

How Credit for Scientific Knowledge Is Appraised

Although transcending your origins in order to evaluate them has been the opening move in cultural criticism at least since Jeremiah, it is surely a mistake to take this move at face value; not so much because you can't really transcend your culture but because, if you could, you wouldn't have any terms of evaluation left—except, perhaps, theological ones.

— WILLIAM BENN MICHAELS,
The Gold Standard and the Logic of Naturalism, 1987

During what Samuel Florman has called “the Golden Age of Engineering” from 1850 to 1950 (6), technical writing gained authority as a discourse by virtue of its position as the lingua franca of engineering and scientific knowledge. Technical writing made engineering knowledge material, engineers were intellectual leaders in the United States, and technical writing was the currency representing the cultural exchange value of their practices. It is little wonder that, in this golden age of engineering, technical writing should begin to exhibit traits of a budding profession in the United States. Technical writing practices, for example, were compiled into textbooks. This act of compiling gave authority to the discourse of technical writing and worked to transform the status of engineering writing from a “sort of literary effeminacy” (Rickard, *Guide* 9; see also 129) to “one of the most valuable subjects you will study in college” (Anderson 4).

At the same time as this shift to professionalism occurred within technical writing, the role of technical writing within our culture remained largely unchanged. It continued throughout this century to stabilize our culture's system of knowledge and power based on scientific knowledge. Technical writing worked to control behaviors of people making knowledge in scientific laboratories, people making technological goods in factories, and people managing processes or services in fac-

tories or retail establishments. It was through technical texts that scientists received credit for their ideas and rewards that might accrue from these credits. Technical records tracked employee and machine production in factories, as well as distribution and sales of goods, thereby enabling managers to determine reward structures for employees and stockholders. Technical writing has been used to track the activities of people and machines, with the goal of assigning value to those activities. Technical writing is the control mechanism of scientific and technical knowledge production. As technical writing gained professionalism and power throughout the 20th century, it has become the subject of disciplinary study. Researchers in technical and professional communication have studied technical writing products and practices in order to improve the efficiency of this control mechanism. In the first half of the century, this study was primarily limited to grammatical advice, exposition of forms, and basic rhetorical principles of audience awareness. Most technical writing study was published in textbooks or handbooks aimed at an audience of engineers, managers, or engineering students. These were the people who practiced technical writing as part of their professions or professional preparation. Specialist technical writers did not appear until after World War II, when some organizations split some communication functions from research and development functions in order to make technology development more efficient. During this last half of the 20th century, technical writing developed as a specialized profession apart from the science and engineering professions. Although the subject matter of technical writing was scientific and technological knowledge, its practitioners were not necessarily scientists or engineers. Yet technical writing continued to control knowledge production in these fields and the rewards that accrued from this production.

WHO GETS CREDIT?

In a system of scientific knowledge production where individuals are rewarded for their ideas, technical writing is the apparatus for assigning credit and value for these ideas. In one aspect, technical writing separates out people who are qualified to accrue rewards for scientific knowledge from those who are not qualified. In this sense, technical writing refines the pool of people eligible for rewards accruing from the production of scientific knowledge. This smelting function is socially important to maintaining a system in which people with scientific and technical knowledge hold power to shape social decisions. As Jacques Ellul argued, in a society where people with technical or scientific

knowledge can “direct the nation according to their technical competence” (24), specialized language becomes an important instrument for determining who has the technical competence to become eligible for that society’s rewards. Only people who know the specialized language and can turn this knowledge into specialized practices are eligible for the power, influence, and funding that accrue from that knowledge. “This is one of the important aspects of the power that ordinary people do not share” (Ellul 27). Technical writing serves to stabilize this social distinction between people who have technical knowledge and those who do not. Technical writing is a tool for appraising people based on their knowledge, thereby working to ensure social stability.

This transactive nature of technical writing is not lost on practicing scientists, as evidenced by Bruno Latour and Steve Woolgar’s interviews. They quoted one younger scientist estimating the value of his work in a knowledge economy: “This instrument can bring me ten papers a year” (190). Another scientist estimated the return on his research investment as communicated in writing: “[M]y ability to find a job in research again will be increased in one year when the papers we are writing now will be published” (191). These are two of many statements Latour and Woolgar heard in which scientists employed economic metaphors to describe their knowledge production. This weight of evidence suggests that many scientists envision themselves participating in an economy of scientific knowledge, where technical writing is the instrument for making their knowledge material for valuation by their peers. Through this writing, scientists work together to assign value and rewards to ideas that conform to the group’s “forceful and coherent characterisations of their social and intellectual world” (Gilbert and Mulkay 137). In this world stabilized through the instrument of technical writing, scientists, in turn, become “malleable” agents working in an economy of scientific knowledge: “In the laboratory, scientists are ‘methods’ of going about inquiry; they are part of a field’s research strategy and a technical device in the production of knowledge” (Knorr Cetina, “Couch” 119). When scientific workers can be shaped by the social power of technical writing, they become, like the writing itself, instruments of knowledge production and appraisal in a stabilized economic system.

