Chapter 27. The Production and Circulation of Environmental Knowledge: Can Historical Scholarship on Writing Effect Social Change?

My research themes in recent years have roots in long-standing interests about writing. Each has taught me more about the nature of writing, has presented particular challenges in writing about them, and has continued to develop my own writing, as I will elaborate in the remaining chapters.

Writing About Environmental Information

My interest in how environmental concerns could be addressed through writing began in the late 1980s when I was putting together a textbook anthology, *The Informed Reader,* where each unit was devoted to an issue drawing on academic disciplinary scholarship and research (Bazerman, 1989b). At the suggestion of my editor, for the natural sciences issue I focused on the greenhouse effect and climate change. The issue of climate change first came to wide public attention with a *New York Times* story in late 1983 (Shabecoff, 1983). I started the unit with this story because it explained the basic concepts and the consequences for our lives; I continued with a series of articles that progressively went deeper into the science, including some foundational articles from scientific journals, and ended with congressional testimony by a leading scientist. This sequence provided a gradual path for students to enter into a technical understanding and drew a direct connection between technical matters and public policy concerns. Putting this unit together, as well, educated me on the science and on how policy issues could be addressed. This led me to think further about data gathering and the relation to evidence.

For the next decade I didn't do much further on environmental issues. As I was finishing up the Edison book, however, I reflected on how that study showed that complex and multidimensional social projects needed to engage many kinds of writing. Climate change seemed just that sort of problem. By the late nineties, climate change was becoming widely recognized as a pressing issue that would require widespread international cooperation and coordination among many spheres, from the scientific and technical, to the political, financial, and public. As opportunities arose to engage in inquiries, I tried to use them to deepen my engagement with environmentalism and climate change. I vaguely thought that this work might come together as a book, though that has not happened as yet.

Fortuitously, after a presentation at another campus, I got into a discussion with a retired scientist about information and how we have come to use the term.

He told me of work he had done in the early 1950s as part of the St. Louis Citizens' Committee for Nuclear Information which had produced a newsletter called *Information*. Through interlibrary loan I obtained copies of the newsletters and dug into the history of the organization as well as the term "information." The term's history went back centuries involving police and spying, but then took on particular meanings in the Second World War concerning scientific military secrets, especially involving the atomic bomb. In the ensuing cold war, the confidentiality of military information was contested both for open scientific use and for the public to make informed policy and citizen choices. In this context the St. Louis Citizens' Committee mobilized the idea of citizen information to advocate for nuclear test bans and to contest the lack of government transparency about nuclear fallout and related dangers. There was a direct line from this campaign to other environmental campaigns, such as for pesticide control, ultimately leading to the creation of the Environmental Protection Agency and the passage of the National Environmental Policy Act. Though the early issues of the newsletter clearly were motivated by an anti-testing political agenda, they attempted to create an "objective" scientific stance for the "information." To do so, the newsletter evoked audience presuppositions and calculations without explicitly invoking them—a technique known in classical rhetoric known as the enthymeme. Unpacking the presuppositions evoked helped me understand a major cluster of meanings we now associate with certain kinds of information (Bazerman, 2001d).

In a consequent project I pursued the governmental response to public pressure for increased information and accountability about environmental issues through examining the Environmental Information Statement (EIS) requirement of the National Environmental Policy Act of 1969 (NEPA) (Bazerman, Little, & Chavkin, 2003f). While this project largely relied on the theoretically-shaped archival research and narrative reconstruction of social processes I had become practiced in, identifying the different kinds of documents that would provide evidence of growth of environmental knowledge in the wake of the congressional discussion and passage of NEPA was a puzzle.

