AMST 4XX
A History of Science and Technology Studies in the U.S.
Course Description

Instructor
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Course Description
This course is designed to engage you in thinking, speaking, and writing about the intersecting conversations among philosophers, historians, social scientists, and others about science and technology in the United States during the last 150 years. We will talk about a range of readings, including works on what science and technology has meant to Americans in the past, case studies of science and technology in a social context, analyses of the ideas that have shaped the new field of science and technology studies (STS), arguments for and against STS, and directions the field might be headed.

Required Texts
- Coursepack of Readings

Assignments
Reading: We will read an average of 85 pages each week from the book and coursepack.
Notebook: It is crucial that you keep up with the assigned reading on the syllabus, because you will be required to write two or three brief (1-2 page) entries about these readings in a notebook throughout the semester. Some of the topics I will assign to you, and others you will decide on for yourself. You will also use the notebook to record your progress on your mid-term presentation and semester project.
Mid-term Presentation: In a 10-15 minute presentation, you will introduce your classmates and me to an issue pertinent to the course by summarizing it in terms of science and technology issues and raising one or two research questions about it. (You may choose to continue researching this issue for your semester project.)
Semester Project: You will conduct primary and secondary research on an issue related to science and technology studies and present your findings in some fashion, for example in a term paper, report, proposal, or web site. Look for details of the mid-term presentation and semester project, including evaluation criteria, in forthcoming handouts.

Grading
The breakdown for grades is as follows:

Notebook 20%
Mid-term Presentation 30%
Semester Project 50%
AMST 4XX  
A History of Science and Technology Studies in the U.S.  
Syllabus

Weeks 1 and 2: Case Studies from Science

- Lederer, “The Charge of Human Vivisection,” from *Subjected to Science*, pp. 27-50; 154-60
- Walsh, “The Quirks of a Woman’s Brain,” pp. 240-63
- Gould, “Science and Jewish Immigration,” from *Hen’s Teeth and Horse’s Toes*, pp. 291-302
- Terry, “The Seductive Power of Science in the Making of Deviant Subjectivity,” pp. 271-95
- Brandt, “Racism and Research: The Case of the Tuskegee Syphilis Study,” pp. 21-29

Week 3: Case Studies from Technology

- Marx, “Alienation and Technology,” pp. 121-30
- Trachtenberg, “Albums of War,” from *Reading American Photographs*, pp. 71-118
- Nye, Introduction and “Electrifying the American West, 1880-1940,” pp. 1-10; 25-43; 194-97, from *Narratives and Spaces*

Week 4: Cultural and Historical Influences

- Toumey, “Science and American Values,” from * Conjuring Science*, pp. 3-44
- Marx, from *The Pilot and the Passenger*, pp. 179-207
- Segal, from *Technological Utopianism in American Culture*, pp. 74-88
- Miller, “Science Policy in the Twentieth Century,” from *The American People and Science Policy*, pp. 4-21
- Reingold, “Reflections on Two Hundred Years of Science in the United States,” from *Science American Style*, pp. 13-23

Week 5: Sociological Influences

- Merton, “The Ethos of Science” and “Science and Social Order,” from *On Social Structure and Science*, pp. 267-76 and 277-85
- Keller, “Gender and Science: An Update,” from *Secrets of Life, Secrets of Death*, pp. 15-36
- Tilghman, “Science versus the Female Scientist,” pp. 51-54

Turn in Notebook
### Week 6: World War II's Influence on STS

- Proctor, "Nazi Medicine and the Politics of Knowledge," pp. 344-58
- Muller-Hill, "Genetics After Auschwitz," pp. 3-20
- "Permissible Medical Experiments (Nuremberg Standards, 1947)," from Medicine, Ethics, and the Third Reich, pp. 222-23
- Sassower, "Responsible Technoscience: The Haunting Reality of Auschwitz and Hiroshima," from Technoscientific Angst, pp. 1-17

### Weeks 7 and 8: Thomas Kuhn and His Critics

- Kuhn, from The Structure of Scientific Revolutions, pp. 1-9 and 35-110
- Barnes, from T. S. Kuhn and Social Science, pp. 41-63

- Hess, "The Philosophy of Science: An Interdisciplinary Perspective," pp. 6-51
- Gieryn, from "Boundaries of Science," pp. 393-407

### Mid-term Presentations

### Weeks 9 and 10: The European Contribution

- Hess, "Social Studies of Knowledge," from Science Studies, pp. 81-111
- Brante, "Reasons for Studying Scientific and Science-Based Controversies," pp. 177-91
- Daston, "Controversy Over Classification: A Case Study from the History of Botany," pp. 211-227
- Collins and Pinch, "The Construction of the Paranormal: Nothing Unscientific is Happening," pp. 151-84

### Mid-term Presentations, ctd.

- Latour and Woolgar, from Laboratory Life, pp. 43-53
- Knorr-Cetina, "Laboratory Studies: The Cultural Approach to the Study of Science," pp. 140-66

### Turn in Notebook

### Week 11: STS in the U.S.

- Nelkin, "Perspectives on the Evolution of Science Studies," pp. 31-36
- Webster, from Science, Technology, and Society, pp. 1-32 and 126-51
- Restivo, from "Critical Sociology of Science," pp. 63-70
## Week 12: Science Wars in the U.S. -- Call to Arms
- Gross and Levitt, "Some History and Politics," from *Higher Superstition*, pp. 16-41
- Paul Gross, Introduction to *The Flight from Science and Reason*, pp. 1-7
- Barry Gross, "Flights of Fancy," pp. 79-86

## Week 13: Science Wars in the U.S. -- Battle Stations
- Harding, from *The Science Question in Feminism*, pp. 15-29
- Gross and Levitt, "Auspiciating Gender," from *Higher Superstition*, pp. 107-48
- Haraway, from *Modest Witness*, pp. 223-39 and 213-85
- Sokal, "A Physicist Experiments with Cultural Studies," pp. 62-64
- "Mystery Science Theater," from *Lingua Franca*, pp. 54-64
- Nye, "Don't Fly Me to the Moon," pp. 147-60

## Week 14: Science Wars in the U.S. -- Toward Detente
- Hayles, "Consolidating the Canon," pp. 226-37
- Levine, "What is Science Studies for and Who Cares?" pp. 123-38
- Martin, "Meeting Polemics and Irenics in the Science Wars," pp. 61-79

## Week 15: The Future of STS in the U.S.
- Dickson, "Towards a Democratic Strategy for Science," pp. 472-83

### Notebook Due

### Semester Project Due
American Studies 4XX:
A History of Science and Technology Studies in the U.S

Why Propose This Course?