WHAT RESEARCH DOES NOT SEE

Although technical writing is an important instrument for stabilizing an economy of scientific knowledge, this cultural role has not been ad-

equately studied in technical writing research. After years of research, technical writing professionals cannot fully answer questions about how technical discourse participates in culturally grounded contests for knowledge and power. We cannot explain why ideas and practices that were legitimate less than 100 years ago are no longer legitimate. We do not understand how technical writing provides a currency for scientific knowledge. How can communication researchers uncover institutional systems of discourse formation that will help us address these uncovered issues? We can begin by examining how a research model based on critical theory provides a vocabulary and framework for researchers to discuss issues of knowledge and power. Two articles written by Lucille McCarthy, both dealing with the *Diagnostic and Statistical Manual (DSM)* charter document in psychiatry, provide a comparison through which we can see how research based on critical theory enables researchers to illuminate institutional relationships of knowledge and power reflected in discourse practices.

In the first of McCarthy's two articles, she examined how the constraints of the *DSM-III* shaped psychiatric practice. Using a social constructionist research framework, McCarthy's 1991 study resulted in a descriptive account of the psychiatric practices she observed in a hospital with the help of her friend, child psychiatrist Dr. Joan Page Gering. In setting up the study situation near the beginning of her report, McCarthy alluded to silenced points of view in her explanation of how a biomedical model of psychiatry gained dominance over an interpretive model through a revision of the charter document: "*DSM-III* is a charter document is [sic] psychiatry, and the particular reality that it stabilizes is the biomedical conceptual model of mental illness" (359). McCarthy went on to explain how, in the biomedical model of psychiatry, "each patient exhibits a form of human activity which can be correlated with biological, psychological, and sociological variables" (362). She contrasted that to the interpretive model, in which "each patient presents 'an exercise in hermeneutics: a reading of the books of consciousness and behavior for their hidden meanings'" (362). What is unsaid in McCarthy's comparison is that the biomedical model of psychiatry allows for more quantified diagnoses, since patients' behaviors relate to scientifically described variables. Once a psychiatrist completes the *DSM-III* checklist describing the patient's behavior, that psychiatrist will be able to prescribe medications and other therapies, and determine how long the patient should be institutionalized or treated as an outpatient. This type of standardized diagnosis is far more amenable to insurance reimbursement, hospital administration,

computerized record keeping, pharmaceutical monitoring, and psychiatrist treatment planning than psychiatric diagnoses rendered using the interpretive model. In addition, the biomedical model works to give psychiatrists the same professional status as medical doctors, who also use a biomedical model of physical illnesses for their diagnoses.

In her article on *DSM-III*, McCarthy described how the psychiatric profession ensured that a scientific biomedical model was valued over an interpretive model of psychoanalysis. But in using a case study approach and a social constructionist research framework, she was not able to explore the political, economic, or social implications of her findings. Instead, McCarthy could simply describe the process of valuation without analyzing its cultural implications: “[I]t is certain that the dominant perspective of virtually all of the 130 members of the American Psychiatric Association task force which developed *DSM-III* was biomedical. These people were chosen on the basis of their clinical and research experience, and most had made ‘significant contributions’ to the literature in diagnosis” (362). The people who determined what counted as “‘significant contributions’ to the literature in diagnosis” were influenced by cultural pressures and conflicts that shaped the makeup of the *DSM-III* task force and, through that document, the practice of psychiatry—conflicts between practitioners of the biomedical and interpretive models of psychiatry, pressure to elevate the status of the psychiatric profession relative to the medical profession, pressure to receive a higher level of insurance funding, pressure to make record-keeping more efficient through the use of computers, conflicts between what is legitimated as scientific knowledge and what is marginalized as non-scientific lore.

The case study reported by McCarthy suggested enough cultural conflict to prompt a response from fellow communication researcher Carl Herndl. In his response, Herndl called for “new research to investigate the ideological work and the struggles that occur within professional discourse” (“Teaching Discourse” 361). This call for a study of technical writing practice within a cultural framework was based on the current state of social constructionist research in technical and professional communication, which is predominantly descriptive but not critical. By looking more closely and critically at tensions like those between the biomedical and interpretive models of psychiatry in McCarthy’s article, technical communication researchers can uncover and analyze political and ideological contests in practices that work to legitimate some knowledge and marginalize others.

