, the collective is always trembling because it has left outside all that it needed to take into account to define itself as a common world” (Latour 2004a, 158).

After laying out the essentials of the blueprint for the Parliament of Things, Latour introduces a third power in the context of a discussion of the State: the ‘power to follow up.’ With this he introduces the importance of having “a sort of ‘quality control’ on the ‘traceability’ of the procedures” (Latour 2004a, 270, n. 32). To govern, according to Latour, is to trace, register, and document the learning process of the collective, without which the resumption of exploration and experimentation would be impossible. Latour proposes the figure of the administrator or bureaucrat as the one in charge of tracing the quality of procedures. “We need not political science but science policy,” writes Latour, “that is, a function that makes it possible to characterize the relative fruitfulness of collective experiments, without its being monopolized right away by either scientists or politicians” (202). The State is not the collective, but something we could characterize as a remembrance device that makes it possible to learn from past mistakes and anticipate future scenarios, making the work of composition a truly progressive one, as opposed to one that moves in circles.

Latour presents the Kyoto conference of 1997 as an empirical instance made symbolic of his argument. In this case, he argues,

there was just one conclave to welcome the great figures of this world, princes, lobbyists, heads of state, captains of industry, scientists and researchers from every discipline, and to decide in common how the planet was faring and how we should all behave toward it from now on to preserve the quality of our sky. Yet the Kyoto conference did not settle for bringing together the two ancient assemblies, one for politicians and one for scientists, in a third house that would be bigger, broader, more organic, more synthetic, more holistic, and more complex. No, politicians and scientists, industrialists and militants found themselves on the benches of the same assembly without being able to count any longer on the ancient advantages of salvation from the outside by Science... We have gone from two houses to a single collective. Politics has

to get back to work without the transcendence of nature: here is the historical phenomenon that we are forcing ourselves to comprehend. (Latour 2004a, 56)

Although the details of Latour's exposition are rich, we already have a general outlook of his Parliament and of the physiognomy of the 'construction site' that the practice of political ecology has been inadvertently setting up. Let us turn now to Michel Callon and his colleagues and their kindred theorization of what we have been doing politically to confront the challenge of technoscience.

Hybrid Forums and the Reinvention of Democracy

In *Acting in an Uncertain World: an Essay on Technical Democracy*, published in French in 2001, Michel Callon, Pierre Lascoumes and Yannick Barthe (Callon et al. 2009) set out to outline a concept of 'dialogic democracy' by way of contrast to what they call 'delegative democracy,' a notion broadly corresponding to contemporary liberal constitutional arrangements, and the accompanying 'social contract for science' (Jasanoff 2003). Similarly to Latour, whose cosmopolitical speculations are rooted in what *actors* have been doing (what he calls the 'practice of political ecology'), Callon *et al.* do not make a sort of *de novo* proposal for a new articulation of our political regimes. Instead, they basically trace what can be described as the invention of a *new form of democracy* in its scattered, singular, and increasingly frequent instantiations in the 'hybrid forums' that have emerged over the last three decades or so. The practices of 'lay' involvement in the co-production of scientific knowledge that sometimes take place in hot situations are now examined in tandem with different (and sometimes related) innovations in the way societies deal with the emergence of new social identities. The *contingent*

relationships between these two dimensions of innovation—people’s engagement in the exploration of technical issues and public recognition and accommodation of emergent identities—is essential to grasp what is at stake in the invention of ‘dialogic democracy.’ In most cases actors have been engaged, more or less intensely, in only one of these two dimensions. I will argue that the really interesting cases, politically speaking, are those hybrid forums—like AIDS treatment activism—that combine and mutually articulate the appearance of issues and emerging groups, of new objects and new subjects.

In hot situations, according to Callon *et al.*, we confront two basic uncertainties: “those concerning our knowledge of the world, and those affecting the composition of the collective” (Callon *et al.* 2009, 119). Instead of facilitating the *exploration* of those uncertainties and the search for possible answers, the authors argue, our current democratic arrangements hinder it. This is because our liberal regimes are based on two ‘breaks’ or divides: one that isolates scientists from the rest of society, and a second that separates political representatives and ordinary citizens. Each divide yields a particular form of ‘delegation.’ The first one is enacted in the ‘social contract’ between science and the state, whereby society delegates to scientists the task of producing certified knowledge in sheltered settings. Callon *et al.* call this model of scientists shut down in their laboratories, autonomous and well funded, ‘secluded research.’ “The main ambition of this first delegation,” they write echoing Rancière, “is to avoid the confusion of roles” (Callon *et al.* 2009, 120). The second delegation is the one known to political scientists whereby elected officials and lawmakers are endowed with the power to make collectively binding decisions.

In their own modulation of ANT's problematization of the modernist bifurcation between science and politics, then, the authors single out laboratories and parliaments as the two isolated places in which the double exploration of the world and the collective has mostly been conducted. Hence, on the one hand, by "delegating the production of knowledge to specialists, who are granted an almost exclusive monopoly moreover, delegative democracy purges political debate of all uncertainty regarding possible states of the world." On the other, "by constituting itself as a political body made up of individuals (citizens) endowed with a will and definite known preferences, delegatory democracy excludes all uncertainty on the composition of the collective, since the latter is reduced to the aggregation of individual wills which are supposed to be perfectly conscious of themselves" (121).

Significantly, the figures and roles, and their police-patrolled divisions—whose contingency and arbitrariness Rancière has been so keen at exposing—are a product of these historically situated delegations:

[This division] is the very movement of delegation—whether that by which laypersons leave the production of knowledge to specialists, or that by which ordinary citizens entrust their representatives with the task of composing the collective in their name—that leads to the existence of *both* the layperson *and* the ordinary citizen, and with them, as their corollaries, *both* 'the' specialist *and* 'the' representative. This double removal confines debate on the state of knowledge to professional researchers and debate on the composition of the collective to spokespersons who tend to take over the voice of those they represent (Callon *et al.* 2009, 121).

"The definition of the common world," they write, almost as if they had Rancière in mind, "cannot be left to spokespersons who are no longer in tune with *the moving reality of the demos*" (Callon *et al.* 2009, 118). Hybrid forums "demonstrate in practice... a desire for public debate, a demand that groups which are ignored, excluded, and often reduced to silence, or

whose voice is disqualified, have the right to express themselves, to be heard, to be listened to, and to take part in the discussion” (Callon *et al.* 2009, 118). But if Rancière emphasizes the sensible distribution of these positions and speech entitlements, Callon *et al.* are concerned above all with the inadequacy of these arrangements (their version, as it were, of Latour’s modern Constitution) for the experimental exploration of states of the world and of the collective’s composition. In these authors we witness a focus on collective learning, and a pragmatist notion of democracy as inquiry that is not present in Rancière.

Also echoing Rancière’s view that politics is not a replacement of the police, but rather depends on the given police configurations it comes to disrupt, the hybrid forums where the double exploration has been attempted are not portrayed by the authors as a substitute for parliaments and laboratories. Dialogic democracy is theorized as a complement to existing arrangements. Unlike the ‘otherwiseness,’ as it were, of Latour’s approximation to politics, whose ambitious metaphysical adventures urge us to abandon old words and categories in favor of new or completely refashioned concepts, Callon and his colleagues tend to uphold a language familiar to political theorists. They are not after a wholesale reconfiguration of our conventional ways of doing politics; rather, their concern—very much in line with my own position—pertains to the possibilities of displacing the best insights of our democratic conceptualizations and putting them to work in the realm of technoscientific controversies.

The two uncertainties faced by contemporary democracy, those concerning the current state of our knowledge of the world and those bearing on the composition of the collective, are presented separately by the authors. Indeed, each one yields a different ‘axis’ comprising the possible (i.e., already existing) and qualitatively distinguishable ‘modalities’ that these two

explorations can assume. I will first examine these two dimensions before addressing the crucial question of their convergence, of the way in which collective research about nature and world (hitherto confined to the secluded practices of the laboratory) and the articulation of identities in the collective (hitherto restricted to the aggregative mechanisms of representative politics) mutually reinforce each other to draw the emerging space of dialogic democracy.

Callon *et al.* mark the “the different modalities of exploration of possible worlds relative to the degree of collaboration between secluded research and research in the wild” (Callon *et al.* 2009, 125) in a *horizontal* axis, as depicted in Figure 2. As we move rightward away from the non-cooperative “Secluded Research” of scientific laboratories, there are at least three different ‘values’ or possible forms of “Cooperation Between Secluded Research and Research in the Wild.” Each modality hosts interactions of increasing intensity and depth between scientists and laypeople, the two populations separated by the first divide of delegative democracy. In the first modality, interaction is minimal: “laypersons are content to wait for researchers outside the doors of the laboratories in order to convince them to work with them on the adaptation of their knowledge and techniques” to local particularities. In the second, laypersons “insert the laboratory in a wider collective, introducing new skills and working out a place of their own within it.” In the third modality, “identification and formalization of problems,” lay intervention in the organization of research dialogue moves upstream to begin earlier, “even before the researchers close the doors of their laboratory” (125). In this schema, the lay-expert divide is

dissolved into various modalities of relation between the two, such that “it is clearly more correct to speak of secluded researchers and researchers in the wild” (125).¹⁶¹

In this sense, and again aligned with a central Rancièrian trope, the authors seem to be suggesting that *everybody can be a researcher*, ‘laypersons’ and ‘scientists’ alike.¹⁶² Although Callon *et al.* pay no attention to the political question of equality, there is in their work a markedly egalitarian thrust whose implications for the disruption of police regimes that the authors, however, do not spell out. Furthermore, the movement rightward along the axis of possible modalities of exploration of world and nature brings with it a change in “the relative definition of the local and the universal” (Callon *et al.* 2009, 126) that resonates strongly with Rancièrè’s account of singular universals. Earlier in the book (Chapter 2), we learn about the

¹⁶¹ What we have as we move rightward in this first axis are three simultaneous “transformations ... in the regime of the production of knowledge.” First we have one concerning the “intensity and depth of the cooperation between secluded research and research in the wild” (Callon *et al.* 2009, 125-126). Secondly, the kind of research “cut off from the world of laypersons” that we witnessed in the science imposed upon Cumbrian sheep-farmers gives way to “forms of organization that establish increasingly close associations, and at increasingly early stages, between researchers in the wild and secluded research” (126). Thirdly, “we pass from a configuration in which scientific uncertainties are managed by the specialists (whom one asks to come back with certainties), to configurations that grant increasing importance to research in the wild” (126). Callon *et al.* importantly refer to the movement along these lines as “a change of regime, a qualitative mutation” (126). On the left, “research in the wild is denied,” but as we move to the right “it is recognized in the same way as secluded research.” In speaking of ‘research’ the authors mean to distinguish the way knowledge is produced in ‘hot situations’ from ‘science,’ that is, ‘cold’ knowledge that has achieved closure (as in Latour’s blackboxes), or which can be safely reopened in order to “clarify, complete, enrich, or amend knowledge that has already been disputed and validated” (126).

¹⁶² This democratization of knowledge production is not founded on a relativist debunking of scientific knowledge, as hardcore science warriors would be led to assume, but precisely on its wilful embracement, albeit under a guise different from the one we have grown used to as a result of the first delegation. According to Callon and colleagues, indeed, a “double recognition” is required once we adopt the term ‘secluded research’ and learn to distinguish between “science in the making” and “completed” or “made science.” On the one hand, the authors stress the “recognition of the *crucial role of research*, which precedes science, and recognition of the *specialized, esoteric, and therefore amendable* character of the forms of knowledge that result from it” (Callon *et al.* 2009, 126, my emphasis) Furthermore, we need to recognize that “what counts in science are not so much the final certainties” as the explicit acknowledgment of “the *path* followed in order to overcome uncertainties” (126). Importantly, then, and notwithstanding the differences in scope and scale of their projects, this double recognition evinces the affinity between the *processual* character of the exploration of common worlds and Latour’s approach.