In my reading of contemporary cultural studies of science, I have often noticed a lack of a historical sensibility; it sometimes seems to me as if this body of scholarship has arisen spontaneously. What cultural and historical factors, I have wondered, inform the work of Andrew Ross and those included in his 1996 collection Science Wars? I know that this anthology of science and technology studies (STS) criticism is a direct response to the Flight from Science and Reason Conference organized by Paul Gross, Norman Levitt, and Martin Lewis in 1996, which in turn grew out of Gross and Levitt’s earlier critical assessment of science studies in Higher Superstition, but from what intellectual impulse did that work spring (if any)? What social and political forces both within and without the academy paved the way for Alan Sokal’s instantly notorious Social Text hoax in 1996, and what accounts for the continuing currency of his counter-attack upon the postmodern critique of knowledge production evidenced in his book Fashionable Nonsense?

My training in American Studies has taught me to consider cultural phenomena in a historical context. A historical framework, I have learned, is often crucial to an analysis that can come closer to answering questions that seek connections among ideas, as my questions usually do. Related to this characteristic historicizing tendency of American Studies, another disciplinary trait is its tendency to frame inquiry from the standpoint of American institutions and ideologies. As an institution, science has been "under siege," as various special interest groups have critiqued such social aspects of
science as funding sources, environmental policy, and educational curricula. Although these critics "do not represent a monolithic critical voice" (Perrucci and Trachtman, 237), science has also allegedly been "under siege" from a broad segment of academia in which STS, in its ideological manifestations, overlaps. Through the lenses of institutions and ideologies, therefore, the science wars phenomenon serves as a springboard for an American Studies course that asks about the cultural, social, and political factors contributing to the development of science and technology studies in the United States during the late nineteenth and throughout the twentieth centuries. Although in the past framing questions about "American institutions and ideologies" has meant only from the point of view of the United States, increasingly this means analysis of the United States in an international context. This shift in emphasis is apparent in the course I am proposing here.

The Edinburgh and Bath Schools of science and technology studies in the United Kingdom are one source from which the development of STS in the United States can be traced (Pickering; Hess 90-92, 94-100). Another significant European influence is the cultural studies movement first undertaken in Birmingham at the Center for Contemporary Cultural Studies (Haraway, "A Game"). Although in my proposed course, "A History of Science and Technology Studies in the U.S.," I wish to acknowledge those intellectual debts, what I wish to examine in detail with my students is the historical and cultural contexts that have brought about the rapid shift in the academy from "American history of science and technology" to "science and technology studies," with its occasional flare-ups into "science wars" that critics like Gross and Levitt attribute to the "residual intelligentsia" of the "academic left," a sort of left-over Left that continue to try apply 1960s thinking to 1990s issues (30-34). Such a project will involve an overview of ideological influences like the Puritan ethos
and American pragmatism on the development of a distinctly "American" science and technology, as well as a summary of the impact of World War II on U.S. science policy and technology transfer into the Cold War period and beyond. Through a cultural and intellectual historical analysis, the course will trace certain specifically American circumstances and ideologies that have influenced the at times controversial aspect of STS in the U.S. today.

A review of the literature suggests that science and technology have been "at best, of marginal concern" (Cravens and Marcus 5) in American Studies (Leo Marx's canonical study of the railroad, The Machine in the Garden, notwithstanding). Links to relevant course syllabi from the American Studies Crossroads Project web site, a resource for scholars and teachers in American Studies, somewhat support this claim. However, I did find syllabi for two undergraduate courses--Pamela Mack's "History of American Technology" and Mark Poster's "Theories of Technology and Culture"--and a description of one high school course--Susan Smulyan's "Discovering Science and Technology Through American History." Why this relative lack of interest in science and technology in American Studies? As Hamilton Cravens and Alan Marcus point out, the emphasis on race, gender, class, and other groups of the new social history of the United States became the emphasis, as well, in American Studies with the decline of the myth-and-symbols school of thought after the 1950s. Although current American Studies scholarship and teaching typically address relationships between social groups and religion, geography, mass culture, and public policy, for example, the mutual influences among various social groups and science have been less developed. However, this is not the case with Robert Perrucci and Leon Trachtman's independent undergraduate studies course "Science Under Siege?" which was taught here at Purdue University in the spring of 1997. This course addresses the science...
wars in light of American special interest groups; I include some of the materials from it in my syllabus. Similarly, David Hess's recent book *Science Studies: An Advanced Introduction* also contributes to my proposal, since he considers twentieth-century currents of thought in the philosophy, history, and sociology of science that now make up the broad field of inquiry known as science and technology studies, and he does so in a decidedly American context (4).

This proposal consists of the following sections: first, I will discuss the goals of this course; second, I will describe the students for whom this course is intended and my qualifications to teach it; third, I will describe the reading and writing assignments; and fourth, I will explain how I plan to teach each week's assigned readings.

I. What are the Goals of This Course?

"A History of Science and Technology Studies in the U.S." is designed to engage undergraduates in thinking critically, from both disciplinary and non-disciplinary vantage points, about the intersecting--and overlapping--conversations among philosophers, historians, social scientists, and others about the meanings and uses of science and technology in the United States during the last 150 years.

Considering the United States's influence on worldwide technoscientific production (as in the development of mass communication technologies and the Human Genome Project), the Cold War American Studies notions of "exceptionalism" and "national identity" continue to have valence. However, in these post-Cold War times, a more critical assessment of the United States as just another player on a complex international field is needed. Thus one of the goals of this course is to encourage students to consider the United States's attitudes toward science and uses of technology as they affect the worldwide community.
On the local level, some observers of cultural studies of science and technology note a greater critical interest among United States citizens regarding science and technology (Aronowitz, "Politics" 207-09, 214; Webster 126-51). This is especially true, for example, of public policy regarding the uses of biotechnologies such as genetic testing and screening (Hubbard and Wald 33-36, 128-44). Although a perceived lack of scientific literacy in the United States has long been lamented (Bishop 21; Park and Goodenough 15; Trefil), it has also been demonstrated that non-specialists can become knowledgeable—or at least motivated to know more—about technoscientific processes and products that affect them (Miller 39-47; Perrucci and Trachtman). Because I view American Studies undergraduate education as preparing knowledgeable non-specialists for participating in public life, another goal of this course is to familiarize students with some of the practical issues surrounding science and technology, especially ways that knowledge production and use within the academy connect with that taking place outside the academy.