LOOKING AT TECHNICAL WRITING
THROUGH A CULTURAL STUDY FRAME

McCarthy and Gerring responded to Herndl's critique in a subsequent article, in which they took a critical approach to examining the political effects of the next revision of the *Diagnostic and Statistical Manual, DSM-IV*. Instead of describing the effects of *DSM-IV* on one hospital's organizational culture and making generalizations about charter documents based on this description, McCarthy and Gerring's critical study analyzed relationships of the revised *DSM* to other cultural elements within a situated context. They found that this particular document had the following effects: "(a) to further solidify the dominance of the biomedical model of mental disorder within psychiatry, (b) to maintain the position of psychiatry as the high-status profession among competing disciplines within the mental health field, and (c) to achieve acceptance of psychiatry as a mature, research-based specialty within medicine" (149). In their critical study, McCarthy and Gerring could talk about how the *DSM-IV* influenced trends in the psychiatric profession, how it affected relationships between psychiatry and other professions, how it worked to legitimate biomedical knowledge as dominant in the medical professions. These issues of change, power, and knowledge were tacit in these authors' first case study of the *DSM-III*. They came to light explicitly when the authors used a critical research approach to the *DSM-IV*.

Applying this critical approach to analyzing technical writing illuminates issues of power and knowledge in technical writing practices, as exemplified in McCarthy and Gerring's second article. Although a few researchers in technical and professional communication have begun to explore how technical writing practice and pedagogy are implicated in cultural contexts in which they are practiced,¹ the bulk of research in this field relies on a social constructionist paradigm that isolates the object of inquiry for the purpose of analysis. This social constructionist research paradigm gained prominence within composition studies in the 1980s in part as a compensation for earlier cognitivist studies—exemplified by the work of Flower and Hayes—that focused on universal psychological actions within "the mind" as a way to explain how individuals composed texts. The social constructionist approach allowed researchers to take into account influences on a writer that they saw as arising outside that writer's own mind, influences such as group or "community" affiliations,² organizational or professional affiliations,³ or relationships between writers and readers.⁴

Some social constructionist researchers sought to synthesize their social position with the cognitivist position to come up with an approach that saw writing as stemming from an individual's mental representations of a social communication situation.⁵ Other social constructionist researchers sought to combine their social position with one influential aspect of cultural contexts of communication—gender—to more fully explain nondominant patterns of communicating.⁶ But even this inclusion of gender as one aspect of a cultural context for communication could not illuminate a wide range of cultural influences affecting a given communication. The social constructionist approach enabled researchers to talk about some influences external to an individual's mind that affect how that individual composes, such as group norms or specialized languages. But even with this recognition of social influences, the constructionist approach has two main limitations: (1) it maintains a decontextualized object of study⁷ and (2) it does not allow researchers to address changes, contradictions, or conflicts in the object of study that can point to sites of ideological tension being played out in practice. It does not allow researchers to explore how technical writing practices work to legitimate some types of knowledge while marginalizing other possible knowledges.

An example of how the social constructionist research framework has been applied can be seen in an article by James Paradis, David Dobrin, and Richard Miller (1985) entitled "Writing at Exxon ITD: Notes on the Writing Environment of an R&D Organization." In this article, the authors looked at "what motivates research and development (R&D) employees to write and edit their internal work documents or how the industrial environment influences the way in which employees carry out these processes" (281). They computed totals and percentages of time spent writing by staff, supervisors, and managers; they looked at how documents are cycled among staff, supervisors, and managers; they looked at conflicts between staff/writers and supervisor/editors over close editing revisions. They found that writing is linked to job responsibilities, productivity, and notions of information transfer. They identified social functions in which writing participates, including work management, self-promotion, networking with a community of colleagues, accountability, idea stimulation, and self-education. But they kept these activities confined within the boundaries of Exxon, which was an organization isolated from its cultural context for the purpose of analysis. The notion of corporate culture used in this study was useful for describing existing practices as R&D staff wrote documents. But it did not allow an examination of the power structure underpinning existing practices in which supervisors'

ideas must be followed by staff members or in which writing is seen as participating in larger issues of self-promotion and accountability (within and external to Exxon). This approach to the “social” missed how technical writing within Exxon worked to stabilize Exxon’s position in relation to its competitors, the government, its customers, its suppliers, etc. This study could not analyze how Exxon’s writing participated in an economy of technical knowledge and power.

The communication practices these researchers observed within Exxon were described, but the assumptions they were based on were misrecognized⁸ as “natural” or inevitable practices. The R&D people at Exxon could not be seen as participating in a culture that extended outside the corporation, in which government contract bidding, legal liabilities, inter-corporation competition for profits, and public image played a part in their decisions about report writing—a culture where corporate practices are shaped by tensions among institutions. Although Paradis, Dobrin, and Miller gave us one view of how organizational communication is structured within Exxon, it is important to note that even a corporate culture extends beyond the corporation’s walls. A wider cultural context exists prior to the R&D writers’ observed practices, shapes their practices, and in turn is shaped by their practices. The social constructionist paradigm illustrated in this Exxon study does not provide a framework to set R&D practices at Exxon within a context of political, economic, ideological tensions.

