Science in Democracy

Expertise, Institutions, and Representation

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Preface

From global warming to biotechnology, politics today is closely intertwined with the sciences. According to the dominant image of science and politics, politics provides the money, with no questions asked, and science produces knowledge, technology, and medicine. This pleasant image has become rather tarnished in recent years, as intractable public controversies have politicized science policy, expertise, and research.

Many commentators respond to the politicization of science by attempting to revive an imagined Golden Age of value-free science. They call for getting the politics out of science, concerned that if science is shaped by society it will fail to accurately represent nature. They tend to believe that representation in science should strive for unmediated correspondence to reality.

The most common alternative response to science politicization has been to promote lay participation in science. From grassroots movements to public hearings to randomly selected citizen advisory bodies, many scholars, activists, and public officials have argued that lay input will improve both the effectiveness and legitimacy of science policy, expertise, and research. They hope that public participation will lead to policies that more accurately represent the public. Many advocates of lay participation also tend to conceive representation as direct correspondence to reality—in this case, the reality of either expressed popular will or presumed public needs.

The first response to politicized science, although based on valid concerns, has usually failed to achieve its goals. Science remains politicized, or it is continually repoliticized. The second response is more promising, but it has fallen far short of its potential. Lay participation often fails to generate significant changes in the politics of science, and citizen engagement efforts frequently become absorbed into technocratic policy making.

Science in Democracy identifies a key reason for these shortcomings in the implicit conception of representation these approaches share. This book develops an alternative account of both political and scientific representation as practices of mediation that transform what they represent. In a democracy, the concept of representation incorporates multiple elements, including authorization, accountability, participation, deliberation, and resemblance. Democracy depends on diverse kinds of institutions—legislatures, interest groups, advisory bodies, and so on—each of which mobilizes different elements of representation. When democracy is understood in this sense, it becomes easier to see both how and why we might respond to politicized science by democratizing it.

To develop these arguments I draw on the history of Western political thought, science and technology studies (STS), and democratic theory. I enlist various contemporary and canonical figures—Machiavelli, Hobbes, Rousseau, Madison, Dewey, and Latour, among others—to explore insights, concepts, and metaphors that seem promising for contending with current dilemmas of science and politics. The purpose of reading canonical authors in the history of political thought is not to look for ready-made answers to today's problems. My first aim in reading such authors is to explore some of the conceptual sources of current modes of thought and practice. My second and more central purpose is to illuminate current assumptions, issues, and debates and explore alternative ways of conceiving them. This task sometimes involves showing how past modes of thought were distinctly unlike current approaches.[1]

To put it somewhat differently, my goal in much of this book is to ask what various canonical authors could and should mean for us today, taking into account what they meant in the past. Leaving aside the complex philosophical issues underlying this approach, it is based on the notion that the meaning of canonical texts for readers today is intertwined with the history of efforts to interpret what their authors meant to say and do, and that interpretive history extends right up to the present. The interpretation of canonical texts depends on, but need not be reduced to, understanding what their authors sought to achieve when they wrote. Given these aims and persuasions, I do not adopt the historian's task of describing the intricate local circumstances of the texts I consider. Nor do I adopt either the sociologist's goal of explaining their emergence, or the philosopher's ambition of analyzing their consistency or validity. Nonetheless, I draw extensively on historical, sociological, and philosophical studies to inform my account. Similarly, I do not pre-

sume a dichotomy between interpretation and explanation, and to the extent that the texts and concepts examined here have shaped contemporary practices and institutions, interpreting the former is key to explaining the latter. These authors' ideas are not "mere ideas," but contributory causal factors in both historical change and stability.

Political theorists have often assumed an essential boundary between science and politics, with the effect that canonical authors become enlisted in polemical attacks on either technocratic scientism or humanistic moralism. Much of the scholarship on Machiavelli, Hobbes, and Dewey, for example, can be divided into two camps according to whether their interpreters associate them with scientific modes of thought. These interpretative debates reach beyond academic political theory, because the authors treated here often become battlegrounds in public controversies over science and technology. Debates over science and religion, for example, rarely get very far before someone invokes the legend of Galileo's heroic resistance to the obtuse Catholic Church. I attempt to shift the lines of battle by showing how these authors, rather than being on one side or the other of a presumed boundary between science and politics, raise intriguing questions about the boundary itself.