“paradoxical” relation between the universal character attained by certified or completed knowledge and the “hyper-localization in time and space” involved in the extremely secluded laboratory conditions where that knowledge is produced. By contrast, the “maximum collaboration between secluded research and research in the wild” afforded by the different modalities of cooperation is “entirely aimed at the production of knowledge whose generality is nourished by the consideration of idiosyncracies and local specificities.” The authors highlight a “reversal of priorities” with respect to the paradoxical character of secluded research: “what matters is not the construction of a universal by standardization, and so by the elimination of local specificities, but the construction of a universal through the recognition and successive reorganizations of these specificities” (127).

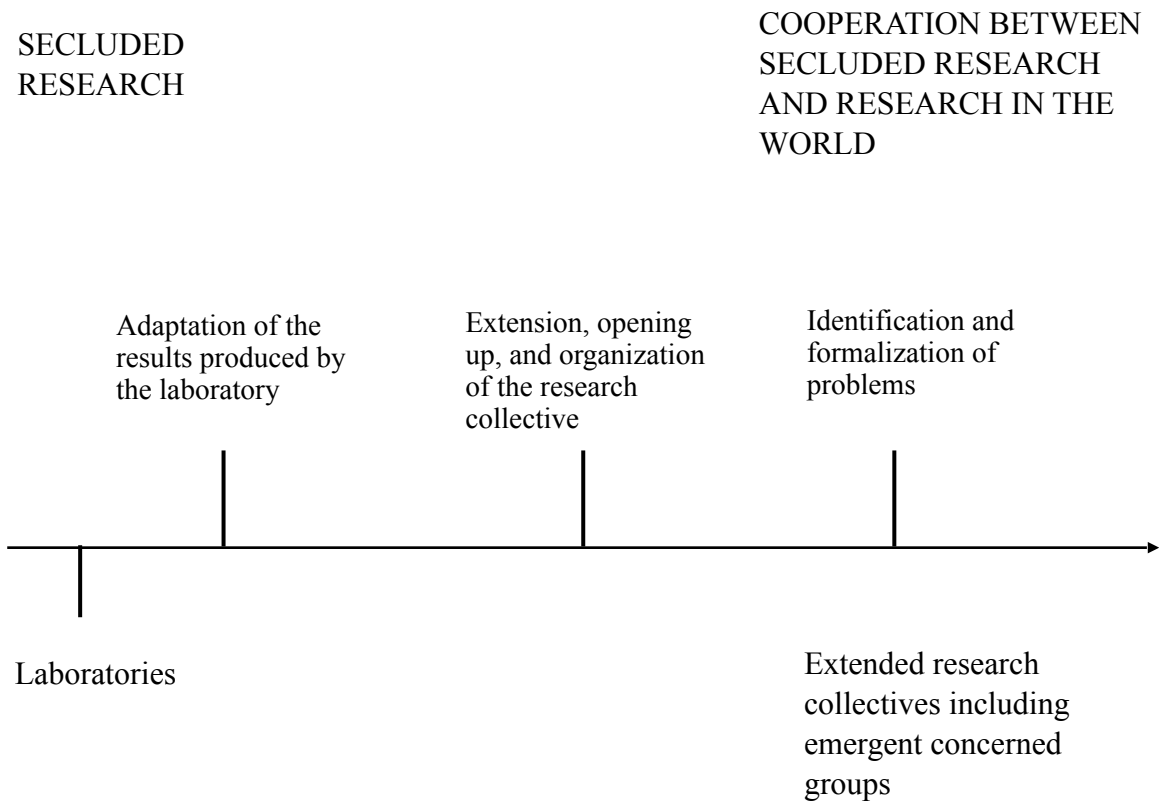


Figure 2: “Different modalities of exploration of possible worlds relative to the degree of collaboration between secluded research and research in the wild” (Callon *et al.*, 2009, 125).

The *vertical* axis (Figure 3) charts the different modalities of constitution of the collective whereby new *group* identities are expressed, considered, and articulated, by contrast to the strictly *individual* identities aggregated by the conventional mechanisms of delegative democracy. This axis marks the three “different modalities for defining the collective relative to the degree to which emergent identities are taken into consideration” (Callon *et al.* 2009, 131). These range downwards from the “aggregation of individuals” through mechanisms of representation and the electoral organization of a ‘general will’ to the “composition of the collective.”

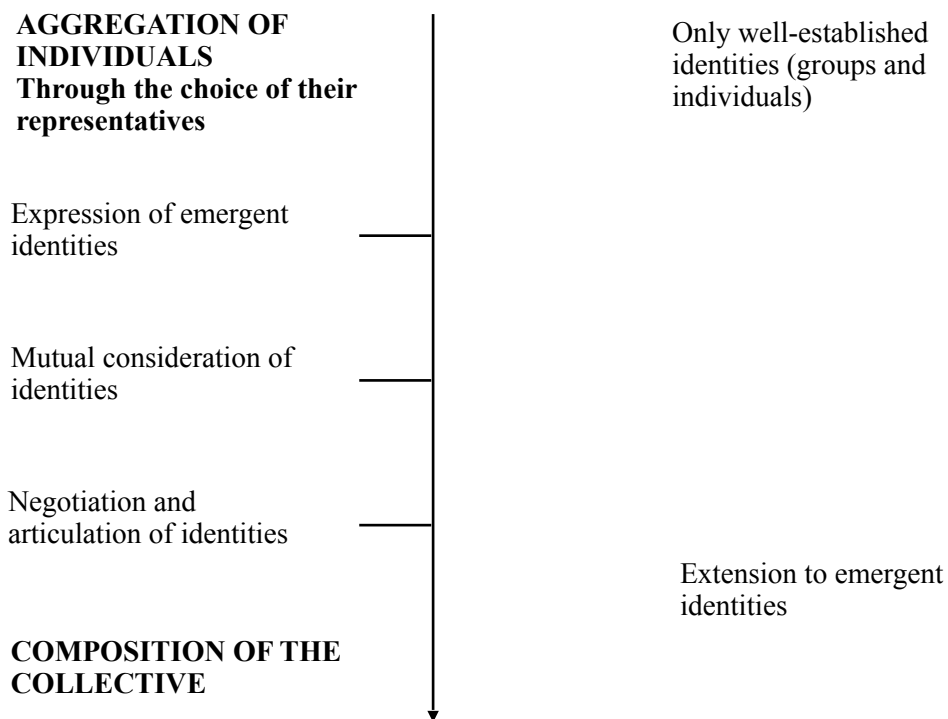


Figure 3: “Different modalities for defining the collective relative to the degree to which emergent identities are taken into consideration” (Callon *et al.*, 2009, 131).

The three modalities identified by Callon *et al.* are the *expression* of emerging identities, their *mutual consideration*, and their *negotiation* and *articulation* (131). In this way, hybrid forums call into question the second delegation that separates “the ordinary citizen and his double, the elected spokesperson who ends up being a professional of representation” (130). Just as hybrid forums enact research beyond the confines of laboratories, the constitution of the collective at stake in the “existence and multiplication” of such settings extends beyond official parliaments and assemblies. Each one of the three qualitatively different modalities along the vertical axis addresses one of three distinguishable aspects of the uncertainty that bedevils the collective’s constitution and interactions once we step beyond conventional modes of aggregation: uncertainties about the identity of emergent groups; about the reciprocal perception and acknowledgment of the existence of other (emergent or extant) groups; and finally about the possibility and willingness of those involved to achieve a negotiated—and always provisional—composition of the collective.

On the first stage, replacing the figure of the citizen that is certain of her identity and interests we have emergent groups (or concerned publics, as Latour would have it), characterized as “singular collectives whose identity, composition, and borders are only gradually clarified” (Callon *et al.* 2009, 128). Representation does not disappear, but is significantly transformed by spokespersons’ “constant interaction with the group,” and by the fact that representatives “can be removed at any time” (128). Importantly, Callon *et al.* are not speaking about already formed identities struggling for recognition, but of the process of emergence of identities that can only become stabilized as a result of their mutual interactions. As “elements of stability gradually emerge” it becomes easier to answer questions regarding who’s a member of

the emergent group, what its “projects, expectations, and interests” might be, and how it defines or describes itself (Callon *et al.*, 2009, 128-29). The role of the spokesperson in these circumstances is not to “record an already existing voice” simply because “the group exists only through the delegation of a voice that it constructs at the same time as it delegates it” (129). In the first stage, then, “silent people recover their voice... in order to launch themselves into a collective dynamic with initially barely defined contours, but which, through successive sequences, may lead to the clarification of who they are” (129). The second stage or modality of composition begins when groups recover “their sense of hearing”, that is, when groups leave behind “the single demand of a singularity occupying the whole political space and whose sole obsession is to be seen and heard” and give way to “a willingness to establish dialogue with other emergent or constituted identities, with other exacerbated singularities, and other groups in the process of formation” (Callon *et al.* 2009, 129). The opening of the third stage sees the “clash” of those singularities that have expressed themselves and listened to one another becoming increasingly ‘composed.’ Each group, those trying to carve out a place in the provisional collective no less than those who are already established, “must accept that its own identity is negotiable, and that the composition of the collective requires compromises and adjustments with the other identities involved” (130).

Thus, instead of being erased by aggregation into a unitary ‘general will,’ singularities are “asserted” and “claimed,” so that “the affirmation of their content constitutes the very substance of political debate” (Callon *et al.* 2009, 133). What matters in the composition of the collective is how singular groups appear in public and have a chance at expressing, negotiating, and articulating ‘who’ (as opposed to ‘what’) they are in relation to one another: “what matters in fact

is being interested in what is specific and singular in particular voices in order then to compose them without concealing their existence” (134). As Callon and colleagues summarize the contrast, “a universal (the aggregate collective) obtained through finicky elimination of specificities is replaced by a universal (the composed collective) linking singularities that have been rendered visible and audible” (134).

Whereas aggregation aims at securing an exhaustive and definitive counting of the collective, the task of composition aims at a closure of the collective that is always provisional and revisable precisely by virtue of the experimental character that its exploration assumes in hybrid forums. In this respect, the perspective of Callon and colleagues also dovetails with Latour’s claim that a non-modern way of handling the proliferation of hybrids requires that measures be taken so that the ‘institution’ and ‘scenarization’ of the collective or *cosmos* always remain haunted by, and responsive to, the emergence of new ‘propositions’ demanding that their place in the collective be ‘officially’ considered and duly processed.

The transformations that take place as we move rightward on the horizontal axis and downward on the vertical one, the authors argue, are homologous. “In both cases,” they write, “what is called into question is the production of two populations and the breach between them”:

Here we witness the appearance of groups of patients who mean to take an active part in the production of knowledge at the same time as they assert their wounded identity; we discover angry residents who speak of their difficulties and fears and who designate spokespersons to take part in technical discussions. Together they mark out the existence of *a new territory, a new political stage*. (Callon *et al.* 2009, 134)

The map the authors offer to describe this new territory or stage is constructed with the help of the two axes (Figure 4), and it serves them to elaborate on a series of qualitative differences between dialogic and delegative democracy.