In this and other articles, the authors misrecognized description for prescription and called for technical writing pedagogy that teaches students to reproduce the types of texts found in the organizations studied.⁹ These prescriptions based on observed practices can help students make the transition from the academy to the corporation by preparing them to maintain existing knowledge, which is certainly an important component of workplace performance. But because these prescriptions do not adequately prepare students to deal with issues of difference and change within organizations, some cultural researchers have questioned the effectiveness of this approach.¹⁰

In one study that analyzed culture in an inclusive sense, Steven Katz illustrated the importance of difference and change by exploring discourse practices within the community of Nazi Germany. Katz argued that Hitler’s rhetoric had its own ethic—the ethic of expediency—that formed a coherent foundation for his programs and propaganda. Katz analyzed texts written by Nazis to show how

[i]n Nazi Germany (and I will suggest, in our own culture) science and technology become the basis of a powerful ethical argument for

carrying out any program. Science and technology embody the ethos of objective detachment and truth, of power and capability, and thus the logical and ethical necessity . . . for their own existence and use ("Ethic of Expediency" 264).

In a traditional application of social constructionism, Katz would have described how Hitler constructed an ethic of expedience that became standard discourse practice within his organizational community. He would have made generalizations about this discourse practice and would probably have recommended remedies to counteract its persuasive power through propaganda. But Katz chose to place Hitler's discourse within a historical context to understand how his propaganda valued technical knowledge while devaluing humanistic knowledge. Katz put forward this example to illuminate a similar condition in our own culture and serve as a warning against runaway technocracy. He used this extreme example to illustrate how an economy built single-mindedly on scientific knowledge can ultimately threaten our social systems. While admitting that the Nazi example is extreme, Katz clearly placed current technical writing practices in contests for power and knowledge legitimation, a research outcome that relies on a critical approach to the object of inquiry and could not be accomplished with conservative description alone.

That social constructionist studies of technical writing ignore political struggles does not place technical writing outside these struggles for knowledge legitimation. Instead, studies that ignore legitimation struggles tacitly conserve existing relations that technical writing stabilizes within an economy of scientific knowledge. In other words, when researchers do not explore tensions and struggles embodied within technical writing, their research may help to change surface features of the knowledge system, but it will not change power relationships within that system. Technical writing practices based on this conservative research will continue to stabilize an existing economy of scientific knowledge that technical writing controls. In this vein, Carl Herndl argued that pedagogy based on social constructionist notions of consensus-based community discourse conventions works to reproduce systems of power and knowledge, not to critique or change them: "[T]he idea of cultural (re)production and the theory of resistance present the major political challenge to the work of social or epistemic rhetoric in professional writing research" ("Teaching" 353). In calling for researchers to critically analyze discourse practices in addition to describing them, Herndl urged researchers to combine institutional critique with constructionist approaches to "see how discourse and the

reality it constructs are shaped by the political, economic, and material interests of professions and the institutions they create" ("Teaching" 354). By re-viewing social constructionist research, like McCarthy's *DSM-III* case study, to look for sites of institutional contests for knowledge legitimation, researchers can locate places for critical analysis of how discourse practices participate in the politics of professional and institutional relationships.

An example of how we could push the boundaries of a social constructionist research framework to include cultural critique can be illustrated by examining the article "Social Context and Socially Constructed Texts: The Initiation of a Graduate Student into a Writing Research Community" by Carol Berkenkotter, Thomas N. Huckin, and John Ackerman. In this article, the authors described how a new Ph.D. student "Nate" at Carnegie Mellon University (CMU) changed his writing practices during his first three semesters in that university's rhetoric and composition program. Describing his context as "entering a new discourse community," the authors showed how Nate learned to use conventional textual forms in introductions to his research papers. They explained that Nate was a novice in this discourse community at the beginning of his first semester, even though he had been an English teacher prior to entering the CMU program. They found he struggled in "making the transition from *composition teacher* to *composition researcher* (i.e., from practitioner to specialist)" and that this struggle "involves a difficult passage from one academic culture to another" (Berkenkotter's italics, 211).

In this study, the view of CMU culture in which Nate learned how to make the transition from teacher to researcher was limited to the confines of one university (just as the Exxon study limited culture to the confines of one corporation). When the authors raised questions that pointed to the academy as an institution within a larger cultural context, they truncated the questions at the borders of the academy:

How . . . do the sociopolitical constraints that govern the "manufacture of knowledge" (Knorr-Cetina) in this emerging field affect a graduate student's choice of research program? To what extent are the issues that concern composition teachers subsumed by the agendas of mentors as they join powerful research or scholarly enterprises, such as the one that we studied? How will the increasing graduate specialization in rhetorical studies and educational research affect the development of the canon within composition studies? (212).