In brief, I want students to use the knowledge they have gained from this course after the course is over in any way they see fit. The course has the pragmatist educator's goal of motivating thought into action. In his preface to Teaching Science, Technology, and Society, Brian Woolnough writes, "STS teaching is not about knowing the applications of science in society, but about developing students' attitudes [ . . . ] about ways of looking at problems and deriving personally significant solutions to them" (Solomon 8). But John Dewey comes closer to the mark when he comments that "understanding," as distinct from simply taking in information, "by its very nature, is related to action" (49). These broad goals are not easily quantifiable, and this is one reason why I am not proposing any quizzes or examinations in this course. Instead, the question-formulating strategy that I emphasize throughout the
course will work better in helping students to achieve these goals.

II. Who Will Take--and Teach--This Course?

In imagining what it would be like to teach this course, it is useful to speculate about the "typical" American Studies undergraduate, and it is helpful to anticipate the general direction that American Studies curricula are now headed. It is not unusual to find American Studies programs that describe their students as pursuing their academic interests in individualized courses of study (Guide). At the same time, post-Cold War scholarship and curricula in American Studies have been reconsidering concepts like "nationality" and the efficacy of limiting American Studies projects in terms of geopolitical borders. These factors suggest a resistance to the canonizing inclination of Cold War American Studies. The student who demonstrates independent thinking by tailoring a study plan to fulfill his or her own academic goals, who at the same time is being encouraged to rethink the relationships among citizens, institutions, and states, may be well served in this proposed course.

In the best-case scenario, students in this course would represent a mix of disciplinary investments that would resemble the disciplinary tributaries of science and technology studies: sociology, anthropology, history, philosophy, and literary studies. Such a mix would be the ideal situation because of the course goal of fostering cross-disciplinary discussion. Included in this mix, I would hope that this course could also be offered as an elective for undergraduates in the sciences.

The reverse scenario occurred recently in Purdue University's School of Veterinary Medicine. Professor Alan Beck's course, "Animal Issues in the Media," while aimed at students in the vet school, also attracted students from the School of Liberal Arts. The interdisciplinary content of Professor Beck's course carried over into his teaching approach. Although Beck was the primary instructor for this course, he
regularly turned over the discussions to various other experts on the issues that the course addressed. For example, Professors Katherine Rowan and Leon Trachtman from the Department of Communication in the School of Liberal Arts discussed risk communication in science and the public understanding of science, respectively. Non-academic experts also led class discussions.

I value team teaching approaches like this one. My most productive seminars as a graduate student were led by two professors from different departments. So ideally, to follow through on my desire to explore interdisciplinary projects, I would be able to teach this course with a colleague from some other program or department or include guest lecturers to discuss a particular topic with the class. At Purdue University we have plenty of qualified faculty and staff in addition to those involved in Professor Beck's course. For example, Rayvon Fouche (History) could speak about his project on African American women and transportation, Melissa Remis (Anthropology) could clarify the political interests involved in contemporary North American museum exhibits of early humans, and Stewart Frescas (Medicinal Chemistry and Molecular Pharmacology) could describe the relationship of technological development to social problems, as exemplified by the development of analogs to combat addiction to illegal drugs that he and his colleagues are working on in their lab. (I have not specifically included these guests in the syllabus as I am not likely to teach this course at Purdue University.) The value of including guest lecturers in the curriculum may be obvious, but it bears reiterating: they add to the range of examples and theories I present to the class, giving students a chance to talk with resident experts who are researching and writing about questions much like theirs in various disciplines.

As for my own qualifications to teach this course, my training in American
Studies includes a self-reflexive emphasis on developing interdisciplinary theories and practices; this background provides a framework for my conceiving this course. My appreciation for Hess's book derives from my commitment to engaging inter- and transdisciplinary approaches to teaching and research. In most of the projects I undertook for courses in American Studies; rhetorical, visual, and literary theory; women's studies; and anthropology, I developed my knowledge about science as culture by reading and writing on such topics as feminist critiques of sociobiology, information metaphors in molecular biology, and scientific imaging technologies. For two prior preliminary examinations, I prepared by studying post-World War II American literature and literary theory, the "two culture" debate, the work and influence of Merton and Kuhn, the communication of scientific information, the peer review process, and the "science wars." Finally, in the fall of 1998 I had the opportunity to teach a section of English 101S to a group of freshman biology majors in the pilot program of a proposed learning community project at Purdue. Course readings, films, and assignments pertained to social and ethical issues in the life sciences and medicine. Many of these interests and experiences are represented in the course syllabus below.

III. What Assignments Will Fulfill the Goals of This Course?

Students will read an average of 82 pages a week and write one to two-page responses to the assigned readings (and their own research) in a notebook throughout the semester. For the most part, assigned readings consist of whole essays or book chapters rather than excerpts; in my lectures on the readings I will supply additional contextual details about the readings, such as biographical information about the author and descriptions of relevant schools of thought and historical events. Pedagogically it is important to provide such context, I believe,
because it can give students the coordinates, so to speak, with which to locate a research question and map out a semester project. I can present this contextual information in terms of “gaps” in the syllabus, using information about students’ programs and interests as a guideline for what to suggest. For example, for a student with a literary background, I might suggest a project in which the student compares David Nye and Leo Marx on the question of American authors’ representation of the landscape. How have technologies of electrification and the railroad mediated representations of the city and countryside in American literature?

Reading assignments will begin with case studies describing the social and historical influences on science and technology, then move on to some more theoretical texts suggesting the cultural, historical, and political contexts precipitating contemporary science studies. Two figures influencing the direction of science and technology studies in the United States—Robert Merton and Thomas Kuhn—will be discussed in detail. Then, after a brief look at the impact of World War II on the development of STS in the U.S., the readings will begin more specifically to map out the critical and cultural science studies project, first in Europe, then in North America. From this background, the course will look at the emergence of the controversy among American academics over what conservative defenders of science consider a full-scale attack on science and speculate about the different directions this debate might go and the various segments of American society beyond the academy that it might affect. The closing discussion on postcolonialism and STS will shift the perspective once again into a more international and historical context. A more detailed description of the semester’s readings follows this section.