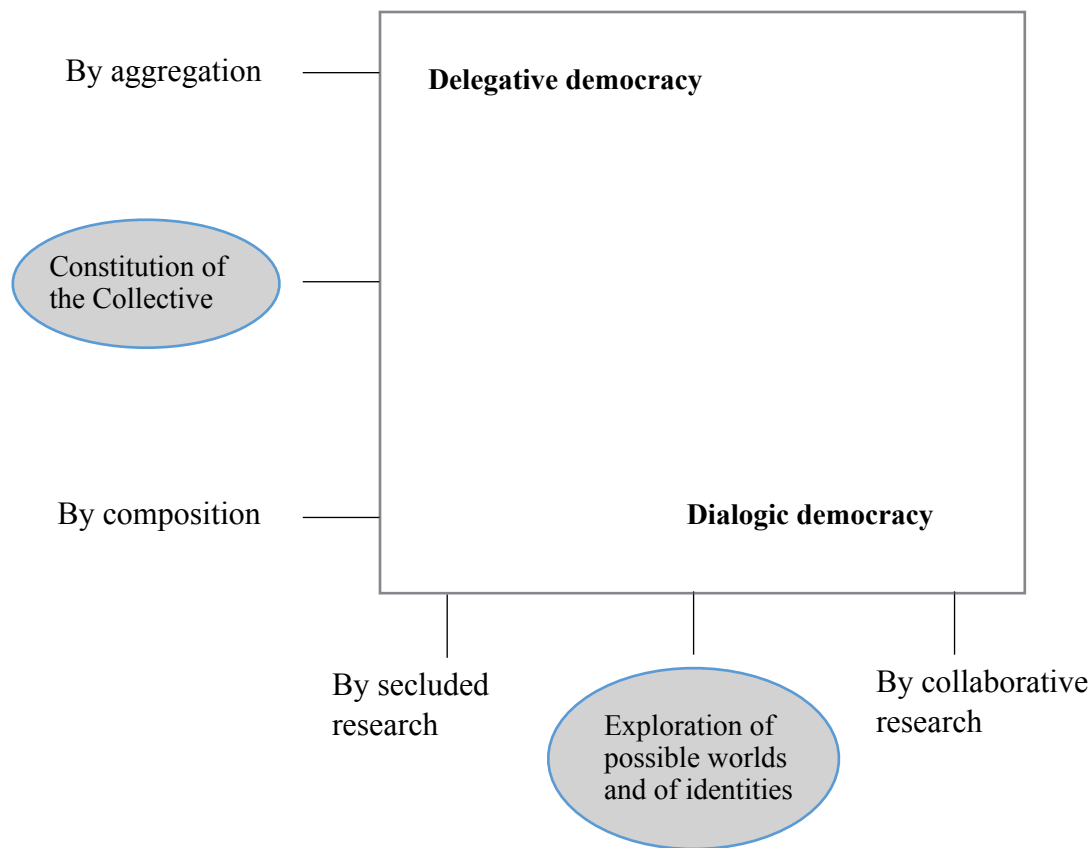


Figure 4: “Different modalities for defining the collective relative to the degree to which emergent identities are taken into consideration” (Callon *et al.*, 2009, 135).

Importantly, the new space of dialogic democracy, “which reveals to us the hybrid forums and their overflows,” itself “communicates with the old scene of secluded research and of the aggregated collective” (134). The diagram, they hasten to add, “confines itself to noting, on the complicated map of the procedures of which democracy consists, the new lands conquered by hybrid forums” (Callon *et al.* 2009, 135).

Now, a crucial issue for Callon *et al.* concerns the relation between the two axes we have just examined. Are they independent or interdependent? Their way of tackling this question shows that the processual *pathos* and exploratory *ethos* defining the new forms of dialogic

democracy are also characteristic of the authors' own scholarly approach to this "new political stage." No general answer can be given to the question of how the exploration of nature and world through collaborative research relates to—and might get entangled with—the composition of emergent identities. The history of hybrid forums, albeit extending only a handful of decades into the past, already shows "the autonomy of the question of the composition of the collective in relation to that of the exploration of possible worlds" (138-39). In this regard, the section titled "In Search of a Common World" has the authors pointing out that the two dimensions "should not be confused" (Callon *et al.* 2009, 136).¹⁶³ That no necessary relationship exists between the composition of the collective and the exploration of possible worlds is important at the moment of explaining "the plurality of the possible configurations of hybrid forums or dialogic democracy, since it opens up a space of combination that allows for a great variety of forms of organization and trajectories of development" (Callon *et al.* 2009, 139). It is also important for grasping the sense in which we should understand those cases in which the movement along one axis has been related to movement in the other dimension. Contingent relationships of interdependence, in which "the two explorations... become entangled" (139), *can* obtain in practice in particular instances of hybrid forums. The vertical and horizontal axes can be independent; but they also can be interdependent, putting in motion the twofold hybridization of the lay-expert and citizen-representative divides.

¹⁶³ The claim is supported empirically by recourse to two contrasting examples. In the case of infantile leukemia clusters in Woburn, Massachusetts, and the involvement of 'lay' affected groups in the production of expert knowledge about the disease, the engagement with the composition of the collective had to wait for the completion of research (136-138). By contrast, in the famous case of Québécois struggles for recognition of their distinctive ethnic and linguistic identity, the composition of the collective was completely independent from any question or uncertainty regarding our knowledge of the world. Reflection on "the modes of composition of the collective [can be pushed] to the limit" (138), as this example indicates, without any involvement in research.

Callon and colleagues discuss two examples of cases of dynamic interaction where, “in order to pursue the exploration on one of the axes, actors change level and reopen the discussion by moving on to the other axis” (Callon *et al.* 2009, 139). Callon’s signature case of muscular dystrophy in France (139-147) begins in the horizontal axis and quickly begins to move to and fro on the vertical one. The genetic identity that patients and their parents constructed in collaborative research with scientists is an emergent identity that will express itself, learn to intersect with the discovery of other identities, and eventually realize that “their identity will be more firmly established if they make room for other identities” (143). After a detailed examination the authors conclude that if the ‘Association française contre les myopathies’ is “able to escape from the ascendancy of delegative democracy and its established groups, it is because it deliberately and boldly embarks on the dual exploration of possible worlds and conceivable collectives” (145). The other example (Callon *et al.* 2009, 147-150) has its point of departure in the horizontal axis. When the French authorities announced plans to bury radioactive waste in a viticultural zone winemakers protested that their Japanese consumers would not buy a product tainted with radioactive associations. The announcement “brings into existence this very real group ‘the-viticulturists-with-commercial-interests-in-Japan’ which was previously formless and now raises its voice to defend its existence and identity” (147). But the emergence, negotiation and articulation of this emergent identity finds itself bound up with the question of research, so as to explore the “possible worlds” that can accommodate already established as well as emergent groups. Thus, “the scientific and technological investigation must be re-launched, making sure that it is a co-piloted investigation in which the different actors concerned are not only associated with the definition of the problem, but also with the work of

the research collective and the transposition of the results on the ground” (150). For each one of these two examples, the authors conclude,

[t]he exploration that gives rise to an acceptable compromise develops ... in the space contained between the two independent axes of our diagram. The axes open the field to a constant to and fro by which groups are formed and change shape, composing their identities and the collectives to accommodate them. It is in this crucible that common worlds are formed made up of mutant genes, bodies in pain, supervised nuclear waste, viticulturalists at peace with their Japanese clients, and sufferers from myopathy displaying their differences in the public space (Callon *et al.* 2009, 152)

In the fifth chapter, entitled “The Organization of Hybrid Forums,” the authors set out to examine the “various measures of containment and channeling” that have been “devised and tried out” to face “the profusion of all sorts of hybrid forums” and “the ferment and continual turmoil that these introduce into our society” (Callon *et al.* 2009, 153). “For more than 30 years, in various places, in different modalities, and under different names, forms of organization have been tried and different methods tested whose single modest objective has been to introduce some rules of the game aiming *to give some order to the conduct of debates and investigations*” (153, my emphasis). It is not the profusion of human-nonhuman imbroglios that stands in need of stabilization in the forms of official recognition, due process, and closure, as in Latour’s Parliament of Things, but the very democratic forms that have been invented to confront such overflowings. “If dialogic democracy is to be viable and not just wishful thinking, this dual exploration has to be framed.” (Callon *et al.* 2009, 151)

The question, then, is not about the absence or presence of framing. Framing, as I argued in chapter 3, is a structural feature of any public space. As Callon himself has shown (Callon 1998b), every activity, no matter how singular, requires some sort of frame in order to proceed and be construed as intentional action, and this applies to the ‘dual exploration’ as well. The

issue is where the frame comes from, whose frame it is, how widely it is shared, and by whom. Just like ‘police regimes,’ a framing can be ‘better’ or ‘worse’ depending on how far it allows us to move in the exploration of common worlds. Since hot situations overflow delegative arrangements, what we need are “procedures more open to debate, more welcoming toward emerging groups, and more attentive to the organization of the expression of their views and the discussions it calls for (Callon *et al.* 2009, 118). *Procedures* are indeed pivotal in their account. What they mean by this, however, differs from what procedures are taken to represent in the minds of political theorists. ‘Procedures’ are the concrete, particular *cases* of dialogic democracy. The organizing principles behind each one of these forums is a different matter.

Thus Callon *et al.* elaborate a set of criteria for the organization and implementation of hybrid forums, which are not arrived at through philosophical (re)construction, but result from the author’s effort to trace, register, and assess the procedures that have been invented and tried ‘on the ground,’ as it were, by actors themselves. This yields a set of standards that can serve to evaluate extant instantiations of dialogic democracy, or counsel the design of new ones. *Acting in an Uncertain World* is a very significant work precisely because the interest in institutional designs and functions is always attentive to the significance of differences and particularities in the emergence of different hybrid forums. “Rather than analyzing the philosophical or political science traditions” (Callon *et al.* 2009, 153) the account of Callon and his colleagues is consistently empirical and historical.

Our approach starts from the problems encountered by the actors, it accompanies them in the analyses they produce, it follows the latter in the solutions they devise, and it strives to help them in the clarification of the lessons of more general import that may be drawn on the basis of the accumulation of experience (Callon *et al.* 2009, 154).

The impetus behind the authors' work of recollection, as we might call it, is not to police or manipulate these forums; they are in fact very aware of the risks of instrumentalization and reduction to legitimizing tools (Callon *et al.*, 2009, 154-155) we touched upon in chapter 5. Their purpose, again very much in line with Latour, is to secure the traceability and remembrance of what actors and groups have been doing to confront the overflows of our sociotechnical imbroglios. At stake is learning through experience, not the preemptive suffocation or prophylactic prevention of dissensus. As they claim, hybrid forums always emerge "at the cost of conflicts, often violent ones." In particular,

To force a debate, and to be allowed to take part in it, you have to be able to call upon resources and put together alliances with a view to reversing the relations of domination that tend to repress any challenge to the double delegation. To leave hybrid forums to develop without any rules of the game for organizing the debate would leave the field free to the logic of relations of force, it would allow the reproduction, without discussion, of the exclusion of the weakest, precisely all those who seek to make their voices heard and be listened to (Callon *et al.* 2009, 154).