As in the Exxon study, this research report left unexamined the roles of the academy, the disciplines of composition studies and technical

writing, and practices of writing researchers as cultural agents participating in historically localized relations of power and knowledge. This study isolated observed practice and misrecognized it as “natural” and inevitable—as common sense.

Both the Exxon and the CMU articles assumed that discourse studies should be valued more highly within the humanities. Both assumed that adopting scientific approaches to their objects of inquiry would help increase the value of their findings in the eyes of their writing studies colleagues, in the eyes of their colleagues in the humanities, and hopefully in the eyes of their colleagues in the sciences and the institutional administrators who make funding decisions, as well as the corporations, non-profit foundations, and governmental agencies who fund university research. Both studies decontextualized observed practices and assumed that the purpose of teaching technical and professional writing in the academy is to prepare students to fit into existing practices in other institutions.

Because of their research design, these studies could not question how, at the particular moment of the study, the academy participated in cultural relationships with other institutions such as the government, business, and industry. Examples of these relationships could be found in research grants from government, non-profit organizations, and industry to support projects at the university; consulting positions in business and government filled by professors from the university; government and private sector scholarships funding student tuition and expenses at the university; publishing industry practices affecting the careers of professors whose promotions are based in part on their publishing records. These studies could not examine how pressures to win a government contract, for example, might have affected the writing practices at Exxon or how pressures to publish research reports may have affected the type of research valued at Carnegie Mellon University. Nor can these studies examine how people in the academy use difference and resistance to accomplish non-dominant, devalued, or non-legitimated practices within a historically situated institutional hegemony. We cannot see if Nate used his knowledge from teaching English to help him practice the discourse conventions of research at Carnegie Mellon. We cannot see if the writers at Exxon used sections from previously written documents to make their writing tasks less time-consuming or whether they asked colleagues at other corporations or in government for insights into writing situations. We cannot know whether the writing assignments were distributed equally among the staff, or whether some people had the power to reassign their writing tasks to other employees.

PUTTING TECHNICAL WRITING
PRACTICES IN CULTURAL CONTEXTS

Researchers in technical communication have only begun to explore how technical writing is involved within historically situated institutional relationships of knowledge and power—how some types of knowledge are valued and legitimated through technical writing practice, while other possible knowledges are devalued or excluded as marginal. Yet, as Vincent Leitch argued, institutions are active agents in creating and (de)stabilizing systems of knowledge and power: “Institutions include . . . both material forms and mechanisms of production, distribution and consumption and ideological norms and protocols shaping the reception, comprehension, and application of discourse” (127–28). If the purpose of critical research is to understand and improve the practice under inquiry—or to facilitate change in a knowledge system—institutions where technical writing is practiced need to be reconstructed as cultural agents that are not necessarily bounded by any one organization’s walls.

A limited view of culture does not allow writers of conservative research reports or histories to question assumptions about technical writing practices. In Stephen Doheny-Farina’s exploration of technology transfer *Rhetoric, Innovation, Technology*, for example, technical writing was seen not as a transfer of information, but as participating in a “series of personal constructions and reconstructions of knowledge, expertise, and technologies by the participants attempting to adapt technological innovations for social uses” (ix). Although Doheny-Farina placed technical writing practice in a social setting, he assumed that problems in technology transfer have more to do with the quality of the technical texts than with economic, political, or social pressures or conflicts affecting a situated writing practice. In his analysis of McCarthy’s case study of the *DSM-III*, Doheny-Farina generalized that “the charter document stabilizes the actions of the members of the discipline and the ways that they think about issues in the discipline” (26), thus forming a “constraint that gives shape to a discipline” (27). While it may be accurate to say that a charter document such as the *DSM-III* forms a constraint that shapes a discipline, this view of McCarthy’s study focuses on the “how” of the document and does not ask “why.” In other words, Doheny-Farina can describe how a text shapes practice, but does not question why the text includes the information that it does and not other information that would be equally possible to include—why the text legitimates some kinds of knowledge and not others. And further, what systems of power does the

knowledge legitimated in the text uphold and what other possible systems of power does the text make impossible?