How Environmental Knowledge Does and Does not Move Between Domains

Another more complex challenge was presented by an invitation to contribute to a volume of cases exploring Thomas Kuhn's incommensurability hypothesis, that findings in one theoretical frame would lack meaning after a revolutionary shift in paradigms. I had first read Kuhn's *Structure of Scientific Revolutions* shortly after its initial appearance in 1962, as it was circulating among my college friends. I found a personal psychological plausibility in the kinds of uncertainties and confusions that appeared during the moments surrounding revolutionary shifts, though Kuhn himself warned against such personalized psychological readings. Over time, as I

began to study the history of scientific writing, however, I came to see his scheme of normal and revolutionary science as oversimplified, creating too strong a distinction between paradigmatic stasis and revolutionary change. I saw shifts of thought and disciplinary alliances occurring in smaller and less disruptive ways. Taking up this invitation was an opportunity to test and elaborate that perception. In seeking a good case to examine the transmission of knowledge across paradigms, I looked for closely related specialties with some boundary disputes, where one field preceded the growth of environmental sciences while the other grew in the wake of new knowledge mandates for environmental information. This described precisely the tensions between the long-standing field of toxicology (a laboratory-based medical study of effects of substances on individuals) and the recent field of ecotoxicology (a field-based statistical study of long-term environmental impacts of pollutants on populations). Once I found this research site, puzzles remained in locating the kinds of documents that would provide evidence of whether and how knowledge flowed between the two specialties. I had constructed specialized corpora of documents previously for study, but this study posed the problem of using intertextual tracing or blockages between two corpora to examine the flow of knowledge. As I immersed myself in the documents of the two fields, including textbooks, research articles, and personal narratives about the development of the fields, these issues sorted themselves out. Synthesizing them into a historical narrative that argued for and illustrated social-literate processes was, again, something I had done before, and it was only a matter of putting these particular facts and materials together into a clear and persuasive story (Bazerman & De los Santos, 2005g).

Another study following shortly thereafter continued pursuing the puzzle of how knowledge moved between domains, but in this case between entirely different social systems: science and the courts. This project was the result of another invitation, in this case to a symposium sponsored by the Project on Scientific Knowledge and Public Policy, an organization devoted to the use of science in the court system. The participants in the organization and the symposium were mostly working scientists or working legal scholars, a number of them quite prestigious in their fields. While I had of course worked on scientific writing and the social organization of science, I had no more than a layperson's knowledge of the courts beyond issues of intellectual property and patents that had come up in studying Edison. I certainly did not have a law degree nor could I consider larger legal reasoning. I again focused on a case, which might help me understand what the processes of transfer were. My first big challenge was to find the right case to look into. Fortunately, the website of the organization (http://defendingscience.org/) had a series of cases which they considered exemplary of the kinds of issues that arose with science in the courts. After spending some time looking at the documents in these cases, I settled on the multiparty case of *In re Phenylpropanolamine* as likely to display the processes I was interested in.

The case documents made evident that the process by which expert witnesses were qualified was crucial to how scientific knowledge entered the courts. It was

known as the Daubert hearing, which derives from the case *Daubert v. Merrell Dow Pharmaceuticals, Inc.* I needed to look into the history and precedents of the Daubert hearing and place that in the context of the laws of evidence, with the logic of court witnesses in the production of evidence. As well I needed to look into some of the pharmacological science surrounding the particular drugs involved in the cases. As I looked into these legal and scientific documents, I was able to trace concretely how scientific knowledge came into the judicial proceedings in the form of the testimony of the expert witnesses qualified through the Daubert procedures. My writing task then became to be able to explain these procedures and how scientific knowledge became reformulated and contested as it passed into legal proceedings through expert opinion to become adjudicated in the court judgment. This study highlighted how different institutional purposes and reasoning guided communicative practices, along with informational relevancies and forms of presentation. Further, it revealed how regulations controlled translation of information across institutional boundaries and thus how knowledge from one domain becomes consequential for deliberations in another (Bazerman, 2009d).

How did Congress Resist Environmental Knowledge?