The criteria in question are straightforward and do not demand extensive commentary. What matters the most in our context is the use these are put to in assessing some predominant forms of hybrid forums as well as certain limit cases that are of particular interest. The authors distinguish two classes of criteria for assessing procedures in terms of the "degree of dialogism," that is, "of the degree to which they contribute to the establishment of *democratic confrontation*" (Callon *et al.* 2009, 161, my emphasis). They first identify three "organizational criteria" (158-161), each one endowed with two subcriteria that can be evaluated as "strong" or "weak." *Intensity* involves the "degree of earliness" of laypersons' involvement in the exploration of possible worlds through collaborative research (corresponding to the horizontal axis), and the "degree of intensity of concern" that is mobilized regarding the composition of the collective (the vertical axis). Secondly, the criterion of *openness* "enables us to distinguish

between procedures that restrict access and those that, on the contrary, enlarge it” (159). On the one hand, we have the degree of diversity of the groups consulted and the extent of their independence in relation to already established groups and stakeholders, and, on the other, the “degree of control of representativity of spokespersons of groups involved in debate.” The latter serves to assess “the ability to follow the transformation of the groups, to take it into account, and, consequently, to leave the question of the representativity of the spokespersons who speak in the name of their constituents open and debatable” (160). A third criterion, which varies independently from the other two, concerns the quality of the debates, which is itself subdivided into degrees of “seriousness of voice” (“are the protagonists able to deploy their arguments and claims, as well as answer objections, with the requisite acuteness and relevance?”) and “continuity” of voice (“are the interventions and discussions spasmodic or can they last?”) (160)

A second set of three criteria (Callon *et al.* 2009, 161-163), each one with “high” and “weak” as possible values, is proposed to assess the “implementation” of procedures. The first one captures what has been the major concern of the critics of deliberative democracy, namely “Equality of conditions of access to debates.” To remedy the asymmetries in power and resources which delegative democracy fails to meet the authors “envisage the formation of new professional roles: translators, mediators, facilitators of debates and negotiations, and political organizers” which, similarly to Latour’s moralists, have as their “explicit task... to make it easier for previously excluded actors to enter the public space” (162). The second criterion is the *transparency* of the procedure that “enables its implementation to be assured and controlled” (162), for without “recording tools” it would not be possible to “track” the different voices and “reconstruct the dialogical richness of a debate” (163). Finally, to avoid manipulations “which necessarily benefit the strongest, the procedure... must be known in

advance by all the participants” (163). What matters here is the degree of *clarity* and publicity of the rules of the forum.

Armed with these criteria, Callon *et al.* set out to evaluate a handful of representative procedures: focus groups, public inquiries, and consensus conferences (including kindred formats like the ‘citizens’ jury’). Although each one scores “strong” or “high” values in the aforementioned criteria, none of them fares very well. Of importance in our context is the case of the consensus conference, which the authors examine and evaluate in its French instantiation in the late 1990s around the issue of GMOs. In terms of the two axes, their conclusion is that consensus conferences move leftwards on the horizontal axis, albeit slightly and without engaging in actual collaborative research, but make no difference at all regarding the expression, negotiation, and articulation of emergent identities. The composition of the collective, in other words, remains trapped in the aggregative logic of delegation. The reason is that no emergent groups are at stake in the proceedings. This is because the participants are randomly selected to fabricate the kind of general, idiotic public we examined in a previous chapter, instead of a self-constituted group, and also because the experts that participating citizens engage are actually already established stakeholders with known identities. No Rancièrian *demos* emerges in this influential procedure: “at no time is the possibility opened up of a dialogue between a group in the process of being constituted and those who, for a time, are designated as its spokespersons” (Callon *et al.* 2009, 175).

After assessing the most commonly rehearsed procedures, the authors close the chapter on the organization of hybrid forums with a section that draws a distinction between hybrid forums and “the public space” (Callon *et al.* 2009, 178-189) and examines their relationship with the help of two contrasting, limit-case examples. Their arguments in this regard are important

because they serve to emphasize the process character and the contingent trajectories traveled by each singular hybrid forum in light of their relationships with the ‘delegative’ arrangements in which they operate in practice, stressing “the necessary integration of procedures in the political process” (187).

Callon and colleagues regard all hybrid forums as singularities, and “public space” as a durable “infrastructure” (Callon *et al.* 2009, 180), a “stable and open framework” enabling the possible continuity of “collective exploration and learning.” On the basis of the accumulated experience of the last few decades, and always in a preliminary and tentative fashion, the authors suggest three forces or elements that are fundamental for the organization of public space and the maintenance of the dynamic of exploration: associations, the media, and public authorities. “Associations give emergent groups their first existence and recognition as well as their first means of expression. The media provide an infrastructure that gives publicity to positions and controversies... Public authorities keep the dialogic procedures in good working order at the same time as they act as a source of support and establish structures of coordination; they allocate resources so that collaborative research develops and the costs of the composition of the collective are taken care of” (181).

This account is followed by a comparison between the French AIDS forum and the myopathy example in light of the extent to which the public space was more or less adequate to their respective explorations. The two forums were comprised of different associations; they differed in the nature and timing of their relationship to the media; and also in the degree to which they benefited from attentiveness on the part of public authorities. The two ‘hybrid forums’ thus had significantly different historical “trajectories” (186). Public authorities, in particular, were better predisposed and more responsive in the case of the AIDS forum. The point

of the comparison is to relate the singularity of each hybrid forum to the constellation of these three “forces” (associations, media, authorities), which provides, depending on the case, a more or less well-functioning public space for the exploration of the two uncertainties.

Procedures or Hybrid Forums?

At this point, a problem with *Acting In An Uncertain World* becomes apparent. These two cases, and other comparable ones, are quite different from the consensus conference and all the other procedures that the authors assess and rank with the help of the two sets of criteria. Indeed, one can't help but wonder if the three ‘modalities’ along each of the two axes were actually identified in light of the histories and trajectories of these two limit examples. Put differently, the expression, mutual consideration, and negotiated articulation of emergent identities, on the one hand, and the adaptation of laboratory results, the extension of the research collective, and collaborative identification and formalization of problems, on the other, could hardly have been imagined by focusing on consensus conferences, public inquiries, or focus groups, all of which score rather low on the different criteria, and thus remain located toward the left and upper ends of the horizontal and vertical axes. Cases like the AIDS and myopathy forums, by contrast, are exemplary in terms of their degree of dialogism and their reciprocal articulation of the public emergence of new issues and groups, of new objects and new subjects. This, I would argue, is what makes them politically significant instantiations of dialogic democracy. Thus, when Callon *et al.* claim that their approach is informed by contemporary experience, by what actors have been doing, the landscape they survey has a few remarkably high democratic peaks that contrast with the more pale and discrete mechanisms of the ‘participatory turn.’ It is the former, I contend, that inform their charting of the space of dialogic democracy. In this respect, it is telling

that they never refer to their ‘hot’ cases (the myopathy, AIDS, and nuclear waste forums) as *procedures*. This, I believe, is precisely because they did not replicate already tried out and officially endorsed mechanisms, as did the French consensus conference on GMOs, but invented new forms of political action on the ground, not entirely from scratch, to be sure, but still in ways that were unprecedented.

Finally, although Callon *et al.* present dialogic democracy by way of contrast to delegative democracy, the scope of the reconfigurations that hybrid forums are able to introduce depends, to an important extent, on the responsiveness of the very delegative mechanisms they are meant to complement (‘the public pace’), particularly those related to public authorities and “the procedures of the delegative process.” Despite their different trajectories, the confrontation between the dialogic democracy instantiated in the two French limit cases (AIDS and myopathy) and the corresponding delegative arrangements was relatively calm and pacific, at least by comparison to the US AIDS forum studied in the previous chapter.¹⁶⁴

The authors acknowledge this much when they address the latter to exemplify the American instance of the breakdown of the boundary between laypeople and experts (Callon *et al.* 2009, 81-87). Interestingly enough, they do not provide an empirical assessment of its vicissitudes, degrees of success, or evolving temporality. Faced with the failure of official institutions to acknowledge and address their emerging demands, a “struggle against the

¹⁶⁴ Callon *et al.* (2009, 83-87) refer to the case of AIDS-treatment activism in the US as an example of a hybrid forum similar to the one set up by the ‘Association française contre les myopathies.’ In both cases we have that “some patients become experts among the experts [and] others do not hesitate to propose new forms of clinical experimentation” (75). In their view, “these patients are concerned groups that, through intermediary representatives, get a foothold in the research collective, which is thereby broadened. What is at stake is the scrambling of the distinction between the object of research (the disease) and the subject of research (the patient who wants to be cured). Subject and object merge in the same person” (87).

authorities is organized” (83) so that the “protest goes through a frontal attack on medical power” (84). And even though the French AIDS hybrid forum also began with diverse associations and various forms of collaboration between patients and medical institutions, the public authorities “played a major role in structuring and unifying the hybrid forum or forums dealing with AIDS” by creating “the CNS, the AFLS, and the ANRS” (183), coordinating and funding bodies through which the forum developed and extended. No comparable responsiveness existed in the American context until late in the movement’s trajectory. Indeed, the ‘success’ of ACT UP consisted precisely in *forcing* the attentiveness of official authorities and the medical establishment and transforming the parameters of ‘public space.’ Put differently, the effort required for reconfiguring the sensible were higher, and the disruptive quality more marked, on this side of the Atlantic. Indeed, the battle language one finds in their brief description of the American AIDS forum is noticeably absent in their account of its French contemporary counterpart. More generally, the place of boisterousness, interruption, and impropriety in relation to the well-functioning of the ‘public space’ is not a question Callon *et al.* raise or engage, either in general or with respect to any particular forum. Although they do acknowledge that hybrid forums always emerge “at the cost of conflicts, often violent ones” (154), the contentiousness of the confrontation between dialogic and delegative logics is not their main concern. I leave the discussion of the relationship and contrast between interference and composition for the Conclusion, to which we now turn.

The work of Latour and Callon *et al.* represent two variants of *composition*. Composition undermines extant divisions between citizens, laypersons, scientists, and politicians, to name the most important ones. Everybody can in principle partake in the composition of the (future) common world. It seeks to stabilize the situations of uncertainty that accompany the current

proliferation of sociotechnical hybrids beyond the failed terms and premises of our modernist heritage. The mark of that departure, is the exploratory, experimental, open-ended, and provisional character of that stabilization. Whereas Latour does this in the global and grand ontological scale of an 'experimental metaphysics,' Callon and his colleagues focus their gaze on the ground, as it were, to assess various local and specific practices they take to be instantiations of a novel form of dialogic democracy.

CONCLUSION

I opened this investigation by interrogating the political significance of science and technology. From the perspective of Enlightenment notions of self-determination and the demands these place on our politics, the main trouble with the myriad actions and fabrications of technoscience is that these increasingly ‘legislate’ our conditions of existence below the radar of liberal and representative political arrangements. To the extent that this goes against the grain of our ideals of public autonomy, so cherished by many political theorists, such a ‘politicization of science’ is challenging enough, in and of itself. Still, and without downplaying the high stakes involved in that, I have tried to articulate a different and even more decisive problem. The actions and artifacts of science and technology—exemplarily represented today by *Mycoplasma laboratorium*, Craig Venter’s hybrid thing-deed—are politically challenging, first and foremost, because they are *real* and yet rarely *appear*. When they do present themselves in public, they do it largely from the narrow perspective of scientific framings of control, prediction, and standardization.