**Required Texts**—In addition to David Hess’s *Science Studies: An Advanced Introduction*, required texts include a coursepack of essays and book excerpts.
Acknowledging that science studies "can be very confusing for newcomers" to the field (2), Hess wrote this book to be used specifically as a teaching tool. According to the author, the confusion—which is by no means limited to "newcomers"—is exacerbated by the range of terms used among various constituent disciplines. The resulting "interdisciplinary misunderstandings," Hess suggests, have contributed to the "science wars." Hess's task then is to describe how terms have been variously defined and used by various disciplines, with the ultimate goal of "realiz[ing] the transdisciplinary promise of an ongoing conversation among philosophers, sociologists, anthropologists, political scientists, historians, and others, including natural scientists" (4). Hess's approach is non-polemical; he seeks to minimize conflict by elucidating why it occurs and, on that basis, what might resolve it. His ultimate goal is to validate what he sees as an important new field of research and practice. It is for all of these reasons that I think Science Studies will make an excellent field guide for upper-level American Studies undergraduates, complementary to the readings in the coursepack in many ways. I will say more about all of these readings below.

**Notebook**—Students will write in the notebook a minimum of two to four times a week throughout the semester, reflecting on topics related to assigned readings, in-class discussions, and individual research projects. Some topics will be directed by me in advance of the readings, others will arise as a result of class discussion, and still others will be generated by the students themselves, as in their notes on researched sources and responses to the mid-term presentations. I will provide students with required and suggested notebook assignments and topics each week. The notebook counts as 20 percent of the course grade based on both quantity and quality.

**Mid-Term Presentations**—For this assignment, students will introduce their classmates to an issue pertinent to the course; the topic may be a different angle on a
topic that is already covered in the required readings. (I will prepare a handout detailing my expectations for this assignment.) I use the word "introducing" here because students will only have enough time--10 to 15 minutes--to summarize their issue and raise one or two questions. Examples of appropriate topics include

- representations of science and technology in literature, the visual arts, and other cultural forms
- the communication of scientific information to the public
- science education and scientific literacy in the United States
- pseudoscience
- private sector versus government funding of research
- ethics commissions in scientific research
- "science by/for the people" projects
- the scientist as expert witness in legal proceedings
- conflicting interests in museum exhibits
- the United States's participation in global technoscientific production

I will encourage students to focus their presentation by explaining their topic in terms of a particular historical or contemporary project in technology or science. An appropriate project, for example, might be to examine in more detail than is provided in the excerpt from Lederer (Subjected to Science) the cultural factors influencing the uses of animals in laboratory research. Another project might be to contrast the United States's space program before and after the Cold War.

The main goals of the mid-term presentation are to focus on a topic, describe it in interdisciplinary terms, and develop a productive question or questions about it. The students' achievement of these three goals early in the semester will be crucial to their later success on the semester project. A secondary goal of this assignment is to
engage students in thinking and talking about how their issues would be examined differently by scholars from various disciplines. This I envision as emerging from the brief discussion in class. Students can also achieve this latter objective by comparing their own projects to that of others, finding common ground. Thus the discussion element is crucial to this assignment. In addition, because this is a course in which we will ask critical questions about the historical, cultural, and political forces influencing the ways research is conducted, it is all the more crucial to emphasize the formulation of the research question itself.

My aim in this assignment is to help students to focus their interest in course issues by discussing a general problem in terms of a specific case. The case studies with which I begin the semester’s reading assignments will establish this inductive approach. Equally important, I hope to get students to see how the features of a particular case can apply to theoretical issues. By the time they will begin presenting their topics, we will have read a number of cases as well as some theoretical writing; these materials should give them some philosophical scaffolding on which to stand. Students may choose to pursue this topic further in expanded form for their semester project. The mid-term presentation counts as 30 percent of the course grade based on relevance of the issue to the course goals; focus; clarity of explanation of the problem; productive potential of the question; and variety, relevance and explanation of the interdisciplinarity of a brief list of resources annotated in the notebook.

Semester Project--In all probability this will end up being a traditional term paper of 12-15 pages that develops an answer to the student’s question raised during the mid-term presentation. This assignment, however, will have the pragmatic thrust of asking the student to consider the continuing uses and usability of the knowledge discussed in the presentation—in his or her disciplinary area, for productive cross-
disciplinary conversation (for example, what will be produced from this conversation?),
for the private business sector, for state and federal policy making. I will also entertain
other project proposals that are in keeping with the course goals of exploring ways that
knowledge production within the university dovetails with or complements that which
takes place in various communities outside the academy. For example, students may
wish to research and develop a web site for a business or organization seeking to
inform the public about the uses and impact of its technology, or they may wish to
research a local technoscience issue, and present findings, for their elected
representative(s), in a "citizen lobbyist"/expert opinion project (for example, the noise
problem at Staley's in Lafayette, Indiana); or they may wish to research and propose a
project that would encourage conversation on course topics "across the two-culture
divide" on their campus.

Obviously, the development of non-term paper projects will depend on local
circumstances. "Local," in fact, will be the key word as I present this semester project
option to students; I will work out the terms of these research projects with individual
students according to their specific interests and needs. In any case, this variation of
the semester project will involve a certain amount of writing, albeit in a different form
than the traditional term paper described above. Of all the assignments, this
alternative perhaps best reflects my vision of a participatory, pragmatic science and
technology studies--the kind that is suggested in the readings for the final week of the
course--and I will encourage students to develop this sort of project. The term
paper/project counts as 50 percent of the course grade.

IV. Overview of Syllabus/Readings

Weeks 1 through 3:
Case Studies from Science and Technology as Culture
There are at least two advantages to beginning this course with case studies. The most obvious advantage is that they "show" rather than "tell" students what the course is about. Since American Studies issues are often framed in terms of identities, and since science and technology have played a tremendous role in both reflecting and shaping cultural concepts of ethnic, racial, sexual, and class identities, I begin with cases that show some ways that this process has occurred during the last 150 years or so in the United States.

Another advantage of beginning with case studies is that they will cue students about appropriate topics and approaches for their semester projects. Trachtenberg's example of the perception of the camera as a tool for establishing authoritative-seeming images of historical events and people could lead to an investigation of the use of the camera (or for that matter any sort of visual imaging technology) in other culturally influenced efforts to document history, such as Edward Curtis's famous photographs taken in the 19th century depicting Native Americans as a "dying race" of "noble savages." Although to be sure, science and technology studies is about far more than mere "identity politics," as Hess suggests, it is the question of identity on which much of the United States debate within STS known as the "science wars" hinges (112).