Similarly, when Doheny-Farina analyzed the Paradis, Dobrin, and Miller study of "Writing at Exxon ITD," he found that their writing practice "becomes part of the process of developing an organizational identity; it becomes part of the process of group membership" (*Rhetoric, Innovation* 28). Social influences that form the culture under investigation in this analysis of the Exxon study are limited to the interior of the Exxon Corporation. The "social" in "social constructionist" here extends to a group of people within one organization. The limitations of confining culture within the walls of one organization are illustrated in Doheny-Farina's consideration of a 1991 article by Herndl, Fennell, and Miller in which these authors examined miscommunication and misunderstanding in the Three Mile Island and *Challenger* disasters. Doheny-Farina constructed the communication problems that contributed to the *Challenger* disaster as problems of technology mediation: "Issues of texts miscommunication and misunderstanding . . . involve the failures of texts to mediate technology to users" (*Rhetoric, Innovation* 28). This focus on the technical writer's role as mediator between technicians and users allowed Doheny-Farina to explore how technical writers uphold science and technology's dominant knowledge economy within our culture. But it did not question what influences other than miscommunication might have contributed to the misunderstandings described in the Herndl et al. article. For example, the decision to go ahead with the *Challenger* launch was made despite evidence of previous O-ring erosion and a forecast of record cold weather at launch. Morton Thiokol engineer Roger Boisjoly argued for safety and against the launch at a meeting with NASA representatives the night before the *Challenger* was launched. He later suggested an extra-textual factor creating pressure to launch: Morton Thiokol was in the process of negotiating a \$1 billion contract with the U. S. government for space shuttle parts and the government was considering second-sourcing Morton Thiokol. NASA staff were intent on launching and, during the pre-launch meeting, asked Morton Thiokol management to "rethink" their recommendation not to launch. Morton Thiokol reversed its no-launch recommendation to acquiesce to NASA's wishes, despite Morton Thiokol engineers' warnings about unsafe launch conditions. More than a simple case of misunderstanding, discourse surrounding the decision to launch the *Challenger* was influenced by economic and political considerations that legitimated some knowledge (the managers' judgment and decision to launch) and marginalized other knowledge (the engineers' data and warnings).

The knowledge legitimated in this case was clearly participating in an economy of institutional power.

If the "social" in a social constructionist framework generally resides within an affiliated group, "culture" within this research framework is similarly limited to reside within an autonomous group.¹¹ In an example of separating a governmental agency's discourse practices from their context of political influences, Susan Kleimann assumed that culture resides within a governmental organization (the General Accounting Office) in her study entitled "The Reciprocal Relationship of Workplace Culture and Review." Kleimann confined the idea of culture either to divisions within the General Accounting Office (GAO) or to the GAO as an isolated governmental entity and described how the organization's values influence document review practices:

Two major influences shape aspects of GAO's culture. First, GAO reports often result in changes to national policy, legislation, and funding; second, until recently, most GAO employees were educated as accountants, valuing minutiae and accuracy. Consequently, the agency has a cautious culture that demands maintaining detailed and extensive workpapers, referencing all facts to these workpapers, wanting both accuracy and objectivity and requiring an extensive review process (58).

While Kleimann noted that GAO texts are influential in shaping national policy, legislation, and funding decisions, she confined the culture discussed in her study within the boundaries of the GAO. While she obviously studied one of the major institutions in any culture (the government), she did not ask how national and international political tensions shaped GAO texts and how politics were in turn shaped by GAO texts. She studied governmental technical writing, but did not place it in an international economy of knowledge.

The limited and conservative view of culture found in most research in technical and professional communication was articulated in Jack Selzer's description of intertextuality: "Indeed, 'context' or 'environment' or 'setting' or 'culture' might be understood as nothing more than a complex of language and texts, and individuals within an environment therefore might be understood as minds assimilated into its concepts and terminology" (172). Or further: "Readers and writers experience the flow of culture as a kind of collaboration among seen and unseen authors and texts and readers, all in the process of making sense. One job of the critic of culture . . . is to uncover the various resonances inscribed in the tapestry of text and to account for their source,

their intricacy, and their meaning" (179). While Selzer's view of culture did acknowledge that cultural criticism involves itself with meaning, his view did not involve texts in tensions within situated ethico-political relations of power and knowledge—where knowledge legitimation is contested by various interested groups and "making sense" means something different depending on your point of view. To view culture as a "kind of collaboration" works to sanitize what Walter Benjamin described as barbarism inherent in the spoils of war (for cultural legitimation):

Whoever has emerged victorious participates to this day in the triumphal procession in which the present rulers step over those who are lying prostrate. According to traditional practice, the spoils are carried along in the procession. They are called cultural treasures .

There is no document of civilization which is not at the same time a document of barbarism. And just as such a document is not free of barbarism, barbarism taints also the manner in which it was transmitted from one owner to another ("Theses" 256).

"Making sense" within a framework of contests for knowledge legitimation is not merely a "kind of collaboration." From a critical point of view, making sense for the victor is not making sense for the vanquished, who might ask why their knowledge must be silenced.