As inhabitants of scientifically and technologically driven societies, most of us stand as passive actants in the socio-technical networks traced by Actor-Network Theory, a-politically partaking in the construction of these hybrids, ‘suffering’ the consequences of processes initiated by distant actors but without having a story to tell about them. In the phenomenological terms I borrowed from Martin Heidegger, the world spawned by technoscience is ‘ready-to-hand’ but not ‘present-at-hand,’ ubiquitously shaping everyday life yet seldom attended to or judged as a

common object that can call forth and gather the plural perspectives of appearing subjects. At stake here is the connection between politics and our sense of reality that worried Hannah Arendt. What we lack, she believed, is a space of appearance to establish, more or less firmly, the reality of our identities and the reality of the worldly artifice that surrounds us. In her words, “[t]he human sense of reality demands that men actualize the sheer passive givenness of their being, not in order to change it but in order to make articulate and call into full existence what otherwise they would have to suffer passively anyhow” (Arendt 1998, 208).

Beyond the challenge to ideals of self-determination at the core of deliberative understandings of democratic politics, then, I have tried to reflect on another ‘casualty’ of the agency of technoscience: the *world* itself, by which I mean everything that ‘appears and shines forth’ in it. To love the world is to care for the space of appearance of objects and subjects, where the objective ‘in-between’ of the human artifice meets the subjective ‘in-between’ of a plurality of actors related through speech and action. Without this common world human activities risk a dizzy descent into the whirlpool of processes, sealing the modern triumph of worldless *animal laborans* so feared by Arendt.

Our proximity to the promiscuous proliferation of hybrids that defines our contemporary condition hides the abysmal *political* distance between ourselves and the technoscientific artifacts that inundate our everyday lives. To give an example, the relationship I have with my ‘smart’ phone—and thus with nanotechnology, quantum mechanics, and the subatomic level at which this gadget performs its tricks—is one of detached immediacy. Almost instantly, and without much effort, I can perform in the palm of my hand tasks that would have been impossible when I was in high-school: emailing, texting, skypeing, buying stuff, downloading

music and podcasts, reading news, rating products, finding directions, wiring money, and so on. The whole world seems to be ‘on call.’ All of this I do *with* the artifact. And yet I never address the thing itself in relation to the world it erects. As long as it functions adequately and represents no risk to my health, I need not care for its political significance. Something analogous could be said about my connection to the GMO veggies in my lunch and the hybrid network of actants they belong to: DNA, molecular biologists, microscopes, farming, world agriculture, and so on. This world ‘legislates’ my everyday life, but is rarely a world I care to care for as something I have in common with others.

The trouble, as Arendt intimated, is that today our “trust in the world as a place fit for human appearance, for action and speech, is gone” (Arendt 1998, 204)—to which we should add our trust in it as a place fit for the appearance and presence-at-hand of technoscientific artifacts such as GMOs and new beginnings in nature like *Mycoplasma laboratorium*. To regain that trust would imply a concern for what we could call our ‘anchors’ to the world: the *appearance* or looks of the technoscientific artifice (beyond its utility and functionality), the *singularity* of the identities of acting and speaking subjects who appear in public to gather around the ‘things’ comprising that artifice (instead of being helplessly affected by its overflowings), and the *meaning* of the stories thereby enacted (through which the existence of our hybrid imbroglios is articulated and publicly recognized).

However, our contemporary situation is not as disquieting as Arendt’s anxieties in *The Human Condition* could lead one to believe. This is made clear by Bruno Latour, convinced as he is that his quasi-metaphysical speculations in *Politics of Nature* are actually meant to make sense of current practice, that the institutions, competencies, and callings he articulates already exist in

tentative forms. As he claims, his goal is “not to overturn the established order of concepts but to describe the actual state of affairs: political ecology is already doing in practice everything that I assert it has to do” (Latour 2004a, 7). More pointedly:

I have no utopia to propose, no critical denunciation to proffer, no revolution to hope for: the most ordinary common sense suffices for us to take hold, without a minute of apprenticeship, of all the tools that are right here at hand. Far from designing a world to come, I have only made up for lost time by putting words to alliances, congregations, synergies that already exist everywhere and that only the ancient prejudices kept us from seeing (Latour 2004a, 163).

Latour is interested in probing the pertinence and soundness of our inherited categories of thought. Like Arendt’s, his reflections have been prompted by the transformations science and technology have introduced in the world. “Inundated by innovations,” Latour regrets, “we are living in a more and more archaic representation of our real state of affairs” (Latour 2005b, 45). But whereas Arendt’s reconsideration of the human condition presupposes that our inherited categories of thought had for a long time been valid and capable of orienting our thought, at least until the modern world “was born with the first atomic explosions” (Arendt 1998, 6), Latour’s critique of the modern Constitution upholds that its main divisions have never been an adequate description of reality. ‘We have *never* been modern.’ So, when he states that “things have become Things again, objects have reentered the arena, the Thing, in which they have to be gathered first in order to exist later as what stands apart,” and that the “the modern parenthesis during which we had, on the one hand, a world of objects, *Gegenstand*, out there, unconcerned by any sort of parliament, forum, agora, congress, court and, on the other, a whole set of forums, meeting places, town halls where people debated, has come to a close” (Latour 2004b, 236), he is not describing an epochal transformation in the world or in the agency of technoscience. He is

simply claiming that our modernist conceptualizations are bankrupt, and that we will never confront the urgent issues of our technological civilization if we persist on our adherence to those ‘archaic representations.’ Hence, the kind of gatherings around matters of concern that Latour is theorizing are not “limited to the present period as if only recently objects had become so obviously things.” What seems to have changed is the frequency and intensity of technoscientific crises and controversies. His point, therefore, is that the old division “is now thrown into doubt with the merging of matters of fact into highly complex, historically situated, richly diverse matters of concern” (236).

The theory and the practice of deliberative democracy, as I claimed in Part II, are ultimately not up to the task of genuinely confronting the challenge of science and technology. In Part III (*Amor mundi*), however, we retrieved empirical instances of a novel form of democratic politics that has emerged in the last few decades—one that has much better chances of politicizing the things we have been doing in a strikingly indiscriminate manner. And we also explored certain theoretical approaches well suited for thinking about the things some actores have been doing to confront the deeds and frames of science and technology. Taken together, these two aspects open up a practical and conceptual space within which the three anchors to the world I just singled out—appearance, singularity, and meaning—can be taken care of and nurtured in a responsive manner.

Hence, on the empirical side, and by way of contrast to the case of the Cumbrian sheep-farmers and the *GM Nation?* deliberative event, I have called attention to the AIDS forum, where new subjects emerged through dis-identification with their lay status to become ‘lay-experts’ capable of naming and debating an emerging and radically uncertain issue, as well as to

reconfigure the givens of public life around technical questions.¹⁶⁵ On the theoretical front, I have turned to the works of Jacques Rancière, Bruno Latour, and Michel Callon in search of a theoretical outlook capable of shedding light on those experiences.

In concluding this investigation, I would like to address two questions related to these empirical and theoretical dimensions. One has to do with the question of exemplarity, and the other with the relationship between ‘interference’ and ‘composition.’ Connecting these two aspects, I wish to argue, is the politico-aesthetical question of *amor mundi*, which I take to be at stake not only in Arendt, but also in Rancière and in the Actor-Network theorists whose political writings we have examined.

Exemplarity and the Sociologist’s Objection

To what extent can we adequately address the question of democratic politics around technoscience on the basis of a singular example? What are the limits to exemplarity in political theorization? Here I wish to address a series of possible objections to the meaning and relevance of the example of AIDS-treatment activism I have used to substantiate some of the main claims put forward in the last part of this dissertation. This will give us an opportunity to revisit the tension between politico-theoretical and sociological modes of engaging political agency.

¹⁶⁵ It should be acknowledged that AIDS-treatment activists have not been the only actors who have challenged the lay/expert divide in questions concerning science and technology. An earlier example was that of ‘popular epidemiology’ around the childhood leukemia cluster in Woburn, Massachusetts (Brown and Mikkelsen 1990; Brown 1992). Also of interest is the movement of so-called ‘citizen science’ (Irwin 1995; Silvertown 2009) where amateurs collect and process data as part of scientific investigations. Examples similar to AIDS-treatment activism can also be found in the realm of environmental health, as documented in Jason Corburn’s *Street Science* (2005): “The street scientists working on the streets of Brooklyn do not seek to dismiss professional science outright, but rather explore how to change that science from the inside by partnering with professionals and revealing that community members are credible experts in their own right” (19).

There are two potential objections that can be raised. Firstly, by basing my arguments on a singular and admittedly exceptional case, we might end up restricting the ‘validity’ and capacity of those arguments to illuminate other forms of democratic confrontation with technoscience. Science, indeed, is not a singular, monolithic endeavour, but a multifarious set of activities involving particular knowledges, differentiated disciplinary fields, ‘basic’ and ‘applied’ approaches, and so on. The example of AIDS-treatment activism bears upon a small subset of these knowledges, discourses, and practices: medical science and related fields like pharmacology, virology, immunology, epidemiology, and biostatistics. In light of this, a possible disconnection with the examples of technoscience I examined in the Introduction and the first chapter should be addressed. There are indeed significant differences in terms of complexity and impact between quantum physics or synthetic biology, on the one hand, and medical science, on the other. In particular, attention to the particular circumstances, condition, and life-history of each patient requires a continuous interpretation and adjustment that differentiates biomedicine from more esoteric forms of scientific knowledge. Doctors are placed at the boundary between everyday lifeworlds and esoteric expert cultures, so that ordinary people’s ‘cultural impoverishment’ in relation to medicine—to use Habermas’s expression—would appear to be negligible compared to the one most of us exhibit in relation to quantum mechanics, nanotechnology, or molecular biology. Medical science is thus closer to laypeople than any of the forms of technoscience which Arendt singled out in the Prologue to *The Human Condition*. Ideally, and in order to put forward a neat, well-rounded argument connecting my concluding reflections with the cases I used at the beginning to set up the tone and scope of this investigation, I should present a case of democratic ‘interference’ in a realm like synthetic

biology. Nothing of that sort, however, is on the horizon. As I suggested in the first chapter, this may be due to our own perplexities and difficulties in describing and understanding what we are making when we do the sort of things Craig Venter and his colleagues have done, perplexities that reflect the radically novel in-distinction between labor-work-action, and the accompanying blurring of boundaries between nature and artifice.

Still, we should not overstate the limits of exemplary validity. The case of AIDS-treatment activism, and the way it interfered with and reconfigured the production of knowledge, is nevertheless a substantial example of the kind of democratic politics we need to enact in relation to science and technology. It is not a second-best illustration or an imperfect approximation to some ideal model. There are no a priori standards and measuring rods with which to design a blueprint for democratic action in relation to technoscience. We only have examples. And it is by choosing examples that we are able to judge other political events. In this respect, the kind of democratic action we need to confront technoscience today is no more utopian, impractical or unthinkable as AIDS activism was in relation to scientific expertise thirty years ago. In that sense, the story of ACT UP is arguably the most powerful one we have to date of a truly ‘public participation in science,’ one that augmented scientific expertise instead of simply debunking it. And we should treasure it. The point, of course, is not for other actors to mimic these activists’ tactics, but rather to acknowledge and remember that some have been capable of emerging as newcomers on the public scene, challenging extant sociological definitions of their identities, and expanding the horizon of possibilities for political action.

A second quibble corresponds to what I would call the ‘sociological objection.’ Faced with singular practices that evince the limits of statistical models and seem recalcitrant to

prediction, sociologists might be inclined to cope with their astonishment and surprise by stressing the uniqueness of the circumstances attending the example, and hastening to conclude that, at the end of the day, the social continues to function as it is supposed to. In this regard, there are two caveats that a typical sociologist could single out to downplay the significance of AIDS-treatment activism or raise doubts about its ‘generalizability’ or ‘replicability’ in other contexts. One objection is about the peculiar openness of medical science to lay interference, while the other highlights the special and strategically advantageous resources possessed by gay activists *qua* demographic or socially classified group.