From the perspective of STS, my reliance on canonical political theory may seem rather old-fashioned. Philosophical interpretations of the "great books" have traditionally assumed an ethereal, male-dominated "conversation of mankind" that stretches across the ages.[2] Much recent work in STS, in contrast, draws on actor-network theory, ethnomethodology, grounded theory, and related approaches to focus on local sites of knowledge production. Formulated in opposition to functionalist theories of society, a key aim of these approaches is to maximize the investigator's receptivity to the empirical material by not introducing conceptual distinctions either prior to or independent of empirical research.[3] STS research in this vein has revealed the importance of local material contexts comprised of instruments, bodies, and practices that traditional philosophers cannot see from their lofty perch. There is no reason to conclude, however, that the only or most relevant context is local. Localized research requires isolating local conditions from the broad historical trends and conceptual traditions within which they are embedded. These trends and traditions are themselves continually reconstructed within local contexts, but that does not prevent them from having real effects that scholars focused on local situations tend to set aside.[4] In this respect, localized STS research is no less "abstract" than historically informed political theory, because both

must isolate or abstract their research topics from other potentially relevant contexts. One can certainly argue about which contexts are most productive for one's goals, but research contexts are not naturally given, and it is impossible to identify *the* context of any particular text, event, discourse, or phenomenon.[5] The goals of this study are best served by locating selected conceptual and institutional features of the contemporary politics of science within the historical continuities and disjunctures of modern political thought. Unlike most work in STS, therefore, this book does not show how particular artifacts have been constructed. Rather, it takes a small step back and considers a few of the ideas and institutions that have been constructed so far, asks what it means for democracy to understand them as constructed, and explores how they might be reconstructed by both actors and analysts in the future.

The interpretations offered here cannot be tested or proven in any strict sense. All the concepts I consider—science, politics, democracy, representation, and so on—are inescapably both normative and descriptive. Any way of conceiving them both provides a normative vantage point for empirical description and has implications for how we conceive the values, interests, and purposes of those whose lives they shape. Consequently, such concepts are not subject to either definitive conceptual analysis or empirical falsification.[6] The merit of my interpretations, therefore, depends on their usefulness for understanding relationships among concepts, practices, and institutions, for clarifying the stakes of various theoretical and practical dilemmas, and for generating hypotheses for empirical research.

In addition to interpreting canonical works in political theory, this study draws on my own empirical research on expert advisory committees and some of the key insights of constructivist research in STS.[7] For the most part, I avoid philosophical debates about whether or to what extent science is constructed by society and politics. I do attempt, however, to illustrate the plausibility and fruitfulness of a particular stance in those debates. To put my philosophical cards on the table: I am persuaded that rationalist, essentialist, and determinist conceptions of science and technology are neither empirically accurate nor normatively desirable. Technological determinism may capture the ways in which many people experience the technical imperatives that shape their lives, but it does not offer a viable theory of scientific and technical change.[8] Technical facts and artifacts do not become socially established merely because they are true or effective. Scientists study nature by engaging with it; nature,

scientists, and often society at large are transformed in the process. I also take it as given, however, that scientific facts are not *socially* constructed, if that means natural forces and entities play no causal role in their creation. The world does not lend itself to all possible constructions. This perspective, common among STS scholars who study the "co-production" of science and society, avoids radical constructivism or relativism on the one hand, and the traditional view of scientific truth as unmediated correspondence to reality on the other.[9] Put in the most general terms, scientific facts emerge from hybrid processes shaped by human ingenuity and initiative, sociotechnical structures and institutions, and nonhuman entities and phenomena.