In *The Differend*, Jean-François Lyotard described the silencing of non-legitimated or devalued knowledge as a "wrong" suffered in "a case of conflict, between (at least) two parties, that cannot be equitably resolved for lack of a rule of judgment applicable to both arguments" (xi). Because there is no universal rule for equitable judgment, actions taken through discourse must privilege one way of knowing over other possible ways of knowing. Unlike a simple idea of consensus-based collaboration, Lyotard's theory of discourse production holds that power is distributed unevenly among possible ways of knowing. Basing his description on how phrases are linked in discourse, Lyotard found, "In the absence of a phrase regimen or of a genre of discourse that enjoys a universal authority to decide, does not the linkage (whichever one it is) necessarily wrong the regimens or genres whose possible phrases remain unactualized?" (xii). Using Lyotard's theory, discourse becomes a contest for legitimating knowledge and culture is more hegemonic than simply collaborative. Discourse becomes a struggle mediated by culture. Technical writing participates in that struggle by working to assign value to scientific knowledge, thereby minting the currency for its economy. Devalued knowledge,

like a counterfeit coin, will not circulate widely in this economy; highly valued knowledge will circulate widely as the genuine coin.

Struggles for value are contained within technical writing. For Michel Foucault, discourse holds histories of struggles for knowledge legitimation and the articulated discourse subsumes other discourses that were possible, but not articulated. In arguing for the study of culture through discourse analysis, Foucault described how the legitimated knowledges articulated in discourse embody historical struggles for their legitimation and conquest:

In the two cases—in the case of the erudite as in that of the disqualified knowledges—with what in fact were these buried, subjugated knowledges really concerned? They were concerned with a *historical knowledge of struggles*. In the specialized areas of erudition as in the disqualified, popular knowledge there lay the memory of hostile encounters which even up to this day have been confined to the margins of knowledge (Foucault's italics, *Power/Knowledge* 83).

At the margins of knowledge we can find two types of delegitimated knowledges: erudite learning that may have been previously legitimated knowledge, but has been subsumed (or conquered) by other subsequently legitimated knowledges; and naive "know-how"¹² that was previously legitimated as sufficient for carrying out everyday practices, but also has been subsumed by other subsequently legitimated knowledges (usually some sort of science or theory). Technical writing has worked to educate know-how into science through its own technologies of language. This educated know-how can then participate in an economy of scientific knowledge and a culture of technology.

Technical communication, rather than being seen as a simple collaborative effort in which writers mediate technology for users, can be seen as working to legitimate and value some kinds of knowledge while marginalizing and devaluing other possible knowledges. Because technical communication participates in institutional relationships, it works to organize knowledge through science and practice through theory. This organizing activity is found by Michel de Certeau to be a trend in Western culture since the time of Francis Bacon: "[T]he sciences are the operational languages whose grammar and syntax form constructed, regulated, and thus writeable, systems; the arts are techniques that await an enlightened knowledge they currently lack" (*Everyday Life* 66). Because science forms the legitimated language of practice, it is a "writing that conquers" (*Writing of History* xxv) other practices based on naive "know-how":

But at the same time that they acknowledge in these practices a kind of knowledge preceding that of the scientists, they have to release it from its "improper" language and invert into a "proper" discourse the erroneous expression of "marvels" that are already present in everyday ways of operating. Science will make princesses out of all these Cinderellas. The principle of an ethnological operation on practices is thus formulated: their *social isolation* calls for a sort of "education" which, through a *linguistic inversion*, introduces them into the field of scientific written language (de Certeau's italics, *Everyday Life* 67).

If technical communication is the mediator between technology and what we have come to term "users," technical communication practices work to conquer users' naive know-how and reformulate these naive practices into scientific discourse. In so doing, technical communication participates in a writing that conquers naive knowledge by educating it into the technologies of scientific disciplines. Thus, technical writing participates in an economy of scientific knowledge and power within our culture—an economy that can only be illuminated using critical approaches to discourse practices.

A few recent studies in technical and professional communication point to an approach for analyzing professional communication and composition from a historically situated perspective. Richard Freed advocated widening our views of discourse communities beyond "company specific" boundaries to enable analysis of inter-company relationships (213, n. 8), thereby bringing corporate relationships into play and expanding culture beyond one organization. Freed's work also illustrates how using Lyotard's notions of grand narratives and *petit récits* as set out in *The Postmodern Condition* enables researchers to reconceptualize knowledge as historically situated: "Because the shape and tonality of knowledge vary by locale, and because for that locale the tone and temper of its knowledge rings and feels true, truths at one locale may be different from those held self-evident at other sites and from those held at different times at the same locale" (204). Using critical theory allows Freed to explore how technical and professional communication work with situated knowledge that is profoundly shaped by contests for legitimation and which, in turn, shapes subsequent discourse and knowledge.