These inquiries into how knowledge migrated or did not migrate across public spheres I thought might prepare me to address the puzzle of why Congress and other political bodies (at least in the US) were so resistant to environmental science. I started from the naive hypothesis that Congress was something like the courts in being a bounded institution with specific procedures for admitting knowledge. Of course, it was foolish to think Congress and similar political bodies acted as rational and clearly bounded institutions. Congress is open to many forces and other organizations; only on occasion does it act anything like a rational deliberative body seeking the best information to identify and solve public policy problems. Of course, I should have known that not just from ordinary political cynicism, but even from the undergraduate papers I had done on pork barrel politics. Even from an activity perspective, Congresspeople needed to be responsive to parties, funders, constituent voters, and news and opinion media, to name just the more obvious. But my theoretic model initially led me to want to treat legislative bodies on the model of scientific communities and the courts—which, faulted and as human as they were, sought something like their institutional ends, relying on the knowledge and regulations inscribed in their documents and professional expectations. After some preliminary work I was reminded of the sad, obvious facts of legislative life, but I still saw that Congress wanted to maintain the appearance of following deliberative procedures in order to maintain legitimacy and to abide by the organizational rules built on the assumption of deliberation. So the question then became how Congressional actors could maintain the trappings of deliberative procedures while still pursuing interests external to

the deliberations. Put another way, a rational deliberative body, if it had facts that indicated a social problem, would seek ways to solve those problems by gathering further facts, weighing various concerns, debating alternatives, and then setting out a course of action. But Congress regularly avoided explicitly recognizing the climate change problem, as a way of avoiding action and offering solutions.

I worked with a doctoral student, Josh Kuntzman, on an initial study around 2008. Josh helped me gather and read through the transcripts of the hearings of Congressional committees on climate and environmental issues, which by that time were all accessible on the internet. We repeatedly lost our analytical thread, however, as we found certain members of Congress using readily recognizable tactics to disrupt reasoned deliberation in committee hearings and to transparently protect the interests of a few specific corporate and financial interests. We could make no headway beyond telling each other outraged stories of the pettifoggery of some individuals and their bag of tricks. We were not able to find any underlying mechanisms of knowledge representation, circulation, and use in exposing such rhetorical displays. There wasn't even much political news in showing Congress was dysfunctional or certain actors were carrying out the bidding of particular interests. This exercise, however, did make me familiar with some characters who would keep cropping up in the news, a number of whom became prominent in the Trump administration.

As far as we got was to see the process of agnotology (the systematic production of uncertainty) at work. A couple of books appearing just at that time, *Agnotology* (Proctor et al., 2008) and *Merchants of Doubt* (Oreskes & Conway, 2010) revealed how strategic doubt was first fostered by the tobacco industry and then applied to energy and climate (often by the same individuals). I felt I had little to add to their well-articulated and evidenced studies, so at that time I just synthesized secondary sources to sketch out how different institutions paid attention to climate knowledge and had it enter into its institutional calculations in ways that fit its procedures (Bazerman, 2010g, 2021d). I still felt, however, that some more systematic and extensive study of Congress would be useful, if I only knew how to do it.

I needed strategies for selective search and principles for coding for making sense of the massive piles of documents. Josh, at one point in his general rhetorical reading of actors' strategies, suggested that the *stases* of the hearings (that is, how the questions were framed for deliberation) seemed important in what Congresspeople and witnesses addressed and how they addressed it. This stuck in the back of my mind when an occasion emerged to return to the project. A few years later, while I was immobilized for a couple of months recuperating from a knee injury, I received an invitation to contribute to a volume on genre and climate change. In all my previous projects that required massive corpora, I had relied on visiting archives and endless hours standing over photocopiers or staring into microfilm readers. But now, I could lie in bed, press buttons, and download pdfs of thousands of hearings, of which more than a thousand turned out to be relevant

and analyzed in the study. Further they were digitally searchable, so I could use key terms to locate the passages of interest.