These case studies in particular interrelate in ways that show the myriad social factors influencing the history of science and technology. The nineteenth and early twentieth centuries are significant in these cases because of the influences of industrialization, the Civil War, developments in medicine, class stratification, Darwinian evolutionary theory, and immigration patterns, among other examples. My main objective during these opening weeks is to help students to find connections among these developments both within and between readings. While some of the
essays, like Stephen Jay Gould's analyses of the anti-Semitism underlying the distortion of Alfred Binet's method of measuring intelligence at Ellis Island, make these connections fairly obvious, I hope that other, less obvious connections arise during class discussions. It is interesting to imagine, for example, how students might respond to the readings from Michele Newman and Jennifer Terry via Susan Lederer's complex account of the rise of the American antivivisectionist movement: they might not immediately recognize the argument from biological common denominators that has been used to justify medical research on women, the insane, and animals, but they will easily recognize the vulnerability potential of members groups.

**Week 4: Cultural and Historical Influences**

With Week 4, we shift the focus away from case studies temporarily and more toward theorizing how these cases might fit into an American cultural, social, intellectual, and political history. As a group, these works range from the colonial period in North America to the bicentennial.

Tourney's introductory chapters make an excellent starting point for a discussion about the cultural and historical factors that precondition an Americanized science and technology. In theoretical terms that undergraduates can easily grasp, he describes the "Protestant model" of the study of nature and the relationship between the "philosophy of useful knowledge" and the early American emphasis on settling land and prospering economically. To demonstrate an Americanizing tendency in science and technology, he contrasts the early colonial attitude toward the relationship between humans and the natural world with the European model of this relationship. And finally, he explores the failure of a thoroughly democratized science in this
country, linking it to many factors, including post-World War II national science policy, which Miller summarizes (14-21).

Meier’s point is that technological development, rather than leading to materialism, actually fostered moral improvement. In this regard it links up well with Tourney’s comments on the similar moralizing approach of American Colonials to technological development. The Meier essay also argues that the ideals of democracy and progress in the early national period were exemplified in the pragmatic sensibility of American industrialization. While labor unrest became an unfortunate reality in European industry, this was not the case in the United States, according to Meier. Because Meier does not develop an analysis of why he thinks this was the case, the question of what might have made the introduction of machine production seem less threatening to the American work force would be a good one to ask students to consider in a notebook entry. Alternatively, students may wish to consider Meier’s thesis in light of Leo Marx’s characteristic technological pessimism or Segal’s comments on the “Machine of Society” (65).

Reingold’s and Cowan’s writings are less analytical than Tourney’s in the sense that they do not touch on issues pertaining in some way to the question of why a critical theory of science and technology has come about in the United States. Still, they provide some valuable additional cultural and historical context. Cowan, for example, examines some connections among Romanticism, art, and science in nineteenth-century U.S., while Reingold’s essay (as the title suggests) demonstrates a bit of the false modesty of bicentennial nationalism that I think students will be able to see through. We may reflect on the nationalistic tone of Reingold’s essay later, when we discuss the readings related to Nazi eugenics program.
Week 5: Sociological Influences

The American sociologist Robert Merton is the key figure in this week’s discussion, for it is from Merton and later, Thomas Kuhn, that much of the sociological thrust of contemporary science and technology studies can be traced. In examining the reasons why Continental Sociology of Scientific Knowledge (SSK) and American Institutional Sociology of Science were not in dialogue during the 1970s and 80s, Hess treats the Mertonian emphasis on norms and values in science as the “common ground” (53).

This will be the students’ first foray in to the Hess book and its introduction to the sometimes complex field of science and technology studies; I will need to prepare them for this week’s readings by prompting them to look for instances of Hess’s strategy of dealing with the meanings of terms from multiple disciplinary perspectives. Hess’s overall project and method are rather simple: to define interdisciplinarity in STS by comparing and contrasting ways that various disciplines have discussed science and pointing out ways that they can proceed more fruitfully by working together, or at least, having a working knowledge of each other. This is a good chapter with which to begin in Science Studies because, unlike the opening chapter on the philosophy of science, Hess clearly situates the discussion “by school” within an American context. Evelyn Fox Keller’s “Update” on gender and science follows through on Walsh’s case study of the difficulties faced by the first women in the United States seeking entrance to medical school; in addition, Keller’s essay provides a first-person account, applying Mertonian concepts of communism and universalism to her own situation, by a scientist who has experienced the cumulative disadvantage phenomenon that Hess describes (59-64). A possible notebook topic for this week’s reading is prompted by Hess: “as affirmative action programs have become
increasingly unpopular [. . .], the research [summarized in this chapter] suggests alternative ways of improving equality [of opportunity] by modifying institutional mechanisms that magnify cumulative disadvantage" (63-64). Given Merton's description of norms in science and Hess’s summary of the problem, I will ask my students, what might some of those changes look like?

**Week 6: World War II’s Influence on STS**

The theme of “silence” permeates this week’s readings: from Evelyn Keller’s emphasis on the secrecy surrounding the Manhattan Project to Benno Muller-Hill’s explanation for the lack of response from the international community to the Nazi version of “normal research”—a term that will become more meaningful to students after the following week’s discussion of Kuhn’s description of “normal science.”

Keller focuses on the role of metaphor in the cultural productions that science and technology both are. By examining the contradictions—and connections—between the technologies of destruction (the atomic bomb) and creation (molecular biology) that were taking place during and immediately after the Second World War, she maps some of the correspondences between STS in academia and the crisis of confidence in the international community regarding science and technology that was precipitated by the particular uses of science and technology during World War II. In this regard Keller’s point is similar to Raphael Sassower’s in “Responsible Technoscience.” Her project, however, is less to demonstrate any loss of confidence in science and technology as a result of the war than it is to demonstrate, as the readings from Donna Haraway do later, the United States’s involvement in a global network of technoscientific production. In this way Keller’s viewpoint problematizes Sassower call for a more “responsible” science and technology. How is this possible
on an international level?

One way to maintain my particular STS focus is to use material that in some way follows through on the case studies examined earlier. For example, Muller-Hill makes it clear that scientists in Nazi Germany were not pawns of the state but participants in the established structure of science at that place and during that time. As he puts it, “Mengele was not an amateur” (5). Whether it was taking place within an established structure or not, whether by amateurs or not, the content of Josef Mengele, et al’s science contributed to what ultimately became the Holocaust via a slippery slope public health program of enforced sterilization and euthanasia. An analog from turn-of-the-century American history is the zeal with which social scientists and physicians intentionally mismeasured skulls and presumed brain capacity based on a unified concept of a heritable “intelligence” in order to achieve certain social, political, and educational goals (Gould, Mismeasure 185-89). That such issues continue to trouble us is apparent in Muller-Hill’s writing; the questions he raises will make good thought-starters for notebook entries: “Was Auschwitz the result of pure scientific thinking?” (4); “Collective knowledge surely exists, but what about collective conscience?” (17). In this second question, his concerns parallel Sassower’s.