Doctors, as Paul Starr has put it, “serve as intermediaries between science and private experience” (Starr 1982, 4). “The victory of medical authority” over the course of the nineteenth and early twentieth centuries, and the social prestige and legitimacy doctors had secured by the 1950s rested, according to Steve Epstein, on “the popular abandonment of an earlier, Jacksonian belief that the healing arts were accessible to ‘common sense’ and the acknowledgment, on the contrary, of medicine’s ‘legitimate complexity’: no longer could everyone be his or her own physician” (Epstein 1996, 7). In the US at least, this situation began to change in the 1960s and 1970s:

Leftists advanced a thoroughgoing critique of the ‘medical-industrial complex’: lurking behind the white coats and the reassuring smiles were profit lust and the dominance of large corporations. While conservatives and liberals argued that medical costs were out of control, feminists strove to take back control over their own bodies, criticizing medical science as a patriarchal institution. Revelations of past abuses in medical experimentation on human subjects led to an expanded emphasis on ‘informed consent,’ premised on the notion that the patient’s trust in a physician is not automatically granted but ‘must be earned through conversation.’ (Epstein 1996, 7)

Since then, at least in the US, medical science has been relatively open to the input and contestation of non-experts, citizens, and activists. In this sense, a road had been paved, and the example of feminist contestations was still fresh in collective memory when AIDS-treatment activism emerged in the mid-1980s.

The other objection stems from the fact that the impact of AIDS was not randomly distributed across the population. On the contrary, the disease was particularly prevalent within specific groups. The gay community was a main protagonist in the story of an epidemic that was initially described in the media as the ‘gay plague,’ until it was discovered that AIDS was caused by a retrovirus (HIV) that could be transmitted through blood and could therefore affect IV-drug users and the more diverse population of blood-transfusion recipients. Importantly, the gay community was no ordinary community. As Collins and Pinch point out, “The successful campaigns for gay rights in the sixties and seventies left them savvy, street-wise and well-organized. ... Although Mainstreet America might still be homophobic, there were sizeable gay communities in several big cities, with their own institutions, elected officials and other trappings of political self-awareness” (Collins and Pinch 2002, 126-127). Thus, when the epidemic broke out “the gay movement was deeply engaged in projects of ‘identity politics’—the linkage of tangible political goals to the elaboration and assertion of an affirmative group identity” (Epstein 1996, 11; see also D’Emilio 1983). Because it threatened their identity, the handling of the disease was likely to be a focal point of contestation and mobilization. Furthermore, as Epstein has remarked, skepticism and suspicion of the medical establishment had played a role in the battles of yesteryear: “An engagement with the medical profession was not entirely foreign to this movement... since a specific accomplishment of gay liberation had

been to ‘demedicalize’ homosexuality by removing it from the official list of psychiatric illnesses. ... And many lesbians (and heterosexual women) who would become active in the AIDS movement were schooled in the tenets of the feminist health movement of the 1970s” (11-12; see also Bayer 1981).

On top of this, the sociologist would also be inclined to explain the influence of the AIDS-treatment movement in terms of the privileged social position of its members, *i.e.*, their relatively high level of economic and cultural capital, as Pierre Bourdieu would have it. Indeed, most of the activists were middle-class, white, and well educated people. For instance, Mark Harrington, a leading figure in the movement, had a bachelor’s degree from Harvard University. Although the work of Walter Benjamin, the topic of Harrington’s senior thesis, was topically quite removed from the science behind clinical trials in which he was to become an expert, the Bourdieusian sociologist would argue that he remained true to his *habitus* and simply converted one form of cultural capital into another, shifting topics but not transforming dispositions. Finally, the fact that the disease disproportionately affected young people may also explain the high level of commitment in the movement. Faced with their own impending death or the sentence of a positive HIV-test, or that of young friends and relatives, activists had all the ‘incentives’ and the time and resources to put their previous lives on hold and devote themselves to the cause of finding a cure.

All of these objections may be true and significant. Still, from the perspective of political theory, political action ought to be judged for its exemplarity. It should be made sense of not for its generalizability and predictability but for the surprise and disruption it brings into the public realm. Not for its replicability but precisely for the singular and unique character of the objects

and subjects it brings forward. What matters is the enacted democratic scene in its ‘singular universality,’ and the light that the example can shed on the questions and answers surrounding democratic politics and technoscience.

Sociology, we could conclude, is the science of *probable* behavior. Political thinking, by contrast, turns its gaze to the *possible*, including the interference and torsion that speech and action produce in police distributions of the sensible.

An alternative vision of the role of social scientists is at stake in the work of Actor-Network theorists. Indeed, and similarly to Latour’s reformulation of the ‘professions’ in terms of the skills they bring to bear on the different tasks of composition, Michel Callon and his collaborators have moved beyond the ‘police’ framing role of social scientists we detected in the design and organization of minipublics. From this perspective, the new role of social scientists is not to *command*, but to *counsel* emergent groups as they partake in collaborative research and the composition of the collective. Social scientists, these authors themselves included, belong to the ‘researchers’ partaking in the process of exploring possible worlds. Their role differs markedly from the function of ‘experts in deliberation’ that handled the *GM Nation?* debate. And it should even be distinguished from the role that scholars such as Brian Wynne and Alan Irwin played as promoters and advisors of the official shift from ‘public understanding of science’ (PUS) to ‘public engagement in science’ (PES) we examined in relation to the ‘participatory turn.’ In the case of Callon and his colleagues, their contribution has been to draw the lessons of more than thirty years of experience in the various instantiations of dialogic democracy in hybrid forums. Hence their aim “to bring out, behind their obvious diversity, the unity of these attempts, and to reveal and make it possible to capitalize on the vicissitudes of experience that these attempts

allow for” (Callon *et al.* 2009, 153). In doing this, they are not acting like social scientists embracing the fact/value or nature/society dichotomies; on the contrary, Callon and his colleagues are as keen as Latour on dismissing the habits of the modern Constitution.¹⁶⁶ In contradistinction to the role of social scientists in delegative democracy, this new breed of social scientists is asked “not to silence spontaneous speech so as to replace it with domesticated and reworked speech... but to shed light on the organization of the debate and put forward procedures for dialogue with the people” (Callon *et al.* 2009, 111). Social scientists, in other words, can intervene to counter technocrats’ disdain for the *demos*, their participation in what Rancière has called the “hatred of democracy” (Rancière 2007). *Acting in an Uncertain World* is the authors’ own performance of this new task.

Interference And/Within Composition

Going against the grain of a venerable tradition of political thought running from Aristotle to Habermas, Jacques Rancière has famously argued that “democracy is not a political regime... [but] *the* regime of politics” (Rancière 2001, 10). In one sense, this thesis is meaningful and valid regardless of specific historical circumstances. It ‘applies,’ as it were, to the irruption of the *demos* in Ancient Athens no less than to proletarian subjectification in the nineteenth century or the more recent emergence of lay-expert activism. This has to do with the structural quality of Rancière’s mode of political theorization, in which democracy invariably consists in the clash

¹⁶⁶ As they put it in the book’s concluding chapter in relation to the “procedural innovations” of the various actors involved in the hot situations where hybrid forums ferment, “we have been able to reveal these innovations... because we are freed from a set of categories and grand narratives that conceal, to the point of making invisible, this anonymous, collective, stubborn work that, day after day, brings dialogic democracy into existence” (Callon *et al.* 209, 225).

between the egalitarian logic of dissensus and the inegalitarian logic of the police. Still, Rancière's thesis has to be grasped in relation to the historical context in which it was meant to intervene (McClure 2003). This refers to the twin arguments about 'the return of political philosophy' and 'the end of politics' that marked the Continental philosophical context of Rancière's political writings of the 1990s (Rancière 1999, 92-93). The former posits that philosophy has finally been able to resume its interrogation about justice and the common good, its quest for a wholly harmonized and sutured distribution of roles and rights, of shares and entitlements. The 'end of politics,' on the other hand, is the mirror claim according to which the triumph of liberal or 'consensual' democracy has brought about a neutralization and successful management of social conflicts that renders politics irrelevant. When "there isn't much to deliberate" and "decisions make themselves," politics becomes a matter of "opportune adaptability in terms of the demands of the world marketplace and the equitable distribution of the profits and costs of this adaptability. The resurrection of political philosophy thus simultaneously declares itself to be the evacuation of the political by its official representatives" (viii).

'Consensual democracy,' as Rancière sees it, is essentially the prevention or suppression of the "ternary mechanism of democracy": *appearance*, *miscount*, and *dispute*.

There is democracy if there is a specific sphere where the people appear. There is democracy if there are specific political performers who are neither agents of the state apparatus nor parts of society, if there are groups that displace identities as far as parts of the state or of society go. Lastly, there is democracy if there is a dispute conducted by a nonidentary subject on the stage where the people emerge. The forms of democracy are the forms taken by the emergence of this appearance, of such nonidentary subjectification and conducting of the dispute. These forms of emergence have an effect on the institutional mechanisms of politics and use whatever mechanisms they choose. (Rancière 1999, 100)

Rancière claims that consensual democracy—‘post-democracy’—is “the government practice and conceptual legitimization of a democracy after the *demos*, a democracy that has eliminated the appearance, miscount, and dispute of the people and is thereby reducible to the sole interplay of state mechanisms and combinations of social energies and interests” (Rancière 1999, 102).

In these circumstances, the ternary apparatus of democratic politics is “strictly opposed,” respectively, by “the proposition of a world in which everything is on show, in which parties are counted with none left over and in which everything can be resolved by objectifying problems” (102). Thus, in an unmistakably Arendtian, quasi-phenomenological turn, he claims that where everything is on show (as in Baudrillard’s ‘simulacrum’) nothing can truly *appear* (103). And, in an argument that rings true today no less than it did twenty years ago, Rancière links this loss of appearance to the ceaseless polling of the population and the accompanying reign of ‘public opinion.’ Once the people is statistically reduced to an object of knowledge, “exhaustive counting procedures can be introduced,” premised on the notion that “[t]he people is identical to the sum of its parts,” that the “summation of its opinions is equal to the sum of the parts that constitute it,” that “[t]heir count is always even and with nothing left over” (105). As for the democratic *miscount*, what blocks the subjectification of a *demos* is the scientific account that is made of the population’s opinions. In opposition to the idea that ‘the people’ is always a supplement to the counting of parts of the community, consensual democracy rests on a statistically posited and scientifically sanctioned identity between *demos* and ‘population’ which, as Rancière contends, “puts everyone in their place, with the right opinion to match” (106). Democratic *dispute*, finally, is suffocated by the work of experts who put “any object of dispute that might revive the name of the people and the appearances of its division in the form of a

problem” (106) that is thereby objectified and presented as processable through state action and deliberation among identified parties.