Once I focused on *stases,* it became obvious that each hearing was organized around a question or questions, often announced in the title of the hearing, or otherwise specified in the opening remarks of the chair. The committee chair (from the majority party) in fact defined the question and selected the witnesses (though the minority were typically granted one or two courtesy witnesses). This framing of the discussion limited the relevance of the statements and questioning by Congressional members and the strategies they used to get things on the record or keep it off. I kept expanding the corpus to cover Congresses with different configurations of majority party in the two houses along with the presidency, as of course the positions of parties and the potential for legislation would affect how *stases* would be framed and what people would want to get on the record. This global analysis of the structure of hearings led me fairly directly to the selection of hearings and key passages from the 109th and 110th Congresses during the second Bush term through the 111th-114th during the Obama years and the first year of the 115th under Trump. This included all party configurations of the Presidency and the two houses of Congress. I used key terms like "climate change" and "global warming" to identify hearings that would be relevant and then to locate specific relevant discussions within them.

I entered each of the selected hearings and coded them to allow for descriptive statistical aggregation. I recorded the name and other identifiers of each relevant hearing, the committee or subcommittee it came from, the theme of the stasis for the hearing (funding, agency oversight, offshore oil leases, problem finding, military expenditures, etc.), how large a role climate change took in the hearing (based on number of mentions and examination of the discussion, from passing mention through central), and then the particular *stases* and stances adopted by climate change addressers and deniers in the course of the hearings. I also added notes on particularly interesting or striking arguments made by particular individuals. One of the most interesting results was how often climate change deniers did not mention or contest testimony of climate change.

While searching and coding these many hearings was time-consuming and tedious, it gave me something to do while I could not get around. With time, the coding started to turn up some striking patterns with many interesting illustrations. Since I had so much data it would be hard for anyone who was not immersed in it to see those patterns or keep straight what was happening with different changes of control of the houses and presidency, what legislative initiatives were being undertaken at different moments, what the various committees were and their relevance to initiatives, and what the different positions and strategies taken by the various committee chairs were. These provided context for the strategic actions of each member of Congress. I had a hard time in finding the most understandable way to present the story. Aggregating the data too much would wash out the most important patterns of the differentiated strategies of

chairs from different parties and the consequent actions of committee members. But as I tried to show the nuances, the detail created struggles for readers to follow. It took a long time, with multiple cycles of feedback from the editors to create the right section summaries and overview charts to help the readers find their way through the material, and to construct intelligible narratives about how committees handled their work in each Congress. I also needed to provide just enough necessary evidence, but no more, no matter how striking the examples I had to cut. The problem of managing the attention and memory of readers so as to have a framework for understanding and sorting details is always a problem in writing, but here it was especially challenging (Bazerman & Kuntzman, 2021f).

The Challenge of Making Rhetorical Analysis Effective for Social Change

These studies together helped me understand and explain some of the complexity of arriving to knowledge about the environment and climate change and how challenging it was to get different systems aligned around the knowledge that eventually was produced. Particularly, the study of Congress revealed how deliberation could be manipulated by position, power, and party. Yet I was left baffled as to what further I could contribute either as a scholar or in a more active role. I never could find a more activist group where my work could be useful. On climate change, many groups are doing good work, and in a practical way are likely familiar with everything I tried to lay out methodically. After all, they are strategically and intentionally carrying out those actions and processes I have been documenting. For others outside these organizations, what I document may be too much an inside game. To rhetoricians and writing studies scholars, these studies are only useful as cases revealing mechanisms that are more widely applicable. As much as I would like, I cannot yet frame an argument in a way that would make a difference in public conversations on the environment as I originally hoped, as the issue is blown by strong crosswinds. Ultimately, it seems that social groups act only when threats become immediate, entering into their most pressing calculations following their typical procedures of reasoning. This is now happening regularly with climate disasters which may finally be changing calculations, choices, and planning in multiple business, financial, political, personal, and other social spheres. As we used to say in the Vietnam War years, sadly, the war only comes home in the body bags. We will see whether the pandemics, droughts, climate disasters, and geopolitical disruptions will mobilize attention and action.