This week’s readings will function as a sort of bridge: Keller’s analysis, especially, will be helpful in bridging any gaps students may perceive between science and technology, between the past and the present, and between the United States and the rest of the world. The readings will continue to resonate as we consider Hess’s distinction between structure and content (81) in science and the differences between the Mertonian essentialist privileging of science and the more constructivist Kuhnian analysis.
Weeks 7 and 8: Thomas Kuhn and his Critics

Along with Merton, Kuhn is another central figure in the development of science and technology studies in the United States. And also like Merton, Kuhn's ideas have been critiqued widely by various thinkers (including Aronowitz, *Science as Power*, 261-5; Barnes; Gieryn, 400-404; and Hess, 23-27; 48-51). Although some reassessments of Kuhn's ideas may be too advanced for most undergraduates (see, for example, Nersessian), those I include here strike me as not just accessible to students but necessary to our overall discussion of Kuhn's role in the development of STS. For example, Barnes emphasizes scientists' use of the paradigm as a communication resource because of its predictive potential. Scientists in fact need a paradigm as a framework for making analogies that extend the boundaries of the known, according to Barnes (49). Gieryn takes up a different notion of "boundary," explaining how Kuhn's presentation of the paradigm serves to set scientific activity apart from other social forms. What students will need to know, however, is that the question of demarcation is the pivotal one regarding Kuhn: initially, people interpreted his ideas about paradigms in science as suggesting that science is, in fact, no different than any other social form because of the negotiations and arguments that take place about the effectiveness of the current paradigm. Science and technology studies owes a considerable debt to Kuhn's ideas in this book. However, the question now becomes, what has occurred in the critical response to Kuhn's ideas that has brought about this revision in our understanding of them?

Students may find Kuhn's *Structure of Scientific Revolutions* rather dry; this is not a teaching text. Likewise, the chapter from Hess that we will read this week is the most difficult in the book. Thus I will need to suggest explicit reading and note-taking strategies so students will be able to find their way. For example, after pointing out
that ambiguities continued to plague Kuhn's "paradigm" concept even after he attempted to refine it in a lengthy second-edition postscript to *The Structure of Scientific Revolutions* (Aronowitz, *Science* 261-62). I could ask students to use their notebooks to be on the lookout for Kuhn's various definitions of this term and keep track of them in their notebooks. Why did Kuhn's definition remain so unsettled? is a question I could ask them to consider.

Next, we will consider Hess's positioning of Kuhn's ideas within a much broader philosophical framework. By elucidating the underlying problem in the philosophy of science of distinguishing between descriptive and prescriptive arguments for theory choice, Hess cinches the reason why Kuhn's ideas continue to be contested. In their notebooks, students can determine where Hess would position Kuhn in his taxonomies of constructivism and relativism, or they can critique Barnes's relative lack of distinction of the descriptive/prescriptive problem in Kuhn via Hess or Gieryn, or they could simply speculate about the efficacy of the "camera analogy" cited in Barnes (42) from an STS point of view (and recalling our discussion of Brady's manipulation of the Civil War photos). Because of the difficulty and scope of this material and the fact that mid-term presentations begin during Week 7, we will spend two weeks on Kuhn.

**Weeks 9 and 10: The European Contribution**

According to Hess, the Social Studies of Knowledge (SSK) program exemplified in the macrosociological and microsociological approaches of the Edinburgh and Bath Schools, respectively, deports from the institutional sociology of science by focusing on the content of science over its form (81). This does not, however, constitute a "paradigm shift" in STS; in fact, one goal for studying "the European Contribution" to STS is to see how these works are in some ways indebted to and carrying on the ideas of the American "founding fathers" of STS. Merton and
Kuhn. Significant to our discussion of these materials is Hess's contrast of the so-called "strong program" of the Edinburgh School with the revisionist "weak program" developed in the United States: while the strong program aimed for impartiality and reflexivity, the weak program undertook a more ideological critique of science and technology, that is, casting the social scientist as critic (86). Central to our project of framing STS in an American context, I will ask students what they think might have fostered this ideological turn in U.S. STS and whether they think it has influenced the more polemical nature of responses to STS in the U.S. This issue is, of course, a thought-starter that we can use to generate discussion rather than a question that we can definitively answer; Hess's explanation of the "imputation problem" in his discussion of interests analysis (92-93) should make this clear.

Thomas Brante's lucid essay on the "Reasons for Studying Scientific and Science-Based Controversies" also serves as a thought-starter. Brante draws from Merton's description of norms and the ethos of science to explain both why controversies in science have not been studied that much and why they should be. Considering the increasing impact of science and technology on society during the second half of this century, and given the escalation of controversy among experts (178-180), it is more important now than ever to understand the process of conflict, from inception to closure. Brante raises many rhetorical questions that students may wish to engage in their notebooks: "If scientists build on objective scientific knowledge, how is disagreement possible?" (187); "Since more and more questions are considered overly technical and too complicated to be dealt with by ordinary democratic decision-making processes, science and expertise play an ever greater role in the development of society. What does this trend imply for democracy [...]?" (188).
We will look at two examples of conflict studies during Week 9, John Dean's analysis of controversy in botanical classification and Harry Collins and Trevor Pinch's analysis of the controversy over paranormal phenomena. The taxonomy issues involved in Dean's study have particular resonance in this course; his focus on "the view that classification is a process of invention rather than discovery" (212) in the natural world complements the case studies of the classification of humans in Gould, Terry, and Newman at the beginning of the semester which, as these authors show, tends to find a basis for sociopolitical biases in biology. We will return to this issue later when we consider the analyses of racial taxonomies of Gloria Marshall and Donna Haraway. Collins and Pinch's study is effective in showing the Edinburgh School principles of impartiality and symmetry and will give us an opportunity to see what Hess means in talking about "epistemological relativism" (87, 97-99), a key problem in the strong program approach to STS.

The shift in our focus from conflict studies in Week 9 to laboratory studies in Week 10 may not strike students as a significant one, but in fact, as Hess points out in his chapter on "Social Studies of Knowledge," it is the difference between macrosociological and microsociological approaches. With the micro methodology of laboratory studies, STS began to pay attention to the technologies used to do science and the conversations that scientists had during their lab work. This shift "moved science studies methods away from reliance on historical records to a variety of sources including observations, interviews, and all sorts of other records that are usually not archived" (Hess 105).