A moderately *constructivist* position of this sort differs from the *relativist* claim that all knowledge is particular to specific social contexts. Indeed, constructivism is fully compatible with the *realist* view that science produces accounts of preexisting material things, and that such accounts are (or may become) universally valid.[10] For constructivists, the better constructed such accounts are, the more universal they become. The material world exists prior to science, but it does not come presorted into isolated packets called "facts" that scientists discover like shells on a beach. Whereas relativists focus on the particular features of local sites of knowledge production, constructivists view science in terms of broad sociotechnical networks. These networks include diverse actors, some of whom may not be certified scientists. Although this book draws more on constructivism than relativism, elements of relativism appear in my concern with the distinctive purposes of established institutions. Such institutions, I argue, create locally or nationally specific conditions that shape (without determining) the production and dissemination of scientific knowledge and expertise.

Contemporary democratic theorists, nurtured on Thomas Kuhn, may be predisposed toward this moderately constructivist view of science, but they have done little to explore its implications for democracy.[11] Indeed, one of the arguments of this book is that a dichotomy between science and politics underlies the longstanding debate between advocates of participatory and representative democracy. Moving beyond the dichotomy between representation and participation in democratic theory requires rethinking representation in science. In making this argument, I draw on an emerging body of work that defends representative democracy on its own terms, as an original and normatively superior form of government.[12] Representative democracy is not merely an expedient for coping

with the size and complexity of modern states. It both fosters and depends on a critical public sphere that should be understood as part of, rather than existing prior to, political representation. Just as scientific representations of nature are mediated by various social practices and laboratory instruments, political representation involves more than a simple transmission or "making present" of constituent ideas, interests, and identities.

The chapters of *Science in Democracy* each highlight selected elements of the concept of democratic representation developed in the book. Part I sketches the historical and conceptual origins of the liberal-rationalist dichotomy between politics and science, showing how it is intertwined with a similar dichotomy between direct democracy and representative government. Chapter 1 explores Machiavelli's distinctly modern view of the relationship between expert knowledge and common sense, showing that he also provides resources for challenging that view. Chapters 2 and 3 examine how Enlightenment thinkers legitimated both modern science and representative government by appealing to the common sense of ordinary citizens, even as they reserved the actual practice of both science and government to an elite. Chapter 4 offers a contemporary illustration of the liberal-rationalist view of representation, showing how it appears in advisory committee guidelines based on the U.S. Federal Advisory Committee Act. Despite their historical association with elitist views of government, I argue that liberal-rationalist theories of representation contain elements worth preserving.

Part II of the book develops a perspective on representative democracy that avoids the modern dichotomy between science and politics and its attendant pathologies. Chapter 5 draws on Hobbes to show that a constructivist theory of both science and politics need not lead to either anarchy or totalitarianism, as critics of science studies often claim. Hobbes also offers a few hints on how to represent nonhumans and others who cannot authorize their own representatives. Chapter 6 shows how Dewey's constructivist account of political representation reappears in his theory of scientific inquiry. Chapter 7 engages Bruno Latour's innovative attempts to conceive scientific and political representation in tandem. Chapter 8 argues that science is neither essentially apolitical, as liberal rationalists would have it, nor essentially political, as some today suggest. Rather, like other social activities, science becomes political whenever it is enrolled in relations of conflict and power. The key distinction between scientific and political representation lies not in any essential

properties of their respective actors or material and cultural resources. Rather, it lies in historically contingent, institutionally solidified differences of function within systems of representative democracy. Chapter 9 brings together the conceptual and historical analysis of the preceding chapters to show how democratic representation can be understood in terms of five distinct elements: authorization, accountability, participation, deliberation, and resemblance. Different institutions mediate these elements in different ways, and democratic representation depends on citizens having effective access to all of them. Chapter 10 illustrates the book's overall argument with reference to different types of advisory bodies, including the U.S. President's Council on Bioethics and lay deliberative forums or minipublics. The concluding chapter summarizes the book's conception of democracy as an institutionally differentiated system of collective representation. If democracy is understood in this specific sense, then the best way of responding to politicized science is to democratize it.