Rancière’s critique of consensual democracy can be augmented by reference to the ‘participatory turn’ in public engagement with science, which emerged shortly after his political interventions in *Dis-agreement*. Indeed, his misgivings about the state of our democracies continue to be relevant as the deliberative apparatuses of elicitation we have seen at work in ‘minipublics’ have come to complement the reign of the survey and opinion consultation. Thus, Rancière’s observation that “most of the measures that our clubs and political ‘think tanks’ relentlessly come up with in a bid to change or revitalize politics by bringing the citizen closer to the state or the state closer to the citizen... offer the simplest alternative to politics: the simple police,” works as well in relation to the empirical side of the deliberative turn. As Rancière puts it, “it is a representation of the community proper to the police that identifies citizenship as a property of individuals definable within a relationship of greater or lesser proximity between the place they occupy and that of public power” (Rancière 1999, 31). My basic point here has been that these efforts to include lay citizens in technical debates do not make hitherto excluded voices visible and hearable; they do not interrupt the counting of society’s parts; nor do they challenge technical expertise. Minipublics are the most recent manifestation of our police regimes and their insistence on putting everyone in their right place. A ‘better’ one, maybe, by comparison to the stultifying ‘politics’ of the ‘public understanding of science’ (PUS). But the ‘general public,’ and the ‘right opinion’ that matches it, are in need of elicitation and fabrication, thereby introducing the displacement of expertise we examined in chapter 5. Unlike a truly democratic interlocutor, which has always been “an unprecedented character, established to expose the dispute and set up

the parties to it... [t]he partner of postdemocracy... is identified with the existing part of society that the formulation of a problem implies in its solution” (107).

This understanding begs the question of how interference and deliberation differ *and* relate to one another. The difference hinges on the distinction I have drawn between deliberation (as conventionally theorized) and the subjectification and dissensus that reconfigure the parameters of deliberation. The latter involves forms of action that disrupt certain norms of decorum and the civil ambient demanded by deliberative theory.¹⁶⁷ Still, that does not mean they don’t require each other. Deliberation is the ‘other’ against which Rancièrian democracy defines itself, and on which it depends to produce its egalitarian effects. Rancièrian dissensus, the polemical introduction of new objects and subjects into the public account of the common world, would make no sense if it were not followed by actual deliberation *à-la*-Habermas, or something of that kind. Conversely, Habermasian deliberation would be sterile and democratically counterproductive if it were not disrupted from time to time by the appearance of new actors and objects on the public scene, a process that—as I have argued—cannot be subsumed under deliberative practice *per se*. My recourse to Rancière, in this sense, has not been meant to

¹⁶⁷ Among scholars of deliberative democracy, David Estlund has been the only one to recognize the disruptive character political action can display, something he rightly takes to be of benefit for deliberative democracy’s cognitive or epistemic credentials. “The idea of civility,” he writes at the beginning of his “Deliberation Down and Dirty” (Estlund 2001), “can suggest perniciously narrow norms of public behavior. ... [T]here are moral standards of civility in political expression that can accommodate much vigorous, disruptive, disturbing, embarrassing, and even illegal expressive activity” (49). Estlund discusses the breakdown of orderly discussion at the International Town Meeting held at Ohio State University in 1998 by protestors to show that disruptive behaviors like entering uninvited with counterfeit passes, ignoring Robert’s Rules of Order, speaking out of turn, and disruptive chanting, can enhance the epistemic value of deliberation by introducing new perspectives, in what amounts to a productive interference between power and reason. Importantly, “[d]isruptive political expression... is not merely another kind of social power, one that, say, raises the costs of continued oppression—though it can also be that. It has often injected ideas, complaints, and perspectives into public discourse in ways that enable the kind of reasoning to which democratic deliberation aspires” (Estlund 2001, 64). Unlike Dryzek, Bohman, and Warren, however, Estlund does not take those disruptive forms of political expression themselves to be deliberative in nature.

denounce the dominant strand of democratic theory, but rather to problematize its premises. These cautionary words are warranted for, as Rancière himself writes, “If the distinction between politics and the police can be useful, it is not to allow us to say: politics is on this side, police is on the opposite side. It is to allow us to understand the form of their intertwinement... [to understand] how politics encroaches on matters of the police and the police on matters of politics” (in Rockhill and Watts 2009, 287-288). Far from further distancing Habermasian and Rancièrian accounts, the perspective I have tried to develop in this dissertation is one that makes them more proximate. Politically, in any particularly fraught moment like those involving technoscience and expertise, Habermasian deliberation and Rancièrian dissensus require each other.

Rancière’s emphasis on appearance, miscount, and dissensus, furthermore, does not entail an *ex-nihilo* view of democratic politics. Part of the ‘poetics of knowledge,’ as we have seen, involves an improper appropriation of available skills and languages, as well as forms of political demonstration that tap on existing rights and institutions. Forms of democratic politics “are in no way oblivious to the existence of elected assemblies, institutional guarantees of freedom of speech and expression, and state control mechanisms. They see in these the conditions for being exercised and in turn modify them” (Rancière 1999, 100-101). Put differently, liberal democracy is not something we need to *get rid of*, nor is it something in need of mere *complementation*, for instance, through deliberative forums. The challenge lies in its *supplementation*, meaning the torsion of the givens of public life that is introduced by the action of a supplementary part.

Still, Rancière’s political theorization of democracy, and the concept of ‘interference’ I have tried to articulate in his company, is haunted by the question of what follows *after*

appearance, miscount, and dispute. Forms of democratic politics, Rancière claims, “produce inscriptions of equality” (Rancière 1999, 100). What does this mean? And how does it relate to ‘composition’?

First of all, we have to be clear about the political significance of composition. Politics for Latour is the composition or explicitly acknowledged construction of the common world and its knowledges. Faced with the ‘unlawful’ and indiscriminate proliferation of socio-technical hybrids that marks our contemporary condition, such composition—Latour insists—is in urgent need of stipulated procedures. The construction should be done, in the words of one of his early collaborators in ANT, “slowly, appropriately, and in conformity with due process—that is, constitutionally” (Law 2009, 4). In Latour’s own words, the ‘constitutionally’ regulated composition of ‘political ecology’ can only be properly done in a manner that is “willful, explicit, [and] spelled out” (Latour 2004, 239). According to Callon, on the other hand, politics concerns the exploration and demonstration of overflows, of the unintended and unanticipated consequences of technoscientific doings in nature, the world, and social lifeworlds.

Latour and Callon have the merit of articulating an idea I take to be significant for theorizing the politics of technoscience, one that I have also tried to discern in Arendt’s reflections in *The Human Condition*, as well as in Rancière’s notion of disagreement; namely, that the emergence or appearance of objects *and* subjects go hand in hand in public life. As we saw in chapter 1, Arendt took politics to be about the disclosure of world and self. “Without being talked about by men,” she argued, “the world would not be a human artifice but a heap of unrelated things,” just as in the absence of “the human artifice to house them, human affairs would be as floating, as futile and vain, as the wanderings of nomad tribes” (Arendt 1998, 204).

To exist, politically speaking, objects have to be *publicly* presented; they must *appear* ‘in-between’ actors, separating and relating them at the same time. Whatever appears as an issue of concern appears on account of the perspective(s) of those who place it as something in common. Similarly, Latour and Callon claim that we must cease thinking about the subjects of politics as entities that are always already given, waiting, as it were, for problems to come knock on the gates of their forums. The reverse holds true. Theorized as ‘publics,’ ANT posits subjects that emerge and coalesce only by virtue of their attachments to ‘issues’ of concern. The point of ANT’s infamous turn to nonhumans, especially *technoscientific* things, is precisely to change the way we think about publics. Unlike ‘stakeholders’ and other already-constituted and officially acknowledged groups, the publics that form around a nuclear disposal plan, a new blood screening test, or a new genetically modified seed, are *newcomers* that enter a public scene that has no name or place to assign to them. On the other hand, these authors argue, the issues themselves have to be seen in relation to the public(s) they affect and summon into existence. As I interpret these works, their premise—and it says much in favor of Latour and Callon that this is a *premise* and not a *goal*—is that emergent publics can bring new perspectives to bear on the common world that deserve acknowledgment, attention, and cultivation, and this at the risk of unsettling existing definitions of issues and upsetting the cast of stakeholders that have a claim on them.

Beyond this convergence, the *political* character of composition is particularly emphasized by Callon. Indeed, “understood as action rather than result” (as opposed to the final picture of aggregation, which “does not reconsider the entities to be aggregated”), composition “replaces the classificatory certainties of aggregation with the uncertainties of groupings that

simultaneously define (or redefine) the significant entities, those that are able to speak and to whom it is advisable to listen, the forms of the relations between these entities, and, in fine, their *modus vivendi*.” Significantly, according to Callon and colleagues, “[t]he sole end of composition is to define in what these entities or substances consist: the political is lodged in this reconfiguration” (132). This location of ‘the political’ in the vertical axis examined in chapter 7 (the one that charts the modalities of the collective’s constitution) is consistent with the fact that this axis is meant to represent the different ways of moving beyond the delegative aggregation of conventional politics. Although this need not imply that nothing political is at stake in the horizontal axis, the fact is that no statement about the “lodging of the political” is made in relation to the different modalities of collaborative research. In other words, Callon *et al.* seem to reserve the adjective ‘political’ to innovations in the constitution of the collective, but not to innovations in the production of scientific knowledge.¹⁶⁸

In light of all this, the nagging question is about how composition relates to interference, and thus to Rancière’s police/politics opposition. In this respect, at least one thing is certain: *composition is not a police operation*. Composition is a *process*, not a final result. Once we reconceptualize the notion of process through the refashioning of “the three conjoined notions of nature, politics, and science” (Latour 2004a, 7) we become attentive to the constant invention of

¹⁶⁸ In a later review essay on Andrew Barry’s *Political Machines*, which praises the latter’s contribution “to thinking on the introduction into the political sphere (*la mise en politique*) of the technosciences,” Callon adopts Barry’s distinction between ‘politics’ and ‘the political,’ reformulating it somewhat in his own terms of ‘framing’ and ‘overflowing’: “Politics is the area of framing, repetition, closure, of the ‘lock-in’ and pre-coding of issues (of overflows) and conflicts. ‘The political,’ by contrast, is the area of the openness of new sites and new sights, of difference, of ‘lock-out,’ of new objects of protest, of the production of events, or, alternatively, of overflows and their demonstration” (Callon 2004, 133). Whereas the Newbury demonstrations studied by Barry overflows existing codings and thus instantiate ‘the political,’ other examples on the controversies around air, water, and the patentability of living matter in Europe repeats the existing codings, and corresponds to ‘politics,’ according to Callon, because “subjectivities are not re-made or reconfigured.”

new procedures and new ways of handling hybrids in the face of new problems. This is what Latour and Callon mean when they talk about elucidating the means for *better ordering* the common world. A nice counter-image to the ‘police’ and its quest for a final closure is provided by Latour:

The collective, as we understand now, is not a thing in the world, a being with fixed and definitive borders, but a movement of establishing provisional cohesion that will have to be started all over again every single day. Its borders, by definition, cannot be the object of any stabilization, any naturalization (Latour 2004a, 147).

What Latour and Callon are trying to conceptualize, in different but kindred ways, is a construction of the common world that is an outcome *of politics*, not of the police.

Composition, I want to claim, relegates the moment of interference as one ‘phase,’ albeit a crucial one, within a larger process within which it is nested. In Latour’s formulation, interference is lodged in the Upper House’s ‘power to take into account,’ with its tasks of perplexity and consultation.¹⁶⁹ In Callon *et al.*’s scheme, interference corresponds to the initial modalities of composition and collaborative research: the expression of emergent identities and the incipient extension of the research collective. My theorization of interference, as the irruption of new subjects and the emergence of the objects they bring to public existence, on the other hand, can augment Latour’s and Callon’s insightful but incomplete account of this moment. Interference, in this sense, is both less *and* more than composition. It is *less* because interference, by itself, lacks the phase of ‘inscription’ that Latour theorizes in terms of the tasks of ‘institution’ and ‘hierarchy’ that comprise the Lower House’s ‘power to arrange in rank order,’ as well as the

¹⁶⁹ That is, “You shall not simplify the number of propositions to be taken into account in the discussion” (perplexity), and “You shall make sure that the number of voices that participate in the articulation of propositions is not arbitrarily short-circuited” (consultation).