Bruno Latour and Steve Woolgar's description of the "inscription technologies" in their participant observation of the research done at the Salk Institute exemplifies the shift in attention to the discursive practices of scientists typical of laboratory studies.
With this change in focus, STS practitioners like Latour and Woolgar were anticipating the more poststructuralist and rhetorical analyses undertaken later, in other contexts, by Alan Gross, Evelyn Fox Keller, and N. Katherine Hayles (1990, 1992). According to Hess, science studies in the United States tends to be more poststructuralist than science studies in Europe (112); the concern with the language of science in laboratory studies has contributed to this emphasis. Once students get past the “yuk” factor in reading Michael Lynch’s study of the destruction of lab animals during and after experiments, they will see that Lynch carefully uses lab notes and conversations between researchers to show how a living animal is transformed into a concept equivalent to data—in effect, becoming another sort of inscription technology. Our discussion of Lynch’s study also resurrects, so to speak, our earlier discussion (from Lederer) about the use of animals in the lab.

**Week 11: STS in the U.S.**

Dorothy Nelkin’s “Perspectives on the Evolution of Science Studies” contributes to the historical project of this course by noting certain trends that have led to a vigorous critical study of science and technology in the United States today. Her linkage of cultural studies to developing science studies programs at the Massachusetts Institute of Technology and Rensselaer Polytechnic Institute is especially instructive of the intellectual climate in which science studies has been developing in the U.S.

Along with Sal Restivo (a proponent of the “weak program,” as the title of his chapter suggests), Andrew Webster emphasizes STS’s potential to influence public policy. In chapter 6, for example, “Controlling Science and Technology: Popular and Radical Alternatives,” Webster takes up the topic of the various public arenas in which citizens can invoke some of the research of STS. As Hess has done, Webster makes
a key point in distinguishing between "people's understanding of the content of science" and "their knowledge of it as a social institution" (128). Making the distinction in this context raises the question, what are these "popular and radical alternatives" alternatives to? I will ask students to assess whether Webster makes this clear in his many examples, one of which--objections to the use of animals in laboratory research--we have already discussed. By the time students have finished this week's readings, they should have a good sense of the American conversation in STS, for they will have already been exposed to some of the figures referred to here, such as Merton, Kuhn, Latour and Woolgar, Miller, and Proctor.

**Weeks 12 through 14: Science Wars in the U.S.**

My use of the military metaphors in the headers for the following readings is ironic and thus intended to be constructive, I need to make clear to my students, in contrast to Paul Gross and Norman Levitt's often destructive use of them. Their writing in *Higher Superstition: The Academic Left and Its Quarrels with Science* often stoops to conquer through ad hominem attacks (for example, their description of feminist STS scholars as "militant" (107) "Beretta-wielders" (125). Indeed, Gross and Levitt's rhetorical strategy constitutes a form of the "pot calling the kettle black" in their accusation that "metaphor mongering is the principal strategy of much feminist criticism of science" (116). In all fairness to my students, I cannot hide my fear and loathing of Gross and Levitt's project in this book, one of the cornerstones of the science wars, for it seems to me to be intended to shut down conversation about STS rather than extend it in any productive direction. And that, of course, is just the opposite of what this proposed course is about.

What will be useful in this section of the course is an examination of the impact
of the war metaphor itself. I see a number of ways my students and I can talk about it. First, of course, framing the discussion over STS in terms of "science wars" has a divisive effect, pitting groups against each other, with the effect that partisan interests eclipse any possible clarification of what humans know. In other words, the metaphor intensifies an existing problem. Second, such divisions tend to be misleading, since not everybody's thinking is going to be representative of the camp in which they have been placed. (We have already seen a similar problem of "representative type" occur in taxonomies.) Not only do these encampments quell the distinction of any one voice in the conversation, they also stymie change. Scientists, scholars, and people in general do sometimes change their thinking on various subjects as new information becomes available. Change and contradiction and even lack of knowledge should not be problematic in research, but in the science wars paradigm, they tend to be treated as such. As we will have learned from Keller, it matters what is and is not said (84). In addition to encouraging students to theorize the causes and effects giving rise to the war metaphor in this description of knowledge production known as STS, I will invite them to consider the impact of some other metaphors to describe the conversations pertaining to science and technology studies.

**Week 12: Science Wars in the U.S.--Call to Arms**

Barry Gross is clearly issuing a "call to arms" in his essay "Flights of Fancy": "We must make no mistake about what it will take to show up the antiscience Luddites for what they are and to defeat them. The two tasks are by no means the same. It will take organized, continuous, strong, and clear opposition" (84). Although Barry Gross's essay does not exemplify the best sort of argumentation that the anti-STS camp can muster (Susan Haack and Stephen Cole come closer to that; see Gross, et al.), it does
exemplify the "battle cry" rhetoric of anti-STSers; it engages the work of Sandra Harding as a case in point; and, by describing critics of science as "utopian," it follows through on an earlier discussion that we have had on Segal's thesis that there is a significant strain of technological utopianism in American culture. Excerpts from the "Flight from Science and Reason conference" in 1996 could also be read as another case study--or another "battle station," to use my metaphor for the following week. My purpose in taking this case study approach to the science wars is, in Hess's words, to set them "in their proper context as only one of the issues that are part of an ongoing dialogue within [STS]." (2)

It is for this reason that I include Gross and Levitt's introduction to an earlier work, *Higher Superstition*. Gross and Levitt's "call to arms" establishes some of this context on its own, for they delve into the history of the "enemy" (34) in this conflict, the academic Left, which paradoxically is exerting so much influence in academia despite holding so little of the power. It may be asking too much of students to consider how Gross and Levitt could have revised this chapter to improve their argument; instead, I will simply ask them to comment on the effectiveness of their choice of words in getting their point across.

Roger Hart critiques Gross and Levitt's book in three ways: first, he comments on the unfairness of their characteristic strategy of criticism out of context, second, he points out their many ad hominem attacks, and third, he analyzes their divide-and-conquer strategy in falsely dichotomizing "science" and "the academic Left." Hart does not minimize the controversies addressed by Gross and Levitt, students need to understand, only their tactics (285). Stanley Aronowitz's "The Politics of the Science Wars" has merit here because of its Marxist argument for the inevitability of a critical theory of science, its analysis of World War II as a turning point in the development of
the current critical mood regarding science and technology, and its contextual references to the Edinburgh School, Merton, and Kuhn.