Other researchers have begun to consider how discourse practices participate in institutional relationships. For example, Bruce Herzberg advocated that composition researchers use Foucault's archaeological research approach "to analyze more closely the role of our institutions and disciplines in producing discourse, knowledge, and power" (80).

He asked this question of the social constructionist research paradigm: "[W]hen the group agrees on standards for sufficient evidence or adequate organization or coherent argument, what is the source of its authority?" (79). This questioning of the basis of authority opens up discussions of how discourse participates in power/knowledge systems. In other words, what power sanctions the authority of the knowledge that is described in observed discourse practices? Ben and Marthalee Barton also asked this question of power and authority in exploring the practice of cartography. They found that maps as discourse practices were closely linked to institutional systems of power and knowledge: "Ultimately, the map in particular and, by implication, visual representations in general are seen as complicit with social-control mechanisms inextricably linked to power and authority" (53). These examples of institutional critique illustrate how discourse can be seen as participating in economies of knowledge and power, exploring why some knowledge is articulated and legitimated while other possible knowledge is marginalized or left silent.

In another example of how critical theory can inform writing research, Lester Faigley explored how subject positions we constitute in composition classrooms rely on teachers' roles "as representatives of institutional authority" (*Fragments* 130). By applying Foucault's archaeology method, Faigley found a technology of confession in writing classrooms where personal narratives are seen as productive of "truths." This technology reproduces existing relations of knowledge and power between teachers and students, in which teachers dominate and students are dominated: "Such an assignment of authority through a teacher's claim to recognize truth is characteristic of Foucault's description of the modern exercise of power. Foucault writes that power is most effective when it is least visible" (*Fragments* 131). Using Foucault's archaeology enabled Faigley to discuss issues of institutional power and individual subject positions in the composition classroom because Foucault's work, and critical theory in general, provide a theoretical basis for recognizing institutional relationships and a vocabulary for discussing power/knowledge systems.

Recent cultural studies of technical communication and composition point to the fruitfulness of an approach based on Foucault's archaeological research methods and augmented by closely related lines of critical theory. Applied to technical communication, this approach can illuminate how struggles for knowledge legitimation taking place within technical writing practices are influenced by institutional, political, economic, and/or social relationships, pressures, and tensions within cultural contexts that transcend any one affiliated group. This

type of cultural study can help to answer questions about why technical writing practices work to value some types of knowledge while devaluing other possible knowledges.

In order to look at struggles for knowledge legitimation that take place within technical communication, researchers can begin by asking Foucault's question, "How is it that one particular statement appeared rather than another?" (*Archaeology* 27). The statements that did appear in technical texts retell stories of the struggles, contradictions, and tensions within historic relations of knowledge and power. These statements also hold the silence of other statements that were possible but did not appear in technical texts at the particular time and place under study. By looking at statements that did appear and positing possible statements that did not appear, the genealogical historian can construct what Foucault called a "systematic history of discourses" (*Birth* 14). Such a systematic history (or genealogy) of discourse asks questions about how one possible discourse was produced and legitimated as knowledge through technical writing, while other possible discourses were not produced and legitimated.

ISSUES IN TECHNICAL WRITING RAISED THROUGH CULTURAL STUDY

This question of how one group's discourse became knowledge within a historically situated culture while another group's discourse was not seen as knowledge strikes at the heart of current discussions of multiculturalism,¹³ gender issues,¹⁴ conflict,¹⁵ ethics,¹⁶ community,¹⁷ and postmodernism¹⁸ within technical and professional communication. In more traditional research designs, these issues are categorized in the familiar language used above. When framed through cultural critique, however, the language used to describe these issues will recast them in poststructural terms. For example, issues of difference (as raised in all the categories listed above) can be recast in these poststructural terms: "Why has common sense about technical writing taken the form it has when other forms of common sense were equally possible? Whose knowledge gained power?" A related wording of this issue could ask, "Why do technical writing practices work to reproduce our culture's power/knowledge system? What ethical issues are at stake in this reproduction?" Issues of technical writing as a discourse could be worded in these terms: "Does technical writing work as a double agent in our cultural language wars between scientific and artistic knowledge legitimation?"

Looking at these questions in more depth, a researcher could question why specific aspects of technical writing practice were shaped as they were through institutional relationships with science, technology, and engineering. Looking at the role of theory in technical writing practice and knowledge, a cultural researcher could ask, "Why is theory implicit in technical writing? How might technical writing's cultural relations be changed if theory was explicit?" Looking at relationships between technical writing and critical analysis, a researcher could ask, "Why does technical writing restrain critical analysis in favor of clarity, efficiency, certainty, and authority?" Looking at relationships between technical writing and history, a researcher could ask, "Is technical writing (a)historical?" This history of technical writing's development will focus on these recast poststructural issues reflecting the categories researchers are currently exploring in the field of professional communication.