‘negotiation and articulation of identities’ and the ‘identification and formalization of problems’ at stake in Callon *et al.*’s dialogic model.

Interference is *more* than composition because the appearance, miscount, and dispute introduced by the *demos* will always exceed Latoureaan ‘constitutional’ provisions (no matter how open ended and self-conscious about their contingency these might be). A ‘republic,’ in Latour’s sense, “designates the collective in its effort to undertake an experimental search for what unifies it; it is the collective assembled according to due process and faithful to the order of the Constitution” (Latour 2004a, 248). Things are more complicated in relation to Callon and his colleagues, who consistently shy away from the sort of proceduralism we find in Latour’s juridical metaphor of Parliaments, Houses, and divisions of power. Recall that for these authors ‘procedures’ are not procedural matters, but singular instantiations of a new form of dialogic democracy, *from which* lessons and criteria can be extracted in order to advise the eventual emergence of new hybrid forums in the future. Without a doubt, interference will always overflow the kind of *standardized* procedures these authors assess (focus groups, public inquiries, consensus conferences, and the like), but the kind of composition we witness in the AIDS, nuclear waste, and myopathy forums that best instantiate their concept of dialogic democracy is largely equivalent to interference.

This brings us back to Rancière’s thesis that democracy is not a political regime. If this is the case, then interference would be incompatible with Callon’s suggestion that hybrid forums instantiate a novel political regime that is emerging to complement the arrangements of delegative democracy. Alternatively, we could claim that Rancière’s thesis loses much of its meaning in the world of hybrid forums and the Parliament of Things depicted in ANT. From a

Rancièrian perspective, indeed, composition can be interpreted as an attempt to square a circle, that is, to incorporate within the political regime the mechanisms for its own subversion. However, once we realize that composition is a *process* and not a final outcome, a task that is resumed the very moment it would seem to be completed, the relationship between interference and composition loses much of its paradoxical character.

According to Rancière, the “better police” is “the one that all the breaking and entering perpetrated by egalitarian logic has most often jolted out of its ‘natural’ logic” (Rancière 1999, 30-31). If so, then we could claim that composition is not a *better* police regime, but the *best*. What I am proposing, then, is to regard composition as the best way of addressing the question of inscription Rancière left largely under-theorized; an alternative that is different but compatible with Aletta Norval’s (and our own) turn to exemplarity.

I close this dissertation in the next section with some reflections on the question of aesthetics in relation to the sense of *amor mundi* I have been stressing from the outset. This provides a connection between the two aspects so far examined in this Conclusion, namely, exemplarity and interference-*cum*-composition.

The Aesthetics Of Concern

To introduce the question of aesthetics, let us begin with one further point of connection between Rancière’s thinking and ANT’s theoretical outlook. Consider the following remark by Michel Callon:

In the traditional view [of social theory], nonhumans are obviously present, but their presence resembles that of furniture in a bourgeois home. At best, when these nonhumans take the form of technical artifacts, they are necessary for the daily life they facilitate; at

worst, when they are present in the form of statements referring to entities such as genes, quarks, or black holes, they constitute elements of context, a frame for action. To the extent that they are treated as lying outside the social collective or as instrumentalized by it, nonhumans are in a subordinate position... [In reality] society is constructed out of the activities of humans and nonhumans who remain equally active and have been translated, associated, and linked to one another in configurations that remain temporary and evolving (Callon 2001, 64).

From the point of view of conventional, human-centered social science, ANT's front-staging of non-humans is indeed a very *improper* thing to do.

And impropriety is one of the hallmarks of politics, according to Rancière. As readers familiar with his work know very well, the logic of his arguments about aesthetics is structurally analogous to that of his political thought (Rancière 2000, 2002, 2009a). At stake in both political and aesthetic interventions are 'redistributions of the sensible' that change the parameters of what is seen, heard, and taken into account in human affairs. Of particular interest here is Rancière's account of the 'aesthetic regime of the arts' that emerged with modernity as a disruption of the logic governing the hierarchies of genres and subjects, destabilizing conventional distinctions between art and non-art, or noble and base subject matters.¹⁷⁰

What is the kernel of the aesthetic revolution? First of all, negatively, it means the ruin of any art defined as a set of systematizable practices with clear rules. It means the ruin of any art where art's dignity is defined by the dignity of its subjects—in the end, the ruin of the whole hierarchical conception of art which places tragedy above comedy and history painting above genre painting. To begin with, then, the aesthetic revolution is the idea that everything is material for art, so that art is no longer governed by its subject, by what it speaks of: art can show and speak of everything in the same manner. In this sense, the aesthetic revolution is an extension to infinity of the realm of language, of poetry. It is the affirmation that poems are everywhere, that paintings are everywhere (Rancière 2003, 205).

¹⁷⁰ “‘Aesthetic’... does not mean the theory or science about art but the paradoxical regime of thinking in which a form is appropriated ‘without a concept’ and art is characterized by the fact of determining a specific experience without defining any order separating art from non-art” (Rancière 2009c, 116).

A good example of this disorder is Balzac's use of epic modes of description to write about the banalities of everyday life, as described at the beginning of his novel *La Peau de chagrin*, when “the hero Raphael enters the show-rooms of a large curiosity shop where old statues and paintings are mingled with old-fashioned furniture, gadgets and household goods. There, Balzac writes, ‘this ocean of furnishings, inventions, works of art and relics made for him an endless poem’” (Rancière 2002, 143-4).¹⁷¹

In light of this structural affinity between politics and aesthetics it would be tempting to say that ANT’s inclusion of non-humans is ‘political,’ but such a claim would clash with Rancière’s confinement of political action to the emancipation of a (human) *demos*. The possibility of thinking non-human entities as a political subject of this kind was suggested by Jane Bennett to Rancière in a conference in 2005, who replied—somewhat against the grain of his own mode of theorization—that politics ought not to be stretched *that far*.¹⁷² I am not willing to go as far as Bennett does (2010a, 2010b) mainly because I follow both Rancière and Arendt in stressing what I would call the ‘non-negotiable’ status of human speech in politics. My point here is simply to suggest that behind ANT’s ostensibly politico-theoretical interventions stands an aesthetic reconfiguration of what is deemed worthy of account in the analysis of social life, something that could further bridge the distance between these positions. Rancière has been

¹⁷¹ Rancière coined the term *literarity* to refer to a condition of language that unsettles relations of propriety and authority, which applies to those forms of “the written word that circulate without a legitimating system defining the relations between the word's emitter and receiver” (Rancière 2000, 7).

¹⁷² “Are there nonhuman actants among the *demos*? Is it possible for an animal, a technology, or a sound to redraw the ‘partition of the sensible’? When I posed this question to Rancière at a conference celebrating his work, his answer was a clear ‘no’. He did not want to extend the concept of the political that far; it ought not, he said, to be stretched beyond the realm of the human. Any political efficacy (apparently) associated with nonhuman entities is ultimately a function of human agents. Despite Rancière’s reply, his theory opens a conceptual space for nonhumans to appear as political actants” (Bennet 2005, 139-140).

emphatic that Flaubert’s literature, for example, “does not perform political action, it does not create collective forms of action, *but it contributes to the reframing of forms of experience...* [and] this reframing makes new forms of political subjectivization possible” (Rancière 2009c, 122, emphasis added). In the same manner, my argument here is not that research inspired by ANT amounts to political action in the sense of staging of dissensus over the givens of public life. It has, however, produced an aesthetic reconfiguration of what is visible and sayable *in social theory*.

A further aesthetic dimension is also at stake in ANT, one that resonates strongly with Arendt’s concern for how the things of the world *look*. Her advice that we should strive to “make articulate and call into full existence what otherwise [we] would have to suffer passively anyhow” (Arendt 1998, 208), namely, what we have called the overflows of hybrid networking, has a striking affinity with Latour’s affirmation that we should “slow down, reorient and regulate the proliferation of monsters by representing their existence officially” (Latour 1993, 12). Indeed, Latour’s Whiteheadian account of matters of concern, and his kindred Deweyan characterization of the formation of publics around problems that *affect* them, I want to argue, place Latour squarely in the company of Arendt.

They share a sense of care for the world and for the ‘things’ that appear in it, for how we relate to them, and, through them, to each other. “Matters of concern,” Latour contends, “have to be *kept up, cared for, accompanied, restored, duplicated, saved*” (Latour 2005b, 49, my emphasis). By contrast, matters of fact—a staple of the sterile representation Latour urges us to abandon—lack the aesthetic aspect which Arendt saw as the potential redemption of things, in the sense that their public appearance can always wrest things from the processual chain of

means and ends in which no singularity can shine forth. Matters of fact in the modern Constitution are supposed to be ‘out there,’ beyond question, and indifferent to the way they look, uninterested in their ‘secondary qualities.’ Significantly, this aesthetic concern is not alien to Latour himself. For if matters of fact are to be redescribed as matters of concern, then the question of how they look like is inseparable from that new depiction.

In the Spinoza Lectures he delivered at the University of Amsterdam in 2005 Latour speculated on the contours that a new, alternative “scenography” would require for experience to capture matters of concern. He speaks of “an immense building site where... artists, scientists, politicians, statesmen, organizers of all kinds... are trying to reinvent an Art of Describing, or rather an Art of *Redescribing* matters of fact [in order to] uptake ‘what is given in experience’” (Latour 2005b, 46). In what basically amounts to a reformulation of the ideas put forward in *Politics of Nature*, Latour proposes four specifications that the construction would have to fulfil for the scenography to yield “an aesthetics of matters of concern” (47). First, “matters of concern *have to matter*,” that is, they have to matter for some people: “let matters of concern distinguish clearly the population of those for whom they matter” (47). Secondly, “matters of concern have to *liked*.” Whereas for a hardcore realist a matter of fact is what it is ‘whether one likes it or not,’ the new scenography has to ensure that disputes over matters of concern are not prematurely put to an end by recourse to facts that reduce them to silence. Thirdly, “matters of concern have to be *populated*” (48), in the sense of being recognized as a

gathering (Thing) and not as a Heideggerean object (*Gegenstand*). Finally, “matters of concern have to be *durable*” (48).¹⁷³

What Latour says of Europeans at the end of his Spinoza Lecture should be taken as pertinent for all of us:

I believe it is the responsibility of Europeans to refuse to live in the ruins of the modernist scenography and to have the courage, once again, to put their skills to work in devising for matters of concern a style that does justice to what is given in experience (Latour 2005b, 50).

Will *Mycoplasma laboratorium* ever become a public issue? The answer to this question I made in the Introduction depends on whether or not we are capable of bringing experiences of worldliness back into the orbit of our political life, on whether or not we are able to interfere with the officially public accounts of the deeds of technoscience and begin composing anew the world that one day we might hold in common. For that to happen, at the very least we need to start caring for what the things of the world look like.

¹⁷³ Latour explains the meaning of this last stipulation by reference to Whitehead: Facts are not the ahistorical, uninterpreted and asocial *beginning* of a course of action, but the extraordinary fragile and transient provisional *terminus* of a whole flow of betting organisms... Endurance is what has to be *obtained*, not what is already given by some substrate, or some substance” (49).

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