**Week 13: Science Wars in the U.S.—Battle Stations**

A more apt title for this week's readings would be "Some Battle Stations," for the issues raised here are by no means exhaustive; for example, I leave out the battles stations of public education and environmental policy. To some extent we have already talked about the health care arena as another controversial site via our examination of the opening case studies from science as culture and the implications of "Genetics After Auschwitz." I also need to bring to students' attention, for example, that critics of STS are raising some of the thornier concerns from philosophy of science that Hess talks about in his first chapter, like the various kinds of relativism and constructivism (Hess 34-39). But these issues do not occupy the kind of social, cultural, and political spaces that I think typify the character of the science wars in the United States. Thus this week's readings are thematically linked by the sociopolitical concepts of gender and race and the real versus imaginary cultural spaces of academia and Americans' changing concept of "the frontier."

Putting Sandra Harding and Donna Haraway in conversation is something I have been meaning to do lately; the two are often cited together as though their ideas were similar (Dienst; Grassie), but I find this pairing problematic on two key points: Harding's use of the concept of "gender" as foundational and her belief in emancipatory knowledge projects, and Haraway's resistance to both of these. Rather than ask my students to theorize these differences, my goal is simply to introduce them to these concepts. That two feminists might diverge so significantly in their theorizing is a fact that eludes Gross and Levitt, but I am optimistic that my students will be
sophisticated enough to figure this out from reading Harding and Haraway together. For a notebook entry, I will ask students to compare Harding’s notion of “standpoint” epistemology with Haraway’s depiction of the “modest witness” in the context of the technological or scientific project of their choosing. How does gender influence what the modest witness sees or does not see in, for example, the re-engineering of the Ford Thunderbird? What social, cultural, and historical factors might account for a shift in his or her standpoint? Reading the selection on race from Haraway’s Modest Witness may help students to get a sense of the “messy materiality,” as Haraway would say, of the “technoscientific productions” in which we are all not only witnesses but participants. Although from the page numbers on the syllabus this reading passage may seem too lengthy, it includes several pages of illustrations, photos, and Haraway’s characteristic kinship categories. With this chapter, Haraway does much to show the uses and abuses of taxonomies, which will be an ongoing discussion in this course.

Despite my “quarrel” with Gross and Levitt, they do raise an important point in their chapter “Auspiciating Gender” that is relevant beyond this battle station: how much knowledge of a particular science or technology does one need to have in order to critique it effectively? Gross and Levitt use Harding’s critique of sexism in physics as a case in point; this is also the question at the heart of the Alan Sokal/Social Text affair, a single episode that I think is having a more lasting impact on the direction of the science wars in the academy than all the efforts of Gross and Levitt. If the concept of “peer review” is not clear to my students by now, discussing Alan Sokal’s hoax on Social Text will give me an opportunity to explain to them how this self-regulating activity works within a thought collective. I hope to show through our discussion of this incident that the responsibility in academic publishing runs in both directions: the
researcher in submitting honest work, and the reviewer in assessing it closely and thoroughly. The fact that peer review did not work in this case brings up a larger question, which Sokal in his commentary in *Lingua Franca* seems not to want to acknowledge: how important is it for knowledge communities to be able to talk to one another? (For that matter, how *possible* is it, considering that sometimes even those within the same discipline have trouble communicating because of their specializations?) Within the context of the science wars, I will ask students to consider whether Sokal inadvertently ends up advocating for just this kind of conversation to take place, or whether he is merely occupying another battle station.

Nye’s chapter on post-Cold War changes the United State’s space program shows how technology occupies the highly mediated battle station of space which, during the Kennedy administration, was America’s “New Frontier” (147). Nye’s focus on the role of television in mediating the Apollo program puts a different spin on Haraway’s modest witness. We can also frame Nye’s analysis of the space war in terms of Hess’s presentation of critical technology theorists like Lewis Mumford and Langdon Winner, who examine technological development as a sort of politics by other means (Hess 123-25).

**Week 14: Science Wars in the U.S.—Toward Detente**

The relatively light reading load this week is not to say that little progress toward “detente” in the science wars has occurred. Rather, I am giving students more time to finish their research and write up their semester projects.

Like Hart, Katherine Hayles is responding directly to Gross and Levitt’s attack on science and technology studies. However, rather than evaluating their argument, as he does, Hayles’s mission here is to locate common ground within STS. It is an effort to rally the troops, yes, but it is also an effort to improve rigor in STS via the kind
of self-regulatory activities typical in thought collectives. And, Hayles concludes, "we should speak to others besides ourselves" (236). At this point, students should be able to articulate whether they think STS is cohesive enough to be a thought collective, which touches on the larger issue of cross-disciplinary coherence that frames Hess's book. George Levine and Emily Martin also share a desire to find common ground in the science wars. Levine's "for" in the title of his essay, for example, suggests that like Hess, he sees a purpose for STS, though one that entails some risk: "What do we think," Levine asks his fellows in STS, "about scientists taking our discourse seriously enough to suggest to us how should do ours?" (125). In short, Levine wants his colleagues to consider their objectives more carefully and to spell them out more clearly. His essay exemplifies the self-reflexivity necessary for a more rigorous STS as well as the "thought-into-action" approach to doing academic research that is one of the goals of this course.

Week 15: The Future of STS in the U.S.

In my closing discussion with my students I want to reiterate Hess's point that the United States version of science and technology studies--as evidenced in the "science wars" controversy spearheaded by Gross and Levitt and exacerbated by Sokal--tends to be identity politics-inflected and, I would argue, anti-humanities. Whether they agree with this assessment or not, and why, would make a useful notebook entry, inviting students to reflect on the whole course. (By this point they will know that it is all right to disagree with the instructor!) After reading Hess's final chapter describing strategies for "intervention" in "the institutions of science and technology, technology use patterns, policy processes, and even the 'content' of science itself" (150), I will ask students to consider why the United States lacks the kind of citizen review and participation the is now taking place in Europe. What are
some possible factors in American research institutions, government, and industry that might mitigate against this presumably more democratic way of doing science or make it unnecessary?

Finally, the essays by Sandra Harding and David Dickson contribute further to the course goal of thinking "outside the box"—the "black box," as Latour might call it—of academia. Harding, in asking what might be the "Role for Postcolonial Histories of Science and Technology Studies," surveys the international impact of STS after colonialism, defining terms like "eurocentrism" (12) and offering different ways to think about postcolonialism. Dickson, by answering his question, who will undertake projects to democratize technological innovation? gives examples of coalitions of academics and non-academics working together on a global scale who have already begun to do just that.
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